



LP Gas & Anhydrous Ammonia Equipment Catalog

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## Determining the Age of Products

All RegO products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of material such as metal and rubber.

The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential.

Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because products are used beyond their safe service life.

The life of a product is determined by the environment in which it “lives.” The LP-Gas dealer knows better than anyone what this environment is.

Since 1960, most RegO products are identified with an alphabetical code indicating the month and the year they were manufactured.

Check the product for this code to determine age. If valves or regulators are repainted, take care to keep the date code clear for later identification and inspection.

### 1960 to 1985 — Two-Letter Date Code

First letter in date code is the month  
 A — January      G — July  
 B — February     H — August  
 C — March        I — September  
 D — April         J — October  
 E — May           K — November  
 F — June          L — December

Relief valves used on ASME tanks carry a numerical code indicating month and year such as 1-75 means January, 1975.

### Second letter in date code is the year

R — 1960	A — 1969	J — 1978
S — 1961	B — 1970	K — 1979
T — 1962	C — 1971	L — 1980
U — 1963	D — 1972	M — 1981
V — 1964	E — 1973	N — 1982
W — 1965	F — 1974	O — 1983
X — 1966	G — 1975	P — 1984
Y — 1967	H — 1976	Q — 1985
Z — 1968	I — 1977	

**EXAMPLE:** DL = April of 1980

### From 1985 to 1990 — Digit Date Code

First digit in date code is the month  
 1 — January      7 — July  
 2 — February     8 — August  
 3 — March        9 — September  
 4 — April         10 — October  
 5 — May           11 — November  
 6 — June          12 — December

### Second 2 digits in date code are the year

86 — 1986	89 — 1989
87 — 1987	90 — 1990
88 — 1988	

**EXAMPLE:** 5-87 = May of 1987

### After 1990 — Digit-Letter-Digit Date Code

First digit in date code is the month  
 1 — January      7 — July  
 2 — February     8 — August  
 3 — March        9 — September  
 4 — April         10 — October  
 5 — May           11 — November  
 6 — June          12 — December

### Letter in date code is the week

A — 1st week
B — 2nd week
C — 3rd week
D — 4th week
E — 5th week

### Second 2 digits in date code are the year

91 — 1991	97 — 1997
92 — 1992	98 — 1998
93 — 1993	99 — 1999
94 — 1994	00 — 2000
95 — 1995	01 — 2001
96 — 1996	02 — 2002
03 — 2003	etcetera. . .

**EXAMPLE:** 6A16 = First week of June, 2016

## Regulator Color Coding

RegO Domestic first stage, second stage, single stage, and integral twin stage LP-Gas regulators are easy to identify. In addition to the standard part number marking which indicates the proper application, each regulator is color coded to help minimize misapplication in the field that can lead

to accidents and costly service callbacks. The color coding system is standard on all 404, LV404, 2302, LV2302, 2403, 2503, LV4403, and LV5503 series domestic LP-Gas regulators manufactured after May of 1986.

- Classic Gold**      Indicates a single stage regulator that is designed to be used alone in single stage systems.
- Brilliant Red**     Denotes a first stage high pressure regulator, normally used in two-stage applications in conjunction with a select brown second stage regulator.
- Select Brown**     Signifies second stage low pressure regulators, designed for use in two-stage systems in conjunction with a brilliant red high pressure regulator — also signifies integral twin stage regulators designed to provide benefits of two-stage regulation in one compact unit.
- Select Blue**        Indicates a second stage 2 PSIG delivery pressure regulator and a line pressure regulator downstream to reduce 2 PSIG to appliance pressure
- Green**                High pressure pounds to pounds anhydrous ammonia regulator.

## Limited 10 Year Warranty and Limitation Of Liability

### LIMITED 10 YEAR WARRANTY

RegO warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships the product to RegO at 100 RegO Drive, Elon, NC 27244, RegO, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used after installation in accordance with RegO's printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

Except as expressly set forth above, and subject to the limitation of liability below, RegO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, with respect to its products and parts, whether used alone or in combination with others. RegO disclaims all warranties not stated herein.

### LIMITATION OF LIABILITY

RegO's total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such cause be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO shall not be liable for incidental, consequential or punitive damages or other losses. RegO shall not be liable for, and buyer assumes any liability for, all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO for technical advice based upon limited facts disclosed to RegO. If RegO furnishes technical advice to buyer, whether or not at buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

**NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from State to State. The portions of this limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.**

### WARNING

All RegO products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of material such as rubber, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammable and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.

### NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of RegO products. Since most users have purchased these products from RegO distributors, the user must within thirty (30) days after the user's discovery of what user believes is a defect, notify in writing and return the product to the distributor from whom he purchased the product/part. The distributor may or may not at the distributor's option choose to submit the product/parts to RegO, pursuant to this Limited Warranty. Failure by buyer to give such written notice within thirty (30) days shall be deemed an absolute and unconditional waiver of buyer's claim for such defects. Acceptance of any alleged defective product/parts by RegO's distributor for replacement or repairs under the terms of RegO's Limited Warranty in no way determines RegO's obligations under this Limited Warranty.

Because of a policy of continuous product improvement, RegO reserves the right to change designs, materials or specifications without notice.



## Foreword

The RegO® section describes a complete line of equipment available from RegO® for use with Liquid Propane (LP)-Gas and anhydrous ammonia (NH<sub>3</sub>). The following points are important to know for proper use of the catalog:

1. Illustrations and drawings of individual products are representative of “product groups” and all products within a product group are similar in construction.
2. Materials used for construction of products in this catalog are suitable for rated service pressure at temperatures of -40°F to +165°F, unless otherwise specified.
3. Products in this catalog are only intended for use in LP-Gas and/or anhydrous ammonia service as follows.
  - a. “A” or “AA” prefix — Products with this prefix are suitable for NH<sub>3</sub> service (i.e., contain no brass parts).
  - b. “AA” prefix on relief valves — These valves are NOT suitable for use with LP-Gas service. These are of partial aluminum materials and are listed by Underwriters Laboratories (UL) for NH<sub>3</sub> service only.
  - c. All other products including “A” prefix are suitable for use with LP-Gas & NH<sub>3</sub> service.
  - d. SS” prefix—Hydrostatic relief valve with this prefix are suitable for NH<sub>3</sub> and LP-Gas service (i.e., they have stainless steel materials).
4. We manufacture valves and adapters designed to be used on LP-Gas and Anhydrous Ammonia systems, we do not design systems or consult in system design. For this type of information consult a professional Engineer.

### Caution

Do not use any product contained in this catalog with any service commodity other than LP-Gas or NH<sub>3</sub>. If you have a need for use of another application, contact RegO, 100 RegO Drive, Elon, NC 27244, (336) 449-7707 [ecii@regoproducts.com](mailto:ecii@regoproducts.com) before proceeding.

Proper application, installation and maintenance of products in this catalog are essential. Users of these products should obtain further information if there are any doubts or questions.

### Notice

Installation, usage, and maintenance of all RegO products must be in compliance with all RegO instructions as well as requirements and provisions of NFPA #54, NFPA#58, DOT, ANSI, and all applicable federal, state, provincial and local standards, codes, regulations, and laws.

Inspection and maintenance on a periodic basis is essential. Installation and maintenance should be performed only by qualified personnel.

Be sure all instructions are read and understood before installation, operation and service.

### Warning

All RegO products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO products are manufactured for storage, transport, transfer and use of toxic flammable and dangerous liquids and gases. Such substances should be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures. Never vent LP-Gas near any possible source of ignition.

### Filters

RegO LP-Gas equipment is designed to operate in a system free from contamination. A variety of in-line filters are commercially available to the LP-Gas industry for installation in domestic systems.

The use of an in-line filter should be considered when other system components may be unclean and the system contaminated by rust, scale, dirt, debris or other foreign material.

## RegO Regulator Dependability

When RegO LP-Gas Regulators are properly installed, safe, precise, trouble-free service is the result.

Dependability is built into every regulator ... the result of rigid standards of quality control and close tolerance machining. And this has been true for more than 90 years.

RegO Products are manufactured from the finest materials, and assembled and tested using procedures second to none.

## RegO Regulator Selection

In order to properly size the RegO Regulator, find the total load of the installation. The total load is calculated by adding up the input ratings (BTU or CFH) of all appliances in the installation. Input ratings may be obtained from the nameplates on the appliances or from the manufacturers' literature.

Determine the type of regulation needed referring to the chart below.

Type of System	Maximum Load	Suggested Regulator
First Stage in a Two Stage System	1,500,000	LV3403TR
	2,500,000	LV4403SR Series LV4403TR Series
Second Stage in a Two Stage System	450,000	LV3403B Series LV3403BR Series
	935,000	LV4403B Series LV4403BD Series
	1,600,000	LV5503B4/B6
	2,300,000	LV5503B8
Second Stage in a 2 PSIG System	1,000,000	LV4403Y4/Y46R
	2,200,000	LV5503Y6/Y8
Integral Twin Stage	450,000	LV404B34/39 Series
	525,000	LV404B4/B9 Series
Integral Twin Stage 2 PSIG Delivery	800,000	LV404Y9
	650,000	LV404Y39
Automatic Changeover	400,000	7525B34 Series
	450,000	7525B4 Series

\* See catalog page for inlet and delivery specifications.

Now determine which regulator in the Series would be most suitable. Turn to the individual product pages and refer to the Performance Curves. Check the performance of the regulator with your actual load conditions at the minimum LP-Gas inlet pressure for the regulator. Use the pressure corresponding to your lowest winter temperatures shown in the chart below or refer to the delivery pressure of your first stage regulator.

Temperature		Approx. Pressure (PSIG)		Temperature		Approx. Pressure (PSIG)	
°F	°C	Propane	Butane	°F	°C	Propane	Butane
-40	-40	3.6		40	4	72	3.0
-30	-34	8		50	10	86	6.9
-20	-29	13.5		60	16	102	12
-10	-23	23.3		70	21	127	17
0	-18	28		80	27	140	23
10	-12	37		90	32	165	29
20	-7	47		100	38	196	36
30	-1	58		110	43	220	45

### Example for a First Stage Regulator

1. Assume a load of 500,000 BTU's per hour.
2. Assume a minimum delivery pressure of 9.5 PSIG.
3. Assume a minimum tank pressure of 15 PSIG.
4. For these conditions, refer to chart for the LV4403TR Series, First Stage Regulator, shown below.

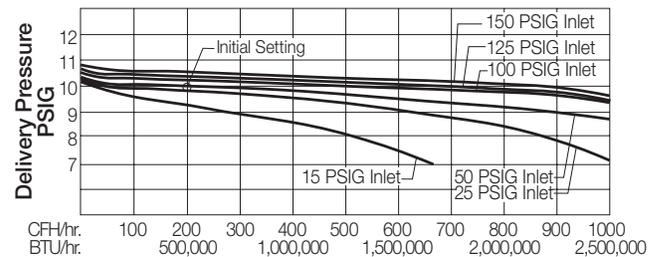
All give you a product that provides accurate gas delivery under varying pressure ranges and load conditions.

RegO LP-Gas Regulators are UL listed and comply with applicable code requirements.

RegO Products offer a complete line of LP-Gas Regulators with capacities for almost every application.

5. Find the line on the chart corresponding to the lowest anticipated winter tank pressure (note that each performance line corresponds to and is marked with a different inlet pressure in PSIG).
6. Draw a vertical line upward from the point of assumed load (500,000 BTU's per hour) to intersect with the line corresponding to the lowest tank pressure.
7. Read horizontally from the intersection of these lines to the delivery pressure at the left side of the chart. In this example the delivery pressure will be 9.7 PSIG. Since the delivery pressure will be 9.7 PSIG at the maximum load conditions and lowest anticipated tank pressure, the regulator will be sized properly for the demand.

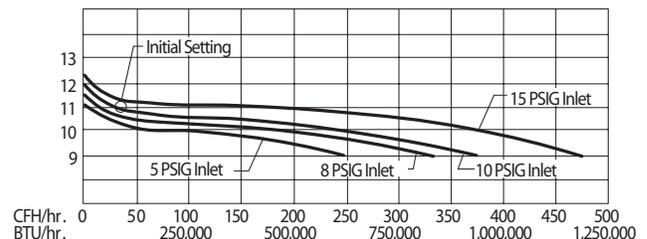
LV4403TR Series First Stage Regulator



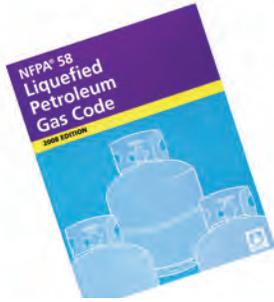
### Example for a Second Stage Regulator

1. Assume load of 250,000 BTU's per hour.
2. Assume a minimum delivery pressure of 10" w.c.
3. Assume a minimum inlet pressure of 10 PSIG.
4. For these conditions, refer to chart for the LV4403B Series, Second Stage Regulator, shown below.
5. Find the line on the chart corresponding to the anticipated inlet pressure.
6. Draw a vertical line upward from the point of assumed load (250,000 BTU's per hour) to intersect with the line corresponding to the lowest inlet pressure.
7. Read horizontally from the intersection of these lines to the delivery pressure at the left side of the chart. In this example the delivery pressure will read 10.6" w.c. Since the delivery pressure will be 10.6" w.c. at the maximum load condition and lowest anticipated inlet pressure, the regulator is sized properly for the demand.

LV4403B Series Second Stage Regulator



## Safety Warnings



### Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

### Nature of Warnings

It is recognized that warnings should be as brief as possible, but the factors involved in regulator failures are not simple. They need to be fully understood so that proper maintenance programs can be established. If there is a simple warning, it would be:

Inspect regulators regularly as outlined in this safety warning and replace as required per these recommendations. When all of these recommendations are followed, the recommended service life of an RegO regulator (except single stage) manufactured after 1995 is 25 years. The recommended service life of all other RegO regulators is 15 years.

### LP-Gas Regulators

This bulletin applies most particularly to permanent LP-Gas installations of cylinders and tanks. The warnings also apply in most cases to portable installations of recreational vehicles, barbecue grills, etc. This bulletin is not intended to be an exhaustive treatment of the subject of regulators and certainly does not cover all safety practices that should be followed in the installation and maintenance of LP-Gas systems.

It should not be necessary to remind readers of this bulletin that regulators must be installed in strict conformance with NFPA Pamphlets 54 and 58, and all other applicable codes and regulations. Codes, regulations and manufacturer's recommendations have been developed by experts with many years of experience in the LP-Gas industry.

### Failure to fully follow these codes, regulations and recommendations could result in hazardous installations.

Pamphlet 58 states "All regulators for outdoor installations, except regulators used for portable industrial applications, shall be designed, installed or protected so their operation will not be affected by the elements (freezing rain, sleet, snow, ice, mud or debris). This protection may be integral with the regulator."

### Failed and/or Inoperative Regulators

Failed regulators can cause three kinds of hazards:

- High pressure LP-Gas in a system downstream of the regulator; and
- Leaks of LP-Gas to atmosphere from the regulator itself.
- Loss of pressure due to a "freeze-up" in the orifice.

### High Pressure LP-Gas in a System

Anything that prevents a regulator from regulating properly could result in high pressure gas at the regulator outlet and thus in a system.

**High pressure gas into piping and appliances could cause piping leaks and damage to appliance burner controls with the potential for fires and explosions.**

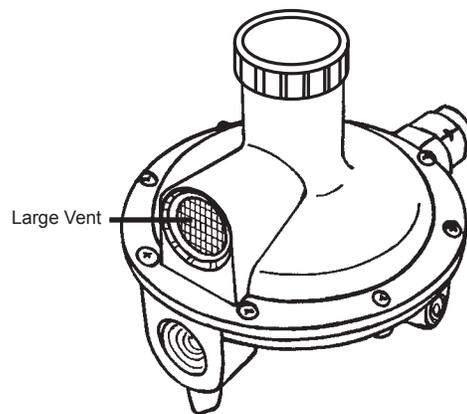
### The Causes of High Pressure Gas in a System are:

#### 1. Regulator vents that are clogged or obstructed.

##### Vents must be clear and fully open at all times.

Many regulators are equipped with a pressure relief valve which discharges to atmosphere through the vent. Ice, snow drifts, dirt, bugs, paint, or other foreign material can clog the vents.

**An obstructed vent may prevent the pressure relief valve from operating properly.**



Regulators should be installed with the vent facing down or protected so their operation will not be affected by the elements. In cases where the regulator vent is equipped with a discharge tube, the outlet of this tube must be facing down. The vents and/or discharge tubes must be protected from the elements and must be equipped with a screen to prevent bugs from obstructing the opening.

**Action Required:** Regulators should be properly installed and regularly inspected when tanks or cylinders are filled. If vents are clogged or the screen is missing, they must be cleaned or replaced. If the vent screen is missing and there is evidence of foreign material around the vent, the regulator should be replaced.

#### 2. Foreign material lodging between the regulator nozzle and seat disc:

**When this occurs, the regulator can remain open, allowing high pressure gas into the system.**

## Safety Warnings

This material can come from system piping between the container shut-off valve and the regulator. Chips created during piping installation or dirty piping can create this hazard. Corrosion inside of copper pigtails and piping can cause problems. This can occur particularly when LP-Gas contains high sulphur or excessive moisture.

**Action Required:** Make sure regulator inlet piping is clean at the time of installation. Periodic checks should be made to ensure piping remains clean without corrosion. Never use old pigtails on new LP-Gas installations. Old pigtails can also work harden and crack if they have been bent and twisted several times.

### 3. Wrong regulator installed for the application:

**The proper regulator must be used for each system.**

For example, installation of high pressure regulators not designed to reduce gas pressure to an appliance requirement of 11" w.c. will cause a hazard. Installing a regulator undersized for the load can cause improper combustion at the appliance burner with a potential for carbon monoxide poisoning.

**Action Required:** Make sure the regulator is correct for each application and test the system with a pressure gauge or a manometer.

### 4. Failure to external mechanical parts due to corrosion:

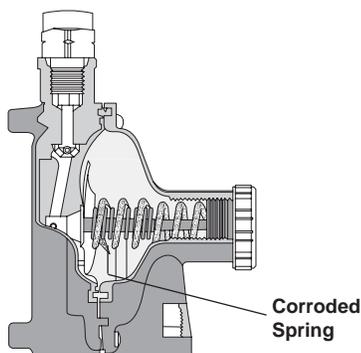
Adjusting springs and relief valve springs can rapidly corrode if exposed to salt air or industrial pollution. Even moisture condensation on these springs can cause them to rust and fail.

**Failure of these springs will result in failure of the regulator to control the pressure.**

With the vent of a regulator facing down, corrosion products from the springs could clog the regulator vent screen blocking the vent.

**Action Required:** Regulator inspection for corrosion should be made according to the guidelines listed below:

- For underground installations subject to submersion, the regulator should be inspected **every** time the container is filled.
- For known corrosive atmospheres of salt air or chemical pollution, the regulator should be inspected at least once a year.

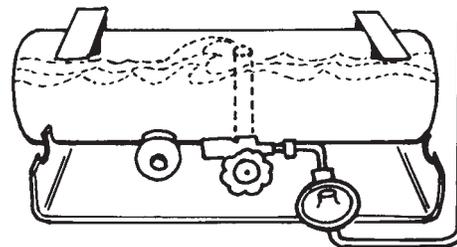


- For other applications, the regulator should be inspected every 3 years. **If any corrosion is evident, replace the regulator.**

It is essential that the regulator bonnet cap be tightly in place at all times to prevent the entrance of water, bugs, dirt, etc. Foreign material can cause the regulator to function improperly with potentially hazardous results.

### 5. Liquid propane in the regulator:

This can occur on recreational vehicles, unless the regulator is installed substantially higher than the container shut-off valve. Here, sloshing propane could get into the regulator with the resulting high pressure downstream of the regulator. It could also occur on stationary installations if the regulator is installed below the shut-off valve and the container is over-filled.



**Action Required:** Be careful of regulator installation and never overfill any LP-Gas container.

### Leaks of LP-Gas to Atmosphere

**While the occurrences of leaking regulators are rare, they can and do occur with a potential for fires and explosions.**

These leaks can be caused by:

1. Corrosion of the relief valve spring or foreign material on the seat disc which causes the relief valve to open, will cause LP-Gas to escape through the regulator vent, as well as permitting high pressure into the system.

**Action Required:** Regulator inspection for corrosion should be made according to the guidelines listed below:

- For underground installations subject to submersion, the regulator should be inspected **every** time the container is filled.
- For known corrosive atmospheres of salt air or chemical pollution, the regulator should be inspected at least once a year.
- For other applications, the regulator should be inspected every 3 years.

**If any corrosion is evident, replace the regulator.**

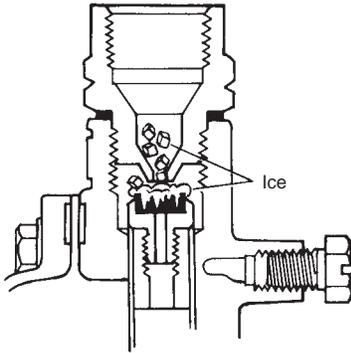
2. Bad piping connections at the regulator inlet and outlet. This can occur at the time of installation where connections are loose or the regulator may have been overstressed by excessive wrenching. It is important that proper wrenches, both on the piping and on the regulator inlet and outlet, be used when connecting the system piping, and that the regulator die cast body is not cracked by wrenching the pipe too deeply into the body.

**Action Required:** Always test for leaks at time of installation and inspect for leaks if there is reason to believe that pipe connections could cause a hazard.

## Safety Warnings

### Loss of Pressure

Freeze-up inside the regulator.



**This will prevent the regulator from regulating properly.**

Regulator freeze-ups occur because there is excessive moisture in the gas. Freeze-ups can also occur in pigtails that are kinked or bent where free flow of the LP-Gas is restricted. These freeze-ups can occur when the moisture, gas flow and temperature combine to create a hazardous condition. Freeze-ups can occur at temperatures above 32° F.

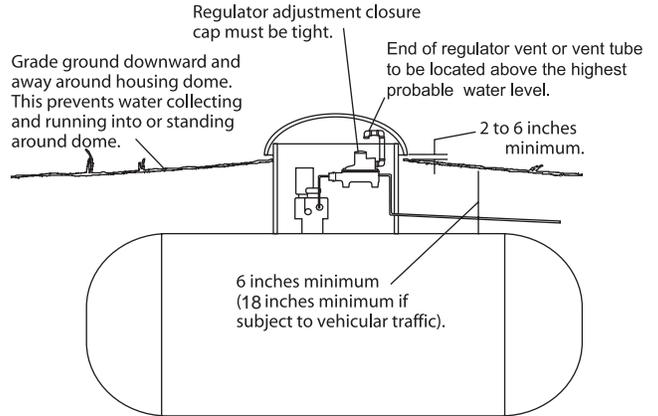
**Action Required:** All LP-Gas should be checked for moisture content prior to delivery to consumers and proper amounts of anhydrous methanol added if the gas cannot be returned to the supplier. Any container suspected of having excessive moisture should be treated with the proper amount of methanol.

### Underground Installations

Special hazards can occur if regulators are not properly installed in underground systems. Water, dirt, mud and insects can get into the regulator if the bonnet cap is not tightly in place and the vent is not protected with a proper vent tube, opening above any potential water level.

Most problems occur because the waterproof dome on the buried storage tank does not extend above the ground level sufficiently to keep out water and mud.

Refer to NPGA No. 401.



Note: Water mark left in housing dome at level above regulator vent, or end of vent tube requires replacement of regulator. Then correct installation.

### Customer Safety

Since regulators are often used by consumers without previous knowledge of the hazards of LP-Gas, and the LP-Gas dealers are the only ones who have direct contact with the consumers,

**It is the dealer's responsibility to make sure that his customers are properly instructed in safety matters relating to their installation.**

At the very minimum, it is desirable that these customers:

1. Know the odor of LP-Gas and what to do in case they smell gas. Use the NPGA "Scratch 'n Sniff" leaflet.
2. Are instructed to never tamper with the system.
3. Know that when protective hoods are used to enclose regulators and/or valves, that these hoods must be closed, but not locked.
4. Keep snow drifts from covering regulators.
5. Know the location of the cylinder or tank shut-off valve in emergencies.

### General Warning

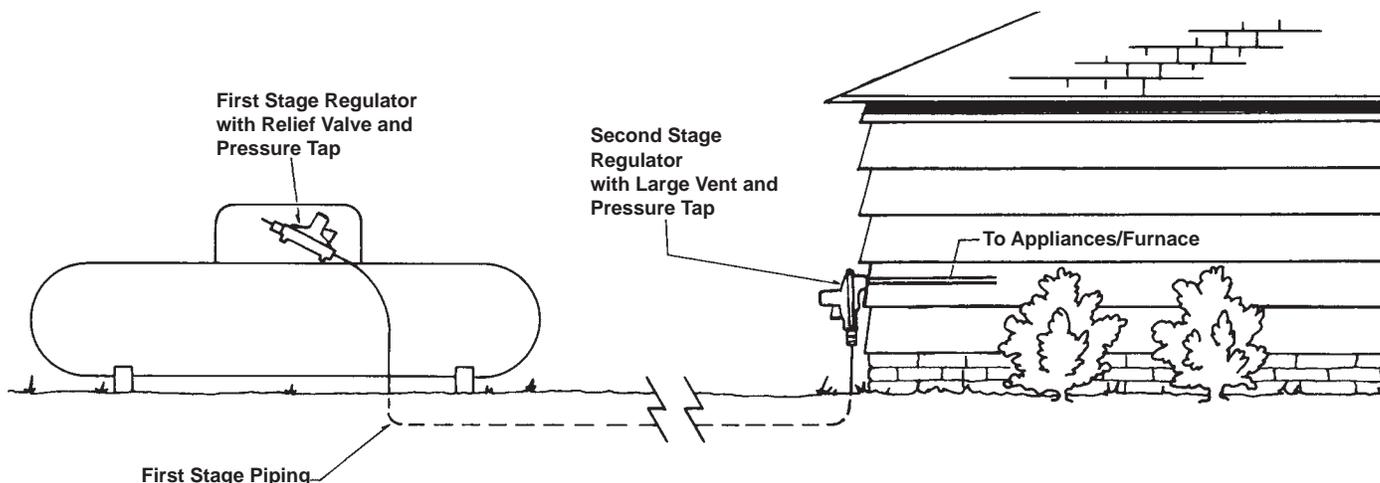
**All RegO Products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber. As a general recommendation, Regulators should be replaced in accordance with all of the recommendations outlined in this safety warning. The recommended service life of a regulator is one of many factors that must be considered in determining when to replace a regulator.**

The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential.

Because RegO Products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a regulator is used beyond its safe service life. Life of a regulator is determined by the environment in which it "lives." The LP-Gas dealer knows better than anyone what this environment is.

NOTE: There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could affect them.

## Advantages of Two-Stage Regulation



The regulator is truly the heart of an LP-Gas installation. It must compensate for variations in tank pressure from as low as 8 PSIG to 220 PSIG – and still deliver a steady flow of LP-Gas at 11" w.c. to consuming appliances. The regulator must deliver this pressure

despite a variable load from intermittent use of the appliances. Though a single-stage system may perform adequately in many installations, the use of a two-stage system offers the ultimate in pin-point regulation. Two-stage regulation can result in a more profitable LP-Gas operation for the dealer resulting from less maintenance and fewer installation callbacks – and there is no better time than now for installing RegO Regulators in two-stage systems.

### Uniform Appliance Pressure

The installation of a two-stage system – one high pressure regulator at the container to compensate for varied inlet pressures, and one low pressure regulator at the building to supply a constant delivery pressure to the appliances – helps ensure maximum efficiency and trouble-free operation year-round. It is important to note that while pressure at the appliances can vary up to 4" w.c. using single-stage systems, two-stage systems keep pressure variations within 1" w.c. New high-efficiency appliances require this closer pressure control for proper ignition and stable, efficient operation. In fact, one major manufacturer requires the use of two-stage systems with their appliances.

### Reduced Freeze-ups/Service Calls

Regulator freeze-up occurs when moisture in the gas condenses and freezes on cold surfaces of the regulator nozzle. The nozzle becomes chilled when high pressure gas expands across it into the regulator body. This chilling action is more severe in single-stage systems as gas expands from tank pressure to 11" w.c. through a single regulator nozzle.

### Size The System Correctly

Prior to installing your two-stage system, be sure the system pipe and tubing is properly sized. Proper sizing will help ensure constant delivery pressure to the appliances during fluctuating loads at all times. Just as important, be sure the RegO Regulators you choose are capable of handling the desired load. This is another advantage of two-stage systems – they are capable of handling much more BTU's/hr. than single-stage systems. The RegO "LP-Gas Serviceman's Manual" provides complete information on pipe sizing and proper regulator selection.

Two-stage systems can greatly reduce the possibility of freeze-ups and resulting service calls as the expansion of gas from tank pressure to 11" w.c. is divided into two steps, with less chilling effect at each regulator. In addition, after the gas exits the first-stage regulator and enters the first-stage transmission line, it picks up heat from the line, further reducing the possibility of second-stage freeze-up.

Service calls for pilot outages and electronic ignition system failures are also reduced as a result of more uniform appliance pressure from two-stage systems.

### Economy of Installation

In a single-stage system, transmission line piping between the container and the appliances must be large enough to accommodate the required volume of gas at 11" w.c. In contrast, the line between the first and second stage regulators in two-stage systems can be much smaller as it delivers gas at 10 PSIG to the second-stage regulator. Often the savings in piping cost will pay for the second regulator.

As an additional benefit, single-stage systems can be easily converted to two-stage systems using existing supply lines when they prove inadequate to meet added loads. This is the least expensive and best method of correcting the problem.

### Allowance for Future Appliances

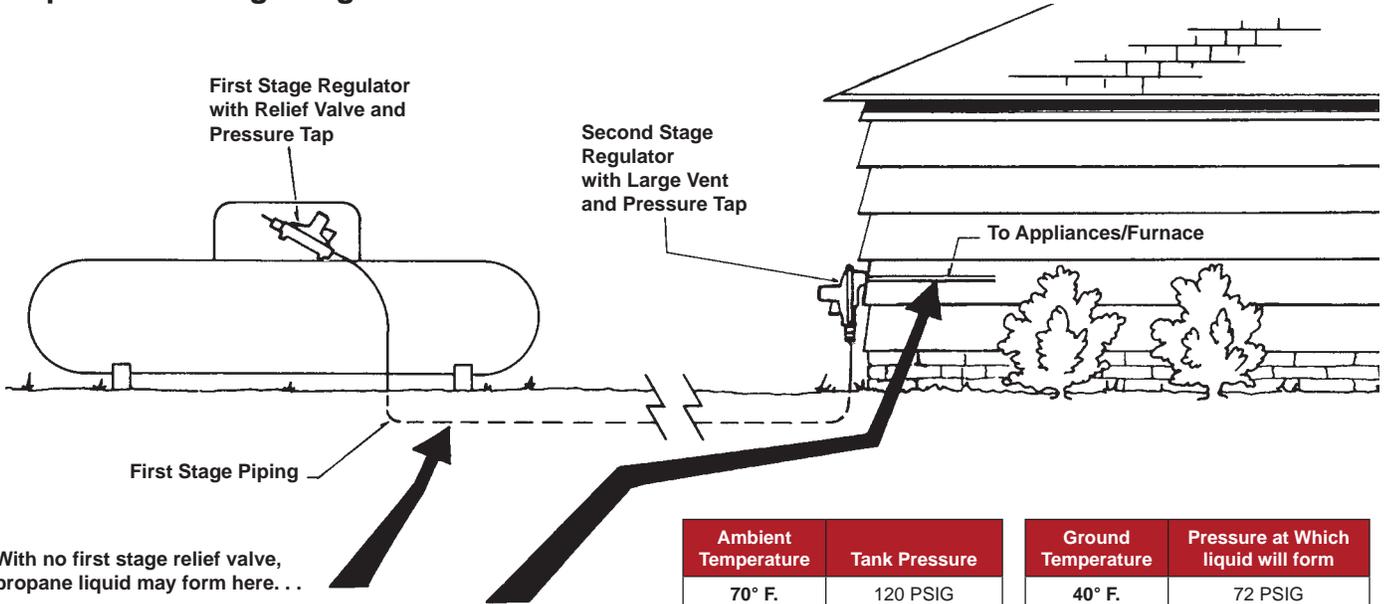
A high degree of flexibility is offered in new installations of two-stage systems. Appliances can be added later to the present load – provided the high pressure regulator can handle the increase – by the addition of a second low pressure regulator. Since appliances can be regulated independently, demands from other parts of the installation will not affect their individual performances.

### Replace Pigtails

If you are replacing an old regulator, remember to replace the copper pigtail. The old pigtail may contain corrosion which can restrict flow. In addition, corrosion may flake off and wedge between the regulator orifice and seat disc – preventing proper lock-up.

## Two-Stage LP-Gas Systems

### Require First Stage Regulators with Built-in Relief Valves



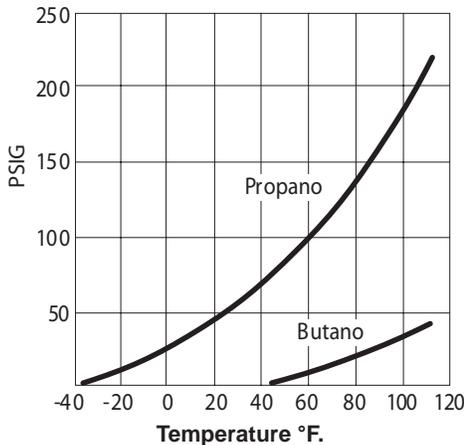
With no first stage relief valve, propane liquid may form here . . .

Resulting in sudden pressure surge due to flashing into vapor here! First stage relief can prevent liquid from forming in first stage piping during periods with no gas demand !!!

Ambient Temperature	Tank Pressure	Ground Temperature	Pressure at Which liquid will form
70° F.	120 PSIG	40° F.	72 PSIG
80° F.	140 PSIG	50° F.	86 PSIG
90° F.	165 PSIG	60° F.	102 PSIG

Pressure at which liquid can form at various temperatures.

#### Vapor Pressures of LP-Gases



#### The Problem

Many modern LP-Gas appliances are equipped with pilotless ignition systems. Water heaters and older appliances use pilot lights, but it has become a common practice for energy conscious homeowners to shut-off the pilot when leaving home for extended periods of time. In each instance, there is **no gas demand at all** for extended periods.

#### The Consequences

If the first stage regulator fails to lock-up tight, usually as a result of a worn seat disc or foreign material lodged between nozzle and seat disc, pressure will build-up in the first stage piping – possibly to a level that approaches tank pressure. Combining this with warm ambient temperatures and cool ground, **propane liquid may form** in the first stage piping.

When gas demand resumes, this liquid may pass through the second stage regulator into the appliances and furnace. NOTE – the second

stage regulator will not relieve the pressure in first stage piping. The rapid vaporization of the liquid may cause a rapid pressure surge that could seriously damage critical components of the appliance and furnace controls.

**A fire or explosion could occur as a consequence.**

#### The Solution

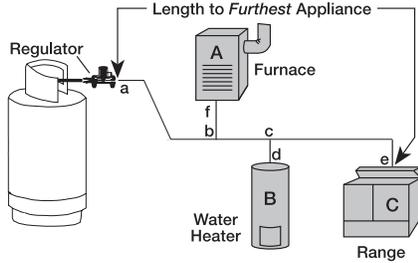
RegO LV4403 Series First Stage Regulators with Built-In Relief Valves reduce the possibility of this serious hazard in two stage applications. The built-in relief valve is designed to vent as needed and reduce the possibility of first stage piping pressure from becoming high enough to form liquid.

## Pipe and Tubing Selection Guide

Use the following simple method to ensure the selection of the correct sizes of piping and tubing for LP-Gas vapor systems. Piping between the first and second stage is considered, as well as lower pressure (2 PSIG) piping between the 2 PSIG second stage or integral twin stage regulator and the line pressure regulator; and low pressure (inches of water column) piping between second stage, single stage, or integral twin stage regulators and appliances. The information supplied below is from NFPA 54 (National Fuel Gas Code) Appendix C, and NFPA 58 (Liquefied Petroleum Gas Code) Chapter 15; it can also be found in CETP (Certified Employee Training Program) published by the Propane Education and Research Council "Selecting Piping and Tubing" module 4.1.8. These illustrations are for demonstrative purposes, they are not intended for actual system design.

### Instructions:

- Determine the total gas demand for the system by adding up the BTU/hr input from the appliance nameplates and adding demand as appropriate for future appliances.
- For second stage or integral twin stage piping:
  - Measure length of piping required from outlet of regulator to the appliance furthest away. *No other length is necessary to do the sizing.*
  - Make a simple sketch of the piping, as shown.
- Determine the capacity to be handled by each section of piping. For example, the capacity of the line between a and b must handle the total demand of appliances A, B, and C; the capacity of the line from c to d must handle only appliance B, etc.
- Using Table 3 select proper size of tubing or pipe for each section of piping, using values in BTU/hr for the length determined from step #2-A. If exact length is not on chart, use next longer length. Do not use any other length for this purpose! Simply select the size that shows at least as much capacity as needed for each piping section.
- For piping between first and second stage regulators
  - For a simple system with only one second stage regulator, merely measure length of piping required between outlet of first stage regulator and inlet of second stage regulator. Select piping or tubing required from Table 1.
  - For systems with multiple second stage regulators, measure length of piping required to reach the second stage regulator that is furthest away. Make a simple sketch, and size each leg of piping using Table 1, 2, or 3 using values shown in column corresponding to the length as measured above, same as when handling second stage piping.



### Example 1

Determine the sizes of piping or tubing required for the twin-stage LP-Gas installation shown.

**Total piping length = 84 feet (use Table 3 @90 feet)**

From a to b, demand = 38,000 + 35,000 + 30,000  
= 103,000 BTU/hr; use 3/4" pipe

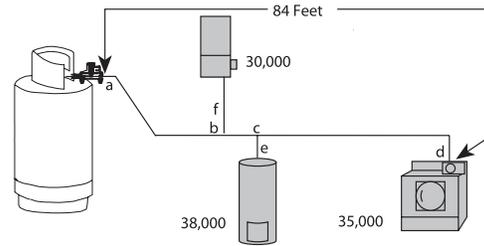
From b to c, demand = 38,000 + 35,000

= 73,000 BTU/hr; use 1/2" pipe or 3/4" tubing

From c to d, demand = 35,000 BTU/hr; use 1/2" pipe or 5/8" tubing

From c to e, demand = 38,000 BTU/hr; use 1/2" pipe or 5/8" tubing

From b to f, demand = 30,000 BTU/hr; use 1/2" pipe or 1/2" tubing



### Example 2.

Determine the sizes of piping or tubing required for the two-stage LP-Gas installation shown.

**Total first stage piping length = 26 feet; first stage regulator setting is 10 PSIG (use Table 1 or 2 @ 30 feet)**

From aa to a, demand = 338,000 BTU/hr; use 1/2" pipe, 1/2" tubing, or 1/2" T plastic pipe.

**Total second stage piping length = 58 feet (use Table 3 @ 60 feet)**

From a to b, demand = 338,000 BTU/hr; use 1" pipe

From b to c, demand = 138,000 BTU/hr; use 3/4" pipe or 7/8" tubing

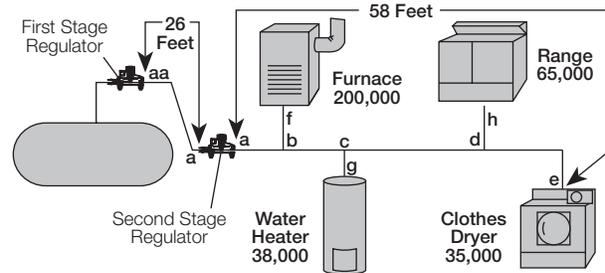
From c to d, demand = 100,000 BTU/hr; use 1/2" pipe or 3/4" tubing

From d to e, demand = 35,000 BTU/hr; use 1/2" pipe or 1/2" tubing

From b to f, demand = 200,000 BTU/hr; use 3/4" pipe or 7/8" tubing

From c to g, demand = 38,000 BTU/hr; use 1/2" pipe or 1/2" tubing

From d to h, demand = 65,000 BTU/hr; use 1/2" pipe or 5/8" tubing



### Example 3

Determine the sizes of piping or tubing required for the 2 PSI LP-Gas installation shown.

**Total first stage piping length = 26 feet; first stage regulator setting is 10psig (use Table 1 or 2 @ 30 feet)**

**Total 2 PSI Piping Length = 19 ft. (use Table 4 @ 20 ft. or Table 6 @ 20 ft.)**

From aa to a, demand= 338,000 BTU use 3/8" CSST or 1/2" copper tubing or 1/2" pipe

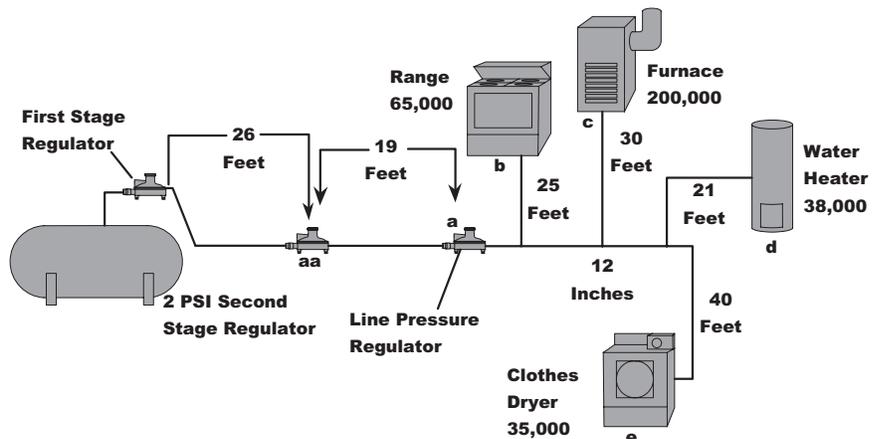
From Regulator a to each appliance:

From a to b, demand= 65,000 BTU; length = 25 ft. (Table 5), use 1/2" CSST

From a to c, demand= 200,000 BTU; length = 30 ft. (Table 5) use 1" CSST

From a to d, demand= 38,000 BTU; length = 21 ft.\* (Table 5) use 3/8" CSST \*use 25 ft. column

From a to e, demand= 35,000 BTU; length = 40 ft. (Table 5) use 1/2" CSST



## Pipe and Tubing Selection Guide

**Table 1 - First Stage Tubing or Pipe Sizing** \* 10 PSIG Inlet with a 1 PSIG Pressure Drop (Between First and Second Stage Regulators)  
 Maximum capacity of pipe or tubing in thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Pipe or Copper Tubing, Inches	Length of Pipe or Tubing in Feet*																				
	10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	350	400	450	500	
Copper Tubing (O.D.)	3/8"	513	352	283	242	215	194	179	166	156	147	131	118	109	101	90	81	75	70	65	62
	1/2"	1,060	727	584	500	443	401	369	343	322	304	270	244	225	209	185	168	155	144	135	127
	5/8"	2,150	1,480	1,190	1,020	901	816	751	699	655	619	270	244	225	209	377	342	314	292	274	259
Pipe Size	3/4"	3,760	2,580	2,080	1,780	1,570	1,430	1,310	1,220	1,150	1,080	549	497	457	426	659	597	549	511	480	453
	1/2"	3,320	2,280	1,830	1,570	1,390	1,260	1,160	1,080	1,010	956	848	768	706	657	582	528	486	452	424	400
	3/4"	6,950	4,780	3,840	3,280	2,910	2,640	2,430	2,260	2,120	2,000	1,770	1,610	1,480	1,370	1,220	1,100	1,020	945	886	837
	1"	13,100	9,000	7,220	6,180	5,480	4,970	4,570	4,250	3,990	3,770	3,340	3,020	2,780	2,590	2,290	2,080	1,910	1,780	1,670	1,580
	1-1/4"	26,900	18,500	14,800	12,700	11,300	10,200	9,380	8,730	8,190	7,730	6,850	6,210	5,710	5,320	4,710	4,270	3,930	3,650	3,430	3,240
	1-1/2"	40,300	27,700	22,200	19,000	16,900	15,300	14,100	13,100	12,300	11,600	10,300	9,300	8,560	7,960	7,060	6,400	5,880	5,470	5,140	4,850
2"	77,600	53,300	42,800	36,600	32,500	29,400	27,100	25,200	23,600	22,300	19,800	17,900	16,500	15,300	13,600	12,300	11,300	10,500	9,890	9,340	

\* Notes: Total length of piping from outlet of first stage regulator to inlet of second stage regulator (or to inlet of second stage regulator furthest away)

1) To allow 2 PSIG pressure drop, multiply total gas demand by 0.707 and use capacities from table.

2) For different first stage pressures, multiply total gas demand by the following factor and use capacities from table.

Example: 1,000,000 BTU load at 5 PSI: 1,000,000 (1.12) = 1,120,000 BTU then use chart based on 1,120,000 BTU

First Stage Pressure PSIG	Multiply By	Data Calculated per NFPA # 54 and NFPA # 58
20	0.844	
15	0.912	
5	1.120	

**Table 2 - First Stage Polyethylene Plastic Tubing or Pipe Sizing** \* 10 PSIG Inlet with a 1 PSIG Pressure Drop (Between First and Second Stage Regulators)  
 Maximum capacity of polyethylene pipe or tubing in thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Plastic Tubing or Pipe	Length of Pipe or Tubing in Feet*																				
	NPS	SDR	10	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350
1/2"	7.00	-	-	762	653	578	524	482	448	421	397	352	319	294	273	256	242	230	219	202	188
1/2"	9.33	-	-	2,140	1,840	1,630	1,470	1,360	1,260	1,180	1,120	990	897	826	778	721	681	646	617	567	528
3/4"	11.00	-	-	2,390	3,670	3,260	2,950	2,710	2,530	2,370	2,240	1,980	1,800	1,650	1,540	1,440	1,360	1,290	1,240	1,140	1,060
1 T	11.00	-	-	5,230	4,470	3,960	3,590	3,300	3,070	2,880	2,720	2,410	2,190	2,010	1,870	1,760	1,660	1,580	1,500	1,380	1,290
1	11.00	-	-	7,740	6,630	5,870	5,320	4,900	4,560	4,270	4,040	3,580	3,240	2,980	2,780	2,600	2,460	2,340	2,230	2,050	1,910
1-1/4"	11.00	-	-	13,420	11,480	10,180	9,220	8,480	7,890	7,400	6,990	6,200	5,620	5,170	4,810	4,510	4,260	4,050	3,860	3,550	3,300
1-1/2"	11.00	-	-	20,300	17,300	15,400	13,900	12,800	11,900	11,200	10,600	9,360	8,480	7,800	7,260	6,810	6,430	6,110	5,830	5,360	4,990
2	11.00	-	-	36,400	31,200	27,600	25,000	23,000	21,400	20,100	19,000	16,800	15,200	14,000	13,000	12,200	11,600	11,000	10,470	9,640	8,970

\* Note: Total length of piping from outlet of first stage regulator to inlet of second stage regulator (or to inlet of second stage regulator furthest away)

T = Tube Size

First Stage Pressure PSIG	Multiply By	Data Calculated per NFPA # 54 and NFPA # 58
20	0.844	
15	0.912	
5	1.120	

**Table 3 - Second Stage or Integral Twin Stage Tubing or Pipe Sizing** \*  
 11-In. Water Column Inlet with a 0.05-In. Water Column Drop

Maximum capacity of pipe or tubing in thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Pipe or Copper Tubing, Inches	Length of Pipe or Tubing in Feet*																			
	10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	350	400		
Copper Tubing (O.D.)	3/8"	45	31	25	21	19	17	16	15	14	13	11	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1/2"	93	64	51	44	39	35	32	30	28	27	24	21	20	18	16	15	14	13	13
	5/8"	188	129	104	89	79	71	66	61	57	54	48	44	40	37	33	30	28	26	26
	3/4"	329	226	182	155	138	125	115	107	100	95	84	76	70	65	58	52	48	45	45
Pipe Size	1/2"	291	200	160	137	122	110	NA	101	NA	94	89	84	74	67	62	58	51	46	46
	3/4"	608	418	336	287	255	231	NA	212	NA	197	185	175	155	140	129	120	107	97	97
	1"	1,150	787	632	541	480	434	NA	400	NA	372	349	330	292	265	243	227	201	182	182
	1-1/4"	2,350	1,620	1,300	1,110	985	892	NA	821	NA	763	716	677	600	543	500	465	412	373	373
	1-1/2"	3,520	2,420	1,940	1,660	1,480	1,340	NA	1,230	NA	1,140	1,070	1,010	899	814	749	697	618	560	560
2"	6,790	4,660	3,750	3,210	2,840	2,570	NA	2,370	NA	2,200	2,070	1,950	1,730	1,570	1,440	1,340	1,190	1,080	1,080	

\* Note: Total length of piping from outlet of regulator to appliance furthest away.

Data Calculated per NFPA # 54 and NFPA # 58

## Pipe and Tubing Selection Guide

**Table 4 - Maximum Capacity of CSST \***  
**2 PSIG and a Pressure Drop of 1 PSIG (Between 2 psig Service and Line Pressure Regulator)**  
 In Thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

EDH** Flow Size Designation	Length of Tubing in Feet*														
	10	25	30	40	50	75	80	100	150	200	250	300	400	500	
3/8"	13	426	262	238	203	181	147	140	124	101	86	77	69	60	53
	15	558	347	316	271	243	196	189	169	137	118	105	96	82	72
1/2"	18	927	591	540	469	420	344	333	298	245	213	191	173	151	135
	19	1,110	701	640	554	496	406	393	350	287	248	222	203	175	158
3/4"	23	1,740	1,120	1,030	896	806	663	643	578	477	415	373	343	298	268
	25	2,170	1,380	1,270	1,100	986	809	768	703	575	501	448	411	355	319
1"	30	4,100	2,560	2,330	2,010	1,790	1,460	1,410	1,260	1,020	880	785	716	616	550
	31	4,720	2,950	2,690	2,320	2,070	1,690	1,630	1,450	1,180	1,020	910	829	716	638

\* Notes:  
 (1) Table does not include effect of pressure drop across the line regulator. If regulator loss exceeds 1/2 psi (based on 13-in. water column outlet pressure).  
**DO NOT USE THIS TABLE.** Consult with regulator manufacturer for pressure drops and capacity factors. Pressure drops across a regulator may vary with flow rate.  
 (2) **CAUTION:** Capacities shown in table can exceed maximum capacity for a selected regulator. Consult with regulator or tubing manufacturer for guidance.  
 (3) Table includes losses for four 90-degree bends and two end fittings. Tubing runs with a larger number of bends and/or fittings shall be increased by an equivalent length of tubing according to the following equation; L-1.3n where L is additional length (ft) of tubing and n is the number of additional fittings and/or bends.  
 \*\*EHD - Equivalent Hydraulic Diameter - A measure of the relative hydraulic efficiency between different tubing sizes. The greater the value of EHD, the greater the gas capacity of the tubing.  
 Data Calculated per NFPA # 54 and NFPA # 58

**Table 5 - Maximum Capacity of CSST \***  
**11-in. Water Column and a Pressure Drop of 0.05-in. Water Column (Between Second Stage (Low Pressure) Regulator and Appliance Shutoff Valve)**  
 In Thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size	EDH** Flow Designation	Length of Tubing in Feet*																
		5	10	15	20	25	30	40	50	60	70	80	90	100	150	200	250	300
3/8"	13	72	50	39	34	30	28	23	20	19	17	15	15	14	11	9	8	8
	15	99	69	55	49	42	39	33	30	26	25	23	22	20	15	14	12	11
1/2"	18	181	129	104	91	82	74	64	58	53	49	45	44	41	31	28	25	23
	19	211	150	121	106	94	87	74	66	60	57	52	50	47	36	33	30	26
3/4"	23	355	254	208	183	164	151	131	118	107	99	94	90	85	66	60	53	50
	25	426	303	248	216	192	177	153	137	126	117	109	102	98	75	69	61	57
1	30	744	521	422	365	325	297	256	227	207	191	178	169	159	123	112	99	90
	31	863	605	490	425	379	344	297	265	241	222	208	197	186	143	129	117	107

\* Notes:  
 Table includes losses for four 90-degree bends and two end fittings. Tubing runs with a larger number of bends and/or fittings shall be increased by an equivalent length of tubing according to the following equation; L-1.3n where L is additional length (ft) of tubing and n is the number of additional fittings and/or bends.  
 \*\*EHD - Equivalent Hydraulic Diameter - A measure of the relative hydraulic efficiency between different tubing sizes. The greater the value of EHD, the greater the gas capacity of the tubing.  
 Data Calculated per NFPA # 54 and NFPA # 58

**Table 6 - Copper Tubing or Schedule 40 Pipe Sizing \***  
**2 PSIG Inlet with a 1 PSIG Pressure Drop (Between 2 PSIG Service and Line Pressure Regulator)**  
 In Thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Pipe or Copper Tubing, Inches	Length of Pipe or Tubing in Feet*																								
	10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	350	400	450	500	550	600	650	700	
Copper Tubing (O.D.)	3/8"	413	284	228	195	173	157	144	134	126	119	105	95	88	82	72	66	60	56	53	50	47	45	43	41
	1/2"	852	585	470	402	356	323	297	276	259	245	217	197	181	168	149	135	124	116	109	103	97	93	89	86
	5/8"	1,730	1,190	956	818	725	657	605	562	528	498	442	400	368	343	304	275	253	235	221	209	198	189	181	174
	3/4"	3,030	2,080	1,670	1,430	1,270	1,150	1,060	983	922	871	772	700	644	599	531	481	442	411	386	365	346	330	316	304
Pipe Size	1/2"	2,680	1,840	1,480	1,260	1,120	1,010	934	869	815	770	682	618	569	529	469	425	391	364	341	322	306	292	280	269
	3/4"	5,590	3,850	3,090	2,640	2,340	2,120	1,950	1,820	1,700	1,610	1,430	1,290	1,190	1,110	981	889	817	760	714	674	640	611	585	562
	1"	10,500	7,240	5,820	4,980	4,410	4,000	3,680	3,420	3,210	3,030	2,690	2,440	2,240	2,080	1,850	1,670	1,540	1,430	1,350	1,270	1,210	1,150	1,100	1,060
	1-1/4"	21,600	14,900	11,900	10,200	9,060	8,210	7,550	7,020	6,590	6,230	5,250	5,000	4,600	4,280	3,790	3,440	3,160	2,940	2,760	2,610	2,480	2,360	2,260	2,170
	1-1/2"	32,400	22,300	17,900	15,300	13,600	12,300	11,300	10,500	9,880	9,330	8,270	7,490	6,890	6,410	5,680	5,150	4,740	4,410	4,130	3,910	3,710	3,540	3,390	3,260
	2"	62,400	42,900	34,500	29,500	26,100	23,700	21,800	20,300	19,000	18,000	15,900	14,400	13,300	12,300	10,900	9,920	9,120	8,490	7,960	7,520	7,140	6,820	6,530	6,270

\* Note: Maximum undiluted propane capacities listed are based on a 2-psig setting and a 1-psi pressure drop. Capacities in 1000 BTU/hr.  
 Data Calculated per NFPA # 54 and NFPA # 58

**Table 7 - Second Stage or Integral Twin Stage Polyethylene Plastic Tubing or Pipe Sizing \*** 11" Water Column inlet with a 0.5" Water Column drop.  
 Maximum capacity of polyethylene pipe or tubing in thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Plastic Tubing or Pipe	Length of Pipe or Tubing in Feet*																							
	NPS	SDR	10	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350	400	450	500
1/2T	7.00		121	83	67	57	51	46	42	39	37	35	31	28	26	24	21	19	18	16	18	16	15	15
1/2	9.33		340	233	187	160	142	129	119	110	103	98	87	78	72	67	60	54	50	46	50	46	43	41
3/4	11.00		680	486	375	321	285	258	237	221	207	196	173	157	145	135	119	108	99	92	99	92	87	82
1 T	11.00		828	569	457	391	347	314	289	269	252	238	211	191	176	164	145	132	121	113	121	113	106	100
1	11.00		1,230	844	677	580	514	466	428	398	374	353	313	284	261	243	215	195	179	167	179	167	157	148
1-1/4	11.00		2,130	1,460	1,170	1,000	890	807	742	690	648	612	542	491	452	420	373	338	311	289	311	289	271	256
1-1/2	11.00		3,210	2,210	1,770	1,520	1,340	1,220	1,120	1,040	978	924	819	742	683	635	563	510	469	436	469	436	409	387
2	11.00		5,770	3,970	3,180	2,730	2,420	2,190	2,010	1,870	1,760	1,660	1,470	1,330	1,230	1,140	1,010	916	843	784	843	784	736	695

\* Note: Total length of piping from outlet of first stage regulator to inlet of second stage regulator (or to inlet of second stage regulator furthest away)  
 T = Tube Size

## RegO Regulator Designs

RegO LP-Gas Regulators have been designed to give outstanding performance and dependability with a minimum of maintenance.

### Nozzle Orifice

Replaceable and precision machined to prevent scoring of the seat disc.

### Seat Disc

Replaceable, resilient construction gives sure closing at lock up pressure. Straight line seat disc to nozzle operation provides even seat disc wear and positive lock up.

### Pivot Pin

Fully enclosed in regulator body.

### Control Linkage

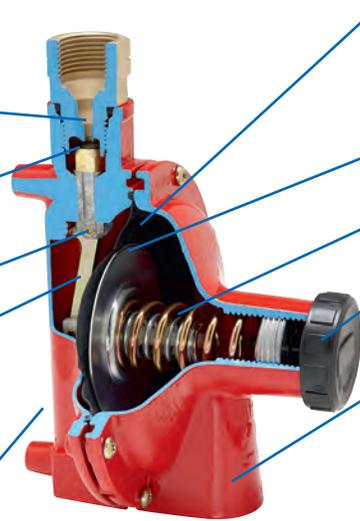
Provides quick response to diaphragm movement; moves directly perpendicular to nozzle orifice to meter gas flow, gives positive closure and reduces seat disc wear.

### Built-In Pressure Tap

Provides a convenient way to check downstream pressure on both high and low pressure models.

### Body & Bonnet

Painted, heavy-duty zinc resists corrosion and gives long-life protection, even under "salty air" conditions.



### Molded Diaphragm Assembly

Molded synthetic rubber with a tough, flexible fabric gives a super sensitive response in a temperature range of -40° to +165°F. Molded diaphragm seals in a groove between the body and bonnet.

### Diaphragm Plate

Rigid diaphragm plate transmits pressure variations to control linkage.

### Relief Valve

It is built in and tamper resistant. Large bonnet vent allows high capacity relief on second stage regulators.

### Bonnet Cap

Bonnet cap incorporates travel stop to help control downstream pressure in the unlikely event of a regulator malfunction.

### Large Bonnet Vent

Large vent is equipped with protective screen and threaded for 3/4" F. NPT vent piping. Large vent helps prevent ice from building up and blocking the vent during inclement weather. The regulator should be installed with vent down and the vent protected against blockage.



### Laser Engraved Bonnet

New bonnet design features laser- engraved information that is easy to see and matches available stickers for gas check and record keeping. \*Patent Pending

### Easy to Turn Adjusting Screw

We redesigned our adjusting screw to be easily turned.

### 1/8" pressure plug ports

Our 1/8" pressure plug ports conform to 7/16" hex wrenches.

## Typical of the 1580 Industrial High Pressure Regulators

The pounds-to-pounds, industrial regulator gives higher delivery pressure as tank pressure decreases, thus permitting full use of the gas in the tank. Most units are field adjustable to meet changing conditions.

**Connections**  
Machined and threaded into the body forging; also includes 1/4" NPT pressure gauge ports.

**Seat Disc**  
Synthetic rubber assembly attached directly to the diaphragm assembly to ensure proper movement and regulation.

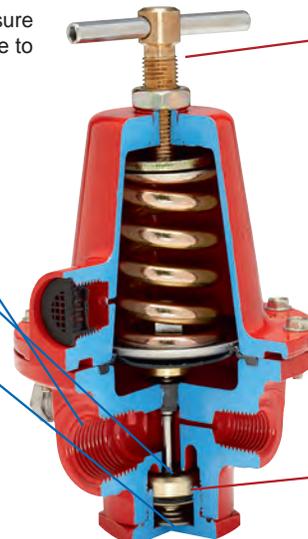
**Back Cap Spring**  
Provides added upward force to help provide a positive lock-up.

### Sensitivity

In those cases where there is a choice of delivery pressure ranges, the **lowest** spring range which will fulfill your requirements is recommended because the sensitivity of a regulator decreases as the range of the adjusting spring increases.

### Relief Valves

Most high pressure regulators are not equipped with integral relief valves. For certain applications where it is desirable to protect equipment downstream of the regulator, relief valves must be installed in the line.



### Adjusting Assembly

Large handle with lock-nut release allows easy resetting of delivery pressure.

### Integral O-Ring

Minimizes tendency to vibrate or hum under extreme loads.

## Compact First Stage Regulators

### LV3403TR

Ideal for use as a first stage regulator on any domestic size ASME or DOT container in propane gas installations requiring up to 1,500,000 BTU's per hour. The regulator is factory set to reduce container pressure to an intermediate pressure of approximately 10 PSIG.



LV3403TR



LV3403TR9

### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Bonnet Vent Position	Vapor Capacity BTU/hr Propane*
LV3403TR	1/4" F.NPT	1/2" F.NPT	7/32"	10 PSIG	Over Outlet	1,500,000
LV3403TRV9					9:00	
LV3403TR9					Over Outlet	

\* Maximum flow based on inlet pressure 20 PSIG higher than the regulator setting and delivery pressure 20% lower than the regulator setting and delivery pressure 20% lower than the setting.

## High Pressure First Stage Regulators

### LV4403SR and TR Series

Provides accurate first stage regulation in two-stage bulk tank systems. Reduce tank pressure to an intermediate pressure of 5 to 10 PSIG. Also used to supply high pressure burners for applications like industrial furnaces or boilers. Also incorporated in multiple cylinder installations.



LV4403 Series

### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range* (PSIG)	Integral Relief Included	Vapor Capacity BTU/hr Propane**	
LV4403SR4	1/2" F. NPT	1/2" F. NPT	1/4"	5	1-5	Yes	2,500,000	
LV4403TR4				10	5-10			
LV4403SR9	F. POL			3/4" F.NPT	5			1-5
LV4403TR9					10			5-10
LV4403SR96	F. POL	3/4" F.NPT		5	1-5			
LV4403TR96				10	5-10			

\* When used for final stage pressure control, must either incorporate integral relief valve or separate relief valve should be specified in accordance with NFPA Pamphlet 58.

\*\* Maximum flow based on inlet pressure 20 PSIG higher than the regulator setting and delivery pressure 20% lower than the setting.

## Low Pressure Second Stage Regulators - Std Settings

### LV4403B Series

Designed to reduce first stage pressure of 5 to 20 PSIG down to burner pressure, normally 11" w.c. Ideal for medium commercial installations, multiple cylinder installations and normal domestic loads.



LV4403B Series

### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane**
LV4403B4	1/2" F. NPT	1/2"	#28 Drill	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	935,000
LV4403B46		3/4" F. NPT					
LV4403B46R*							
LV4403B66	3/4" F. NPT	3/4" F. NPT					
LV4403B66R*							

\* Backmount design

\*\* Maximum flow based on 10 PSIG inlet and 9" w.c. delivery pressure.

## Dielectric Second Stage Regulators

### LV4403BD Series

RegO's Dielectric second stage regulators are designed to reduce first stage pressure normally 10PSIG down to burner pressure, normally 11" w.c. and are ideal for medium commercial installations, multiple cylinders installations and normal domestic loads.

RegO Dielectric second stage regulators are engineered to isolate potential electrical current from metallic piping before entering a building. The use of a separate dielectric union is not necessary because the regulator contains a dielectric union as part of the inlet assembly. Available in both SAE Flare and F.NPT inlet connection.



LV4403BD Series

### Ordering Information

Part #	Inlet Connection	Outlet Connection	Inlet Material	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr Propane
<b>3/8" M. Flare = 3</b>								
LV4403B3D	3/8" M Flare	1/2" F. NPT	Brass	# 28 Drill	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	935,000
LV4403B36D		3/4" F. NPT						
LV4403B3RD*		1/2" F. NPT						
LV4403B36RAD**		3/4" F. NPT						
LV4403B36RABD***								
<b>1/2" M. Flare = 1</b>								
LV4403B1D	1/2" M Flare	1/2" F. NPT	Brass	# 28 Drill	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	935,000
LV4403B16D		3/4" F. NPT						
LV4403B16RD*								
LV4403B16RAD**								
LV4403B16RABD***								
<b>5/8" M. Flare = 5</b>								
LV4403B5D	5/8" M Flare	1/2" F. NPT	Brass	# 28 Drill	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	935,000
LV4403B56D		3/4" F. NPT						
LV4403B56RD*								
LV4403B56RAD**								
LV4403B56RABD***								
<b>1/2"- 3/4" F. NPT Female Union</b>								
LV4403B4D	1/2" F.NPT	1/2" F.NPT	Brass & Plated Steel	# 28 Drill	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	935,000
LV4403B46D	3/4" F. NPT	3/4" F. NPT						
LV4403B66D								
LV4403B46RD*								
LV4403B66RD*	3/4" F. NPT							
LV4403B66RAD**								
LV4403B66RABD***								

\* Backmount Design.

\*\* Right Angle Design

\*\*\*Right Angle with Bracket

Maximum flow based on 10 PSIG inlet and 9" w.c. delivery pressure.

## Low Pressure Second Stage Regulators - Special Settings

### LV4403H Series

Designed to reduce first stage pressure of 5 to 10 PSIG down to pressure higher than 11" water column, the actual pressure setting is specified in the table below. These regulators are designed for installations where the appliances require pressures greater than 11 inches w.c.



### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Delivery Pressure at 10 PSIG Inlet	Adjustment Range Inches w.c.	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane**
LV4403H222	1/4" F.NPT	1/2" F.NPT	#28	22" w.c.	15-35	Inlet	700,000
LV4403H414	1/2" F.NPT			14" w.c.	12.5-19		
LV4403H420		20" w.c.		15-35			
LV4403H4614		3/4" F.NPT		14" w.c.	12.5-19		
LV4403H4620				20" w.c.	15-35		
LV4403H6614	3/4" F.NPT	14" w.c.		12.5-19			



LV4403H Series

\* Maximum flow based on 10 PSIG inlet 20% drop in delivery pressure (5/1/08)

## Compact “Back-Mount” Regulator

### LV3403BR Series

The LV3403BR Back Mount Regulator is designed to reduce first stage pressure of 5-10 PSIG down to burner pressure normally 11" w.c. Designed as a second stage regulator for smaller applications with flow requirements up to 450,000 BTU/hr. and are ideal for homes, mobile homes, and cottages.



LV3403BR Series

#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr *
LV3403B44R	1/2" F.NPT	1/2" F.NPT	7/32"	11" w.c. At 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	450,000
LV3403B46R		3/4" F.NPT					

\* Maximum flow based on 10 PSIG inlet and 9" w.c. delivery pressure.

## Compact Second Stage Regulator for LP-Gas

### LV3403B4

The LV3403B4 is designed to reduce first stage pressure of 5-20 PSIG down to burner pressure normally 11" w.c. Designed as a second stage regulator for smaller applications with flow requirements up to 450,000 BTU's/hr, they are ideal for homes, mobile homes, and cottages.



LV3403B4 Series

#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr *
LV3403B4	1/2" F.NPT	1/2" F.NPT	7/32"	11" w.c. At 10 PSIG Inlet	9" to 13" w.c.	Inlet	450,000
LV3403B4V3						3:00	
LV3403B4V0						Outlet	
LV3403B4V9						9:00	

\* Maximum flow based on 10 PSIG Inlet 9" w.c. delivery pressure

## Low Pressure Second Stage Regulators

### LV4403B66RA Series

Designed to reduce first stage pressure of 5 to 20 PSIG down to burner pressure, normally 11" w.c. Ideal for medium commercial installations, vapor meter installations and normal domestic loads.



LV4403B66RA Series

#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
LV4403B66RA	3/4" F. NPT	3/4" F. NPT	3/16"	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	1,000,000
LV4403B66RAB**							

\* Maximum flow is based on 10 PSIG inlet and 9" w.c. delivery pressure.

\*\* Mounting Bracket Included.

## Low Pressure Second Stage Regulators - Standard Settings

### LV5503B Series

Designed to reduce first stage pressure of 5 to 20 PSIG down to burner pressure, normally 11" w.c. Ideal for larger commercial and industrial applications, multiple cylinder installations and large domestic systems.



LV5503B Series

#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane
LV5503B4	1/2" F. NPT	3/4" F. NPT	1/4"	11" w.c. at 10 PSIG Inlet	9" - 13" w.c.	Over Inlet	1,600,000
LV5503B6							
LV5503B8	3/4" F. NPT	1" F. NPT	9/32"				2,300,000

Maximum flow is based on 10 PSIG inlet and 9" w.c. delivery pressure.

## Low Pressure Second Stage Regulators - Special Settings

### LV5503H Series

Designed to reduce first stage pressure of 5 to 20 PSIG down to burner pressure, normally 11" w.c. Ideal for larger commercial and industrial applications, multiple cylinder installations and large domestic systems.



#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure @ 10 PSIG Inlet	Adjustment Range Inches w.c.	Bonnet Vent Position	Vapor Capacity BTU/hr.* Propane			
LV5503H414	1/2" F. NPT	3/4" F. NPT	1/4"	14" w.c.	7-16	Inlet	1,600,000			
LV5503H614	3/4" F. NPT			1/4"	20" w.c.	11-28		Outlet		
LV5503H620					3/4" F. NPT	1/4"		40" w.c.	28-84	Inlet
LV5503H620V								Outlet		
LV5503H640								3/4" F. NPT	1/4"	14" w.c.
LV5503H640V		Outlet								
LV5503H814	1" F. NPT	9/32"	20" w.c.	11-28						
LV5503H820			40" w.c.	28-84						
LV5503H840										

Maximum flow is based on 10 PSIG inlet 20% drop in delivery pressure (5/1/08)



LV5503H Series

## Second Stage Regulators for 2 PSI Systems

### LV4403Y and LV5503Y Series

Designed to reduce first stage pressure of 10 PSIG down to 2 PSIG. A line pressure regulator is required downstream to reduce the 2 PSIG to a nominal 11" w.c.



#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane***
LV4403Y4	1/2" F. NPT	1/2" F. NPT	1/4"	2 PSIG @ 10 PSIG Inlet	Over Inlet	1,000,000
LV4403Y46R*	1/2" F. NPT	3/4" F. NPT	1/4"	2 PSIG @ 10 PSIG Inlet	Over Inlet	1,000,000
LV5503Y6	3/4" F. NPT	3/4" F. NPT	1/4"	2 PSIG @ 10 PSIG Inlet	Over Inlet	2,200,000
LV5503Y8	3/4" F. NPT	1" F. NPT	9/32"	2 PSIG @ 10 PSIG Inlet	Over Inlet	2,200,000

Maximum flow is based on 10 PSIG inlet pressure and 1.5 PSIG delivery pressure.



LV5503Y Series

LV4403Y Series

## Low Pressure Second Stage Tobacco Barn Regulator

### LV5503G4 Series

Especially developed for drying barns in the tobacco industry. The LV5503G4 regulator will supply a steady and constant flow of fuel to as many as 12 to 20 burners throughout the barn.



#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
LV5503G4	1/2" F. NPT	3/4" F. NPT	1/4"	15" w.c. at 15 PSIG Inlet	8" - 18" w.c.	Above Inlet	1,750,000

Maximum flow is based on 15 PSIG inlet pressure and 13" w.c. delivery pressure.



LV5503G4 Series

## Compact Twin Stage Regulators

### LV404B4 and LV404B9 Series

This compact two-stage regulator is designed to reduce container pressure down to 11" w.c. delivery pressure. It is ideal for "on-site" cylinder applications, mobile homes and average domestic service including small ASME and 100 to 420 pound DOT cylinders.



#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range 2nd Stage	Bonnet Vent Position 1st Stage	Bonnet Vent Position 2nd Stage	Capacity BTU/hr. Propane*	Accessories
									1st Stage Vent Pipe-Away
LV404B4	1/4" F. NPT	1/2" F. NPT	3/16"	11" w.c. at 100 PSIG Inlet	9" - 13" w.c.	Down	Over Outlet	525,000	404PE
LV404B4V9		9 o'clock				9 o'clock			
LV404B46		3/4" F. NPT				Down	Over Outlet		
LV404B46V9						9 o'clock	9 o'clock		
LV404B9	F. POL	1/2" F. NPT	3/16"	11" w.c. at 100 PSIG Inlet	9" - 13" w.c.	Down	Over Outlet	525,000	404PE
LV404B9V9		9 o'clock				9 o'clock			
LV404B96		3/4" F. NPT				Down	Over Outlet		
LV404B96V9						9 o'clock	9 o'clock		

Maximum flow is based on 25 PSIG inlet pressure and 9" w.c. delivery pressure.

## New Compact Twin Stage Regulators for LP-Gas

### LV404B34 & LV404B39 Series

The compact twin-stage regulator is designed to reduce container pressure down to 11" w.c. delivery pressure. It is ideal for "on site" container applications such as homes, mobile homes and cottages for average domestic service; including small ASME tanks and 100-420 pound DOT cylinders.

#### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range 2nd Stage	Bonnet Vent Position 1st stage**	Bonnet Vent Position 2nd stage**	Vapor Capacity BTU/hr *
LV404B34	1/4" F.NPT	1/2" F.NPT	7/32"	11" w.c. @ 100 Psig Inlet	9" to 13" w.c.	Rear	Outlet	450,000
LV404B39	F.POL					Left	9:00	
LV404B34V9	1/4" F.NPT							
LV404B39V9	F.POL							

\* Maximum flow based on 10 PSIG Inlet 9" w.c. delivery pressure

\*\* Other vent positions available upon request



## Twin Stage Automatic Changeover Regulators

### 7525B Series

These combination automatic changeover, two stage regulators are especially suitable for homes, mobile homes, cottages, construction and other portable two cylinder installations. Empty containers may be replaced without interrupting customer's gas service.

#### Ordering Information

Automatic Changeover Regulator	Inlet	Outlet	Pigtails	Bracket	Capacity BTU/hr. Propane
7525B34	1/4" Inverted Flare	1/2" F. NPT	912FA20	2302-31	400,000
7525B34			912FS20		
7525B4			912FA20	2503-22	450,000
7525B4			912FS20		

Maximum flow is based on 25 PSIG inlet pressure and 9" w.c. delivery pressure.



## Two PSIG Delivery Pressure Twin-Stage Regulators LV404Y9 & Compact LV404Y39

SPECIAL 2 PSIG DELIVERY pressure twin stage regulator is designed to reduce container pressure down to 2 PSIG. A line pressure regulator is required downstream to reduce the 2 PSIG to a nominal 11" w.c.



### Ordering Information

Part #	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (PSIG)	Adjustment Range (PSIG)	Bonnet Vent Position 1st Stage	2 PSIG Bonnet Vent Position	Capacity BTU/HR*
LV404Y9	F.POL (CGA 510)	1/2" F.NPT	7/32"	2	1.8 to 2.5	Down	Outlet	800,000
LV404Y39								650,000

Maximum flow is based on 25 PSIG inlet pressure and 1.5 PSIG delivery pressure.



LV404Y39

LV404Y9

## Two Stage Regulator Outfits 5807, 5808, 5820 Series

These outfits contain the equipment required to provide two-stage regulation.



### Ordering Information

Kit Number	1st Stage Regulator Included		2nd Stage Regulator Included		Bracket Included	Pigtail Included	Capacity BTU/hr. Propane
	Part #	Inlet x Outlet Female	Part #	Inlet x Outlet F. NPT			
5807	LV4403TR9	POL x 1/2" NPT	LV4403B4	1/2" x 1/2"	2503-22	913PS12	935,000
5808			LV4403B46R	1/2" x 3/4"	Not Required		
5820	LV4403TR96	POL x 3/4" NPT	LV4403B66R	3/4" x 3/4"			



LV4403TR9

LV4403B Series



913PS12



2503-22

## Twin Stage Regulator Outfits 5828 and 5832

This outfit contains the equipment required to provide twin-stage regulation.



### Ordering Information

Kit Number	Twin Stage Regulator Included	Inlet F. NPT	Outlet F. NPT	Pigtails Included	Capacity BTU / hr. Propane
5828	LV404B4	1/4"	1/2"	912JS12	525,000
5832	LV404B34V9				400,000



LV404B4

LV404B34V9



912JS12



2503-22

## Automatic Changeover Regulator Outfits

5726B34, 5727B34, 5754B4, 5755B4

This outfit contains the equipment required to provide twin-stage regulation.



### Ordering Information

Kit Number	Automatic Changeover Regulator Included	Inlet	Outlet	Pigtails Included-2	Bracket Included	Capacity BTU/hr. Propane
5726B34	7525B34	1/4" Inverted Flare	1/2" F. NPT	912FA20	2302-31	400,000
5727B34	7525B34			912FS20		
5754B4	7525B4			912FA20	2503-22	
5755B4	7525B4			912FS20		



7525B4



912FA20

## Compact Regulators

### 302 Series

These compact regulators are designed for smaller outdoor grills and fish cookers. It is intended for use on small portable appliances that use 100,000 BTU's/hr. or less. It may not be used on fixed pipe systems per NFPA 58, 1995 edition.



### Ordering Information

Part #	Type	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
302	Single Stage	1/4" F. NPT	3/8" F. NPT	No. 50 Drill	11" w.c. at 100 PSIG inlet	9-13" w.c.	Small Vent Above Inlet	125,000
302V		1/4" F. NPT					Drip Lip Above Inlet	
302V9		1/4" F. NPT					Drip Lip at 9 o'clock	
302V9LS		Soft POL w/o orifice						

Maximum flow is based on 25 PSIG inlet pressure and 9" w.c. delivery pressure.



302



302V

## High Pressure Industrial / Commercial Pounds-to-Pounds Regulators

### 597F Series

Designed to reduce propane gas container pressure down to between 3 and 100 PSIG. Ideal for liquid or vapor service, they can be used in a variety of applications including salamander heaters, weed burning torches, fish cookers, tar pot heaters, and other industrial type services.



### Ordering Information

Part #	Adjustment Method	Inlet Connection	Outlet Connection	Recommended Delivery Pressure Range (PSIG)	Capacity Determined at Set Pressure of PSIG*	Capacity BTU/hr. Propane**
597FA	Tee Handle	1/4" NPT	1/4" NPT	1-15	10	1,750,000
597FB				10-30	20	3,000,000
597FC				20-45	30	3,500,000
597FD				40-100	40	4,500,000

\* Set pressure established at 100 PSIG inlet and a flow of 250,000 BTU/hr.

\*\* Capacity determined at actual delivery pressure 20% less than set pressure with inlet pressure 20 PSIG higher than the set pressure.



597F

## High Pressure Industrial / Commercial Pounds-to-Pounds Regulators 1580V and AA1580V Series

Designed to reduce LP-Gas and anhydrous ammonia container pressures to between 3 and 125 PSIG. Precision-built with a multi-million BTU capacity, the 1580V series is perfect for such big, tough jobs as crop dryers, asphalt batch mixing plants, road building "tar wagons", heat treating and other large industrial and commercial loads. It's also ideal as a first stage regulator in large multiple operations. The AA1580V series is ideal for use in anhydrous ammonia applications such as blue print machines and heat treating.



1580V

### Ordering Information

Part Number	Service	Adjustment Method	Inlet & Outlet Connections	Recommended Delivery Pressure Range (PSIG)	A Width	B Height (max.)	Capacity Determined at Set Pressure of PSIG*	Capacity**	
1584VN	LP-Gas	Tee Handle	1/2" F. NPT	3-30	2- 15/16	4-7/32"	20	7,000,000 BTU/hr. LPG	
1584VL				25-50			30	10,000,000 BTU/hr. LPG	
1584VH				45-125			60	10,000,000 BTU/hr. LPG	
AA1584VW	NH3			3-25			20	4,500 CFH NH <sub>3</sub>	
AA1584VL				20-50			30	4,800 CFH NH <sub>3</sub>	
AA1584VH				45-125			60	5,100 CFH NH <sub>3</sub>	
1586VN	LP-Gas		Tee Handle	3/4" F. NPT	3-30	3-1/2"	7"	20	7,500,000 BTU/hr. LPG
1586VL					25-50			30	14,000,000 BTU/hr. LPG
1586VH					45-125			60	14,000,000 BTU/hr. LPG
AA1586VW	NH3				3-25			20	7,700 CFH NH <sub>3</sub>
AA1586VL					20-50			30	8,900 CFH NH <sub>3</sub>
AA1586VH					45-125			60	8,900 CFH NH <sub>3</sub>
1588VN	LP-Gas	Tee Handle		1" F. NPT	3-30	3-1/2"	7"	20	7,500,000 BTU/hr. LPG
1588VL					25-50			30	14,000,000 BTU/hr. LPG
1588VH					45-125			60	14,000,000 BTU/hr. LPG

\* Set pressure is established with 100 PSIG inlet pressure and a flow of 500,000 BTU/hr. propane for 1580V Series, and 180 CFH/hr. NH<sub>3</sub> for AA1584V and AA1586V Series.

\*\* Capacity determined at 100 PSIG inlet, set pressure noted on chart at 20% drop.

NOTE: Care must be taken to prevent re-liquefaction of propane at normal temperatures by heat tracing or other effective means. Use of a relief valve upstream or downstream of these regulators is recommended in accordance with NFPA 58.

## High Pressure / High Temperature Industrial / Commercial Pounds-to-Pounds Regulators

### X1584V, X1586V, and X1588V Series

Designed to reduce LP-Gas container pressures to between 3 and 50 PSIG. Ideal for crop drying, heat treating, asphalt batch mixing and other large industrial and commercial load application utilizing high temperature LP-Gas or high temperature atmosphere under conditions up to 300°F. Also ideal as a first stage regulator in large multiple operations.



X1584

### Ordering Information

Part #	Service	Adjustment Method	Width	Height	Inlet & Outlet Connections	Recommended Delivery Pressure Range (PSIG)	Capacity Determined at Set Pressure of PSIG*	Capacity BTU/hr. Propane**
X1584VN	LP-Gas	Tee Handle	2-7/8"	8-7/8"	1/2" F. NPT	3-30	20	7,000,000
X1584VL						25-50	30	10,000,000
X1586VN					3/4" F. NPT	3-5/16"	6-7/8"	3-30
X1586VL			25-50	30				14,000,000
X1588VN			1" F. NPT	3-30				20
X1588VL					25-50	30	14,000,000	

\* Set pressure is established with 100 PSIG inlet pressure and a flow of 500,000 BTU/hr. propane.

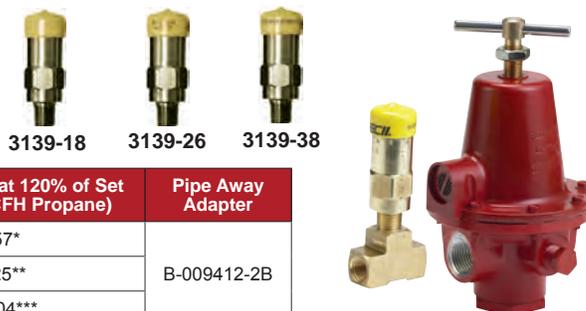
\*\* Capacity determined at 100 PSIG inlet, set pressure noted on chart at 20% drop.

NOTE: Care must be taken to prevent re-liquefaction of propane at normal temperatures by heat tracing or other effective means. Use of a relief valve upstream or downstream of these regulators is recommended in accordance with NFPA 58.

## Vapor Relief Valves

### 3139 Series

Designed for use as a relief valve on high pressure regulators to comply with NFPA 58 5.1.1 "High-pressure regulators with a rated capacity of more than 500,000 BTU/hr where permitted to be used on two stage systems shall incorporate an integral relief valve or shall have a separate relief valve."



Part #	Set Pressure	Regulator Settings	Connection Size	Height	Width	Flow Capacity at 120% of Set Pressure (SCFH Propane)	Pipe Away Adapter
3139-18	18 PSIG	10 PSIG	1/4" M. NPT	2-27/32"	1-1/16"	1357*	B-009412-2B
3139-26	26 PSIG	15 PSIG				1725**	
3139-38	38 PSIG	20 PSIG				2304***	

\* Flow recorded at 21.6 PSI inlet pressure for this valve. \*\* Flow recorded at 31.2 PSI inlet pressure for this valve. \*\*\* Flow recorded at 45.6 PSI inlet pressure for this valve.

## Copper Pigtails

### 912 and 913 Series

#### Straight Pigtails Ordering Information

Connections	Approximate Length	Part #		
		1/4" Tube		3/8" Tube
		7/8" Hex Short Nipple	1-1/8" Hex Long Nipple	7/8" Hex Short Nipple
M.POL x M.POL	5"	-	-	913PS05
	12"	912PS12	-	913PS12
	20"	912PS20	912PA20	913PS20
	30"	912PS30	-	913PS30
	36"	912PS36	912PA36	913PS36
1/4" Inverted Flare x M.POL	12"	912FS12	-	-
	20"	912FS20	912FA20	-
	30"	912FS30	-	-
	36"	912FS36	-	-
1/4" M.NPT x M.POL	5"	-	-	913JS05
	12"	912JS12	-	913JS12
	20"	912JS20	-	913JS20
1/2" M.NPT x M.POL	12"	-	-	913LS12
1/2" M.NPT x 3/8" M.NPT	12"	-	-	913KL12

Pigtails are available in a variety of connections, sizes and styles. Care should always be taken in selecting the proper pigtail for a particular application.

Note: RegO recommends a new pigtail be installed with every new and replaced regulator.



#### Dielectric Pigtails



Part #	Approximate Length	Tube	Connections
D912P12	12"	1/4"	M.POL x M.POL
D912P20	20"		
D912P30	30"		
D912J12	12"		1/4" M.NPT x M.POL
D912J20	20"		
D912J30	30"	3/8"	M.POL x M.POL
D913P12	12"		
D913P20	20"		
D913P30	30"		1/4" M.NPT x M.POL
D913J12	12"		
D913J20	20"		
D913J20	30"		

#### Bent Pigtails Ordering Information

Connections	Approximate Length	Part #	
		3/8" Tube	
		7/8" Hex Short Nipple	Type/Degree of Bend
1/4" M. NPT x M. POL	5"	913JS05A	90°
		913PS05A	
M. POL x M. POL	12"	913PS12G	270° Right Hand
		913PS12H	270° Left Hand
		913PS12S	360°

## Inlet Fittings

Part #	Description
970	Hard nose POL with wrench nut.
970AX	Hard nose POL with wrench nut and excess flow.
970AXS	Soft nose POL with wrench nut and excess flow.
970WXS	
3199W	Heavy duty hard nose POL with wrench nut and excess flow.
970AW	Soft nose POL with Handwheel.
970HT	Soft nose POL with Handwheel and 60 DMS orifice.
970S	Soft nose POL with wrench nut and 60 DMS orifice.

These inlet fittings are available for assembly into either first stage of single stage regulators. All have 1/4" M. NPT connections and are machined from brass.



## Brackets

RegO Brackets are especially designed for use in installing RegO Regulators in applications requiring the use of a bracket.

Part Number	Material	For Use With Regulator Model:
2302-31	Cadmium Plated Steel	LV3403, LV404B34, LV404B39
2503-22	Aluminum	LV404B4 LV404B9 Series, LV5503 Series
2503-19	Aluminum	LV4403 Series



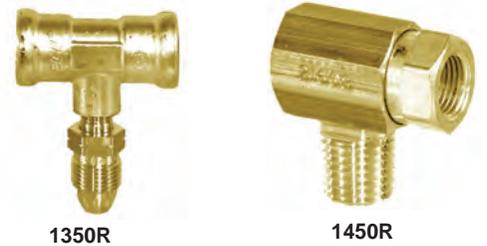
## Manifolds

### Tee Check Manifolds

1350R and 1450R

For use in systems that require uninterrupted gas service during cylinder exchange. Especially for summer cottages, mobile homes and single appliance loads.

Part #	Inlet Connections	Outlet Connection
1350R	F. POL	M. POL
1450R	1/4" Inverted Flare	1/4" M. NPT



### Multiple Cylinder Manifolds

1350E and 1450E

Use with suitable pigtails to connect multiple cylinders together. Ideal for loads that require more than one cylinder to be in service at a time.

Part #	Inlet Connections	Outlet Connection
1350E	F. POL	M. POL
1450E	1/4" Inverted Flare	1/4" M. NPT



## Adjustable Flexible Vent Kit

Part #	Flex Tubing Length	Reusable End Connectors	90° Elbow	Mounting Bracket
LV960-48	48" (4 feet)	2	1	3
LV960-72	72" (6 feet)			4
LV960-120	120" (10 feet)			5



## Test Kits

### Low Pressure Test Set

2434A Series

This kit provides the equipment necessary for checking regulator delivery pressure (low pressure) at the appliances. The basic set contains a 2424A-2 low pressure gauge and a 3 foot — 3/16" O.D. flexible synthetic rubber tube. Adapters are also available.

Part #	Contents	Adapters	Adapter size
2434A	Test Kit	1328	3/8" OD
		1331	1/2" OD
		1332	5/8" OD



2434A



1328 Adapter

### Water Manometer Kit

1212 Kit

The water manometer kit is especially suited for use with low pressure LP-Gas systems. It is ideal for pressure checks downstream of the low pressure regulator and at the appliances.

Part Number	Description
1212 KIT	Flexible Tube Water Manometer Kit



1212 KIT

## Accessories

### High Pressure Gauge Adapter

2962

Designed for testing high pressure lines. Adapter has 0 to 300 PSIG gauge. A bleeder valve allows you to bleed down to correct pressure during pressure tests.

Part #	Inlet Connection	Outlet Connection	Pressure Gauge Range (PSIG)
2962	Soft Nose M. POL	F. POL	0 - 300



2962

## Adhesive Warning Labels

These adhesive warning labels are intended for application as close as possible to the LP-Gas regulator once the regulator has been installed.

Part #	Description
LV4403-400	Adhesive Warning Label

**DANGER                      WARNING**

**LP-GAS IS EXTREMELY  
FLAMMABLE AND EXPLOSIVE**

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR ESCAPING GAS...EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

Insist that your LP-Gas dealer regularly inspect and maintain this installation and properly instruct you in safety matters.

Make sure ice, snow drifts, dirt, bugs and other foreign material do not obstruct vent passage-ways and openings. The vent opening must have a screen installed. If screen is missing, call your gas dealer for immediate examination and replacement.

DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL.  
DO NOT FILL CONTAINER UNLESS THIS LABEL IS READABLE.

ADDITIONAL SAFETY INFORMATION IS AVAILABLE FROM

**ECI** *Engineered Controls International, Inc.* Printed in U.S.A. 04-0994-1189  
Part Number LV4403-400

100 RegO Drive PO Box 247 Elton College, NC 27244 USA Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

LV4403-400

**DANGER                      READ THIS FIRST                      WARNING**

**LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE**

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS...EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

Make sure you are thoroughly trained before you attempt any regulator installation or maintenance. Improper conditions of procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warning "LP-Gas Regulators" found in the regulator section of the L-500 & L-102 Catalogs. Follow its recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Pamphlet 58 also states that "All regulators for outdoor installations, except regulators used for portable industrial applications, shall be designed, installed or protected so their operation will not be affected by the elements (freezing rain, sleet, snow, ice, mud or debris). This protection may be integral with the regulator."

Vents must be clear and fully open at all times. An obstructed vent will prevent the regulator from functioning properly and may result in property damage and personal injury.

Regulators should be installed with the vent facing down or otherwise covered for protection.

Twin-Stage Regulators should be installed completely under cover and/or with screened vent pipe away adapters that position both vents in a down position without obstructing flow through the vents.

Make sure piping is clean and free from foreign material (such as dirt, corrosion, chips, pipe joint compound, etc.) Always replace the pigtail when replacing a regulator. Thread sealant used on piping must be compatible with LP-Gas.

Make sure the use and location of the regulator(s) as a component(s) of the LP-Gas system to be installed is proper. (Avoid misusing LP-Gas equipment.) See the following RegO publications: L-500 & L-102 Catalogs and the LP-Gas Serviceman's manual.

For underground installations, make sure that water, mud, dirt, and insects cannot get into the regulator, and that the regulator is easily accessible for regulator maintenance. Follow NPGA Bulletin 401. See RegO Safety Warning "LP-Gas Regulators" found in the regulator section of the L-500 & L-102 Catalogs.

Check regulator and installation for leaks following NFPA #54 and NPGA Bulletin 403 "Pressure Testing and Leak Checking LP-Gas Piping Systems".

In selecting a label for posting at the installation site, consider RegO part number 2403-400 along with your own, NPGA's and others.

Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warning "LP-Gas Regulators" found in the regulator section of the L-500 & L-102 Catalogs.

RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.

**REGO** Printed in USA 08A-0910-0390  
Part number LV4403-500

Elton, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

LV4403-500

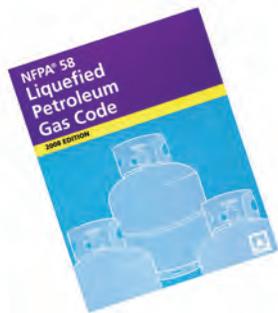
#### Warning Notice

The following warning information, Part Number LV4403-500, is included with each shipment of regulators to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

## LP-Gas Cylinder and Service Valves

### Safety Warnings



#### Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

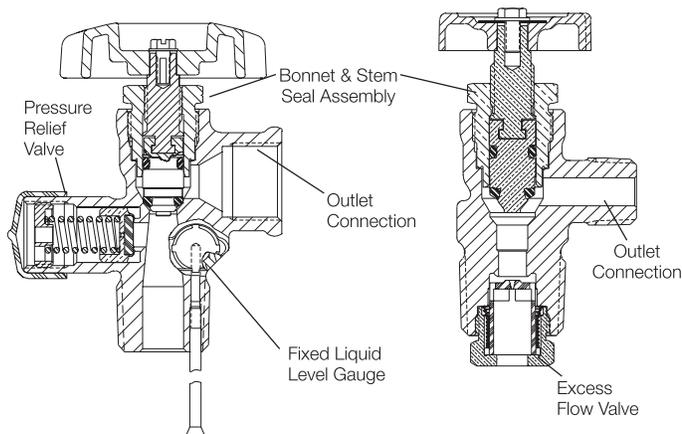
The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

### Nature of Warnings

It is recognized that warnings should be as brief as possible, but the factors involved in cylinder valve failure are many because of the multiple functions the valve serves. If there is any simple warning, it would be:

Check cylinder valves for leaking components every time cylinders are filled.

The bulletin is not intended to be an exhaustive treatment of the subject of cylinder valves and certainly does not cover all safety practices that should be followed in installation, operation and maintenance of LP-Gas systems which include cylinder valves.



### LP-Gas Cylinder Valves

These valves are mounted in DOT cylinders, and are intended to provide one or more of the following functions:

1. Vapor service shut-off
2. Liquid service shut-off (with excess flow valve)
3. Liquid filling
4. Pressure relief
5. Fixed liquid level gauge

These functions, although simple, are extremely critical in the safe operation of an LP-Gas cylinder system.

Abuse of these valves, failure to follow a good installation and maintenance program and attempting to use cylinder valves beyond their normal service life can result in extremely hazardous conditions.

#### Important Factors:

1. Installation: It should not be necessary to remind the readers that cylinder valves must be installed and used in strict conformance with NFPA Pamphlet 58, and all other applicable codes and regulations. Codes, regulations and manufacturers' recommendations have been developed by experts with many years of experience in the LP-Gas industry in the interest of safety for users of LP-Gas and all personnel servicing LP-Gas systems. Failure to fully follow these codes, regulations and recommendations could result in hazardous installations.

2. The bonnet and stem seal assembly of a cylinder valve are extremely critical, since any malfunction could cause external leakage and spillage. Check bonnet to see that it is in proper position. If there is any doubt about tightness of threaded connection between bonnet and body, valve must be repaired in accordance with manufacturers' repair instructions before cylinder is filled. Handwheel must be in good condition, stem threads must not be worn or damaged and bonnet must be properly assembled. This area should be examined each time the cylinder is filled. A leakage test should be conducted while the shut-off valve is in the open position during filling.

3. The cylinder outlet connection is usually a female POL. Threads must be free of dents, gouges and any indication of excessive wear. Seating surface inside this connection must be smooth and free of nicks and scratches to ensure a gas tight seal when connected to a male POL cylinder adapter. Cylinder adapter must spin on freely all the way, without indication of drag, roughness or excessive looseness, and must then be tightened with a wrench. Connection must be checked for leakage.

4. The pressure relief valve is of critical importance: Its proper operation is vital in avoiding excessive pressures during emergencies, such as overfilling or exposure to excessive heat. No repair of this device is allowable. Relief valve should be visually inspected and checked for leaks each time the cylinder is returned for filling. All flow passages must be clean and free of foreign material.

## LP-Gas Cylinder and Service Valves

Entire assembly must be free of dents, distortion or other indications of damage. If relief valve appears too contaminated or damaged, the cylinder valve must be replaced. (Caution: Eye protection must be used when examining relief valves under pressure.)

5. The liquid service shut-off valve, with excess flow valve provided on some cylinder valves, is also of critical importance. The excess flow valve must be periodically tested for proper performance, in addition to the inspection of the shut-off valve.

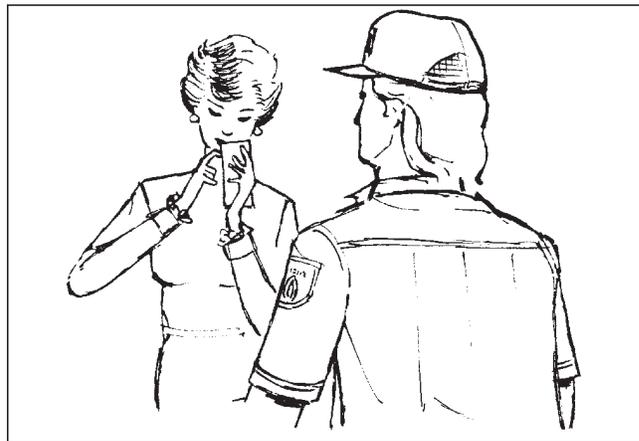
6. The fixed liquid level gauge on a cylinder valve is, when present, essential to prevent overfilling the cylinder. The gauging valve must operate freely, venting vapor when loosened, and sealing gas-tight easily when tightened with the fingers. Gauge valves meant for use with a socket key or screwdriver must also seal easily without excessive torque. The fixed liquid level gauge diptube must be of the proper length, and be in proper position. Periodic test should be conducted by weighing the cylinder after filling, to determine that it does not contain more than the allowable amount of LP-Gas. This check should be done periodically, and any time there is suspicion that the gauge diptube may be damaged or broken.

### Do Not Overfill Cylinders

**Do not fill a cylinder without first repairing or replacing the cylinder valve, as required, if any defect is noted.**

While not required by codes, it is recommended that a plug or suitable protection be inserted in the POL outlet of the cylinder valve at all times except during filling and while connected for use. This will guard against discharge of gas should the handwheel be inadvertently opened while the cylinder is in storage or transit. This is highly advisable for small cylinders that could be transported inside an automobile or trunk. It is important that proper wrenches and adapters be used when filling, servicing and installing cylinder valves in order to avoid damage to the valve or associated piping.

Since cylinders are often used by consumers without previous knowledge of the hazards of LP-Gases and the LP-Gas dealers are the only ones who have direct contact with the consumers, **it is the dealers' responsibility to make sure that his customers are properly instructed in safety matters relating to their installation.**



**At the very minimum, it is desirable that these customers:**

1. Know the odor of LP-Gas and what to do in case they smell gas. Use of the NPGA "Scratch 'n Sniff" leaflet could be productive.
2. Are instructed never to tamper with the system.
3. Know that when protective hoods are used to enclose regulators and/or valves, that these hoods must be closed, but not locked.
4. Know the location of the cylinder shut-off valve in emergencies.

### General Warning

All RegO Products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber.

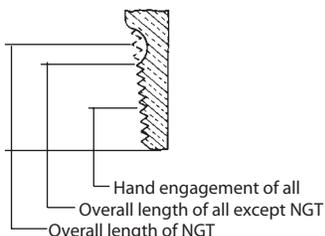
The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential. Because RegO Products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a cylinder valve is used beyond its safe service life. Life of a cylinder valve is determined by the environment in which it "lives". The LP-Gas dealers know better than anyone what this environment is. NOTE: There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could affect them.

## Thread Specifications

### Cylinder Valve Threads

Because of the many thread forms available on equipment used in the LP-Gas industry today, the maze of letters, numbers and symbols which make up various thread specifications becomes confusing. To help eliminate some of this confusion, a brief explanation of some of the more widely used thread specifications is shown below.

### Inlet Connections



#### NGT and NPT Threads

The NGT (National Gas Taper) thread is the commonly used valve-to-cylinder connection. The male thread on the valve has about two more threads at the large end than the NPT in order to provide additional fresh threads if further tightening is necessary. Additionally, the standard 3/4" NGT valve inlet provides the greater tightness at the bottom of the valve by making the valve threads slightly straighter than the standard taper of 3/4" per foot in NPT connections. In all other respects NPT and NGT threads are similar.

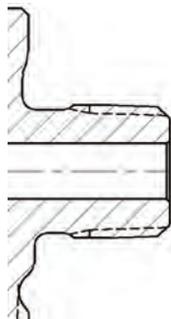
### Outlet Connections

#### CGA Outlets

The CGA (Compressed Gas Association) outlets are standard for use with various compressed gases. The relation of one of these outlets to another is fixed so as to minimize undesirable connections. They have been designed to prevent the interchange of connections which may result in a hazard.

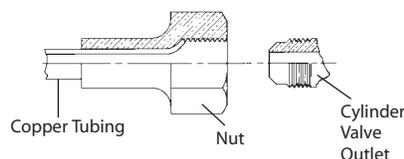
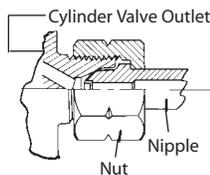
#### 3/8"-18 NPT Thread Connection

This connection is also used for vapor or liquid withdrawal. It has a 3/8" diameter thread, and 18 threads per inch, National Pipe Taper Outlet form.



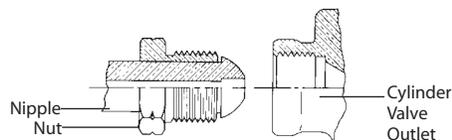
#### CGA 555

CGA 555 is the standard cylinder valve outlet connection for liquid withdrawal of butane and/or propane. Thread specification is .903" – 14 NGO – LH – EXT, which means .903" diameter thread, 14 threads per inch, National Gas Outlet form, left-hand external thread.



#### CGA 182, or SAE Flare

This connection ensures a leak-tight joining of copper tubing to brass parts without the need for brazing or silver soldering. The common size used on LP-Gas valves and fittings is 3/8" SAE (Society of Automotive Engineers) flare. Although this connection is referred to as a 3/8", because 3/8" OD tubing is used, the thread actually measures 5/8". The specifications are .625 – 18 UNF – 2A – RH – EXT, which means .625" diameter thread, 18 threads per inch, Unified Fine Series Class 2 Tolerances, right-hand, external thread.



#### CGA 510 or POL

Most widely used in this industry, POL is the common name for the standard CGA 510 connection. Thread specification is .885" – 14 NGO – LH – INT, meaning .885" diameter thread, 14 threads per inch, National Gas Outlet form, left-hand internal thread. RegO POL outlet connections for LP-Gases conform to this standard.

## LP-Gas Cylinder and Service Valves

### General Information

The wide acceptance of RegO Cylinder Valves is based on their reliable performance as well as their reputation for engineering and manufacturing excellence.

Together with thorough testing, these efforts result in years of trouble-free service. RegO Cylinder Valves are listed by Underwriters' Laboratories and approved by the Bureau of Explosives for pressure relief valve operation, wherever applicable. See section on relief valves for important information.

### Reliability

RegO Cylinder Valves are built with attention to each detail: Beginning with comprehensive inspection of forgings and machined parts, and ending with intense quality testing on each individual valve prior to shipment.

Every valve must pass a stringent and comprehensive underwater leakage test. Additionally, valves with pressure reliefs are tested for proper pressure and operation, including reseating to ensure proper opening and closing at required pressures. Those equipped with excess flow checks are tested for compliance with published closing specifications, and tested to ensure minimum leakage after closing.

### Instructions for the Proper Use and Applications of RegO Cylinder Valves

1. Containers and pipe line should be cleaned thoroughly before valves are installed. Large particles of solid foreign matter can cut the seating surface of any resilient seat disc, causing the valve to leak. Care must be exercised in inserting valves into lines or containers to avoid damaging or exerting pressure against pressure relief valves and outlet connections. Use a minimum amount of a suitable luting compound on the cylinder valve threads only. Excess amounts of luting compound can foul the operating parts of the valves.

### Heavy-Duty Valve Stem Seals

RegO Cylinder Valves utilize seat discs and stem seals which resist deterioration and provide the kind of reliable service required for

LP-Gas utilization. Diaphragm or O-Ring stem seals are available. Valves with diaphragm stem seals are recognized for their heavy-duty body design and are suitable for use in cylinders up to 200 lbs. propane capacity.

O-Ring type stem seals are the most widely accepted in the industry. The simple, economical and long life design features a tapered and confined nylon seat disc which provides positive, hand-tight closings, and a faster filling cylinder valve.

### Pressure Relief

RegO Valves have full-capacity "pop action" pressure reliefs with start to discharge settings starting at 375 PSIG.

### A Valve for Every Need

RegO Cylinder Valves are available for all LP-Gas services; a wide choice for domestic, commercial, industrial, RV, motor fuel, and lift truck applications.

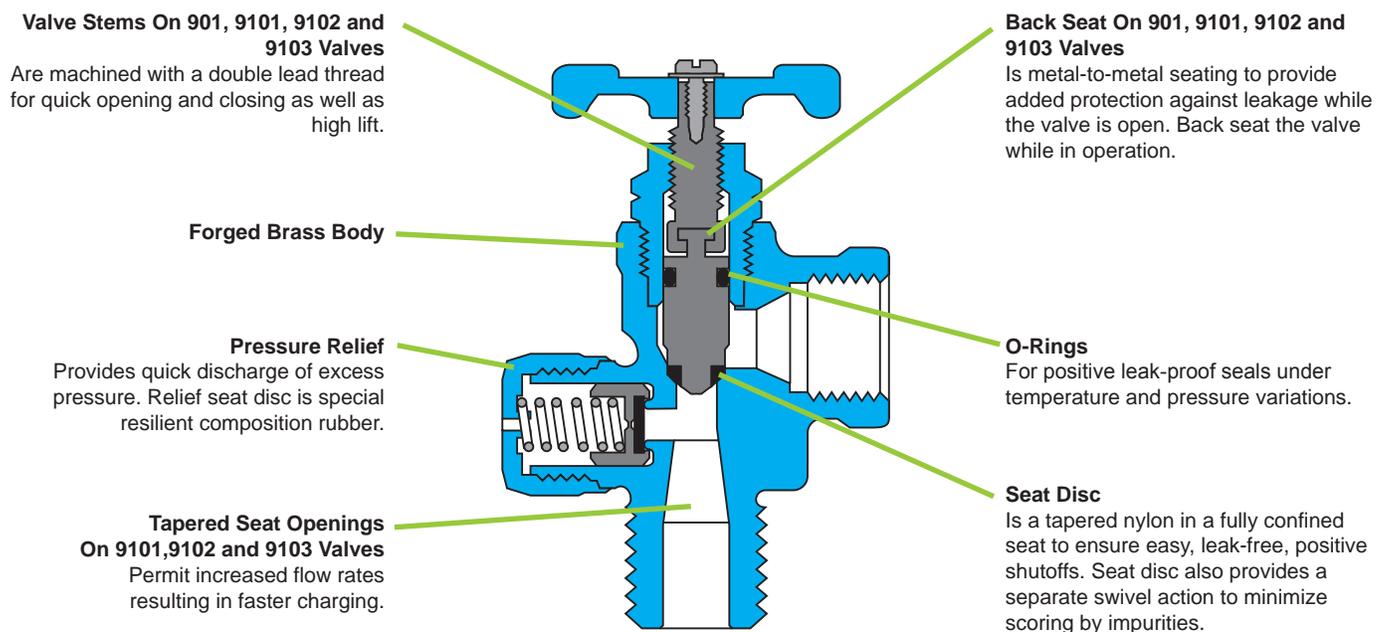
Valves are available with a combination of options such as pressure reliefs, liquid level gauges, and liquid withdrawal tubes. Also available for special applications are plumber's pot valves, tamper resistant valves for field service, and dual valves for simultaneous liquid and vapor service.

2. Do not use excessive force in opening or closing the valves. The seat disc and diaphragm materials permit the valves to be opened and closed easily by hand. Never use a wrench on wheel handle valves.

3. When the design of the piping installation allows liquid to be locked between two valves, a hydrostatic relief valve must be installed in the line between the two valves. The pressures which can develop due to temperature increase in a liquid full line are tremendous and can cause rupture of the line or damage to the valves.

4. The valves are designed to withstand normal atmospheric temperatures. They should not, however, be subjected to abnormally high temperatures.

## Design Features of RegO Cylinder Valves



## Heavy-Duty Cylinder Valves for Vapor Withdrawal

### 9103 Series

This heavy duty cylinder valve is designed for vapor withdrawal of DOT cylinders up to 100 lbs. propane capacity. It is used in domestic hookups and industrial commercial installations.



9103D

### Ordering Information

Part #	Container Connection	Service Connection	Fixed Liquid Level Vent Valve	Dip Tube Length w/ Deflector	Pressure Relief Valve Setting	For Use in Cylinders w/ Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM				Accessories
							Pressure Drop Across Valves				
							10 PSIG	25 PSIG	50 PSIG	100 PSIG	POL Plug
*9103D10.6	3/4" M NGT	F. POL (CGA 510)	Yes	10.6"	375 PSIG	100 lbs.	12.7	20.3	29.0	41.3	N970P
*9103D11.6				11.6"							

\* 72 Orifice low emission version is also available.

## Tamper-Resistant Cylinder Valve with Outlet Check for Vapor Withdrawal

### 9103T9F

This valve is designed for vapor withdrawal from and protection of DOT cylinders up to 100 lbs. propane capacity. Ideal for cylinders used in the field by construction crews, utility repair men and plumbers.



9103T9F

### Ordering Information

Part #	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Pressure Relief Valve Setting	For Use in Cylinders w/Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM			
						Pressure Drop Across Valves			
						10 PSIG	25 PSIG	50 PSIG	100 PSIG
9103T9F	3/4" M. NGT	F. POL (CGA 510)	None	375 PSIG	100 lbs.	5.0	7.6	10.7	14.9

NOTE: These valves incorporate an excess flow valve. Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.

## Cylinder Valve for RV and Small ASME System Vapor Withdrawal

### 9106CO

Designed especially for vapor withdrawal service in small ASME containers with surface area up to 23.8 square feet. UL flow capacity is 645 SCFM/air.



9106CO

### Ordering Information

Part #	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Pressure Relief Valve Setting	For Use In Cylinders w/ Propane Capacity Up To	Flow Capacity SCFM/Air
9106CO	3/4" M. NGT	F. POL (CGA 510)	none	312 PSIG	ASME Tanks*	645

\* Surface area up to 23.8 square feet.

## Cylinder Valve for Liquid Withdrawal

### 9107K8A

Equipped with excess flow valves and liquid withdrawal tubes, they are designed for liquid withdrawal of DOT cylinders up to 100 lbs. propane capacity. They are most often used with heavy BTU loads found in industrial uses.



9107K8A

### Ordering Information

Part #	Container Connection	Service Connection	Fixed Liquid Level Vent Valve	Dip Tube Length	Liquid Withdrawal Tube Length
*9107K8A	3/4" M. NGT	CGA 555	Included	11.6"	44"

\* 72 Orifice low emission version is also available.

Pressure Relief Valve Setting	For Use in Cylinders w/ Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM				Closing Flow (LP-Gas) *		
		Pressure Drop Across Valves				Vapor		Liquid
		10 PSIG	25 PSIG	50 PSIG	100 PSIG	25 PSIG Inlet	100 PSIG Inlet	
375 PSIG	100 lbs.	3.3	5.4	7.7	11.1	525 SCFH	1,000 SCFH	1.7 GPM

\*Closing flows based on 3/8" O.D. withdrawal tube 44" long or less attached.

IMPORTANT: 1/4" O.D. pigtailed or POL connections for 1/4" O.D. pigtailed should not be used with these valves.

NOTES: To ensure proper functioning and maximum protection from excess flow valves, the cylinder valve should be fully opened and backseated when in use. These valves incorporate an excess flow valve. Refer to L-500 / Section F, for complete information regarding selection, operation and testing of excess flow valves.

Cylinder & Service Valves

## Service Valves for ASME and DOT Containers or Vapor Fuel Line Applications

### 901C1, 9101C, 9101D, 9101R and PT9102 Series

Designed for vapor withdrawal service on ASME and DOT containers or in fuel line applications. Since none of these valves have an integral pressure relief valve, they may only be used as an accessory valve on containers that have an independent pressure relief valve sufficient for that container's capacity.



### Ordering Information

Part #	Bonnet Style	Container Connection	Service Connection	Fixed Liquid Level Vent Valve	Approximate Filling Rate Liquid Flow, GPM				Ready To Go™
					Pressure Drop Across Valve				
					10 PSIG	25 PSIG	50 PSIG	100 PSIG	
901C1	Standard	3/4" M. NGT	F. POL CGA 510	No	5.3	8.2	10.8	14.2	NA
9101C1				Yes	8.8	12.4	15.8	21.7	
*9101D11.1				MultiBonnet	No	8.6	12.7	16.3	
*9101D11.7	Yes				7.6	11.7	15.2	20.6	
9101R1	No								
*9101R11.1	Yes								
*9101R11.7	MultiBonnet	3/4" M. NGT	F. POL CGA 510	No	7.6	11.7	15.2	20.6	No
9102D11.1				Yes					Plugged
9102R11.7				No					Yes
*PT9102R1				Yes					
*PT9102R11.1									
*PT9102R11.7									

\* 72 Orifice low emission version is also available.

Note: Since these valves have no integral pressure relief valve, they can be used on any container with an independent relief device sufficient for that tank's capacity.



901C1



9101R1



PT9102



9101D

## Service Valves for ASME Motor Fuel Containers 901C, 9101H, and 9101Y Series

Designed specifically for vapor or liquid withdrawal service on ASME motor fuel containers. Since none of these valves have an integral pressure relief valve, they may only be used as an accessory valve on containers that have an independent pressure relief valve sufficient for that container's capacity.

The integral excess flow valve found in all these service valves helps prevent excessive product loss in the event of fuel line rupture.

When installed for liquid withdrawal, the 9101H6 has provisions for attachment of a liquid withdrawal tube. All other valves must be installed in containers that have provisions for a separate liquid withdrawal.

To ensure proper functioning and maximum protection from integral excess flow valves, these service valves should be fully opened and backseated when in use.



901C5



9101H5



9101Y5H



9101H6

Cylinder & Service Valves

### Ordering Information

Part #	Container Connection	Service Connection	Liquid Withdrawal Connection	Closing Flow (LP-Gas)		
				Vapor		Liquid GPM
				25 PSIG Inlet (SCFH)	100 PSIG Inlet (SCFH)	
901C3	3/4" M. NGT	F. POL CGA 510	None	350***	605***	1.5***
901C5				550***	1050***	2.6***
9101H3		3/8" SAE Flare		430**	800**	1.5**
9101H5*				765**	1300**	3.6**
9101H6*			1/4" NPT	550****	1050****	2.6****
9101Y5H*		60° Angle 3/8" SAE Flare	None	765**	1300**	3.6**

\* Heavy-duty models  
 \*\* Based on 3/8" O.D. pigtail, 20" long or less, connected to valve outlet. For greater lengths, the pigtail must have a larger O.D.  
 \*\*\* Same as (\*\*). In addition, 1/4" O.D. pigtails or POL connections for 1/4" O.D. should not be used with this valve.  
 \*\*\*\* Based on 3/8" O.D. pigtail; 20" long or less, connected to valve outlet. Also based on 1/4" pipe size dip tube, 42" long or less, attached to special inlet connection. For longer pigtail lengths, the diameter of the pigtail must be increased.  
 NOTE: These valves incorporate an excess flow valve. Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.

## "Dual" Cylinder Valve for Simultaneous Liquid and Vapor Withdrawal 8556

This dual cylinder valve was designed especially for industrial uses. It increases the cylinder's flexibility by permitting DOT cylinders up to 100 lbs. propane capacity to be used interchangeably or simultaneously for either liquid or vapor withdrawal.



8556

### Ordering Information

Part #	Container Connection	Service Connection		Fixed Liquid Level Vent Valve Style	Liquid Withdrawal Tube Length
		Vapor	Liquid		
8556	3/4" M. NGT	F. POL (CGA 510)	CGA 555	None	44"

Pressure Relief Valve Setting	For Use in Cylinders w/ Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM				Liquid Closing Flow* (LP-Gas)
		Pressure Drop Across Valves				
		10 PSIG	25 PSIG	50 PSIG	100 PSIG	
375 PSIG	100 lbs.	6.6	10.0	14.5	21.0	2.3 GPM

\* To ensure proper functioning and maximum protection from integral excess flow valves, the cylinder valve should be fully opened and backseated when in use.  
 NOTE: These valves incorporate an excess flow valve. Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.

## Service Valves for DOT Fork Lift Containers

### 9101P5 and 9101P6 Series

Designed specifically for vapor or liquid withdrawal service on DOT fork lift containers. Valves with 1.5 GPM closing flow are for use in small and medium size lift truck applications, while those with 2.6 GPM closing flow are for large lift trucks. Since none of these valves have an integral pressure relief valve, they may only be used as an accessory valve on containers that have an independent pressure relief valve sufficient for that cylinder's capacity.

The integral excess flow valve found in all these service valves helps prevent excessive product loss in the event of fuel line rupture.

When installed for liquid withdrawal, the 9101P6 Series has provisions for attachment of a liquid withdrawal tube. The 9101P5 Series must be installed in containers that have provisions for a separate liquid withdrawal.

To ensure proper functioning and maximum protection for integral excess flow valves, these service valves should be fully opened and backseated when in use.

#### Ordering Information

Part #	Container Connection	Service Connection	Liquid Withdrawal Connection	Closing Flow (LP-Gas)			Approximate Filling Rate Liquid Flow, GPM				Accessories		
				Vapor		Liquid (GPM)	Pressure Drop Across Valve				ACME Check Connectors		
				25 PSIG Inlet (SCFH)	100 PSIG Inlet (SCFH)		10 PSIG	25 PSIG	50 PSIG	100 PSIG	Male	Female	Cap
9101P5	3/4" M. NGT	3/8" M. NPT	None	430	900	1.5	5.0	7.6	10.7	14.9	7141M	7141F	7141M-40 or 7141FP
9101P5T*				550	1050	2.6							
9101P5H			1/4" NPT	430	900	1.5	4.5	7.2	10.3	14.8			
9101P5HT*				550	1050	2.6							
9101P6	3/4" M. NGT	3/8" M. NPT	1/4" NPT	430	900	1.5	4.5	7.2	10.3	14.8	7141M	7141F	7141M-40 or 7141FP
9101P6H				550	1050	2.6							

\*With thread sealant.

Note: These valves incorporate an excess flow valve. Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.



9101P5  
9101P5H



9101P6  
9101P6H

## Cylinder Valve for Propylene Service

### 9104PT and 9104PPA

Designed for vapor withdrawal from and protection of DOT cylinders up to 100 lbs. propylene capacity with pressure ratings such as 4B-260, 4BA-260, and 4BW-260 cylinders.



9104PT



9104PPA

#### Ordering Information

Part #	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length*	Pressure Relief Valve Setting	For use in Cylinders w/ Propylene Capacity up to:
9104PPA	3/4" M.NPT	F.POL - (CGA 510)	N/A	N/A	435 PSIG	100lbs
*9104PT10.1			Knurled	10.0"		
*9104PT10.7				10.7"		

\* Valve can be ordered with other dip tube lengths. Specify required length when ordering. X = diptube size

## Adhesive Warning Labels

### 901-400 and 903-400

These adhesive warning labels are intended for application as close as possible to the cylinder valve and/or service valve.

The basic information contained on the label is intended for the benefit of the user of the valves and is not intended to be an "all-inclusive" product warning.

These labels are printed on a heavy duty material with pressure sensitive adhesive backing. The ultra-violet ink stands up well when exposed to the environment.

Part #	
901-400	Adhesive Label Primarily for Fork Lift Cylinders
903-400	Adhesive Label Primarily for Small DOT Cylinders
903-500	Adhesive Label Primarily for Cylinder and Service Valves

**DANGER** LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE **WARNING!**  
**KEEP CYLINDER OUT OF THE REACH OF CHILDREN**

**AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR THIS HISS OF ESCAPING GAS... IMMEDIATELY GET AWAY FROM THIS CYLINDER. CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT USE OR STORE IN BUILDING OR ENCLOSED AREA. FOR OUTDOOR USE ONLY.**

This container is filled with highly flammable LP-Gas under pressure. A serious fire or explosion can result from leaks and misuse or mishandling of the container and its valve. Do not remove, heat or fill the container by any of the valves. Do not expose to fire or temperatures above 120°F (49°C) or 20" (51 cm) H<sub>2</sub>O head.

The container incorporates a pressure relief valve. The pressure relief valve can expel a large jet of LP-Gas into the air if the container is exposed to high temperatures over 120°F (49°C) or 20" (51 cm) H<sub>2</sub>O head and exposed to a temperature higher than the temperature of the time it was filled.

The pressure relief valve is equipped with a protective cover. The protective cover must remain in place at all times except when inspecting the valve. **CAUTION:** Use eye protection. If dust, dirt, moisture or other foreign material collects in the valve, it may not function properly to prevent container rupture or restrain product flow after opening.

Each time the container is filled, the pressure relief valve must be checked to ensure that it is completely undamaged and that it has not suffered damage. If there is any doubt about the condition of the valve, the container must be removed from service and the pressure relief valve must be replaced.

Only trained personnel should be permitted to fill the container. Before the container is filled for the first time, it must be purged of air. The total liquid volume of LP-Gas must never exceed the amount designated by the regulator. It is the law in many states. A copy of this publication may be obtained by writing NPGA, Ballymarrack Park, Quincy, MA 02269.

Do not allow any welds if the head liquid level gauge is used during filling. Keep the vent closed tightly at all other times. Each time the container is filled, it must be checked for leaks with a leak detection solution. **Safe container to print:** Do not disconnect or connect this container without first reading the instructions accompanying the valve or appliance with which this container is intended to be used. **CAUTION:** The opening valve connecting or disconnecting the container. Make sure the service valve is shut off tightly before beginning to assemble or disassemble the coupling. **Important!** LP-Gas may flow or leak from the coupling. The liquid can cause skin burns, frostbite and other serious injury in addition to those caused by fire and explosion. **CAUTION:** These proper skin and eye protection. Any contact or injury to the coupling must be routinely checked for wear and replaced as required. After connecting the coupling, make sure the connection is leak tight. Check for leaks with a leak detection solution (leak check solution to print). If the connection leaks after tightening, close the service valve, disconnect the coupling and remove from service.

When not in use, keep the service shut-off valve closed. When in use, keep the service valve fully open. Keep the equipment out to the reach of children.

This container must be used only in compliance with all applicable laws and regulations, including National Fire Protection Association Publication #58, which is the law in many states. A copy of this publication may be obtained by writing NPGA, Ballymarrack Park, Quincy, MA 02269.

**DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL. DO NOT FILL THIS CONTAINER UNLESS THIS LABEL IS READABLE.**

**ADDITIONAL SAFETY INFORMATION IS AVAILABLE FROM:** **REGO** (Elon, NC 27244 USA) • www.regoproducts.com • Phone (336) 449-7707 • Fax (336) 449-6584 • Warning 901-400

901-400

**DANGER!** LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE **WARNING!**  
**KEEP CYLINDER OUT OF THE REACH OF CHILDREN**

**CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT USE OR STORE IN BUILDING OR ENCLOSED AREA. FOR OUTDOOR USE ONLY.**

This cylinder contains highly flammable LP-Gas under pressure. A serious fire or explosion can result from leaks and misuse or mishandling of the cylinder and its valve. **Do not carry, hold or fill the cylinder by its valve. Do not expose to fire or temperatures above 120°F (49°C).**

The Cylinder Valve incorporates a Shut-Off Valve and Pressure Relief Valve. The Pressure Relief Valve can expel a large jet of LP-Gas into the air if the cylinder is (1) exposed to high temperatures - over 120°F (49°C), or (2) overfilled and exposed to a temperature higher than the temperature at the time it was filled.

**Never attempt to fill this cylinder yourself. Do not tamper with it or attempt repairs.**

**Only trained LP-Gas Dealer personnel should be permitted to fill this cylinder and to repair or replace its valve. Each time the cylinder is filled, the Cylinder Valve must be checked for leaks with a leak detection solution. Leaks cause bubbles to grow. The Shut-Off Valve and Filled Liquid Level Gauge (if incorporated) must be checked for proper operation. The Pressure Relief Valve must be checked to ensure that it is completely undamaged and that it has no physical damage. CAUTION: eye protection must be worn when emptying cylinders. Do not use for anything other than the intended use.**

**DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL! DO NOT FILL THIS CYLINDER UNLESS THIS LABEL IS READABLE!**

**ADDITIONAL SAFETY INFORMATION IS AVAILABLE FROM:** **REGO** (Elon, NC 27244 USA) • www.regoproducts.com • Phone (336) 449-7707 • Fax (336) 449-6584

**IF YOU SEE, SMELL, OR HEAR THIS HISS OF ESCAPING GAS... IMMEDIATELY GET AWAY FROM THIS CYLINDER. CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT USE OR STORE IN BUILDING OR ENCLOSED AREA. FOR OUTDOOR USE ONLY.**

Before the cylinder is filled for the first time, it must be purged of air. The total liquid volume must never exceed the amount designated by DOT for this cylinder.

If the cylinder has a Filled Liquid Level Gauge, filling should stop the moment a white LP-Gas cloud is emitted from its bleed hole. **Keep the Vent Valve closed tightly at all other times.**

**Keep this cylinder firmly secured in an upright position at all times. Do not lay it on its side during transport, storage or use. In other than an upright position, liquid LP-Gas may flow or leak. This liquid can cause skin burns, frostbite and other serious injuries in addition to those caused by fire or explosion.**

**When not in use:** Close the Shut-Off Valve. Insert a protective plug (P.O.L.) into the Cylinder Valve outlet. (P.O.L. means "counterdownward thread"). The P.O.L. plug must be inserted whenever the cylinder is stored, manually moved, or transported by vehicle.

**When making connections to an appliance:** Do not use the connection to the appliance with which this cylinder is intended to be used. **DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL! DO NOT FILL THIS CYLINDER UNLESS THIS LABEL IS READABLE!**

2. Before connecting the Cylinder Valve outlet connection to an appliance, make sure the connection does not contain dirt or debris. These may cause the connection to leak or may impair the functioning of the regulator, creating a hazardous condition.

3. When connecting the Cylinder Valve outlet to an appliance (CAUTION: counterdownward thread), make sure the connection is tight. Check for leaks with a high quality leak detection solution (leak check solution to print). If the connection leaks after tightening, close cylinder valve, disconnect it from the appliance, insert the P.O.L. plug and immediately return the cylinder, with the Cylinder Valve attached to your LP-Gas Dealer for examination.

This cylinder must be used only in compliance with all applicable laws and regulations, including National Fire Protection Association Publication #58, which is the law in many states. A copy of this publication may be obtained by writing NPGA, Ballymarrack Park, Quincy, MA 02269.

Printed in U.S.A. 06-0414-0384  
 Warning 903-400

903-400

The following warning information, Part Number 903-500, is included with each shipment of cylinder valves and service valves to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

**DANGER** **READ THIS FIRST** **WARNING**  
**LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE**  
**AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR ESCAPING GAS...EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.**

Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warnings "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs. Follow their recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NPGA, Ballymarrack Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment.

Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.

Install valves by applying force to wrenching flats only.

Tighten pipe threads approximately 1 to 1 1/2 turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.

Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.

Check container-valve connection with a non-corrosive leak detection solution before filling with LP-Gas.

Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).

Test excess flow check valve for proper operation before placing into service. See NPGA Bulletin 113 for recommended procedure.

Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.

**RegO Filler Valves:** To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use ONLY RegO 3119A, 3120 and 3121 Unloading Adapters with RegO Filler Valves. Carefully follow the instructions supplied with these unloading adapters.

If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.

In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NPGA's and others.

Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs.

RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.

**REGO** (Elon, N.C. 27244 U.S.A.) • Phone (336) 449-7707 • Fax (336) 449-6584 • www.regoproducts.com

Printed in USA 09A-0910-0686  
 Part number 903-500

903-500

## RegO Multivalve® Assemblies

### General Information

RegO Multivalves® were pioneered in the 1930's. By combining several valve functions in one unit, Multivalves® made possible new and more practical tank designs (fewer openings and smaller, less cumbersome protective hoods). They received immediate acceptance.

The Multivalve® design has kept pace with changing industry needs over the years. They are as popular as ever; still keeping fabricating costs down and reducing operating expenses for the LP-Gas dealer.

### RegO Multivalves® Reduce the Cost of Fabrication by

- Combining several valve functions in one less expensive body.
- Reducing the number of threaded openings in ASME containers.
- Diminishing the size and cost of protective hoods.
- Providing generous sized wrenching bosses for quick, easy installation.

### RegO Multivalves® Reduce LPG Dealer Expenses by

- Permitting on-site filling of 100 lb. to 420 lb. DOT cylinders, thus eliminating cylinder return and interrupted customer service.
- Providing well-placed hose connections for easy filling.
- Allowing ample space for secure attachment and easy removal of the regulator.
- Providing substantial savings of bonnet repairs on valves with the MultiBonnet®.

### RegO Multivalves® Satisfy Customer Demands for Tough, Safe Equipment with These Features

#### Heavy-Duty Valve Stem Seals —

- Tapered nylon disc in a fully confined seat resists deterioration and provides hand-tight closings over a long service life.

#### Comprehensive Testing —

- Every Multivalve® must pass a stringent underwater leakage test prior to shipment.
- Multivalves® with pressure relief valves are individually tested and adjusted to ensure proper pressure settings.
- Those equipped with excess flow checks are tested for compliance with published closing specifications and for leakage after closing.

#### Pressure Relief Valves and Other Devices —

- Multivalves® equipped with integral pressure relief devices employ full-capacity, "pop-action" reliefs with set pressures of 250 psig for ASME use and 375 psig for DOT cylinders.

#### Double Back-Check Filler Valves —

- Multivalves® with filling connections have double backcheck safety. If the upper check ceases to function, the lower stand-by check will continue to protect the filling connection from excessive leakage.

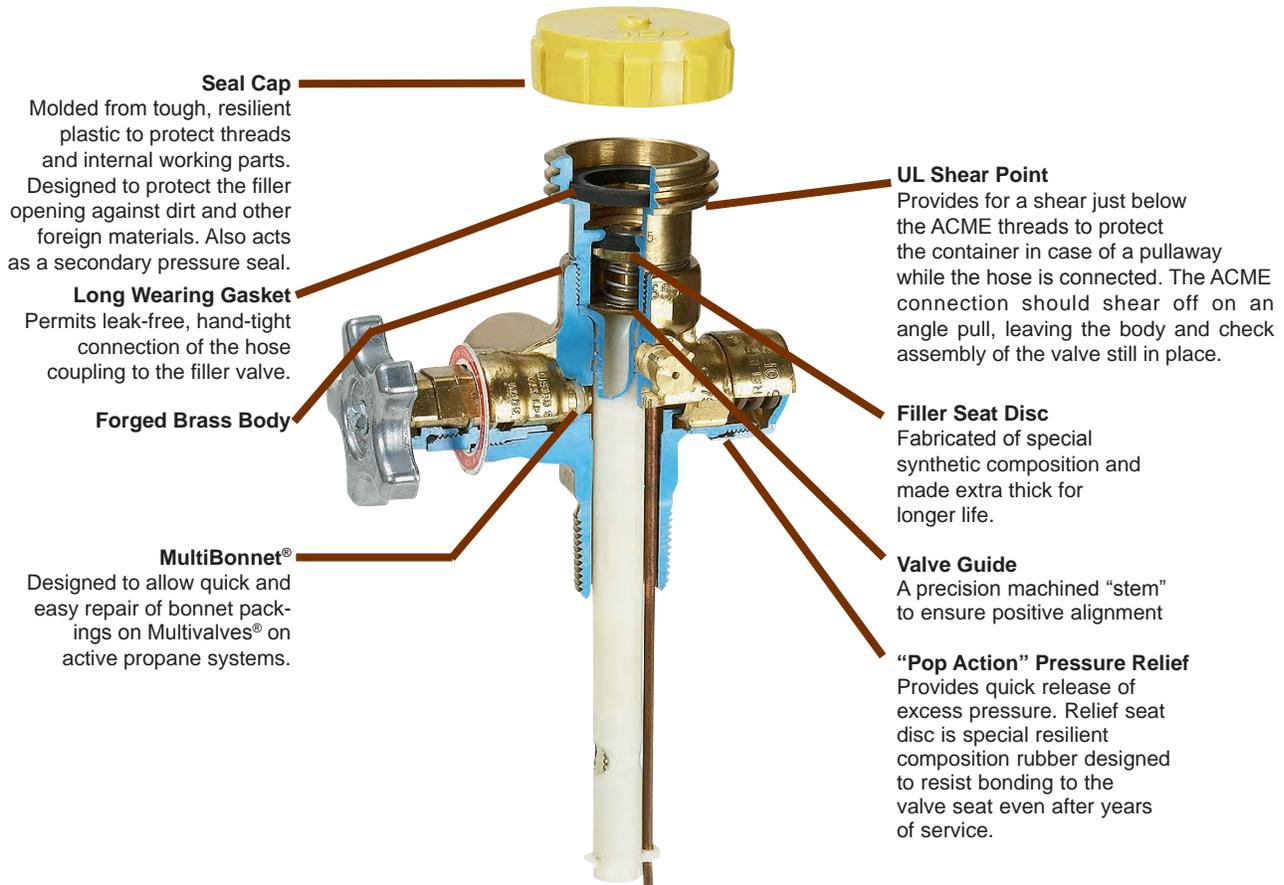
#### Ease of Maintenance —

- Standardization of parts makes it possible for one repair kit to maintain the bonnet assemblies of RegO cylinder valves, service valves, motor fuel valves, and Multivalves®.

#### RegO Multivalves® fit every LP-Gas need.

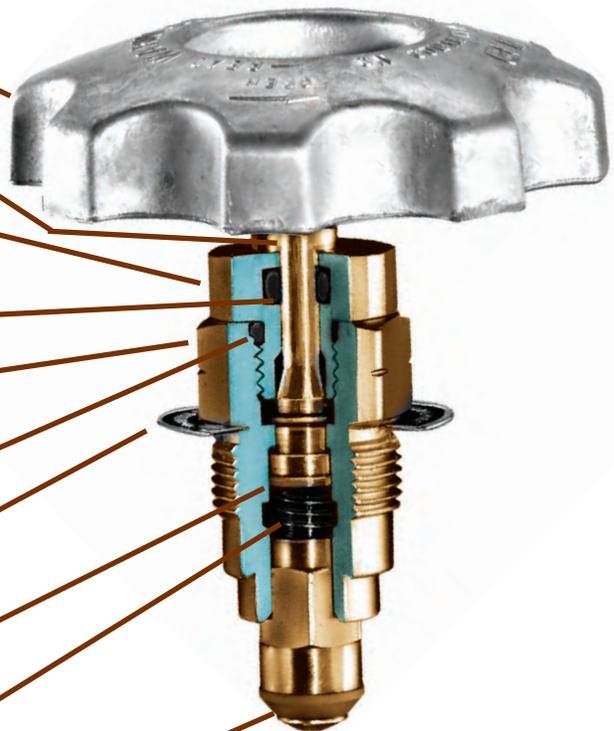
- Wide selection of Multivalves® for domestic, commercial, and industrial needs are available.
- Multivalves® may be ordered with pressure relief, liquid level tube, filler valve, vapor equalizing valve, internal pipe connections, liquid filling and withdrawal connections, and 1/4" NPT tapped opening for pressure gauge with or without steel plug.

## Design Features of RegO Multivalves®



## RegO Multibonnet® Assemblies

- Design Features of the MultiBonnet®**
- Handwheel**  
Aluminum die cast handwheel.
  - Non-Rising Stem**  
Designed to allow easy backseating and long service life.
  - Upper Packing Assembly**  
Contains both internal and external o-rings. Provides leak resistant performance.
  - Internal O-ring**
  - Lower Bonnet and Stem Assembly**  
Machined brass construction offers durability to bonnet design.
  - External O-ring**
  - Nameplate**  
Provides easy identification of the RegO MultiBonnet®.
  - Teflon Backseat**  
Provides for upper packing isolation when valve is fully open.
  - Machined Double Lead Threads**  
Provides for quick opening and closing of the valve.
  - Shut-off Seat Disc**  
Tapered nylon disc is retained in a fully confined seat that helps ensure positive shut-offs.



The MultiBonnet® is designed to allow quick and easy repair of bonnet packings in certain Multivalves® and service valves on active propane systems. It allows you to repair valve bonnet stem o-ring leaks in minutes, without interrupting gas service to your customers.

- Eliminates the need to evacuate tanks or cylinders to repair the MultiBonnet® packing.
- Two section design allows repair of MultiBonnet® assemblies on active propane systems without interruption in gas service or shutting off appliances downstream. This helps to prevent time consuming relighting of pilots, special appointments, and call backs.
- Cost of replacing the MultiBonnet® packing is only 1/3 as much as replacing a complete bonnet assembly—not including time cost savings, which can be substantial.

- Available on certain new Multivalves® and service valves as well as repair assemblies for many existing RegO valves.
- UL listed as a component of valve assembly.

### Here's How The MultiBonnet® Works

- When the valve is fully open, only the lower stem will rise and backseat against the teflon washer which isolates the upper packing.
- This allows you to remove the upper packing nut, which contains the o-rings, and replace it while the valve is fully open and gas service not interrupted.

## ASME Multivalves® for Vapor Withdrawal G8475RL Series Valves with Presto-Tap

### PG8475, PT7556 Series Valves

These Multivalves® are designed for use in single opening ASME containers equipped with a 2-1/2" M. NPT riser. They can be used with underground ASME containers up to 639 sq. ft. surface area, and above ground ASME containers up to 192 sq. ft. surface area. A separate opening is required for liquid withdrawal. The MultiBonnet® is standard on this valve.



PG8575RL

### Liquid Filling Rates

Part #	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
G8475RL				
G8475RLW	42	72	98	125
PG8475RL				

### Ordering Information

Part Number	Container Connection	Service Connection	Filling Connection	Relief Valve Height	Vapor Equalizing Connection		Float Gauge Flange Opening	Fixed Liquid Level Vent Valve	Dip Tube Length	Pressure Relief Valve			For use in containers w/ surface area up to:	
					Size	UL Listed Closing Flow				Setting	Part #	Flow Capacity		
												UL		ASME
G8475RL	2-1/2" F. NPT	F. POL (CGA 510)	1-3/4" M. ACME	6-3/4"	1-1/4" M. ACME	4200 CFH @ 100 PSIG	Fits "JUNIOR" size	Yes	30"	250 PSIG	M3131G	2020 SCFM, air	1939 SCFM, air	83 sp ft. above ground
*G8475RLW			8-1/2"	MV3132G								3995 SCFM, air	n/a	276 sp ft. under ground
														192 sq ft. above ground
														639 sp ft. under ground

\*Dip tube not installed, may be cut by customer to desired length.  
\*\* 72 Orifice low emission version is also available.

## ASME Multivalves® for Vapor Withdrawal 8593AL

These Multivalves® provide vapor withdrawal and filling of ASME containers. A separate pressure relief valve is required in addition to this valve. The MultiBonnet® is standard on this valve.



8593AL

### Liquid Filling Rates

Part #	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
8593AL16.0	42	72	98	125

### Ordering Information

Part #	Container Connection	Service Connection	Filling Connection	Vapor Equalizing Connection		Fixed Liquid Level Vent Valve Style	Dip Tube Length	For Use In Containers w/ Surface Area Up To:
				Connection Size	UL Listed Closing Flow			
8593AL16.0	1-1/2" M. NPT	F. POL (CGA 510)	1-3/4" M. ACME	1-1/4" M. ACME	4200 CFH at 100 PSIG	Knurled	16"	**

\*Dip tube not installed, may be cut by customer to desired length.

\*\*Since these Multivalves® have no integral pressure relief valves, they can be used on any ASME container with an independent relief device sufficient for that tank's capacity.

Multivalve® Assemblies

## DOT Multivalve® for Liquid Withdrawal 8555DL

These Multivalves® permit liquid withdrawal from DOT cylinders with up to 100 lbs. propane capacity. They eliminate unnecessary cylinder handling when servicing high volume loads and allow on-site filling into the vapor space without interrupting gas service.



8555DL

### Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
****8555DL11.6	8	23	34	42

### Ordering Information

Part #	Container Connection	Service Connection	Filling Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length w/ Deflector	Liquid Withdrawal Tube Length	Pressure Relief Valve Setting	For Use In Cylinders w/ Propane Capacity Up To:	Liquid Closing Flow (LP-Gas)***
****8555DL11.6	3/4" M. NGT	CGA 555*	1-3/4" M. ACME	Knurled	11.6"	44"	375 PSIG	100 lbs. **	1.7 GPM

\* Use adapter 12982 to connect to pipe threads.

\*\* Per CGA Pamphlet S-1.1.

\*\*\* To ensure proper functioning and maximum protection from integral excess flow valves, the cylinder valve should be fully opened and backseated when in use.

\*\*\*\*72 orifice low emission version is also available.

## DOT & ASME Multivalves® for Vapor Withdrawal 6555R, 8555D and 8555R Series

These Multivalves® permit vapor withdrawal. They allow for container filling without interrupting gas service.



The 6555R Series is designed for ASME containers with up to 25 ft<sup>2</sup> surface area or 60 gallons water capacity.

The 8555D and 8555R Series are designed for DOT cylinders with up to 200 lbs. propane capacity.



8555R

### Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
**6555D Series	8	23	34	42
**6555R Series				
**8555D Series				
**8555R Series				

### Ordering Information

Part #	Bonnet Style	Application	For Use In Containers with Size Up To:	Dip Tube Length w/ Deflector	Container Connection	Service Connection	Filling Connection	Fixed Liquid Level Vent Valve	Pressure Relief Valve		
									Setting	Flow Capacity*	
										UL Listing	ASME
**6555R10.6	MultiBonnet®	ASME Containers	25 ft <sup>2</sup> surface area or 60 gallons water capacity	10.6"	3/4" M. NGT	F. POL (CGA 510)	1-3/4" M. ACME	Yes	250 PSIG	793 SCFM, air	700 SCFM, air
**6555R11.6	MultiBonnet®			11.6"							
**6555R12.0	MultiBonnet®			12.0"							
**8555D10.6	Standard	DOT Cylinders	200 lbs. Propane **	10.6"	3/4" M. NGT	F. POL (CGA 510)	1-3/4" M. ACME	Yes	375 PSIG	n/a	n/a
**8555R10.6	MultiBonnet®			11.6"							
**8555D11.6	Standard										
**8555R11.6	MultiBonnet®										

\*Per CGA Pamphlet S-1.1.

\*\*72 orifice low emission version is also available.

## DOT and ASME Multivalves® for Vapor Withdrawal

6532, 6533, 6542, 6543 Series and PT6542, PT6543 Series with Presto-Tap®

These Multivalves® permit vapor withdrawal from ASME containers up to 50 sq. ft. surface area and DOT containers up to 420 lbs. propane capacity. They allow on-site cylinder filling without interrupting gas service.



### Liquid Filling Rates

Part #	Approximate Filling Rate -- Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
6532A12.0/6532R12.0	11	16	23	28
6542A12.0/6542R12.0	23	32	46	57
6533A10.5/6533R10.5	11	16	23	28
6533A11.7/6533R11.7				
6543A11.1/6543R11.1	23	32	46	57
6543A11.7/6543R11.7				
PT6542A12.0/6542R12.0	23	32	46	57
PT6543A11.1/6543R11.1				
PT6543A11.7/6543R11.7				



PT6543R

### Ordering Information

Part #	Bonnet Style	Application	Container Connection	Service Connection	Filling Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length with Deflector	Pressure Relief Valve Setting	For Use In Cylinders w/Propane Capacity Up To:**	UL Flow Capacity @ 120% of set pressure SCFM (air)	Ready To Go™
6532A12.0	Standard	ASME*	3/4" M. NGT	F. POL (CGA 510)	1-3/4" M. ACME	Knurled	12.0"	250 PSIG	-	1180	Plugged
6532R12.0	MultiBonnet®										
6542A12.0	Standard		Yes								
PT6542A12.0	MultiBonnet®										Yes
6533A10.5	Standard	DOT	3/4" M. NGT	375 PSIG	420 lbs. Propane	-	-	-	-	Plugged	
6533R10.5	MultiBonnet®										10.5"
6533A11.7	Standard		11.7"							Yes	
6533R11.7	MultiBonnet®										Yes
6543A11.1	Standard		11.1"	Plugged							
PT6543A11.1	MultiBonnet®				Yes						
6543R11.1	Standard		11.7"	Plugged							
PT6543R11.1	MultiBonnet®				Yes						
6543A11.7	Standard		1" M. NGT	Plugged							
PT6543A11.7	MultiBonnet®				Yes						
6543R11.7	Standard	Plugged									
PT6543R11.7	MultiBonnet®		Yes								

\*\* Per CGA Pamphlet S-1.1.

## ASME Multivalves® for Vapor Withdrawal 7556R

These compact Multivalves® are especially suited for vapor withdrawal of ASME containers where compact groupings of components are necessary. Separate filler valves and pressure relief valves are required.



PT7556R

### PT7556 R Multivalve®

Especially suited for vapor withdrawal of ASME containers where compact groups of components are necessary. Separate filler valves and pressure relief valves are required

### Ordering Information

Part #	Container Connection	Service Connection	Vapor Equalization Connection		Fixed Liquid Level Vent Valve	Dip Tube Length	Ready to Go™
			Connection Size	UL Listed Closing Flow			
7556R12.0	3/4" M. NGT	F. POL (CGA 510)	1-1/4" M. ACME	4200 CFH @ 100 PSIG	Yes	12"***	Plugged
PT7556R12.0							Yes

\* Since these Multivalves® have no integral pressure relief valves, they can be used on any ASME container with an independent relief device sufficient for that tank's capacity.

\*\* Other tube lengths available.

### Adhesive Warning Label

The following warning information, Part # 903-500, is included with each shipment of Multivalve® Assemblies to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

**DANGER      READ THIS FIRST      WARNING**

**LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE**

**AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS...EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.**

Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NPGA Safety Pamphlet 206 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs. Follow their recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment.

Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.

Install valves by applying force to wrenching flats only.

Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.

Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.

Check container-valve connection with a non-corrosive leak detection solution before filling with LP-Gas.

Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).

Test excess flow check valve for proper operation before placing into service. See NPGA Bulletin 113 for recommended procedure.

Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.

**RegO Filler Valves:** To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use ONLY RegO 3119A, 3120 and 3121 Unloading Adapters with RegO Filler Valves. Carefully follow the instructions supplied with these unloading adapters.

If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.

In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NFPA's and others.

Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs.

RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.

**REGO**

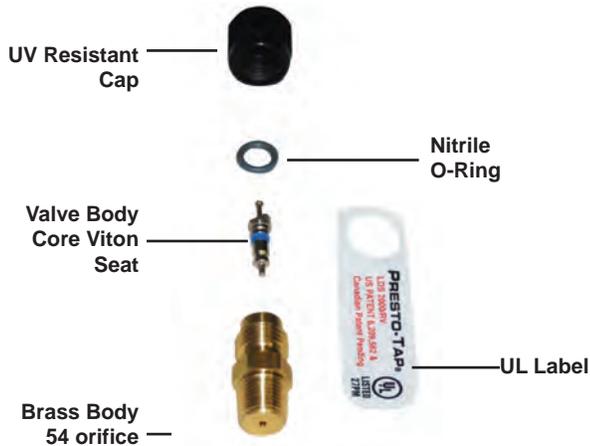
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Multivalve® Assemblies

## DOT and ASME Multivalves® Info Page

### Patented LDS200RV Design Features



US Patent # 6,209,562

The Patented Presto-Tap LDS2000RV pressure fitting is designed to be one of the most cost efficient and simplest methods to quickly and easily perform system pressure checks.

- Patented & UL Listed.
- Provides instant ROI after only one use.
- Will reduce fugitive emissions by up to 90%.
- Can be installed into valves, regulators & appliances.
- Eliminates the need to break the system to perform a leak test.

### Presto-Tap System Leak Test Procedure

The Presto-Tap fitting installed into the test port located on the downstream side of the service valve is designed to allow quick and easy access when performing a system leak test. It eliminates the need to break the system to install expensive test block apparatus. The following PT9102R series service valve shown here, illustrates how to use the Presto-Tap fitting to perform a high-pressure system leak test. This same procedure applies to the PT7556R, PG8475, PT6542 and PT6543 series valves not shown here that carry the same feature.



1 Remove Gas Tight Cap from pressure fitting.

2 Attach 300 LB Gauge to pressure fitting. Perform System Leak Test Per NFPA 58 - Your Company Policy.

3 Once the system has been leak tested successfully simply remove the 300 LB gauge and replace and snug the Gas Tight Cap.



PG8475RL Series



PT7556 Series



PT9102R Series



PT6543 Series  
PT6542 Series

Only trained qualified personnel should perform leak testing. As for any LP-Gas installation, service or repair it is required that time be taken to ensure safety and all federal, state and local regulations are met.

## Safety Warning — LP-Gas Pressure Relief Valves

### Purpose

In its continuing quest for safety, RegO is publishing safety warning bulletins explaining the hazards associated with the use, misuse and aging of RegO Products. LP-Gas dealer managers and service personnel must realize that the failure to exercise the utmost care and attention in the installation, inspection and maintenance of these products can result in personal injury and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

This Warning Bulletin should be provided to all purchasers of RegO and all personnel using or servicing these products. Additional copies are available from RegO and your Authorized RegO Distributor.

# WARNING

### What You Must Do:

- **Read This Entire Warning**
- **Install Properly**
- **Inspect Regularly**

### Scope

This bulletin applies to pressure relief valves installed on stationary, portable and cargo containers and piping systems utilized with these containers. This bulletin is not intended to be an exhaustive treatment of this subject and does not cover all safety practices that should be followed in the installation and maintenance of LP-Gas systems. Each LP-Gas employee should be provided with a copy of NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspection and Maintenance" as well as the NPGA "LP-Gas Training Guidebooks" relating to this subject.

Warnings should be as brief as possible. If there is a simple warning, it is:

**Inspect pressure relief valves regularly. Replace unsafe or suspect valves immediately. Use common sense.**

## Inspect Regularly

A pressure relief valve discharges when some extraordinary circumstance causes an over pressure condition in the container. If a pressure relief valve is known to have discharged, the relief valve, as well as the entire system, should be immediately and thoroughly inspected to determine the reason for the discharge. In the case of discharge due to fire, the valve should be removed from service and replaced.

Relief valves should be inspected each time the container is filled but no less than once a year. If there is any doubt about the condition of the valve, it must be replaced.

Eye protection must be worn when performing inspection on relief valves under pressure. Never look directly into a relief valve under pressure or place any part of your body where the relief valve discharge could impact it. In some cases a flashlight and a small mirror are suggested to assist when making visual inspections.

### To Properly Inspect A Pressure Relief Valve, Check For:

- 1. A rain cap.** Check protective cap located in valve or at end of pipeaway for a secure fit. Protective caps help protect the relief valve against possible malfunction caused by rain, sleet, snow, ice, sand, dirt, pebbles, insects, other debris and contamination. **REPLACE DAMAGED OR MISSING CAPS AT ONCE AND KEEP A CAP IN PLACE AT ALL TIMES.**
- 2. Open weep holes.** Dirt, ice, paint and other foreign particles can prevent proper drainage from the valve body. **IF THE WEEP HOLES CANNOT BE CLEARED, REPLACE THE VALVE.**
- 3. Deterioration and corrosion on relief valve spring.** Exposure to high concentrations of water, salt, industrial pollutants, chemicals and roadway contaminants could cause metal parts to fail. **IF THE COATING ON THE RELIEF VALVE SPRING IS CRACKED OR CHIPPED, REPLACE THE VALVE.**
- 4. Physical damage.** Ice accumulations and improper installation could cause mechanical damage. **IF THERE ARE ANY INDICATIONS OF DAMAGE, REPLACE THE VALVE.**
- 5. Tampering or readjustment.** Pressure relief valves are factory set to discharge at specified pressures. **IF THERE ARE ANY INDICATIONS OF TAMPERING OR READJUSTMENT, REPLACE THE VALVE.**
- 6. Seat leakage.** Check for leaks in the seating area using a noncorrosive leak detection solution. **REPLACE THE VALVE IF THERE IS ANY INDICATION OF LEAKAGE.** Never force a relief valve closed and continue to leave it in service. This could result in damage to the valve and possible rupture of the container or piping on which the valve is installed.
- 7. Corrosion and contamination.** **REPLACE THE VALVE IF THERE ARE ANY SIGNS OF CORROSION OR CONTAMINATION ON THE VALVE.**
- 8. Moisture, foreign particles or contaminants in the valve.** Foreign material such as paint, tar or ice in relief valve parts can impair the proper functioning of the valves. Grease placed in the valve body may harden over time or collect contaminants, thereby impairing the proper operation of the relief valve. **DO NOT PLACE GREASE IN THE VALVE BODY. REPLACE THE VALVE IF THERE ARE ANY INDICATIONS OF MOISTURE OR FOREIGN MATTER IN THE VALVE.**
- 9. Corrosion or leakage at container connection.** Check container to valve connection with a non-corrosive leak detection solution. **REPLACE THE VALVE IF THERE IS ANY INDICATION OF CORROSION OR LEAKAGE AT THE CONNECTION BETWEEN THE VALVE AND CONTAINER.**

**CAUTION:** Never plug the outlet of a pressure relief valve. Any device used to stop the flow of a properly operating pressure relief valve that is venting an overfilled or overpressurized container - raises serious safety concerns!

### Replace Pressure Relief Valves In 10 Years Or Less

The safe useful life of pressure relief valves can vary greatly depending on the environment in which they live.

Relief valves are required to function under widely varying conditions. Corrosion, aging of the resilient seat disc and friction all proceed at different rates depending upon the nature of the specific environment and application. Gas impurities, product misuse and improper installations can shorten the safe life of a relief valve.

Predicting the safe useful life of a relief valve obviously is not an exact science. The conditions to which the valve is subjected will vary widely and will determine its useful life. In matters of this kind, only basic guidelines can be suggested. For example, the Compressed Gas Association Pamphlet S-1.1 Pressure Relief Device Standards — Cylinders, section 9.1.1 requires all cylinders used in industrial motor fuel service to have the cylinder's pressure relief valves replaced by new or unused relief valves within twelve years of the date of manufacture of cylinder and within each ten years thereafter. The LP-Gas dealer must observe and determine the safe useful life of relief valves in his territory. The valve manufacturer can only make recommendations for the continuing safety of the industry.

**WARNING:** Under normal conditions, the useful safe service life of a pressure relief valve is 10 years from the original date of manufacture. However, the safe useful life of the valve may be shortened and replacement required in less than 10 years depending on the environment in which the valve lives. Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage.

#### For Additional Information Read:

1. CGA Pamphlet S-1.1 Pressure Relief Standards - Cylinders, Section 9.1.1.
2. RegO Catalog L-500.
3. RegO Warning # 8545-500.
4. NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspection and Maintenance" and "LP-Gas Training Guidebooks".
5. NFPA # 58, "Storage and Handling of Liquefied Petroleum Gases".
6. NFPA # 59, "LP-Gases at Utility Gas Plants".
7. ANSI K61.1 Safety Requirements for Storage and Handling of Anhydrous Ammonia.

## RegO Pressure Relief Valves

### Requirements for Pressure Relief Valves

Every container used for storing or hauling LP-Gas and anhydrous ammonia must be protected by a pressure relief valve. These valves must guard against the development of hazardous conditions which might be created by any of the following:

Hydrostatic pressures due to overfilling or the trapping of liquid between two points.

High pressures resulting from exposure of the container to excessive external heat.

High pressures due to the use of incorrect fuel.

High pressures due to improper purging of the container.

Consult NFPA Pamphlet #58 for LP-Gas and ANSI #K61.1 for anhydrous ammonia, and/or any applicable regulations governing the application and use of pressure relief valves.

### Operation of Pressure Relief Valves

Pressure relief valves are set and sealed by the manufacturer to function at a specific "start-to-discharge" pressure in accordance with regulations. This set pressure, marked on the relief valve, depends on the design requirement of the container to be protected by the relief valve. If the container pressure reaches the start-to-discharge pressure, the relief valve will open a slight amount as the seat disc begins to move slightly away from the seat. If the pressure continues to rise despite the initial discharge through the relief valve, the seat disc will move to a full open position with a sudden "pop". This sharp popping sound is from which the term "pop-action" is derived.

Whether the relief valve opens a slight amount or pops wide open, it will start to close if the pressure in the container diminishes. After the pressure has decreased sufficiently, the relief valve spring will force the seat disc against the seat tightly enough to prevent any further escape of product. The pressure at which the valve closes tightly is referred to as the "re-seal" or "blow-down" pressure. Generally, the re-seal pressure will be lower than the start-to-discharge pressure. The re-seal pressure can be, and in most cases is, adversely affected by the presence of dirt, rust, scale or other foreign particles lodging between the seat and disc. They interfere with the proper mating of the seat and disc and the pressure in the container will usually have to decrease to a lower pressure before the spring force embeds foreign particles into the resilient seat disc material and seals leak-tight. The degree by which the presence of dirt decreases the re-seal pressure, is, of course, dependent on the size of the interfering particles.

Once particles have been trapped between the disc and seat, the start-to-discharge pressure is also affected. For example, the pressure relief valve will start-to-discharge at some pressure lower than its original start-to-discharge pressure. Again, the pressure at which the valve will start to discharge is dependent on the size of the foreign particles.

In the case of a pressure relief valve that has opened very slightly due to a pressure beyond its start-to-discharge setting, the chances of foreign material lodging between the seat and disc is negligible although the possibility is always present. If the relief valve continues to leak at pressures below its start-to-discharge setting it must be replaced.

Relief valves which have "popped" wide open must also be checked for foreign material lodged between the seat and disc, as well as for proper reseating of the seat and disc. Continued leakage at pressures below the start-to-discharge setting indicate the relief valve must be replaced.

The pressure at which a pressure relief valve will start to discharge should never be judged by the reading of the pressure gauge normally furnished on the container.

### The reasons for this are two-fold:

If the relief valve is called upon to open, the resulting discharge produces an increased vaporization of the product in the container with the result that the liquid cools to a certain extent and the vapor pressure drops. A reading taken at this time would obviously not indicate what the pressure was when the relief valve opened.

The pressure gauges usually on most containers provide somewhat approximate readings and are not intended to provide an indication of pressure sufficiently accurate to judge the setting of the relief valve.

### Repair and Testing

RegO Pressure Relief Valves are tested and listed by Underwriters Laboratories, Inc., in accordance with NFPA Pamphlet #58. Construction and performance of RegO Pressure Relief Valves are constantly checked at the factory by U.L. inspectors. Therefore, testing of RegO Pressure Relief Valves in the field is not necessary.

Any pressure relief valve which shows evidence of leakage, other improper operation or is suspect as to its performance must be replaced immediately using approved procedures.

### Pipe-Away Adapters

Pipe-away adapters are available for most RegO Pressure Relief Valves, where it is required or desirable to pipe the discharge above or away from the container. Each adapter is designed to sever if excessive stress is applied to the vent piping – thus leaving the relief valve fully operative.

Weep hole deflectors are available on larger relief valves. These deflectors provide protection against flame impinging on adjacent containers which could occur from ignition of LP-Gas escaping through the relief valve drain hole when the valve is discharging.

### Selection of RegO Pressure Relief Valves For ASME Containers

The rate of discharge required for a given container is determined by the calculation of the surface area of the container as shown in "Chart A" for LP-Gas and "Chart B" for anhydrous ammonia. See page D9.

Setting - The set pressure of a pressure relief valve depends upon the design pressure of the container. Refer to NFPA Pamphlet #58 for more information.

### Selection of RegO Pressure Relief Valves for DOT Containers

To determine the proper relief valve required for a given DOT container, refer to the information shown with each pressure relief valve in the catalog. This information will give the maximum size (pounds water capacity) DOT container for which the relief valve has been approved.

Setting - The standard relief valve setting for use on DOT cylinders is 375 PSIG.

## RegO Pressure Relief Valves

### Ordering RegO Pressure Relief Valves

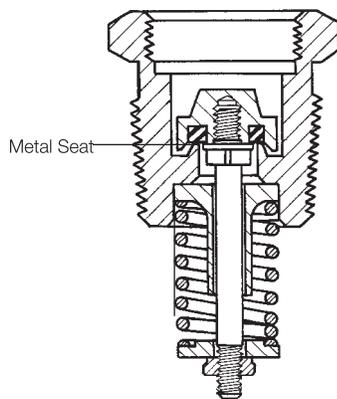
When ordering RegO Pressure Relief Valves, be sure you are certain that it will sufficiently protect the container as specified in the Foreword section, NFPA Pamphlet #58 and any other applicable standards or specifications.

All adapters, protective caps and deflectors must be ordered separately, unless specified otherwise.

### Part Number Explanation

Products carrying an "A" or "AA" prefix contain no brass parts and are suitable for NH3. Hydrostatic relief valves carrying an "SS" prefix are of stainless steel construction and are suitable for use with NH3. The products are also suitable for use with LP-Gas service except relief valves carrying an "AA" prefix. These are of partial aluminum construction and are listed by U.L. for NH3 service only.

## Safety Information - Relief Valves Don't Last Forever



### RegO Relief Valve for lift truck containers

The internal spring is protected from external contamination but the other external parts must be protected with a cap. Circular rubber seat disc ring seats on brass shoulder approximately 3/64" wide.

This article was prepared by the engineers of RegO products, after technical consultation with valve manufacturers and other industry sources. Its purpose is to alert and remind the LP-Gas industry of the importance of proper maintenance of pressure relief valves. It applies most particularly to separate relief valves with emphasis on lift truck and motor fuel containers where the hazards of contamination are greatest.

Since the beginning of our industry, manufacturers of equipment and distributors of LP-Gas have worked diligently to provide a safe environment for employees and consumers. The history of the industry testifies to the success of their efforts.

But the industry is now entering its sixth decade and equipment installed years ago is failing because of age. Every year, additional equipment will fail unless it is replaced. Pressure relief valves are no exception. The valve manufacturers and LP-Gas dealers are naturally concerned about this situation.

### Causes of Relief Valve Failure

A relief valve is designed to have a safe useful life of many years, but that life will vary greatly depending on the environment in which it "lives." To attempt to estimate the safe useful life of a relief valve and the effect of environment on its performance, a brief discussion of the materials used and the nature of its performance should be helpful.

Relief valve bodies are generally made of brass or steel. Springs are made from various spring wires which are plated or painted, or made of stainless steel. Valve seat discs are made of synthetic rubber compounds which will remain serviceable in an atmosphere of LP-Gas. Relief valve stems, guides, etc. are generally made from brass or stainless steel.

### Relief valves, over the years, may not function properly in several ways:

- They may leak at pressures below the set pressure.
- They may open and fail to properly reset.
- They may open at higher than the set pressure.

### These failures to function properly are due primarily to four "environmental" conditions:

1. Corrosion of metal parts (particularly springs) which result in the component parts failing to perform.
2. Deterioration of the synthetic rubber seat disc material.
3. Clogging or "cementing" of the movable relief valve components so that their movement is restricted.
4. Debris on the valve seat after the relief valve opens, effectively preventing the valve from reseating.

Corrosion is caused by water, corrosive atmospheres of salt and industrial pollutants, chemicals, and roadway contaminants. High concentrations can attack the metal parts vigorously. No suitable metals are totally resistant to such corrosion.

Synthetic rubber and seat disc materials can also be attacked by impurities in the gas and corrosive atmospheres, particularly those with sulphur dioxide. There are no suitable rubber materials which resist all contaminants.

"Cementing" of relief valve parts has been caused by normal industrial atmospheres containing particles of dirt, iron oxide, metal chips, etc. combined with water, oil, or grease. Ice collecting in recessed valves could cause relief valves to fail to open. Paint and tar in relief valves also cause failure to function properly.

## Safety Information - Relief Valves

Debris on valve seats which prevents reseating can occur whenever the valve collects material in the relief valve opening which is not blown out when the relief valve opens.

### Inspection of Relief Valves

Unfortunately many of the above problems may not be easily observed because of the compact nature of some relief valve designs.

A casual visual inspection of a relief valve may not necessarily disclose a potential hazard. On the other hand, a visual inspection will often disclose leakage, corrosion, damage, plugging and contamination.

### If additional light is required, a flashlight should be used.

If there is any doubt about the condition of the valve, or if there is a suspicion that the valve has not been protected by a cap for some time, it should be replaced before refilling the container.

Eye protection must be used when examining relief valves under pressure.

### Smaller Relief Valves

The industry's requirement for a small full-flow safety relief valve challenged design engineers some years ago:

The valve must be leakproof before operating and must reseal leakproof each time after each operation. The only known satisfactory seat disc materials to accomplish this have been special synthetic rubber compounds.

- Valve discharge settings are relatively high and require high spring loads to keep the valve closed.
- Because of the small interior diameter of the valve, the round metal seating area is small.

All of these parameters may result in the development of a significant indentation in the rubber seat disc after some years. The seat disc may have a tendency to cling to the metal seat. This may result in the relief valve not opening at the set pressure as the seat disc ages.

Tests have been conducted on small LP-Gas relief valves of all the U.S. valve manufacturers. Valves over 10 years old were removed from service and tested to determine at what pressure the valves discharged. In many of the valves, the pressure required to open the valve exceeded the set pressure.

Because of the critical importance of proper functioning of relief valves, common sense and basic safety practice dictate that small relief valves should be replaced in about 10 years.

Some larger relief valves on bulk storage tanks can be replaced with rebuilt valves obtained from the manufacturers. Small relief valves cannot be rebuilt economically, thus, new valves are required. Most LP-Gas dealers find it impractical and costly to test relief valves and field repairing of relief valves is not sanctioned by the manufacturers, Underwriter's Laboratories, or ASME.

### Use of Protective Caps

Many of the problems that cause inoperative relief valves could be prevented if proper protective caps were kept in place at all times.

Collection of debris would be prevented. Contamination caused by corrosive atmospheres would be reduced. Water collection in the valves would be eliminated. Relief valves protected with caps from the time of installation in the container would obviously have a much longer safe useful life, but they still should be replaced at some time because of the gradual deterioration of the rubber seat disc due to age alone.

NFPA 58 requires that protective caps must be kept in place as a protective cover on some relief valves. This is a mandatory requirement on several types of relief valves. The fact that use of caps may make inspection more time consuming should not be viewed as a reason for either not using the caps, or not making required periodic inspections.

In the event a relief valve has been used without the required cap, the relief valve should be thoroughly inspected and the required cap placed on the relief valve. If damage is noted to the relief valve, it should be replaced and the replacement valve should be capped. Relief valves with pipe-away adapters or deflectors used on lift truck containers have been found choked with debris. Inspection of relief valves with deflectors can only be accomplished by removing the deflector.

Similarly, larger relief valves with vent stacks have been found choked with debris and water. Valves have failed because springs rusted through. The weep hole was plugged. It was obvious that the relief valves had not been inspected in many years. These conditions must be alleviated by periodic inspections and replacement of relief valves as needed.

### Summary Recommendations

Predicting the safe useful life of a relief valve is obviously not an exact science. The conditions to which the valve is subjected will vary widely and will largely control its life. In matters of this kind, only basic guidelines can be suggested. The LP-Gas dealer must observe and determine the safe useful life of relief valves in his territory. The valve manufacturers can only make recommendations for the continuing safety of the industry:

1. Make sure proper protective caps are in place at all times. Do not release a container for service or fill a container unless it has a protective cap in place.
2. Replace relief valves periodically, at least every 10 years. Every relief valve has the month and year of manufacture stamped on the valve. This is most particularly true of small separate relief valves.
3. Carefully inspect valves each time before the container is filled. Replace valves showing any signs of contamination, corrosion, damage, plugging, leakage, or any other problem. Eye protection must be used when examining relief valves under pressure.

## Minimum Required Rate of Discharge for Pressure Relief Valves Used on ASME Containers

### Chart A — Minimum Required Rate of Discharge for LP-Gas Pressure Relief Valves Used on ASME Containers

From NFPA Pamphlet #58, Appendix D (1986).

Minimum required rate of discharge in cubic feet per minute of air at 120% of the maximum permitted start-to-discharge pressure for pressure relief valves to be used on containers other than those constructed in accordance with Interstate Commerce Commission specification.

Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air
20 or less	626	85	2050	150	3260	230	4630	360	6690	850	13540	1500	21570
25	751	90	2150	155	3350	240	4800	370	6840	900	14190	1550	22160
30	872	95	2240	160	3440	250	4960	380	7000	950	14830	1600	22740
35	990	100	2340	165	3530	260	5130	390	7150	1000	15470	1650	23320
40	1100	105	2440	170	3620	270	5290	400	7300	1050	16100	1700	23900
45	1220	110	2530	175	3700	280	5450	450	8040	1100	16720	1750	24470
50	1330	115	2630	180	3790	290	5610	500	8760	1150	17350	1800	25050
55	1430	120	2720	185	3880	300	5760	550	9470	1200	17960	1850	25620
60	1540	125	2810	190	3960	310	5920	600	10170	1250	18570	1900	26180
65	1640	130	2900	195	4050	320	6080	650	10860	1300	19180	1950	26750
70	1750	135	2990	200	4130	330	6230	700	11550	1350	19780	2000	27310
75	1850	140	3080	210	4300	340	6390	750	12220	1400	20380		
80	1950	145	3170	220	4470	350	6540	800	12880	1450	20980		

**Surface area** = Total outside surface area of container in square feet.

When the surface area is not stamped on the name plate or when the marking is not legible, the area can be calculated by using one of the following formulas:

1. Cylindrical container with hemispherical heads. Area (in sq. ft.) = overall length (ft.) x outside diameter (ft.) x 3.1416.
2. Cylindrical container with semi-ellipsoidal heads. Area (in sq. ft.) = overall length (ft.) + .3 outside diameter (ft.) x outside diameter (ft.) x 3.1416.
3. Spherical container. Area (in sq. ft.) = outside diameter (ft.) squared x 3.1416.

**Flow Rate SCFM Air** = Required flow capacity in cubic feet per minute of air at standard conditions, 60°F. and atmospheric pressure (14.7 psia).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than 2000 square feet, the required flow rate can be calculated using the formula, Flow Rate-SCFM Air = 53.632 A<sup>0.82</sup> Where A = total outside surface area of the container in square feet.

### Chart B — Minimum Required Rate of Discharge for Anhydrous Ammonia Pressure Relief Valves Used on ASME Containers

From ANSI K61.1-1981, Appendix A (1981).

Minimum required rate of discharge in cubic feet per minute of air at 120% of the maximum permitted start-to-discharge pressure for pressure relief valves to be used on containers other than those constructed in accordance with United States Department of Transportation cylinder specifications.

Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air
20	258	95	925	170	1500	290	2320	600	4200	1350	8160	2100	11720
25	310	100	965	175	1530	300	2380	650	4480	1400	8410	2150	11950
30	360	105	1010	180	1570	310	2450	700	4760	1450	8650	2200	12180
35	408	110	1050	185	1600	320	2510	750	5040	1500	8900	2250	12400
40	455	115	1090	190	1640	330	2570	800	5300	1550	9140	2300	12630
45	501	120	1120	195	1670	340	2640	850	5590	1600	9380	2350	12850
50	547	125	1160	200	1710	350	2700	900	5850	1650	9620	2400	13080
55	591	130	1200	210	1780	360	2760	950	6120	1700	9860	2450	13300
60	635	135	1240	220	1850	370	2830	1000	6380	1750	10090	2500	13520
65	678	140	1280	230	1920	380	2890	1050	6640	1800	10330		
70	720	145	1310	240	1980	390	2950	1100	6900	1850	10560		
75	762	150	1350	250	2050	400	3010	1150	7160	1900	10800		
80	804	155	1390	260	2120	450	3320	1200	7410	1950	11030		
85	845	160	1420	270	2180	500	3620	1250	7660	2000	11260		
90	885	165	1460	280	2250	550	3910	1300	7910	2050	11490		

**Surface area** = Total outside surface area of container in square feet.

When the surface area is not stamped on the name plate or when the marking is not legible, the area can be calculated by using one of the following formulas:

1. Cylindrical container with hemispherical heads. Area (in sq. ft.) = overall length (ft.) x outside diameter (ft.) x 3.1416.
2. Cylindrical container with other than hemispherical heads. Area (in sq. ft.) = overall length (ft.) + .3 outside diameter (ft.) x outside diameter (ft.) x 3.1416.
3. Spherical container. Area (in sq. ft.) = outside diameter (ft.) squared x 3.1416.

**Flow Rate SCFM Air** = Required flow capacity in cubic feet per minute of air at standard conditions, 60°F. and atmospheric pressure (14.7 psia).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than 2,500 square feet, the required flow rate can be calculated using the formula, Flow Rate-SCFM Air = 22.11 A<sup>0.82</sup> where A = outside surface area of the container in square feet.

**Conversion Factor**

$$\begin{aligned} \text{ft}^2 \times 0.092903 &= \text{m}^2 \\ \text{SCFM} \times 0.028317 &= \text{m}^3/\text{min} \\ \text{ft} \times 0.3048 &= \text{m} \end{aligned}$$

## “Pop-Action” Pressure Relief Valves

### General Information

The “Pop-Action” design permits the RegO Pressure Relief Valve to open slightly to relieve moderately excessive pressure in the container. When pressure increases beyond a predetermined point, the valve is designed to “pop” open to its full discharge capacity, reducing excess pressure quickly. This is a distinct advantage over ordinary valves which open gradually over their entire range, allowing excessive pressure to develop before the relief valve is fully open. All RegO internal, semi-internal, and external relief valves incorporate this “Pop-Action” design.

Relief Valves in this catalog are only intended for use in LP-Gas or anhydrous ammonia service. Do not use any other service commodity. If you have an application other than conventional LP-Gas or anhydrous ammonia service, contact RegO before proceeding.

## Fully Internal “Pop-Action” Pressure Relief Valves for Transports and Bobtail Delivery Vehicles

### A8434 and A8436 Series

Designed specifically for use as a primary relief valve on ASME cargo tanks for transportation and bobtails with 2” and 3” F.NPT couplings.



A8434-SERIES

### Ordering Information

Part #	Start To Discharge Setting PSIG	A Container Connection	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	LP-Gas	NH <sub>3</sub>	Propylene	Protective Cap (Included)
A8434G	250	2” M. NPT	9-1/16”	1/2”	3700	3456	Yes	Yes	No	A8434-11B
A8434N	265					3659				
A8436G	250					9598				
A8436N	265	10210	3/4”	9839						
VA8436G	250			9596						
VA8436N	265			9839						

\* Per NFPA Pamphlet #58, Appendix D. Area shown is for UL or ASME flow rating—whichever is larger.

## Semi-Internal “Pop-Action” Pressure Relief Valves for ASME Portable Containers

### 7583, 8684 and 8685 Series

Designed for use as a primary relief valve on ASME containers such as 250, 500 and 1,000 gallon tanks. Underwriters’ Laboratories lists containers systems on which these types of valves are mounted outside the hood without additional protection, if mounted near the hood and fitted with a protective cap.



7583G

### Ordering Information

Part #	Start To Discharge Setting PSIG	A Container Connection M. NPT	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	D Wrench Hex Section	Flow Capacity SCFM/Air		Protective Cap (Included)
						UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	
7583G	250	3/4”	8-3/16”	1-7/16”	1-3/4”	1980	1806	7583-40X
8684G		1”	9-3/8”	1-9/16”	1-7/8”	2620	2565	8684-40
8685G		1-1/4”	11-1/16”	1-11/16”	2-3/8”	4385	4035	7585-40X

## Fully Internal “Pop-Action” Pressure Relief Valves for Motor Fuel Containers

### 8543, 8544 and 8546 Series

8543 Series relief valves are designed for use as a primary relief valve in larger ASME motor fuel containers such as on buses, RV's, trucks and construction equipment.

8544 Series relief valves are designed for use as a primary relief valve in smaller ASME and DOT motor fuel containers such as on tractors, lift trucks, cars and taxicabs.



8546-11 3/4"



7544-11A 1"



7543-10 1-1/4"



8544

### Ordering Information

Part #	Container Type	Start To Discharge Setting PSIG	A Container Connection M. NPT	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	D Hex Wrenching Section	Flow Capacity SCFM/Air****		Protective Cap (Included)	Accessories
							UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)		Pipeaway Adapter
8546G	ASME	250	3/4"	4-1/2"	15/16"	1-1/16"	723	651	11565-26	8546-11
8544G			1"	5-7/16"	7/8"	1-5/16"	1020	936	7544-41G	7544-11A*
8543G			1-1/4"			1-11/16"	1465	1400	7543-40C	7543-10**
8546T		312	3/4"	4-1/2"	15/16"	1-1/16"	880	792	11565-26	8546-11
8544T			1"	5-7/16"	7/8"	1-5/16"	1282	1158	7544-41	7544-11A
8543T			1-1/4"			1-11/16"	1990	1731	7543-40C	7543-10**
8544A375T	DOT	375	1"			1-5/16"	NA	1384	7544-41G	7544-11A
8544K						1545***	NA	7544-41	7544-11A	

\* 1" M. NPT outlet connection.

\*\* 1-1/4" M. NPT outlet connection.

\*\*\* Rating also applies to DOT requirements.

\*\*\*\* Flow rates shown are for bare relief valves. Adapters and pipeaway will reduce flow as discussed in the Foreword section.

## Fully Internal “Pop-Action” Pressure Relief Valve for DOT Fork Lift Cylinders

### 8545AK

Designed specifically for use as a primary relief valve on forklift cylinders, the 8545AK reduces the possibility of improper functioning of the relief mechanism due to foreign material build up. All guides, springs, stem and adjusting components are located inside the cylinder - removed from the direct exposure of foreign materials and debris from the atmosphere.

NFPA Pamphlet #58 requires that:

“All containers used in industrial truck (including forklift truck cylinders) service shall have the container pressure relief valve replaced by a new or unused valve within 12 years of the date of manufacture of the container and each 10 years thereafter.”



7545-12 90° Adapter



7545-14 45° Adapter



8545AK

### Ordering Information

Part #	Container Type	Start To Discharge Setting PSIG	Container Connection M. NPT	Flow Capacity SCFM/Air** (RegO Rated at 480 PSIG)	Accessories (Order Separately)		
					Protective Cap	Deflectors***	
						45° Elbow	90° Elbow
8545AK	DOT	375	3/4"	400*	11557-19	7545-14	7545-12
8545AKT <sup>†</sup>							

<sup>†</sup> With thread sealant.

\*Classified by U.L. in accordance with Compressed Gas Association Pamphlet S-1.1 Pressure Device Standards for Cylinders. Meets requirements for use on DOT containers with 262 pounds or less weight of water or 109 pounds or less of LP-Gas.

\*\* Flow rates are shown for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

\*\*\* Order protective cap #8545-41 or 7545-40.

## Semi-Internal “Pop-Action” Pressure Relief Valves for Large Storage Containers

### 7534B and 7534G

Designed especially for use as a primary relief valve on large stationary storage containers, these low profile relief valves are generally mounted in half couplings. However, they are designed so that the inlet ports clear the bottom of a full 2” coupling. This ensures that the relief valve should always be capable of maximum flow under emergency conditions.



7534

### Ordering Information

Part #	Start To Discharge Setting PSIG	Container Connection M. NPT	Flow Capacity SCFM/Air*		Accessories	
			UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	Protective Cap	Pipeaway Adapter
7534B	125	2"	6,025	-	7534-40X	7534-20**
7534G***	250		11,675	10,422		

\* Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

\*\* 3" F. NPT outlet connection.

\*\*\* Other seat materials are available.

## External “Pop-Action” Pressure Relief Valves for ASME Containers and Bulk Plant Installations

### AA3126, AA3130, 3131, 3132, 3133, 3135, AA3135, and A3149 Series

Designed for use as a primary relief valve on ASME above ground and underground containers, bulk plant installations and skid tanks. The 3131 Series may also be used as a primary or secondary relief valve on DOT cylinders, or as a hydrostatic relief valve. All working components of these relief valves are outside the container connection, so the valves must be protected from physical damage.



3135-10



3132-10



3135



A3149



AA3135



W3132G

### Ordering Information

Part #	Start To Discharge Setting PSIG	A Container Connection M. NPT	B Overall Height (Approx.)	C Wrench Hex Section	Flow Capacity SCFM/Air (a)		Accessories					
					UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	Protective Cap	Pipeaway Adapter		Weep Hole Deflector		
								Part #	Outlet Size			
AA3126L030	30	1/2"	2-3/8"	7/8"	(b)	-	9103-54	AA3126-10	1/2" M. NPT	-		
A3149L055	55	2-1/2"	10-1/2"	4-1/8"	2608(c)	-	3149-40	(h)		Included (j)		
A3149L200	200				8770 (c)	-						
AA3126L250	250	1/2"	2-3/8"	7/8"	277 (c)	-	9103-54	AA3126-10	1/2" M. NPT	3133-11		
3131G		3/4"	3-7/16"	1-3/4"	2060	1939	3131-41 (g)	-				
AA3130UA250					2045	1838	11557-110	AA3131-10	1" F. NPT			
W3132G		1"	6-1/32"	2-3/8"	3340	-	3132-54 (g)	3132-10			1-1/4" F. NPT	
3132G					4130	-		-				
T3132G					3790	-		3132-10			1-1/4" F. NPT	
MV3132G					3995	-		-				
3135G		1-1/4"	5-21/32"	2-11/16"	5770	-	3135-54 (g)	3135-10	2" F. NPT			
AA3135UA250			6-13/32"		6430	6341	AA3135-40PR	AA3135-10				
3133G		1-1/2"	5-15/16"	3-1/8"	6080	-	3133-54 (g)	3133-10	(h)		Included (j)	
A3149MG		2-1/2"	10-1/2"	4-1/8"	10390	-	3149-40	(h)				
A3149G					9153	-						
AA3130UA265	265	3/4"	3-7/16"	1-3/4"	2125	1912	11557-110	AA3131-10	1" F. NPT	-		
AA3135UA265		1-1/4"	6-13-32"	2-11/16"	6615	6703	AA3135-40PR	AA3135-10	2" F. NPT	3133-11		
AA3126L312	312	1/2"	2-3/8"	7/8"	330 (c)	-	9103-54	AA3126-10	1/2" M. NPT	-		

(a) Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

(b) Not UL or ASME rated. .059 square inch effective area.

(c) Not UL or ASME rated. RegO rated at 120% of set pressure.

(g) Cap supplied with chain.

(h) Outlet 3-1/2-8N (F) thread, will accept 3" M. NPT pipe thread.

(j) Weep hole deflector is Part No. A3134-11B.

## External “Pop-Action” Supplementary Pressure Relief Valves for Small ASME Containers and DOT Cylinders

### 3127 and 3129 Series

Designed for use as a supplementary relief valve on small ASME above ground and underground containers. They may also be used as a primary or secondary relief device on DOT cylinders, or as hydrostatic relief valves.

All working components of these relief valves are outside the container connection, so the valves must be protected from physical damage.



3129-10 Pipe Away Adapter



3127 Series

### Ordering Information

Part #	Container Type	Start To Discharge Setting PSIG	A Container Connection M. NPT	B Overall Height (Approx.)	C Wrench Hex Section	Flow Capacity SCFM/Air		Suitable for Tanks w/Surface Area Up To:*	Protective Cap	Accessories	
						UL (At 120% of Set Pressure)	RegO Rated at 480 PSIG***			Pipeaway Adapter Part #	Outlet Size
3127G	ASME	250	1/4"	1-31/32"	7/8"	295	-	-	9103-54		
3129G			1/2"	2-19/32"	1-1/8"	465	-	-	3129-40P	3129-10	1/2" F. NPT
3127K	DOT	375	1/4"	1-31/32"	7/8"	-	450	100 lbs./Propane	9103-54	-	-
3129K			1/2"	2-19/32"	1-1/8"	-	780	200 lbs./Propane	3129-40P	3129-10	1/2" F. NPT

\* Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

\*\* Not UL or ASME rated. RegO rated at 480 PSIG.

\*\*\* Meets DOT requirements.

## External Hydrostatic Relief Valves

### 3125, 3127, 3129, SS8001, SS8002, SS8021 and SS8022 Series

Designed especially for the protection of piping and shut-off valves where there is a possibility of trapping liquid LP-Gas or anhydrous ammonia. They may be installed in pipelines and hoses located between shut-off valves or in the side boss of RegO shut-off valves.



### Ordering Information

Part #	Start To Discharge Setting PSIG	Valve Body Material	Container Connection M. NPT	Height (Approx.)	Wrench Hex Section	Accessories	
						Protective Cap	Pipeaway Adapter or Threads
SS8001G	250	Stainless Steel	1/4"	7/8"	11/16"	-	-
SS8002G			1/2"		7/8"		
SS8021G			1/4"	1-3/8"	11/16"		1/4" NPSM Thrds
SS8022G			1/2"		7/8"		3/8" NPT Thrds
3127G	275	Brass	1/4"	1-31/32"	7/8"	9103-54	-
3129G			1/2"	2-19/32"	1-1/8"	3129-40P	3129-10*
3127H			1/4"	1-31/32"	7/8"	9103-54	-
3129H			1/2"	2-19/32"	1-1/8"	3129-40P	3129-10*
3127P	300	Brass	1/4"	1-31/32"	1-1/8"	9103-54	-
3129P			1/2"	2-19/32"	1-1/8"	3129-40P	3129-10*
SS8022P			1/2"	1-3/8"	7/8"	-	3/8" NPT Thrds
3127J	350	Brass	1/4"	1-31/32"	7/8"	9103-54	-
3129J			1/2"	2-19/32"	1-1/8"	3129-40P	3129-10*
SS8001J			1/4"	7/8"	11/16"	-	-
SS8002J			1/2"		7/8"		
SS8021J	1/4"	1-3/8"	11/16"	1/4" NPSM Thrds			
SS8022J	1/2"		7/8"	3/8" NPT Thrds			
3127K	375	Brass	1/4"	1-31/32"	7/8"	9103-54	-
3129K			1/2"	2-19/32"	1-1/8"	3129-40P	3129-10*
3125L	400	Brass	1/4"	1-9/16"	5/8"	3125-40P	-
3127L			1/2"		7/8"	9103-54	-
3129L			1/2"	2-19/32"	1-1/8"	3129-40P	3129-10*
SS8001L			1/4"	7/8"	11/16"	-	-
SS8002L	1/2"	7/8"					
SS8021L	1/4"	1-3/8"	11/16"		1/4" NPSM Thrds		
SS8022L	1/2"		7/8"		3/8" NPT Thrds		
3127U	450	Brass	1/4"	1-31/32"	7/8"	9103-54	-
3129U			1/2"	2-19/32"	1-1/8"	3129-40P	3129-10*
SS8001U			1/4"	7/8"	11/16"	-	-
SS8002U			1/2"		7/8"		
SS8021U	1/4"	1"	11/16"	1/4" NPSM Thrds			
SS8022U	1/2"		7/8"	3/8" NPT Thrds			

\* 1/2" F. NPT outlet connection.



3125 Series (.161 Orifice)  
3127 Series (.274 Orifice)  
3129 Series (.386 Orifice)



SS8022G

## DuoPort® Pressure Relief Valve Manifolds for Small Storage Containers 8542 Series

Designed especially for use as a primary relief device on smaller stationary storage containers, with 2" NPT threaded couplings. These manifolds allow servicing or replacement of either of the two relief valves without evacuating the container or loss of service. The operating lever selectively closes off the entrance port to the relief valve being removed while the remaining valve provides protection for the container and its contents. The rating of each manifold is based on actual flow through the manifold and a single pressure relief valve, taking friction loss into account. It is not merely the rating of the relief valve alone.



8542

### Ordering Information

Part #	Start to Discharge Setting PSIG	Application		Container Connection M. NPT	Relief Valve Included				Flow Capacity SCFM/Air** (at 120% of set pressure)		
		LP-Gas	NH <sub>3</sub>		Quantity	Part #	Inlet Connection M. NPT	Accessories Pipeaway Adaptors	UL Rating (at 120% of set Pressure)	ASME Rating (at 120% of set Pressure)	
8542G	250	Yes	No	2"	2	3135MG	1-1/4"	3135-10*	5250 (1)	NA	
8542AG									NA	5549 (1)	
AA8542UA250	265	No	Yes						AA3135MUA250	6430 (1)	6341 (1)
AA8542UA265									AA3135MUA265	6615 (1)	6703 (1)

\* 2" F. NPT outlet connection.

\*\* Flow rating based on number of relief valves indicated in parenthesis ( ). Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow rates as discussed in the Foreword section.

## Delta Port Relief Valve Manifolds

### 8530/AA8530 Series

Designed especially for use as a primary relief device on large stationary pressurized storage containers, the base is supplied with a two-inch NPT threaded container connection. These manifolds incorporate an additional relief valve, not included in the flow rating, allowing for servicing or replacement of any one of the relief valves without evacuating the container. The hand-wheel on the manifold selectively closes off the entrance port to the relief valve being removed while the remaining relief valves provide protection for the container and its contents. All manifold flow ratings are based on flow through the relief valves after one has been removed for service or replacement.



8533AG

### Ordering Information

Part #	Start to Discharge Setting PSIG	Application		Container Connection M. NPT	Relief Valve				ASME Flow Rating SCFM (air) @ 120% of Set Pressure *
		LPG	NH <sub>3</sub>		Qty.	Part #	Inlet Connection M. NPT	Accessories Pipe-away Adapter**	
8532AG	250	Yes	No	2"	2	3135MG	1-1/4"	3135-10	5,549 (1)
8533AG					3				11,098 (2)
AA8532MA250		No	Yes		2	AA3135MA250		AA3135-10	6,341 (1)
AA8533MA250					3				12,682 (2)
AA8532MA265	2				6,615 (1)				
AA8533MA265	3				13,230 (2)				

\* Flow rating based on number of relief valves indicated in parentheses ( ).

Flow rates shown are for bare relief valves. Adapters and pipe-always will reduce flow rates as discussed in forwarding information in L-500 catalog. \*\* 2" F. NPT outlet connection

## Multiport<sup>™</sup> Pressure Relief Valve Manifold Assemblies for Large Storage Containers

### A8560, A8570 and AA8570 Series

Designed especially for use as a primary relief device on large stationary pressurized storage containers with flanged openings. These manifolds incorporate an additional relief valve, not included in the flow rating, allowing for servicing or replacement of any one of the relief valves without evacuating the container. The handwheel on the manifold selectively closes off the entrance port to the relief valve being removed while the remaining relief valves provide protection for the container and its contents. All manifold flow ratings are based on flow through the relief valves after one has been removed for service or replacement.



A8560  
A8570

### Bolt Stud and Nut Assemblies

Part Number	Consists of	For Use With:	For Connection To:	Number Required
7560-55	1-Bolt Stud and Nut	All RegO Multiports <sup>™</sup>	Modified 3" - 300# and 4"-ANSI 300# Welding Neck Flange	8
7560-56			Manhold Cover Plate	

### Ordering Information

Part #	Start To Discharge Setting PSIG	Application		Container Flange Connection	Quantity	Relief Valve			Flow Capacity SCFM/Air** At 120% of Set Pressure	
		LP-Gas	NH <sub>3</sub>			Part #	Inlet Connection M. NPT	Accessories Pipeaway Adapters	UL Rating	ASME Rating
A8563G	250	Yes	Yes	3"-300#*	3	A3149MG	2-1/2"	****	18,500 (2)	Not Applicable
A8564G					4				27,750 (3)	
A8573G				4"-300#	3				18,500 (2)	
A8574G					4				27,750 (3)	
A8563AG				3"-300#*	3	A3149G			Not Applicable	18,300 (2)
A8564AG					4					27,400 (3)
A8573AG					4"-300#	3				18,300 (2)
A8574AG						4				27,400 (3)

\* For use with modified 300# ANSI flange with 4" port.

\*\*\* 2" F. NPT outlet connection.

\*\* Flow rating based on number of relief valves indicated in parentheses ( ). Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow rates as discussed in the Foreword section.

\*\*\*\*Outlet 3-1/2-8N (F) thread, will accept 3" M. NPT pipe thread.

## Adhesive Warning Label

The following warning information, Part Number 8545-500, is included with each shipment of pressure relief valves and relief valve manifolds to the first purchaser of the product from the factory.

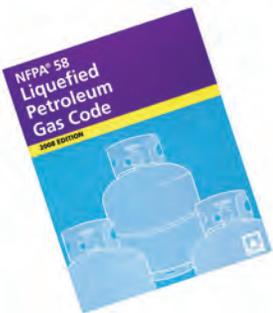
This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

<b>DANGER</b>	<b>READ THIS FIRST</b>	<b>WARNING</b>
<b>LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE</b>		
<b>AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS...EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.</b>		
<small>Make sure you are thoroughly trained before you attempt any pressure relief installation or maintenance. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.</small>		
<small>Become thoroughly familiar with NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections &amp; Maintenance" and RegO Safety Warning "Pressure Relief Valves" found in the relief valve section of the L-500 &amp; L-102 Catalogs. Follow its recommendations.</small>		
<small>Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."</small>		
<small>Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment. Flow rates in the charts are for bare relief valves found in the relief valve section of the L500 &amp; L102 Catalogs. The addition of deflectors, pipeway adapters and piping will restrict the flow. To properly protect any container, the total system flow must be sufficient to relieve pressure at the pressure setting of the relief valve in accordance with all applicable codes.</small>		
<small>Use only RegO adapters on RegO relief valves. Adapters not designed specifically for piping away RegO relief valves, such as those with 90° turns or reduced internal diameters, will decrease flow dramatically. These should never be used as they can cause the relief valve to chatter and eventually destroy itself.</small>		
<small>Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.</small>		
<small>Install valves by applying force to wrenching flats only.</small>		
<small>Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.</small>		
<small>Check for damage after valve installation. Check that the pressure relief valve is clean and free of foreign material. Make sure protective cap is properly in place.</small>		
<small>Check that there are no leaks with a non-corrosive leak detection solution before filling with LP-Gas.</small>		
<small>Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure.)</small>		
<small>In selecting a label for posting at the installation site, consider RegO part number 901-400 along with your own, NPGAs and others.</small>		
<small>Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warning "Pressure Relief Valves" found in the relief valve section of the L-500 &amp; L-102 Catalogs.</small>		
<small>RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.</small>		
		<small>Printed in USA 07A-0910-0386 Part number 8545-500</small>
<small>Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com</small>		

8545-500

## LP-Gas Hose-End Filling Valves (With ACME Connectors)

### Safety Warnings



#### Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures. Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

### Nature of Warnings

It is recognized that warnings should be as brief as possible, but factors involved in filler valve and filling valves failure are not simple. They need to be fully understood so that proper procedures and maintenance can be used to prevent accidents. If there is a simple warning, it would be:

**Loosen filling valve from filler valve very slowly.  
If there is a leak, know procedure to follow.**

This bulletin is not intended to be an exhaustive treatment of the subject of filler valves and certainly does not cover all safety practices that should be followed in the installation, operation and maintenance of LP-Gas systems, which include filler and filling valves.

#### Hose-End Filling Valves With ACME Connectors

Hose-end valves must never be dragged over the ground or dropped or banged into the truck when the hose is reeled in.

They could open accidentally or they could be damaged. Dragging will cause abnormal wear and eventual valve failure. Foreign material will lodge in the connector which can cause failure of the filler valve.

To prevent hazardous conditions, operators should follow this procedure on every filling application:

Always wear gloves and eye protection.

Check for foreign material in hose-end valve and the filler valve, and if present, remove with extreme care. If material cannot be safely removed, do not proceed with filling and replace valve.

Make sure the ACME connector spins on easily by hand.

If leak is noticed when filling is started, stop the operation and correct the leaking condition.

After filling, bleed the gas trapped between the filler valve and hose-end valve by using the vent on the hose-end valve or by slightly loosening coupling nut to vent the gas before disconnecting.

**If gas does not stop venting, then filler valve or hose-end valve is leaking. Do not disconnect filling connector. This is a hazardous situation and your company procedure for handling this problem must be carefully followed.**

#### Make sure your company has such a procedure. Inspection of Filling Valves with Handwheel

Valves should be inspected at least once a month to be sure that the valve handle is tight and not damaged, that the stem is not bent and that there is no "play" in the threads in the bonnet. "Play" will normally not be noticed if the valve is under pressure.

The ACME threads should be examined for wear, dents or nicks and the seating area should be clean and smooth.



Loosen slowly.  
If gas continues to vent, retighten ACME connector and follow company emergency procedures.

#### Inspection of Quick Acting Filling Valves

Valves should be inspected daily to make sure locking mechanism functions properly.

The ACME threads should be examined for wear, dents or nicks and the seating area should be clean and smooth.

The retaining ring on the filler connection should be examined to make sure it is properly holding the female ACME rotating nut or handle so as to keep the surface that seats on the filler valve gasket protected.

If any problems are evident, valves should be immediately replaced or repaired.

#### Larger Filler and Filling Valves

For 2-1/4" and 3-1/4" valves with ACME connections, use only the special wrenches designed for the purpose.

Do not use pipe wrenches or hammers to tighten the connections. All of the previous warnings about the smaller valves also apply here.

#### General Warning

All RegO products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging components made of materials such as rubber and metal. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential. Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a filler valve or a filling valve is used beyond its safe service life. Life of these valves is determined by the environment in which they "live." The LP-Gas dealer knows better than anyone what this environment is. Note: There is a developing trend in state legislation and in proposed national legislation to make the owner of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of the legislation which could affect them.

## Quick-Acting Minimum Loss Hose-End Valves for Bobtail Delivery Trucks and Dispensing Stations

### A7793A and A7797A

Designed to vastly reduce the amount of product vented when disconnecting bobtail delivery trucks, dispensing systems and anhydrous ammonia nurse tanks. These valves provide instant, full-on flow at the flip of a handle. Shut-off is instant and the handle locks for added protection. This "top of the line" hose-end valve is a fully contained unit that does not require additional filling adapters or connectors.



A7793

### Ordering Information

Part #	Inlet Connection (F. NPT)	Outlet Connection (F. ACME)	Locking Handle	Flow at 1 PSIG (Cv) Pressure Drop* (GPM/Propane)
A7793A	3/4"	1-3/4"	Yes	16.0
A7797A	1"	1-3/4"	Yes	16.0

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: A7797 @ 9 PSIG = 16.0 x √9 = 48.0 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

## Quick-Acting Hose-End Valves for Bobtail Delivery Trucks and Dispensing Stations

### A7707L and A7708L

Designed especially for safe operator handling of LP-Gas in bobtail delivery truck, dispensing systems and anhydrous ammonia nurse tank service.

These valves provide instant, full-on flow at the flip of the handle and provide instant positive shut-off with a handle lock for added protection.



A7707L

A7708L

### Ordering Information

Part #	Body Design	Inlet & Outlet Connection (F. NPT)	Locking Handle	Flow at 1 PSIG Pressure Drop (Cv) (GPM/Propane)**	Accessories		
					Filling Connectors**		
					Extended	Compact	
					Steel	Brass	Steel
A7707L	Straight	1"	Yes	18.0	A7575L4	3175A	A3175A
A7708L	Angle			22.0			

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: A7708L @ 9 PSIG = 22.0 x √9 = 66.0 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

\*\* See appropriate catalog section for additional information.

## New 2" ACME Low Emission Hose End Valve for Loading Bobtails and Transports

### A7914

The A7914 Low Emission valve is designed to reduce the amount of product vented when disconnecting bobtail and transport loading hoses. This valve provides a full-on flow when pressing the release trigger and the lifting of an easy grip handle. Lowering the handle will immediately stop flow and lock the lever in the closed position. This valve can be used with any standard 3-1/4" Male ACME connector, or our 6588LE and 6589LE minimum loss filler valves.



### Ordering Information

Part #	Inlet Connection	Outlet Connection	Locking Handle	Flow at (Cv) Pressure Drop GPM Propane	
				1 PSIG	10 PSIG
A7914	2" F.NPT	3-1/4" F.Acme	Yes	55	174

\*To obtain approximate flow at other than 1 PSIG drop, multiply flow in table by square root of pressure drop. Example A7914 @ 9PSIG drop = 55 X √9 = 165 GPM /propane

## Quick-Acting Valves for Crop Driers and Charging Manifold Hoses

### 7554 Series

7554S Series valves provide instant shut-off and fast opening control on LP-Gas crop driers. They are also ideal for charging manifold hoses, stationary fuel transfer hoses and other applications requiring quick, positive shut-off. They are not for use with delivery truck hoses because the handle could snag on the ground and open the valve as the hose is reeled back to the truck.

7554L Series valves feature a locking handle device to help prevent accidental opening of the valve. It is ideal for all the same applications as the 7554S Series and may be used on delivery trucks as it incorporates the locking handle design.

Both valve series must be installed so that flow through the valve is opposite to that of a conventional globe valve. This allows the inlet flow to assist in closing the valve and prevents the valve from being opened by high pump pressures.



### Ordering Information

Part #	Inlet & Outlet Connection (F. NPT)	Locking Handle	Flow At 1 PSIG (Cv) Pressure Drop* (GPM/Propane)
7554SAV	1/2"	No	7.3
7554LAV		Yes	
7554SV	3/4"	No	11.3
7554LV		Yes	

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: 7554LV @ 9 PSIG = 11.5 X  $\sqrt{9}$  = 34.5 GPM/propane.

## Quick-Acting Valves for Cylinder Charging Hoses

### 7053T and 7901T Series

Designed primarily for use on cylinder charging hoses to provide fast, convenient shut-off and fast opening.

These valves must be installed so that flow through the valve is in the opposite direction to that of a conventional globe valve. This allows the inlet flow to assist in closing the valve, and even more important, helps prevent the valve from being forced open by high pump pressure.



### Ordering Information

Part #	Inlet Connection (F. NPT)	Outlet Connection (F. NPT)	Body Material	Flow At 1 PSIG (CV) Pressure Drop* (GPM/Propane)
7901T	1/4"	1/4"	Brass	1.95
7901TA	3/8"	3/8"		
7901TB	1/2"	1/4"		
7901TC		1/2"		
7053T		1/2"		

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: 7901T @ 9 PSIG =  $\sqrt{1.95} \times 9 = 5.85$  GPM/propane. For NH3 flow, multiply propane flow by .90.

## Quick-Acting Valves with Locking Handle for Dispensing Hoses

### 7901TL Series

Designed primarily for use on dispensing hoses to provide safe, convenient shut-off and fast opening.

The locking handle prevents accidental opening if the valve is dropped.



### Ordering Information

Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. NPT)	Body Material	Flow At 1 PSIG (CV) Pressure Drop* (GPM/Propane)
7901TLA	3/8"	3/8"	Brass	1.95
7901TLB	1/2"	1/4"		
7901TLC		1/2"		

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: 7901T @ 9 PSIG =  $1.95 \times \sqrt{9} = 5.85$  GPM/propane. For NH3 flow, multiply propane flow by .90.

## “V”-Ring Seal Globe and Angle Valve Information

### General Information

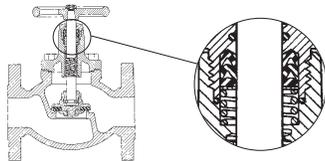
RegO Globe and Angle Valves are designed and manufactured especially to meet the rigid requirements of the LP-Gas industry. The high quality construction and wide variety of sizes and styles also make them highly suited to many other industries such as anhydrous ammonia, chemical and petrochemical.

These ductile iron valves are available in both threaded and flanged connections. Threaded connections are available in 1/2" F. NPT to 3" F. NPT sizes. Flanged connections are available in 1-1/2", 2" and 3" pipe sizes.

The ductile iron used in these valves has a 60,000 PSIG tensile strength which closely approaches that of steel castings. Its yield strength of 45,000 PSIG and elongation of 15% is also comparable to that of steel castings. These material features ensure the ability of the valve body to withstand impact, wrenching stresses and thermal shock. This ductile iron conforms to ASTM specification A395.

RegO globe and angle valves are designed for working pressures up to 400 PSIG WOG and for operating temperatures from -40° F. to +160° F.

### “V”-Ring Stem Seal



The “V”-ring spring-loaded pressure seal used in these RegO globe and angle valves is the most effective stem seal yet developed. It should not be confused with conventional valve stem packing where the seal is obtained by compressing the packing around the stem by means of a packing gland with resultant hard operation and frequent packing replacement.

The wax like surface of the teflon “V”-ring seal and consequent low friction ensures leak-tight performance for an indefinite period where periodic retightening of the packing is not required and the seal provides extra long service life.

In the RegO “V”-ring design, the seal is effected by the pressure expanding the “V”-shape of the seal, forcing it against the stem and bonnet surfaces to prevent leakage. The higher the pressure within the valve, the more effective the seal becomes. A spring loaded washer under the “V”-rings keeps them in an expanded position to ensure an effective seal under low pressure conditions. A wiper ring, located above the seal, keeps the seal free from grit, and/or other foreign material that may hamper operation.

### Installation and Operation Note

Containers and pipe lines should be thoroughly cleaned before globe and angle valves are installed. Large particles of solid foreign matter can permanently damage the seating surface in the valve body, causing the valve to leak. Use a minimum amount of a suitable pipe dope on the male connecting threads as excess amounts may fall off and be carried into the valve, causing damage to the seat or other operating parts.

It is totally unnecessary to use excess force in opening or closing RegO valves. The type of seat disc material used and the general design of these valves permits them to be opened and closed easily. Proper valve operation insures unusually long life.

Wrenches must never be used to operate valves equipped with handwheels and designed for hand operation.

### Downstream Accessory Boss

These RegO valves incorporate a plugged 1/4" F. NPT boss on the downstream side of the body for attaching either a hydrostatic relief valve or vent valve. Boss size on the 2" and 3" valves has been increased to allow a 3/4" drilling for accommodation of a standard by-pass valve or jumper lines.

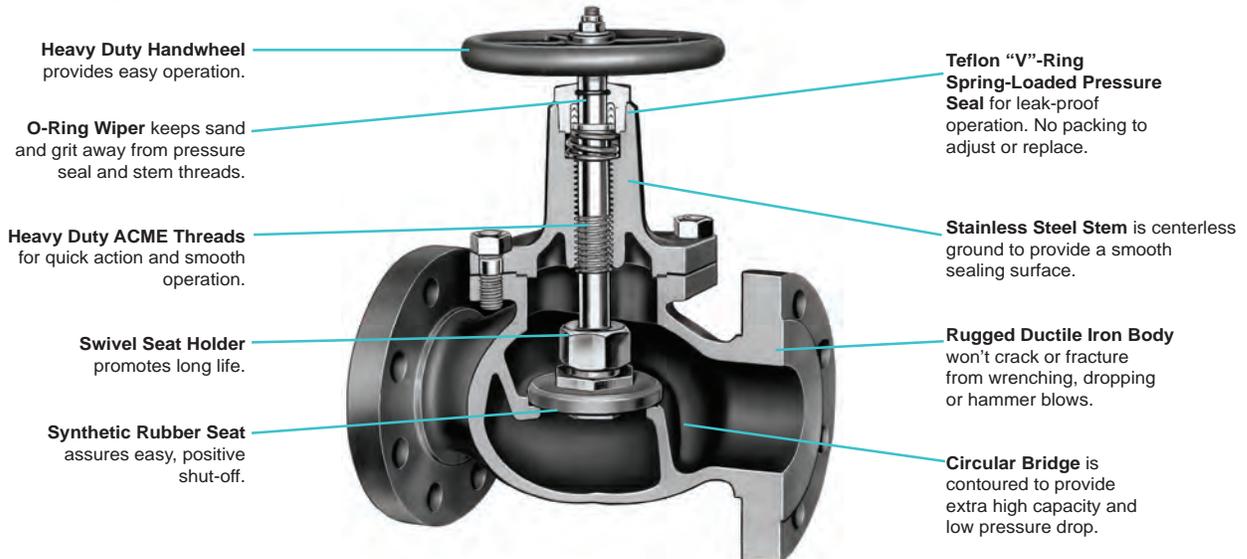
**Hydrostatic Relief**—When the design of the piping installation is such that liquid may be locked between two shut-off valves, a hydrostatic relief valve should be installed in the lines between the valves. The pressures which can develop due to temperature increase in a liquid fill line are tremendous and can easily damage the valves or piping unless a hydrostatic relief valve is installed.

**Vent Valve**—If the globe or angle valve is used as a shut-off valve on a loading hose, a vent valve should be installed in the downstream boss to allow liquid trapped beyond the shut-off valve to be vented before disconnecting the hose coupling.

### Replace Gate Valves with Flanged Valves

Except for standard flange sizes, RegO Flanged Globe and Angle Valves are smaller and lighter than contemporary valves, thus reducing price and shipping costs and making them far easier to install. RegO face-to-face flange dimensions conform to gate valve dimensions, making replacement of most gate or plug valves with RegO valves simple and easy.

## General Features



## “V”-Ring Seal Globe and Angle Valves for Bulk Storage Containers, Transports, Bobtails and Plant Piping

### A7500 Series and TA7500 Series

Specifically designed to ensure positive shut-off and long, maintenance free service life in liquid or vapor service on bulk storage containers, transports, bobtails, cylinder filling plants and plant piping.



The high quality construction and wide variety of sizes make them highly suited for use with LP-Gas, anhydrous ammonia and in the chemical and petrochemical industries.



A7517AP



TA7034



A7513AP



A7505AP



A7514AP



A7518FP



A7517FP

### Ordering Information

Part #				Inlet and Outlet Connection	Port Diameter	Flow at 1 PSIG Pressure Drop (Cv) (GPM/Propane)***		Accessories	
Buna N Seat Discs		Teflon Seat Discs*				Globe	Angle	Hydrostatic Relief Valve	Vent Valve
Globe	Angle	Globe	Angle						
-	-	TA7034P	TA7034LP	1/2" F. NPT	3/4"	10.0	14.8	SS8001U	TSS3169
A7505AP	A7506AP	TA7505AP	TA7506AP	3/4" F. NPT		12.0	17.7		
A7507AP	A7508AP	TA7507AP	-	1" F. NPT	1"	17.8	22.0		
A7509BP	A7510BP	TA7509BP	TA7510BP	1-1/4" F. NPT	1-1/4"	36.5	54.0		
A7511AP	A7512AP	TA7511AP	TA7512AP	1-1/2" F. NPT	1-1/2"	43.0	55.5		
A7511FP	-	TA7511FP	-	1-1/2" Flange**		46.0	-		
A7513AP	A7514AP	TA7513AP	-	2" F. NPT	2"	75.0	88.5		
A7513FP	A7514FP	TA7513FP	TA7514FP	2" Flange**		78.0	133.0		
A7517AP	A7518AP	TA7517AP	-	3" F. NPT	3-1/8"	197.0	303.0		
A7517FP	A7518FP	TA7517FP	-	3" Flange**					

\* Teflon seat discs on valves built to order.

\*\* 300# ANSI R.F. Flange.

\*\*\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in chart by square root of pressure drop. Example: 7514FP @ 9 PSIG = 133 x<sup>3</sup>/9 = 399 GPM/propane. For NH<sub>3</sub> flow, multiple propane flow by .90.

## 2" & 3" Globe/Angle valves with Built-in Automatic Back Check

### HA7513AP/HA7514AP and HA7517AP/HA7518AP

Designed for use in conjunction with our 6588LE and 6589LE low emission filler valves installed on bobtails and transports. The valves are designed to stop flow out of the container when the hand-wheel is closed. They incorporate an automatic integral back check that is designed to allow flow back into the container to prevent liquid from becoming trapped between the 6588/89LE and the closed globe/angle valve.



HA7514AP



HA7513AP

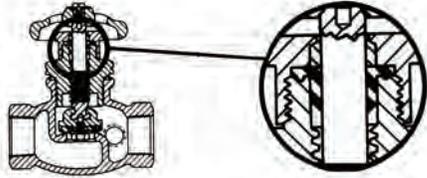
### Ordering Information

Part #		Inlet/Outlet Connection	Port Diameter	Flow at 1 PSIG Pressure drop GPM Propane	
Globe	Angle			Globe	Angle
HA7513AP	HA7514AP	2" -FNPT	2"	75.0	88.5
HA7517AP	HA7518AP	3"-FNPT	3-1/2"	197.0	303.0

## Flange Seal Globe and Angle Valve Information

### General Information

Globe and Angle Valves, incorporating the synthetic rubber flange seal design, operate on the same principle as the “V”-ring valves. Gas pressure in the valve is exerted against the synthetic rubber flange, forcing it tightly against the stem.



Leak-tight performance is assured and periodic adjustment is not required. The synthetic rubber construction provides smooth operating performance with long service life.

These valves all incorporate a plugged 1/4” NPT side boss on the downstream side of the valve that can be equipped with a hydrostatic relief valve or vent valve.

Please be familiar with the “Installation and Operation Note” and “Downstream Accessory Boss” section of the “V”-ring valve design general information before ordering these valves.

### General Features

Rugged quick-acting ACME threads on stem. Threads are under flange ring . . . dust, sand and grit can't reach them.

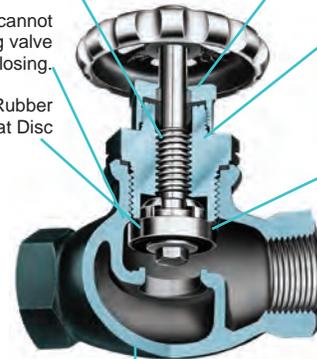
Swivel seat cannot grind during valve opening or closing.

Synthetic Rubber Seat Disc

Nylon bearing surrounds stem to prevent galling.

Rubber flange ring stem seal effectively prevents gas escape. The higher the pressure, the tighter the seal.

Metal to metal back seat permits replacement of flange ring with valve in service.



Valve body made of shell molded ductile iron. Highly resistant to cracking or fracturing from wrenching, dropping or hammer blows. Bonnet and seal cap are steel on “A” prefix valves.

## Flange Seal Globe and Angle Valves for Bulk Storage Containers, Filling Hoses and Plant Piping

### 7704, 7705 and 7706 Series

Designed to ensure positive shut-off and long maintenance-free service life in liquid or vapor service. Ideally suited for use on cylinder charging manifolds, truck filling hoses, bulk storage containers and plant piping.

The high quality construction and wide variety of sizes make them highly suited for use with LP-Gas, anhydrous ammonia and in the chemical and petrochemical industries.



7706 P



A7704P

### Ordering Information

Part #		Inlet & Outlet Connection (F. NPT)	Flow at 1 PSIG Pressure Drop (Cv) (GPM/Propane)*		Accessories	
Globe	Angle		Globe	Angle	Hydrostatic Relief Valve	Vent Valve
7704P	7704LP	1/2"	7.3	12.3	SS8001J or SS8001L	TSS3169
A7704P	A7704LP					
7705P	7706P	3/4"	11.5	17.7		
A7705P	A7706P					

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: A7704LP @ 9 PSIG = 12.3 x  $\sqrt{9}$  = 36.9 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

## Flange Seal Liquid Transfer Angle Valves for Bulk Storage Containers 7550 and 7551 Series

Designed especially for liquid transfer of LP-Gas from consumer bulk storage containers when used with a Chek-Lok® or equipped with an integral excess flow valve. May also be used for vapor LP-Gas service.



In NH<sub>3</sub> applicator tanks they may be used as a vapor bleeder valve or as a liquid withdrawal valve when installed in a coupling with a dip pipe.

These liquid transfer valves are equipped with an integral excess flow valve for liquid transfer directly from the tank fitting, or without an integral excess flow for LP-Gas transfer through a Check-Lok®.

When equipped with an integral excess flow valve (7550PX), the valve should be mounted in a forged steel 3000 lb. half coupling. When mounted in a 1-1/4" x 3/4" NPT reducing coupling, the 3/4" female thread in this coupling must be full length — equivalent to a forged steel 3000 lb. half coupling.

The excess flow valve will not function properly if these specifications are not met. Refer to the Warning Bulletin in the Excess Flow Valve Section of this catalog.



7550P



7550PX

### Ordering Information

Part #	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Integral Excess Flow	Flow at 1 PSIG (Cv) Pressure Drop* (GPM/Propane)	Excess Flow Approximate Closing Flow** (GPM/Propane)	Accessories	
						Hydrostatic Relief Valve	Vent Valve
7550P	3/4"	3/4"	No	13.3	-	3127U	3165
A7550P			Yes	-	16.0	SS8001J	TSS3169
7550PX						3127U	3165
A7550PX			SS8001J	TSS3169			
7551P		1/2"	No	8.9	-	3127U	3165
A7551P						SS8001J	TSS3169

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: 7550P @ 9 PSIG = 13.3 x √9 = 39.9 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

\*\* For NH<sub>3</sub> flow, multiply propane flow by .90.

## Tank Car Angle Valves for Railroad Tank Cars TA7894P

Designed especially for transfer of LP-Gas and anhydrous ammonia in railroad tank car service.



The combined heavyweight ductile iron castings and precision machining provide ruggedness and superior performance in working pressures up to 400 PSIG.

AAR Approval #E-149515



TA7894P

### Ordering Information

Part #	Inlet Connection	Outlet Connection (F.NPT)	Flow At 1 PSIG (Cv) Pressure Drop	Accessories	
				Hydrostatic Relief Valve	Vent Valve
TA7894P	Tank Car Flange	2"	112	SS8001U	TSS3169

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: TA7894P @ 9 PSIG = 112 x √9 = 336 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

## High Capacity Liquid Withdrawal Valves For NH3

### A8012 Series

The A8012 Series is designed especially for use as a high capacity liquid withdrawal valve on anhydrous ammonia nurse tanks or risers.

This valve incorporates an integral excess flow valve; when the valve is in operation the handwheel must be completely open and back-seated to allow the excess flow valve to function properly as explained in the excess flow section of our L-500 and L-102 catalogs.



A8012D

### Ordering Information

Part #	Inlet Connection	Outlet Connection	Approximate Closing Flow GPM	Accessories for NH3 Use	
				Hydrostatic Relief Valve	Vent Valve
A8012D	1-1/2" M.NPT	1-1/4" F.NPT	72 GPM NH3*	SS8001J	TSS3169
A8012C			45 GPM NH3*		

\* When installed in a horizontally flowing system.

## Multipurpose Valve for Filling of NH3 Containers

### A8016DBC

Designed specifically for use as a manual filler valve on anhydrous ammonia applicator tanks. This valve incorporates an integral back check valve.



A8016DBC

### Ordering Information

Part #	Inlet Connection	Filling Connection	Filling Capacity at 20 PSIG Pressure Drop GPM/NH <sub>3</sub>	Accessories	
				Hydrostatic Relief Valve	Vent Valve
A8016DBC	1-1/4"	1-3/4"	95	SS8001J	TSS3169

## Multipurpose Valve for Filling of NH3 Containers

### A8016DP

Designed specifically for use as a manual valve or vapor equalizing valve on anhydrous ammonia applicator and nurse tanks.

This valve incorporates an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow section of this catalog.



A8016DP

### Ordering Information

Part #	Inlet Connection (M. NPT)	Filling Connection (M. ACME)	Filling Capacity At 20 PSIG Pressure Drop GPM/NH <sub>3</sub> *	Approximate Excess Flow Closing Flows		Accessories	
				Liquid* GPM/NH <sub>3</sub>	Vapor** CFH/NH <sub>3</sub>	Hydrostatic Relief Valve	Vent Valve
A8016DP	1-1/4"	1-3/4"	95	44	24,000	SS8001J	TSS3169

\* Determined at 9.5 to 12 PSIG differential.

\*\* Determined at 100 PSIG inlet.

## Multipurpose Valves for Liquid Withdrawal of LP-Gas and NH<sub>3</sub> Containers

### A8017D & A8020D

Designed especially for use as a high capacity liquid withdrawal valve on LP-Gas and anhydrous ammonia containers.

These valves incorporate an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow valve section of this catalog.

The A8017DH is equipped with a soft seated automatic differential back pressure check valve in the seat disc assembly. This allows any pressure build up in the liquid transfer line in excess of 10-15 psig above the container pressure to flow back into the container. The transfer hose is protected against excessive liquid or vapor pressure entrapment, which adds materially to the useful life of flexible hose. In addition to increasing hose service life, the equalizing valve adds substantially to the operating safety of liquid transfer systems.



A8017DP



A8020D

### Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Approximate Excess Flow Liquid Closing Flow** (GPM/Propane)	Accessories	
				Hydrostatic Relief Valve	Vent Valve
A8017DH*	1-1/4"	1"	49	Not Required	TSS3169
A8017DP			55		
A8017DLP		3/4"	49		
A8020D	1-1/4"	1"	78	SS8001J	TSS3169

\* Built-in back pressure check valve incorporated into shut-off valve.

\*\* Determined at 11.5 to 13.5 PSIG differential for 3/4" outlet and 9 to 12 PSIG differential for 1" outlet. For NH<sub>3</sub> flow, multiply by .90.

## Multipurpose Valve for Filling and Liquid Transfer of NH<sub>3</sub> Containers

### A8018DP

Designed primarily for use as a combination filler and liquid withdrawal valve on three-opening applicator tanks or on nurse tanks.

This valve incorporates an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow valve section of this catalog.



A8018DP

### Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Filling Connection (M.ACME)	Filling Capacity At 20 PSIG Pressure Drop GPM/NH <sub>3</sub>	Approximate Excess Flow Liquid Closing Flow GPM/NH <sub>3</sub>	Accessories	
						Hydrostatic Relief Valve	Vent Valve
A8018DP	1-1/4"	1"	1-3/4"	74	50	SS8001J	TSS3169

\* Determined at 9 to 12 PSIG differential.

## Multipurpose Filler Valves

### 8118P and 8117

Designed primarily for use as a Multipurpose valve with combination filler valve and manual shutoff valve for the outlet connection of the valve for use on LP-Gas containers.



8118P

This valve incorporates an integral excess flow valve. When product is required, the valve must be completely open and back seated to allow the excess flow valve to function properly as explained in the excess flow valve section of the RegO L-102 or L-500 catalogs.

### Ordering Information

Part #	Inlet Connection	Outlet Connection	Filler Connection	Plug	Filling Capacity at 20 PSIG Pressure Drop	Excess Valve Closing Flow SCFH at 100 PSIG
8117	1-1/4" M.NPT	3/4" F. NPT	1-3/4" M.ACME	No	82 GPM	19,300
8118P		1" F. NPT		Yes		

## Adhesive Warning Labels

The following warning information, Part Number 903-500, is included with each shipment of Quick-Acting and Tank Car Valves to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

<b>DANGER</b>	<b>READ THIS FIRST</b>	<b>WARNING</b>
<b>LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE</b>		
<b>AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS, EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.</b>		
Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.		
Become thoroughly familiar with NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs. Follow their recommendations.		
Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."		
Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment.		
Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.		
Install valves by applying force to wrenching flats only.		
Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.		
Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.		
Check container-valve connection with a non-corrosive leak detection solution before filling with LP-Gas.		
Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).		
Test excess flow check valve for proper operation before placing into service. See NPGA Bulletin 113 for recommended procedure.		
Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.		
<b>RegO Filler Valves.</b> To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use ONLY RegO 31195, 31199 and 31211 Unloading Adapters with RegO Filler Valves. Carefully follow the instructions supplied with these unloading adapters.		
If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.		
In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NPGA's and others.		
Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs.		
RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.		
		Printed in USA 09A-0910-0686 Part number 903-500
Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com		

903-500

## LP-Gas Excess Flow Valves

### Safety Warnings



#### Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

### Nature of Warnings

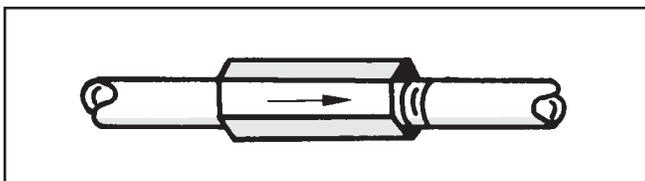
It is recognized that warnings should be as brief as possible, but the factors involved in excess flow valve failures to perform are not simple. They need to be fully understood. If there is a simple warning, it would be:

**Make sure that the excess flow valve really closes when the flow exceeds normal transfer flow.**

This bulletin is not intended to be an exhaustive treatment of excess flow valves, and certainly does not cover all safety practices that should be followed in installation, operation and maintenance of LP-Gas systems which include excess flow valves.

### Selection and Installation

The selection of a given closing rating of an excess flow valve involves an analysis of the complete piping system and is beyond the scope of this bulletin.



It is sufficient to say that an excess flow valve must be installed in the correct direction and will close only if the flow of liquid or vapor exceeds its designed closing rating. Many valves have been installed with closing ratings considerably higher than any flow that could be obtained by a downstream rupture in piping or hoses and thus give none of the protection for which they are intended.

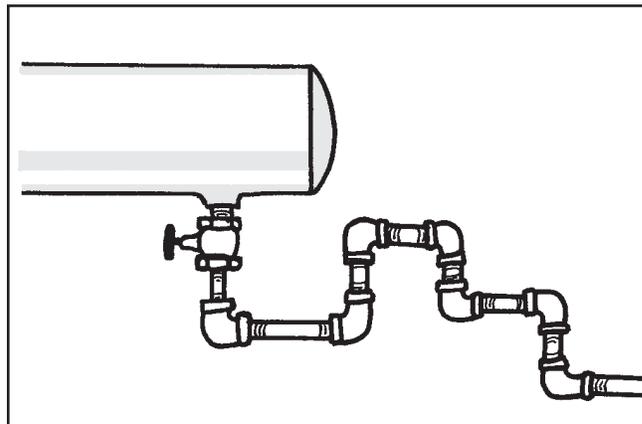
RegO provides excess flow valves with a number of closing ratings. RegO obviously can take no responsibility for the proper selection or correct installation of any valve.

Excess flow valves do not provide complete shut-off because there is a bleed at the check to permit pressure equalization.

### Causes of Failure to Close

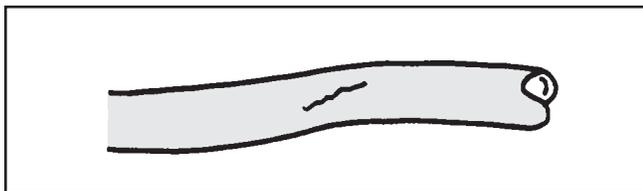
Installers, LP-Gas plant managers and service personnel should be aware that the excess flow valves may not close if these conditions are present.

1. The piping system restrictions (due to pipe length, branches, reduction in pipe size or number of other valves) decrease the flow rate to less than the valve's closing flow.

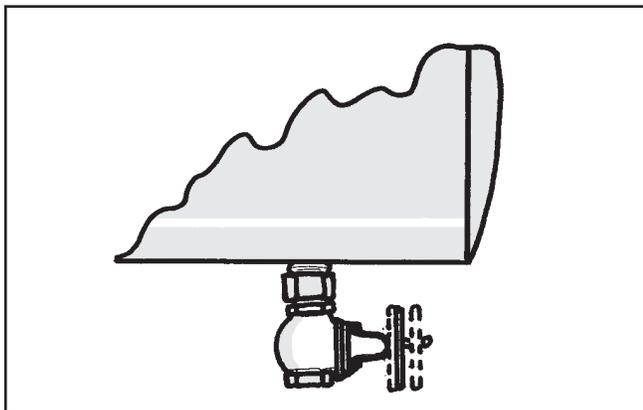


## LP-Gas Excess Flow Valves

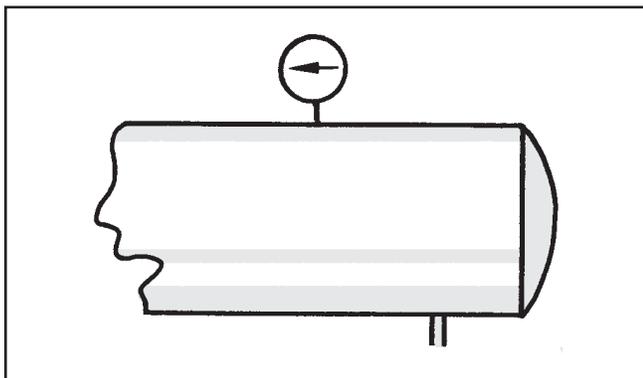
2. The break or damage to the downstream line is not large enough to allow enough flow to close the valve.



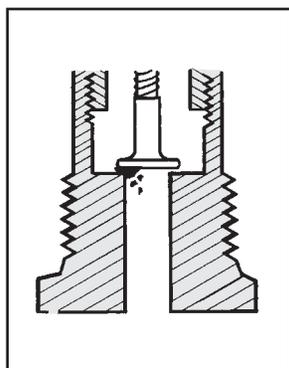
3. A shut-off valve in the line is only partially open and will not allow enough flow to close the excess flow valve.



4. LP-Gas pressure upstream of the excess flow valve, particularly due to low temperature, is not high enough to produce a closing flow rate.



5. Foreign matter (such as welding slag, scale or sludge) is lodged in the valve and prevents closing.



Because of these limitations, it is good industry practice to NOT rely entirely on excess flow valves for protection. Installation of emergency shut-off valves with remote controls is recommended in addition to excess flow valves.

### Testing

The National Propane Gas Association Safety Bulletin #113-78 states:

"In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating. This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under a sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

A test involving venting gas to the atmosphere is hazardous and may be impractical, or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition, and the flow rate sizing for those test conditions."

### General Warning

All RegO products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber.

The environment and conditions of use will determine the safe service life of these products. Periodic testing at least once a year when tank pressures are low and maintenance, as required, are essential.

Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because an excess flow valve is used beyond its safe service life. Life of an excess flow valve is determined by the environment in which it "lives". The LP-Gas dealer knows better than anyone what this environment is.

NOTE: There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could effect them.

## Troubleshooting Excess Flow Valve Installations

### Periodical Inspections for Excess Flow Valves

Excess flow valves should be tested and proven at the time of installation and at periodic intervals not to exceed one year. CAUTION: Testing an excess flow valve in the summer when tank pressures are high will not prove that the same valve will also function under low pressure conditions in the winter. Once a year testing should be conducted during the winter.

The test should include a simulated break in the line by the quick opening of a shut-off valve at the farthest point in the piping that the excess flow valve is intended to protect. If the excess flow valve closes under these conditions, it is reasonable to assume that it will close in the event of accidental breakage (clean break) of the piping at any point closer to the excess flow valve.

The National Propane Gas Association Safety Bulletin Number 113-78 states:

In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating. This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

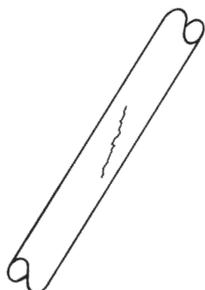
A test involving venting gas to the atmosphere is hazardous and may be impractical or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition and the flow rate sizing for those test conditions.

### What prevents excess flow valves from closing when the line breaks?

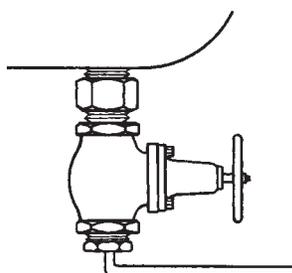
For one or a combination of the following reasons, excess flow valves have been prevented from closing in emergencies:

#### 1. Not a Clean Break



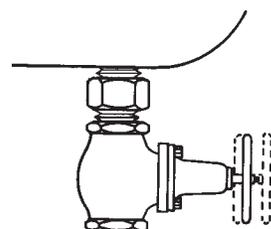
Hoses with a split or tear, and pipe lines not completely severed may be emitting LP-Gas in an amount insufficient to cause an "excess" flow. The amount of LP-Gas which can escape through such breaks may be even less than the flow during normal transfer service and under these conditions the excess flow valve could not be expected to close.

#### 2. Line Restriction Too Great



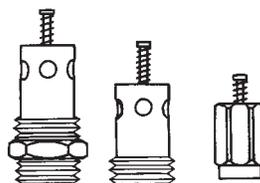
An excess flow valve installed in a tank outlet will not close if the line beyond it is reduced or if the flow is otherwise restricted by too many fittings or too long a run because the line is incapable of passing the amount of LP-Gas necessary to create an "excess" flow. This condition should be corrected when testing a system by simulating a break at the farthest possible point and replacing any restrictive hose, pipe or fittings.

#### 3. Improper Operating Practice



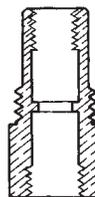
A restriction can also be imposed upon the excess flow valve by an improperly opened valve at the tank outlet. The shut-off valve should be either fully opened or fully closed. If "throttled," the valve could reduce the amount of LP-Gas passing through the excess flow valve in a sufficient amount to keep it from closing. Throttling operations should not be performed in the lines being protected by excess flow valves.

#### 4. Improper Selection



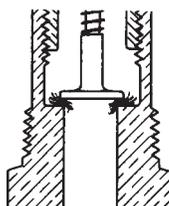
The many types of excess flow valves available are designed for specific jobs. The excess flow valve selected should remain open during normal flow but close at "excess" flow. An inspection which simulates a line break prior to start-up operations will determine if the proper valve has been selected.

#### 5. Tampering with Excess Flow Valves



Sometimes an operator, annoyed with frequent closures of an excess flow valve with too low a rating, has mutilated the valve and forgotten to replace it with a properly rated excess flow valve. A pre-test of the system would reveal this and allow the excess flow valve to be replaced.

#### 6. Impurities in the Line



Dirt, weld slag, broken drill taps, and various other foreign objects have been found jammed between the valve disc and valve seat to prevent excess flow valves from closing. A pre-test of the system would also discover this.

## The Limitations of Excess Check Valves for LP-Gas

Excess flow check valves have been of help in limiting gas loss in many incidents involving breakage of hoses and transfer piping. Thus, they do provide a useful safety function in LP-Gas systems. However, there have also been transfer system accidents where excess flow valves have been ineffective in controlling gas loss due to a variety of conditions and to the inherent limitations of these valves. This bulletin explains what protection excess flow valves can offer, points out conditions which can interfere with that protection, and offers suggestions for effective excess flow valve installation.

An excess flow valve is a protective device to help control the discharge of product in the event of complete breakage of pipe lines or hose rupture. However, an excess flow valve can only offer limited protection from gas discharge, because it will only close under those conditions which cause the flow through the valve to exceed its rated closing flow, and even when closed it necessarily allows some "bleed" past the valve.

**An excess flow valve is not designed to close and thus may not provide protection, if any of the following conditions are present:**

1. The piping system restrictions (due to pipe length, branches, reduction in pipe size, or number of other valves) decrease the flow rate to less than the valve's closing flow. (Valve should be selected by closing flow rating — not just by pipe size).
2. The break or damage to the downstream line is not large enough to allow enough flow to close the valve.
3. A shut-off valve in the line is only partially open and will not allow enough flow to close the excess flow valve.
4. LP-Gas pressure upstream of the excess flow valve, particularly due to low temperature, is not high enough to produce a closing flow rate.
5. Foreign matter (such as welding slag) is lodged in the valve and prevents its closing.
6. A buildup of process material (sludge), which may be found in LP-Gas, may occur over a period of time and cause the valve to stick open.
7. The piping break or damage occurs upstream of an in-line excess flow valve, so the escaping product is not passing through the valve.
8. The flow through the valve is in the wrong direction. (Excess flow valves only respond to flow in one direction.)
9. The excess flow valve has been damaged, or is otherwise not in operating condition.

Because of these limitations of excess flow valves, they should not be relied upon as the only means of controlling the escape of product in the event of piping damage. When possible, shut-off protection by quick closing valves, with shut-off controls accessible in spite of likely line damage, should be provided in addition to, or instead of excess flow valves.

**Where excess flow valves are installed, they should be checked to see that:**

1. They are installed in the correct direction — the arrow on the valve indicates the shut-off direction.
2. The flow rating on the valve is proper for the installation. The rating must be above the normal system flow, but not higher than necessary to prevent "nuisance" closing in normal conditions. If the manufacturer's catalog information is not sufficient, the valve suppliers can provide sizing assistance.
3. In-line excess flow valves are installed so likely piping damage will occur downstream of the valve and will not separate the valve from the upstream piping.

When the excess flow valves can be examined separate from the line (before the installation or if removed for system maintenance), they should be checked to see that the parts are in good condition and that the poppet can be pushed fully closed.

### Testing of Excess Flow Valves

In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating.

This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge, and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under a sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick-closing valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

A test involving venting gas to the atmosphere is hazardous and may be impractical, or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition, and the flow rate sizing for those test conditions.

For additional information on excess flow valves and other means of shut-off protection, contact RegO and refer to NFPA 58.

Prepared by

NATIONAL PROPANE GAS ASSOCIATION

The purpose of this bulletin is to set forth general safety practices for the installation, operation, and maintenance of LP-Gas equipment. It is not intended to be an exhaustive treatment of the subject, and should not be interpreted as precluding other procedures which would enhance safe LP-Gas operations. The National Propane Gas Association assumes no liability for reliance on the contents of this bulletin.

## Excess Flow Valves

### General Information

RegO Excess Flow Valves have been designed, developed, and manufactured for a wide variety of industry needs for more than three decades.

Throughout the years, those concerned with installing and operating bulk plant facilities have looked to RegO products with confidence for reliable, long-lasting valves as required by the National Fire Protection Association (NFPA) Standards 58 and 59, as well as any state, provincial, and local regulations.

It is a responsibility we have not taken lightly. RegO products continue to not only assess the most effective designs, but anticipate and meet the industry's changing requirements. Toward that goal, RegO products include over fifty different types and sizes of excess flow valves (most of which are listed by Underwriters Laboratories) to meet the needs of the LP-Gas and anhydrous ammonia industries.

### An Explanation and Warning

An excess flow valve is a spring-loaded check valve which will close only when the flow of fluid through the valve generates sufficient force to overcome the power of the spring holding it open. Each valve has a closing rating in gallons per minute and CFH/air.

The selection of a proper closing rating is critical. It requires a technical understanding of the flow characteristics of the piping system, including restrictions of the piping and other valves and fittings downstream of the excess flow valve.

System designers and operating people must understand why an excess flow valve, which remains open in normal operations, may fail to close when an accident occurs.

**Warning: A downstream break in piping or hoses may not result in sufficient flow to close the valve.**

### How They Work

Excess flow valves permit the flow of liquid or vapor in either direction. This flow is controlled in only one direction (the direction of the arrow stamped on the valve). If the flow in that direction exceeds a predetermined rate (shown in this catalog for each valve), the valve automatically closes.

The valve disc is held in the open position by a spring. When the flow creates a pressure drop across the valve disc that overcomes the preset load on the spring, the valve disc moves to the closed position. It remains closed until the force on both sides of the valve disc are approximately equal (a small bleed hole in the disc of each valve permits equalization), then the spring automatically reopens the valve. When a line is completely broken, the pressure cannot equalize and the excess flow valve remains closed until the line is repaired. Because the bleed hole in each valve disc permits equalization of pressure, excess flow valves do not provide a 100 percent type shut-off.

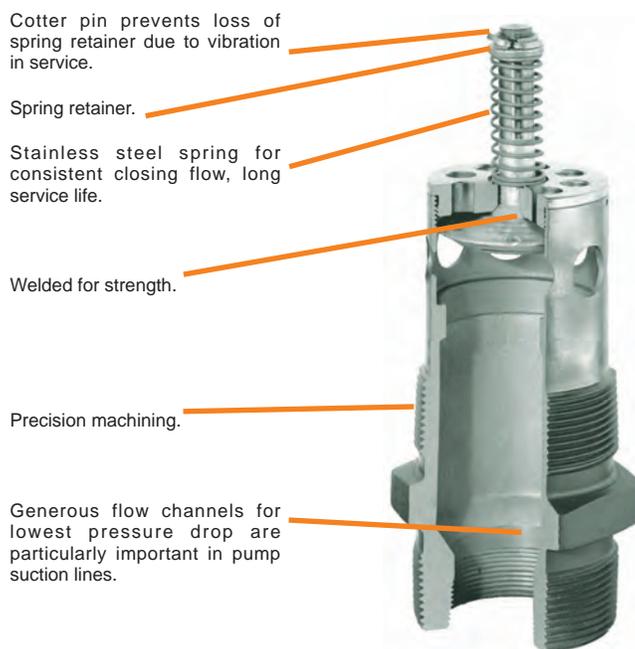
### Proper Installation

Since excess flow valves depend on flow in order to close, the line downstream of the excess flow valve should be large enough not to excessively restrict the flow. If the piping is too small, unusually long or restricted by too many elbows, tees and other fittings, consideration should be given to the use of larger size pipe fittings.

An excess flow valve in a pump suction line cannot be expected to close in the case of a clean break in the line beyond the pump, as the pump constitutes too great a restriction, even if running.

Good piping practices dictate the selection of an excess flow valve with a rated closing flow of approximately 50 percent greater than the anticipated normal flow. This is important because valves which have a rated closing flow very close to the normal flow may chatter or slug closed when surges in the line occur during normal operation, or due to the rapid opening of a control valve.

All installations must be in accordance with NFPA Standards 58 and 59, as well as state, provincial and local regulations.



## Excess Flow Valves for Liquid or Vapor Service

### 1519C Series

Designed for top mounting in storage tank manhole covers for liquid or vapor applications. The tapped inlet allows for an optional 1" NPT dip pipe connection to withdraw liquid from the top of the tank.

The 1519C4 is designed for installation in long line or branch piping applications.



1519C2



1519C4

### Ordering Information

Part #	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx.)	E Threaded End to Port	Approximate Closing Flows**		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
1519C2	1-1/2" Male*	1"	2-1/4"	2-1/16"	2-11/16"	25	5,000	8,800
1519C4	2" Female	2"	3"	4-9/16"	-	170	28,590	48,600

\* 1" Female Dip Pipe Connection

\*\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.  
NOTE: Multiply flow rate by .94 to determine liquid butane flow.

## Excess Flow Valves for Liquid or Vapor Line Service

### 1519A Series, 1519B Series and A1519 Series

Designed for top installation, in any position, in liquid or vapor service lines. They are intended for long lines or branch piping where tank mounted excess flow valves cannot suffice.



1519A2, 1519A3, 1519A4, 1519B4, A1519A2, A1519A4, A1519B4



A1519A6

### Ordering Information

Part #	Brass or Steel	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx)	Approximate Closing Flows*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
1519A2	Brass	1"	1"	1-3/4"	3-1/2"	25	5,000	8,800
A1519A2	Steel							
1519A3	Brass	1-1/2"	1-1/2"	2-1/4"	4"	60	11,500	20,200
1519A4								
A1519A4	Steel	2"	2"	3"	4-9/16"	100	19,000	34,500
1519B4	Brass				4-13/16"			
A1519B4	Steel				4-9/16"			
A1519A6					4-13/16"			
		3"	3"	4"	6-27/32"	225	45,000	82,000

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

## Excess Flow Valves for Liquid or Vapor

**3272 Series, 3282 Series, 3292 Series, A3272 Series, A3282 Series, A3292 Series, 7574 and 12472**

Designed for liquid or vapor use for filling, withdrawal and vapor equalizing in container or line applications. They are intended for long lines or branch piping where tank-mounted excess flow valves are inadequate.



**3282A**

### Ordering Information

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

Part Number	Brass or Steel	A Inlet Connection (M. NPT)	B Outlet Connection (F. NPT)	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*				
						Liquid (GPM Propane)	Vapor SCFH (Propane)			
							25 PSIG Inlet	100 PSIG Inlet		
12472	Brass	3/4"	3/4"	1-3/8"	1-7/16"	4	1,050	1,700		
3272E					10	2,100	3,700			
3272F					15	2,800	5,000			
3272G					20	3,700	6,900			
A3272G	Steel	1-1/4"	1-1/4"	2"	1-3/8"	30	5,850	10,000		
3282A	1-7/16"				40	7,600	13,600			
3282B	50				9,000	16,300				
3282C	1-5/8"				90	15,200	28,100			
A3282C	Steel	1-1/2"	1-1/2"	2-1/4"	1-7/8"	70	14,000	25,000		
7574	Brass				2"	2"	2-7/8"	75	14,200	24,800
7574L							3"	100	18,100	32,700
3292A	Steel				2"	2"	2"	2-7/8"	122	22,100
A3292A	Brass	3"								
3292B	Steel									
A3292B										
A3292C	Steel									

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

## Excess Flow Valve for Autogas Dispensing Systems

**3272H**

Especially designed for high flow/high differential dispensing systems. Can also be used for filling, liquid withdrawal, and vapor equalizing in container or line applications.



**3272H**

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Wrench Hex Flats	Effective Length (Approx.)	Liquid (GPM Propane)
3272H	3/4"	3/4"	1-3/8"	1-3/8"	29

## Excess Flow Valves for Container Service

### A7537 Series, A7539 Series, A8523 and A8525

Designed for mounting in threaded full or half couplings in container installations. They may be used for filling, withdrawal or vapor equalizing applications. The exceptionally low pressure drop makes them ideal for pump suction lines. If a riser pipe to the vapor space is used with these valves, the minimum inside diameter of the riser pipe must be at least two times the valve thread size in order not to restrict flow to the side inlet ports.



A7537N4

### Ordering Information

Part Number	For Use With This Type Coupling	A Inlet Connection M. NPT	B Outlet Connection NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
A8523	Half	3/4"	3/4" Male	1-1/8"	1-3/4"	15	5,170	8,800
A8525	Half	1-1/4"	1-1/4" Male	1-3/4"	2-1/8"	35	12,540	21,560
A7537L4	Half	2"	2" Male and 1-1/4" Female	2-5/8"	2-1/2"	75	13,000	25,600
A7537L4F	Full					125	25,000	42,500
A7537N4	Half							
A7537N4F	Full							
A7537P4	Half							
A7537P4F	Full							
A7539R6	Half	3"	3" Male and 2" Female	3-3/4"	3-1/8"	150	32,100	55,500
A7539R6F	Full					200	39,400	68,300
A7539T6	Half							
A7539T6F	Full							
A7539V6	Half							
A7539V6F	Full					250	51,100	88,700

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

## Excess Flow Valves for Vapor or Liquid

### A2137 Series and 2139 Series

Designed especially for filling, withdrawing or vapor equalizing in half and full coupling installations. Ideal for container service where welded-in dip pipes are not provided. For vapor use, mount in the bottom opening with a threaded dip pipe. For liquid use, mount in the top opening with a threaded dip pipe. These may also be installed in pipe lines provided the connection is made to the male inlet thread and not the female dip pipe connection.



A2137

### Ordering Information

Part #	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flows***		
					Liquid (GPM Propane)	Vapor SCFH (Propane)	
						25 PSIG Inlet	100 PSIG Inlet
A2137	2**	2" Male and 1-1/4" Female	2-7/16"	1-9/16"	50	10,000	17,000
A2137A					70	14,000	25,000
2139	3***	3" Male and 2" Female	3-1/2"	1-3/4"	125	26,500	46,000
2139A					160	32,700	57,200

\* 1-1/4" F. NPT Dip Pipe Connection

\*\* 2" F. NPT Dip Pipe Connection

\*\*\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

## Excess Flow Valves for Flange Mounting in Container Service A3500 Series and A4500 Series

Designed for mounting in flanged tank connections with internal threads in the bottom of a container. They may be used in filling, withdrawal or vapor equalizing application. They provide high flow capacity with low pressure drop to minimize pump inlet line cavitation.



If a riser pipe to the vapor space is used with these excess flow valves, the minimum inside diameter of the riser pipe must be at least two times the valve thread size in order not to restrict flow to the side inlet ports.

Flange mounted excess flow valves are readily accessible for servicing and completely enclosed and protected in event of fire. Because there is no direct connection between external piping and the valve, stresses imposed on piping will not affect the excess flow valve.



**A3500L4**

### Ordering Information

Part #	A Inlet Connection NPT	B For Installation	C Effective Thread (Approx.)	D Threaded End To Port	Approximate Closing Flows*		
					Liquid (GPM Propane)	Vapor SCFH (Propane)	
						25 PSIG Inlet	100 PSIG Inlet
A3500L4	2"	Slotted Body	3/4"	1-15/16"	75	13,000	22,500
A3500N4					125	25,000	42,500
A3500P4					150	30,500	52,000
A3500R6	3"		1"	1-9/16"	150	32,100	55,500
A3500T6					200	39,400	68,300
A3500V6					250	51,100	88,700
A4500Y8	4"		1-1/16"	1-15/16"	500	89,000	154,000

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

## Excess Flow Valves for Liquid or Vapor Withdrawal 2723C and A8013D Series

These valves are designed for bottom mounting in consumer storage tanks for liquid service. They may also be top mounted for vapor service. These valves are designed especially for use with RegO globe and angle valves.



**A8013D**



**2723C**

### Ordering Information

Part #	A. Inlet Connection M. NPT	B. Outlet Connection NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	E. Threaded End To Port	Approximate Closing Flow**		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
A8013D	1-1/4"	3/4"	1-3/4"	1-3/32"	-	39	8,700	14,700
A8013DA		1"		1-3/16"		44		
A8013DB		1-1/4"	1-11/16"	1-7/32"		55	10,900	19,300
2723C		3/4"		1-5/16"		1-15/16"	20	3,900

\* 3/4" F. NPT Dip Pipe Connection

\*\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

## Excess Flow Valve for Pressure Gauges

### 2884D

Designed for container use in pressure gauge installations to minimize excess gas discharge in the event the pressure gauge is sheared. A suitable shut-off valve should be installed between this valve and the pressure gauge to allow convenient gauge replacement.



2884D

### Ordering Information

Part Number	A. Inlet Connection M. NPT	B. Outlet Connection F. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	E. Threaded End To Port	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
2884D	3/4"	1/4"	1-1/16"	11/16"	15/16"	N/A	60	110

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow.

## Excess Flow Valve for DOT Cylinders

### 3199W

Designed for use on portable systems with vapor or liquid including torches, heaters, lead melting burners, tar and asphalt burners, wallpaper steamers and other applications involving portable DOT cylinders. The POL inlet attaches directly to the cylinder valve and the outlet mounts to the regulator.



3199W

### Ordering Information

Part Number	A. Inlet Connection	B. Outlet Connection	C. Wrench Hex Flats	D. Effective Length (Approx.)	Approximate Closing Flow*		
					Liquid (GPM Propane)	Vapor SCFH (Propane)	
						25 PSIG Inlet	100 PSIG Inlet
3199W	Male POL	1/4"	7/8"	2-7/16"	.95	265	500

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow.

## Chek-Lok® Excess Flow Valves

### 7590U and 7591U Series

Chek-Lok® Excess Flow Valves are designed to provide a convenient means of withdrawing liquid from stationary containers prior to moving the container. The Chek-Lok® permits one transfer shut-off valve with an adapter to be used interchangeably on a number of tanks.

The 7590U and 7591U Chek-Loks® are also designed for use on permanent installations provided the excess flow valve is sized properly for the system and piping. NOTE: In some cases, it may be necessary to use an in-line excess flow valve to protect the downstream piping. This valve is not recommended for use as a liquid source for pumps.



7590U with Cap

### Ordering Information

Chek-Lok® Number	Inlet Connection	Outlet Connection	A. Body Wrench Hex Flats	B. Approximate Effective Length	C. Cap Wrench Hex Flats	Approximate Closing Flow, Liquid GPM (Propane)*
7590U	3/4" M. NPT	1-5/8" UNF	1-3/4"	1-7/16"	1-5/16"	20
7591U	1-1/4" M. NPT		1-3/4"	1-7/8"		35

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up, and slightly less when installed with outlet down.

Note: Multiply flow rate by .94 to determine liquid butane flow.

## Chek-Lok® Excess Flow Valves

Designed to provide a convenient means of withdrawing liquid from stationary containers prior to moving the container.

NFPA Pamphlet 58 standards require: 1) containers with 125 gallons water capacity, or more, have a connection for liquid evacuation which is at least 3/4" NPT, and 2) containers designed for stationary use, have no more propane than 5% of their water capacity in liquid form during transportation. These rules apply to containers manufactured after July 1, 1961.

### Chek-Lok® Operation

#### Instructions to Open Chek-Lok®

1 Loosen cap to vent any accumulated LP-Gas from the Chek-Lok. After venting stops, remove the cap. If venting does not stop, retighten the cap and use other approved means to withdraw liquid from the container.

NOTE: Use a suitable size wrench when removing the cap and adapter from the Chek-Lok. Do not allow the Chek-Lok to un-thread from the tank during removal. When necessary, use a second wrench to secure the Chek-Lok in position.

2 Before beginning withdrawal, securely connect a RegO 7550P angle valve or suitable shut-off valve to the adapter. Fully open the shut-off valve – the valve's handwheel must be fully opened before connecting adapter to tank.

3 Completely thread the adapter and shut-off valve assembly onto the Chek-Lok by turning adapter's coupling nut clockwise until it is tight. Immediately close the shut-off valve. Listen for an audible click to signal that the Chek-Lok has opened and is actuated for liquid withdrawal. The flow can now be controlled by the transfer valve.

4 Check the coupling nut and adapter assembly for leaks using a suitable leak detection solution.

If the Chek-Lok fails to open after following this procedure, the pressure downstream of the shut-off valve should be increased to equalize pressure in the Chek-Lok. It is simple to equalize pressures using vapor from either the vapor return valve or service valve, or from a hose end valve connected to the delivery truck.

#### Instructions to Close Chek-Lok®

1 To re-lock the Chek-Lok, container pressure must be in excess of 35 PSIG. Close shut-off valve and disconnect the hose or piping.

2 Open shut-off valve fully. Liquid discharging to the atmosphere should cause the excess flow feature of the Chek-Lok to close, provided tank pressure is 35 PSIG or more.

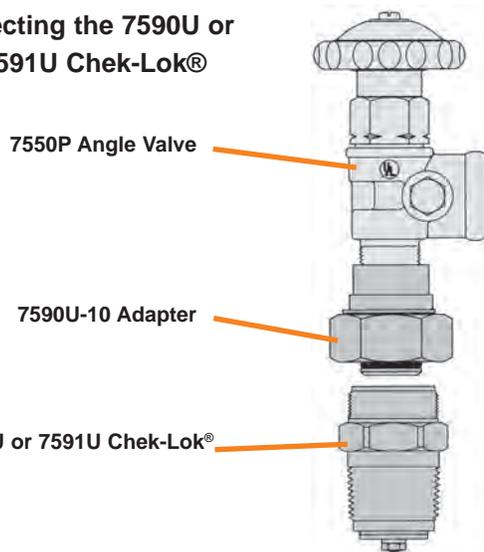
If, for any reason, the excess flow valve does not close, the shut-off valve must be closed immediately and must not be removed until the system can be evacuated and the unit repaired.

3 After the excess flow valve closes, remove the Adapter and Shut-Off Valve Assembly.

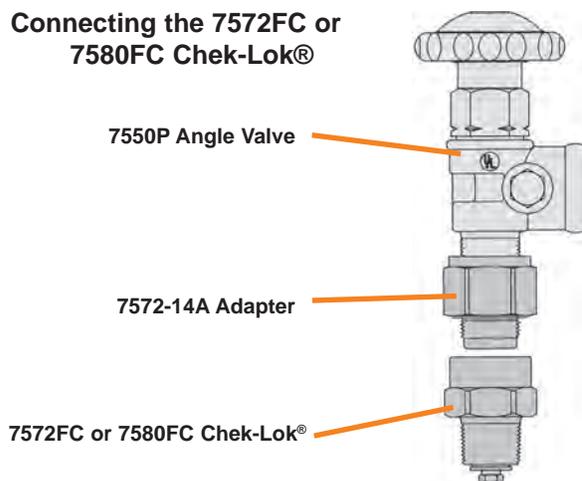
4 Clean face of Chek-Lok and install the Cap with a gasket. IMPORTANT: Only use the proper Chek-Lok Cap. Do not use a standard pipe cap.

The Chek-Lok® permits one transfer shut-off valve with an adapter to be used interchangeably on a number of tanks. With a Chek-Lok® on each tank and a high capacity RegO 7550P Series transfer valve and adapter on all your service and delivery trucks – the need for individual transfer valves is eliminated. This provides a substantial savings without sacrificing safety.

#### Connecting the 7590U or 7591U Chek-Lok®



#### Connecting the 7572FC or 7580FC Chek-Lok®

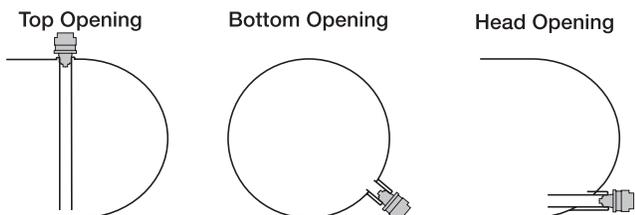


In the absence of a 7550P transfer valve, a 3/4" A7505A Globe Valve or A7506AP Angle Valve may be used. Follow the above procedures using the 7572C-15A adapter instead of the 7572C-14A. Use a RegO 7550P without an adapter in an emergency only.

**CAUTION: Always wear approved protective gloves when working with the Chek-Lok®. Do not vent LP-Gas near possible source of ignition.**

#### Chek-Lok® Mounting

Chek-Lok® Valves may be either top mounted with a dip tube or bottom mounted. For bottom mounting, it is preferable to position the coupling in the head or slightly off of the bottom. This helps prevent the accumulation of sludge, etc. around the valve which could affect the proper operation of the excess flow valve.



## Chek-Lok® Liquid Evacuation Adapter for 7590U and 7591U Valves

### 7590U-20

Designed specifically for use with RegO 7590U and 7591U Chek-Lok® Excess Flow Valves. Adapter's operating handle opens and closes equalizing stem in the Chek-Lok® valve. Eliminates gas flow through Chek-Lok® valve when installing or removing adapter. Use of RegO adapter ensures proper connections and opening of the check mechanism.



7590U-20

### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A Wrench Hex Flats	B Approximate Length
7590U-20	1-5/8"-12 UNF	3/4"	1-3/4"	4-3/16"

## Liquid Evacuation Adapter for older design 7572FC and 7580FC Chek-Lok® Valves

### 7580F-20

Designed specifically for use with RegO 7572FC and 7580FC Chek-Lok® Excess Flow Valves. The adapter's operating handle opens and closes the equalizing stem in these older style Check-Lok® valves. This adapter is designed to eliminate the need for gas to flow from the Chek-Lok® when the adapter is installed or removed. A shutoff valve, such as a full port ball valve must be installed at the outlet of the 7580F-20.



7580F-20

### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	Approximate Length	Wrench Hex Flats
7580F-20	3/4" M.NPT	3/4" F. NPT	4-9/32"	1-3/8"

## Union Style Adapters for 7590U and 7591U Valves

The 7590U-10 adapter must be used to connect to the 7590U and 7591U Chek-Lok. This insures a proper connection to open the check mechanism. A built-in nylon gasket provides a gas tight seal.



7590U-10

### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Length
7590U-10	1-5/8" UNF	3/4" F. NPT	1-3/4"	1-7/8"

## Adapters for 7572FC and 7580FC Valves

These adapters must be used to connect to the 7572FC and 7580FC Chek Loks to open the check mechanism properly. A built in nylon gasket provides a gas tight seal.



7572C-14A  
For Transfer Valves



7572C-15A  
For Globe and Angle Valves

### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Effective Length
7572C-14A	3/4" M. NPT	3/4" F. NPT	1-3/8"	1"
7572C-15A	NPT	3/4" M. NPT		3/4"

## Double-Check Filler Valves

### General Information

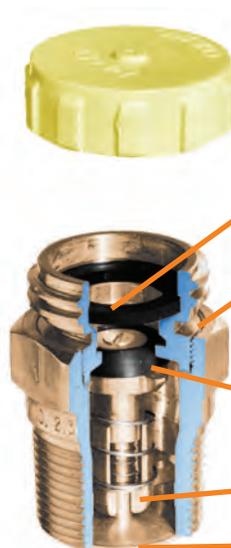
RegO Double-Check Filler Valves incorporate a resilient upper check valve, normally designated as a filler valve, and a lower check valve, commonly called a back pressure check valve. Available in a range of sizes to cover virtually all LP-Gas storage containers, these valves are UL listed and meet NFPA standards, as well as other safety requirements.

Flow of liquid into the storage container opens both check valves. When flow stops, they both are designed to close automatically to permit the operator to disconnect the hose coupling. The automatic closing action also helps prevent the discharge of container contents in the event of hose failure. The lower back pressure check affords extra protection by restricting the discharge if the upper check fails to function properly due to accidents or other causes.

The double back check construction allows emergency inspection, repair, or replacement of the upper fill assembly without removing product from the container. When the upper filler valve body is removed, the lower back check valve provides a seal, permitting only some leakage, allowing a new upper filler valve body to be installed.

### Spare Gasket Ordering Information

ACME	Part #
1-1/4"	A2797-20R
1-3/4"	A2697-20R
2-1/4"	A3184-8R
3-1/4"	A3194-8R



- Seal cap made of tough, resilient molded plastic. Protects threads and internal working parts. Caps are designed to contain normal tank pressures, and must be kept on valves at all times.
- Long-wearing gasket permits hand-tight connection of cap and hose coupling.
- Safety groove is designed to shear below the ACME thread, leaving the valve seats closed and unaffected if the delivery truck pulls away with the hose connected.
- Seat disc of special synthetic composition is extra thick for longer life.
- Valve guide is precision machined to ensure positive seal.
- Exclusive swing-away lower back check valve for extra fast filling is provided on Models L6579 and 6587. Differs from conventional design by swiveling to a vertical position when opened.

## Double-Check Filler Valves for Large DOT and ASME Tanks

### L6579 Series and L7579 Series

Designed to provide fast filling of large motor fuel and ASME domestic tanks. The 6579 Series incorporates a swing-away lower check which greatly reduces pressure drop across the valve. This lower pressure drop promotes faster filling rates and greater efficiency resulting in more profitable operations.



7579P



L7579



L6579

### Ordering Information

Part #		A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)				
Basic	With Cap & Lanyard					5 PSIG	10 PSIG	25 PSIG	50 PSIG	75 PSIG
L7579	L7579C	1-3/4"	1-1/4"	1-7/8"	1-27/32"	50	70	111	157	192
7579P*	-				2-1/32"	37	52	82	116	142
L6579**	L6579C**				1-27/32"	78	110	174	246	301
L6579										

\* Incorporates 3/4 F. NPT dip pipe connection

\*\* Swing-away lower back check valve design for higher filling rate. NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

## New Low Emission Filler Valve with Manual Shutoff Feature

### 7501L & 7502L

RegO Manual Double-Back Check filler valves that incorporate a resilient upper check and a **manual shutoff feature**. When filling a container from a delivery truck, this valve will allow flow into the container through the upper and lower check, when the manual lever is in the open position. When flow stops both the upper and lower checks will close; the lever is then turned to the closed position, the hose-end valve can then be removed from the filler valve.

Designed for fast filling of larger DOT cylinders and ASME domestic containers; the 7501L and 7502L feature a manual shutoff in addition to upper and lower back checks.



CE 0036



7502L



7501L

### Ordering Information

Part Number	Container Connection	ACME Hose Connection	Propane Liquid Capacity at Various Differential Pressures		
			15 PSIG	25 PSIG	50 PSIG
7501L	1-1/4" M.NPT	1-3/4" M.ACME	62 GPM	90 GPM	6125 GPM6
7502L					

## Combination Filler and Overfill Protection Device (OPD)

### Low Emissions SF7647V Series

This combined filler valve and overfill protection device is designed to provide fast filling and protection against overfilling of Vertical above ground small bulk type containers. The SF7647V Series offers good fill rates and an overfill prevention device that will stop\* the flow of product into the container when the liquid level reaches 80-83% of its capacity.

CE 0036



SF7647V

### Ordering Information

Part #	Propane Liquid Capacity at 20 PSIG differential pressure gallons/minute	Propane Liquid Capacity at 30 PSIG differential pressure gallons/minute	Propane Liquid Capacity at 50 PSIG differential pressure gallons/minute
SF7647V11.0	19	24	50
SF7647V11.1			

## Combination Low Emission Filler and Overfill Protection Device (OPD) SFL7579V Series

The SFL7579V Series filler valve is for use on ASME containers. This combined filler valve and overfill protection device is designed to provide fast filling and protection against overfilling of vertical and horizontal above ground LPG containers. This is typically installed in the top of horizontal containers.



**Note:**

- Must be installed in a vertical position.
- Depending on the application this valve is designed to be used in conjunction with another device such as a fixed liquid level gauge or float gauge in low emission transfer systems.



SFL7579V

### Ordering Information

Part Number**	ACME Hose Connection	Tank Connection M.NPTF	Wrench Hex Flats	Length A*	Propane Liquid Capacity at Various Differential Pressures GPM			
					1 PSI	25 PSI	50 PSI	75 PSI
SFL7579V13.8	1-3/4" Male	1-1/4"	1-7/8"	14.43"	23	49	54	66
SFL7579V13.0				13.63"				
SFL7579V12.3				12.93"				
SFL7579V11.1				11.73"				
SFL7579V10.6				11.23"				

\* Distance from center thread to float at closure.

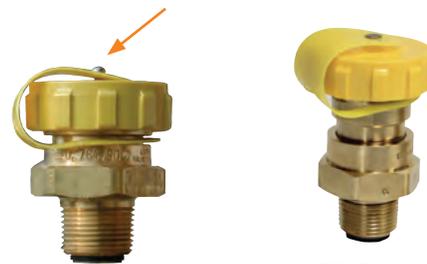
\*\* Suffix number indicates dip tube length (Fixed liquid level gauge) different lengths available upon request.

## Double Check Low Emission Filler Valves for Forklift and DOT Containers 7647 Series

Designed to provide fast filling of forklift, motor fuel, and recreational vehicle tanks.



Lanyard and Cap



7647SC

7647DC

### Ordering Information

Part #	A Hose Connection	B Tank Connection M. NPT	C Wrench Flats	D Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)**				
					10 PSIG	20 PSIG	30 PSIG	40 PSIG	50 PSIG
7647DC	1-3/4" ACME + F. POL	3/4"	1-5/8"	2-9/16"	14	20	24	27	50
7647SC*	1-3/4" ACME		1-3/4"	1-11/16"					

\* Large 1-3/4" hex wrench flats.

\*\* Multiply flow rate by .94 to determine liquid butane capacity.

## Double Check Filler Valves for Delivery Truck Tanks and Large Storage Containers

### 7579S, 6587EC and 3197C

Designed to provide fast filling of bobtails, transports and large bulk storage tanks.

The 6587EC incorporates a swing-away lower check which greatly reduces pressure drop across the valve. This lower pressure drop promotes faster filling rates and greater efficiency resulting in more profitable operations.



### Ordering Information

Part #	A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)				
					5 PSIG	10 PSIG	25 PSIG	50 PSIG	75 PSIG
7579S	1-3/4"	1-1/2"	2"	2-11/16"	44	62	98	139	170
6587EC*	2-1/4"	2"	2-7/8"	4-3/8"	92	130	206	291	356
3197C	3-1/4"	3"	4"	6-1/2"	148	210	332	470	575

\* Swing-away lower back check valve design for higher filling rates.  
NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

## Single Check Filler Valves for Storage Tanks with Supplementary Back Check Valves

### 3174C, 3194C and 6584C

Designed for use with RegO Back Check Valves to provide fast filling of bulk storage tanks. Also may be used as a spare or replacement part.

These single check filler valves must never be installed directly into container couplings. They must be used with the appropriate back check valve to comply with NFPA Pamphlet #58.



### Ordering Information

Part #	ACME Hose Connection	Outlet Connection M. NPT	Wrench Hex Flats	Propane Liquid Capacity at Various Differential Pressures (GPM)				For Use With Back Check Valve:
				5 PSIG	10 PSIG	25 PSIG	50 PSIG	
3174C	1-3/4"	1-1/4"	1-11/16"	23	33	52	74	3176
6584C*	2-1/4"	2"	2-3/8"	156	220	348	492	A3186
3194C	3-1/4"	3"	3-1/2"	147	208	329	465	A3196

\* Stem Assembly designed for higher filling rates.  
NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

## Vapor Equalizing Valves

### General Information

RegO Vapor Equalizing Valves consist of an upper back check valve and lower excess flow valve. In the closed position, the attachment of a vapor hose coupling with its projecting nozzle, opens the back check valve to permit flow in either direction. The lower excess flow valve is designed to close automatically when flow out of the container being filled exceeds the rated capacity. The valve closes automatically when the coupling is removed. Like the double-check filler valves, the vapor equalizing valves utilize a two-piece body construction. The lower excess flow valve will permit some leakage when the upper back check valve is removed for emergency repairs or replacement.

RegO Vapor Equalizing Valves are designed for use in both ASME and DOT containers.



#### Spare Gasket Ordering Information

ACME	Part #
1-1/4"	A2797-20R
1-3/4"	A2697-20R

## Double Check Vapor Equalizing Valves for ASME and DOT Containers

### 7573 Series and 3183AC

Designed to facilitate loading operations by providing equalization of pressures in the supply and storage containers. The supplementary excess flow valve closes when the flow from the container being filled exceeds a predetermined rate.

The 7573 Series is designed for use in bulk delivery systems and motor fuel containers. The 3183AC is designed for use in delivery trucks and other large containers.



7573 Series

### Ordering Information

Part #		A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Approx. Closing Flow at 100 PSIG Inlet Pressure (SCFH/Propane)
Basic	W/ Chain & Cap					
7573D	7573DC	1-1/4"	3/4"	1-3/8"	1-15/32"	4,100
-	3183AC	1-3/4"	1-1/4"	2"	2-29/32"	10,000

## Single Check Vapor Equalizing Valves for ASME and DOT Containers with Supplementary Excess Flow Valves

Designed for use with RegO Excess Flow Valves to facilitate loading operations by providing equalization of pressures in the supply and storage containers. Also may be used as a spare or replacement part. These vapor equalizing valves must never be installed directly into container couplings. They must be used with the appropriate excess flow valve to comply with NFPA Pamphlet #58.



3170

### Ordering Information

Part #		A. ACME Connection	B. Tank Connection M.NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Approximate Closing Flow at 100 PSIG Inlet Pressure (SCFH/Propane Vapor)	For Use With Excess Flow Valve:
Basic	With Cap & Chain						
3170	-	1-1/4"	3/4"	1-1/4"	1-7/16"	7,600	3272E
-	3180C	1-3/4"	1-1/4"	1-11/16"	1-1/2"	10,000	3282A

## Back Pressure Check Valves

### General Information

RegO Back Pressure Check Valves are designed to allow flow in one direction only. The check, normally held in the closed position by a spring, precludes the possibility of flow out of the container. When flow starts into the container, the pressure overcomes the force of the spring to open the check. When the flow stops or reverses, the check closes.

Metal-to-metal seats will allow slight leakage after closure. These valves will restrict the escape of container contents in the event of accidental breakage of the piping or fittings.

## Back Pressure Valves for Container or Line Applications

### 3146 Series, 3176 Series, A3186, A3187S, A3196, and A3276BC

Designed to provide protection of a container opening when desired flow is always into the vessel. May be used in line applications where flow must be limited to one direction.

When used with the appropriate single check filler valve, the combination forms a double check filler valve suitable for use in filling of bulk storage tanks.



3146 Series, 3176 Series, A3186, A3196



A3276BC



A3198S



A3187S

### Ordering Information

Part #		A Inlet Connection F. NPT	B Outlet Connection M. NPT	C Wrench Hex Flats	D Effective Length (approx.)	Propane Liquid Capacity at various differential pressures (GPM)			
Brass	Steel					5 PSIG	10 PSIG	25 PSIG	50 PSIG
3146	A3146	3/4"	3/4"	1-15/16"	1-15/16"	11	16	25	36
3146S*									
3176	A3176	1-1/4"	1-1/4"	2"	1-13/32"	28	40	63	89
	A3276BC*				2-1/8"	32	45	73	103
	A3186	2"	2"	3"	2-3/8"	124	175	276	391
	A3187S* **	2" M & 1-1/4" F	2" M & 1-1/4" F	2-3/8"	1-27/32"	60	110	225	350
	A3196	3"	3"	4"	3-7/32"	297	420	664	939
	A3198S* **	3" M & 2" F	3" M & 2" F	3-1/2"	3-1/4"	210	290	400	

\*Soft seat version.

\*\*The 1-1/4" and 2" outlet connections are for a standpipe when installed inside of a container.

NOTE: Multiply flow rate by .94 to determine liquid butane capacity and by .90 to determine liquid anhydrous ammonia capacity.

## Swing-Away Back Pressure Check Valves for Container or Line Applications

### 6586D and A6586D

Designed to provide protection of a container opening when desired flow is always into the vessel. May also be used in the line applications where flow must be limited to one direction.

When used with the appropriate single check filler valve, the combination forms a double check filler valve suitable for use in filling of bulk storage tanks.

The swing-away check offers more efficient flow rates than conventional designs. It swivels open vertically to reduce pressure drop across the valve and improves flow rates.



6586D

### Ordering Information

Part #		A. Inlet Connection F. NPT	B. Outlet Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)			
Brass	Steel					5 PSIG	10 PSIG	25 PSIG	50 PSIG
6586D		2"	2"	2-3/4"	2-1/32"	190	270	420	600
	A6586D			2-7/8"					

NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

## Back Pressure Check Valves for Flanged Installation

### A3400L4 and A3400L6

Designed to provide high flow capacity and allow more efficient tank filling than conventional designs. The unobstructed throat area reduces flow turbulence through the valve, thereby reducing pressure drop. Large flow channels and spacious side ports ensure ample capacity for the most demanding high capacity filling operations.

The valve is designed for installation in internally threaded flanges in container bottoms.



A3400L6

### Ordering Information

Part #	A. Flange Connection M. NPT	B. Wrench Hex Flats	C. Overall Length	D. Threaded End To Port	Propane Liquid Capacity at Various Differential Pressures (GPM)			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A3400L4	2"	Slotted	5-1/4"	1-5/16"	223	316	500	707
A3400L6	3"		5-9/32"	1-9/16"	424	600	949	1342

NOTE: For installation in flange tank connections with internal threads, see the "Flanged Installation in Container" section under "Excess Flow Valves." Multiply flow rate by .94 to determine liquid butane capacity and by .90 for liquid anhydrous ammonia capacity.

## Adhesive Warning Label 7572-400

The following warning information, Part Number 903-500, is included with each shipment of Excess Flow, Check, Filler and Vapor Equalizing Valves to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

The 7572-400 adhesive warning label is intended for application as close as possible to the Chek-Lok® once the Chek-Lok® is installed.

The basic information contained on the label is intended for the benefit of the user of the Chek-Lok® and is not intended to be an "all-inclusive" product warning.

This label is printed on a heavy duty material with pressure sensitive adhesive backing. The ultra-violet ink stands up well when exposed to the environment.

Part #	Description
7572-400	Adhesive Warning Label

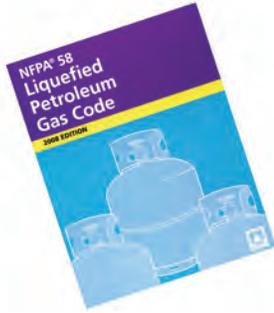
<b>DANGER</b>	<b>READ THIS FIRST</b>	<b>WARNING</b>
<b>LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE</b>		
<p><b>AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS... EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.</b></p> <p>Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.</p> <p>Become thoroughly familiar with NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections &amp; Maintenance" and RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 &amp; L-102 Catalogs. Follow their recommendations.</p> <p>Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."</p> <p>Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment.</p> <p>Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.</p> <p>Install valves by applying force to wrenching flats only.</p> <p>Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.</p> <p>Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.</p> <p>Check container-valve connection with a non-corrosive leak detection solution before filling with LP-Gas.</p> <p>Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).</p> <p>Test excess flow check valve for proper operation before placing into service. See NPGA Bulletin 113 for recommended procedure.</p> <p>Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.</p> <p><b>RegO Filler Valves:</b> To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use ONLY RegO 3119A, 3120 and 3121 Unloading Adapters with RegO Filler Valves. Carefully follow the instructions supplied with these unloading adapters.</p> <p>If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.</p> <p>In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NPGAs and others.</p> <p>Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 &amp; L-102 Catalogs.</p>		
<p>RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.</p>		
		
<p>Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com</p>		

**903-500**

<b>DANGER</b>	<b>WARNING</b>
<b>LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE</b>	
<p><b>AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR ESCAPING GAS... EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.</b></p> <p style="text-align: center;"><b>CAUTION!</b></p> <p>Use this CHEK-LOK® connection only for liquid evacuation before moving tank in accordance with NFPA Pamphlet 58, which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Read and follow RegO product instruction number 7572FC-301.</p> <p style="text-align: center;"><b>DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL. DO NOT FILL THIS CONTAINER UNLESS THIS LABEL IS READABLE.</b></p>	
<p><small>ADDITIONAL SAFETY INFORMATION IS AVAILABLE FROM</small></p>  <p style="text-align: right;"><small>Printed in U.S.A. 05-0114-0286 Part Number 7572-400</small></p>	
<p><small>Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com</small></p>	

**7572-400**

## Warnings



### Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.'

### Nature of Warnings

It is recognized that warnings should be as brief as possible, but the factors involved in internal valve and excess flow valve failures to perform are not simple. They need to be fully understood. If there is a simple warning, it would be:

Make sure that the internal valve's excess flow feature really closes when the flow exceeds rated closing flow, and that the valve will shut-off.

This bulletin is not intended to be an exhaustive treatment of internal valves, and certainly does not cover all safety practices that should be followed in installation, operation and maintenance of LP-Gas systems, which include internal valves.

Internal valves must be closed on Cargo Vehicles when traveling on public roads and highways. The valve should only be open when pumping. Per MC 330 or 331, internal valves must also be equipped with remote closure system when used on transports or bobtails.

There are two types of internal valves being used on storage tanks, transports and bobtails — spring loaded internal valves and differential pressure internal valves. They both provide positive shut-off when product is not being withdrawn and may include excess flow protection for the system during transfer operations.

### Spring Loaded Internal Valves

Spring loaded internal valves are manually opened by levers, by means of fuse linked cable mechanisms or pneumatic or hydraulic actuators. They incorporate an excess flow feature that will close the valve when the flow through the valve exceeds its rate of flow. These valves should never be locked open by means of wires, chains, pegs or other devices.

### Testing

#### Testing should be completed on a periodic basis.

1. To check operation of a spring loaded valve, activate the remote control to close the valve while unit is pumping. If the meter indicator flow continues, the valve should be repaired immediately.

2. Testing excess flow feature.

The National Propane Gas Association Safety Bulletin #113-78 states: "In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating."

This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained.

The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that the excess flow valves are "surge sensitive" and will close quicker under a sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

A test involving venting gas to the atmosphere is hazardous and may be impractical, or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valves condition, and the flow rate sizing for those test conditions.

3. Tight Shut-Off — A test should be made to ensure the internal valve will give a gas tight seal when the valve is in the closed position. This will require removal of all product downstream from the internal valve, to ensure the valve will give 100% seal when in the closed position. If the internal valve does not give 100% seal the valve should be repaired immediately.

## Pressure Differential Internal Valves (Flomatics®)

Pressure differential valves (Flomatics®) open by pump pressure and close when the pump stops. These valves must never be locked open by means of wires, chains, pegs or other devices.

### Testing

Testing should be completed on a periodic basis.

1. To check operation of a differential pressure internal valve activate the remote control shut-off valve while the unit is pumping. If the meter indicates that flow continues the valve should be repaired immediately.

2. Since the differential pressure internal valve requires at least 18 psi to open and 8 psi over container pressure to keep open, a test may be performed to check for closure. With the PTO disengaged, connect delivery hose to a container with very low pressure. Then with hose end valve open, engage PTO. The internal valve should remain closed, no flow should be detected through the meter. If flow continues through the meter the valve should be repaired immediately.

3. Tight Shut-Off — A test should be made to ensure the internal valve will give a gas tight seal when the valve is in the closed position. First ensure the pump prime valve is closed by turning clockwise until it seats. Then with the valve closed (PTO disengaged) the product downstream from the internal valve will have to be safely removed. If the internal valve does not give 100% seal, the valve should be repaired immediately.

### General Warning

All RegO Products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber.

The environment and conditions of use will determine the safe service life of these products. Periodic testing at least once a year when tank pressures are low and maintenance, as required, are essential.

Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because an excess flow valve is used beyond its safe service life. Life of an excess flow valve is determined by the environment in which it “lives”. The LP-Gas dealer knows better than anyone what this environment is.

**NOTE:** There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could effect them.



## Manual Internal Valves

### A3200 Series

#### General Information

Manual Internal Valves are designed for a variety of uses in LP-Gas and anhydrous ammonia service. In addition, accessories allow most of them to be actuated manually, by cable or with air.

Installation, usage and maintenance of this product must be in compliance with all RegO instructions, as well as requirements and provisions of NFPA # 58, DOT, ANSI, and all applicable federal, state, provincial, and local standards, codes, regulations and laws.

#### How The Valves Work

Refer to the drawings. View "A" shows the valve held closed without leakage by tank pressure and the valve's closing spring. Actuation of the operating handle alone does not open the valve, it only allows pressure to equalize between the inlet and outlet of the valve by rapid bleeding of the product downstream. This equalized pressure then allows the valve to open via the internal spring.

The valve opens by moving the handle to mid-point, see view "B". This position allows the actuator to put the equalizing portion of the valve stem in the pilot opening, allowing more product to bleed downstream than if the handle was fully open.

In a few seconds, the tank and downstream pressure will be nearly equal. The excess flow spring will push the main poppet to the open position, see view "C", the handle should then be moved to the fully open position.

If at first, the handle is quickly moved to the fully opened position, the pilot valve allows a small amount of bleed downstream, but much less than during rapid bleed (view "B"). This results in a longer pressure equalizing time before the main valve can open.

**NOTE:** The main poppet will not open until outlet pressure approximates tank pressure!

Once the main poppet is open, flow greater than the excess flow rating, or a sufficient surge in flow, forces the main poppet closed against the excess flow spring, as seen in view "D". The pilot valve in this position is open and allows a small amount of bleed downstream, but much less than during rapid bleed (view "B").

When the operating handle is moved to the closed position, the valve closes and a leak-tight seal is re-established as seen in view "A".

**NOTE:** To provide excess flow protection, the flow rating of the pump, piping, valves, fittings, and hose on the inlet and outlet sides of the valve must be greater than the flow rating of the valve. Any restrictions that reduce the flow to less than the excess flow valve rating will result in the excess flow valve not operating when required.

#### Valve Operation and Precautions

1. Valve must be opened before starting pump, and before opening valve on pump outlet.
2. Leave pumping system "wet" to avoid drying of seals and to reduce time involved in opening valve. Drain piping only when required by codes or safe operating practices.
3. When piping is dry or at lower pressure than the tank, open valve half-way for a few seconds to allow line pressure to equalize before fully opening the valve handle. The main poppet may not open immediately if the handle is placed in the open position too quickly.
4. Flow surges may close the built-in excess flow valve and should be avoided. If the valve slams shut, immediately stop the pump, close the nearest downstream valve, and move handle to midpoint position to equalize pressure until valve reopens with a click, then restart pump and open downstream valve slowly.

These valves must remain in the closed position except during product transfer. A line break downstream of the pump may fail to actuate the excess flow valve as the pump may limit flow. If break occurs in the system, or the excess flow closes, immediately shut down the system.

Inspection and maintenance on a periodic basis is essential. Installation and maintenance must be performed only by qualified personnel.

Be sure all instructions are read and understood before installation and operation of these valves.

5. Always keep valve closed except during product transfer.

6. Completely open all valves during pumping. Partially closed or throttle type valves may prevent excess flow valve from closing when required, even in a properly designed piping system.

7. All personnel must be aware of remote closure locations and their operation in case of emergency. They must also be aware of the equalizing opening through which bleeding can occur after the excess flow valve closes. If this bleed is not stopped by closing a downstream valve, a hazard may occur.

8. Never, under any circumstances, permanently wire open the operating handle of the internal valve.

#### Cable Control System

The cable control system employed must meet the requirements and be in accordance with the provisions of NFPA #58, DOT, ANSI, and all applicable federal, state, provincial and local codes.

#### Troubleshooting

**1. Internal Valve Will Not Open.** Causes may be excess leakage downstream, pump engaged too quickly, excessive wear of valve, or ice freezing of poppet.

When there is excessive volume downstream, a greater amount of time is required to equalize tank and downstream pressure.

To determine if the pilot seat is opening, install a pressure gauge downstream of valve outlet, open any hand valves between valve and pressure gauge, and open valve. Pilot seat is not opening if pressure does not build up to tank pressure. Perform this test with pump off. A broken internal part may cause pilot seat not to open.

If operating handle rotates past the full open position, there is internal malfunctioning, and the valve must be disassembled and repaired.

**2. Premature Valve Closure.**

First, check to see that operating lever is properly connected and fully opens valve. Premature closure may also be a result of engaging pump too quickly, sudden line surges, an underrated excess flow spring or an obstructed inlet port.

**3. Valve Will Not Close.**

Usually a result of faulty or sticking actuator. First, check the actuator to see that it works freely by disconnecting it from valve handle and cycling it several times. Also, operate valve handle manually. If it sticks in the open position, replace the packing and bushings. This should free the operating mechanism providing the valve has no internal damage.

**4. Low Flow Capacity**

Downstream piping may be too small and/or long, screen or strainer may be plugged, possible restriction downstream, or a bypass valve stuck in the open position are causes of low flow. Also, the bypass valve may be set too low and prematurely opening. Check for high differential pressure across the bypass valve. If bypass valve is open, the differential across the valve should not exceed 5 to 6 psig.

## Maintenance

Potential problems may be eliminated with preventive internal valve maintenance. Perform the following steps once a month:

1. Check to see that the operating lever moves freely and smoothly. There should be no leakage around the lower stem or seal housing. Leakage requires replacement of the seal housing packing. A sticking lever indicates trapped foreign material or mechanism wear.

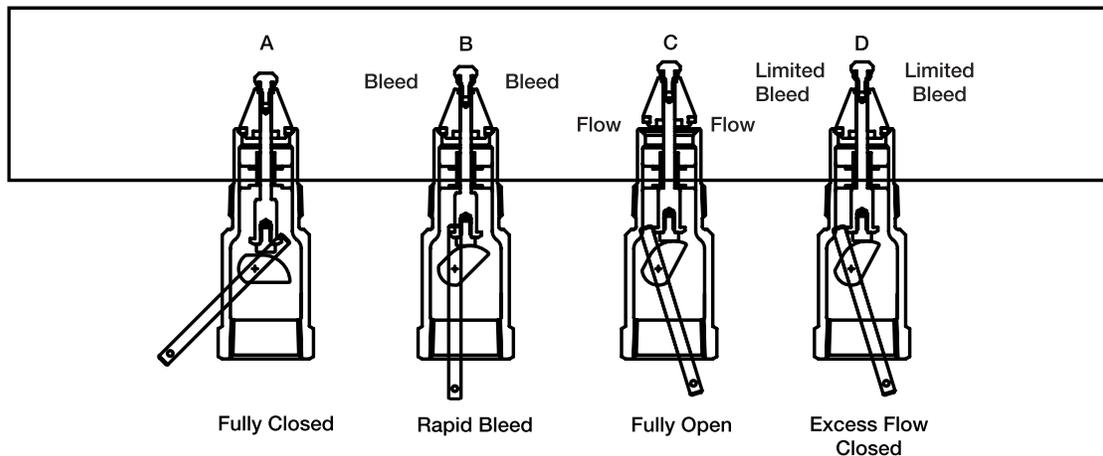
2. Check both seat discs for tight closure. Close valve and exhaust downstream pressure. Be sure piping is warmed to an ambient temperature. Close the first downstream valve and note pressure buildup between the closed valves with a pressure gauge. If leakage occurs, replace both seat discs.

3. Inspect, clean and oil all operating controls. Check controls to see that they open fully, but do not overtravel the valve operating lever. See that they work freely to close the valve. Worn parts should be replaced.

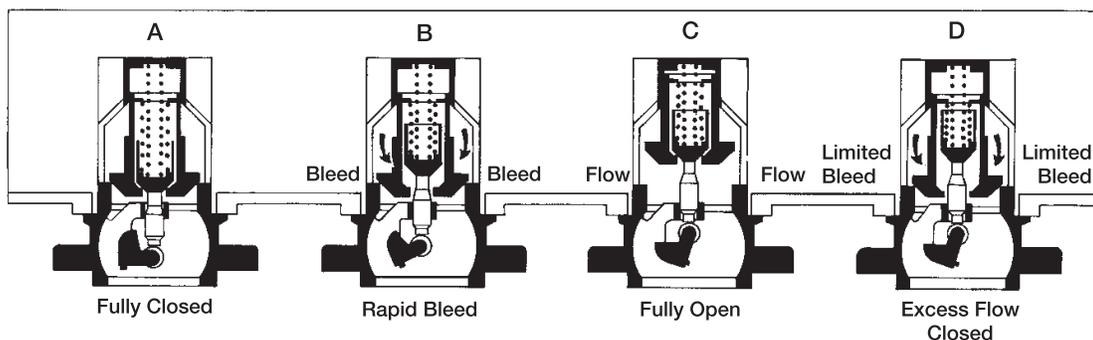
4. Remove valve if the tank is to be steam cleaned. Heat may damage the valve's seals.

5. Valve is not designed for water service. After tank is hydrostatically tested, immediately remove all water and allow tank to thoroughly dry out before installing valve.

A3209D Series, 1-1/4" Straight  
 A3209DT Series, 1-1/4" Straight  
 A3211D Series 1-1/2" Straight  
 A3212R Series, 2" Straight  
 A3212R T Series 2" Tee Body  
 A3213D Series, 3" Straight  
 A3213DT Series 3" Tee Body



A3219FA Series, 4" Flanged



## 1-1/4" Threaded Internal Valve for Small Capacity Pumping Systems and Bobtail Vapor Equalization

### A3209D & A3209DT Series

Designed primarily for use with LP-Gas and anhydrous ammonia as a main valve on small capacity pumping systems, NH3 nurse tanks and in-line installations. It may also be installed in the vapor equalizing opening on bobtail delivery trucks. Installation is quick and easy, and it fits in both full and half couplings, as well as, in-line applications. The valve may be actuated manually by hand or cable.



### Ordering Information

Part #	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow		LP-Gas Vapor Capacity** (SCFH/Propane)		Accessories	
			LP-Gas	NH3	25 PSIG	100 PSIG	Thermal Latch	Pneumatic Actuators
A3209D050	1-1/4"	1-1/4"	50	45	13,300	22,900	A3209TL	A3209PA A3209PAF
A3209D080	1-1/4"	1-1/4"	80	72	15,700	26,700		
A3209DT050*	1-1/4"	1-1/4"	50	45	13,300	22,900		
A3209DT080*	1-1/4"	1-1/4"	80	72	15,700	26,700		

\* T-Body Design

## Threaded Internal Valve with Electric Actuator for Small Capacity Pumping Systems and Bobtail Vapor Equalization

### EA3209 Series

Designed primarily for use with LP-Gas and anhydrous ammonia as a main valve on small capacity pumping systems, NH3 nurse tanks and in-line installations. It may also be installed in the vapor equalizing opening on bobtail delivery trucks. Installation is quick and easy, and it fits in both full and half couplings, as well as, in-line applications. The valve may be actuated manually by hand or cable.



### Ordering Information

Part #	Inlet Connection M. NPT	Outlet Connection F. NPT	Voltages	Closing Flow		LP-Gas Vapor Capacity** (SCFH/Propane)	
				LP-Gas	NH3	25 PSIG	100 PSIG
EA3209D050	1-1/4"	1-1/4"	12/24 VDC	50	45	13,300	22,900
EA3209DT050*				80	72	15,700	26,700
EA3209D080				80	72	15,700	26,700
EA3209DT080*				110	99	N/A	N/A
EA3212R105	2"	2"	12/24 VDC	105	95	42,975	73,048
EA3212RT105*				175	158	48,169	81,876
EA3212R175				250	225	57,067	97,001
EA3212RT175*				150	135	26,900	45,900
EA3213D150	3"	3"	12/24 VDC	200	180	32,300	55,100
EA3213DT150*				300	270	50,500	86,500
EA3213D200				400	360	71,400	121,300
EA3213DT200*							
EA3213D300							
EA3213DT300*							
EA3213D400							
EA3213DT400*							

\* T-Body Design

\*\*Data for full flow in half coupling.

## Straight Through 1-1/2" Internal Valve A3211D Series

Designed primarily for use with LP-Gas and anhydrous ammonia as a main valve on pumping systems, and in-line installations. Installation is quick and easy and it fits in both full and half couplings, as well as, in-line applications. The valve may be opened manually by hand or pneumatic actuator.



A3211D

### Ordering Information

Part Number	Inlet M.NPT	Outlet F.NPT	Closing Flow GPM				LP-Gas Vapor Capacity (SCFH/Propane)		Accessories	
			Half Coupling		Full Coupling		25 PSIG Inlet	100 PSIG Inlet	Thermal Latch	Pneumatic Actuator
			LP-Gas	NH <sub>3</sub>	LP-Gas	NH <sub>3</sub>				
A3211D080	1-1/2"	1-1/2"	80	72	63	67	15,700	26,700	A3209TL	A3209PAF
A3211D110	1-1/2"	1-1/2"	110	99	84	76	N/A	N/A		

## 3" Flanged Internal Valves for Bobtail Delivery Trucks, Transports and Large Stationary Storage Containers

### A3217A & A3217DA

Designed primarily for LP-Gas and anhydrous ammonia filling and/or withdrawal on MC331 bobtail delivery trucks, transports and stationary storage tanks with flanged pumps or piping. Installation is quick and easy, and the valve may be operated manually by cable or pneumatically. Lever available on right or left side to allow for installation without the use of an extra pulley.



A3217AR

### A3217ARPA and A3217ALPA Pneumatic Actuators

These Pneumatic Actuators are designed specifically for use with the A3217 Series 3" Internal Valves. The diaphragm design provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen.

### Ordering Information

Part Number	Operating Lever Position	Inlet Connection	Outlet Connection	Closing Flow GPM		Accessories	
				LP-Gas	NH <sub>3</sub>	Pneumatic Actuator	
						Right Operation	Left Operation
<b>Single Flange</b>							
A3217AR160	A3217AL160	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	160	145	A3217ARPA A3217RA	A3217ALPA A3217LA
A3217AR210	A3217AL210			210	190		
A3217AR260	A3217AL260			260	236		
A3217AR410	A3217AL410			410	372		
A3217AR510	A3217AL510			510	459		
<b>Double Flange</b>							
A3217DAR160	A3217DAL160	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	160	145	A3217ARPA A3217RA	A3217ALPA A3217LA
A3217DAR210	A3217DAL210			210	190		
A3217DAR260	A3217DAL260			260	236		
A3217DAR410	A3217DAL410			410	372		
A3217DAR510	A3217DAL510			510	459		

\* Valve supplied with 16 nuts and 8 studs for mounting.

\*\*Modified bore=4-5/8" diameter with 5-3/4" diameter raised face.

## 4" Flanged Internal Valve for Transports and Large Stationary Storage Tanks

### A3219 Series

Designed primarily for LP-Gas and anhydrous ammonia service on MC331 transport pressure vessels and large stationary storage tanks. Installation is quick and easy, and it fits in most existing tank flanges. The valve may be actuated manually or pneumatically.

Use of the A3219RT Remote Thermal Release with this valve is suggested to provide a remote means of mechanical closure along with thermal protection, as required by DOT.



A3219FA



A3219FPA



A3219RA

#### A3219FPA Pneumatic Actuator

The A3219FPA Pneumatic Actuator is designed especially for use with the A3219FA Series Flanged Internal Valves. The diaphragm type A3219FPA provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen, on LP-Gas and NH3 transport trailers and stationary tanks.

### Ordering Information

Part #*	Inlet Connection	Outlet Connection	Closing Flow GPM***		Accessories	
			LP-Gas	NH3	Pneumatic Actuator	Remote Thermal Release
A3219FA400L	4" 300# ANSI RF Modified Flange**	4" 300# ANSI RF Flange	400	360	A3219FPA A3219RA	A3219RT (2)
A3219FA600L			600	540		
A3219FA600W			400	360	-	A3219W
A3219FA400W						

\* Valve supplied with 16 nuts and 8 studs for mounting.  
 \*\* Modified bore = 5 7/8" diameter with 7" diameter raised face.  
 \*\*\* Other closing flows available

## Remote Thermal Release for DOT MC331 Pressure Vessel

### A3219RT

Designed especially for use with Internal Valves installed in DOT MC331 pressure vessels. The A3219RT provides a remote means of mechanical closure along with thermal protection, as required by DOT MC331.

The A3219RT is connected by cable to the internal valve(s) on the vessel. In the event of extreme heat (over 212° F.), the fuse link will melt, causing the spring to contract and pull the cable. When properly installed the cable will trip the internal valve release lever(s) allowing the connected handle(s) to move to the closed position.



A3219RT

### Ordering Information

Part #	For Use With	Release Temperature	Spring Load		Minimum Number Required By MC331
			Fully Extended	After 4" Travel	
A3219RT	Internal Valves	212° F.	≈100 lbs.	≈50 lbs.	2

## Remote Cable Controls for Internal Valves

### 3200C and 3200L

The 3200C Remote Cable Kit is designed especially for use with the 3200L Remote Operating Lever to operate internal valves from a remote location.

The internal valve is opened by pulling back the remote operation lever and closed by returning the lever to its original position. A remote release is provided to close the internal valve from a different remote location.



3200L

### Ordering Information

Part #	Description	Contents
3200C	Remote Cable Kit	100 Foot Cable, 6 Cable Clamps, Quick Link, Sign, Fuse Link, Steel Nut and Bolt
3200L	Operating Lever	Lever Assembly

## Threaded Internal Valves For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks

### A3213D Series

Designed primarily for use with LP-Gas and anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations. The valve may be operated manually by cable or pneumatically.



A3213D Series



A3213PA



A3213RA



A3213TL

### Ordering Information

Part #	Inlet Connection M.NPT	Outlet Connections F.NPT	Closing Flow Half Coupling (GPM)		Closing Flow Full Coupling (GPM)		Vapor Closing Flow (SCFH)		Accessories		
			LPG	NH <sub>3</sub>	LPG	NH <sub>3</sub>	25 PSIG Inlet	100 PSIG Inlet	Pneumatic Actuator	Rotary Actuator	Thermal Latch
A3213D150	3"	3"	150	135	125	113	26,900	45,900	A3213PA	A3213RA	A3213TL
A3213D200			200	180	160	144	32,300	55,100			
A3213D300			300	270	250	225	50,500	86,500			
A3213D400			400	360	325	293	71,400	121,300			
A3213DT150*			150	135	125	113	26,900	45,900			
A3213DT200*			200	180	160	144	32,300	55,100			
A3213DT300*			300	250	250	225	50,500	86,500			
A3213DT400*			400	325	325	293	71,400	121,300			

\* T-body design

## Pneumatic Operating Pressures

Part Number	Min. PSI	Max. PSI	Inlet Connection
A3209PA	60#	250#	1/4"
A3209PAF	50#	125#	
A3212PA	35#	100#	
A3212RA	25#	125#	
A3213PA	35#	100#	
A3213RA	25#	125#	
6016-60C	20#	250#	
6016-60D	40#	80#	
6016-60D	N/A	125#	1/8"
RSA-M3820602		150#	1/4"
RSA-PTSAE		N/A	N/A

## Threaded Internal Valves For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks

### A3212 Series

Designed primarily for use with LP-Gas and anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations. The valve may be operated manually by cable or pneumatically.



A3212R Series

### Ordering Information

Part #	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow (GPM) Half Coupling		Closing Flow (GPM) Full Coupling		A	B	C	Accessories			
			LP-Gas	NH3	LP-Gas	NH3				Thermal Latch	Pneumatic Actuator	Rotary Actuator	
A3212R 105	2"	2"	105	95	65	59	1-9/16"	4-11/16"	3-45/64"	A3213TL	*A3213PA	A3212RA	
A3212R T105		2" T-body											
A3212R 175		2"	175	158	100	90							4-11/16"
A3212R T175		2" T-body											
A3212R 250		2"	250	225	130	117							4-11/16"
A3212R T250		2" T-body											

\* For the old A3212A Series please use the A3212PA Pneumatic Actuator

## Flomatic® Internal Valves for Bobtail Delivery Trucks, Transports and Large Stationary Storage Tanks

### A7883FK

Designed primarily for LP-Gas and anhydrous ammonia liquid withdrawal on MC331 bobtail delivery trucks, transports and large stationary storage containers with flanged connections. The valve is fully automatic, opening and closing as the pump is turned on or off.



A7883FK

### Ordering Information

Part #	Inlet Connection ANSI Flange	Outlet Connection ANSI Flange	Strainer Width	Base Width	Overall Height (Approx.)	Height from Indicator to Base	Accessories (included with Flomatic® along with studs, nuts & gaskets)	
							Filter	3-Way Valve
A7883FK	3"-300#*	3"-300#	4-3/4"	8-1/4"	10-7/8"	4-13/16"	A7884-201	A7853A

\* With 4-13/16" diameter bore.

## 1/4" Three-Way Quick-Acting Valve

### A7853A



A7853A 1/4" Three-Way Quick-Acting Valve

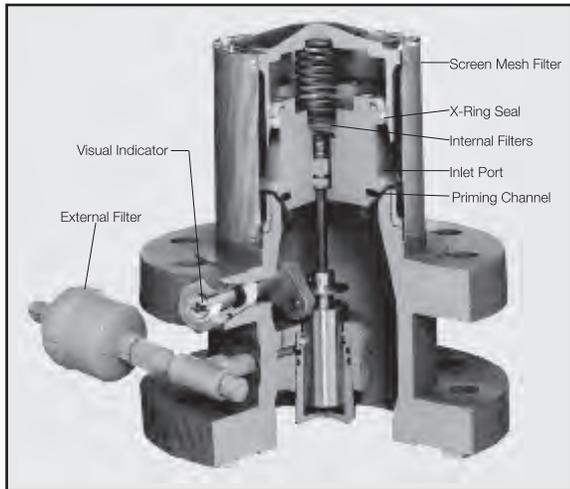


EA7853A 1/4" Three-Way Quick-Acting Valve with Electric Actuator

### Ordering Information

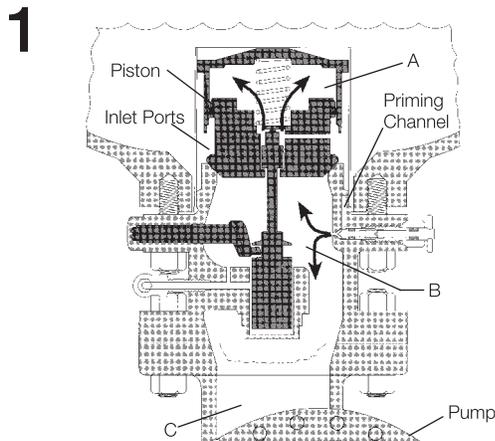
Part #	Flange Type	A	B	C	D	Accessories	
						Pneumatic Actuator	Electric Actuator (Ships with Valve)
A7853A	T-1 Steel Carbon Steel	4-13/16"	5-3/4"	6-5/8"	8-1/4"	A7853PAF	-
EA7853A						-	12/24 VDC Voltage

## Flomatic® Internal Valve Operation



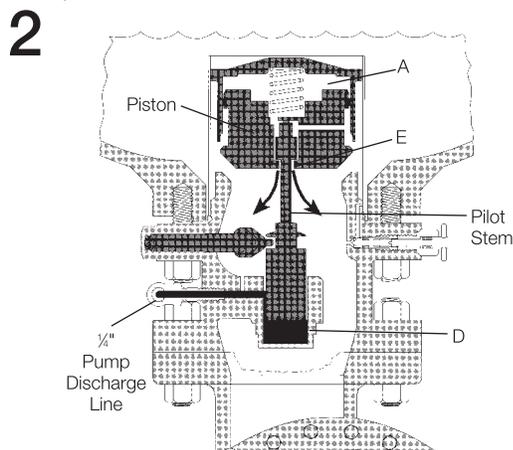
### 1. Normally Closed

When the valve is closed, liquid flows into the INLET PORTS, through a channel in the PISTON, and into area A. It also flows down through the PRIMING CHANNEL in the valve body, into area B beneath the valve seat, and into area C to prime the PUMP.



### 2. Pump On – Valve Opening

When the pump is started, differential pressure transmits through the 1/4" piping into chamber D. lifting the PILOT STEM. This opens the seat between the stem and piston at E. Pump suction then evacuates the tank pressure in area A, which becomes equal to the pump suction pressure.



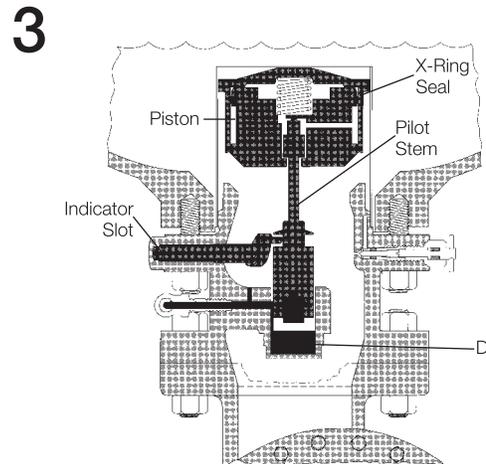
### General Information

RegO piston type Flomatic Internal Valves are normally closed and use pressure differential to provide completely automatic service. Mounted directly between the tank body and pump, the Flomatic® uses the pressure differential developed by the pump to open the valve and it closes automatically when the differential no longer exists.

This means the RegO Flomatic opens when the pump is on and closes when the pump is shut off – fully automatic.

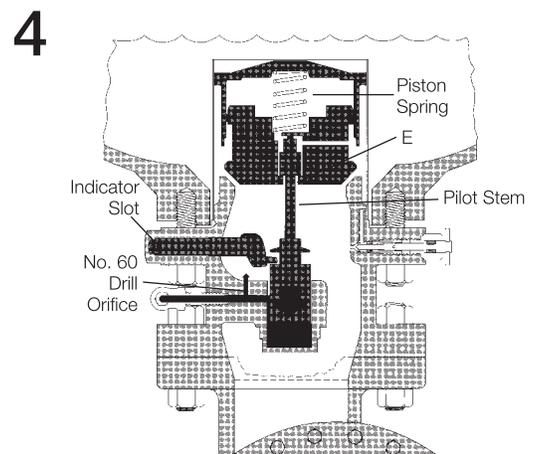
### 3. Pump On – Valve Open

The force below the pilot stem forces the piston up to open the valve; rotating the INDICATOR SLOT to its vertical (valve open) position. Pump differential pressure in area D holds the PILOT STEM and PISTON open. Approximately 20 psig pump differential pressure is required to open the valve; approximately 8 psig differential pressure will hold the valve open.



### 4. Pump Off – Valve Closes

With the pump shut off, the pressure in area D which holds the valve open, bleeds out through the #60 DRILL ORIFICE. This loss of pressure permits the SPRING to push the PILOT STEM down to reseat at point E. Since pressures are equal above and below the PISTON, with no sustaining pressure in area D, the SPRING forces the valve closed. The INDICATOR SLOT rotates to the horizontal (valve closed) position.



## On-The-Job Service Guide for the Flomatic® Valve

### Introduction

Efficient, profitable transport and delivery truck operations depend on keeping the equipment working safely and efficiently under changing conditions. It is important to know how to eliminate expensive delays by handling unloading problems as they arise.

The purpose of this technical guide is to provide basic information on the Flomatic® valve, along with simple, appropriate steps to follow in the event things go wrong.

The Flomatic® valve is mounted on the bottom of your transport or delivery truck tank, with the pump mounted immediately downstream. When the pump starts to push the liquid down the piping, the Flomatic® Valve opens automatically, allowing you to unload the tank, and closes when the pump stops pushing. It takes at least 20 pounds per square inch of "push" at the pump to open the valve.

Your flanged Flomatic® valve has an indicating shaft on it that shows whether it's open or closed (Figure 1). If the indicating shaft is horizontal, the valve is closed. If it's vertical, the valve is open.

A threaded type, diaphragm-operated Flomatic® valve has an indicating shaft on the bottom, covered by a clear plastic hood. The indicating shaft projects down when the valve is closed and is concealed when the valve is open (Figure 2).

### Important Facts About Pressure

When handling propane or anhydrous ammonia, storage and transport tank pressures vary from about 20 pounds per square inch or less when it's cold to 200 pounds per square inch or more in hot weather (Figure 3). If you're hauling butane, tank pressures will be 50 pounds per square inch or less.

The transport or delivery truck tank pressure may be higher than the storage tank pressure when you are ready to unload (Figure 4). This is because your rig may have been freshly loaded at the terminal or bulk plant without a vapor equalizing line and hasn't had time to get back to normal. Also, the storage tank pressure tends to drop when a lot of LP-Gas is being used.

### Troubleshooting on the Job

O.K. So you follow your procedures, hook up your hoses, open the required valves and start your pump. The indicating shaft on the Flomatic® valve moves to the open position and the liquid goes in to storage. Great! You're happy and so is the boss, and so are we.

But, let's say you do these things, start the pump and the liquid doesn't move. Now, how do you find out what is wrong?

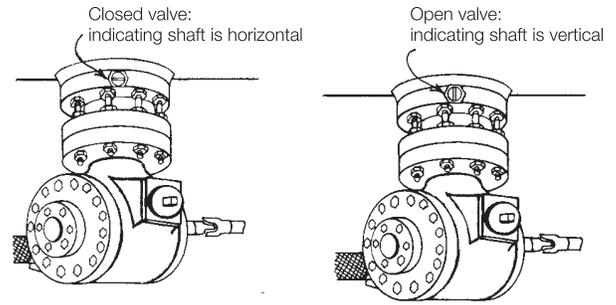


Figure 1. Flanged Flomatic Valve

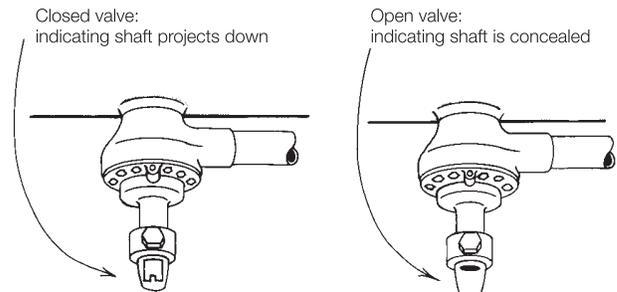


Figure 2. Threaded, Diaphragm-operated Flomatic Valve

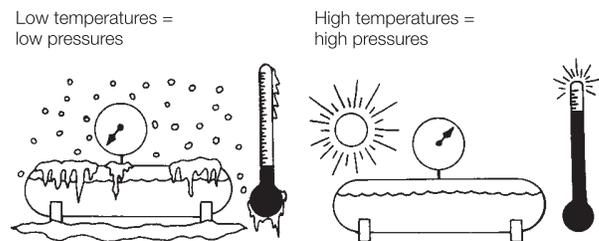


Figure 3. Weather Conditions Affect Pressure

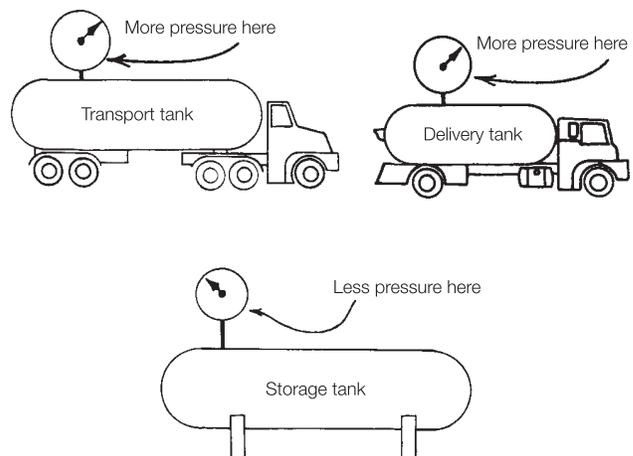


Figure 4. Unloading Conditions Affect Pressure

## On-The-Job Service Guide for the Flomatic® Valve

### Step 1

Immediately shut down the pump so you don't cause possible damage to the seals or valves. Next:

1. Check all manual valves in the system to make certain they are open or closed as required for proper operation.
2. Check the liquid level in the transport or delivery tank. If the level is low, it may slow the transfer rate.
3. Check to ensure that the pump rotates normally when power is applied. If not, inspect and repair as needed the power takeoff, universal joints, drive shaft and clutch, etc.
4. Make sure the lever is straight out on the 1/4" operating valve in the line between the pump discharge line and the Flomatic® valve (Figure 5). If it isn't, the Flomatic® valve will remain closed.
5. Make certain the priming valve on the side of the Flomatic® valve is open (Figure 6).

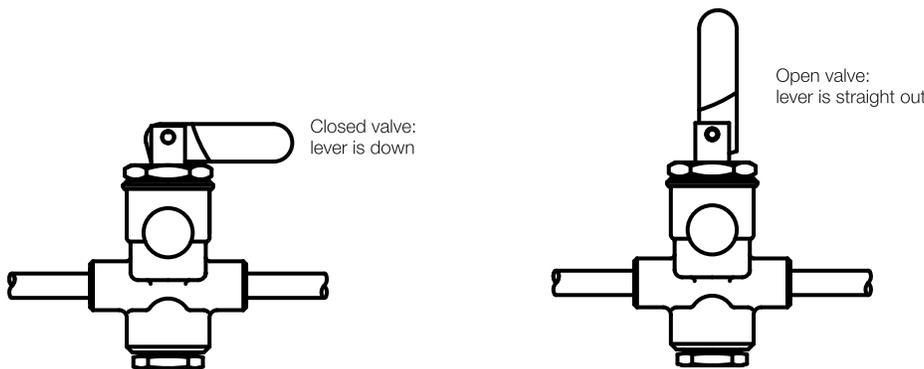


Figure 5. Operating Lever Positions

6. Ice in the system may prevent proper operation, as will a collapsed or kinked sensing line or a clogged sensing line filter. If you found the trouble within STEP 1, just start the pump and continue unloading. If not, proceed accordingly.

- a. New Models with T-handle: To adjust to the proper position, push in the end of the valve stem and tighten the needle valve clockwise until it seats. Then, turn counterclockwise 1-1/2 turns.
- b. Old Models with Plug: To adjust to the proper position, carefully remove the plug. A small amount of liquid LP-Gas may be discharged when plug is loosened. Insert a small screwdriver and tighten the needle valve clockwise until it seats. Then turn it counterclockwise 1 turn only. **CAUTION: Do not open needle valve more than 1 turn as it might blow out!**
- c. Threaded Models with Internal Priming Channel. The internal priming channel normally self-actuates. To be sure the system is primed, remove the plastic hood and push the travel indicator up about 1/8" and hold for at least 15 seconds.

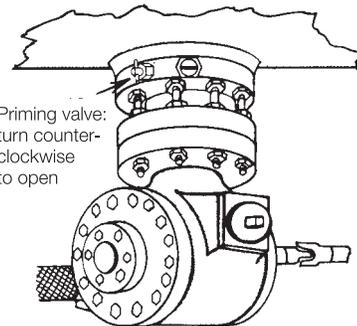


Figure 6. Priming Procedures

### Step 2

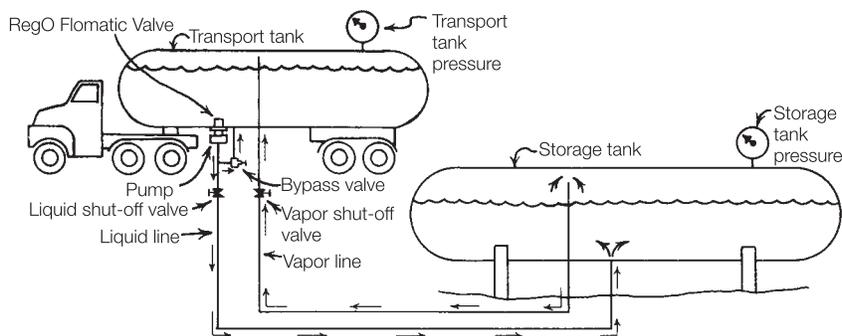


Figure 7a. Unloading Diagram of Transport Trailer Truck

The liquid flows out of the transport tank through the Flomatic® valve, into the pump and through the delivery hose to the storage tank. The vapor line allows vapor to flow from storage back to the transport so that the storage tank pressure won't build up too much and make the pump work harder than necessary.

### For Transport Trailer Trucks Only (Figure 7a)

1. Check the difference between the pressure in your transport and the storage tank. If there's 15 or 20 pounds per square inch more pressure in the transport tank than in the storage tank, chances are the Flomatic® valve won't open. This is because the pump can't develop enough "push."

If you have a good bypass valve on your rig to send the extra liquid back into the tank, you can merely close the liquid shut-off valve in the discharge line and restart your pump (Figure 8a). Now, the Flomatic® indicating shaft should move to the open position (see Figures 1 and 2).

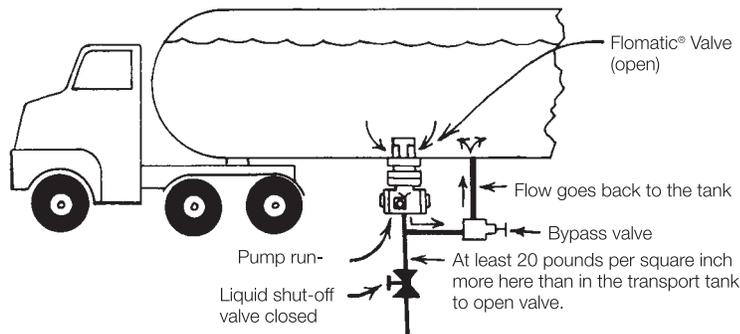
2. Slowly open the liquid shut-off valve in the discharge line and the liquid will start to move out of the transport. If the Flomatic® valve indicating shaft starts to move toward the closed position once you've opened this liquid shut-off valve all the way, throttle the valve for a while until the transport tank pressure drops to where the Flomatic® valve indicating shaft will stay open. Then, open the liquid shut-off valve all the way until you finish unloading.

## On-The-Job Service Guide for the Flomatic® Valve

Internal Valves & Accessories

3. If your pump system doesn't have a bypass valve, the liquid shut-off valve in the discharge line should be left partially open when you restart the pump. Just be sure that the pump is pushing at least 20 pounds per square inch, so the Flomatic® valve can open.

Don't worry about how much it may slow up your loading speed when you pinch down the liquid shut-off valve to get the Flomatic® valve open. Your pump is running at constant RPM and will move liquid at almost the same rate, even when pushing harder. (It's a lot like using engine braking on a downhill grade, except, in this case, the pump keeps the liquid moving at a constant flow rate.)



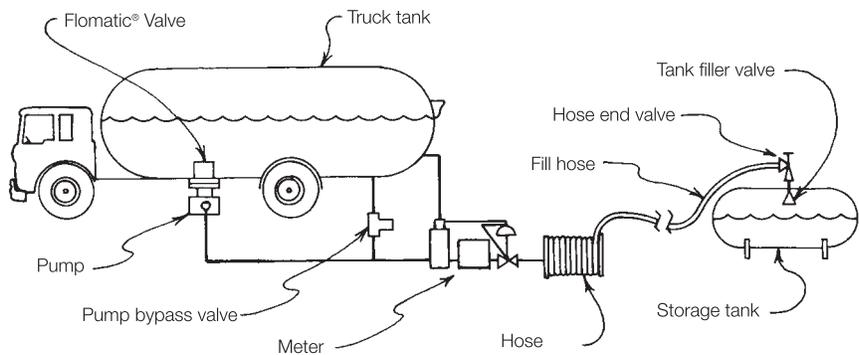
**Figure 8a. Unloading Diagram of Transport Trailer Truck with Back-to-tank Bypass Valve**  
You must have a separate back-to-tank bypass valve if the pump is to be run with the liquid shut-off valve closed.

### For Delivery Trucks Only (Figure 7b)

1. Check the pump bypass piping. If your truck is equipped with a manual bypass valve, close it and try the pump again. (Figure 8b). If the Flomatic® valve indicating shaft moves to the open position, the problem is that the pump can't develop 20 pounds per square inch or more to "push" open the Flomatic® valve with the bypass valve open. You can prevent this in the future by not opening the manual bypass valve too wide.

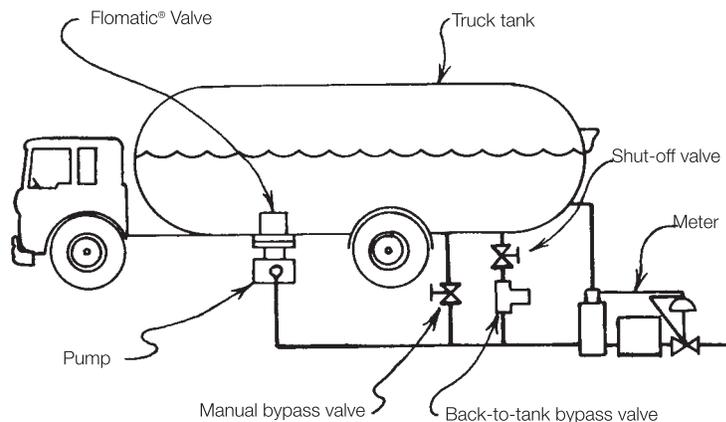
2. If the delivery truck is not equipped with a manual bypass valve, merely start the pump. Slowly close the shut-off valve between the back-to-tank bypass valve and tank. If the Flomatic® valve indicating shaft moves to the open position as you close the valve, the back-to-tank bypass valve may be stuck open, adjusted too low, or the spring may be broken. **CAUTION: Don't close the shut-off valve all the way, because excessive pressures and pump damage may occur.**

3. If the Flomatic® valve indicating shaft remains in the closed position, the problem is either in the pump or the Flomatic® valve.



**Figure 7b. Unloading Diagram of Delivery Truck**

The liquid flows out of the truck tank, through the Flomatic® valve and into the pump, where it is then pushed through the meter and delivery hose into the storage tank. The liquid normally enters the vapor space of the storage tank to minimize pressure buildup, so a vapor equalizing line is usually not needed. The back-to-tank bypass valve opens to divert excess pump capacity back to the truck tank, preventing the pump from creating too much pressure.



**Figure 8b. Unloading Diagram of Delivery Truck with Manual Bypass Valve**

## On-The-Job Service Guide for the Flomatic® Valve

**USE EXTREME CARE AT ALL TIMES WHEN WORKING AROUND YOUR VEHICLE!**  
Watch out for drive shafts and moving parts. It is common knowledge that serious injury can result if any part of one's body or clothing is caught in moving machinery.

If you manually open the Flomatic® valve, you are responsible for safely unloading the liquid and closing the valve when you're through. If this procedure is being followed, under no circumstances must the valve be left unattended. The valve must never be permanently held in the open position.

If you are not able to cause the Flomatic® valve indicating shaft to move to the open position after completing the preceding steps, a complete detailed diagnosis will have to be made.

In the meantime, you can actuate the flanged Flomatic® valve by using a special wrench and attempt to unload manually (Figure 9).

If you still can't unload by following the preceding steps, it is suggested that you unload by an alternate method, such as through the valve normally used for liquid filling.

In any event, if you haven't solved the problem and the unit still doesn't operate properly, immediately take it out of service, have a complete analysis made and repair as needed.

Be sure to obtain and keep available for quick referral the Manufacturers' Operation and Service Manuals for the valves, pump, meter and all operating equipment in the system.

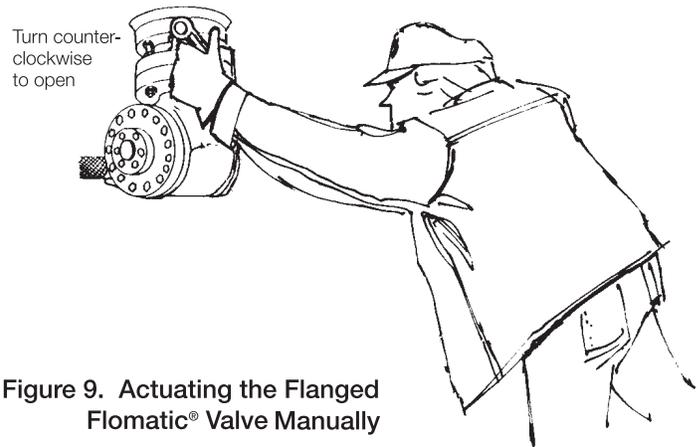


Figure 9. Actuating the Flanged Flomatic® Valve Manually

## Extended Type Hose Couplings for Vapor and Liquid Service

### A7571 and A7575 Series

Designed especially for liquid filling and vapor equalization of LP-Gas and anhydrous ammonia. The limited travel of the handle on the tailpiece minimizes spin-off, encouraging cautious removal to properly bleed off trapped product to ensure closure of the filler valve and hose end valve. The ACME threads are machined on a rugged steel insert which is permanently cast in the aluminum handle, providing for durability under repeated use.



A7571 Series



A7575 Series

### Ordering Information

Part Number	Type of Service	A. Hose Connection (M. NPT)	B. Coupling Connection (F. ACME)	C. Approx. Length
A7575L2*	Liquid	1/2"	1-3/4"	7"
A7575L3		3/4"		
A7575L4		1"		
A7575L5**		1-1/4"		
A7571LA	Vapor	1/2"	1-1/4"	
A7571LB		3/4"		

\* Includes 7199-33 adapter, shipped loose.  
 \*\* Includes A7575L5-1 adapter, shipped loose.

## Short Type Hose Couplings for Vapor and Liquid Service

### 3171, 3175, 3181, 3185 and 3195 Series



3175 Series



A3185 Series



3171A Series



3191 Series

### Ordering Information

Part Number	Material	Style	A. Hose Connection (M. NPT)	B. Coupling Connection (F. ACME)	C. Tailpiece Bore	D. Hose End To Nut	E. Overall Length		
3175B	Brass	A	1/2"	1-3/4"	35/64"	1-13/16"	2-11/16"		
3175			3/4"		3/4"				
3175A			1"		15/16"				
3185	Brass Nut & Steel Nipple	B	1-1/4"	2-1/4"	1-3/16"	2-11/16"	3-3/4"		
3195			2"		7/8"			2-1/4"	3-5/8"
3195S*									
A3175			Steel		A			3/4"	1-3/4"
A3175A	1"	7/8"		2-1/4"		3-1/8"			
A3185	B	1-1/4"		2-1/4"		1-1/4"	2-1/8"	3-3/16"	
A3195		2"	3-1/4"	1-7/8"	2-1/4"	3-5/8"			
A3195S*									
3171	Brass	C	3/8"	1-1/4"	3/8"	1-17/32"	2-13/32"		
3171A			1/2"		31/64"				
3181			3/4"		3/4"			1-3/16"	2-11/16"
3181A			1"		3/4"			1-7/8"	2-3/4"
3191			D		1-1/4"			2-1/4"	1-3/16"

\* With screen.

## ACME Check Connectors for Lift Trucks

### 7141F and 7141M

These brass connectors are especially designed to join the carburetor fuel line to the service valve on lift truck cylinders. Sturdy, long lasting ACME threads allow quick, hand-tight assembly that provides for quick and simple cylinder replacement. Back checks automatically close in each connector when disconnected.

The 7141M couples directly to the service valve. An integral O-ring is designed to seal before the internal check opens, aiding in product loss prevention. A gasket at the ACME thread is a secondary seal when the connectors are tightened together. The connector fits RegO lift truck cylinder filling adapters for fast, convenient filling.

The 7141F accepts fuel line adapter and couples directly to the 7141M. The O-ring seal in the 7141M is designed to seal before the internal check opens to allow product to pass through the connection. The knurled coupling eases threading and the ACME threads provide rapid effortless make-up, even against LP-Gas pressure.

NOTE: Refer to the "Cylinder and Service Valves" section of the L-500 catalog for additional information.



7141M



7141F

### Ordering Information

Part #	Application	A. Inlet	B. Outlet	Protective Cap*		Repair Parts
				Rubber	Brass	
7141M	Service Valve	3/8" F. NPT	1-1/4" M. ACME	7141M-40	7141FP	Gasket 7141M-3R (25/pkg)
7141F	Fuel Line	1-1/4" F. ACME	1/4" F. NPT	-	-	O-Ring 7513-2S

\* Recommended to minimize foreign material entering valves which could result in leakage.

## Unloading Adapters for Container Evacuation

### 3119A, 3120 and 3121

Designed to provide an efficient means of evacuating an LP-Gas container for relocation or repair. They thread directly onto the 1-3/4" ACME male hose connection of RegO Filler Valves used on RegO Double Check Filler Valves and Multivalves®.

The unloading adapters can be used to withdraw liquid provided the container is equipped with a dip pipe extending from the filler valve to the bottom of the container.



3120



3121



3119A

### Ordering Information

Part #	Style	A. Filler Valve Connection	B. Hose Connection
3119A	In-Line	1-3/4" F. ACME	1-3/4" M. ACME
3120	Angle		3/4" F. NPT
3121			

## Left Hand Thread ACME Connectors for Vapor Withdrawal Industrial Cylinders

### 7142LF and 7142LM

These brass connectors are especially designed to join the carburetor vapor fuel line to the service valve on industrial cylinders especially designed for and used on propane fueled lawn mowers. Sturdy long lasting ACME left hand threads provides for quick hand tight assembly that provides for quick and simple cylinder replacement.



7142LM



7142LF

### Ordering Information

Part #	Application	Inlet	Outlet	Protective Cap
7142LM	Vapor Service Valve	3/8" F.NPT	1-1/4" M.ACME –left hand	7141M-40
7142LF	Vapor Fuel Line	1-1/4" F.ACME –left hand	-1/4" F.NPT	-

## Filler Hose Adapters

7576, 7577V and 3179A & B

These adapters are designed with minimal flow restriction and recommended for use on the outlet of the LP-Gas delivery truck filler hose. If the controlled bleed off of the connection indicates the filler valve on the tank being filled has failed to close, the hose adapter should be left in place on the filler valve and disconnection should be made at the regular filler hose coupling. (Repair of the filler valve must be made as soon as possible). An integral check valve in these adapters helps prevent further loss of product. The standard filler valve cap should be attached to these adapters when left on the container.



### Ordering Information

Part #	Built-in Vent Valve	A Filler Valve Connection	B Hose Connection
7576	Yes	1-3/4" F. ACME	1-3/4" M. ACME
7577V			
3179A	No		
3179B			

## POL Plugs

Highly recommended for installation in LP-Gas cylinder valve POL outlets whenever the service line is disconnected or when the cylinder is being transported. When properly installed, the POL plug is designed to prevent contamination of the valve outlet and guards against product leakage if the cylinder valve is accidentally opened.



### Ordering Information

Part Number	Material	Connection
N970P	Cyclac	M. POL (CGA 510)
10538P	Brass	
3705RC		

## 3-1/4" M.ACME X 2" M.NPT Adapter with Vent Valve & Integral Screen

5769HVB and 5769VSS

Designed to prevent debris from impeding the action of valves and components of LPG piping systems at bulk plants and industrial plants.



### Ordering Information

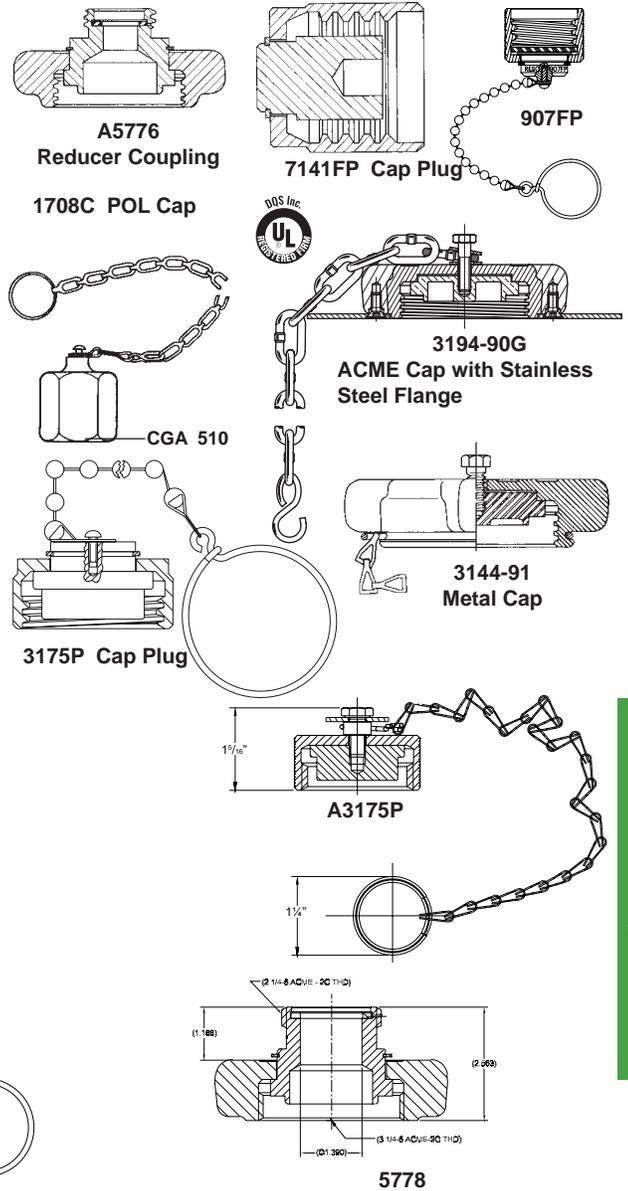
Part Number	Style	Gasket Qty	Vent Valve	Hex Size	Thread	"A" Length
5769HVB	1	1	3165CBT	3-1/4"	2" M.NPT	3.150
5769VSS	1	1	TSS3169			3.150

## Caps and Reducers

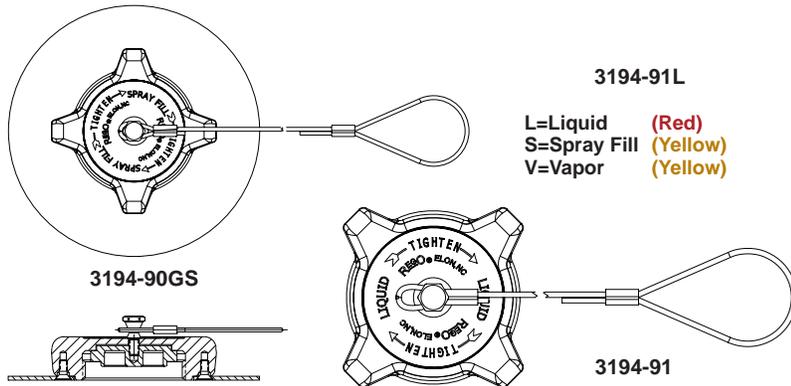
### Ordering Information

Cap With Chain & Ring		Cap Only Part #	Material	Thread Connection
Part Number	Ring Fits Pipe Size Up To:			
3144-91	3/4"	3144-9P	ABS	1-1/4" F. ACME
3174-91		3174-9P		1-3/4" F. ACME
3174-93		1-1/4"		A8016-9P
A8016-93				
1708C	3/4"	-	Brass	F. POL (CGA 510)
7141FP	-			1-1/4" F. ACME
3175P	1-1/4"		Steel	1-3/4" F. ACME
A3175P	-			2-1/4" F. ACME
3184-90				3-1/4" F. ACME
3194-90	Adjustable Cable	5776*	Brass	2-1/4" F. ACME
-				3-1/4" F. ACME
A3184-90		-	Steel	2-1/4" F. ACME
A3194-90				3-1/4" F. ACME
-				A5776*
907FP	1"	-	Brass	3-1/4" ACME
3194-90G	-			
3194-90GS	Adjustable Cable			
3194-91L				
3194-91S				
3194-91V				
A3194-91L				
A3194-91S				
A3194-91V				
5778				

\* Reduces to 1-3/4" M. ACME



Adapters, Connectors & Fittings



## ACME Plugs

Specifically designed to withstand the everyday abuse given to hose end valves on delivery trucks and hose end couplings on risers in bulk plants, these rugged plugs protect the coupling tip as well as prevent the entrance of dirt, dust, snow and rain. They also prevent possible gas contamination from these same sources. The heavily ribbed outer surface permits hand-tight make-up.

These plugs are available in a choice of four sizes which may be used with liquid as well as vapor type couplings. As a convenience, the nylon plugs have a retaining chain and ring to prevent loss during a transfer operation.

All are suitable for LPG or anhydrous ammonia service except the brass 5765PR, which is for LP-Gas only.

Not intended for use as pressure closures.



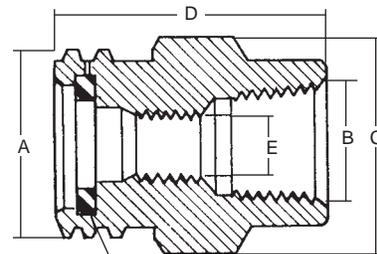
### Ordering Information

Part #	Material	A (M. ACME)	Chain & Ring Fits Pipe Size Up To:
C5763N	Nylon	1-1/4"	3/4"
C5765N		1-3/4"	1-1/4"
5765PR	Brass		Not Applicable
C5767N	Nylon	2-1/4"	1-1/4"
C5769N		3-1/4"	2"

## ACME Adapters

### Ordering Information

Part #	Material	A M. ACME	B F.NPT	C Hex	D Overall Length	E Diameter	For Spare Gasket Order Part No.
5764A	Brass	1-3/4"	1/4"	1-3/4"	1-3/4"	13/32"	A2697-20R
5764B			3/8"		1-23/32"	9/16"	
5764C			1/2"		1-1/4"	11/16"	
5764D			3/4"		1-9/32"	29/32"	
5764E			1"		1-5/8"		
5766E	Brass	2-1/4"	1"	2-1/4"	2-5/16"	1-3/32"	A3184-8R
5766F			1-1/4"		1-3/8"		
5768G			1-1/2"		3-1/4"	1-3/4"	
A5764D	Steel	1-3/4"	3/4"	1-3/4"	2-3/16"	7/8"	A2697-20R
A5764E			1"				
A5768H			2"		3-1/4"	1-13/16"	

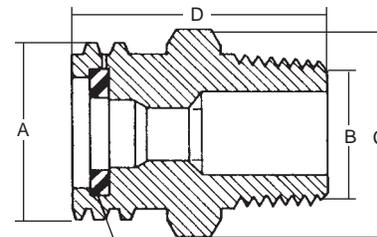


Gasket (Furnished with adapter)  
**ACME x Female NPT**



### Ordering Information

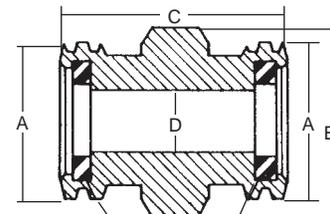
Part #	Material	A M. ACME	B M. NPT	C Hex	D Overall Length	For Spare Gasket Order Part No.
5763D	Brass	1-1/4"	3/4"	1-1/4"	1-3/4"	A2797-20R
5765D		1-3/4"	3/4"	1-3/4"	1-23/32"	A2697-20R
5765E			1"		2-3/32"	
5765F			1-1/4"			
5767F		2-1/4"	1-1/4"	2-1/4"	2-3/8"	A3184-8R
5767G			1-1/2"	2-7/16"		
5767H			2"	2-7/16"		
5769H		3-1/4"	2"	3-3/8"	2-7/8"	A3194-8R
5769K			3"	3-1/2"	3-5/8"	
5769M			3-1/4" ACME	3-1/4"	2-3/4"	
A5765C	1/2"					
A5765D	Steel	1-3/4"	3/4"	1-3/4"	2-3/16"	A2697-20R
A5765E			1"			
A5765F			1-1/4"			
A5767F			2-1/4"			
A5769H	3-1/4"	2"	3-1/4"	2-5/8"	A3194-8R	
A5769K		3"	4"	3-13/16"		



Gasket (Furnished with adapter)  
**ACME x Male NPT**

### Ordering Information

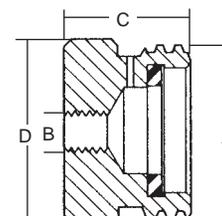
Part #	Material	A M. ACME	B Hex	C Overall Length	D Diameter	For Spare Gasket Order Part No.
5765M	Brass	1-3/4"	1-3/4"	2-1/16"	29/32"	A2697-20R
5767M		2-1/4"	2-1/4"	2-5/16"	1-25/64"	A3184-8R
5769M		3-1/4"	3-1/4"	2-3/4"	1-15/16"	A3194-8R



Gasket (Furnished with adapter)  
**ACME x ACME**

### Ordering Information

Part #	Material	A M. ACME	B F. NPT	C Overall Length	D Diameter	For Spare Gasket Order Part No.
A5764W	Steel	1-3/4"	3/8"	1-1/4"	1-3/4"	2697-20
5764W	Brass					



**ACME x Miscellaneous**  
(Recommended for securing hose-end valve when not in use).

\* 3/8" -16 UNC Thread.

## Low Emission ACME Connector For Transports and Bobtails

6588LE & 6589LE

Designed to provide fast filling of bobtails, transports and large bulk storage tanks while providing for low emission of LPG when disconnecting.



6588 Series

### Ordering Information

Part #	ACME Connection	Outlet Connection M.NPT	Wrench Flats	Hydrostatic Relief Valve	Propane Capacity at Various Differential Pressures (GPM)		
					5 PSIG	10 PSIG	25 PSIG
6588LE	3-1/4"	2"	3-1/2"	3125L	138	223	349
6589LE	3-1/4"	3"		3125L			

## Copper Pigtails

### Straight Pigtails

#### Ordering Information

Connections	Approximate Length	Part #		
		1/4" Tube		3/8" Tube
		7/8" Hex Short Nipple	1-1/8" Hex Long Nipple	7/8" Hex Short Nipple
M.POL x M.POL	5"	-	-	913PS05
	12"	912PS12	-	913PS12
	20"	912PS20	912PA20	913PS20
	30"	912PS30	-	913PS30
	36"	912PS36	912PA36	913PS36
1/4" Inverted Flare x M.POL	48"	912PS48	912PA48	913PS48
	12"	912FS12	-	-
	20"	912FS20	912FA20	-
	30"	912FS30	-	-
1/4" M.NPT x M.POL	36"	912FS36	-	-
	5"	-	-	913JS05
	12"	912JS12	-	913JS12
1/2" M.NPT x M.POL	20"	912JS20	912JA20	913JS20
	12"	-	-	913LS12
1/2" M.NPT x 3/8" M.NPT	12"	-	-	913KL12



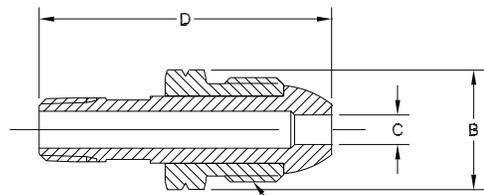
912JS12

### Bent Pigtails

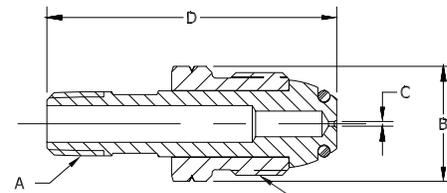
#### Ordering Information

Connections	Approximate Length	Part #	Type/Degree of Bend
		3/8" Tube	
1/4" M. NPT x M. POL	5"	7/8" Hex Short Nipple	90°
		913JS05A	
M. POL x M. POL	12"	7/8" Hex Short Nipple	270° Right Hand
		913PS05A	270° Left Hand
		913PS12G	360°
		913PS12H	
		913PS12S	

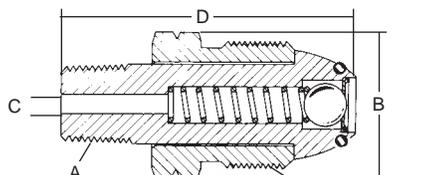
## Male POL Swivel Adapters



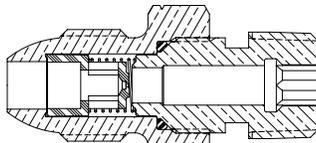
**970**  
Hard Nose POL  
(CGA 510) POL



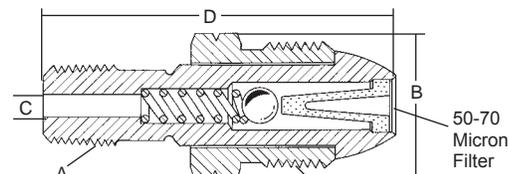
**970S**  
Soft Nose POL w/60 DMS Orifice  
(CGA 510) POL



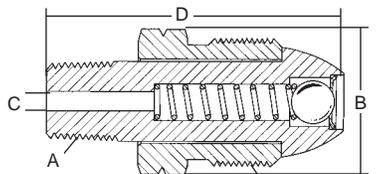
**970AXS**  
Soft Nose POL w/Excess Flow  
(CGA 510) POL



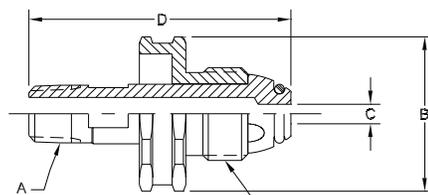
**3188 Series**



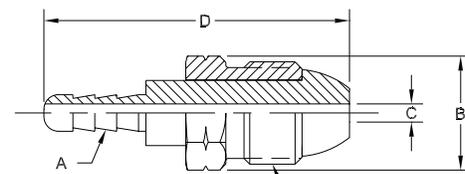
**3199W**  
Heavy Duty Hard Nose POL w/Excess Flow  
(CGA 510) POL  
50-70 Micron Filter



**970AX**  
Hard Nose POL w/Excess Flow  
(CGA 510) POL



**970AW**  
**970HT**  
Soft Nose POL w/Handwheel  
(CGA 510) POL



**970JR**  
Hard Nose POL w/Hose Barb Connection  
(CGA 510) POL

### Ordering Information

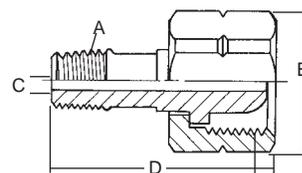
Part Number	Material	A Outlet Thread	B Hex	C Drill	D Overall Length	Vapor at 100 PSIG Inlet (SCFH)	Liquid (GPM)	
970	Brass	1/4" M. NPT	7/8"	1/4"	2-15/32"	-	-	
970S				.040" orifice				
970AX				1/8"				
970AXS				1/8"				
3199W			5/32"	2-7/16"	450	0.95		
970AW			1-3/8"	3/16"	2-15/32"	-	-	
970HT				.040" orifice				
970JR			1/4" Hose Barb	7/8"	5/32"	2-5/8"	-	-
3188A			1/2" M. NPT	1-1/8"	9/32"	2-1/2"	350	.95
3188B							700	1.9
3188C	1180	2.9						

Note: All nipples incorporate wrench hex section.

## CGA 555 Swivel Adapters

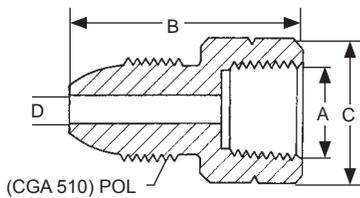
### Ordering Information

Part Number	Material	A Outlet Thread	B Hex	C Drill	D Overall Length
12982	Brass	1/4" M. NPT	1-1/8"	3/16"	1-7/8"



CGA 555

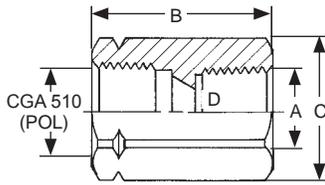
## POL Adapters



Male POL x Female NPT

### Ordering Information

Part #	Material	A	B	C Hex	D Diameter
2906A	Brass	1/4"	1-11/32"	7/8"	9/32"
2906G		1/2"	2"	1-1/8"	

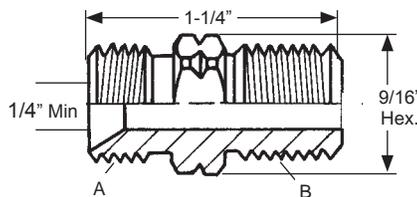


Female POL x Female NPT and Female POL

### Ordering Information

Part #	Material	A	B	C Hex	D Diameter
5760A	Brass	1/4" F.NPT	1-5/8"	1-1/8"	13/32"
5760B		3/8" F.NPT			
5760C		1/2" F.NPT	1-7/8"	1-3/8"	13/32"
5760D		3/4" F.NPT			
5760S		POL (CGA 510)			

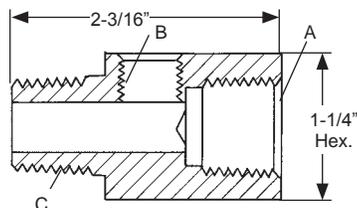
Hose Adapter  
For use with fuel gases (LP-Gas, Acetylene).



### Ordering Information

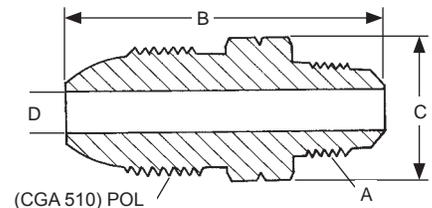
Part #	Material	A	B
1300	Brass	9/16"-18UNF (L.H.)	1/4" M. NPT

Pressure Gauge Adapter



### Ordering Information

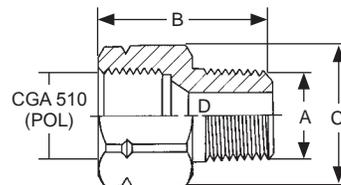
Part #	Material	A	B	C
1494-1	Brass	1/2" F. NPT	1/4" F. NPT	1/2" M. NPT



Male POL x Male NPT and SAE Flare

### Ordering Information

Part #	Material	A	B	C Hex	D Diameter
2906D	Brass	3/8" M. NPT	2-5/64"	7/8"	11/32"
2906F		3/8" SAE Flare	2-3/32"		
2906E		1/2" SAE Flare	2-9/32"	9/32"	



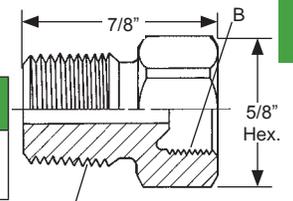
Female POL x Male NPT

### Ordering Information

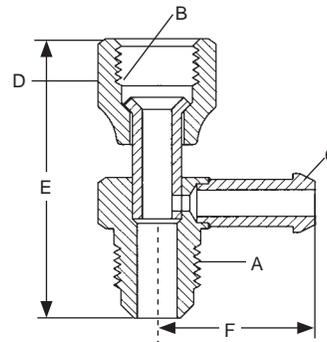
Part #	Material	A	B	C Hex	D Diameter
5761A	Brass	1/4" M.NPT	1-5/8"	1-1/8"	3/16"
5761B		3/8" M.NPT			13/32"
5761C		1/2" M.NPT			7/16"
5761D		3/4" M.NPT			

### Ordering Information

Part #	Material	A	B
15774-1	Brass	1/4" M. NPT	1/4" Female Inverted Flare



Female Inverted Flare x Male NPT



### Ordering Information

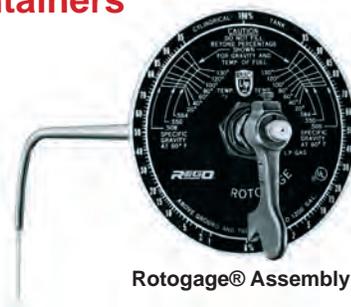
Part #	Material	A	B	C	D	E	F
1328	Brass	3/8" SAE Male Flare	3/8" SAE Female Flare	3/8" Hose Barb	13/16"	2"	1/8"
1331		1/2" SAE Male Flare	1/2" SAE Female Flare		1"	2-1/8"	1-1/4"
1332		5/8" SAE Male Flare	5/8" SAE Female Flare		1-1/8"	2-1/2"	

## Complete Rotogage® Assemblies are Ordered in Parts: Gauge, Tube, and Dial

### 1" Rotogage® for Large Mobile and Stationary Containers A9090 Series

Rotogages® are designed to provide an accurate determination of LP-Gas or anhydrous ammonia container contents. They mount in a standard 1" NPT coupling on large mobile or stationary containers.

To operate the Rotogages®, the vent valve is opened and the dip tube rotated slowly from the container vapor space to the liquid space. The difference in appearance of the discharge indicates when the liquid level is reached. Dial readings then indicate the percentage of product in the container.



Rotogage® Assembly

For Small Mobile or Stationary Containers  
A9091R and A9092R Series

#### Ordering Information

Part #		For Container Inside Diameter			
		Ellipsoidal Heads		Hemispherical Heads	
For Mobile or Stationary Containers	For Stationary Containers Only	Side Mounted	End Mounted	Side Mounted	End Mounted
A9091R	-	30" - 45"	30" - 75"	30" - 45"	30" - 45"
A9092R	-	46" - 61"	76" - 108"	46" - 61"	46" - 61"
A9093TS*	A9093RS	62" - 79"	109" - 147"	62" - 79"	62" - 79"
A9094TS*	A9094RS	80" - 99"	-	80" - 99"	80" - 99"
A9095TS*	A9095RS	100" - 147"	-	100" - 147"	100" - 147"

\* Supported Design

NOTE: The dip tube must be cut to the required length (1/2" of container inside diameter minus 5-3/4").

### Rotogage® Tubes & Dials for Large Mobile and Stationary Containers

Tubes for use with A9090 Series Rotogages  
Cut to length required.

#### Ordering Information

Service	Part #
Up to 48"	A9091-M24.0
Up to 72"	A9091-M36.0
Up to 96"	A9091-M48.0
Up to 120"	A9091-M60.0
Up to 144"	A9091-M72.0



A9091-18LX

Rotogage® Dials

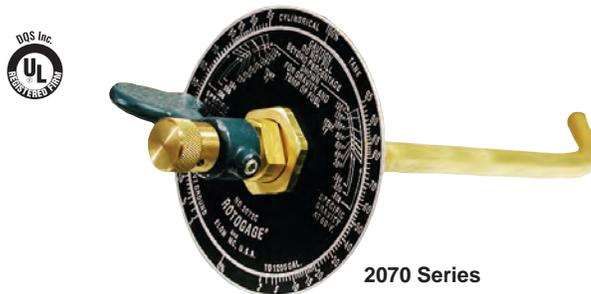
#### Ordering Information

Part #	Service	Container Size
A9091-18L	LP-Gas	All Sizes
A9091-18LX*	LP-Gas	Over 1200 U.S. gallons
A9091-18N	NH3	All Sizes

\* Dial permits higher filling level, per NFPA 58.

## 3/4" Rotogage® for Small Stationary and Mobile LP-Gas Containers 2070 Series

Rotogauges® are designed to provide accurate determination of LP-Gas container contents. They may be end or side mounted in a standard 3/4" NPT coupling on stationary or mobile containers. To guarantee accurate measurement, they should not be used on stationary containers that exceed 60" I.D. or on mobile containers, subject to vibration, with an I.D. of more than 24".



2070 Series

### Ordering Information

Part #		For Containers with Inside Diameter	Tank Connection	Valve Seat Orifice
Rotogage®	Dip Tube			
2070C0	2071-L25.7	Up to 40"	3/4 M. NPT	No. 54 Drill Size
	2071-L39.7	Up to 60"		

NOTE: The dip tube must be cut to the required length (1/2 of container inside diameter minus 1/2"), when mounted on center line of tank.

## Pull-Away Valves for Transfer Operations A2141 Series

Designed especially to provide pull-away protection for LP-Gas and anhydrous ammonia transfer operations including transport and delivery truck loading and unloading, engine fuel container filling and miscellaneous cylinder filling operations. When properly fastened to the inlet end of the discharge hose, the valve is designed to stop gas escape from both upstream and downstream lines in the event of a pull-away. An excessive tension pull causes the valve to automatically separate, closing two internal back pressure checks. Only a few cubic centimeters of gas escape at the instant of separation.

It is recommended that a convenient means be provided to safely remove the pressure from the line upstream of each coupling half to enable reassembly of the valve. To reassemble, simply push the male half firmly into the female half until the retaining balls slip into the retaining groove. Check for leaks after reassembly.

NOTE: It is recommended that pull-away valves be maintained and safety tested periodically to confirm that they will separate properly in the event of a pull-away. Lubrication every six months is essential to the pull-away's operation. Dry nitrogen or other inert gas is suggested as a source of pressure for pull-away tests.

If the A2141 pull-away valve is going to be stored for a period of time, A2141 Series such as in seasonal applications, it is recommended that it be sprayed with a good grade of rust-preventive machine oil, and covered to protect it from moisture.



A2141A6



A2141A10

### Ordering Information

Part #*	Inlet/Outlet Connections NPT F.	Disconnect Force Approx-lbs	Reconnect Force Approx-lbs	Length Of Valve	LP-Gas Liquid Flow Capacity at Various Differential Pressures (GPM)**			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A2141A6	3/4"	130	80	3-7/8"	11	16	25	36
A2141A6L								
A2141A8	1"	75	50	4-9/16"	21	30	47	67
A2141A8L								
A2141A10	1-1/4"	160	25	5-5/8"	52	75	120	170
A2141A16	2"	300	50	14-5/16"	250	350	550	750

\* "L" denotes lanyard style. All others bracket style.

\*\* To Determine NH3 liquid flow capacity, multiply by .90.

Miscellaneous Equipment  
(Including Rotogauges & ESVs)

## LP-Gas Emergency Shut-Off Valves (ESV's)

Why and how they should be used for Bobtail Filling and Transport Unloading.

### General Information

The primary purpose of Emergency Shut-Off Valves in bobtail filling and transport unloading is to allow quick shut-off of liquid and vapor flow in the event there is an accidental pull-away of a truck or a hose rupture, both of which could cause a fire.

A system using Emergency Shut-Off Valves will not prevent some spillage of liquid and vapor, but the total system should be constructed so this spillage will be kept to a minimum.

This can be accomplished either by making possible, quick action by the driver or plant personnel in closing the valves by manual remote or pneumatic remote actuation; or in case of a pull-away, by automatic closing of the liquid valve by means of a cable connected to the liquid hose.

By minimizing the presence of liquid and vapor, the chance of a fire or explosion will be reduced. In case of a fire, thermal links at the valves or at other appropriate locations could close the valves and prevent further release of liquid and vapor.

The valve closing systems will be discussed later in this section. The user should decide which system is most appropriate, depending on the piping configuration and the general layout of the filling/unloading area.

### ESV Application for Bobtail Loading and Transport Unloading

A very important function of the typical LP-Gas storage plant is to transfer LP-Gas into bobtails for delivery to customers. How efficiently and rapidly these bobtails can be filled often determines the number of customers that can be served each day, as well as how many bobtails are required to satisfactorily serve all customers. Therefore, the selection of an ESV for the bobtail liquid loading line should be done with care so as to maximize efficiency in filling and have year-round dependability.

The RegO 2" (A6016) and 3" (A6024) liquid ESVs have a full open port so that the restrictions of flow would be no more than you would expect through an equivalent length of schedule 80 pipe. To improve the overall efficiency of the system, the valves were designed as an operating valve so it could replace an existing globe or angle valve already installed at the end of the fixed piping. Thus, installing a RegO ESV could actually result in a more efficient pumping operation than the existing system.

Equally important in the consideration of an ESV is its performance in an emergency, especially bobtail pull-aways. Therefore, when selecting the proper ESV for bobtail filling, also consider the dependability of performance, and simplicity of operation and maintenance.

The RegO ESVs clearly indicate to the operator its open or closed position. It allows full manual control by the operator and provides means for remote operation in emergencies from either in front of the valve or in the rear.

No complicated systems of pulleys and cables are necessary since direct, straight pulls will close the valve. Means are even provided to secure a length of cable to the transfer hose so as to produce an automatic closing in the event the driver pulls away without disconnecting the hose.

### NFPA Provisions (2014)

The pertinent provisions of NFPA Pamphlet 58, as they apply to Emergency Shut-Off Valves and how they are to be installed are below (for complete information refer to NFPA 58):

Section 5.12.2.3 requires that emergency shutoff valves be approved and incorporate all the following means of closing: (1) Automatic shutoff through thermal (fire) actuation, (2) Manual shutoff from a remote location, (3) Manual shutoff at the installed location.

Section 5.12.2.4 states where fusible elements are used; the melting point cannot exceed 250°F (121°C).

This provision sets for the basic criteria for the emergency shutoff valve, a key valve in the protection of many liquid transfer operations. Actuating means for remote control may be electrical, mechanical or pneumatic.

Many systems use a pneumatic system where the tubing itself acts as a fusible element releasing the pressure holding the valve open. With respect to the feature of manual shutoff at the installed location, it is recommended that this valve be operated occasionally. Also, the system should be tested periodically to determine that it will function properly.

Section 6.12.1 covers new and existing installations, stationary container storage systems with an aggregate water capacity of more than 4000 gal (15.1m<sup>3</sup>) utilizing a liquid transfer line that is 1-1/2 in. (39 mm) or larger and pressure equalizing lines 1-1/4 in (32 mm) or larger, must be equipped with emergency shutoff valves.

Section 6.12.2 describes where an emergency shutoff valve must be installed in the transfer lines of the fixed piping transfer system within 20 ft (6m) of lineal pipe from the nearest end of the hose or swivel-type piping connections.

Section 6.12.5 covers installations where there are two or more liquid or vapor lines with hoses or swivel-type piping connected of the sizes designated in 6.12.1, an emergency shutoff valve or a backflow check valve, where allowed, must be installed in each leg of the piping.

Section 6.12.6 states the requirements for thermal protection; emergency shutoff valves must be installed so that the temperature-sensitive element in the valve, or a supplemental temperature-sensitive element that operates at a maximum temperature or 250°F (121°C) that is connected to actuate the valve. It also states maximum distance this can be which is not more than 5ft (1.5m) from the nearest end of the hose or swivel-type piping connected to the line in which the valve is installed.

Section 6.12.7 requires that the temperature-sensitive elements of emergency shutoff valves cannot be painted, or can they have any ornamental finishes applied after manufacture.

Section 6.12.8 emergency shutoff valves or backflow check valves must be installed in the fixed piping in manner to protect them so that any breaks resulting from a pull will occur on the hose or swivel-type piping side of the connection; allowing the valves and piping on the plant side of the connection to remain intact.

Section 6.12.9 emergency shutoff valves that are required to be installed in accordance with 6.12.2, that a means must be incorporated to actuate the emergency shutoff valves in the event of a break of the fixed piping resulting from pulling of the hose.

Section 6.12.10 states that all emergency shutoff valves required by the code be annually tested for the functions required in 5.12.2.3 (2) Manual shutoff from a remote location, (3) Manual shutoff at the installed location; the results of the test are documented.

Section 6.12.12 requires that new and existing emergency shutoff valves shall comply with 6.12.12.1 through 6.12.12.3 below.

Section 6.12.12.1 requires that the emergency shutoff valve shall have at least one clearly identified and accessible manually operated remote shutoff device.

Section 6.12.12.2 states that the remote shutoff device for an emergency shutoff valve must be located not less than 25ft (7.6m) or more than 100 ft. (30 m) in the path away from the emergency shutoff valve.

Section 6.12.12.3 describes the requirements when an emergency shutoff valve is used in place of an internal valve in compliance with 5.7.4.2(D) (2) the remote shutoff device have to be installed in accordance with 6.11.4 and 6.11.5.

The provisions above and others covered in NFPA 58 can assist in determining how bobtail filling and transport unloading stations are to be configured. The diagrams shown here offer general information, they should not be used as an installation guide.

## LP-Gas Emergency Shut-Off Valves (ESV's)

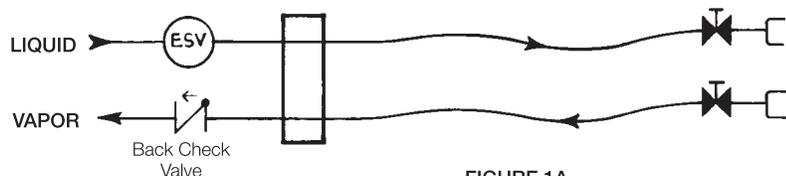


FIGURE 1A  
Bobtail Filling Only

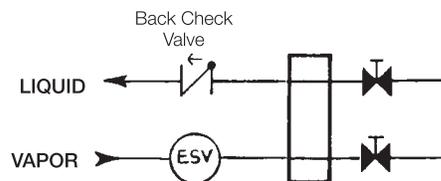


FIGURE 1B  
Transport Unloading Only

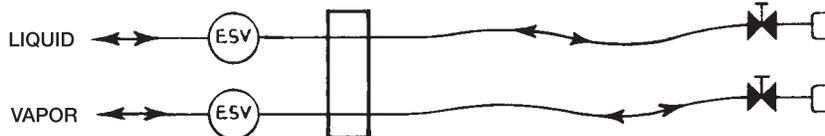


FIGURE 1C  
Combined Bobtail Filling  
and Transport Unloading

### Installation Compliance with NFPA Requirements

A valve that is approved as an ESV may be installed in the fixed piping up to a distance of 20 feet (along the pipe) from the point where the transfer hose is attached to the fixed piping.

However, when the ESV is located more than five feet from the end of the fixed piping, an additional fusible element must be installed within five feet of the point of attachment of the hose, and be connected to the ESV valve in such a manner that it will cause the ESV to close in the event of a fire.

The ideal location of the ESV is as close to the end of the fixed piping as possible. This position eliminates the need for an additional fusible element and cable, and it may also permit the elimination of a restrictive valve already installed at the end of the fixed piping.

To this point, our comments have been principally concerned with ESV protection of the liquid line at bulk plants because this is the area of greatest potential danger in the event of a pull-away or hose rupture.

However, regulations also require an ESV in the vapor transfer line when the vapor hose is 1-1/4" or larger. A helpful rule of thumb in determining whether or not an ESV control valve is required in your

vapor system is this: If the vapor flow is out of the storage tank, an ESV is required. ESV systems are designed to protect the storage tank contents against uncontrolled release.

Therefore, a bobtail loading system could use a 1-1/4" or larger back pressure check valve in the vapor system since the flow of vapor is always from the bobtail being filled back to the storage tank. To improve transfer rates, the use of the RegO 6586D back check valve at this location would provide protection at minimum pressure drop.

If the bobtail vapor line is also used when unloading transports, then the RegO A6010 ESV should be used. The A6010 provides thermal protection, manual closing and a remote emergency closing system similar to the RegO 2" liquid ESV, A6016.

### Remote Control Systems

Usually in transfer loading operations, the valve handles and cables are located in close proximity to the area of greatest potential danger during an emergency. Therefore, each bobtail filling system or transport unloading system should have installed in it at least one readily accessible, alternate remote operating device.

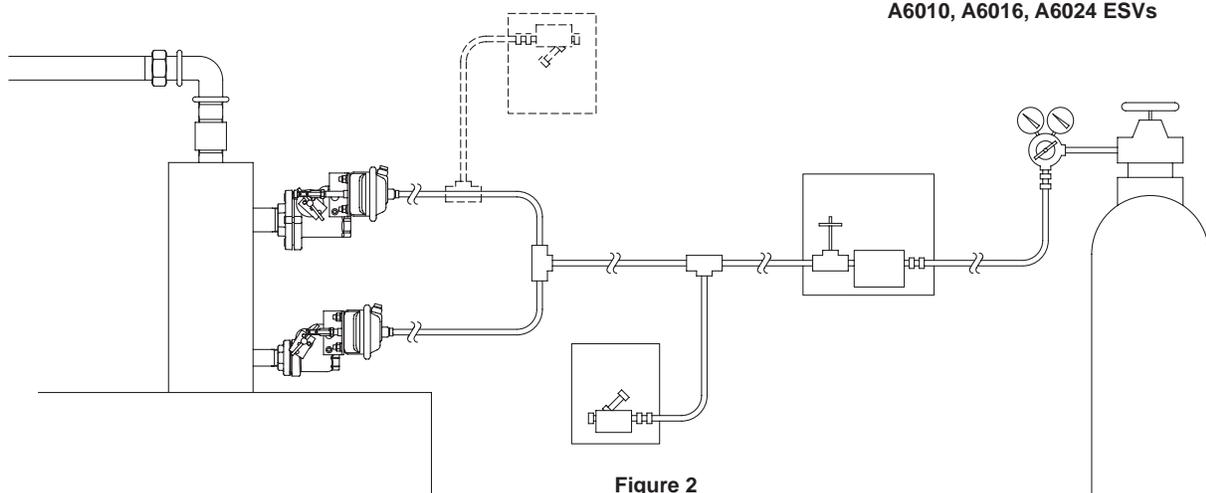


Figure 2  
RegO ESV's with Remote Pneumatic  
and Transfer Hose Cable Release  
Systems Typical Installation

Miscellaneous Equipment  
(Including Rotogauges & ESVs)

## Swing-Check ESVs for Bulk Plants

### A6010, A6016, and A6024 Series

Designed for installation in liquid transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.



### Ordering Information

Part #	Seat	Inlet and Outlet Connections	Liquid Flow Capacity at 10 PSIG Drop (GPM)	Accessories		
				Remote Close Pneumatic	Remote Open/Close Pneumatic	Remote Open/Close Rotary
VA6010	Viton	1-1/4" F. NPT	259 (LP-Gas) 233 (NH <sub>3</sub> )	6016-60D	6016-60C	6016RA
A6010	Buna-N	1-1/4" F. NPT				
VA6016	Viton	2" F.NPT	711 (LP-Gas) 640 (NH <sub>3</sub> )			
A6016	Buna-N	2" F.NPT				
VA6024	Viton	3" F.NPT	1325 (LP-Gas) 1173 (NH <sub>3</sub> )			
A6024	Buna-N	3" F.NPT				
<b>Flanged</b>						
FVA6010	Viton	1-1/4" - 300# ANSI RF Flange	259 (LP-Gas) 233 (NH <sub>3</sub> )	FA6016-60D	*	6016RA
FA6010	Buna-N	1-1/4" - 300# ANSI RF Flange				
FVA6016	Viton	2" - 300# ANSI RF Flange	711 (LP-Gas) 640 (NH <sub>3</sub> )			
FA6016	Buna-N	2" - 300# ANSI RF Flange				
FVA6024	Viton	3" - 300# ANSI RF Flange	1325 (LP-Gas) 1173 (NH <sub>3</sub> )			
FA6024	Buna-N	3" - 300# ANSI RF Flange				

\* Not Available

## Swing-Check ESVs for Bulk Plants with Electric Actuator

### EA6010, EA6016 and EA6024 Series

Designed for installation in liquid transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.



### Ordering Information

Part #	Seat*	Inlet and Outlet Connections	Liquid Flow Capacity at 10 PSIG Drop (GPM)	Voltages
EA6010	Buna-N	1-1/4" F.NPT	259 (LP-Gas) 233 (NH <sub>3</sub> )	12/24 VDC
EA6016	Buna-N	2" F.NPT	711 (LP-Gas) 640 (NH <sub>3</sub> )	
EA6024	Buna-N	3" F.NPT	1325 (LP-Gas) 1173 (NH <sub>3</sub> )	
<b>Flanged</b>				
EFA6010	Buna-N	1-1/4" - 300# ANSI RF Flange	259 (LP-Gas) 233 (NH <sub>3</sub> )	12/24 VDC
EFA6016	Buna-N	2" - 300# ANSI RF Flange	711 (LP-Gas) 640 (NH <sub>3</sub> )	
EFA6024	Buna-N	3" - 300# ANSI RF Flange	1325 (LP-Gas) 1173 (NH <sub>3</sub> )	

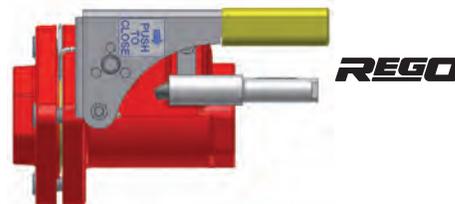
\* Viton seat available on request.

Miscellaneous Equipment (Including Rotogauges & ESVs)

## ESV Pneumatic Controls

RegO Emergency Shut-Off Valves modified for remote pneumatic shutdown operation retain all the operating features of the standard valves.

Once equipped with pneumatic cylinders and then pressurized, the pneumatic cylinder piston rod disengages from a striker plate, allowing the ESV to be manually opened and the striker plate to act as a latch and hold the valve open. Release of the control system pressure for any reason closes the ESV for fail-safe operation.



A6016 with 6016-60D Remote Close Actuator

## 6016PN-50 Pneumatic Remote Control Kit

Control kit with components for connecting and charging the pneumatic controls from a source of compressed gas (air or nitrogen) to a RegO liquid or vapor ESV. Includes charging valves with low pressure indicator, operating valves, 100 feet of 1/4" plastic tubing and tube fittings.



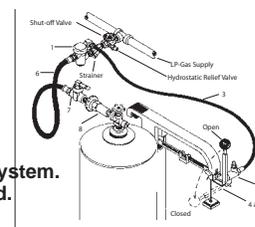
## Ordering Information

Part #	Description
6016-60D	Cylinder assembly kit to convert 6016 ESVs to pneumatic shutdown.
6016PN-50	Pneumatic remote shutdown system kit, complete with 100' of tubing, fittings, 1 charging valve assembly and 1 remote shutdown valve assembly
6016PN-80	Bypass kit for pneumatic actuators.
7605A-BT	100' roll of 1/4" pneumatic tubing.
7605AP-16	1/4" tubing tee, with nuts.
7605AP-15	1/8" NPT x 1/4" tubing, straight connector.
7606RM	Remote Close Cable Kit

## Hydraulic Automatic Cylinder Filling System

### 7194MD and 7194HD

Designed to provide accurate, economical filling of LP-Gas, DOT and fork lift cylinders by weight. Filling stops automatically as the total weight of the cylinder reaches the amount pre-set on the scale. One individual can efficiently handle up to four cylinder filling operations simultaneously to maximize profits, increase efficiency and allow servicing of more customers.



Hydraulic self-contained system. No external power required.

Hydraulic System Components

## Ordering Information

Key No.	Description	Size	Part No.
Assembly for Fairbanks-Morse. Includes items 1 thru 8 below.			7194MD
Assembly for Howe. Includes items 1 thru 8			7194HD
1	Propane Control Valve	1/2" NPT Female, with 1/8" NPT Female Hydraulic Connection	7177
2	Master Cylinder, with Actuator Lever	1/8" NPT Hydraulic Connection	7188
3	Hydraulic Hose Assembly	3/16" I.D. with 1/8" NPT Male Ends, 43-1/2" Overall Length	7194-1
1-3	Valve, Cylinder and Hose Assembly for Fairbanks-Morse Scales	-	7188MS
1-3	Valve, Cylinder and Hose Assembly for Howe Scales	-	7188HS
4A	Bracket Kit for Fairbanks Morse Scales, Complete with Screws, Washers, Nuts and Instructions	-	7194M-3A
4B	Bracket Kit for Howe Scales, Complete with Screws, Washers, Nuts and Instructions	-	7194H-3
5	Can of Hydraulic Fluid, Complete with Filling Spout	1-1/2 ounce	7188-21
6	Propane Filling Hose Assembly	1/2" I.D., with 1/2" NPT Male Ends. 50-1/2" Overall Length	7193D
7	Quick-acting Shut Off Valve	1/2" NPT Inlet X 1/4" NPT Outlet	7901TB
8*	Soft Nose Cylinder Connector	1/4" NPT Male X POL Male	7193D-10L

Miscellaneous Equipment (Including Rotogauges & ESVs)

## 3" Heavy Duty Swing Check with Flow Indicator

### A7624

This back check valve is designed to provide required back flow protection for the unloading riser in the bulk plant's transfer area. It is designed specifically for pipeline installation and is suitable for LP-Gas and anhydrous ammonia service. Product flow moves the swing check to the open position, when flow stops the spring loaded swing check closes.



A7624

### Ordering Information

Part #	For Use With:	Inlet & Outlet Connections	Liquid Capacity at 10 PSIG Drop GPM
A7624	LPG & NH3	3" F.NPT	1325-GPM(LPG) 1173-GPM(NH3)

## 2" Heavy Duty Swing Check with Flow Indicator

### A7616

This back check valve is designed to provide required back flow protection for the unloading riser in the bulk plant's transfer area. It is designed specifically for pipeline installation and is suitable for LP-Gas and anhydrous ammonia service. Product flow moves the swing check to the open position, when flow stops the spring loaded swing check closes.



A7616

### Ordering Information

Part #	For Use With:	Inlet & Outlet Connections	Liquid Capacity at 10 PSIG Drop GPM
A7616	LPG & NH3	2" F.NPT	711-GPM(LPG) 640-GPM(NH3)

## Sight Flow Indicators for Bulk Plants

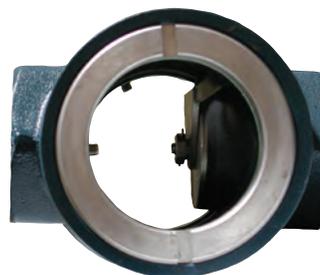
### A7794 and A7796

Designed to promote maximum pump efficiency, these indicators enable bulk plant operators to visually inspect liquid flow conditions. With glass on both sides of the indicator, flow can be observed from either side, even under some poor light conditions. The integral swing check also serves as a back-check valve to prevent reverse flow and product loss if the hose fails in a loading operation.

By installing an indicator on the upstream side of the plant pump, suction conditions can be observed and the pump speed adjusted to obtain the maximum possible flow rate without cavitation. Additionally, if an indicator is installed in the piping at the loading rack, just ahead of the loading hose, the operator can maintain a constant check on pump conditions.

Both installations are designed to allow for observation to provide maximum pump efficiency and ensure safe plant pump operation.

In compressor operations a sight flow indicator installed in the liquid line will give a visual indication when the tank car or transport is emptied. Compressor operation can then be immediately reversed to start recovery of the vapor.



A7794

### Ordering Information

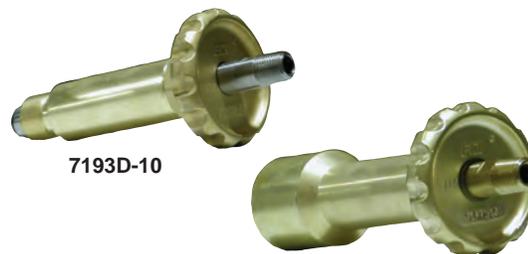
Part #	A Inlet/Outlet Connections	B Length
A7794	2" F. NPT	5-3/4"
A7796	3" F. NPT	7-3/8"

## Hose End Adapters for DOT Cylinder Filling

### 7193D-10 and 7193U-10

Designed to provide quick and easy filling of DOT cylinders with POL or Type I connections. This adapter may be used with hydraulic and electric automatic systems or with manual systems in conjunction with a RegO 7901TB Quick Acting Shut-Off Valve.

These filling connectors have an extended connection on the handwheel, which makes it possible to connect the loading hose to valves on cylinders with fixed collars. The handwheel is well outside the collar for easy operation.



7193D-10

7193U-10

### Ordering Information

Part #	Applications	Inlet Connection	Outlet Connection	Materials
7193D-10	Filling of DOT Cylinders with POL Connections	1/4" M. NPT	M. POL (CGA 510)	Brass & Stainless Steel
7193U-10	Filling of DOT Cylinders with Type I Connections		Type 1 Connection (1-5/16" F. ACME)	Brass

## Connector for DOT Cylinder Filling Adapter

### 7193T-10

The 7193T-10 Connector is designed for use on the 7193D-10 Filling Adapters. Connector allows quick connection to the Type I 1 5/16" M. ACME threads for operators that fill both POL and Type I valves.



7193T-10

### Ordering Information

Part #	Applications	Inlet Connection	Outlet Connection	Materials
7193T-10	Converts 7193D-10 Adapters from POL to a Type 1 Connection	F. POL CGA 510	Type 1 Connection (1-5/16" F. ACME)	Brass

## New Patented Low Emission Hose End Safety Adapter

### 7193D-10L & 7193U-10L

Low Emission Adapter (1.18 cc at disconnect) designed to provide quick and easy filling of DOT cylinders with POL connections with minimal release of product on disconnect. This adapter may be used with dispensing systems in conjunction with RegO 7901T Series Quick Acting Shut-Off Valve. Balanced, light weight design for filling into 20 # - 200 # cylinders.



7193D-10L Series



7193U-10L Series

### Ordering Information

Part #	Application	Inlet Connection	Outlet Connection	Materials
7193D-10L	Filling of DOT cylinders with POL Connections	1/4" M. NPT	M. POL (CGA 510)	Brass & Stainless Steel
7193U-10L	Filling of DOT cylinders with Type 1 Connections	1/4" M. NPT	Type 1 Connection (1-5/16" F. ACME)	Brass

Miscellaneous Equipment  
(Including Rotogauges & ESVs)

## Hose End Adapter for Lift Truck Cylinder Filling

### 7193L-10A

The 7193L-10A is designed to provide quick and easy attachment of the filling hose to DOT cylinders equipped with RegO 7141M check connectors.

The 1-1/4" ACME outlet threads facilitate rapid make-up. When connected, back-checks in the adapter and check connector automatically open. Low pressure drop between the two ensures high filling rates. An integral check closes when disconnected, eliminating the need to close any valves manually to disconnect the charging hose.

Because a leak-tight seal is formed before the integral check opens or closes, product loss is kept to an absolute minimum when connecting or disconnecting the loading hose.



7193L-10A

### Ordering Information

Part #	Application	Inlet Connection	Outlet Connection	Body Material	Accessories
					Adapter
7193L-10A	Filling of Fork Lift Cylinders*	1/4" M. NPT	1-1/4" F. ACME	Brass	5760A

\*The 7193L-10A is intended to be permanently attached to the filling hose.

A 5760A adapter enables the 7193L-10A to be attached to the POL connection on the 7193D-10 at regular cylinder filling stations to allow for occasional filling of fork lift cylinders.

## Lever Operated Hose End Adapter for Fork Lift Cylinder Filling

### 7193K-10B

Designed to drastically reduce labor and time when continuously filling large numbers of lift truck cylinders equipped with RegO 7141M check connectors.

Rapid make-up is accomplished by simply slipping the adapter yoke behind the hex wrenching section of the 7141M connector and depressing the lever. When the cylinder is filled, the adapter is easily disengaged by releasing the operating lever. When connected, back checks in the adapter and connector automatically open. An integral check closes when disconnected, eliminating the need to close any valves manually on the filling manifold to disconnect the charging hose. The shut-off valve on the container must be closed after filling.

Because a leak-tight seal is formed before the checks close, product loss is kept to an absolute minimum when connecting or disconnecting the loading hose.

The 7193K-10B is intended to be permanently attached to the filling hose.



7193K-10B

### Ordering Information

Part #	Application	Inlet Connection	Outlet Connection	Materials
7193K-10B	Lever Operated for Quick Filling of Fork Lift Cylinders	1/4" F. NPT	Quick Disconnect Yoke*	Brass and Steel

\* For use with RegO 7141M check connector.

Miscellaneous Equipment  
(Including Rotogauges & ESVs)

## Combination Valve for Bulk Storage Containers

### A2805C

Designed for installation on bulk storage containers, this valve combines a pressure gauge mounting and provision for a fixed tube liquid level gauge.

The shut-off valve prevents the pressure gauge from being subjected to constant pressure, thereby prolonging its life and accuracy. The valve may be closed, and the vent valve opened to vent pressure from the gauge to permit replacement.

For fixed liquid level gauging, the valve can be mounted at the maximum permitted filling level. When equipped with a dip tube threaded 1/8" M.NPT, it can be installed at any convenient level.



A2805C

### Ordering Information

Part #	Container Connection	Service Connection	Liquid Level Vent
A2805C	3/4" M. NPT	1/4" F. NPT for Gauge Mounting	Tee Handle

\*Has 1/8" F. NPT opening for installing separate dip tube.

## Gritrol Fuel Line Filters

### 12802

Designed especially for use in liquid motor fuel lines to trap foreign material which otherwise may damage precision components in the LP-Gas carburetion system. These filters incorporate an integral sintered metal filter element in a straight through design.



12802

### Ordering Information

Part #	Inlet Connection	Outlet Connection
12802	1/4" F. NPT	1/4" M. NPT

## Vent Valves

### 3165C, 3165D, 3165S and TSS3169

Especially designed to bleed off liquid or vapor pressures trapped in transfer lines. When installed in the downstream boss of RegO globe and angle valves used at the end of a liquid transfer hose, the bleeder valve allows for the controlled venting of the product and indicates to the operator that the valves are closed and he can disconnect the coupling. They may also be used as a fixed liquid level gauge where the dip tube is part of the container.

The 3165C, 3165S and TSS3169 incorporates a No 54 drill size orifice. The 3165D incorporates a No 72 drill size orifice.

An optional instruction plate with "Stop Filling When Liquid Appears" may be ordered for use with these valves.



3165C



3165S



TSS3169

### Ordering Information

Part Number	Service	Connection	Actuation	Accessories
				Warning Plate Kit
3165C	LP-Gas Only	1/4" M. NPT	Ribbed	2550-40P
3165D			Slotted	
3165S			Tee Handle	
TSS3169	LP-Gas & NH <sub>3</sub>			

Miscellaneous Equipment  
(Including Rotogauges & ESVs)

## Fixed Liquid Level Gauges

### 3165 Series and TA3169F

Especially designed to provide a visible warning when containers are filled to the maximum permitted filling level. At the start of the filling operation, with the vent stem opened, the valve discharges vapor. When the maximum permitted filling level is reached, the valve discharges liquid. The 3165CF\*, 3165CF12.0, 3165SF12.0 and TA3169F12.0 incorporate a No 54 drill orifice; the 3165DF\* and 3165DF12.0 incorporate a No 72 drill orifice. They all are normally furnished with a 12" 3/16" OD dip tube.

An optional instruction plate with "Stop Filling When Liquid Appears" may be ordered for use with these valves.



3165CF12.0  
3165DF12.0



TA3169F12.0

### Ordering Information

Part #	Service	Connection	Actuation	Dip Tube Length	Accessories
					Warning Plate Kit
3165CF*	LP-Gas Only	1/4" M. NPT	Ribbed	*	2550-40P
3165DF*				12"	
3165CF12.0					
3165DF12.0					
3165SF12.0			Slotted		
TA3169F12.0	LP-Gas & NH <sub>3</sub>		Tee Handle		

## Pressure Gauges

Especially designed in a variety of sizes and construction for the LP-Gas and anhydrous ammonia industry.



612-PG



5575

### Ordering Information

Part #	Service	Case Material	Maximum Pressure	Inlet Connection M.NPT	Case Size	Increment Divisions	
2434A-2*	LP-Gas Only	Steel	35" w.c. and 20 oz. (Dual)	1/4"	2-1/2"	1" w.c. and 1 oz.	
2434-2**			30 PSIG			2"	1/2 PSI
3226A-3							
2411		Brass	60 PSIG		1 PSI		
5575							
5547							
5576		Steel	100 PSIG		2 PSI		
1286							
948							
948B		Brass	300 PSIG		5 PSI		
A8060							
A8150							
A8400	NH <sub>3</sub> and LP-Gas	Steel	150 PSIG	2-1/2"	5 lb.		
	400 PSIG						
612-PG	LP-Gas Only		0-300 PSI	1/8"	1-1/2"	30 PSI	
612-G2					2"	5 PSI	

\* 1/4" Hose Connection

\*\* 1/8" M. NPT Connection

Miscellaneous Equipment (Including Rotogauges & ESVs)

## Needle Valves

1224, 1316 and 1318

Additional Needle Valves can be found on page 273.

These valves are high quality, "true" throttling valves. Unlike most so-called needle valves, both the body seat and stem are tapered to provide fine, precise control over a wide range of adjustment without stem galling.

The 1224 may be used as a small, inexpensive shut-off valve between a pressure gauge and bulk storage container to allow for convenient gauge replacement.

The 1316 and 1318 provide taper pipe thread by left hand hose connection threads and are useful in a wide range of torch and fuel burner applications where an accurate throttling action is required.



1224

### Ordering Information

Part #	A. Inlet Connection	B. Outlet Connection	C. Height	D. Length
1224WA	1/4" M. NPT	1/4" M. NPT	1-9/16"	1-3/4"
1316WA	9/16" - 18 L.H.	1/8" M. NPT		
1318WA		1/4" M. NPT		

## Gaskets

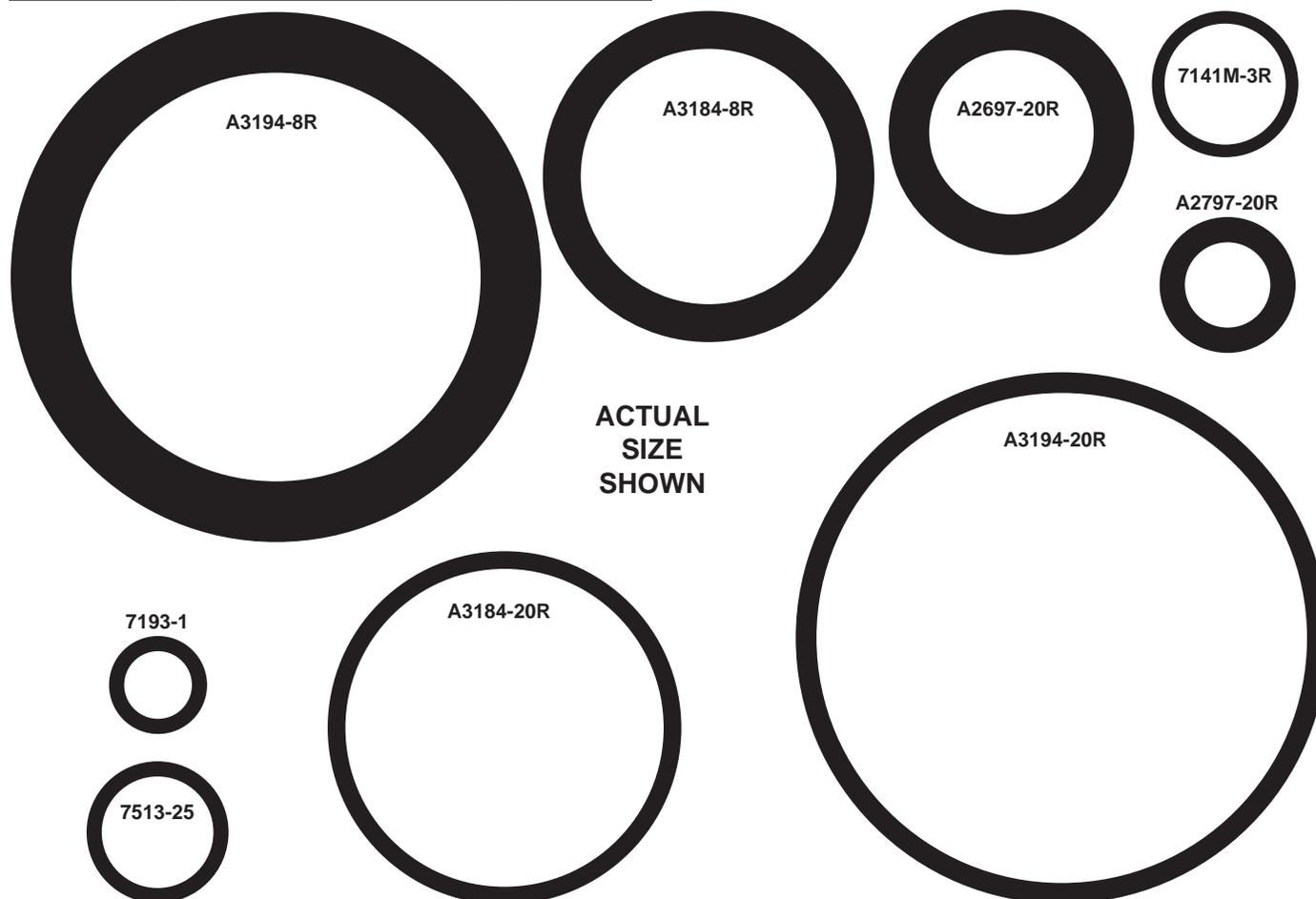
### Ordering Information

Part #	Connections	Size	Package Size
7141M-3R	Forklift	1-1/4" ACME	25
A2697-20R	Filter, Vapor & Adapter	1-3/4" ACME	25
A2797-20R		1-1/4" ACME	25
A3184-8R		2-1/4" ACME	10
A3194-8R		3-1/4" ACME	10

## Buna-N O-Rings

### Ordering Information

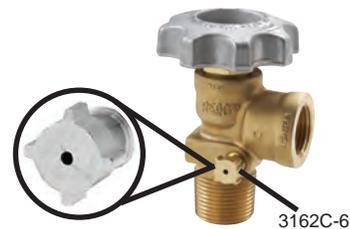
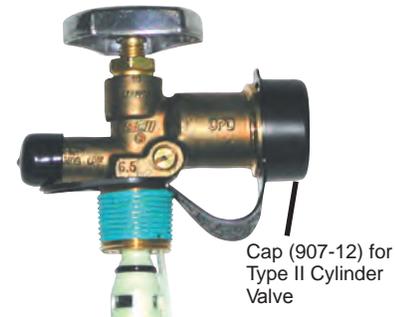
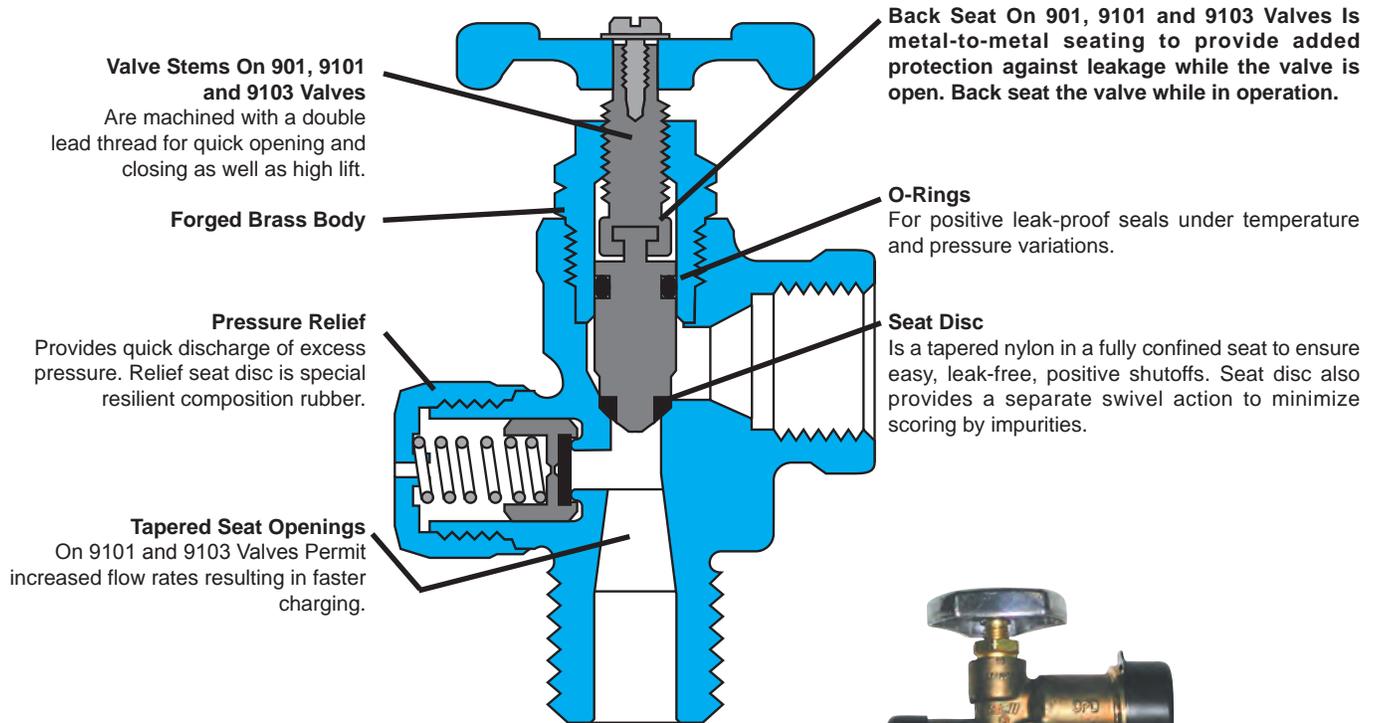
Part #	Connections	Size	Package Size
7193-1	POL Nipple	POL	1
7513-25	Internal Forklift	1-1/4" ACME	1
A3184-20R	Filter, Vapor & Adapter	2-1/4" ACME	10
A3194-20R		3-1/4" ACME	10



Miscellaneous Equipment  
(Including Rotogauges & ESVs)

## Repair Kits - Service Valves

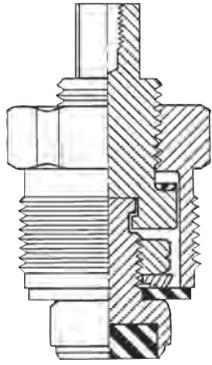
Make sure you are thoroughly trained before you attempt any ASME tank maintenance. Improper conditions or procedures can cause accidents resulting in property damage and personal injury



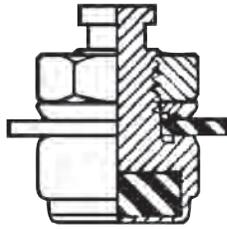
## Cylinder and Service Valves

Part #	Kit Number	Kit Contents
901 Series 903 Series 9106CO	903-50	Bonnet; stem & disc assembly; large handwheel; self-tapping screw
	903-51	Bonnet; stem & disc assembly; small handwheel; self-tapping screw
9101 Series	19100-50B	Complete MultiBonnet assembly-bonnet assembly; handwheel; nameplate; self-tapping screw
9107K8A		
3100 Series (Obsolete) 7100 Series (Obsolete)	3100-81K Conversion Kit	Bonnet & stem assembly; gasket (Conversion Assembly)
	3100-80A	Diaphragm; bonnet & stem assembly
	3100-80B	Diaphragm assembly; back seat; washer
9101P5 P5H	19100-50B	Bonnet; stem & seat disc assembly; large handwheel; self-tapping screw
	19100-50	Bonnet; stem & seat disc assembly; small handwheel; self-tapping screw

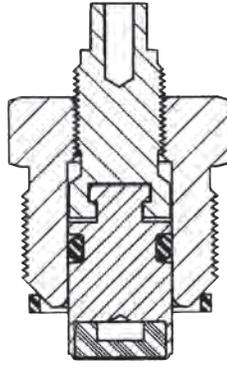
**WARNING:** Under normal conditions, the useful safe service life of a pressure relief valve is 10 years from the original date of manufacture. However, the safe useful life of the valve may be shortened and replacement required in less than 10 years depending on the environment in which the valve lives. Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage.



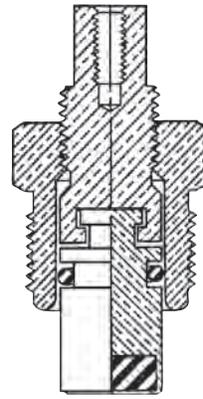
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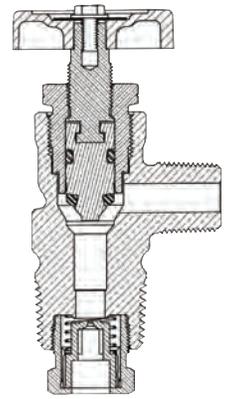
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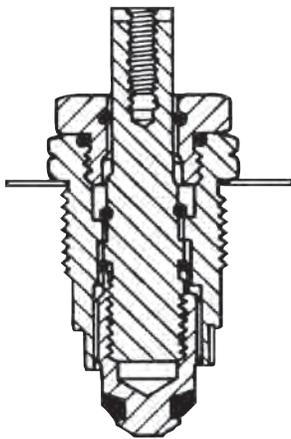
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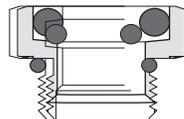
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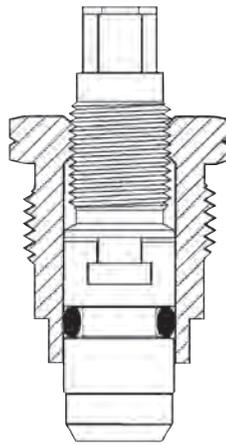
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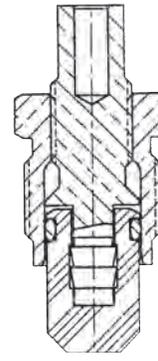
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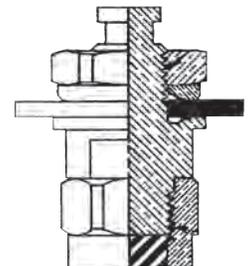
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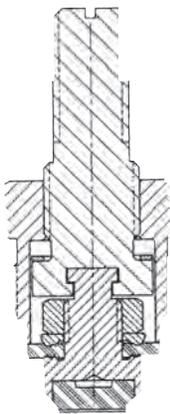
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9



10



11

## Service Valve Repair Kits

Figure Number	Part Number	Description	Fits Valve
1	3100-80A	Bonnet	RegO 3100 & 7100 Series
2	3100-80B	Seat	
3	3100-81K	Conversion assembly. Converts 3100-80A from diaphragm to "O" Ring Seal.	
4	8100-50	Bonnet	RegO 8100 Series
5	19101-50		RegO 9100 Series Forklift
6	19104-50		RegO 9100 Series
7	19104-80	Packing for 19104-50 Multibonnet	
8	19100-50B	Bonnet	RegO 9100 Series
9	903-50		RegO 900 Series
9	903-51	Bonnet w/large handwheel	
10	7128-5	Dia. Assy.	Old style 2400 & 2500 Series Multivalve
11	7130BR-1	Bonnet	John Deere OEM

The 7130BR-1 John Deere OEM repair assembly is no longer being manufactured. The 3100-81K offers a complete bonnet and stem assembly with an o-ring seal rather than a diaphragm, 3100-80A offers a complete diaphragm bonnet assembly and the 3100-80B has a replacement diaphragm assembly and it too will repair the bonnet area. These kits will work on the 7130B series valves with the shorter stem length.

## Quick Acting Hose End Valves

Part #	Kit Number	Kit Contents
A7707 Series A7708 Series	A7707-50	Gaskets; groove pin; jam ring
	A7707-75	Bonnet assembly; packing; seat disc & retainer; stem; washers

## Quick Acting Valves

Part #	Kit Number	Kit Contents
7554L Series	7554L-20	Bonnet assembly
7554S Series	7554S-20	
7901 Series	7901T-50	Bonnet assembly; gasket lever
	7901T-80	Gasket; o-ring; seat retainer assembly
A7553A	A7553A-50	Gaskets; o-ring; roll pin; seat disc; spring; stem assembly

## Charging Manifolds

Part #	Kit Number	Kit Contents
7177 Control Valve	7177-50	Diaphragm; gasket; o-ring; seat disc; washer
7188 Master Cylinder	7188-50	Hydraulic fluid; o-rings; piston; spring; trip latch

## Check Connectors

Part #	Kit Number	Kit Contents
7141M	7141M-50	Check assembly; gasket; o-ring; retaining ring

## Pull-Away Couplings

Part #	Kit Number	Kit Contents
A2141A6 A2141A6L	A2141A6-50	O-ring
	A2141A6M	Male coupling
A2141A8 A2141A8L	A2141A8-50	O-ring
	A2141A8M	Male coupling
A2141A10	A2141A10-50	O-ring
	A2141A10M	Male coupling
A2141A16	A2141A16-50	O-ring
	A2141A16M	Male coupling

## Cylinder and Service Valves

Part #	Kit Number	Kit Contents
901 Series 903 Series 9106CO	903-50	Bonnet; stem & disc assembly; large handwheel; self-tapping screw
	903-51	Bonnet; stem & disc assembly; small handwheel; self-tapping screw
9101 Series	19100-50B	Complete MultiBonnet assembly-bonnet assembly; handwheel; nameplate; self-tapping screw
9107K8A		
3100 Series (Obsolete) 7100 Series (Obsolete)	3100-81K Conversion Kit	Bonnet & stem assembly; gasket (Conversion Assembly)
	3100-80A	Diaphragm; bonnet & stem assembly
	3100-80B	Diaphragm assembly; back seat; washer
9101P5 P5H	19100-50B	Bonnet; stem & seat disc assembly; large handwheel; self-tapping screw
	19100-50	Bonnet; stem & seat disc assembly; small handwheel; self-tapping screw

## Filler Valves

Part #	Kit Number	Kit Contents
7547 Series (Obsolete)	7547B-80	Gaskets; spring; seat disc & retainer assembly
6579 7579	7579-50 w/ upper body	Gaskets; seat disc & retainer assembly; spring; upper body
	7579-80 w/o upper body	Gaskets; seat disc & retainer assembly; spring
7647 Series	7647B-80	Gaskets; spring; seat disc & retainer assembly
L6579 L7579	L7579-51 w/ upper body	Gaskets; seat disc & retainer assembly; spring; upper body
	L7579-81 w/o upper body	Gaskets; seat disc & retainer assembly; spring

## Filling Connectors

Part #	Kit Number	Kit Contents
7193K-10B	7193K-50	7193K-51 assembly; adjusting screw; nut; spring; tee
	7193K-51	Check body & disc assembly; gasket nipple; tailpiece nipple; slip washer

## Multivalves - Vapor Equalizing

Part #	Kit Number	Kit Contents
7556V Series G8475 Series 8593AR16.0	8475-51A	Body; gaskets; spring; stem & seat disc assembly
	8475-81A	Gaskets; spring; stem & seat disc assembly

## Multivalves - Filler Valve

Part #	Kit Number	Kit Contents
6532 Series 6533 Series 6542 Series 6543 Series 8555 Series* 8555DL Series *(Mfd. Oct. 1990 or before)	6542B-50 w/ upper body	Gaskets; spring; spring guide; stem & seat disc assembly; upper body
	6542B-80 w/o upper body	Gaskets; spring; spring guide; stem & seat disc assembly
6555 Series 8555 Series *(Mfd. after Oct. 1990)	8555-50 w/ upper body	Gaskets; spring; spring guide; stem & seat disc assembly; upper body
	8555-80 w/o upper body	Gaskets; spring; spring guide; stem & seat disc assembly
G8475 Series 8593AR16.0	8475-50 w/ upper body	Gaskets; seat disc & retainer assembly; spring; upper body
	8475-80 w/o upper body	Gaskets; seat disc & retainer assembly; spring
G8475RL Series	8475L-50 w/ upper body	Gaskets; seat disc & retainer assembly; spring; upper body
	8475L-80 w/o upper body	Gaskets; seat disc & retainer assembly; spring

## Duoport & Multiport Relief Valve Manifolds

Part #	Kit Number	Kit Contents
8542G AA8542 Series	8540-50	Bleeder valve assemblies; packing gland; set screw; washer; gasket; key
A/AA8560 Series A/AA8570 Series	8560-50	Bleeder valve assemblies; seat ring assemblies; pressure seal rings; packing gland; jam ring; washer; gasket

## Multi Purpose and Transfer Valves

Part #	Kit Number	Kit Contents
A8016D Series A8017D Series A8018D Series	A8016B-50	Gaskets; jam ring; o-ring; pressure seal rings; seat disc; washer
A8017DH A8018DH	A8017BH-20R	Bonnet stem & seat disc assembly; gasket

## Multivalves - Bonnet Assemblies

Part #	Kit Number	Kit Contents
6532D Series 6533D Series 6542D Series 6543D Series	903-50	Bonnet; stem & seat disc assembly; large handwheel; self-tapping screw
	903-51	Bonnet; stem & seat disc assembly; small handwheel; self-tapping screw
6532A Series 6533A Series 6542A Series 6543A Series 6555D Series 7556V Series 8555D Series 8555DL Series	19100-50B	Upper packing with seal rings - For MultiBonnet only
	19104-50	Complete assembly-bonnet assembly; handwheel; nameplate; self tapping screw
6532R Series 6533R Series 6542R Series 6543R Series 6555R Series 7556R Series G8475R Series 8555R Series 8593AR16.0 Series 9101R Series	19104-80	Upper packing with seal rings - For MultiBonnet only

## Flomatic Valves

Part #	Kit Number	Kit Contents
A7884 A7883F A7884F	A7883F-50	Stem assembly kit; bleeder assembly; cylinder cap screws; upper & lower piston cap screws; lock washers; filters; springs; block vee packing; x-seal; gaskets; o-rings; retaining ring; insert roll pin; screw seal; cap
A7883F	A7883F-80	Retaining ring; seat disc; insert; block vee packing; filters; x-seals; cylinder cap screws; o-rings; gaskets
A7884F	A7884F-80	
A7883F	A7883F-150	X-seal; seat disc; gaskets
A7884F	A7884F-150	

## Vapor Return Valves

Part #	Kit Number	Kit Contents
7573A	7573A-81	Gaskets; spring; seat disc & retainer assembly
7573D	7573D-81	

## Transfer Valves

Part #	Kit Number	Kit Contents
7550P 7550PX 7555P	7550-15	Bonnet; retainer assembly; cap; flange packing; bushing
A7550P A7550PX A7555P	A7550-15	Bonnet; stem; seat disc retainer assembly; cap; flange packing; bushing

## Manual Internal Valves

Part #	Kit Number	Kit Contents
A3209A	A3209A-50	Bearing; cam; gasket; main seat disc assembly; retaining ring; seal o-ring; seat disc
A3209D/DT	A3209D-50	
A3209R050 A3209R080	A3209R-50	
A3210A065	A3210A-50	Bushing; gasket; jam ring; main seat disc assembly; upper & lower retaining rings; o-ring; seal rings (2); seat disc
A3212A Series	A3212A-50	Bearing; cam; gasket; o-rings; seat disc; stem packing
A3212R Series A3212RT Series	A3212R-50	
A3213A Series A3213R/RT Series	A3213A-50	
A3213D/DT Series A3213R Series A3213RT Series	A3213R-50	
A3217F Series	A3217F-50	Dust seal; jam ring; stem o-ring; stem seals (3); stem spring; stem washer
	A3217F-80 O-ring Flange	Cotter pin; dust seal; inner & outer stem bearing; jam ring; main & pilot seat disc; poppet seal o-ring; retaining ring; roll pins (2); seat o-ring; stem o-ring; stem seals (3); upper & lower flange seal o-ring; wear button
	A3217F-80G Gasket Flange	Dust seal; inner stem bearing; jam ring; lower flange seal gasket; main seat disc; outer stem bearing; pilot seat disc; poppet seal o-ring; retaining ring; roll pins (2); seat o-ring; stem o-ring; stem seals (3); upper flange seal gasket; wear button
A3219F Series	A3219F-80 O-ring Flange	Bumper; cotter pins (3); dirt seal; inner & outer stem bearing; lever release spring; main seat disc; poppet seat disc; pivot pin locknut; poppet bearing; seal gland gasket; seat seal o-ring; stem jam ring; stem o-ring; stem seal rings (3); stop screw; upper & lower flange seal o-ring
	A3219F-80G Gasket Flange	Bumper; cotter pins (3); dirt seal; inner & outer stem bearing; lever release spring; main seat disc; poppet seat disc; pivot pin locknut; poppet bearing; seal gland gasket; seat seal o-ring; stem jam ring; stem seal rings (3); stop screw; upper & lower flange seal o-ring
A3219FA	A3219FA-80G Gasket Flange	Bumper; cotter pins (3); dirt seal; inner & outer stem bearing; lever release spring; main seat disc; poppet seat disc; pivot pin locknut; poppet bearing; seal gland gasket; seat seal o-ring; stem jam ring; stem o-ring; stem seal rings (3); stop screw; upper & lower flange seal o-ring

## Shut Off Valves

Part #	Kit Number	Kit Contents
TA7034LP TA7034P	TA7034-50	Gaskets; jam ring; o-ring; pressure seal rings; seat disc; washer
A7505AP A7506AP	A7505-50	Complete bonnet assembly
	7505A-20	
TA7505AP TA7506AP	TA7034-50	Gaskets; jam ring; o-ring; pressure seal rings; seat disc; washer
A7507AP A7508AP	A7507-50	Complete bonnet assembly
	7507A-20	
TA7507AP	TA7507-50	Gaskets; jam ring; o-ring; pressure seal rings; seat disc; washer
A7509BP A7510BP	A7509-50	Complete bonnet assembly
	7509B-50	
TA7509BP TA7510BP	TA7509B-50	Gaskets; jam ring; o-ring; pressure seal rings; seat disc; washer
A7511AP A7511FP A7512AP A7512FP	A7511-50	Complete bonnet assembly
	7511A-20	
	TA7511AP TA7511FP TA7512AP TA7512FP	
A7513AP A7513FP A7514AP A7514FP	A7513-50	
A7513AP A7514AP	7513-20	Complete bonnet assembly
A7513FP A7514FP	A7513F-20	
TA7513AP TA7513FP TA7514AP TA7514FP	TA7513A-50	Gaskets; jam ring; o-ring; pressure seal rings; seat disc; washer
A7517AP A7517FP A7518AP A7518FP	A7515-50	Gaskets; jam ring; o-ring; pressure seal rings; roll pin; seat disc; washers
	A7515-20	Complete bonnet assembly
TA7517AP TA7517FP TA7518AP TA7518FP	TA7515A-50	Gaskets; jam ring; o-ring; pressure seal rings; roll pin; seat disc; washers
A7704 A7705 A7706	7705-50	Flange packing; friction washer; gaskets; seat disc
TA7894P	TA7894-50	Gaskets; jam ring; o-ring; pressure seal rings; seat disc; washer

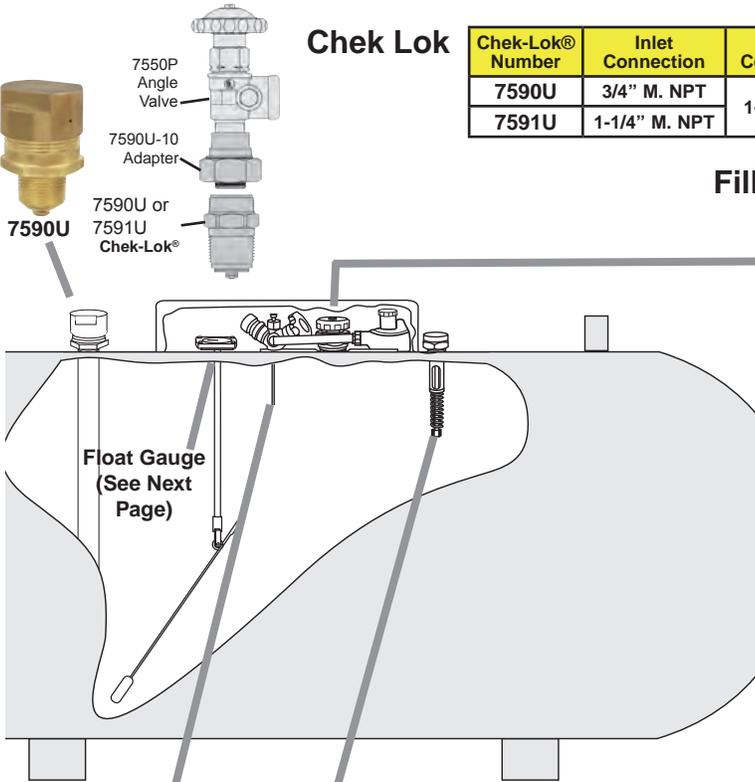
## Spring Kits For Manual Internal Valves

Part #	Kit Number	Kit Contents
A3212A Series A3212R Series A3212RT Series	A3212R-K105 A3212R-175 A3212RK-250	O-ring; ID plate; spring
A3213A Series A3213T Series	A3213A-K150 A3213A-K200 A3213A-K300 A3213A-K400	
A3213D Series	A3213D-K150 A3213D-K200 A3213D-K300 A3213D-K400	

## ASME Tank Refurbish

Make sure you are thoroughly trained before you attempt any ASME tank maintenance. Improper conditions or procedures can cause accidents resulting in property damage and personal injury

Tank configuration shown is appropriate for tanks built since the mid-1970's. If yours does not match, please call the Gas Equipment Company location nearest you and we will be glad to help.



### Chek Lok

Chek-Lok® Number	Inlet Connection	Outlet Connection	Approximate Closing Flow, Liquid GPM (Propane)	Adapters
7590U	3/4" M. NPT	1-5/8" UNF	20	7590U-10
7591U	1-1/4" M. NPT		30	7590U-20



### Filler Valve



Part #	ACME Hose Connection	Tank Connection M. NPT
7647SCT	1-3/4"	3/4"
L7579		1-1/4"
7579	Cap	N/A
3174-9P		N/A
3174-93L		Cap w/Lanyard

Valve Part #	Repair Kit #	Contains
7547 Series (Obsolete)	7547B-80	Gaskets, spring, seat disc and retainer assembly
6579 7579	7579-50	Gaskets, seat disc & retainer assembly, spring & upper body
	7579-80	Gaskets, spring, seat disc and retainer assembly w/out upper body
7647 Series	7647B-80A	Gaskets, spring, seat disc and retainer assembly
L6579 L7579	L7579-5	Gaskets, seat disc & retainer assembly, spring & upper body
	L7579-81	Gaskets, spring, seat disc and retainer assembly w/out upper body

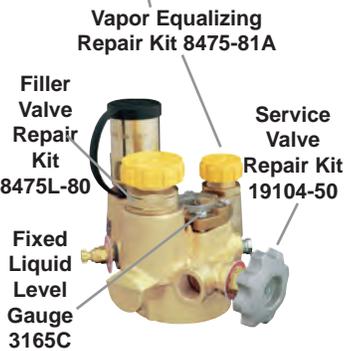
### Relief Valves



Part #	Start To Discharge Setting PSIG	Container Connection M. NPT	Flow Capacity SCFM/Air		Suitable For Tanks w/Surface Area Up To:	Rain Caps
			UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)		
7583G	250	3/4"	1980	1806	80 Sq. Ft.	7583-40X
8684G		1"	2620	2565	113 Sq. Ft.	8684-40
8685G		1-1/4"	4385	4035	212 Sq. Ft.	7583-40X
3132G			4130	-	200 Sq. Ft.	3132-54

To calculate approximate outside surface area (OSSA) in Square Feet:  
 NOTE: Values to be in Feet  
 1. Cylindrical container with hemispherical heads:  
 Area = Overall length X outside diameter X 3.1416  
 250 gal = 60 S.F.  
 320 gal = 75 S.F.  
 500 gal = 98 S.F.  
 1000 gal = 173 S.F.  
 2. Cylindrical container with semi-ellipsoidal heads:  
 Area = (Overall length + .3 outside diameter) X outside diameter X 3.1416  
 3. Spherical container: Area = Outside diameter squared x 3.1416

### Multivalves



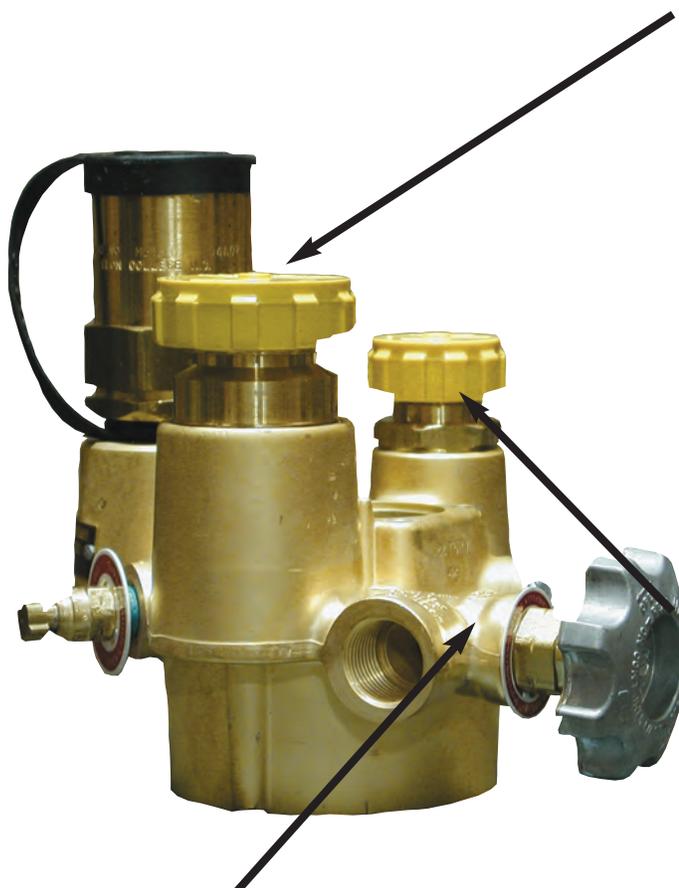
Part Number	Container Connection	Service Connection	Filling Connection	Vapor Equalizing Connection	Float Gauge Relief Valve Style	Fixed Liquid Level Vent Valve Style	Pressure Relief Valve Setting	For Use In Containers w/Surface Area Up To:
G8475RL	2-1/2" F. NPT	F. POL (CGA 510)	1-3/4" M. ACME	1-1/4" M. ACME	Fits "JUNIOR" Size	Knurled	250 PSIG	83 Sq. Ft. Above Ground
G8475RLW								276 Sq. Ft. Underground
7556R12.0	3/4" M. NGT		N/A					192 Sq. Ft. Above Ground
8593AL16.0	1-1/2" M. NPT		1-3/4" M. ACME		N/A		N/A	639 Sq. Ft. Underground

Service Valve Repair Kit for G8475RL, RLW -7556R, 8593AL — 19104-50 — Contains: MultiBonnet assembly, handwheel, nameplate, and self-tapping screw.  
 Service Valve Repair Kit Prior to 1962 — 8100-50 — Contains: Bonnet assembly.  
 Service Valve Repair Kit for 1470, 1480 Series, 2593/K, 2594/K Series —3100-81K — Contains: Bonnet and stem assembly

### Underground Multivalve

## Repair Kits - Multivalves, Filler & Vapor Valves

Make sure you are thoroughly trained before you attempt any ASME tank maintenance. Improper conditions or procedures can cause accidents resulting in property damage and personal injury



### Multivalves - Filler Valve

Part #	Kit Number	Kit Contents
6532 Series 6533 Series 6542 Series 6543 Series 8555 Series* 8555DL Series <small>*(Mfd. Oct. 1990 or before)</small>	6542B-50 w/ upper body	Gaskets; spring; spring guide; stem & seat disc assembly; upper body
	6542B-80 w/o upper body	Gaskets; spring; spring guide; stem & seat disc assembly
6555 Series 8555 Series <small>*(Mfd. after Oct. 1990)</small>	8555-50 w/ upper body	Gaskets; spring; spring guide; stem & seat disc assembly; upper body
	8555-80 w/o upper body	Gaskets; spring; spring guide; stem & seat disc assembly
G8475 Series 8593AR16.0	8475-50 w/ upper body	Gaskets; seat disc & retainer assembly; spring; upper body
	8475-80 w/o upper body	Gaskets; seat disc & retainer assembly; spring

### Multivalves - Vapor Equalizing

Part #	Kit Number	Kit Contents
7556V Series G8475 Series 8593AR16.0	8475-51A	Body; gaskets; spring; stem & seat disc assembly
	8475-81A	Gaskets; spring; stem & seat disc assembly

### Vapor Return Valves

Part #	Kit Number	Kit Contents
7573A	7573A-81	Gaskets; spring; seat disc & retainer assembly
7573D	7573D-81	

### Multivalves - Bonnet Assemblies

Part #	Kit Number	Kit Contents
6532D Series 6533D Series 6542D Series 6543D Series	903-50	Bonnet; stem & seat disc assembly; large handwheel; self-tapping screw
	903-51	Bonnet; stem & seat disc assembly; small handwheel; self-tapping screw
6532A Series 6533A Series 6542A Series 6543A Series 6555D Series 7556V Series 8555D Series 8555DL Series	19100-50B	Upper packing with seal rings - For MultiBonnet only
	19104-50	Complete assembly-bonnet assembly; handwheel; nameplate; self tapping screw
6532R Series 6533R Series 6542R Series 6543R Series 6555R Series 7556R Series G8475R Series 8555R Series 8593AR16.0 Series 9101R Series		19104-80

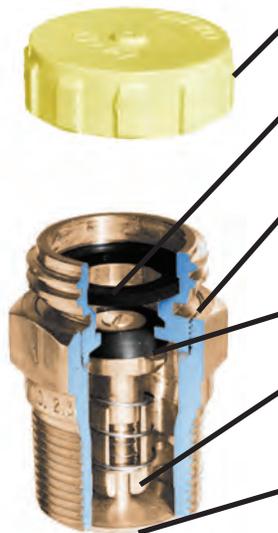


**WARNING:** Under normal conditions, the useful safe service life of a pressure relief valve is 10 years from the original date of manufacture. However, the safe useful life of the valve may be shortened and replacement required in less than 10 years depending on the environment in which the valve lives. Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage.

## Repair Kits - Multivalves, Filler & Vapor Valves (con't.)

### Filler Valves

Part #	Kit Number	Kit Contents
7547 Series (Obsolete)	7547B-80	Gaskets; spring; seat disc & retainer assembly
6579 L7579	L7579-50 w/ upper body	Gaskets; seat disc & retainer assembly; spring; upper body
	L7579-80 w/o upper body	Gaskets; seat disc & retainer assembly; spring
7579	7579-50 w/ upper body	Gaskets; seat disc & retainer assembly; spring; upper body
	7579-80 w/o upper body	Gaskets; seat disc & retainer assembly; spring
7647 Series	7647B-80	Gaskets; spring; seat disc & retainer assembly



Seal cap made of tough, resilient molded plastic. Protects threads and internal working parts. Caps are designed to contain normal tank pressures, and must be kept on valves at all times.

Long-wearing gasket permits hand-tight connection of cap and hose coupling.

Safety groove is designed to shear below the ACME thread, leaving the valve seats closed and unaffected if the delivery truck pulls away with the hose connected.

Seat disc of special synthetic composition is extra thick for longer life.

Valve guide is precision machined to assure positive seal.

Exclusive swing-away lower back check valve for extra fast filling is provided on Models 6579 and 6587. Differs from conventional design by swiveling to a vertical position when opened.

### Spare Gasket Ordering Information

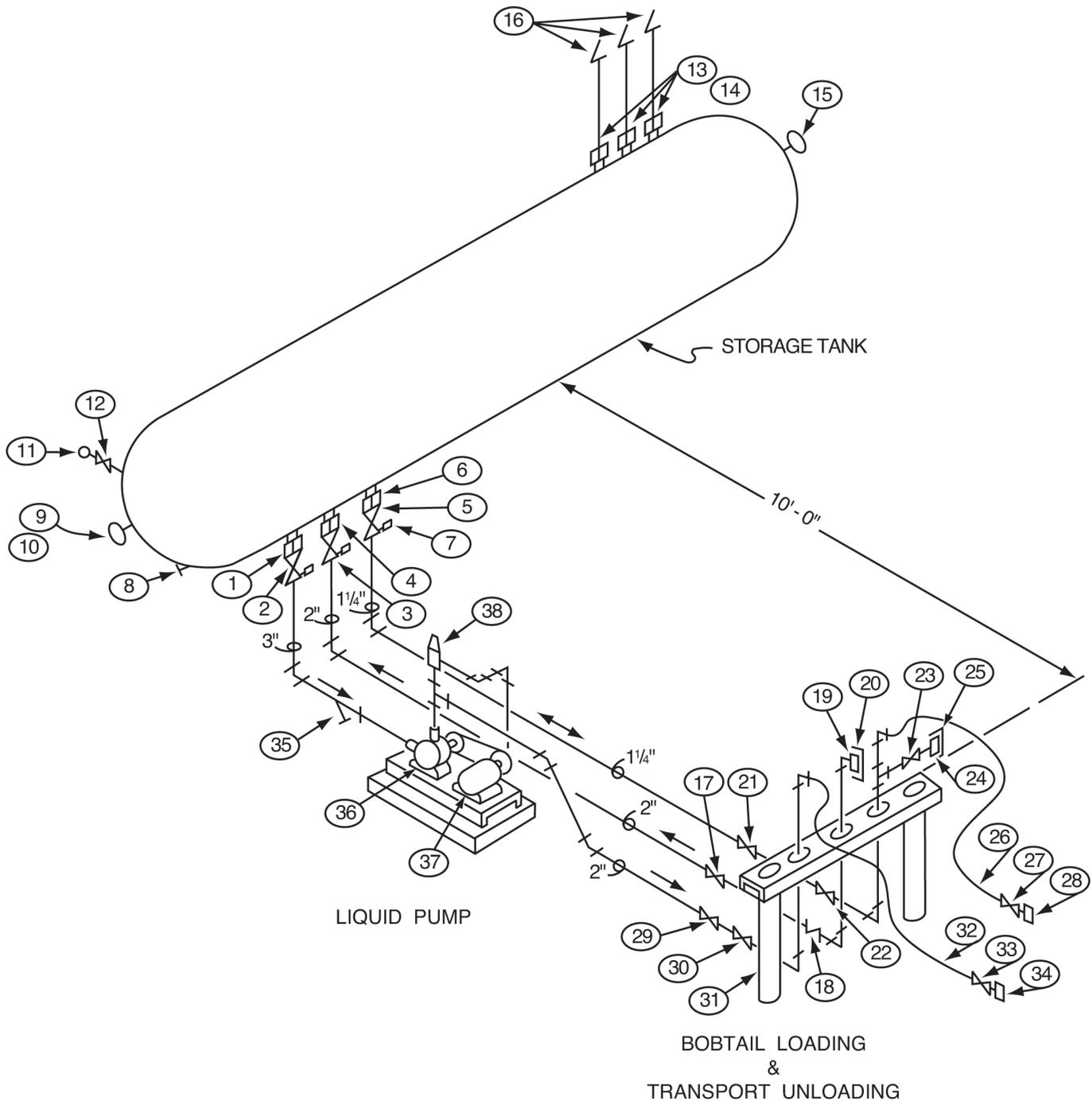
ACME	Part #
1-1/4"	A2797-20R
1-3/4"	A2697-20R
2-1/4"	A3184-8R
3-1/4"	A3194-8R

### Obsolete Multivalve Repair Parts

Multivalve Part #	Replaced By	Container Connection	Repair Kits							
			Service Valve	Filler Valve	Vapor Equalizing					
1470LV, 1480V, 1470W, 1480W	G8475RV, G8475RW	2-1/2" M.	3100-80A, bonnet-diaphragm-stem 3100-80B, diaphragm, washer 3100-81K, conversion, bonnet assy.	1475-80, kit	2418-51, assy.					
2180	8555 for 200# Cyl, 6543 for 420# Cyl	3/4"	No repair parts available, replace due to age	—	—					
2418	G8475RV	2-1/2" F.	7218-5, diaphragm assy.	N/A	2418-51, assy.					
2465, 2486		—								
2550		2418-51, assy.								
2555 Series	6532, 6533, 6542, 6543	3/4", 1"	Replace due to age	—	—					
2557 Series	No replacement	1-1/2"	No repair parts available							
2577	6532, 6533, 6542, 6543	3/4", 1"	No repair parts available, replace due to age	—	—					
2580, 2581	8555D/8555R	3/4"	No repair parts available	—	—					
2593, 2594	8593AL16.0	1-1/2"	3100-80A, bonnet-diaphragm-stem 3100-80B, diaphragm, washer 3100-81K, conversion, bonnet assy.							
2593K, 2594K	8593AL16.0 not a direct replacement			1475-80, kit	2418-51, assy.					
6477A	N/A	2-1/2" M.	8100-50, bonnet assy., handwheel	8475-50, -80	8475-51A, kit					
6532D, 6533D, 6542D, 6543D	—	3/4", 1"	903-50 (lg), 903-51 (sm), kits	6542-50, -80	—					
7555	8555D/R	3/4"	Replace due to age	—						
7556 (mfg. before 1962)	—		2-1/2" F.	8100-50, bonnet assy., handwheel	8475-50, -80					
G8475 (mfg. before 1962)	—									
8477 (mfg. before 1962)	G8475RV	—	19100-50B/19104-50, kit	—	8475-51A, kit					
8484 (mfg. before 1962)	No replacement*									
8484A	—	—	No repair parts available, replace due to age	—	—					
8555 (mfg. before 1962)	8555D/R									
8555S	—	—	903-50 (lg), 903-51 (sm), kits	6542-50, -80	—					
8593K, 8594K (mfg. before 1962)	8593AL16.0					8100-50, bonnet assy., handwheel	8475-50, -80	8475-51A, kit		
8594									—	—
8594/K (mfg. before 1962)									19100-50B/19104-50, kit	8475-50, -80

\*Tanks equipped with obsolete 8484 & 8484A series valve can be retained in service. Please call your local GEC Branch for information.

## Single Bulkhead



**NOTE:**

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**The Bill of Materials on the following page is to be used as a general guide.** The end user MUST follow material guidelines for proper materials where NO BRASS can be used in Anhydrous Ammonia Systems. Follow all guidelines set forth by NFPA #54/NFPA #58/DOT and ANSI requirements for plant installations including local authority having jurisdiction. Contact the LOCAL AHJ or your Gas Equipment Specialist for assistance on materials.

# Bulk Plant Layout - Bill of Materials

## Single Bulkhead

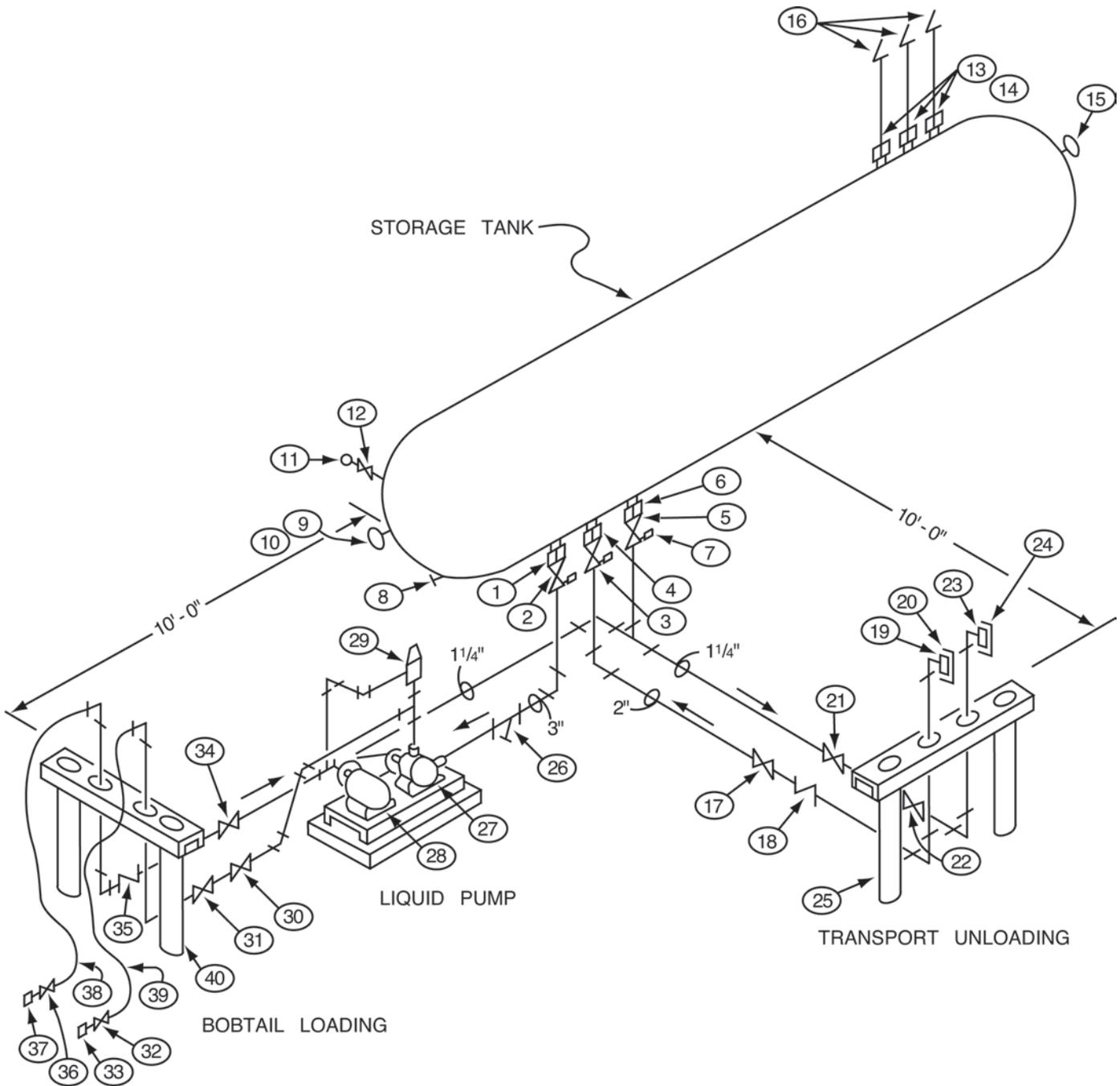
Part #	Ref. No.	Description	Quantity
<b>TANK TRIM</b>			
A3213	1	Rego 3" Internal Valve	1
A3213RA	1	Rego Pneumatic Actuator	1
A7517AP	2	Rego 3" Globe Valve	1
A7513AP	3	Rego 2" Globe Valve	1
A3212	4	Rego 2" Internal Valve	1
A3212RA	4	Rego Pneumatic Actuator	1
A7509BP	5	Rego 1-1/4" Globe Valve	1
A3209	6	Rego 1-1/4" Internal Valve	1
A3209 PA	5	Rego Pneumatic Actuator	1
3127U	7	Rego Hyd. Relief Valve	3
1750-00115	8	Thermometer	1
C6342-11-108	9	Magnetel Gauge	1
22-29	10	Flange Mounting Adapter	1
J5563	11	0-300 Pressure Gauge	1
A2805C	12	Rego Combo Valve	1
7534G	13	Rego Relief Valves	3
7534-20	14	Rego Adapter Pipeaway	3
A9095RS, A9091-18LX, A9091M	15	Rotogage	1
RVS-3	16	Relief Vent Stacks w/Weather Caps	3
<b>BOBTAIL LOADING &amp; TRANSPORT UPLOADING</b>			
A7513AP	17	Rego 2" Globe Valve	1
A7616	18	Rego 2" Swing Check with Flow Indicator	1
5769H	19	Rego 3-1/4" ACME x 2" Adapter	1
A3194-90	20	Rego Cap & Chain	1
A7509BP	21	Rego 1-1/4" Globe Valve	1
A6010	22	Rego 1-1/4" ESV	1
6016RA	22	Rego Rotary Actuator	1
A7509BP	23	Rego 1-1/4" Globe Valve	1
5765F	24	Rego 1-3/4" x 1-1/4" Adapter	1
3175P	25	Rego Cap & Chain	1
E20LP2x15FT	26	1-1/4" Hose w/Couplings	15 ft.
A7509BP	27	Rego 1-1/4" Globe Valve	1
A7575L5	28	Rego Extended Type Hose Coupling	1
A7513AP	29	Rego 2" Globe Valve	1
A6016	30	Rego 2" ESV	1
6016RA	30	Rego Rotary Actuator	1
BH-10CV3-2CPLG	31	3 Port Bulkhead	1
BH-SCH80V3-2CPLG-12IN		3 Port Bulkhead (Texas Approved)	1
L3-32LP3x15FT-F	32	Smarthose 2" Hose w/Coupling	15 ft.
A7513AP	33	Rego 2" Globe Valve	1
A3195S	34	Rego Steel Hose Coupling with Screen	1
<b>LIQUID PUMP</b>			
STYLEC-DI-300	35	3" Strainer	1
	36	3" Pump Unit	1
	37	10 HP Motor	1
BV-200	38	Pump Bypass Valve	1

## Relief Valve Stack



Part #	Description
RVS-3	3" Relief Valve Stack w/Weather Cap
RVS-4	4" Relief Valve Stack w/Weather Cap

## Double Bulkhead



**NOTE:**

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**The Bill of Materials on the following page is to be used as a general guide.** The end user MUST follow material guidelines for proper materials where NO BRASS can be used in Anhydrous Ammonia Systems. Follow all guidelines set forth by NFPA #54/ NFPA #58/DOT and ANSI requirements for plant installations including local authority having jurisdiction. Contact the LOCAL AHJ or your Gas Equipment Specialist for assistance on materials.

# Bulk Plant Layout - Bill of Materials

## Double

Part #	Ref. No.	Description	Quantity
<b>TANK TRIM</b>			
A3213	1	Rego 3" Internal Valve	1
A3213RA	1	Rego Pneumatic Actuator	1
A7517AP	2	Rego 3" Globe Valve	1
A7513AP	3	Rego 2" Globe Valve	1
A3212	4	Rego 2" Internal Valve	1
A3212RA	4	Rego Pneumatic Actuator	1
A7509BP	5	Rego 1-1/4" Globe Valve	1
A3209	6	Rego 1-1/4" Internal Valve	1
A3209 PA	6	Rego Pneumatic Actuator	1
3127U	7	Rego Hyd. Relief Valve	3
1750-00115	8	Thermometer	1
C6342-11-108	9	Magnetel Gauge	1
22-29	10	Flange Mounting Adapter	1
J5563	11	0-300 Pressure Gauge	1
A2805C	12	Rego Combo Valve	1
7534G	13	Rego Relief Valves	3
7534-20	14	Rego Adapter Pipeaway	3
A9095RS, A9091-18LX, A9091M	15	Rotogage	1
11011	16	3" Weather Caps	3
<b>BOBTAIL LOADING &amp; TRANSPORT UPLOADING</b>			
A7513AP	17	Rego 2" Globe Valve	1
A3186	18	Rego 2" Back Check Valve	1
5769H	19	Rego 3-1/4" ACME x 2" Adapter	1
3194-90	20	Rego Brass Cap	1
A7509BP	21	Rego 1-1/4" Globe Valve	1
A6010	22	Rego 1-1/4" ESV	1
6016RA	22	Rego Rotary Actuator	1
5765F	23	Rego 1-3/4" x 1 1/4" Adapter	1
3174-93	24	Rego Cap & Chain	1
BH-10CV2-2CPLG	25	2 Port Vertical Bulk Head w/ 2" 3M Full Couplings	1
BH-SCH80V2-2CPLG-12IN		2 Port Bulkhead (Texas Approved)	1
<b>LIQUID PUMP</b>			
STYLEC-DI-300	26	3" Strainer	1
	27	3" Pump Unit	1
	28	10 HP Motor	1
BV-200	29	Pump Bypass Valve	1
<b>BOBTAIL LOADING</b>			
A7513AP	30	Rego 2" Globe Valve	1
A6016	31	Rego 2" ESV	1
6016RA	31	Rego Rotary Actuator	1
A7513AP	32	Rego 2" Globe Valve	1
A3195S	33	Rego Steel Hose Coupling with Screen	1
A7509BP	34	Rego 1 1/4" Globe Valve	1
A6010	35	Rego 1 1/4" ESV	1
6016RA	35	Rego Rotary Actuator	1
A7509BP	36	Rego 1 1/4" Globe Valve	1
A7575L5	37	Rego Extended Type Hose Coupling	1
E20LP2x15FT	38	1 1/4" Hose w/Couplings	15 ft.
L3-32LP3x15FT-F	39	Smarthose 2" Hose w/Coupling	15 ft.
BH-10CV2-2CPLG	40	2 Port Vertical Bulk Head w/2" 3M Full Couplings	1
BH-SCH80V2-2CPLG-12IN		2 Port Bulkhead (Texas Approved)	1

## Bulkhead

### Standard Construction

Safety Bulkheads are designed to allow the safe transfer of propane at the bobtail loading and transport unloading points in a bulk plant. The bulkhead is Rigid All-Steel construction. It is designed to protect the piping systems against truck pull-away with hose still connected.



#### Standard Construction

These bulkheads are made of 10" channel iron legs and top rail. When anchored in a concrete block (approximately 4 ft. x 4 ft.), the bulkhead becomes a sound wall of protection against most pull-aways.

Part #	Description
<b>BH-10CV2-2CPLG</b>	2-Port Vertical Bulk Head w/2" 3M Full Couplings
<b>BH-10CV2-3CPLG</b>	2-Port Vertical Bulk Head w/3" 3M Full Couplings
<b>BH-10CV3-2CPLG</b>	3-Port Vertical Bulk Head w/2" 3M Full Couplings
<b>BH-10CV3-3CPLG</b>	3-Port Vertical Bulk Head w/3" 3M Full Couplings

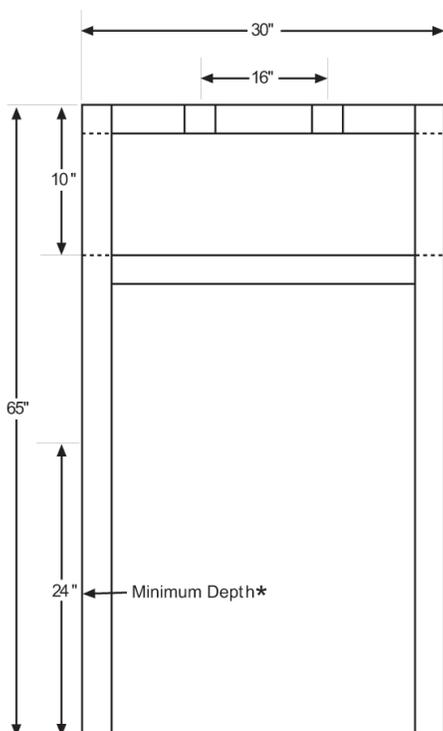
## Bulkhead Piping Kit

### BH-10CV2-PKG



Kit Includes	Description	Qty
<b>EL90-200-2M</b>	FS ELBOW 90 DEGREE 2 INCH AT 2000#	2
<b>REL90-200X114</b>	2" M.NPT X 12" EXTRA HEAVY SCH 80 BLACK PIPE NIPPLE	2
<b>N-200X12</b>	2" M.NPT X 12" EXTRA HEAVY SCH 80 BLACK PIPE NIPPLE	4

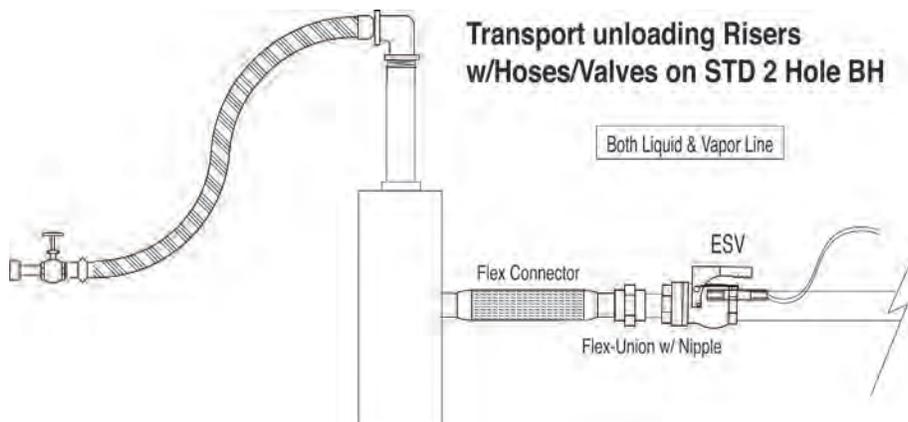
Note: Piping kit for HBH-10CV2-2CPLG bulkhead only



Check with local codes for proper above grade height.

Bulkheads shall be anchored in reinforced concrete to prevent displacement of the bulkhead.

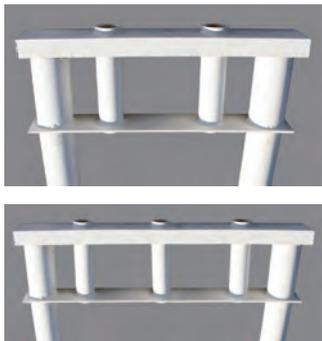
Reinforcement rod not supplied.



## Bulkhead

### 12" Coupling Construction - Texas Approved

Safety Bulkheads are designed to allow the safe transfer of propane at the bobtail loading and transport unloading points in a bulk plant. The bulkhead is Rigid All-Steel construction. It is designed to protect the piping systems against truck pull-away with hose still connected.



#### 12" Coupling

These bulkheads are built to comply with the Railroad Commission of Texas regulations for bulkhead design; they incorporate 4" schedule 80 pipe legs with a channel iron top rail and 12" long full couplings welded between the top rail and kick plate.

Part #	Description
<b>BH-SCH80V2-2CPLG-12IN</b>	2-Port Vertical Bulk Head w/2" 3M Full Couplings
<b>BH-SCH80V2-3CPLG-12IN</b>	2-Port Vertical Bulk Head w/3" 3M Full Couplings
<b>BH-SCH80V3-2CPLG-12IN</b>	3-Port Vertical Bulk Head w/2" 3M Full Couplings
<b>BH-SCH80V3-3CPLG-12IN</b>	3-Port Vertical Bulk Head w/3" 3M Full Couplings

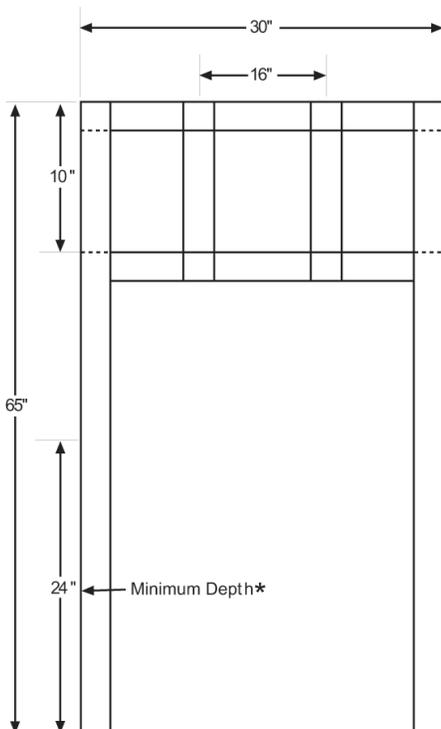
## Bulkhead Piping Kit - Texas Approved

### BH-SCH80V2-FTG-PKG



Kit Includes	Description	Qty
<b>EL90-200-2M</b>	FS ELBOW 90 DEGREE 2 INCH AT 2000#	2
<b>REL90-200X114</b>	2" X 1-1/4" REDUCING 90 DEGREE ELBOW 3000#	2
<b>N-200X12</b>	2" M.NPT X 12" EXTRA HEAVY SCH 80 BLACK PIPE NIPPLE	2
<b>N-200X4</b>	EXTRA HEAVY WELDED BLACK PIPE NIPPLE 2 X 4	2

Note: Piping kit for BH-SCH80V2-2CPLG-12IN bulkhead only



Check with local codes for proper above grade height.

Bulkheads shall be anchored in reinforced concrete to prevent displacement of the bulkhead.

Reinforcement rod not supplied.

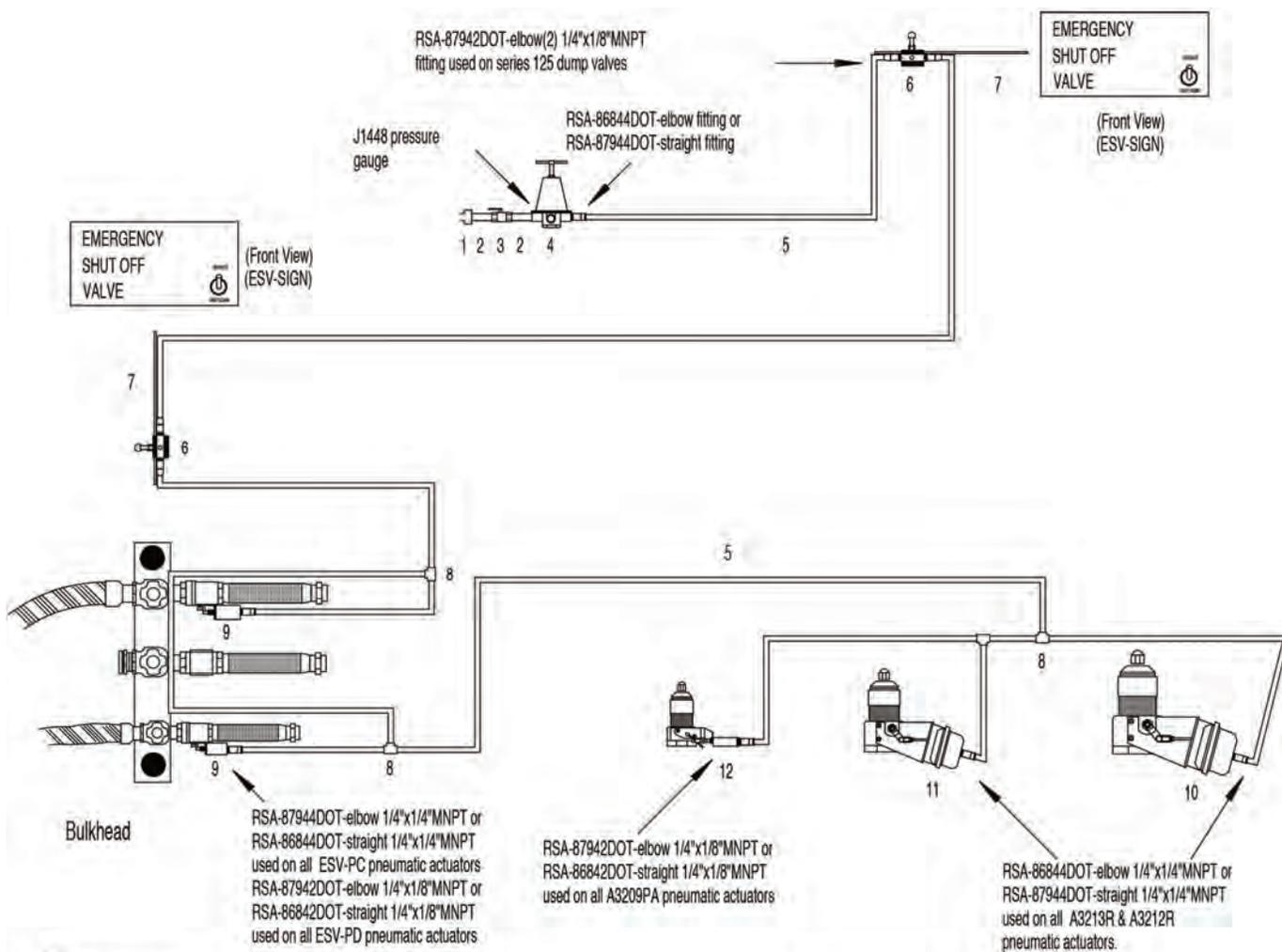
## Smart-Hose Break-Away Coupler



For more information see Smart-Hose in the Hose Section

Part #	Size	Ends	Length	Application
<b>L3-32LP3-FBA</b>	2"	FNPT X FNPT	12"	LPG
<b>L3-32LP3-MBA</b>	2"	MNPT X MNPT	12"	LPG
<b>A80-016-95-0012-0-00-00</b>	2"	FNPT X MNPT	12"	
<b>A80-024-97-0018-0-00-00</b>	3"	MNPT X MNPT	18"	LPG/NH3
<b>A80-024-97-0018-0-1121-1121</b>	3"	FNPT X FNPT	18"	LPG/NH3
<b>L3-32NH3-FBA</b>	2"	FNPT X FNPT	12"	NH3
<b>L3-32NH3-MBA</b>	2"	MNPT X MNPT	12"	NH3

## Bulk Plant Pneumatic Layout



Note:  
Pneumatic tubing should be routed and affixed to risors to provide pull-away protection

Note:  
If Nitrogen is used to power pneumatic actuators, replace 597FD (#4) with approved regulator.

Note:  
Set Pressure at 25-30psi

Note:  
Check Local Regulations Before Proceeding with Pneumatic Installation

Note:  
Layout Not Drawn to Scale

Part #	Ref. No.	Description
PL-631-54	1	1/4" M x 1/4" F with 54 orifice
N014XC	2	1/4" x Close Nipple
T-100-014	3	1/4" Ball Valve
597FD	4*	Rego Adjustable Regulator
RSA-PTSAE	5	1/4" Pneumatic Tubing
125V-3-10-20	6	Dump Valve
ESV-SIGN	7	ESV Aluminum Sign with Hole for Toggle
RSA-86444DOT	8	1/4" Tubing Tee
ESV-PC	9**	Pneumatic Actuator Open/Close
ESV-PD	9**	Pneumatic Actuator Close
A3213R	10**	Rego Pneumatic Actuator
A3212R	11**	Rego Pneumatic Actuator
A3209PA	12**	Rego Pneumatic Actuator

\*Can be substituted for air or inert gas regulator

\*\*See drawing for information on Straight or Elbow fittings

## Pneumatic Fittings



Part #	Description
125V-3-10-21	Discharge Valve with Base



Part #	Description
125V-3-10-20	Pneumatic Toggle Valve, 3-way, with Locknut



Part #	Description
RSA-M3820602	Lexair 3-way actuated valve



Part #	Description
RSA-57444DOT	1/4" Tube x 1/4" Tube x 1/4" Female NPT Tee



Part #	Description
ESV-SIGN	Aluminum "Emergency Shutoff Valve" Sign 5-1/2" x 9-1/2" Red on White (valve not included)



Part #	Description
ESV-SIGN-R	Metal "Emergency Shutoff Valve" Sign 29" x 15-1/2" Red on White (valve not included)



Part #	Description
RSA-PTSAE	1/4" Pnuematic Tube 100 ft Roll



Part #	Description
RSA-86244DOT	1/4" Tube Union



Part #	Description
RSA-87242DOT	1/4" Tube x 1/4" Tube x 1/8" NPT Tee



Part #	Description
RSA-86444DOT	1/4" Tubing Tee



Part #	Description
RSA-87244DOT	1/4" Tube x 1/4" Tube x 1/4" NPT Tee



Part #	Description
RSA-87942DOT	1/4" Tube x 1/8" NPT Swivel Elbow



Part #	Description
RSA-86544DOT	1/4" x 1/4" Tube Elbow



Part #	Description
RSA-87944DOT	1/4" Tube x 1/4" NPT Swivel Elbow



Part #	Description
RSA-86842DOT	1/4" Tube x 1/8" NPT Straight



Part #	Description
RSA-86844DOT	1/4" Tube x 1/4" NPT Straight

## SQE Super Quick Exhaust Valve



The universal design of this valve allows it to be used as a SUPER QUICK EXHAUST VALVE or a SHUTTLE VALVE. With the molded shuttle design, the Super Quick Exhaust valves have an operating range as low as 1 psi to 150 psi.

SQE: NFPA limits the pneumatic supply line size to a maximum of 3/8" OD. To reduce closing time of internal valves and ESV's, a SQE valve can be installed in lengthy tubing runs to reduce the closure times.

SHUTTLE VALVE: The shuttle valve can provide for control of internal valves with individual bulkhead ESV's control from multiple bulkhead control station locations without hindering other operators.

Specifications Required
Media: Compressed Air (Consult factory for others)
Operating Speeds: Up to 600 CPM
Materials: Zinc & Aluminum Die Cast, Zinc Plated Steel Fasteners, Buna N, Polyurethane
Temperature Range: -25°F to 180°F (-31.7°C to 82.2°C)

Part #	Port Size		
	In	Out	Exhaust
SQE1	1/8"	1/8"	1/4"
SQE2	1/4"	1/4"	1/4"

## Self-Contained Compressor System

### Parafour Eco-Air Series



P4-Eco-Air



P4-Eco-Air-Lite

The P4-ECO-Air Series, Self-Contained Compressor Systems, offer Autogas station operators, bulk plant and distribution systems a unique and reliable way to operate pneumatic controls, with little or no maintenance, and no ongoing cost of consumables (either compressed nitrogen, or tank pressure propane vapor).

- Operating Temperature Range = -45°C to 55°C
- Operating Voltage = 120v 60 Hz or 220v 50 Hz (Specify when ordering.)
- Circuit Protection = 10 amp supplemental breaker (requires minimum 10 amp primary service breaker)
- Enclosure = NEMA 4X / 12 / 13, Poly enclosure, metal enclosure is optional
- Output Pressure range = 30-60 psi (2-4.5 bar) field adjustable
- Reservoir Size = Eco-AIR unit is 1 US gallon (7.5 litres), ECO Air-Lite has no reservoir
- Reservoir storage pressure = 80-120 PSI (5.5 – 8.5 bar)
- Min pressure / recharge point = 40 psi
- Compressor Maintenance = NONE
- Regulated Outlet Pressure = 0-100 psi gauge

Part #	Actuators Controlled	Storage Reservoir	Water Drain	Indicator Lamps	External Alarm
<b>P4-Eco-Air</b>	21	Yes	Automatic	1-Power, 1-Fault	Yes - Visual and/or Audible
<b>P4-Eco-Air-Lite</b>	3	No	Manual	1-Power	No

## Cylinder Filling Pump



These 1" motor speed pumps have long been popular for cylinder filling, small volume motor fueling & supplying small vaporizers. They offer the same heavy-duty construction of larger Blackmer models. Available in two mounting styles & capacity ranges.



### C-Face Mounting — Direct Motor Drive

Pumps in the LGF Series mount directly to standard C-Face, 1750 rpm motors with flexible coupling. LGF1 pumps use a 1 hp motor as standard and LGF1P pumps use a 1-1/2 hp motor as standard. Standard motors for these pumps are single-phase, 115/230 volt, right-hand rotation, explosion-proof construction, with automatic reset thermal overload protection. U.L. listed & suitable for continuous duty. An explosion-proof manual switch is also available for mounting either at the motor or at a remote location.

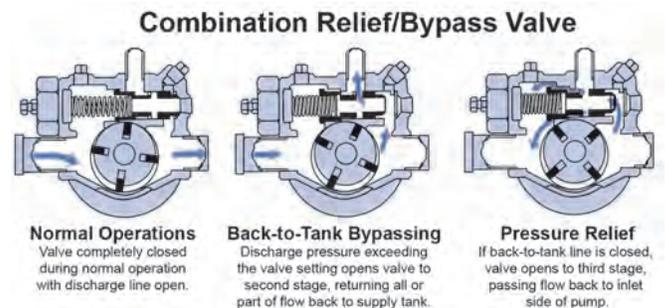
### Base Mounting — Direct Motor Drive

LGB1 Series pumps have brackets for foot-mounting to a conventional baseplate. The mounted pump is furnished with a flexible shaft coupling for connection to a standard motor. These units are designated as LGB1-DM or LGB1P-DM. Motors for these units are shipped to customer specifications. Coupling guard included.

Part #	Description	Factory Relief Valve Setting	Pump & Motor Speed	Approx. Delivery of Propane @ Diff. Pressures & Pump Speeds		Motor Size (HP)	Normal Time to Fill LP Gas Cylinders (Min.)		Max. Diff. Pressure in PSI for Continuous Duty Rated @	Shaft Size
				50 PSI Diff.	100 PSI Diff		20 lb.	100 lb.		
LGF1E	1" Flange Mounted C-Face Style	105 PSI	1,750 RPM	8	6	1	3/4	3	105	11/16
LGF1PE		120 PSI	1,750 RPM	13	10	1.5	1/2	2	120	11/16
LGB1E	1" Bracket Mounted DM Style	105 PSI	1,750 RPM	8	6	1	3/4	3	105	11/16
LGB1PE		120 PSI	1,750 RPM	13	10	1.5	1/2	2	120	11/16

## Built-in Combination Valve Eliminates Cost of Separate Bypass Valves

Built into the LGF1 & LGB1 Series pump is a patented "combination" valve acting as a back-to-tank bypass valve & as an internal relief valve. This feature lowers installation costs by eliminating the need for a separate bypass valve. It also assures pressure relief if the back-to-tank bypass line is closed. The valve's unique three-stage operation is illustrated to the right.



## LGL150 Series Autogas Pump

### High Differential Pressure Pump



Designed for use with single and dual hose fuel dispenser in above or underground applications.

Part #	Max. Speed	GPM	HP	Maximum Differential Pressure	Recommended Bypass Valve Setting	Relief Valve Setting	Maximum Working Pressure
LGL158	1750	32.3	7.5	200 PSI	200 PSI	225 PSI	425 PSI

## Ebsray RC Series Autogas Pump

### Regenerative Turbine Pump for Liquefied Gas Applications



The Ebsray RC Series Regenerative Turbine Pumps are single-stage regenerative turbine pumps designed and precision built for high-pressure transfer of LPG, and Autogas.



Part #	Inlet	Outlet	Pump Speed	Approx. Delivery in GPM		Motor Size	Max. Diff. Pressure PSI
				110 PSI Diff	160 PSI Diff		
RC20	1" FNPT	1" FNPT	3500	13	10	3 HP	200
RC25	1" FNPT	1" FNPT	3500	23	19	5 HP	200
RC40	1-1/2" FNPT and ANSI Flange	1" FNPT and ANSI Flange	3500	45	39	5 HP / 7.5 HP	200

## Multi-Cylinder & Motor Fuel Filling Pumps



These motor-speed pumps offer higher capacities than the LGF1/B1 Series pumps. They are suited to a variety of small transfer jobs, but are especially popular for multi-station cylinder-filling systems. They are equipped with a built-in relief valve and are fitted for both LP Gas or anhydrous ammonia service. These pumps are designed for foot-mounting. All of the pumps are equipped with replaceable cylinder liners and end discs, permitting rebuilding of the pump to like new condition.

#### C-Face Mounting - Direct Motor Drive

This drive is available for the LGLF1-1/4 & LGLF1-1/2 Series pumps. The pump is mounted to a steel baseplate and furnished with a flexible shaft coupling for connection to a standard motor. A coupling guard is included.

#### Base Mounting - Direct Motor Drive

This drive is available for the LGL1-1/4 & LGL1-1/2 Series pumps. The pump is mounted to a steel baseplate and furnished with a flexible shaft coupling for connection to a standard motor. A coupling guard is included.

Part #	Description	Pump & Motor Speed (RPM)	Approx. Delivery In GPM Propane		Motor Size (HP)	Max. Diff. Pressure in PSI	Max. Motor Size to Mount On Standard Base	Shaft Size
			50 PSI Diff.	100 PSI Diff.				
LGLF11/4A	1-1/4" Flange Mount for C-Face Motor	1750	21	18	2	150	215T	7/8
LGL11/4	1-1/4" Foot Mount	1750	21	18	2	150	215T	7/8
LGLF11/2A	1-1/2" Flange Mount for C-Face Motor	1750	33	29	3	150	215T	7/8
LGL11/2	1-1/2" Foot Mount	1750	33	20	3	150	215T	7/8

## Multi-Purpose Pumps for Bulk Plants, Terminals & Truck Systems



These workhorse pumps have long been popular for a broad range of service on bobtails, transports, vaporizers and bulk transfer service. The LGLD2 and LGLD3 are particularly suited to bobtails, because they offer a double shaft extension. This permits use of the pump by either right or left handed PTO rotation simply by reversing the position in which the pump is mounted.

Models in these series are fitted for either LP Gas or anhydrous ammonia service. All of the pumps are equipped with replaceable cylinder liners and end discs, permitting rebuilding of the pump to like new conditions.

### High Capacity Liquefied Gas Pump



Blackmer's LGLD4 pump is fitted with a special cavitation suppression liner for optimum performance & extended service life. UL listed for handling butane, propane & anhydrous ammonia, this durable pump is ideal for rapid loading & unloading of transports and bob-tails or bulk plant service. Flow rates range from 130 to 270 GPM with differential pressures up to 125 psi.

### V-Belt Drive Style Pumps



These units have high torque V-belts and quick disconnect sheaves. Sheaves are thinner, which puts them closer to the bearings, reducing the stress on both motor and pump shafts. Sheaves and hubs are a two-part assembly that comes apart easily. Units come complete with belt guard pump mounted to base plate, and a motor.

Part #	Size	RPM	GPM*	HP*	Max. Diff. Pressure
LGLD2E	2"	420	40	3	150 PSI
LGLD2E	2"	520	50	5	150 PSI
LGLD2E	2"	640	65	5	150 PSI
LGLD3F	3"	420	80	5	150 PSI
LGLD3F	3"	520	108	7.5	150 PSI
LGLD3F	3"	640	133	10	150 PSI
LGLD4B	4"	420	170	10	125 PSI
LGLD4B	4"	520	220	15	125 PSI
LGLD4B	4"	640	270	20	125 PSI

\* Differential Pressure = 50 PSI

Note: Delivery depends on system design, pipe sizing and valve capacity.

### High Pressure Liquefied Gas Pump



Based on Blackmer's industry standard LGLD2 transfer pump, the LGLH2 has the muscle to handle the toughest jobs. Whether pumping from a bobtail to the top of an 8-story building or feeding a vaporizer in the middle of winter — the LGLH2 can do it. The LGLH2 is dimensionally interchangeable with the LGLD2.

Part #	Performance at 145 psid Differential Pressure			Max. Diff. Pressure	Relief Valve Setting	Maximum Working Pressure
	780 rpm	640 rpm	520 rpm			
LGLH2	61 gpm	47 gpm	32.6 gpm	165 psi	190 psi	390 psi

## Cold Climate 4" LPG Pump



Utilizing upgraded materials, the CCLGLD4A pump is good for cold weather installations. Minimum temperature ratings on standard ductile-iron pumps is -25°F. THE CCLGLD4 pump is certified to -40°F. NOTE: This pump is NOT UL listed.



Part #	Factory Relief Valve Setting	Pump Speed (RPM)	Approx. Delivery of Propane at Diff. Pressure and Pump Speeds Shown (1) (GPM)		Maximum Differential Pressure	Maximum Working Pressure (2)
			50 PSI	100 PSI		
CCLGLD4-VB	150 PSI	340	130	90	125	350
	150 PSI	420	170	130	125	350
	150 PSI	520	220	180	125	350
	150 PSI	640	270	220	125	350
CCLGLD4-HRB	150 PSI	400	160	120	125	350
	150 PSI	500	210	170	125	350
	150 PSI	640	270	220	125	350

(1) Check the pump's delivery and brake horsepower requirements to the performance curves on spec sheet. See footnote with the curves which explains the factors that can cause delivery to vary.

(2) Maximum rated working pressure is 350 PSI for LPG and NH3.

(3) Maximum horsepower the standard drive (V-Belt/gearbox and base) will transmit.

(4) Motors may be specified.

## LGL 3021 Series



Based on Blackmer's industry standard LGLD3 transfer pump, the LGL3021 replaces competitive pumps without changing piping connections or motor drives. Whether filling an LPG bobtail or transport - the LGL3021 can do it faster and more efficiently than competitive models.



Part #	Size	Maximum Speed	GPM*	HP	Max. Diff. Pressure	Maximum Working Pressure
LGL3021	3" or 4" NPT Flange, Nodular	800 RPM	155	15	150 PSI	350 PSI

\* Approximate delivery of propane at 800 RPM at 100 PSI differential pressure.

## Liquid Transfer Assembly



Pre-plumbed "Loop" Bobtail-Truck-Storage loading and transport unloading. Available with 2" or 3" pumps. Approximate GPM are 50, 120, and 250 respectively 2", 3", and 4".



Part #	Pump Size	Capacity
LGLD2-VB-NH	2"	50 GPM
LGLD3-VB-NH	3"	112 GPM
LGLD4-VB-NH	4"	220 GPM

Please specify size and phase of explosion proof motor.

Note: Capacity calculated using 100 PSI differential at 640 RPM

## Blackmer Flange Mounted Pumps for Transports and Bobtails



**For Transport Service**  
The TLGLF4 series transport pump is designed to mount to 4" internal valves. It is suitable for both LP Gas and Anhydrous Ammonia service. Ideal intake conditions assure maximum pumping rates and the shortest possible transport turnaround time.

An auxiliary intake port next to the mounting flange can be used for emergency unloading of another tank or transport. Rated for differential Pressures to 125 psi, the pump has twin discharge ports which permit the use of two hoses, if necessary to reduce pressure loss when unloading into restrictive receiving systems.

### For Bobtail Service

The TLGLF3 pump series flange mounts directly to the truck tank in combination with a flanged internal control valve. Because it eliminates the intake line and related restrictions to flow, it also eliminates the vaporization problem caused by them. That means longer pump life and higher effective pump capacity. The pump is rated to 125 psi differential.

The TLGLF3 pump is suitable for both LP Gas and Anhydrous Ammonia. A double shaft extension is standard, making the pump suitable for either right or left-hand PTO rotation. The pumps is equipped with replaceable cylinder liners and end discs, permitting rebuilding of the pump to like-new conditions.

Part #	Description	Suction Flange	Discharge Flange	Pump Speed (RPM)	Maximum Working Pressure (PSI)	Maximum Differential Pressure
TLGLF3C	Flange Mounted	3" 300# ANSI	2" NPT	650	350	150 PSID
TLGLFD4B	Flange Mounted	4" 300# ANSI	2" NPT	650	350	150 PSID

## Bypass Valves



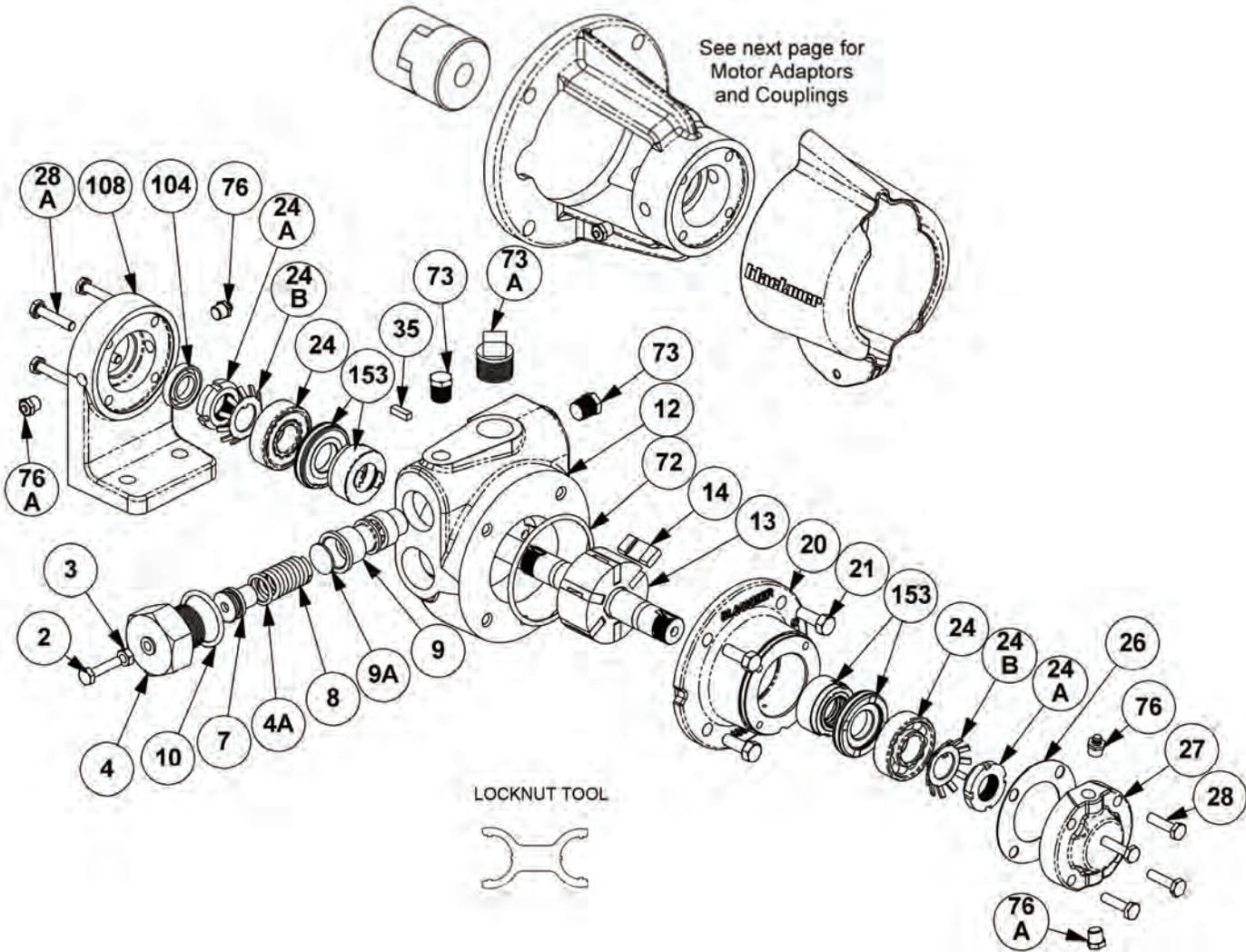
Part #	Common Applications	Used with Blackmer Pump Model	Ports	Max. Rated Flow* - GPM @			
				20 PSI	50 PSI	80 PSI	120 PSI
BV-034	Cylinder Filling Systems	1-1/4" or 1-1/2" Either Valve	3/4" NPT Tapped	25	40	50	60
BV-100	Cylinder Filling Systems	1-1/4" or 1-1/2" Either Valve	1" NPT Tapped	25	40	50	60
BV-114	Bobtail Trucks or Smaller Bulk Plant Systems	2" or 3" Either Valve	1-1/4" NPT Tapped	60	80	100	125
BV-112	Bobtail Trucks or Smaller Bulk Plant Systems	2" or 3" Either Valve	1-1/2" NPT Tapped	60	80	100	125
BV-200	Transports or Large Bulk Plant Systems	3" and 4"	2" NPT Companion Flanges	150	180	220	250

\* Normal maximum bypass flow rates without significantly exceeding the set pressure limit.

## Ebsray RV18 Bypass Valve



Part #	Flow Rate	Differential Pressure	Hydrostatic Test Pressure
RV18	52	203	155



Part #	Ref. No.	Description	Parts Per Pump
432901	2 (2)	Adjusting Screw – Relief Valve (R/V)	1
922811	3 (2)	Locknut – Adjusting Screw	1
412901	4	Cover – R/V	1
711940	4A (1)(2)	O-Ring – Spring Guide	1
422901	7 (2)	Spring Guide – R/V	1
472901	8 (2)	Spring – R/V	1
452901	9 (2)	Valve – R/V	1
442901	9A (2)	Disc – R/V	1
701965	10 (2)	O-Ring – R/V Cover	1
022914	12	Cylinder – LGF1, LGB1	1
022915	12	Cylinder – LGF1P, LGB1P	1
262907	13	Rotor & Shaft Assembly, Six Vane (Includes Ref. Nos. 24A & 24B)	1
092913	14 (1)	Vane – Duravane	6
032905	20	Head	1
920178	21	Capscrews – Head	4
903405	24 (1)	Ball Bearing	2
903531	24A	Locknut – Bearing	2
903532	24B	Lockwasher – Bearing	2
383075	26 (1)	Gasket – Bearing Cover	1

Part #	Ref. No.	Description	Parts Per Pump
043071	27	Bearing Cover	1
920080	28	Capscrews – Bearing Cover	4
920090	28A	Bracket Mounting Screws	4
909152	35 (1*)	Key – Shaft, Square	1
711941	72	O-Ring – Head	1
908198	73	Gage Plug (1/4")	2
908225	73A	Gage Plug (3/4")	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
331934	104 (1)	Grease Seal	1
832913	108	Mounting Foot - LGB1(P)E	1
903090	—	Tool - Locknut	—
899094	—	Kit – RV Maintenance	—
898994	—	Kit – Maintenance (6-Vane)	—

1—Included in Maintenance Kit.

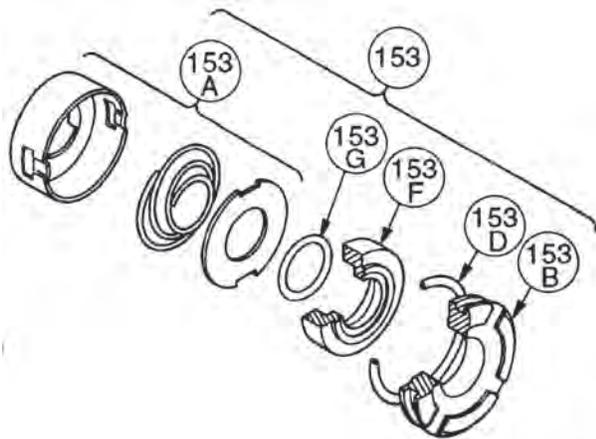
2—Included in RV Kit.

3—Install the vanes with the slot facing the direction of rotation.

4—Maintenance Kit also includes Woodruff Key 909126 used previously

## Models: LGF1E, LGB1E, LGF1PE, LGB1PE

### Mechanical Seal

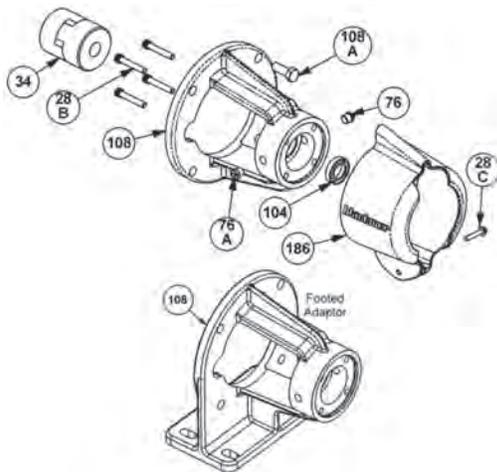


Part #	Ref. No.	Description	Parts Per Pump
332920	153 (1)	Mechanical Seal Assembly	2
**	153A**	Jacket Assembly – Seal	2
**	153B**	Stationary Seat (Steel)	2
711916	153D	O-Ring – Stationary Seat (Buna-N)	2
**	153F**	Seal Face (Carbon)	2
711939	153G	O-ring – Rotating (Buna-N)	2

1—Included in Maintenance Kit.

\*\* Ref. Nos. 153A, 153B & 153F are not available as separate repair parts.

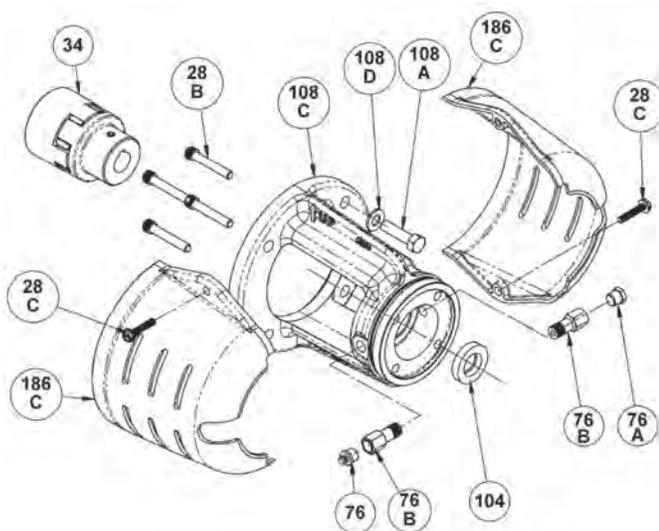
### NEMA C-Faced Motor Adaptors – LGF Models



Part #	Ref. No.	Description	Parts Per Pump
920101	28B**	Motor Adaptor Mounting Screws	4
920026	28C	Guard Screw	1
906150	34	Coupling Half – Pump	1
906151	34	Coupling Half – Motor 56C	1
906147	34	Coupling Half – Motor 143/145TC, 184C	1
906155	34	Coupling Spider	1
832912	108	Motor Adaptor – Unfooted	1
833000	108	Motor Adaptor- Footed	1
920331	108A	Capscrew – Motor Adaptor	4
804120	186	Guard	1

\*\* Ref. Nos. 153A, 153B & 153F are not available as separate repair parts.

### IEC Motor Adaptors – LGF Models



Part #	Ref. No.	Description	Parts Per Pump
920101	28B	Motor Adaptor Mounting Screws	4
920026	28C	Guard Screw	2
906183	34	Coupling Half – Pump	1
906176	34	Coupling Spider	1
906186	34	Coupling Half – Motor (IEC 90)	1
317815	76	Grease Fitting	1
701992	76A	Grease Relief Fitting	1
701905	76B	Extension Coupling	2
331934	104	Grease Seal	1
920043	108A	Capscrew – Motor Adaptor to Motor	4
832920	108C	Motor Adaptor (IEC90 B14A) Includes Ref. Nos. 76, 76A & 76B	1
792094	108D	Washer	4
804196	186C	Guard Half	2

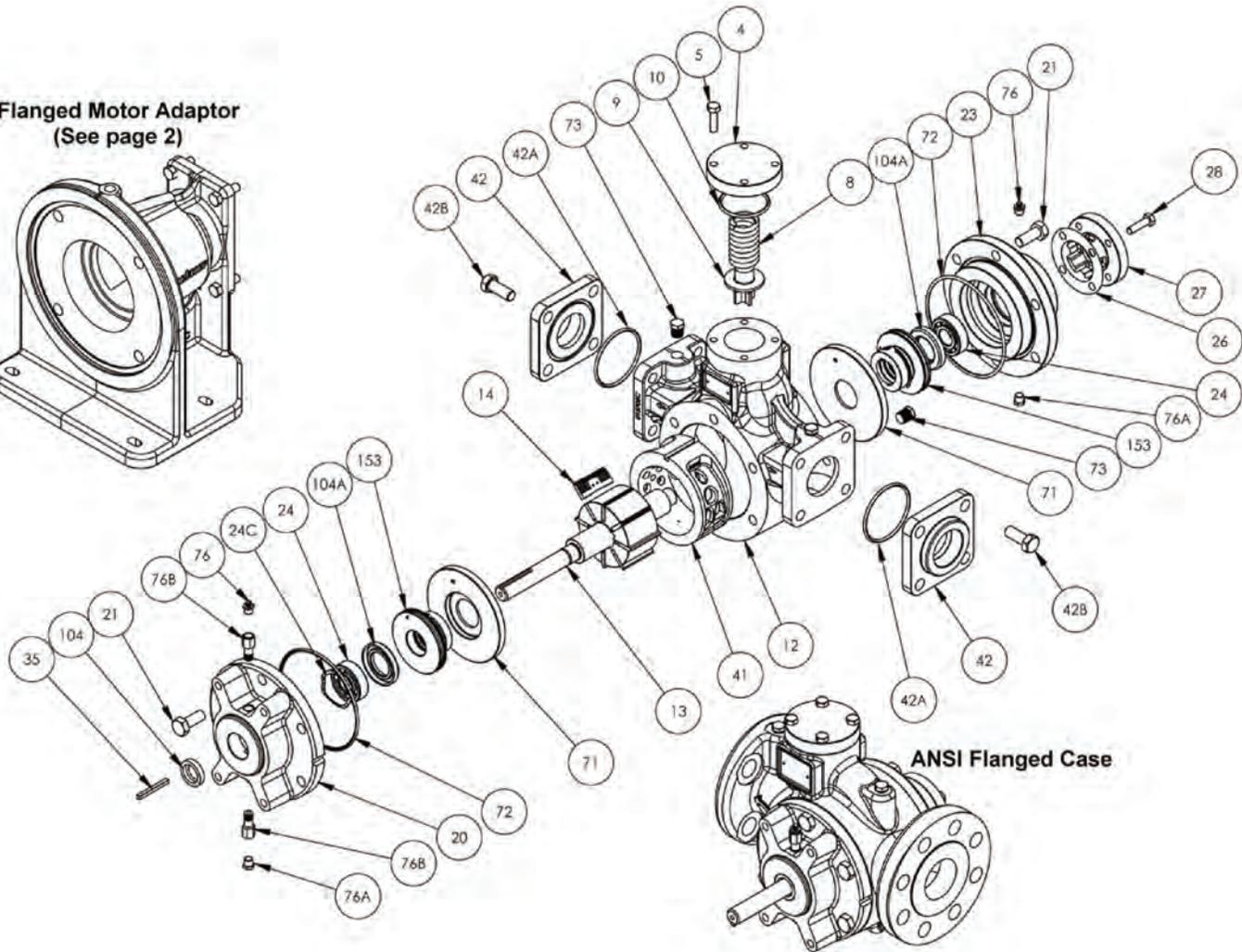
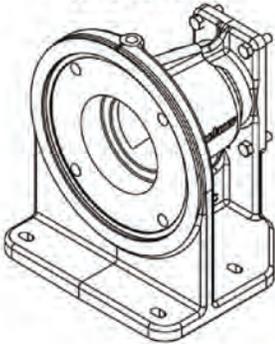
**Models: LGL156C, LGL158C**

**Discontinued Models: LGL154C**



Pumps & Compressors

**Flanged Motor Adaptor**  
(See page 2)



**ANSI Flanged Case**

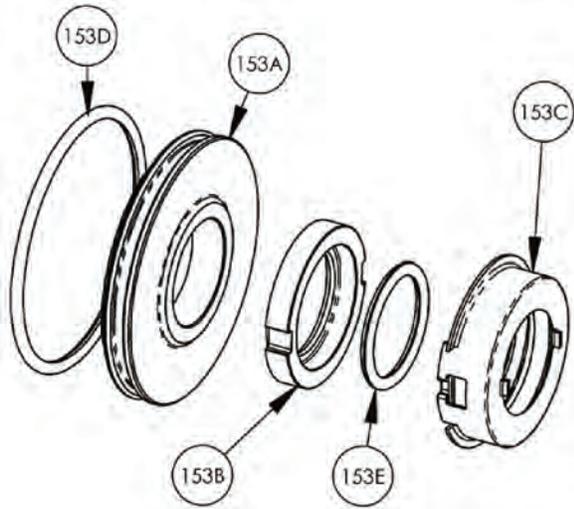
Part #	Ref. No.	Description	Parts Per Pump
415701	4	Cover - Relief Valve (R/V)	1
920122	5	Capscrews - R/V Cover	4
471400	8	Spring - R/V (225 psi)	1
455701	9	Valve - R/V	1
711924	10 (1)	O-Ring - R/V Cover	1
015705	12	Casing - 4 Bolt Flange	1
015702	12	Casing - ANSI Flange	1
265703	13	Rotor & Shaft Asy.	1
094860	14 (1)	Vane - Duravane	8
035705	20	Head Inboard	1
920468	21	Capscrews - Head	12
035703	23	Head Outboard	1
903148	24 (1)	Ball Bearing	2
903187	24C (1)	Bearing Spring	1
905172	26 (1)	Shim Kit (6 ea: .002", .005" & .010")	Varies
045701	27	Bearing Cover	1
920122	28	Capscrews - Bearing Cover	4
909153	35 (1)	Key - Shaft	1
185701	41	Liner (LGL158)	1
185710	41	Liner (LGL156)	1

Part #	Ref. No.	Description	Parts Per Pump
185711	41	Liner (LGL154)	1
See Flanges	42	Flanges	See Flanges
065701	71 (1)	Disc	2
702169	72 (1)	O-Ring - Head	2
908198	73	Gage Plug	2-4
909177	74	Key - Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
701905	76B	Grease Fitting Extension	2
331921	104 (1)	Grease Seal - Outer	1
335702	104A (1)	Grease Seal - Inner	2
899222	—	Kit - Maintenance	—
455750	—	Priming Valve (for Underground Tank Installations)	—

1—Included in Maintenance Kit.

## Models: LGL156C, LGL158C

### Mechanical Seal - LPG



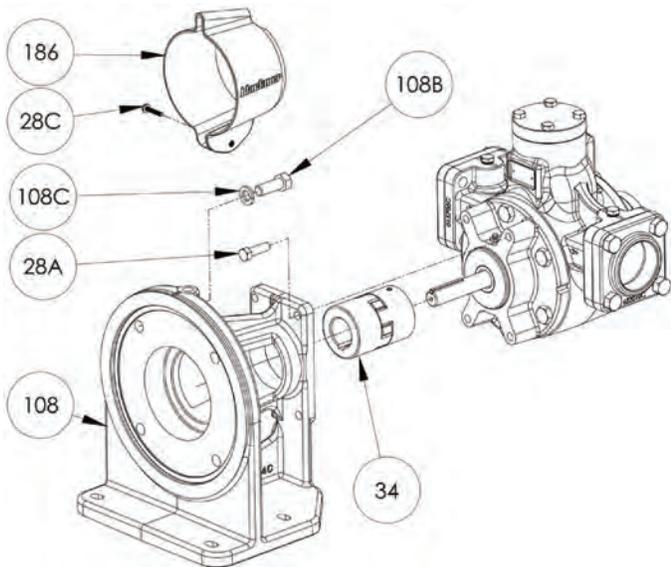
Part #	Ref. No.	Description	Parts Per Pump
335703	153 (1)	Mechanical Seal Assembly - SNCN	2
**	153A	Stationary Seat (Steel)	2
**	153B	Seal Face (Carbon)	2
**	153C	Jacket Assembly	2
701934	153D	O-Ring - Stationary (Buna-N)	2
711917	153E	O-Ring Rotating (Buna-N)	2

1—Included in Maintenance Kit and Rebuild Kit.

\*\*Mechanical Seal Ref. No. 153 is only sold as a complete assembly.

Ref. Nos. 153A, 153B & 153C are not available as separate replacement parts.

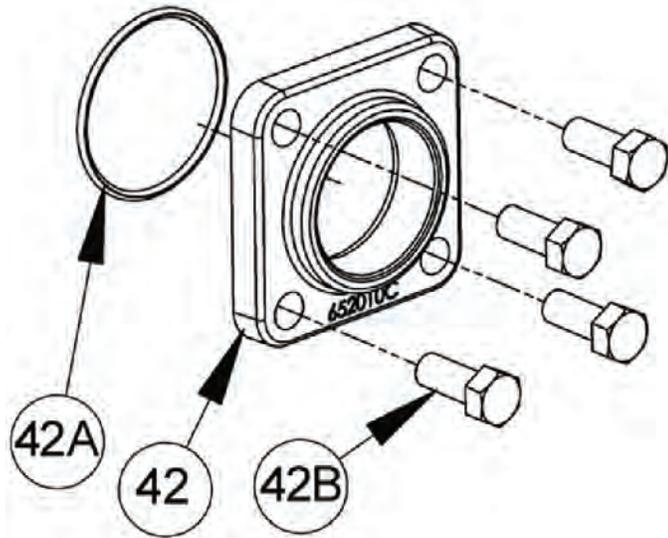
### Flanged Motor Adapter



Part #	Ref. No.	Description	Parts Per Pump
920026	28C	Guard Screw	1
920359	28A	Bracket Mounting Screws	4
906033	34	Coupling Half – Pump (NEMA)	1
906181	34	Coupling Half – Pump (IEC)	1
906034	34	Coupling Spider (NEMA)	1
906178	34	Coupling Spider (IEC)	1
906164	34	Coupling Half – Motor (182TC, 184TC, 215C)	1
906032	34	Coupling Half – Motor (213TC, 215TC)	1
906180	34	Coupling Half – Motor (IEC 112)	1
906179	34	Coupling Half - Motor (IEC 132)	1
833004	108	Mounting Bracket – NEMA	1
833005	108	Mounting Bracket – IEC 100/112 B5	1
833006	108	Mounting Bracket – IEC 132 B14	1
098277	108B	Motor Mounting Screw (NEMA)	4
920055	108B	Motor Mounting Screw (IEC 100/112)	4
920050	108B	Motor Mounting Screw (IEC 132)	4
909706	108C	Lockwasher (NEMA)	4
909707	108C	Lockwasher (IEC 100/112)	4
793095	108C	Lockwasher (IEC132)	4
804120	186	Guard	1

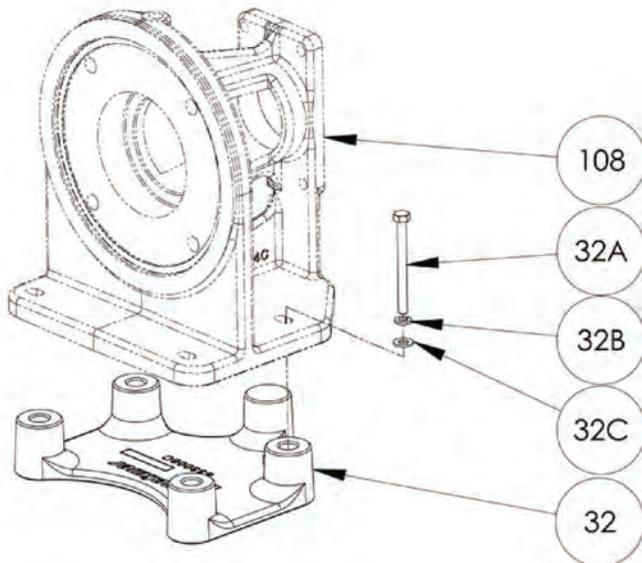
## Models: LGL156C, LGL158C

### Flange Options (4 bolt flange cases)



Part #	Ref. No.	Description	Parts Per Pump
652010	42	Flange – 2" NPT	2
652024	42	Flange – 2" Slip-on Weld	2
655109	42	Flange – 2" Socket Weld El	2
652028	42	Flange – 1.5" NPT	2
652026	42	Flange – 1.5" Slip-on Weld	2
652029	42	Flange – 1.25" NPT	2
652027	42	Flange – 1.25" Slip-on Weld	2
702004	42A	O-Ring – Flange (Buna-N)	2
920491	42B	Capscrews – Flange	8

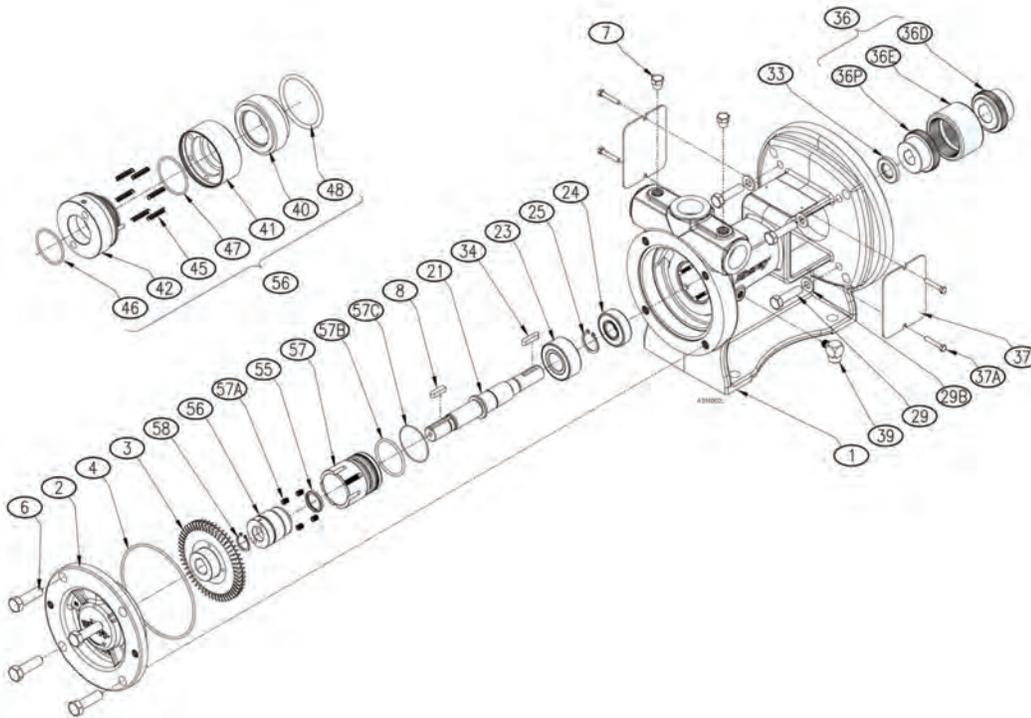
### Optional Riser Spacer



Part #	Ref. No.	Description	Parts Per Pump
833008	32	Bracket Riser	1
920246	32A	Capscrews - Bracket	4
909613	32B	Mounting Lockwashers	4
790494	32C	Mounting Washers	4

## Models: Ebsray RC20 & RC25

### Repair Parts



Part #	Ref. No.	Description	Qty
815722	1	Body - NEMA - RC20	1
815727	1	Body - NEMA - RC25	1
815723	2	Cover - RC20	1
815728	2	Cover - RC25	1
815724	3	Impeller - RC20	1
815729	3	Impeller - RC25	1
815701	4	O-Ring – Cover - RC20	1
815701	4	O-Ring – Cover - RC25	1
—	6	Hex Head Capscrew, M12-1.75x40	4
908198	7	Plug –Gauge Tap	2
—	8	Key – Impeller, Steel 6x6x20	1
815702	21	Shaft	1
815703	23	Ball Bearing – Impeller End	1
815704	24	Ball Bearing – Motor End	1
815705	25	Circlip – Bearing	1
815706	33	Dust Seal - Bearing	1
—	34	Key – Pump Shaft, Steel 6x6x20	1
815750	36	Coupling Assembly - 0.875 Motor Shaft, NEMA 140TC, 184C	1
815751	36	Coupling Assembly - 1.125 Motor Shaft, NEMA 180TC, 215C	1
—	36	#36D Half Coupling – 0.875 Motor Shaft	0-1
—	36	#36D Half Coupling – 1.125 Motor Shaft	0-1
—	36	#36E Coupling Element	1
—	36	#36P Half Coupling – Pump	1
815707	37	Coupling Guard	2
—	37A	Hex Head Capscrew – Coupling Guard, M5-0.8x30	4
—	38	Plug - Spare Port	1
815708	39	Seal Drain Elbow	1

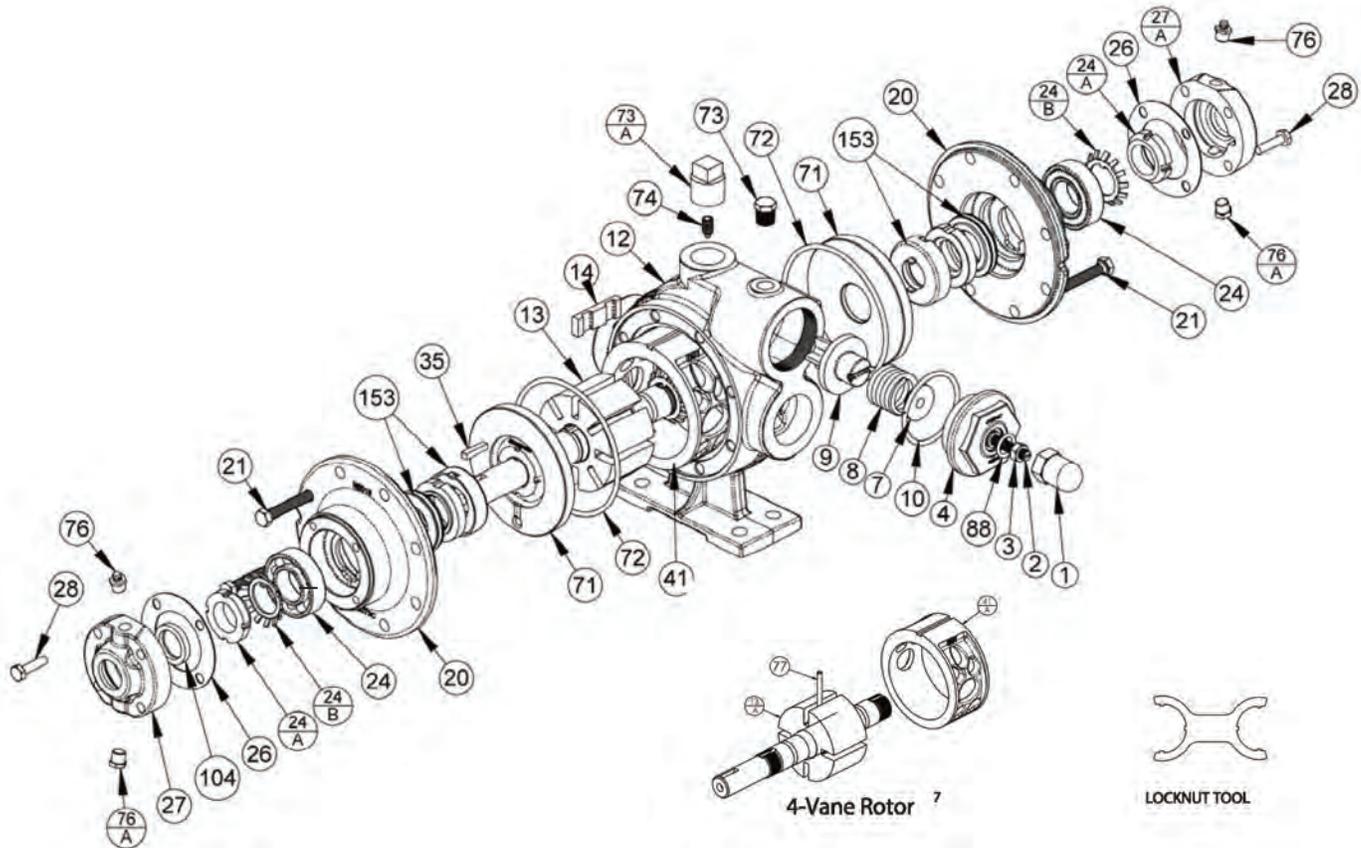
Part #	Ref. No.	Description	Qty
815710	55	Lip Seal - Secondary Seal	1
815709	56	Mechanical Seal Assembly	1
—	40	Seal Seat	1
—	41	Rotating Seal Face	1
—	42	Seal Sleeve	1
—	45	Seal Spring	6
—	46	O-Ring – Shaft	1
—	47	O-Ring – Seal Sleeve	1
—	48	O-Ring – Seal Seat	1
815711	57	Cartridge - Mechanical Seal	1
—	57A	Oval Point Setscrew, 1/4-28x0.375	4
815712	57B	O-Ring – Cartridge Primary	1
815713	57C	O-Ring – Cartridge Secondary	1
815714	58	Circlip - Mechanical Seal	1
815715	—	Shaft Assembly, All items marked 1	1
<b>Motor Attachment - NEMA 140TC, 184C</b>			
—	29	Hex Head Capscrew - 0.375-16 x 1.50	4
—	29B	Spring Lock Washer - 0.375	4
<b>Motor Attachment - NEMA 180TC, 215C</b>			
—	29	Hex Head Capscrew - 0.500-13 x 2.00	4
—	29B	Spring Lock Washer - 0.500	4
SPARE PARTS			
When ordering spare parts, ALWAYS quote the pump Serial Number located on the nameplate of the pump.			

**Models: LGRL1.25, LGL1.25, LGL1.5, LGRLF1.25A, LGLF1.25A, LGLF1.5A**



## Repair Parts

Pumps & Compressors



Part #	Ref. No.	Description	Parts Per Pump
413200	1	Cap – Relief Valve (R/V)	1
433909	2	Adjusting Screw – R/V	1
922923	3	Locknut – Adjusting Screw	1
413076	4	Cover – R/V	1
423955	7	Spring Guide – R/V	1
471428	8	Spring – R/V (81 – 150 psi)	1
453077	9	Valve - R/V	1
711924	10 (1)	O-Ring – R/V Cover	1
013075	12	Casing with feet (1.25)	1
013376	12	Casing with feet (1.5)	1
262300	13 (2)	Rotor & Shaft Assembly, Eight	1
262300	13 (2)	Vane (with Ref. Nos. 24A & 24B)	1
093088	14 (1)	Vane – Duravane	8
033073	20	Head	2
920276	21	Capscrews – Head	16
903114	24 (1)	Ball Bearing	2
903534	24A (2)	Locknut – Bearing	2
903533	24B (1)	Lockwasher – Bearing	2
383075	26 (1)	Gasket - Bearing Cover	2
043070	27	Bearing Cover – Inboard	0-1
043071	27A	Bearing Cover – Outboard	1
920080	28	Capscrews – Bearing Cover	8
909152	35 (1)(3)	Shaft Key	1

Part #	Ref. No.	Description	Parts Per Pump
183019	41 (2)	Liner – LGRL(F)1.25 [8 - Vane Only]	1
183020	41 (2)	Liner – LGL(F)1.25 [8 - Vane Only]	1
183310	41 (2)	Liner – LGL(F)1.5 [8 - Vane Only]	1
063075	71 (1)	Disc	2
701918	72 (1)	O-Ring – Head	2
908198	73	Gage Plug (1/4")	1
908225	73A (4)	Gage Plug (3/4")	1
922088	74	Setscrew – Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
701949	88 (1)	O-Ring – R/V Cap	1
331927	104 (1)	Grease Seal	1
903090	—	Tool - Locknut	—
898976	—	Kit - Maintenance [8 Vane]	—
899076	—	Kit - Rebuild LGRL(F)1.25(A) [8 Vane]	—
899077	—	Kit - Rebuild LGL(F)1.25(A) [8 Vane]	—
899078	—	Kit - Rebuild LGL(F)1.5(A) [8 Vane]	—

1—Included in Maintenance Kits and Rebuild Kits.

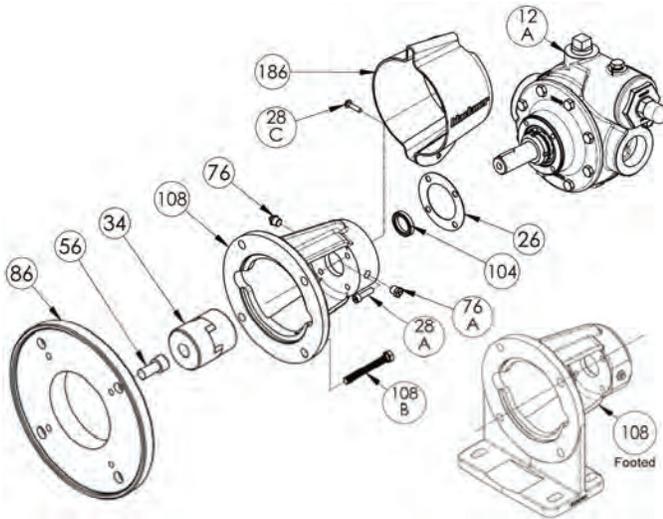
2—Included in Rebuild Kits.

3—Ref. No. 73A: Older pumps may use a 1/4" plug (pn 908198) or 1/2" plug (pn 908215).

4—Ref. No. 35: Early pumps used Woodruff Key 909125.

## Models: LGRLF1.25A, LGLF1.25A, LGLF1.5A

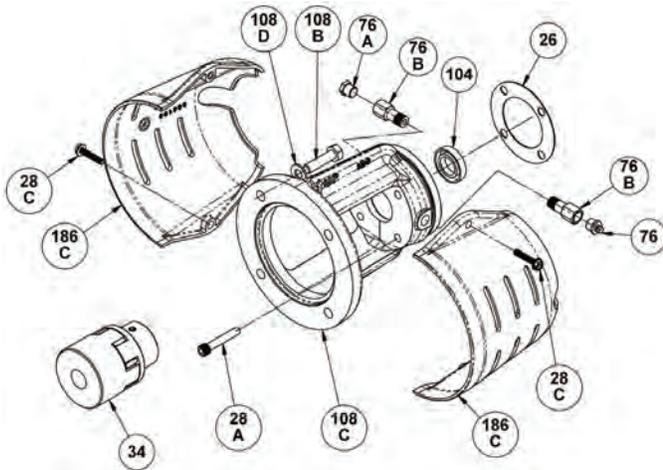
### NEMA C-Face Motor Adapters



Part #	Ref. No.	Description	Parts Per Pump
013077	12A	Casing without Feet – LG(R)LF1.25	1
013377	—	Casing without Feet – LGLF1.5	—
383075	26	Gasket - Bearing Cover	1
920101	28A	Motor Adaptor Mounting Screws	4
920026	28C	Guard Screw	1
906147	34	Coupling Half – Pump	1
906155	34	Coupling Spider	1
906151	34	Coupling Half – Motor (56C)	1
906147	34	Coupling Half – Motor (143TC, 145TC, 184C)	1
906146	34	Coupling Half – Motor (182TC, 184TC, 215C)	1
920480	56	Capscrews – Adapter Ring Mounting	4
317815	76	Grease Fitting	1
701992	76A	Grease Relief Fitting	1
832914	86	Motor Adapter Ring - 182TC, 184TC, 215C	1
331927	104	Grease Seal	1
832912	108	Motor Adaptor – Unfooted (Includes Ref. 76 & 76A)	1
833000	108	Motor Adaptor – Footed (Includes Ref. 76 & 76A)	1
920331	108B	Capscrews - Motor Adaptor	4
804120	186	Guard	1

## Models: LGRLF1.25A, LGLF1.25A, LGLF1.5A

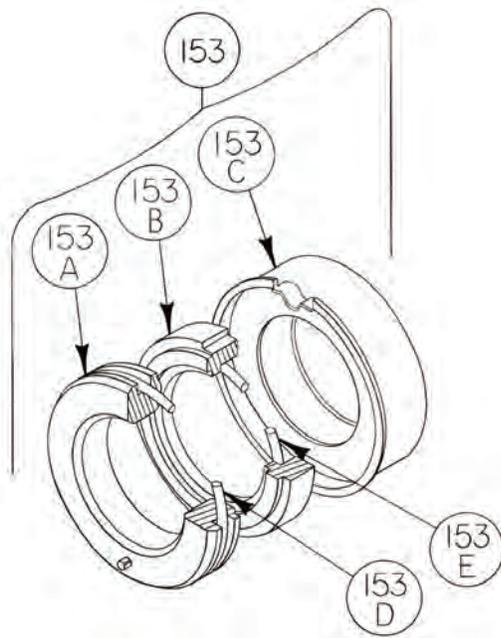
### IEC Flanged Face Motor Adaptor



Part #	Ref. No.	Description	Parts Per Pump
383075	26	Gasket - Bearing Cover	1
920101	28A	Motor Adaptor Mounting Screws	4
920026	28C	Guard Screw	2
906182	34	Coupling Half – Pump (for IEC100/112)	1
906178	34	Coupling Spider (for IEC100/112)	1
906180	34	Coupling Half – Motor (IEC100/112)	1
317815	76	Grease Fitting	1
701992	76A	Grease Relief Fitting	1
701905	76B	Extension Coupling	2
331927	104	Grease Seal	1
920044	108B	Capscrew – Motor Adaptor to Motor	4
832930	108C	Motor Adaptor (IEC 100/112 B14A) Includes Ref. Nos. 76, 76A & 76B	1
792094	108D	Washer	4
804198	186C	Guard Half	2

**Models: LGRLF1.25A, LGLF1.25A, LGLF1.5A**

**Mechanical Seal**



Part #	Ref. No.	Description	Parts Per Pump
333045	153 (1)	Mechanical Seal Assembly	2
**	153A	Stationary Seat ( Hardened Steel )	2
**	153B	Seal Face ( Carbon )	2
**	153C	Jacket Assembly	2
711916	153D	O-Ring – Stationary (Buna-N)	2
711915	153E	O-Ring – Rotating (Buna-N)	2

1—Included in Maintenance Kit.

\*\* Ref. Nos. 153A, 153B & 153F are not available as separate repair parts.

## 4-Vane Rotor/Shaft Parts

Part #	Ref. No.	Description	Parts Per Pump
263076	13A (2)	Rotor & Shaft Assembly, Four Vane	1
263076	13A (2)	(Includes Ref. Nos. 24A & 24B)	1
093088	14 (1)	Vane – Duravane	4
183003	41A (2)	Liner – LGRL(F)1.25 [4 - Vane Only]	1
183004	41A (2)	Liner – LGL(F)1.25 [4 - Vane Only]	1
183301	41A (2)	Liner – LGL(F)1.5 [4 - Vane Only]	1
123004	77 (1)	Push Rod – LGRL(F)1.25	2
123076	77 (1)	Push Rod – LGL(F)1.25	2
123401	77 (1)	Push Rod LGL(F)1.5	2

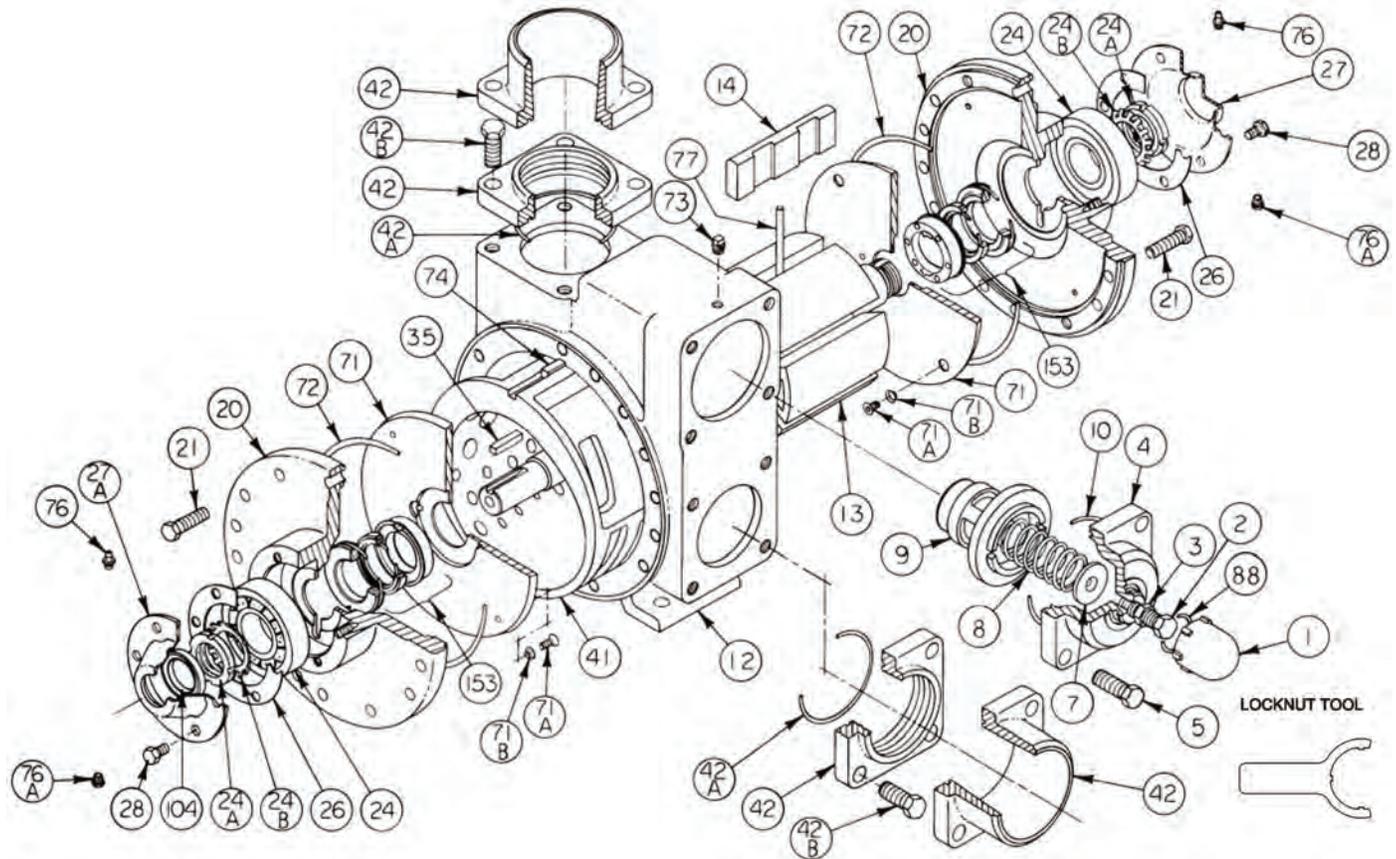
1—Included in Maintenance Kit and Rebuild Kit.

2—Included in Rebuild Kit.

Part #	Description
898917	Kit – Maint LGRL(F)1.25A [4 Vane]
898918	Kit - Maint LGL(F)1.25(A) [4 Vane]
898919	Kit - Maint LGL(F)1.5(A) [4 Vane]
899017	Kit - Rebuild LGRL(F)1.25A [4 Vane]
899018	Kit - Rebuild LGL(F)1.25(A) [4 Vane]
899019	Kit - Rebuild LGL(F)1.5(A) [4 Vane]

## Models: LGL4B

### Repair Parts



Part #	Ref. No.	Description	Parts Per Pump
413957	1	Cap - Relief Valve (R/V)	1
436310	2	Adjusting Screw - R/V	1
432039	3	Locknut - Adjusting Screw	1
412001	4	Cover - R/V	1
920663	5	Capscrew - R/V Cover	4
426355	7	Spring Guide - R/V	1
472039	8 (1)	Spring - R/V	1
452001	9	Valve - R/V	1
701946	10 (1)	O-Ring - R/V Cover	1
012019	12	Casing	1
262023	13	Rotor & Shaft Asy, Single End (Includes Ref. No. 24A & 24B)	1
092019	14 (1)	Vane - Duravane	6
032041	20	Head	2
920532	21	Capscrews - Head	28
903172	24 (1)	Ball Bearing	2
903541	24A	Locknut - Bearing	2
903542	24B (1)	Lockwasher - Bearing	2
385125	26 (1)	Gasket - Bearing Cover	2
041815	27	Bearing Cover - Inboard, LGL4B	1
041817	27A	Bearing Cover - Outboard, LGL4B	1
920285	28	Capscrews - Bearing Cover	12
909183	35 (1)	Key - Shaft	1
182000	41	Liner	1
652012	42	Flange - 3" NPT	1-2

Part #	Ref. No.	Description	Parts Per Pump
652007	42	Flange - 3" Weld	1-2
652005	42	Flange - 4" Weld	1-2
701937	42A (1)	O-Ring - NPT, Weld Flange	2
920663	42B	Capscrew - NPT Flange	8
920640	42B	Capscrew - Weld Flange	8
62039	71 (1)	Disc	2
920015	71A	Machine Screw - Disc	8
909634	71B	Lockwasher - Machine Screw	8
702039	72 (1)	O-Ring - Head	2
908198	73	Gage Plug	2
182040	74	Key - Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
122005	77 (1)	Push Rod - metal - LGL4B	3
701926	88 (1)	O-Ring - R/V Cap	1
331908	104 (1)	Grease Seal - LGL4B	1
903092		Tool - Locknut	
898922		Kit - Maintenance	

1—Included in Maintenance Kit.

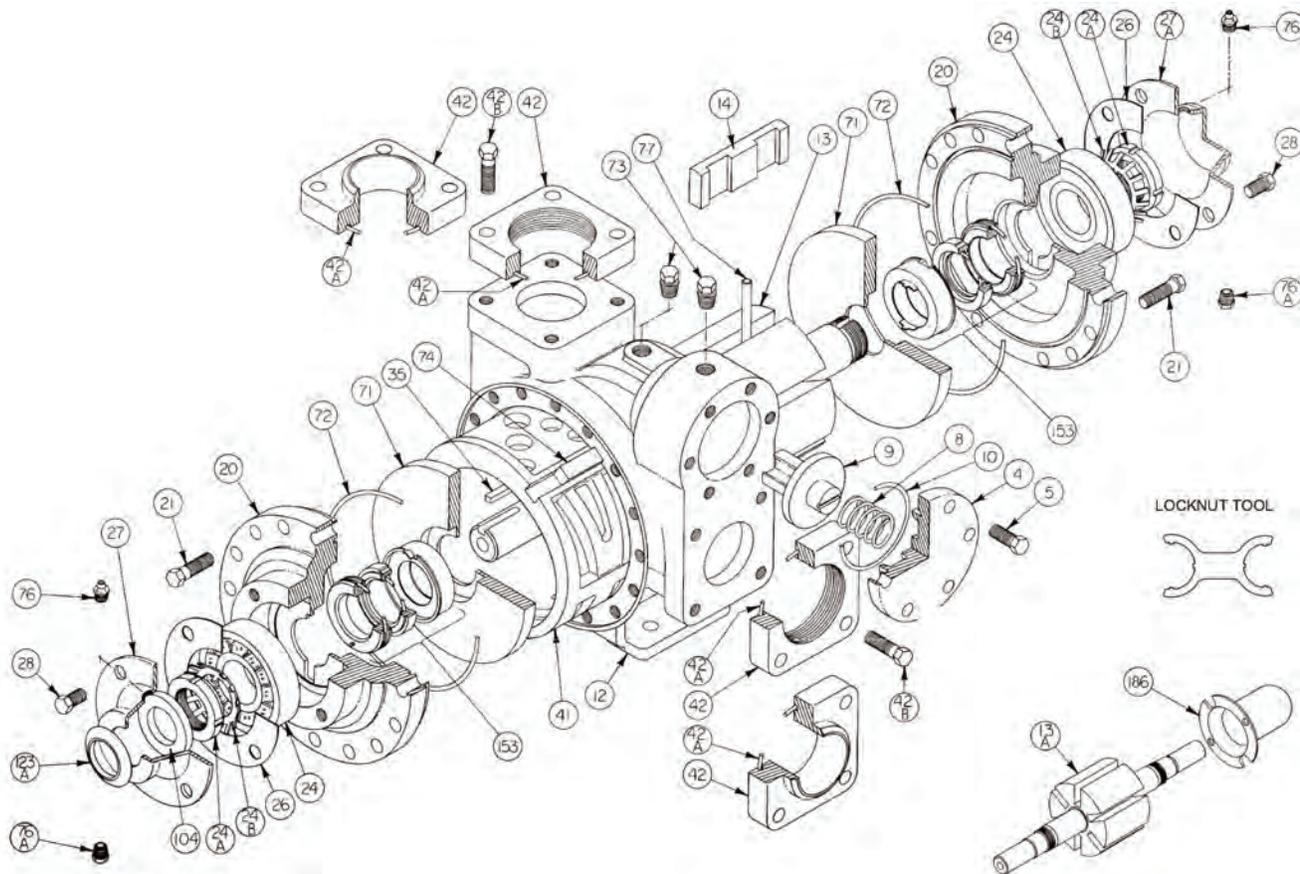
# Blackmer Pump Repair

**Models: LGLD2E, LGL2E, LGLD3F, LGL3F**

**Discontinued Models: LGLD3E, LGL3E**



Pumps & Compressors



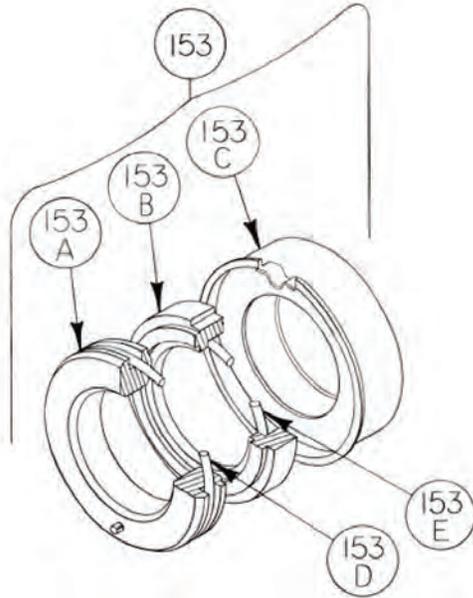
Size 2 Part #	Size 3 Part #	Ref. No.	Description	Parts Per Pump
414401	415113	4	Cover - Relief Valve (R/V)	1
920331	920331	5	Capscrews - R/V Cover	6
471423	475135	8 (1)	Spring - R/V	1
454405	455129	9	Valve - R/V	1
701919	701925	10 (1)	O-Ring - R/V Cover	1
014405	015127	12	Casing	1
264443	265149	13	Rotor & Shaft Asy. - LGL (Includes Ref. Nos. 24A & 24B)	1
264445	265148	13A (2) (5)	Double-Ended Rotor & Shaft Asy. - LGLD (Includes Ref. Nos. 24A & 24B)	1
091419	095131	14 (1)	Vane - Duravane (Std.)	6
034416	035128	20	Head	2
920351	N/A	21	Capscrews - Head (Size 2)	32
N/A	920369	21	Capscrews - Head (Size 3)	40
903156	903166	24 (1)	Ball Bearing	2
903521	903523	24A (2)	Locknut - Bearing	2
903522	903524	24B (1)	Lockwasher - Bearing	2
383940	385125	26 (1)	Gasket - Bearing Cover	2
041431	041815	27 (3)	Bearing Cover (Inboard)	1
041433	041817	27A (4)	Bearing Cover (Outboard)	1
920285	920285	28	Capscrews - Bearing Cover	8 - 12
909209	090209	35 (1)(7)	Key - Shaft, 1/4" Square	1
184405	185111	41 (2)	Liner	1
654401	655112	42	Flange - NPT	2
654405	655102	42	Flange - Weld	2

Size 2 Part #	Size 3 Part #	Ref. No.	Description	Parts Per Pump
702004	702002	42A (1)	O-Ring - Flange	2
920384	920547	42B	Capscrew - NPT Flange	8
920351	920510	42B	Capscrew - Weld Flange	8
064412	065112	71 (1)	Disc	2
702022	702041	72 (1)	O-Ring - Head	2
908198	908198	73	Gage Plug	2
183991	185191	74 (2)(8)	Key - Liner	1
317815	317815	76	Grease Fitting	2
701992	702992	76A	Grease Relief Fitting	2
123905	125110	77 (1) (6)	Push Rod	3
331918	331908	104 (1) (3)	Grease Sea	1
701480	N/A	123A (1) (3)	Dirt Shield	1
341601	341801	186	Shaft Protector (LGLD Models Only)	1
903091	903091	—	Tool - Locknut	—
898979	898981	—	Kit - Maintenance	—
899079	899081	—	Kit - Rebuild	—

1-Included in Maintenance Kit and Rebuild Kit. 2-Included in Rebuild Kit.  
 The following applies to double end shaft pumps (LGLD): 3-Use Two 4-Use None  
 5-Double-Ended Rotor & Shaft. 6-2" pushrod is metal, 3" is composite.  
 7-Pumps before April 2008 used Woodruff key 909130, included in Maintenance kits.  
 8-Pump before 1995 require liner key 184407.

## Models: LGLD2E, LGL2E, LGLD3F, LGL3F

Mechanical Seal - NH3 or Dual Service - SNCN (ID Code = QA)

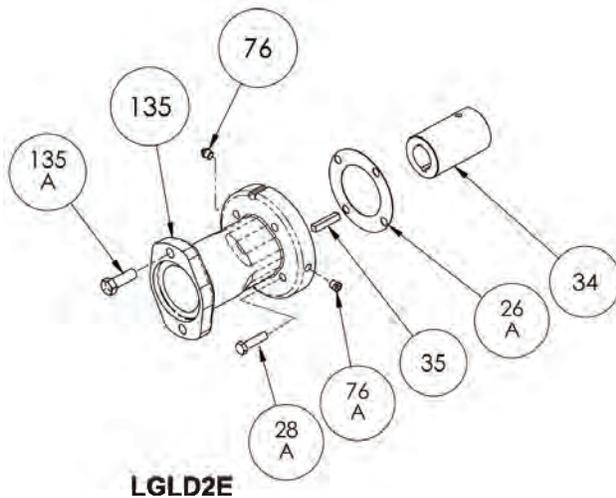


Size 2 Part #	Size 3 Part #	Ref. No.	Description	Parts Per Pump
334439	335225	153(1)	Mechanical Seal Assembly	2
**	**	153A	Stationary Seat (Steel)	2
**	**	153B	Seal Face (Carbon)	2
**	**	153C	Jacket Assembly	2
711924	702025	153D	O-Ring - Stationary (Buna-N)	2
711918	711912	153E	O-Ring Rotating (Buna-N)	2

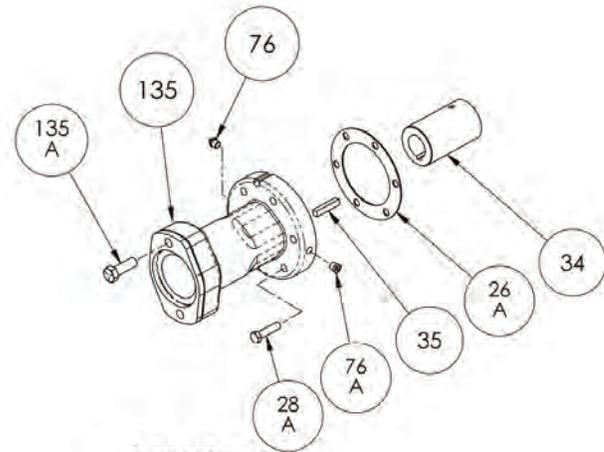
1— Included in Maintenance Kit and Rebuild Kit.

\*\* NOTE: Mechanical Seal Ref. No. 153 is only sold as a complete assembly. Ref. Nos. 153A, 153B & 153C are not available as separate replacement parts.

### Optional Hydraulic Motor Adapter Parts



**LGLD2E**



**LGLD3F**

Part # Size 2 1-1/4" Hyd Motor Shaft	Part # Size 3 1-1/4" Hyd Motor Shaft	Part # Size 3 1" Hyd Motor Shaft	Ref. No.	Description	Parts Per Pump
894425	894425	895140	See Below	Hydraulic Motor Adapter Kit *	See Below
383940	381817	381817	26A	Gasket- Hydraulic Motor Adapter	1
920369	920369	920369	28A	Capscrew – Hydraulic Motor Adapter / Head	4 / 6
906967	906967	906990	34	Coupling w/ Setscrew – straight key hydraulic motor shaft	1
909184	909184	909184	35	Key – Coupling	1
317815	317815	317815	76	Grease Fitting	1
701992	701992	701992	76A	Grease Relief Fitting	1
041827	041831	041831	135	Hydraulic Motor Adapter – SAE A Flange	1
920510	920510	920510	135A	Capscrew – Adapter / Motor	2

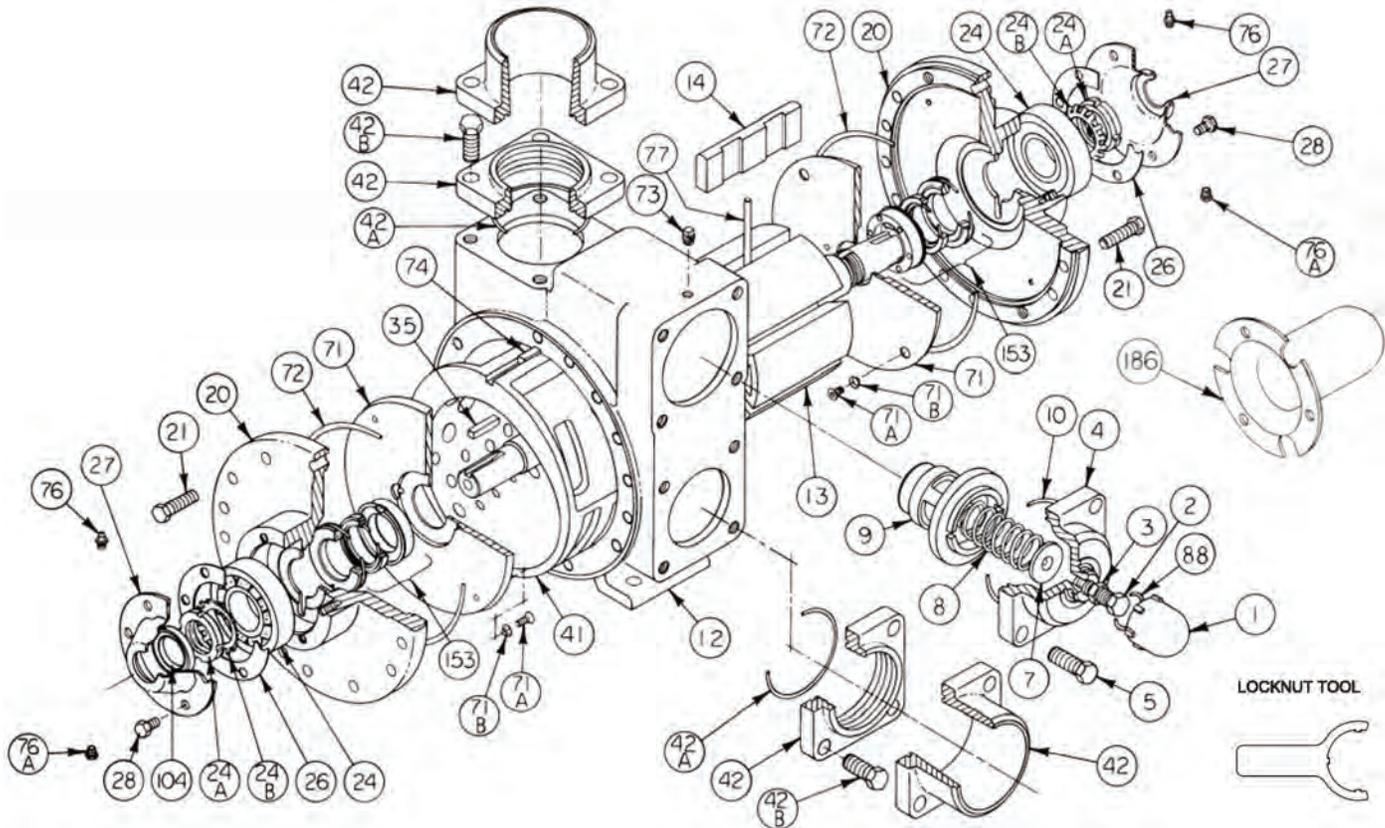
\* Hydraulic Motor Adapter Kits shipped prior to Spring 2002 were of a two piece design – refer to page 206-C00.

## Models: LGLD4B

### Repair Parts



Pumps & Compressors



Part #	Ref. No.	Description	Parts Per Pump
413957	1	Cap - Relief Valve (R/V)	1
436310	2	Adjusting Screw - R/V	1
432039	3	Locknut - Adjusting Screw	1
412001	4	Cover - R/V	1
920663	5	Capscrew - R/V Cover	4
426355	7	Spring Guide - R/V	1
472039	8 (1)	Spring - R/V	1
452001	9	Valve - R/V	1
701946	10 (1)	O-Ring - R/V Cover	1
12019	12	Casing	1
262041	13 (2)	Rotor & Shaft Asy, Dbl. End (Includes Ref. No. 24A & 24B)	1
92019	14 (1)	Vane - Duravane	6
32041	20	Head	2
920532	21	Capscrews - Head	28
903166	24 (1)	Ball Bearing	2
903541	24A (2)	Locknut - Bearing	2
903542	24B (1)	Lockwasher - Bearing	2
385125	26 (1)	Gasket - Bearing Cover	2
041815	27	Bearing Cover - LGLD4B	2
920285	28	Capscrews - Bearing Cover	12
909183	35 (1)	Key - Shaft	1
182000	41 (2)	Liner	1
652012	42	Flange - 3" NPT	1-2
652007	42	Flange - 3" Weld	1-2
652005	42	Flange - 4" Weld	1-2

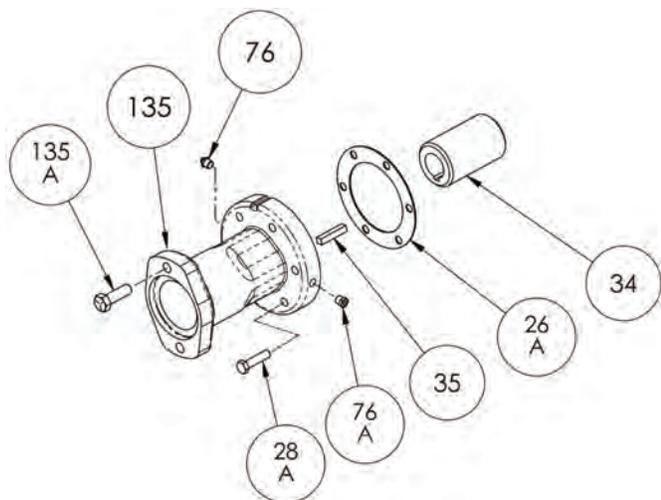
Part #	Ref. No.	Description	Parts Per Pump
701937	42A (1)	O-Ring - NPT, Weld Flange	2
920663	42B	Capscrew - NPT Flange	8
920640	42B	Capscrew - Weld Flange	8
062039	71 (1)	Disc	2
920015	71A (2)	Machine Screw - Disc	8
909634	71B (2)	Lockwasher - Machine Screw	8
702039	72 (1)	O-Ring - Head	2
908198	73	Gage Plug	2
182040	74 (2)	Key - Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
122009	77 (1)	Push Rod - composite - LGLD4B	3
701926	88 (1)	O-Ring - R/V Cap	1
331908	104 (1)	Grease Seal - LGLD4B	2
341801	186	Shaft Protector	1
903092		Tool - Locknut	
898922		Kit - Maintenance	
899022		Kit - Rebuild -LGLD4B	

1—Included in Maintenance Kit and Rebuild Kit.

2—Included in Rebuild Kit only.

## Models: LGLD4B

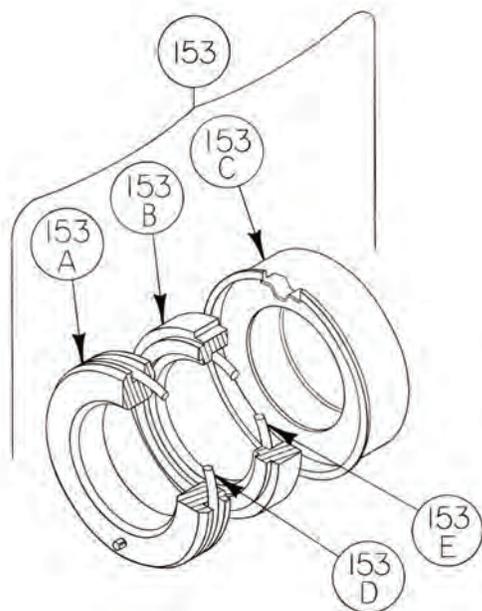
### Hydraulic Motor Adapter Parts



Part #	Ref. No.	Description	Parts Per Pump
892037	—	Hydraulic Motor Adapter Kit *	See Below
<b>Includes Items Listed Below</b>			
381817	26A	Gasket – Hydraulic Motor Adapter	1
920369	28A	Capscrew – Hydraulic Motor Adapter / Head	6
906970	34	Coupling w/ Setscrew – 1.25" straight key hyd. motor shaft	1
909184	35	Key – Coupling	1
317815	76	Grease Fitting	1
701992	76A	Grease Relief Fitting	1
041829	135	Hydraulic Motor Adapter – SAE A Flange	1
920510	135A	Capscrew – Adapter / Motor	2

## Models: LGLD4B & LGL4B

### Mechanical Seal - Standard



Part #	Ref. No.	Description	Parts Per Pump
332050	153 (1)	Mechanical Seal Assembly	2
**	153A	Stationary Seat (Hardened Steel)	2
**	153B	Seal Face (Carbon)	2
**	153C	Jacket Assembly	2
701934	153D	O-Ring - Stationary (Buna-N)	2
711912	153E	O-Ring - Rotating (Buna-N)	2

1—Included in Maintenance Kit and Rebuild Kit.

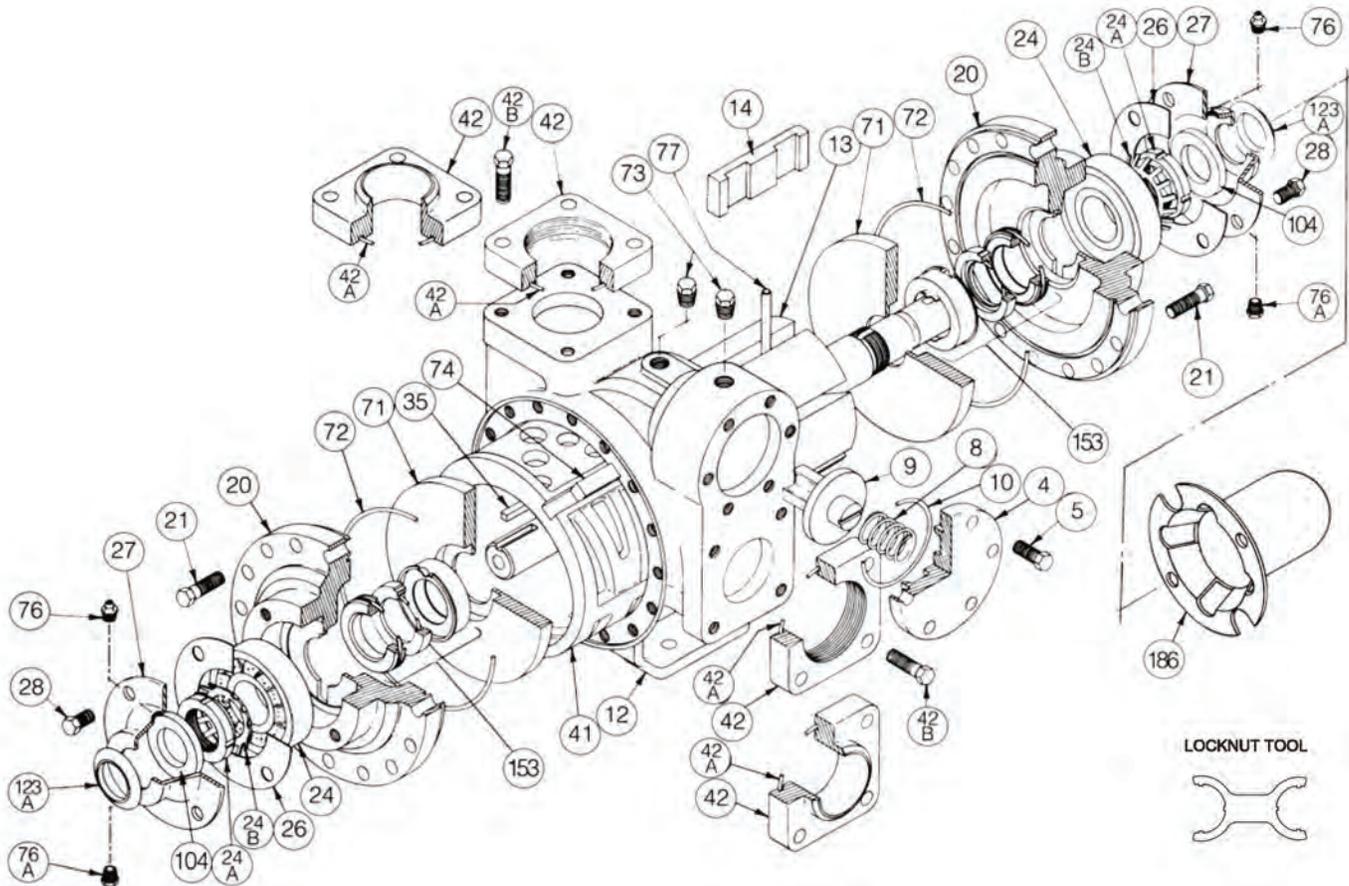
\*\* NOTE: Mechanical Seal Ref. No. 153 is only sold as a complete assembly. Ref. Nos. 153A, 153B & 153C are not available as separate replacement parts

## Models: LGLH2A

### Repair Parts



Pumps & Compressors



Part #	Ref. No.	Description	Parts Per Pump
414401	4	Cover - Relief Valve (R/V)	1
920331	5	Capscrews - R/V Cover	6
471622	8 (1)	Spring - R/V (190 psi)	1
454405	9	Valve - R/V	1
701919	10 (1)	O-Ring - R/V Cover	1
014405	12	Casing	1
264446	13 (2)	Rotor & Shaft Asy. (Includes Ref. Nos. 24A & 24B)	1
091419	14 (1)	Vane - Duravane	6
034416	20	Head	2
920351	21	Capscrews - Head	32
903191	24 (1)	Spherical Roller Bearing	2
903521	24A	Locknut - Bearing	2
903522	24B (1)	Lockwasher - Bearing	2
383940	26 (1)	Gasket - Bearing Cover	2
041431	27	Bearing Cover	2
920285	28	Capscrews - Bearing Cover	8
909209	35 (1)(3)	Key - Shaft	1
184405	41	Liner	1
654401	42	Flange - NPT	2
654405	42	Flange - Weld	2
702004	42A (1)	O-Ring - Flange	2
920384	42B	Capscrew - NPT Flange	8
920351	42B	Capscrew - Weld Flange	8

Part #	Ref. No.	Description	Parts Per Pump
064412	71 (1)	Disc	2
702022	72 (1)	O-Ring - Head	2
908198	73	Gage Plug	2
183991	74	Key - Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
123905	77 (1)	Push Rod	3
331918	104 (1)	Grease Seal	2
701480	123A (1)	Dirt Shield	2
341601	186	Shaft Protector	1
903091	—	Tool - Locknut	—
899221	—	Kit - Maintenance	—
899121	—	Kit - Rebuild	—

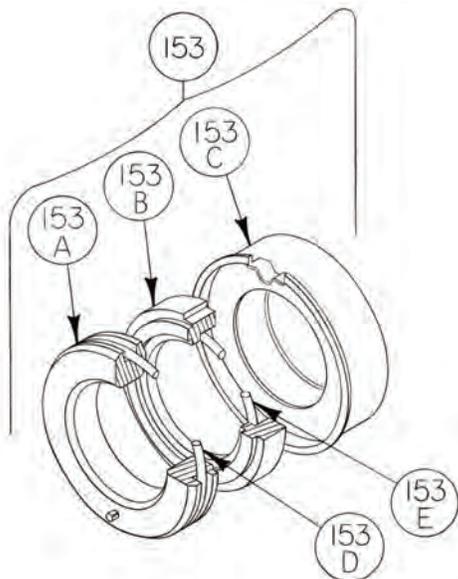
1—Included in Maintenance Kit.

2—Marked "46" on shaft ends.

3—Previous versions used Woodruff Key 909130

## Models: LGLH2A

Mechanical Seal- NH3 or Dual Service - SNCN (ID Code =QA)

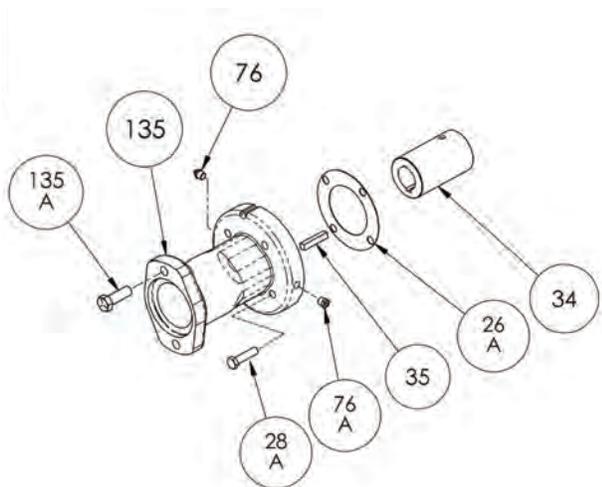


Part #	Ref. No.	Description	Parts Per Pump
334439	153 (1)	Mechanical Seal Assembly	2
**	153A	Stationary Seat (Steel)	2
**	153B	Seal Face (Carbon)	2
**	153C	Jacket Assembly	2
711924	153D	O-Ring - Stationary (Buna-N)	2
711918	153E	O-Ring Rotating (Buna-N)	2

1—Included in Maintenance Kit.

\*\* NOTE: Mechanical Seal Ref. No. 153 is only sold as a complete assembly. Ref. Nos. 153A, 153B & 153C are not available as separate replacement parts.

## Optional Hydraulic Motor Adapter Parts



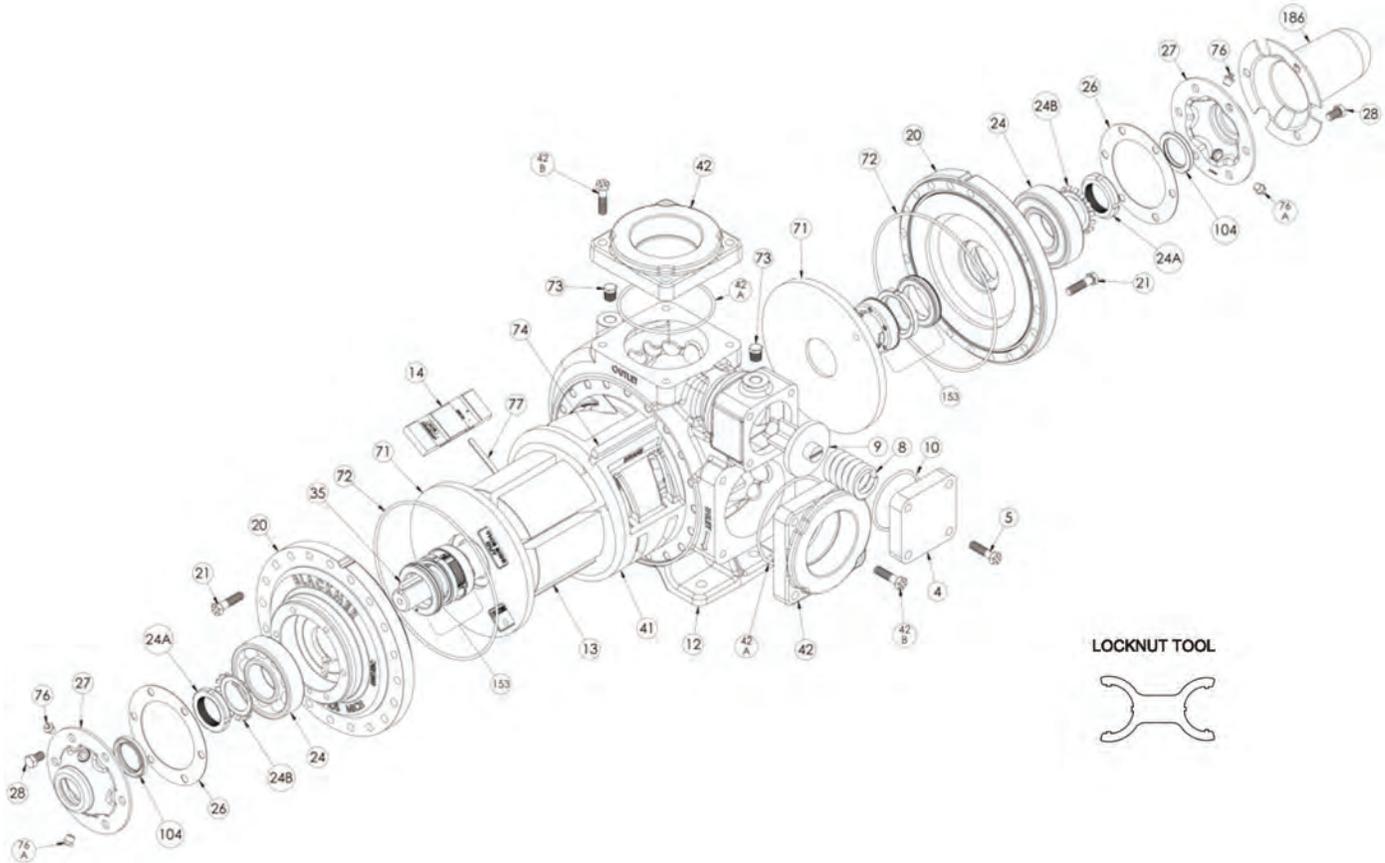
Part #	Ref. No.	Description	Parts Per Pump
894425		Hydraulic Motor Adapter Kit	
383940	26A	Gasket- Hydraulic Motor Adapter	1
920369	28A	Capscrew – Hydraulic Motor Adapter / Head	4
906967	34	Coupling w/ Setscrew – 1.25" straight key hydraulic motor shaft	1
909184	35	Key – Coupling	1
317185	76	Grease Fitting	1
701992	76A	Grease Relief Fitting	1
041827	135	Hydraulic Motor Adapter – (SAE A Flange)	1
920510	135A	Capscrew – Adapter / Motor	2

## Models: LGL3021A

### Repair Parts



Pumps & Compressors



Part #	Ref. No.	Description	Parts Per Pump
415115	4	Cover - Relief Valve (R/V)	1
920379	5	Capscrews - R/V Cover	4
475135	8 (1)	Spring - R/V	1
455129	9	Valve - R/V	1
711941	10 (1)	O-Ring - R/V Cover	1
015131	12	Casing	1
265190	13A (2)	Rotor & Shaft Asy. (Includes Ref. Nos. 24A & 24B)	1
095131	14 (1)	Vane - Duravane	6
035128	20	Head	2
920379	21	Capscrews - Head	40
903166	24 (1)	Ball Bearing	2
903523	24A (2)	Locknut - Bearing	2
903524	24B (1)	Lockwasher - Bearing	2
385125	26 (1)	Gasket - Bearing Cover	2
041815	27	Bearing Cover	2
920285	28	Capscrews - Bearing Cover	12
909209	35 (1)	Key - Shaft, 1/4" Square	1
185111	41 (2)	Liner	1
655132	42	Flange - NPT 3"	2
655133	42	Flange - NPT 4"	2
712245	42A (1)	O-Ring - 3" Flange	2
794126	42A (1)	O-Ring - 4" Flange	2
920379	42B	Capscrew - NPT Flange	8

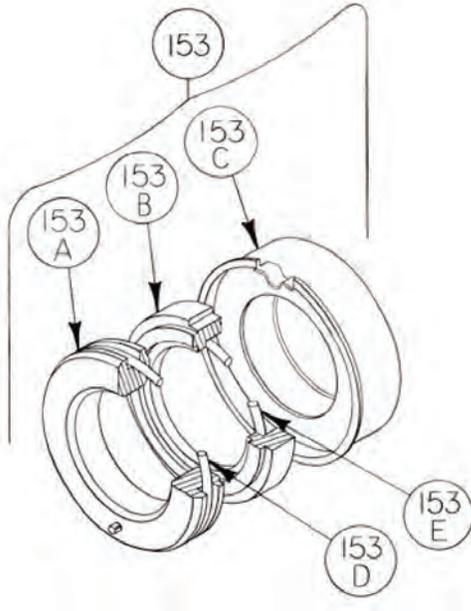
Part #	Ref. No.	Description	Parts Per Pump
065112	71 (1)	Disc	2
702041	72 (1)	O-Ring - Head	2
908198	73	Gage Plug	2
185191	74 (2)	Key - Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
125110	77 (1)	Push Rod	3
331908	104	Grease Seal	2
341801	186	Shaft Protector	1
903091	—	Tool - Locknut	—
899195	—	Kit - Maintenance	—
899095	—	Kit - Rebuild	—

1—Included in Maintenance Kit and Rebuild Kit.

2—Included in Rebuild Kit.

## Models: LGL3021A

Mechanical Seal- NH3 or Dual Service - SNCN (ID Code =QA)



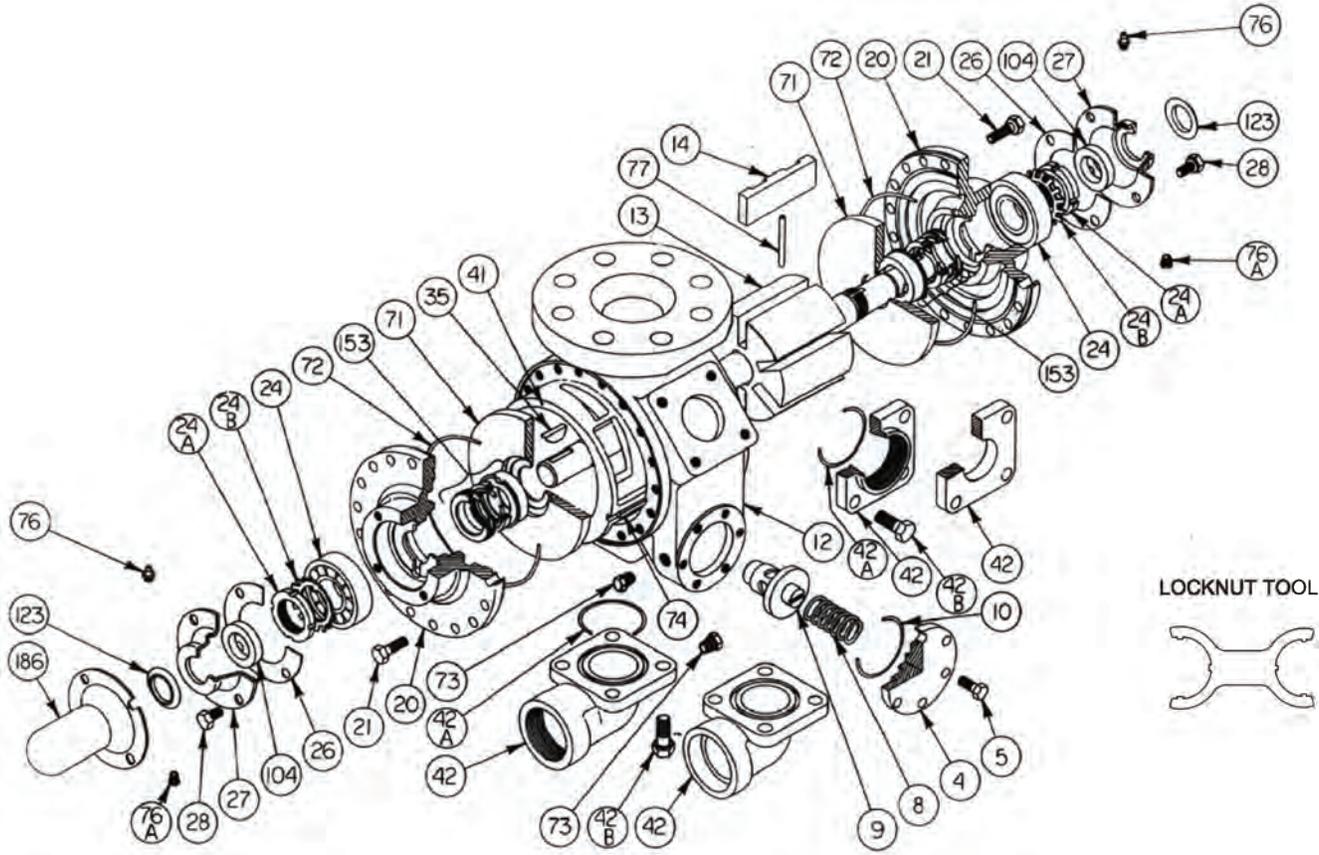
Part #	Ref. No.	Description	Parts Per Pump
335225	153 (1)	Mechanical Seal Assembly	2
**	153A	Stationary Seat (Steel)	2
**	153B	Seal Face (Carbon)	2
**	153C	Jacket Assembly	2
702025	153D	O-Ring - Stationary (Buna-N)	2
711912	153E	O-Ring Rotating (Buna-N)	2

1—Included in Maintenance Kit and Rebuild Kit.

\*\* NOTE: Mechanical Seal Ref. No. 153 is only sold as a complete assembly. Ref. Nos. 153A, 153B & 153C are not available as separate replacement parts.

## Models: TLGLF3C

### Repair Parts



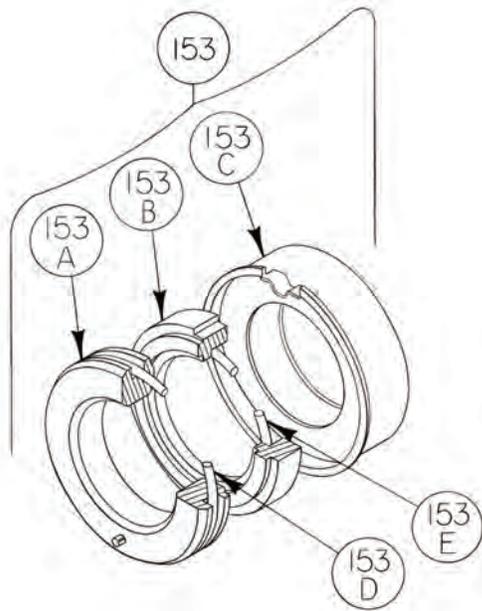
Part #	Ref. No.	Description	Parts Per Pump
415108	4	Cover - Relief Valve (R/V)	1
920331	5	Capscrew - R/V Cover	6
471428	8 (1)	Spring - R/V	1
451460	9 (4)	Valve - R/V	1
332907	9A	Relief Valve Shim, .035"	0-1
332937	9A	Relief Valve Shim, .075"	0-1
701919	10 (1)	O-Ring - R/V Cover	1
015128	12	Casing	1
265147	13 (2)(5)	Rotor & Shaft Assembly	1
095132	14 (1)	Vane - Duravane	6
35132	20	Head	2
920351	21	Capscrews - Head	36
903156	24 (1)	Ball Bearing	2
903521	24A (2)	Locknut - Bearing	2
903522	24B (1)	Lockwasher - Bearing	2
383940	26	Gasket - Bearing Cover	2
041431	27	Bearing Cover	2
920285	28	Capscrews - Bearing Cover	8
909130	35 (1)	Key - Shaft	1
185101	41 (2)	Liner	1
652010	42	Flange - 2" NPT	1-2
652024	42	Flange - 2" Slip-on Weld	1-2
655100	42	Flanged Elbow - 2" NPT	1-2
655109	42	Flanged El - 2" Socket Weld	1-2
652036	42	Blank Flange for Auxiliary Inlet	1-2

Part #	Ref. No.	Description	Parts Per Pump
702004	42A (1) (3)	O-Ring - Flange 2 5/8" x 2 7/8" (current)	2
701919	42A (1)	O-Ring - Flange 2 1/2" x 2 3/4" (older pumps)	2
920491	42B	Capscrew - Flanges	8
065121	71 (1)	Disc	2
711923	72 (1)	O-Ring - Head	2
908198	73	Gage Plug	2
185193	74 (2)	Key - Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
121607	77 (1)	Push Rod	3
331918	104 (1)	Grease Seal	2
701480	123 (1)	Dirt Shield	2
341601	186	Shaft Protector	1
903091	—	Tool - Locknut	—
898980	—	Kit - Maintenance	—
899225	—	Kit - Maintenance with R/V	—
899080	—	Kit - Rebuild	—
899125	—	Kit - Rebuild with R/V	—

- 1—Included in Maintenance Kit and Rebuild Kit.
- 2—Included in Rebuild Kit.
- 3—Larger O-Ring introduced October 2002.
- 4—Additional parts Included in Kits with R/V.
- 5—Includes Ref. No. 24A & 24B.

## Models: TLGLF3C

Mechanical Seal- NH3 or Dual Service - SNCN (ID Code =QA)

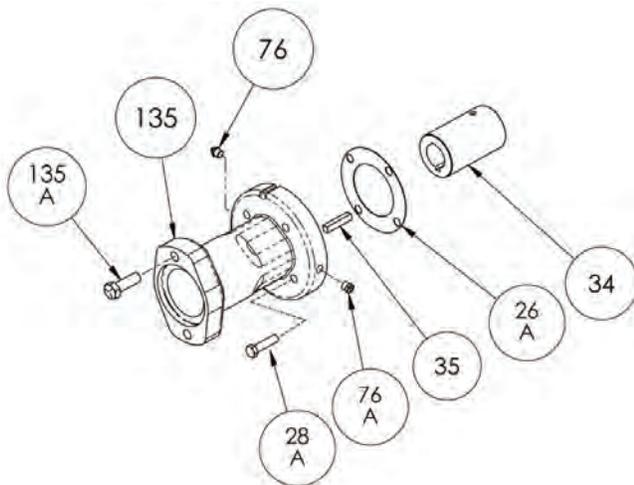


Part #	Ref. No.	Description	Parts Per Pump
334439	153 (1)	Mechanical Seal Assembly	2
**	153A	Stationary Seat (Steel)	2
**	153B	Seal Face (Carbon)	2
**	153C	Jacket Assembly	2
711924	153D	O-Ring - Stationary (Buna-N)	2
711918	153E	O-Ring - Rotating (Buna-N)	2

1—Included in Maintenance Kit and Rebuild Kit.

\*\* NOTE: Mechanical Seal Ref. No. 153 is only sold as a complete assembly. Ref. Nos. 153A, 153B & 153C are not available as separate replacement parts.

## Optional Hydraulic Motor Adapter Parts

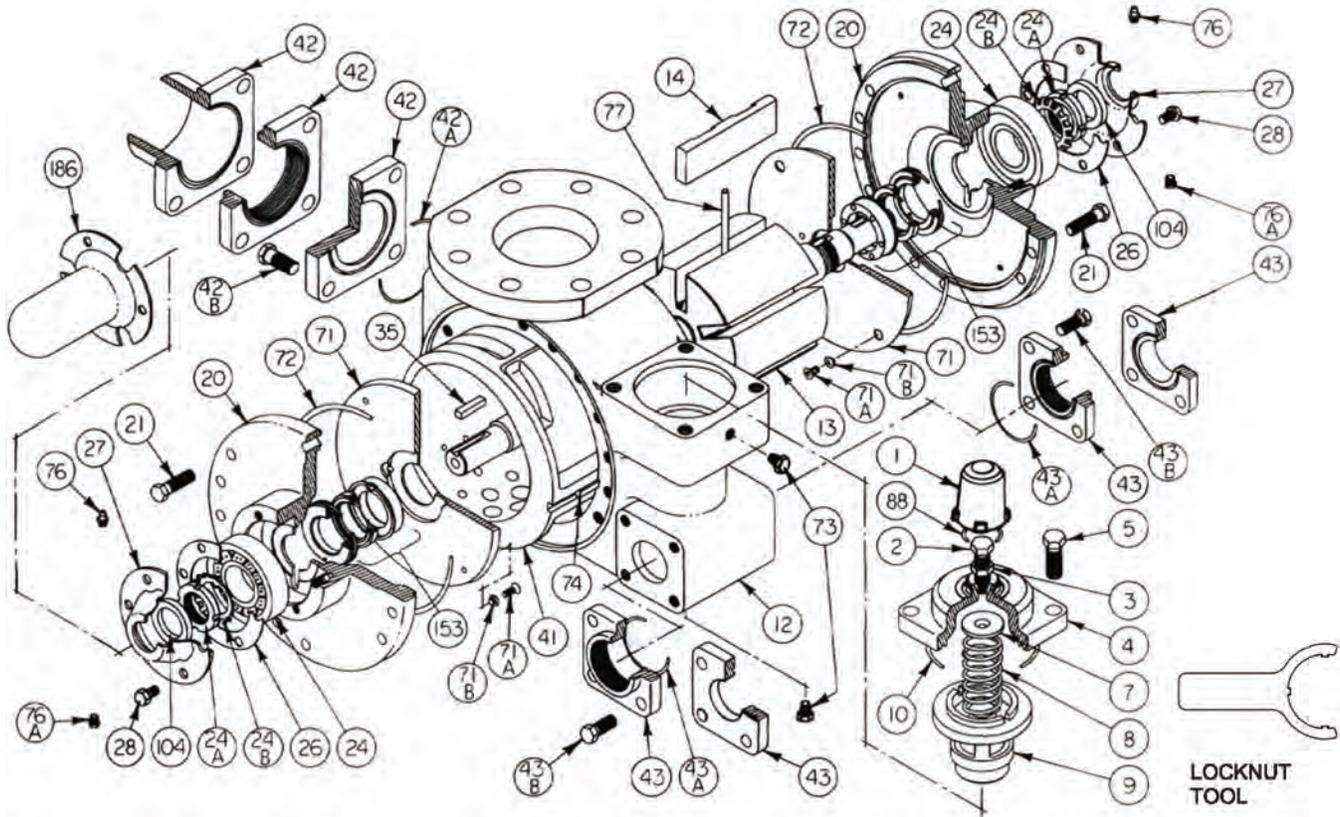


Part #	Part #	Ref. No.	Description	Parts Per Pump
891458	891205	See Below*	Hydraulic Motor Adapter Kit	See Below
383940	383940	26A	Gasket – Hydraulic Motor Adapter	1
920369	920369	28A	Capscrew – Hydraulic Motor Adapter / Head	4
906967	906966	34	Coupling w/ Setscrew – straight key hyd. motor shaft	1
909184	N/A	35	Key – Coupling	1
317815	317815	76	Grease Fitting	1
701992	701992	76A	Grease Relief Fitting	1
041828	041827	135	Hydraulic Motor Adapter – SAE A Flange	1
920510	920510	135A	Capscrew – Adapter / Motor	2

\* Hydraulic Motor Adapter Kits shipped prior to Spring 2002 were a two piece design - refer to page 206-C00

## Models: TLGLF4B

### Repair Parts



Part #	Ref. No.	Description	Parts Per Pump
413957	1	Cap - Relief Valve (R/V)	1
436310	2	Adjusting Screw - R/V	1
432039	3	Locknut - Adjusting Screw	1
412001	4	Cover - R/V	1
920663	5	Capscrews - R/V Cover	4
426355	7	Spring Guide - R/V	1
472039	8 (1)	Spring - R/V	1
452001	9	Valve - R/V	1
701946	10 (1)	O-Ring - R/V Cover	1
012041	12	Casing	1
262041	13 (2)	Rotor & Shaft Asy. (includes Ref. No. 24A & 24B)	1
92019	14 (1)	Vane - Duravane	6
032041	20	Head	2
920532	21	Capscrews - Head	28
903166	24 (1)	Ball Bearing	2
903541	24A (2)	Locknut - Bearing	2
903542	24B (1)	Lockwasher - Bearing	2
385125	26 (1)	Gasket - Bearing Cover	2
041815	27	Bearing Cover	2
920285	28	Capscrews - Bearing Cover	12
909183	35 (1)	Key - Shaft	1
182000	41 (2)	Liner	1
<b>AUXILIARY INLET OPTIONS</b>			
652012	42	Flange - 3" NPT	1
652030	42	Flange - 2" NPT	1
652005	42	Flange - 4" Weld	1
652007	42	Flange - 3" Weld	1

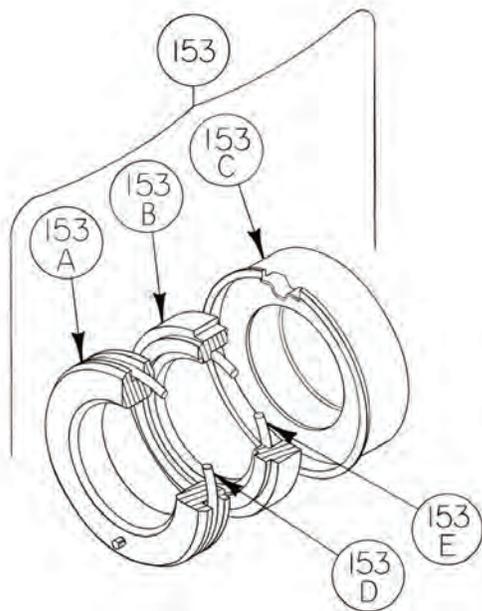
Part #	Ref. No.	Description	Parts Per Pump
652000	42	Flange - Blank	1
701937	42A	O-Ring - Aux. Inlet Flanges	1
920663	42B	Capscrew - 2", 3" NPT Flange	4
920640	42B	Capscrew - 3", 4" Weld Flange; Blank Flange	4
<b>TWIN DISCHARGE PORT OPTIONS</b>			
652010	43	Flange - 2" NPT	2
652024	43	Flange - 2" Slip-on Weld	2
702004	43A (1)	O-Ring - 2" Discharge Flanges	2
920491	43B	Capscrew - Discharge Flange	8
062039	71 (1)	Disc	2
920015	71A (2)	Machine Screw - Disc	8
909634	71B (2)	Lockwasher - Machine Screw	8
702039	72 (1)	O-Ring - Head	2
908198	73	Gage Plug	2
182040	74 (2)	Key - Liner	1
317815	76	Grease Fitting	2
701992	76A	Grease Relief Fitting	2
122009	77 (1)	Push Rod - Composite	3
701926	88 (1)	O-Ring - R/V Cap	1
331908	104 (1)	Grease Seal	2
341801	186	Shaft, Protector	1
903092	—	Tool - Locknut	—
898922	—	Kit - Maintenance	—
899022	—	Kit - Rebuild	—

1-Included in Maintenance Kit and Rebuild Kit.

2-Included in Rebuild Kit.

## Models: TLGLF4B

### Mechanical Seal

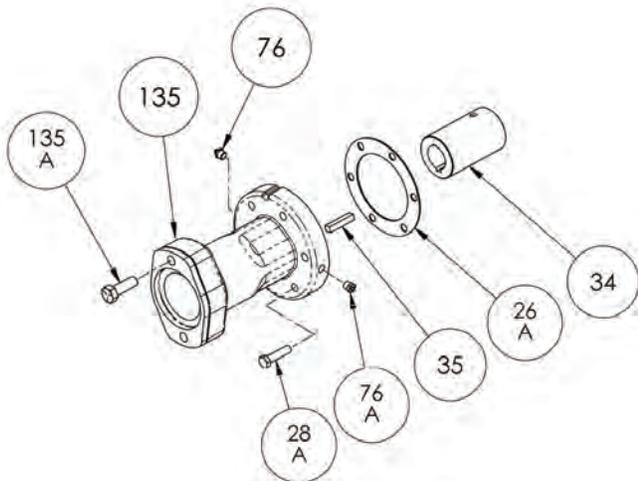


Part #	Ref. No.	Description	Parts Per Pump
332050	153 (1)	Mechanical Seal Assembly	2
**	153A	Stationary Seat (Hardened Steel)	2
**	153B	Seal Face (Carbon)	2
**	153C	Jacket Assembly	2
701934	153D	O-Ring - Stationary (Buna-N)	2
711912	153E	O-Ring - Rotating (Buna-N)	2

1—Included in Maintenance Kit and Rebuild Kit.

\*\* NOTE: Mechanical Seal Assy. (Ref. 153) is only sold as a complete assembly. Ref. Nos. 153A, 153B & 153C are not available as separate replacement parts.

### Optional Hydraulic Motor Adapter Parts

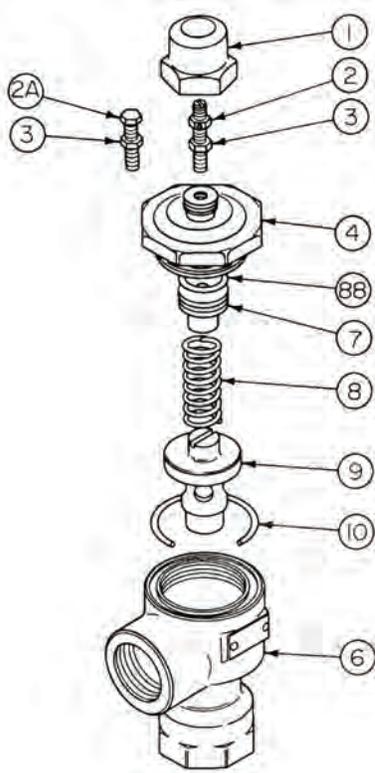


Part #	Ref. No.	Description	Parts Per Pump
892037		Hydraulic Motor Adapter Kit	See Below
<b>Includes Items Listed Below</b>			
381817	26A	Gasket – Hydraulic Motor Adapter	1
920369	28A	Capscrew – Hydraulic Motor Adapter / Head	6
906970	34	Coupling w/ Setscrew – 1.25" straight key hyd. motor shaft	1
909184	35	Key – Coupling	1
317815	76	Grease Fitting	1
701992	76A	Grease Relief Fitting	1
41829	135	Hydraulic Motor Adapter – SAE A Flange	1
920510	135A	Capscrew – Adapter / Motor	2

# Blackmer Bypass Valve Repair

## Models: BV0.75A, BV1A Differential Bypass Valve

Discontinued Models: BV0.75, BV3/4 and BV1



Part #	Ref. No.	Description	Parts Per Unit
414402	1	Cap	1
*	2	Adjusting Stud & Nut Assy. (71 - 100 psi) (Std.)	1
*	2	Adjusting Stud & Nut Assy. (101 - 200 psi)	1
431808	2A (1)	Adjusting Screw (20 - 40 psi)	1
431808	2A	Adjusting Screw (41 - 70 psi)	1
922923	3	Locknut	1
412845	4	Cover	1
402845	6	Body - 0.75" NPT	1
402846	6	Body 1", NPT	1
422853	7	Spring Guide	1
471411	8 (1)	Spring (20 - 40 psi)	1
471412	8	Spring (41 - 70 psi)	1
471415	8	Spring (71 - 100 psi) (Std.)	1
471420	8 (3)	Spring (101 - 125 psi) & (126 - 150 psi)	1
471428	8 (4)	Spring (151 - 200 psi)	1
452841	9	Valve	1
701933	10	O-Ring - Cover (Buna-N) (Std.)	1
701967	10 (2)	O-Ring - Cover (FKM)	1
711917	88	O-Ring - Spring Guide (Buna-N) (Std.)	1
701979	88 (2)	O-Ring - Spring Guide (FKM)	1

\*—Assembly is not a saleable part; preset at factory.

1—Used on BV1 only

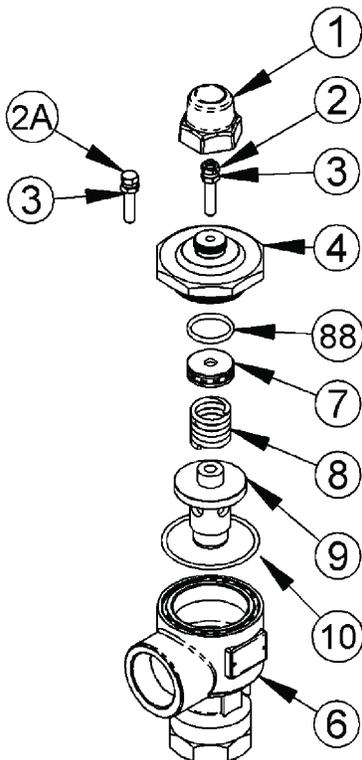
2—Not U.L. listed.

3—For use with pumps rated over 125 psi differential pressure.

4—For use with pumps rated over 150 psi differential pressure.

## Models: BV1.25A, BV1.50A Differential Bypass Valve

Discontinued Models: BV1-1/4, BV1-1/2



Part #	Ref. No.	Description	Parts Per Unit
414402	1	Cap	1
*	2	Adjusting Stud & Nut Assy. (springs over 70 psi)	1
437803	2A	Adjusting Screw (20 - 40 psi)	1
437803	2A	Adjusting Screw (41 - 70 psi)	1
922923	3	Locknut	1
413045	4	Cover	1
403045	6	Body - 1.25" NPT	1
403345	6	Body - 1.5", NPT	1
422853	7	Spring Guide	1
471415	8	Spring (20 - 40 psi)	1
471417	8 (3)	SS Spring (20 - 40 psi) (BV1.50A only)	1
471420	8	Spring (41 - 70 psi)	1
471428	8	Spring (71 - 125 psi) (Std.)	1
471428	8 (1)	Spring (126 - 165 psi)	1
471426	8 (2)	Spring (166 - 200 psi)	1
453042	9	Valve	1
701934	10	O-Ring - Cover (Buna-N) (Std.)	1
701921	10 (3)(4)	O-Ring - Cover (FKM) 3, 4	1
711917	88	O-Ring - Spring Guide (Buna-N) (Std.)	1
701979	88 (3)(4)	O-Ring - Spring Guide (FKM) 3, 4	1

\*—Assembly is not a saleable part; preset at factory.

1—For use with pumps rated over 125 psi differential pressure.

2—For use with pumps rated over 150 psi differential pressure.

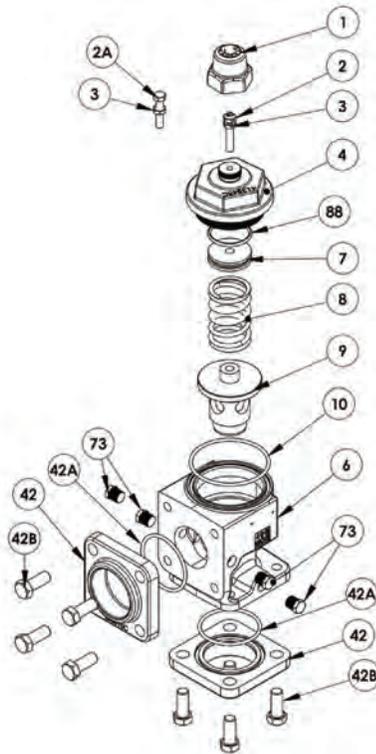
3—Not U.L. listed.

4—For MAPP Gas; to be used with stainless steel (SS) spring only.



## Models: BV2A Differential Bypass Valves

Discontinued Models: BV2



Part #	Ref. No.	Description	Parts Per Unit
414402	1	Cap	1
*	2	Adjusting Stud & Nut Asy. (91-125 psi) (std)	1
437803	2A	Adjusting Screw (20 - 40 psi)	1
437803	2A	Adjusting Screw (41 - 70 psi)	1
437803	2A	Adjusting Screw (71 - 90 psi)	1
433905	2A	Adjusting Screw (126 - 150 psi)	1
922923	3	Locknut	1
413945	4	Cover	1
403945	6	Body	1
423953	7	Spring Guide	1
471803	8	Spring (20 - 40 psi)	1
471805	8	Spring (41 - 70 psi)	1
471815	8	SS Spring (41 - 70 psi)	1
471811	8	Spring (71 - 90 psi)	1
471806	8	Spring (91 - 125 psi) (Std.)	1
471810	8	Spring (126 - 150 psi)	1
453942	9	Valve (with pressure equalizing hole)	1
701916	10	O-Ring - Cover (Buna-N) (Std.)	1
711959	10	O-Ring - Cover (FKM)	1
652010	42	Flange - 2" NPT (Std.)	2
652024	42	Flange - 2" Slip-on Weld **	2
655109	42	Flange - 2" Socket Weld El	2
652029	42	Flange - 1.25" NPT	2
652028	42	Flange - 1.5" NPT	2
652027	42	Flange - 1.25" Slip-on Weld	2
652026	42	Flange - 1.5" Slip-on Weld	2
702004	42A	O-Ring - Flange (Buna-N) (Std.) **	2
702086	42A (1)(2)	O-Ring - Flange (FKM)1,3	2
920491	42B	Capscrews - Flange	8
908198	73	Pipe Plug - 1/4" NPT	4
711916	88	O-Ring Spring Guide (Buna-N)	1
711908	88 (1)(2)	O-Ring - Spring Guide (FKM)1,3	1

\*—Assembly is not a saleable part; preset at factory.

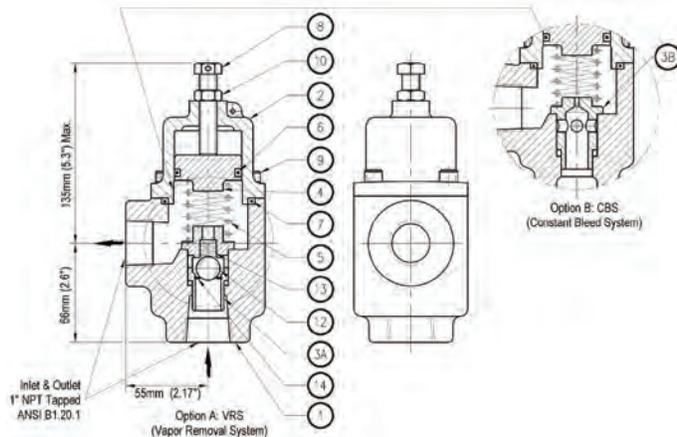
\*\*—Weld Flange O-rings before Nov 2002: 701919 Buna-N, 711929 FKM (Not U.L. Listed).

1—Not-U.L. Listed.

2—For MAPP Gas; use FKM O-rings and SS spring together.

## Models: Ebsray RV18 Inline Bypass Valve

Repair Parts



Ref. No.	Description	Qty
1	Housing NPT	1
2	Valve Cover	1
3a	Valve	1
3b	Valve	1
4	Spring Cap	1
5	Spring Bypass	1
6	O-Ring, 1/8x1-7/16	1
7	O-Ring, 1/8x2	1
8	Adjusting Screw	1
9	Socket Hd Capscrew M8x1.25x25	4
10	Nut Hexagon Head Metric	1
12	Ball	1
13	Spring Vent	1
14	Circlip	1

Spare Parts Inquiries

To facilitate Parts inquiries, please provide Blackmer with:

a. Model and Serial Number on the valve nameplate.

b. Ref. # and Description from the Parts Designation table.

c. Quantity required.

## By-Pass Valves

### CORKEN



Pump & Compressors

Part #	Description	Common Applications	Ports	Flow Rate GPM	O-ring Material Options
<b>B166-12</b>	Automatic Dual-Purpose By-pass Valve	Cylinder Filling	3/4" NPT	Up to 30	Buna-N (std), Neoprene®, PTFE, Viton®, Ethylene-Propylene
<b>B166-16</b>	Automatic Dual-Purpose By-pass Valve	Cylinder Filling	1" NPT	Up to 40	Buna-N (std), Neoprene®, PTFE, Viton®, Ethylene-Propylene
<b>B166-1BAU</b>	Automatic Dual-Purpose By-pass Valve	Autogas Filling	3/4" NPT	Up to 30	Buna-N (std), Neoprene®, PTFE, Viton®, Ethylene-Propylene
<b>B166-1CAU</b>	Automatic Dual-Purpose By-pass Valve	Autogas Filling	1" NPT	Up to 40	Buna-N (std), Neoprene®, PTFE, Viton®, Ethylene-Propylene
<b>T166-20</b>	Pump Flow Control Valve	Bobtail Truck & Smaller Bulk Plant Systems	1-1/4" NPT	Up to 80	Buna-N (std), Neoprene®, PTFE, Viton®, Ethylene-Propylene
<b>T166-24</b>	Pump Flow Control Valve	Bobtail Truck & Smaller Bulk Plant Systems	1-1/2" NPT	Up to 100	Buna-N (std), Neoprene®, PTFE, Viton®, Ethylene-Propylene
<b>ZV200</b>	Differential By-pass Valve	Transports or Large Bulk Plant Systems	2" NPT	Up to 250	Buna-N (std), Neoprene®, PTFE, Viton®, Ethylene-Propylene

Note: By-Pass valves are NOT preset. Refer to Corken's installation instruction manual for proper setting procedures.

## Cylinder Filling & Motor Fuel Dispensing Pumps

### CORKEN



The close-coupled design of a C-model turbine pump makes installation easy and eliminates alignment issues. Ideal for dispensing applications like propane cylinder filling stations and dispensers. Five models available with NPT connections only.

Part #	Motor Only*	Motor Specs				Capacity in GPM			Max. Diff.	Connections	
		HP	Voltage	Phase	RPM	20 PSID	50 PSID	75 PSID		Inlet	Outlet
<b>C10KD6A</b>	4261-1	1	208-230	1	3450	12	6.5	2.5	75	1-1/4"	1"
<b>C12KD6A</b>	4261-1	1	208-230	1	3450	19	15	11	100	1-1/2"	1"
<b>C12FD6A</b>	4261	2	115/208-230	1	3450	19	15	11	100	1-1/2"	1"
<b>C13FD6A</b>	4261	2	115/208-230	1	3450	26	21	17	125	1-1/2"	1"
<b>C14MD6A</b>	2557	3	115/208-230	1	3450	38	32	25	125	1-1/2"	1"
<b>C14GD6A</b>	2557	3	230/460	3	3450	38	32	25	125	1-1/2"	1"
<b>C16MF6A</b>	4885	3	115/208-230	1	3450	13	11	10	150	1-1/4"	1"
<b>C16GD6A</b>	2557	3	230/460	3	3450	13	11	10	150	1-1/4"	1"

Note: See page 192 for motor and wall mounted start switches.

\* When ordering motors only, switch box & switch are ordered separately.

## Autogas Pumps

**CORKEN**



The frame mount design requires a baseplate, coupling, and coupling guard and utilizes a direct drive configuration so the pump runs at motor speed. With a frame mount design, the user has the flexibility to choose from a variety of motor sizes. FF- & DLF-models 075, and 150 produce higher differential pressures than F-Model pumps and are commonly used in Autogas applications.

Part #	GPM	HP	Inlet	Outlet	RPM	Max. Working Pressure	Max Diff. Pressure	Mounting
FF075	22.5	7.5	1.5" ANSI 300# Raised Face Flange	1" ANSI 300# Raised Face Flange	3,450 @ 60 Hz or 2,880 @ 50 HZ	400 PSI	150 PSI	Rigid Base
DLF075	22.5	7.5	1.5" ANSI 300# Raised Face Flange	1" ANSI 300# Raised Face Flange	3,450 @ 60 Hz or 2,880 @ 50 HZ	400 PSI	150 PSI	C-Face
FF150	33.79	10	1.5" ANSI 300# Raised Face Flange	1" ANSI 300# Raised Face Flange	3,450 @ 60 Hz or 2,880 @ 50 HZ	400 PSI	250 PSI	Rigid Base
DLF150	33.79	10	1.5" ANSI 300# Raised Face Flange	1" ANSI 300# Raised Face Flange	3,450 @ 60 Hz or 2,880 @ 50 HZ	400 PSI	250 PSI	C-Face

Part #	Motor Only*	Motor Specs			Capacity in GPM			Max. Diff.	Connections		Heater Element
		HP	Voltage	Phase	100 PSID	125 PSID	150 PSID		Inlet	Outlet	
DL16CD6A (HDPDL16-1P3)	6037-2CNA1	3	115/230	1	13	11	10	200	1-1/4"	1"	Internal
DL16CD6A (HDPDL16-3P3)	6037-2C2B1	3	230/460	3	13	11	10	200	1-1/4"	1"	Internal

\* When ordering motors only, switch box & switch are ordered separately.

### Companion Flange Kit

Part #	Description
6133-X1	Companion Flange Kit for FF/DLF075 or FF/DLF150. Includes flanges, gaskets, studs and nuts for both inlet and outlet.

### Autogas Pump Packages

Includes pump, coupling, motor and bypass valve. Some packages include a VFD.

**CORKEN**

Part #	Description
HDPDL16-1P3-75BAU	Pump, coupling, B166B-75BAU bypass & 3HP-1PH C-face motor
HDPDL16-3P3-75BAU	Pump, coupling, B166B-75BAU bypass & 3HP-3PH C-face motor
HDPDL16-1P33-75BAU	Pump, coupling, B166B-75BAU bypass, 3HP-3PH C-face motor & 4204-6X1 VFD
HDPDLF060-3P53	Pump, coupling, B166B-1CAU bypass, & 5HP-3PH C-face motor
HDPDLF075-1P75	Pump, coupling, B166B-1CAU bypass, 7.5HP-3PH C-face motor & 4204 VFD
HDPDLF075-3P75	Pump, coupling, B166B-1CAU bypass & 7.5HP-3PH C-face motor
HDPFF075-3P75	Pump, 101 mounting, B166B-1CAU bypass & 7.5HP-3PH motor
HDPFF150-3P10	Pump, 101 mounting, B166B-1CAU bypass & 10HP-3PH motor

## Stationary Bottle Pumps



Turbine pumps, motor driven or engine driven for handling high head pressure at 75 PSID.



Part #	Inlet x Outlet	Capacity	RPM	Shaft Size	Includes
<b>F10-101-8</b>	1-1/4" X 1"	3 GPM	3600	1"	Pump base, flex coupling, coupling guard
<b>F12-101-8</b>	1-1/2" X 1"	12 GPM	3600	1"	Pump base, flex coupling, coupling guard
<b>F14-101-8</b>	1-1/2" X 1"	25 GPM	3600	1"	Pump base, flex coupling, coupling guard
<b>F10CD6A</b>	1-1/4" X 1"	3 GPM	3600	1"	Pump only
<b>F12CD6A</b>	1-1/2" X 1"	12 GPM	3600	1"	Pump only
<b>F14CD6A</b>	1-1/2" X 1"	25 GPM	3600	1"	Pump only

## Coro-Vane Stationary Pumps



The Z-Series pump is a special type of rotary positive displacement pump, known as a sliding vane pump for use in bulk plant installations. The sliding vane pump has many of the positive displacement advantages of the gear pump, plus the ability to compensate for wear, and operate at a lower noise level. The sliding vane pump consists of a rotor turning in a cam (liner) machined eccentrically in relation to the rotor; thereby displacing the liquid trapped between the rotor, cam and vanes. The Z-Series pumps are made with vanes produced from advanced polymers which exhibit extremely low coefficients of friction. The vanes are self-adjusting for wear which gives the pump long life.

Part #	Flange Size	Capacity
<b>Z2000</b>	2"	84 GPM
<b>Z3500</b>	3"	185 GPM
<b>Z4500</b>	4" x 3"	385 GPM

Note: Pump capacity shown are only approximate and will vary depending on motor horsepower, RPM, differential pressures and piping.

## Coro-Vane Truck Pumps



The Z-Series pump is a special type of rotary positive displacement pump, known as a sliding vane pump for use in mobile applications.

The sliding vane pump has many of the positive displacement advantages of the gear pump, plus the ability to compensate for wear, and operate at a lower noise level.

The sliding vane pump consists of a rotor turning in a cam (liner) machined eccentrically in relation to the rotor; thereby displacing the liquid trapped between the rotor, cam and vanes. The Z-Series pumps are made with vanes produced from advanced polymers which exhibit extremely low coefficients of friction. The vanes are self-adjusting for wear which gives the pump long life..

Part #	Suction Flange	Discharge Flange	Max. RPM	Max. Working Pressure PSIG	Max Differential Pressure
<b>Z2000</b>	2" NPT	2" NPT	800	400	125 psid
<b>Z3200</b>	3" 300# ANSI	2" EL	800	400	125 psid
<b>Z4200</b>	4" 300# ANSI	2" Dual NPT	800	400	125 psid
<b>Z3500</b>	3" NPT	3" NPT	800	400	125 psid
<b>Z4500</b>	4" 300# ANSI	3" ANSI	800	400	125 psid

## Coro-Vane LP-Gas Bulk Plant Selection Guide



Pump Model	Pump RPM	GPM @ 20 PSI	HP	Phase	Frame Size	Suggested Pipe Size			By-pass Valve	Hose Size	
						Inlet	Outlet	Vapor		Liquid	Vapor
Z2000-103-9	780	84	5	3	182T	2-1/2"	2"	1-1/4"	1-1/4"	1-1/2"	1"
Z2000-103-9	780	84	5	1	213T	2-1/2"	2"	1-1/4"	1-1/4"	1-1/2"	1"
Z3500-103	640	160	7-1/2	3	184T	3"	3"	1-1/4"	2"	2"	1-1/4"
Z3500-103	640	160	7-1/2	3	215T	3"	3"	1-1/2"	2"	2"	1-1/4"
Z3500-103	780	185	10	3	215T	3"	3"	1-1/2"	2"	2"	1-1/4"
Z4500-103	640	315	15	3	254T	4"	4"	2"	2"	2"	1-1/2"
Z4500-103	780	385	20	3	256T	4" to 6"	4"	2"	2"	2"	1-1/2"

## Coro-Vane Truck Pump Selection Guide



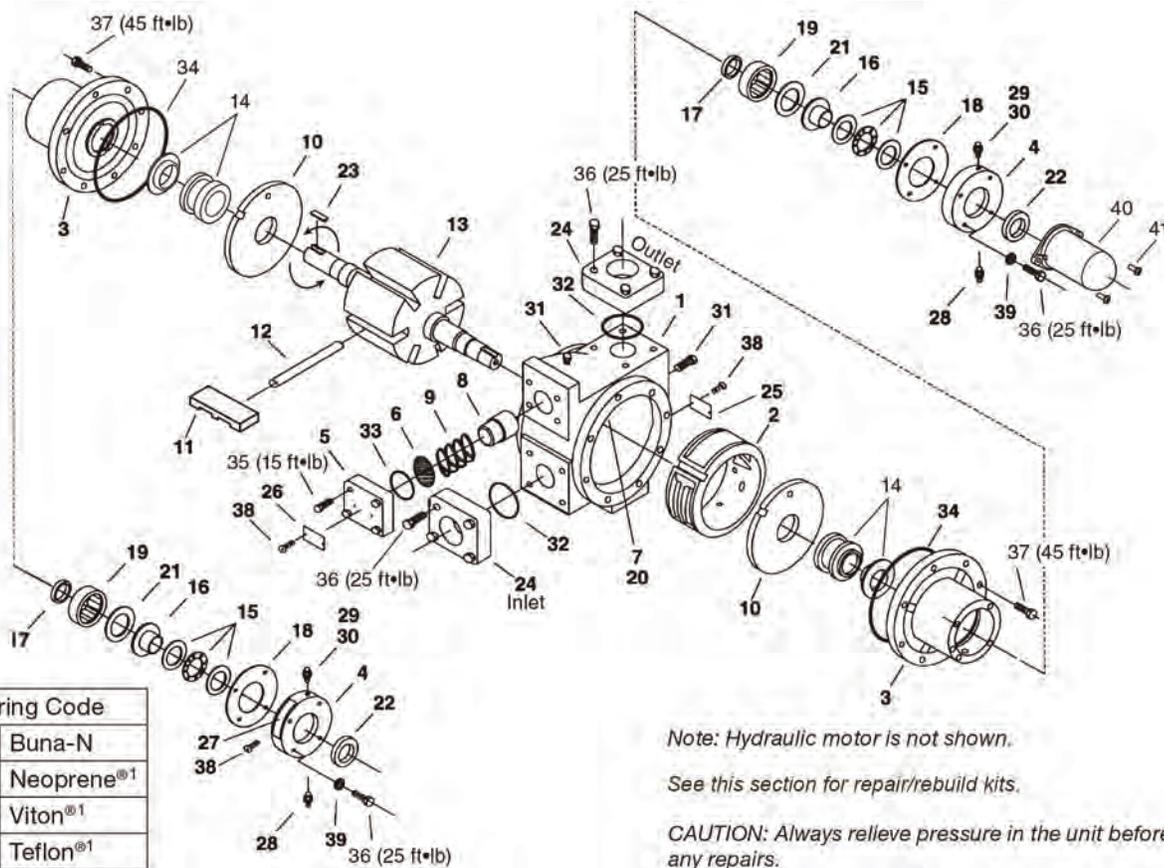
Pump Model	Pump Speed (RPM)	Differential Pressure (PSI)	Approximate Delivery of Propane <sup>1</sup> (GPM)	Brake HP Required (BHP)	Pump Torque Required (Ft°Lb)
Z2000	750	50	82	2.9	20.4
Z2000	750	100	77	5.8	40.8
Z2000	650	50	69	2.5	20.4
Z2000	650	100	64	5.1	40.8
Z2000	600	50	63	2.3	20.4
Z2000	600	100	58	4.6	40.8
Z2000	500	50	52	1.9	20.4
Z2000	500	100	46	3.9	40.8
Z3200	750	50	112	6.2	43.4
Z3200	750	100	99	9.9	69.3
Z3200	650	50	95	5.2	42
Z3200	650	100	84	8.2	66.3
Z3200	600	50	86	5	41.3
Z3200	600	100	76	7.8	64.8
Z3200	500	50	70	3.8	39.9
Z3200	500	100	62	5.8	60.9
Z4200	750	50	369	12.5	87
Z4200	750	100	325	25.1	175
Z4200	650	50	316	10.8	87
Z4200	650	100	278	21.7	175
Z4200	600	50	289	9.9	87
Z4200	600	100	254	20	175
Z4200	500	50	236	8.4	87
Z4200	500	100	208	16.7	175

<sup>1</sup> The chart shows approximate delivery rates as seen in vapor equalized propane systems at 70°F (21°C) with no pressure loss in pump suction piping.

The following will cause increased vaporization of the liquid in pump suction, adversely affecting the delivery.

1. Restrictions in the suction piping such as internal valves, excess flow valves, elbows, etc.
2. Restriction or lack of a vapor return line.
3. Temperatures below 70°F (21°C)

This loss of delivery is not caused by the pump but is a result of the natural thermodynamic properties of liquified petroleum gases. See the GUIDE TO CORKEN LIQUIFIED GAS TRANSFER EQUIPMENT CP226 for a complete description of these phenomena.



O-ring Code	
A	Buna-N
B	Neoprene <sup>®1</sup>
D	Viton <sup>®1</sup>
E	Teflon <sup>®1</sup>

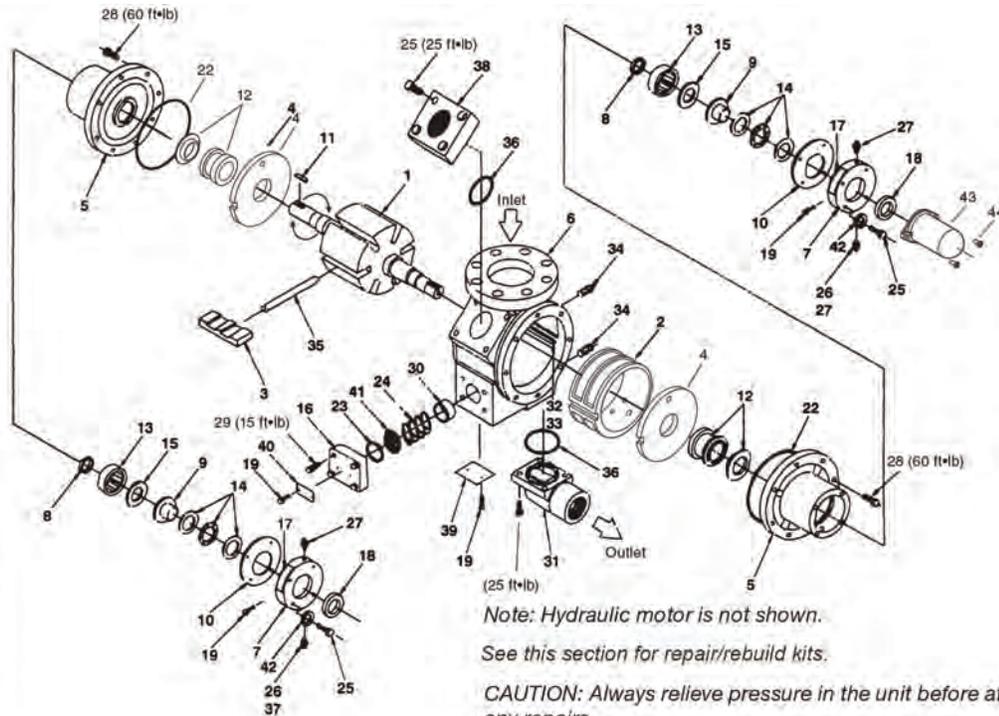
Note: Hydraulic motor is not shown.  
See this section for repair/rebuild kits.

**CAUTION:** Always relieve pressure in the unit before attempting any repairs.

Part #	Ref. No.	Description	Qty.
4413	1	Case	1
4414	2	Cam	1
4416	3	Head	2
4417	4	Bearing cap	2
1174-3	5	Relief valve cap	1
4282	6	Shim	1
4424	7	Cam key	1
4425	8	Relief valve cap	1
4426	9	Relief valve spring	1
4427	10	Sideplate	2
4428	11 (2)	Vane	6
4262-X	12	Vane driver	3
4430-X2R	13	Rotor-shaft assembly	1
4431-X_6	14 (4)	Seal Assembly	2
4432	15	Thrust bearing assembly	2
4435	16	Bearing race mounting ring	2
4438	17	Grease seal	2
4439	18	Bearing cap shim (.002) Red	As Req.
4439-1	18	Bearing cap shim (.010) Brown	As Req.
4439-2	18	Bearing cap shim (.020) Yellow	As Req.
2754-X	19	Bearing	2
3253	20	Cam key pin	2
2760-244	21	Retainer ring	2

Part #	Ref. No.	Description	Qty.
4441	22	Grease seal	2
2270	23	Shaft key — 1/4" x 1-9/16"	2
4479-2	24 (3)	Flange — 2" NPT	2
2649	25	Nameplate	1
4248	26	Relief valve nameplate	1
1359	27	Lubrication instruction plate	2
1342	28	1/8" NPT relief fitting	4
2158	29	1/8" NPT grease zerk	2
2159	30	Lubricap	2
3442	31	1/4" NPT pipe plug	2
2-231_	32 (4)	O-ring — flange	2
2-224_	33 (4)	O-ring — relief valve cap	1
2-261_	34 (4)	O-ring — case	2
7001-031NC125A	35	Bolt — hexagon head	4
7001-037NC150A	36	Bolt — hexagon head	16
7001-043NC125A	37	Bolt — hexagon head	16
7012-006SF025E	38	Screw	8
7206-037A	39	Lockwasher	8

(1) Registered trademarks of the DuPont company.  
 (2) Slots in blades must face TOWARDS the direction of rotation.  
 (3) Optional: 479-2S 2" welded.  
 (4) \_Denotes O-ring code.



O-ring Code	
A	Buna-N
B	Neoprene <sup>®1</sup>
D	Viton <sup>®1</sup>
E	Teflon <sup>®1</sup>

Note: Hydraulic motor is not shown.  
See this section for repair/rebuild kits.

**CAUTION:** Always relieve pressure in the unit before attempting any repairs.

Part #	Ref. No.	Description	Qty.
4495-X2R	1	Rotor shaft assembly	1
4242	2	Cam	1
4232	3 <sup>(1)</sup>	Vane	6
4321	4	Sideplate	2
4488	5	Head	2
4239	6	Case	1
4417	7	Bearing cap	2
4438	8	Grease seal	2
4435	9	Mounting ring	2
4439	10	Bearing cap shim (.002) Red	As Req.
4439-1	10	Bearing cap shim (.010) Brown	As Req.
4439-2	10	Bearing cap shim (.020) Yellow	As Req.
2270	11	Shaft key	2
4431-X_6	12 <sup>(3)</sup>	Seal assembly	2
2754	13	Bearing outer race	2
4432	14	Thrust bearing assembly	2
2760-244	15	Retainer ring	2
1174-2	16	Relief valve cap	1
1359	17	Lubrication instruction plate	2
4441	18	Grease seal	2
7012-006SF019E	19	Screw	8
2-223_	20 <sup>(3)</sup>	O-ring — seal	2
2-227_	21 <sup>(3)</sup>	O-ring — seat	2
2-262_	22 <sup>(3)</sup>	O-ring — case	2
2-224_	23 <sup>(3)</sup>	O-ring — relief valve cap	1
1240	24	Relief valve spring	1
7001-037NC150A	25	Bolt - 3/8-16 x 1-1/2" hex head	16
2158	26	1/8" NPT grease zerk	2

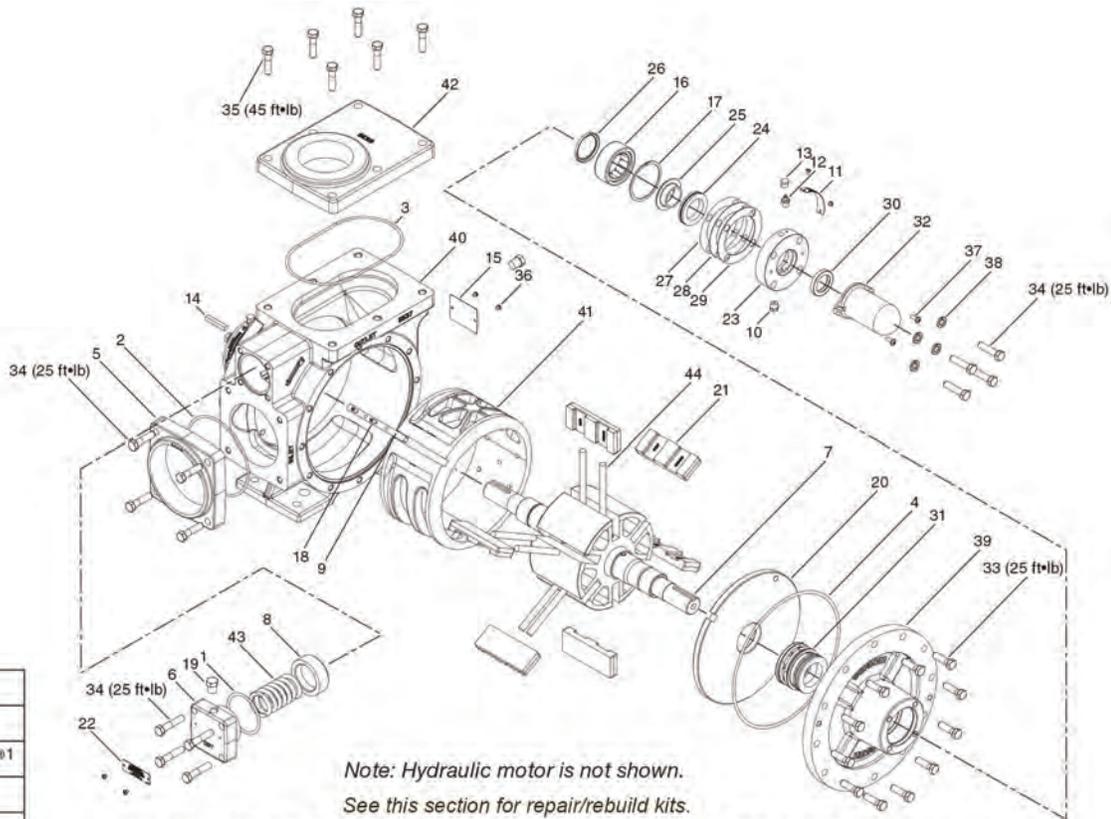
Part #	Ref. No.	Description	Qty.
1343	27	1/8" NPT relief fitting	4
7001-050NC150A	28	Bolt — 1/2-13 x 1-1/2" hex head	16
7001-031NC125A	29	Bolt — 5/16-16 x 1-1/4" hex head	4
1241	30	Relief valve	1
4243	31 <sup>(2)</sup>	Flanged elbow — 2"	1
4241	32	Cam key	1
3253	33	Cam key pin	1
3442	34	1/4" NPT pipe plug	1
4262-X	35	Vane driver	3
2-234_	36 <sup>(3)</sup>	O-ring — flange	1
2159	37	Lubricap	2
1172-2	38	Flange — 2" NPT	1
2649	39	Nameplate	1
4248	40	Relief valve nameplate	1
4282	41	Relief valve shim	As Req.
7206-037A	42	3/8" lockwasher	8

- (1) Registered trademarks of the DuPont company.
- (2) See flange chart for options.
- (3) \_Denotes O-ring code.
- (4) Slots in blades must face TOWARDS the direction of rotation.

# Corken Pump Repair

Models: Z3500

## CORKEN



O-ring Code	
A	Buna-N
B	Neoprene <sup>®1</sup>
D	Viton <sup>®1</sup>
E	Teflon <sup>®1</sup>

Note: Hydraulic motor is not shown.  
See this section for repair/rebuild kits.

CAUTION: Always relieve pressure in the unit before attempting any repairs.

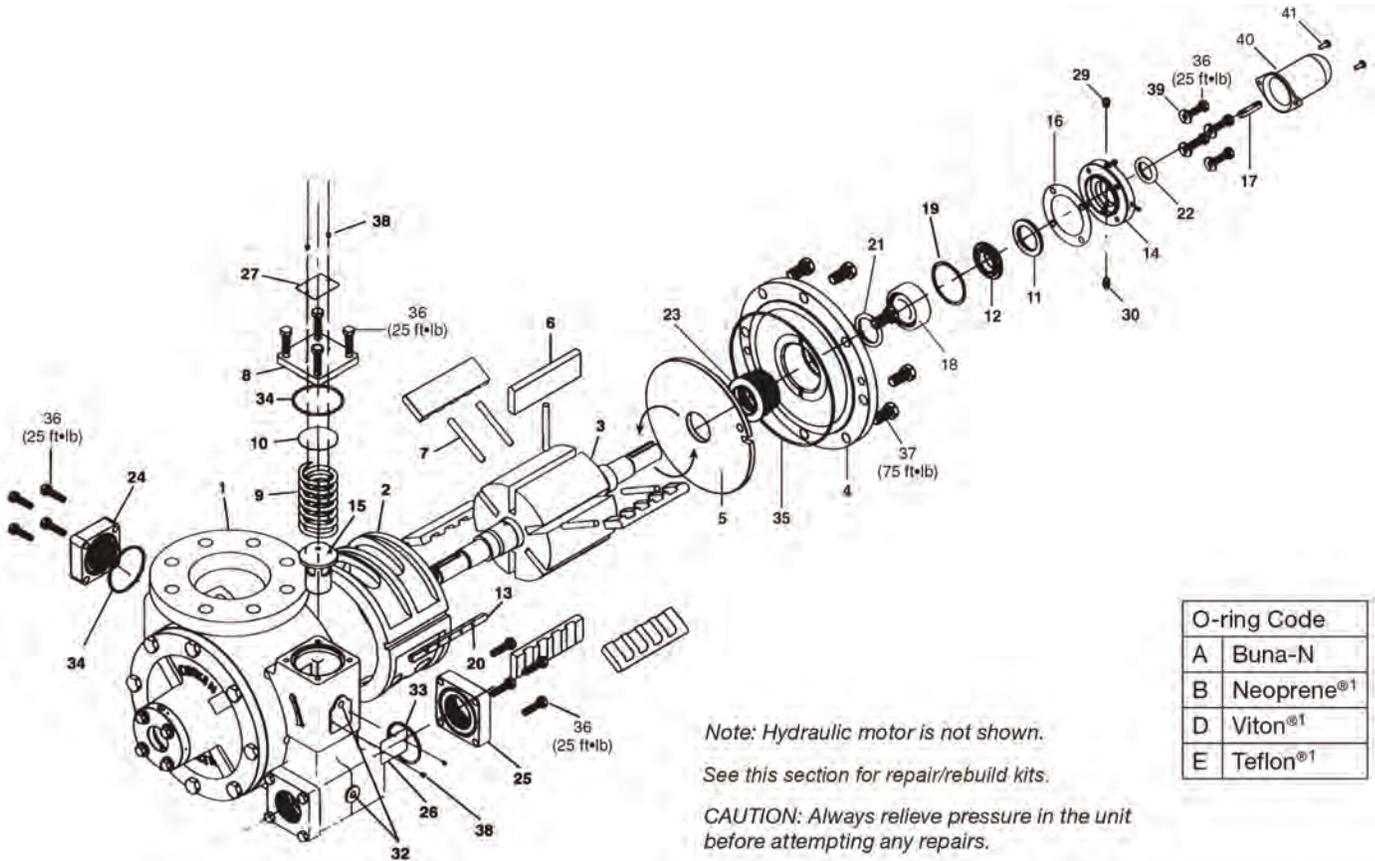
Part #	Ref. No.	Description	Qty.
2-228_	1 (2)	O-ring	1
2-245_	2 (2)	O-ring	1
2-259_	3 (2)	O-ring	1
2-268_	4 (2)	O-ring	2
1206-3	5	Inlet flange — 3" NPT	1
1206-4	5	Inlet flange — 4" NPT	1
1206-3S	5	inlet flange — 3" WF	1
1206-4S	5	inlet flange — 4" WF	1
1207-2	6	Relief valve cap	1
1208-1X6R	7	Rotor shaft assembly	1
1224	8	Relief valve	1
1309	9	Cam key	1
1343	10	Grease relief fitting	4
1359	11	Lubrication plate	2
2158	12	Grease zerk	2
2159	13	Lubricap	2
2270	14	Shaft key — 1/4"	1
2649	15	Nameplate	1
2754	16	Outer bearing	2
2760-244	17	Retainer ring	2
3253	18	Cam key pin	2
3442	19	Pipe plug — 1/4" NPT	2
3935	20	Sideplate	2
3936	21 (3)	Vane	6
4248	22	Relief valve warning tag	1
4417	23	Bearing cap	2
4432	24	Thrust bearing assembly	2
4435	25	Thrust bearing mounting ring	2
4438	26	Grease seal / Oil seal	2

Part #	Ref. No.	Description	Qty.
4439	27	Bearing cap shim (.002) Red	2
4439-1	28	Bearing cap shim (.010) Brown	2
4439-2	29	Bearing cap shim (.020) Yellow	2
4441	30	Grease seal	2
4431-X_6	31 (2)	Mechanical seal assembly	2
4985	32	Coro-vane shaft cover	1
7001-037NC125A	33	Hex head bolt	24
7001-037NC150A	34	Hex head bolt	16
7001-043NC150A	35	Hex head bolt	6
7012-006SF019E	36	Screw	9
7012-010SF050E	37	Screw	2
7206-037A	38	Lockwasher — 0.375"	8
5534	39	head	2
5537	40	Case	1
5539	41	Cam	1
5538	42	Outlet flange — 3" NPT Elongated	1
5538-3S	42	Outlet flange — 3" WF Elongated	1
5548	43	Spring	1
5554-X	44	Vane driver	6

(1) Registered trademarks of the DuPont company.

(2) \_ Denotes O-ring code.

(3) Slots in blades must face TOWARDS the direction of rotation.



Part #	Ref. No.	Description	Qty.
4442	1	Case	1
4443	2	Cam	1
4444-X2R	3	Rotor-shaft assembly	1
4445	4	Head	2
4446	5	Sideplate	2
4448	6 <sup>(4)</sup>	Vane	6
4449-X	7	Vane driver	5
4450	8	Relief valve cap	1
4451	9	Relief valve spring	1
4452	10	Shim	1
4453	11	Thrust bearing assembly	2
4454	12	Bearing race mounting ring	2
4455	13	Cam key	1
4456	14	Bearing cap	2
4457	15	Relief valve	1
4458	16	Bearing cap shim (.002) Red	As Req.
4458-1	16	Bearing cap shim (.010) Brown	As Req.
4458-2	16	Bearing cap shim (.020) Yellow	As Req.
4459	17	Shaft key — 5/16" x 1-3/4"	1
4460-X	18	Roller bearing	2
2760-281	19	Retainer ring	2
3253	20	Cam key pin	5
4462	21	Grease seal	2
4463	22	Grease seal	2
4464-X 6	23 <sup>(3)</sup>	Seal assembly	2

Part #	Ref. No.	Description	Qty.
1172-2	24 <sup>(2)</sup>	Aux. inlet flange — 2" NPT	1
4479-2	25 <sup>(2)</sup>	Discharge flange — 2" NPT	2
2649	26	Nameplate	1
4248	27	Relief valve nameplate	1
1359	28	Lubrication instruction plate	2
1343	29	1/8" NPT relief valve	4
2158	30	1/8" NPT grease zerk	2
2159	31	Lubricap	2
3442	32	1/4" NPT pipe plug	2
2-231	33 <sup>(3)</sup>	O-ring — discharge flange	2
2-234	34 <sup>(3)</sup>	O-ring — auxiliary inlet flange	1
2-270	35 <sup>(3)</sup>	O-ring — case	2
7001-037NC150A	36	Bolt — hexagon head	24
7001-062NC125A	37	Bolt — hexagon head	16
7012-006SF019E	38	Screw	8
7206-037A	39	Lockwasher	8

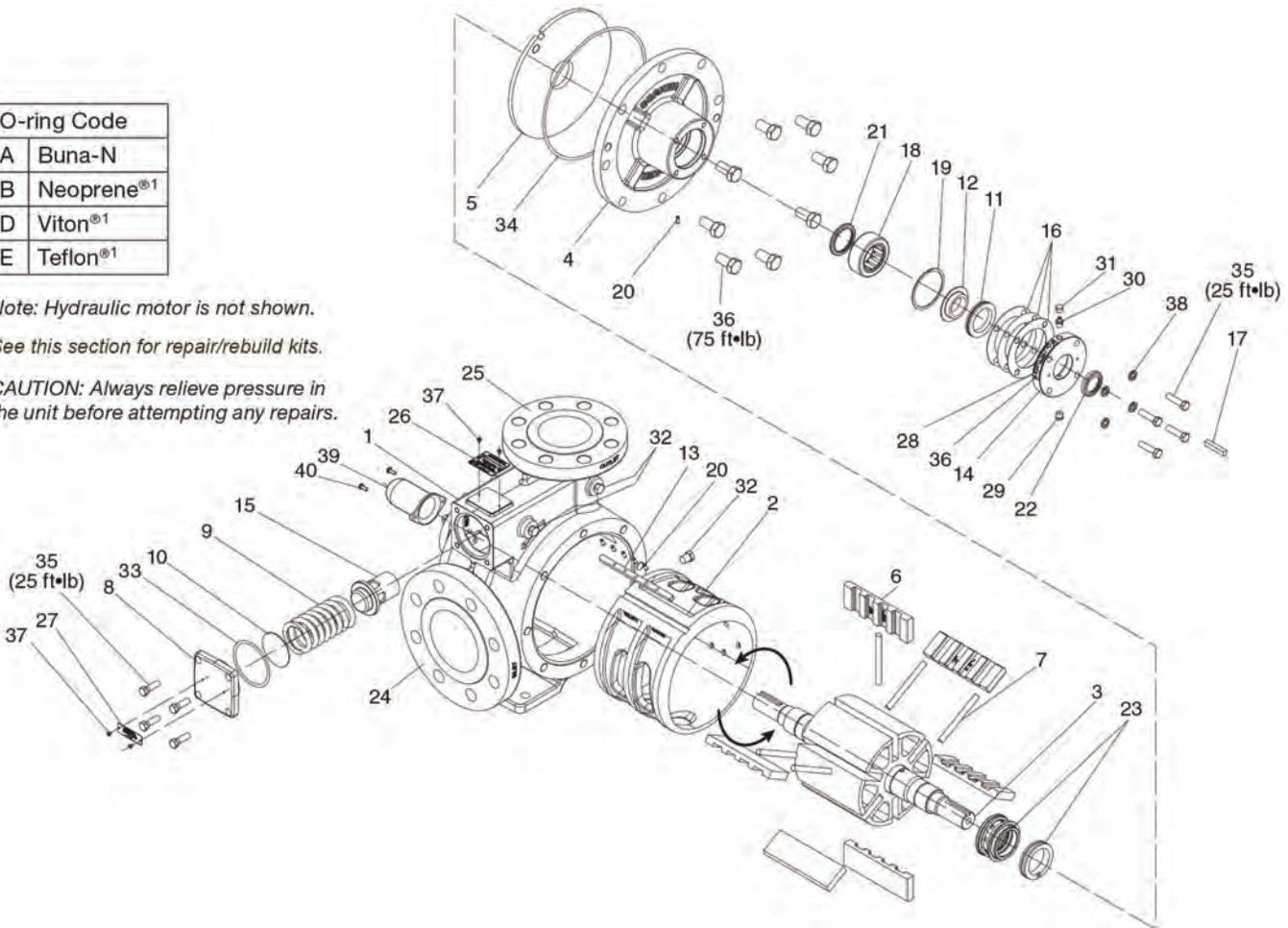
- (1) Registered trademarks of the DuPont company.
- (2) See flange chart for options.
- (3) \_Denotes O-ring code.
- (4) Slots in blades must face TOWARDS the direction of rotation.

O-ring Code	
A	Buna-N
B	Neoprene <sup>®1</sup>
D	Viton <sup>®1</sup>
E	Teflon <sup>®1</sup>

Note: Hydraulic motor is not shown.

See this section for repair/rebuild kits.

**CAUTION:** Always relieve pressure in the unit before attempting any repairs.



Pump & Compressors

Part #	Ref. No.	Description	Qty.
5522	1	Case	1
4443	2	Cam	1
4444-X2R	3	Rotor-shaft assembly	1
4445	4	Head	2
4446	5	Sideplate	2
4448	6 <sup>(3)</sup>	Vane	6
4449-X	7	Vane driver	5
4450	8	Relief valve cap	1
4451	9	Relief valve spring	1
4452	10	Shim	1
4453	11	Thrust bearing assembly	2
4454	12	Bearing race mounting ring	2
4455	13	Cam key	1
4456	14	Bearing cap	2
4457	15	Relief valve	1
4458	16	Bearing cap shim (.002) Red	As Req.
4458-1	16	Bearing cap shim (.010) Brown	As Req.
4458-2	16	Bearing cap shim (.020) Yellow	As Req.
4459	17	Shaft key — 5/16" x 1-3/4"	1
4460-X	18	Roller bearing	2
2760-283	19	Retainer ring	2
3253	20	Cam key pin	5
4462	21	Grease seal	2
4463	22	Grease seal	2
4464-X_6	23 <sup>(2)</sup>	Mechanical sea assembly	2

Part #	Ref. No.	Description	Qty.
— —	24	Inlet flange — 4" ANSI	1
— —	25	Outlet flange — 3" ANSI	2
2649	26	Nameplate	1
4248	27	Relief valve nameplate	1
1359	28	Lubrication instruction plate	2
1343	29	1/8" NPT relief fitting	4
2158	30	1/8" NPT grease zerk	2
2159	31	Lubricap	2
3442	32	1/4" NPT pipe plug	2
2-231_	33 <sup>(2)</sup>	O-ring — discharge flange	2
2-234_	34 <sup>(2)</sup>	O-ring — auxiliary inlet flange	1
2-270_	35 <sup>(2)</sup>	O-ring — case	2
7001-037NC150A	36	Bolt — hexagon head	24
7001-062NC125A	37	Bolt — hexagon head	16
7012-006SF019E	38	Screw	8
7206-037A	39	Lockwasher	8
4985	40	Shaft cover	1
7012-010SF050E	41	Screw	2

(1) Registered trademarks of the DuPont company.

(2) \_Denotes O-ring code.

(3) Slots in blades must face TOWARDS the direction of rotation.

### Repair Kit 3193-X16 Z2000

Part #	Description	Qty.
2-224A	Relief valve O-ring, Buna-N	1
2-231A	Flange O-ring, Buna-N	2
2-261A	Case O-ring, Buna-N	2
2754-X	Roller bearing	2
4262-X	Vane driver	3
4428	Vane	6
4431-XA6	Seat assembly	2
4432	Thrust bearing	2
4435	Thrust bearing mounting ring	2
4439	Bearing cap shim (.002) Red	8
4439-1	Bearing cap shim (.010) Brown	2
4439-2	Bearing cap shim (.020) Yellow	2
4441	Grease seal (outer)	2
4438	Grease seal (inner)	2
2270	Shaft key	1

### Repair Kit 3195-X16 Z3200

Part #	Description	Qty.
2-224A	Relief valve O-ring, Buna-N	1
2-234A	Flange O-ring, Buna-N	2
2-261A	Case O-ring, Buna-N	2
2754-X	Roller bearing	2
4262-X	Vane driver	3
4232	Vane	6
4431-XA6	Seat assembly	2
4432	Thrust bearing	2
4435	Thrust bearing mounting ring	2
4439	Bearing cap shim (.002) Red	8
4439-1	Bearing cap shim (.010) Brown	2
4439-2	Bearing cap shim (.020) Yellow	2
4441	Grease seal (outer)	2
4438	Grease Seal (inner)	2
2270	Shaft key	1

### Rebuild Kit 3194-X16 Z2000

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4414	Cam	1
4427	Sideplate	2

### Rebuild Kit 3196-X16 Z3200

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4242	Cam	1
4231	Sideplate	2

### Full Rebuild Kit 3194-X36 Z2000

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4414	Cam	1
4427	Sideplate	2
4430-X2R	Rotor-shaft assembly	1

### Full Rebuild Kit 3196-X36 Z3200

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4242	Cam	1
4231	Sideplate	2
4495-X2R	Rotor-shaft assembly	1

### Repair Kit 3195-X26 Z3500

Part #	Description	Qty.
2-228A	Relief valve O-ring, Buna-N	2
2-268A	Case O-ring, Buna-N	2
2-245A	Flange O-ring, Buna-N	1
2-259A	Flange O-ring, Buna-N	1
2754-X	Roller bearing	2
5554-X	Vane driver	6
3936	Vane	6
6660-XA6	Seat assembly	2
4432	Thrust bearing	2
4435	Thrust bearing mounting ring	2
4439	Bearing cap shim (.002) Red	8
4439-1	Bearing cap shim (.010) Brown	2
4439-2	Bearing cap shim (.020) Yellow	2
4441	Grease seal (outer)	2
4438	Grease seal (inner)	2
2270	Shaft key	1

### Repair Kit 3197-X16 Z4200 & Z4500

Part #	Description	Qty.
2-231A	Flange O-ring, Buna-N	1
2-234A	Relief valve O-ring, Buna-N	2
2-270A	Case O-ring, Buna-N	2
4460-X	Roller bearing	2
4449-X	Vane driver	3
4448	Vane	6
4464-XA6	Seat assembly	2
4453	Thrust bearing	2
4454	Thrust bearing mounting ring	2
4458	Bearing cap shim (.002) Red	8
4458-1	Bearing cap shim (.010) Brown	2
4458-2	Bearing cap shim (.020) Yellow	2
4463	Grease seal (outer)	2
4462	Grease seal (inner)	2
4459	Shaft key	1

### Rebuild Kit 3196-X26 Z3500

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
5539	Cam	1
3935	Sideplate	2

### Rebuild Kit 3198-X16 Z4200 & Z4500

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4443	Cam	1
4446	Sideplate	2

### Full Rebuild Kit 3196-X46 Z3500

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
5539	Cam	1
3935	Sideplate	2
1208-1X6R	Rotor-shaft assembly	1

### Full Rebuild Kit 3198-X36 Z4200 & Z4500

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4443	Cam	1
4446	Sideplate	2
4444-X2R	Rotor-shaft assembly	1

### Repair Kit 3193-X1 Z2000

Part #	Description	Qty.
2-224A	O-ring, Buna-N	1
2-231A	O-ring, Buna-N	2
2754-X	Roller bearing	2
4262-X	Vane driver	3
4428	Vane	6
4431-XA2	Seat assembly	2
4432	Thrust bearing	2
4435	Thrust bearing mounting ring	2
4439	Bearing cap shim (.002) Red	8
4439-1	Bearing cap shim (.010) Brown	2
4439-2	Bearing cap shim (.020) Yellow	2
4441	Grease seal	2
2270	Shaft key	1

### Repair Kit 3195-X1 Z3200

Part #	Description	Qty.
2-224A	O-ring, Buna-N	1
2-234A	O-ring, Buna-N	2
2754-X	Roller bearing	2
4262-X	Vane driver	3
4232	Vane	6
4431-XA2	Seat assembly	2
4432	Thrust bearing	2
4435	Thrust bearing mounting ring	2
4439	Bearing cap shim (.002) Red	8
4439-1	Bearing cap shim (.010) Brown	2
4439-2	Bearing cap shim (.020) Yellow	2
4441	Grease seal	2
2270	Shaft key	1

### Rebuild Kit 3194-X1 Z2000

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4414	Cam	1
4427	Sideplate	2

### Rebuild Kit 3196-X1 Z3200

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4424	Cam	1
4231	Sideplate	2

### Full Rebuild Kit 3194-X3 Z2000

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4414	Cam	1
4427	Sideplate	2
4430-X2R	Rotor-shaft assembly	1

### Full Rebuild Kit 3196-X3 Z3200

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4424	Cam	1
4231	Sideplate	2
4495-X2R	Rotor-shaft assembly	1

### Repair Kit 3195-X2 Z3500

Part #	Description	Qty.
2-228A	O-ring, Buna-N	2
2754-X	Roller bearing	2
5554-X	Vane driver	6
3936	Vane	6
6660-xa2	Seat assembly	2
4432	Thrust bearing	2
4435	Thrust bearing mounting ring	2
4439	Bearing cap shim (.002) Red	8
4439-1	Bearing cap shim (.010) Brown	2
4439-2	Bearing cap shim (.020) Yellow	2
4441	Grease seal	2
2270	Shaft key	1

### Repair Kit 3197-X1 Z4200 & Z4500

Part #	Description	Qty.
2-231A	O-ring, Buna-N	1
2-234A	O-ring, Buna-N	2
4460-X	Roller bearing	2
4449-X	Vane driver	3
4448	Vane	6
4464-XA2	Seat assembly	2
4453	Thrust bearing	2
4454	Thrust bearing mounting ring	2
4458	Bearing cap shim (.002) Red	8
4458-1	Bearing cap shim (.010) Brown	2
4458-2	Bearing cap shim (.020) Yellow	2
4463	Grease seal	2
4459	Shaft key	1

### Rebuild Kit 3196-X2 Z3500

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
5539	Cam	1
3935	Sideplate	2

### Rebuild Kit 3198-X1 Z4200 & Z4500

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4443	Cam	1
4446	Sideplate	2

### Full Rebuild Kit 3196-X4 Z3500

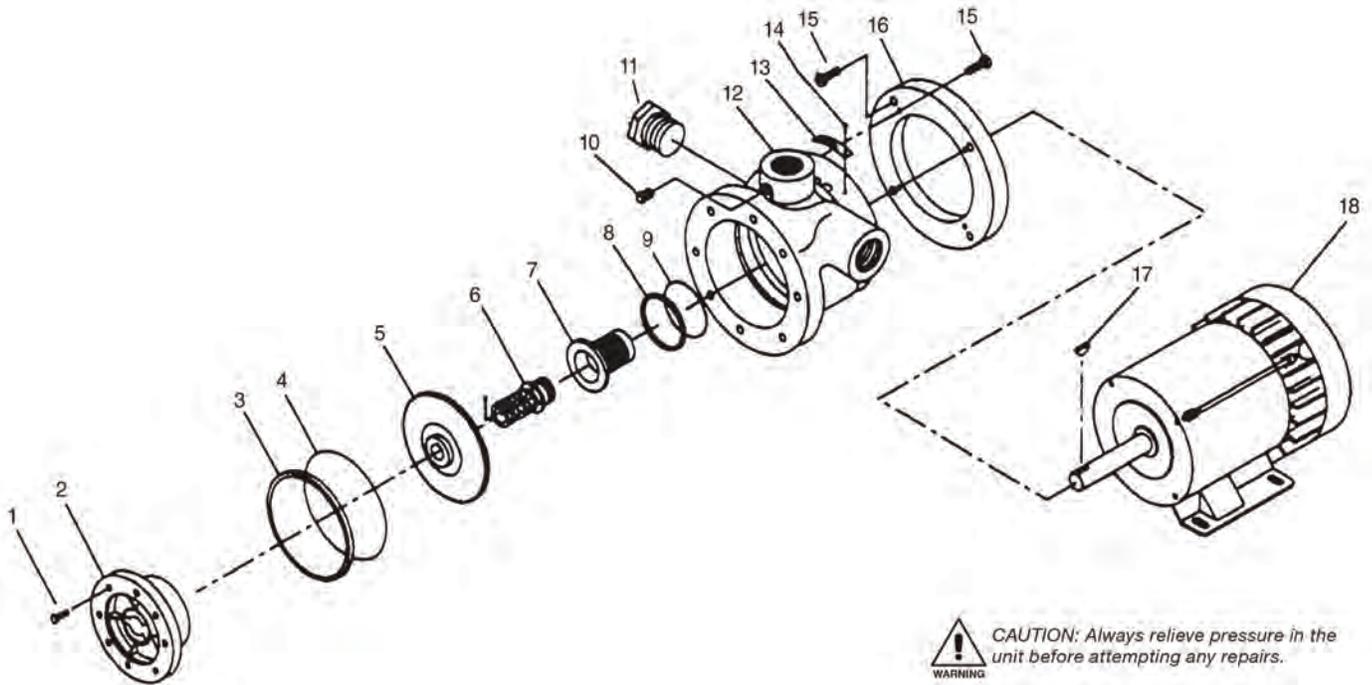
Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
5539	Cam	1
3935	Sideplate	2
1208-1X6R	Rotor-shaft assembly	1

### Full Rebuild Kit 3198-X3 Z4200 & Z4500

Includes all the items in the Repair Kit Plus the following

Part #	Description	Qty.
4443	Cam	1
4446	Sideplate	2
4444-X2R	Rotor-shaft assembly	1



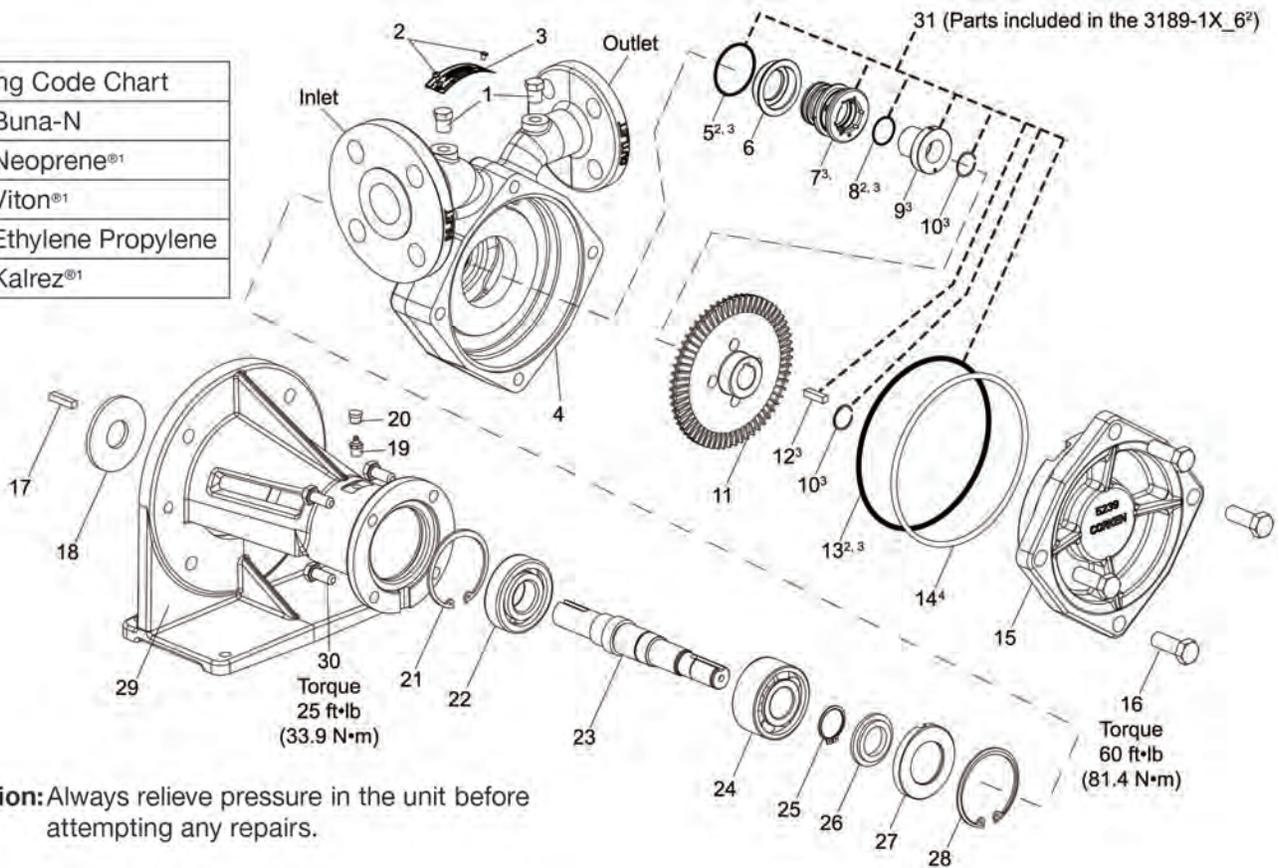
**WARNING** CAUTION: Always relieve pressure in the unit before attempting any repairs.

Part #	Ref. No.	Description	Qty.
7001-031NC100A	1	Hex head cap screw	8
1001-0	2	Cover — model 10	1
1001-2	2	Cover — model 12	1
1001-3	2	Cover — model 13	1
1001-4	2	Cover — model 14	1
1001-6	2	Cover — model 16	1
1014	3 (a)	Case clearance shim (.002" red)	As req.
1014-1	3 (a)	Case clearance shim (.003" green)	As req.
2-246	4 (a)	Case O-ring (Buna-N)	1
1003-0	5 (b)	Impeller, brass — model 10	1
1003-2	5 (b)	Impeller, brass — model 12	1
1003-3	5 (b)	Impeller, brass — model 13	1
1003-4	5 (b)	Impeller, brass — model 14	1
1003-6	5 (b)	Impeller, brass — model 16	1
113-CXA6	6 (b)	Seal assembly (Buna-N O-rings)	1
1004-1X	7	Seal housing (Steel)	1
1013	8	Housing adjustment shim (.010")	As req.
1013-1	8	Housing adjustment shim (.020")	As req.
2-224	9 (a)	Housing O-ring (Buna-N)	1
3442	10	Pipe plug — 1/4" NPT	1

Part #	Ref. No.	Description	Qty.
3444	11	Pipe plug — 3/4" NPT	1
1002-0	12	Case — model 10	1
1002-2	12	Case — model 12	1
1002-3	12	Case — model 13	1
1002-4	12	Case — model 14	1
1002-6	12	Case — model 16	1
1914-1	13	Nameplate	1
7012-006SF019E	14	Phillips head screw 6-32 x 1/4"	2
7002-037NC087A	15	Socket head cap screw	8
1015	16	Adapter ring	1
2497	17 (a)	Woodruff key — steel	1
2497-1	17 (a)	Woodruff key — SS	1
2557	18	Motor 3 HP — models 10, 12 and 13	1
4261	18	Motor 2 HP — models 10, 12 and 13	1
4261-1	18	Motor 1 HP — models 10 and 12	1
4885	18	Motor 3 HP — models 14 and 16 (single phase)	1

(a) - Included with seal assembly/repair kit 113-CXA6  
 (b) - Add a 1 to # for Iron or a 2 for Stainless Steel (example: model 10 with iron is 1003-01).

O-ring Code Chart	
A	Buna-N
B	Neoprene <sup>®1</sup>
D	Viton <sup>®1</sup>
G	Ethylene Propylene
K	Kalrez <sup>®1</sup>



**Caution:** Always relieve pressure in the unit before attempting any repairs.

Part #	Ref. No.	Description	Qty.
3442	1	1/4" pipe plug	2
7012-0065F019E	2	Nameplate screw	2
1914-1	3	Nameplate	1
5238-060	4	060 Case — ANSI flange (FF)	1
5238-75	4	075 Case — ANSI flange (FF)	1
5238	4	150 Case — ANSI flange (FF)	1
5238-061	4	060 Case — DIN flange (FD)	1
5238-751	4	075 Case — DIN flange (FD)	1
5238-1	4	150 Case — DIN flange (FD)	1
2-133_	5 <sup>(2,3)</sup>	Seal housing — O-ring	1
5244-1X	6	Seal housing assembly	1
Not Sold Separately	7 <sup>(3)</sup>	Seal sub assembly	1
2-018	8 <sup>(2,3)</sup>	Seal sleeve O-ring	1
Not Sold Separately	9	Seal sleeve assembly	1
2760-88	10 <sup>(3)</sup>	7/8" retainer ring	1
5240-060	11	060 Impeller (bronze)	1
5240-75	11	075 Impeller (bronze)	1
5240	11	150 Impeller (bronze)	1
5240-061	11	060 Impeller (stainless steel)	1
5240-751	11	075 Impeller (stainless steel)	1
5240-1	11	150 Impeller (stainless steel)	1
5240-062	11	060 Impeller (steel)	1
5240-752	11	075 Impeller (steel)	1
5240-2	11	150 Impeller (steel)	1
4244	12 <sup>(3)</sup>	Impeller key	1
2-260_	13 <sup>(2,3)</sup>	Case O-ring	1

Part #	Ref. No.	Description	Qty.
5248	14 <sup>(4)</sup>	Case clearance shim	1
5239-75	15	075 Cover	1
5239	15	150 Cover	1
7301-140MC040A	16	M14-2 x 40mm hex head bolt	4
3226	17	Shaft key	1
4377	18	Bearing plate	1
2158	19	Grease zerk	1
2159	20	Lubricap	1
5000-281	21	Retainer ring	1
4378	22	Single row ball bearing	1
5241-2	23	Shaft	1
2758	24	Double row ball bearing	1
5102-118	25	Retaine ring	1
1006	26	Grease seal	1
1238	27	Bearing cap	1
5002-281	28	Retainer ring	1
4298	29	Mounting frame — NEMA	1
4298-1	29	Mounting frame — IEC	1
7301-100MC025A	30	N10-1.5 x 25mm hex head bolt	4
3189-1X_6	31 <sup>(2)</sup>	Seal assembly 2	1

(1) Registered trademarks of the DuPont company.

(2) \_Denotes O-ring code.

(3) Included in seal assembly kit 3189-1X\_6. 2

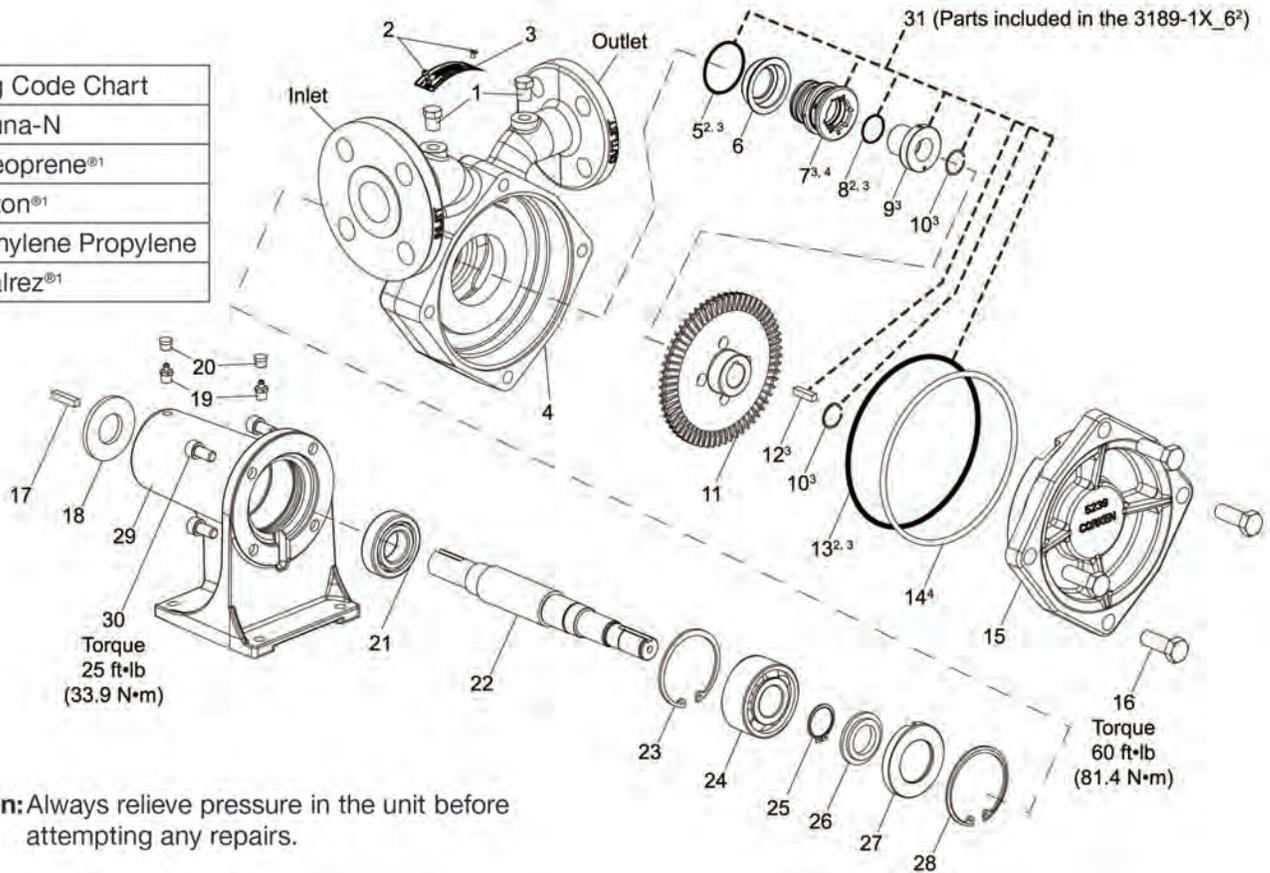
(4) The case clearance shim only applies to model prior to serial number prefix YU. For a complete explanation of Corken's serial number prefix codes, see "Policy and Prices" section of Corken's sales catalog or service manual.

Models: FF075, FF150



Pump & Compressors

O-ring Code Chart	
A	Buna-N
B	Neoprene <sup>®1</sup>
D	Viton <sup>®1</sup>
G	Ethylene Propylene
K	Kalrez <sup>®1</sup>



**Caution:** Always relieve pressure in the unit before attempting any repairs.

Part #	Ref. No.	Description	Qty.
3442	1	1/4" pipe plug	2
7012-0065F019E	2	Nameplate screw	2
1914-1	3	Nameplate	1
5238-060	4	060 Case — ANSI flange (FF)	1
5238-75	4	075 Case — ANSI flange (FF)	1
5238	4	150 Case — ANSI flange (FF)	1
5238-061	4	075 Case — DIN flange (FD)	1
5238-751	4	075 Case — DIN flange (FD)	1
5238-1	4	150 Case — DIN flange (FD)	1
2-133_	5 <sup>(2,3)</sup>	Seal housing — O-ring	1
5244-1X	6	Seal housing assembly	1
Not Sold Separately	7 <sup>(3)</sup>	Seal sub assembly	1
2-018	8 <sup>(2,3)</sup>	Seal sleeve O-ring	1
Not Sold Separately	9	Seal sleeve assembly	1
2760-88	10 <sup>(3)</sup>	7/8" retainer ring	1
5240-060	11	060 Impeller (bronze)	1
5240-75	11	075 Impeller (bronze)	1
5240	11	150 Impeller (bronze)	1
5240-061	11	060 Impeller (stainless steel)	1
5240-751	11	075 Impeller (stainless steel)	1
5240-1	11	150 Impeller (stainless steel)	1
5240-062	11	060 Impeller (steel)	1
5240-752	11	075 Impeller (steel)	1
5240-2	11	150 Impeller (steel)	1
4244	12 <sup>(3)</sup>	Impeller key	1
2-260_	13 <sup>(2,3)</sup>	Case O-ring	1

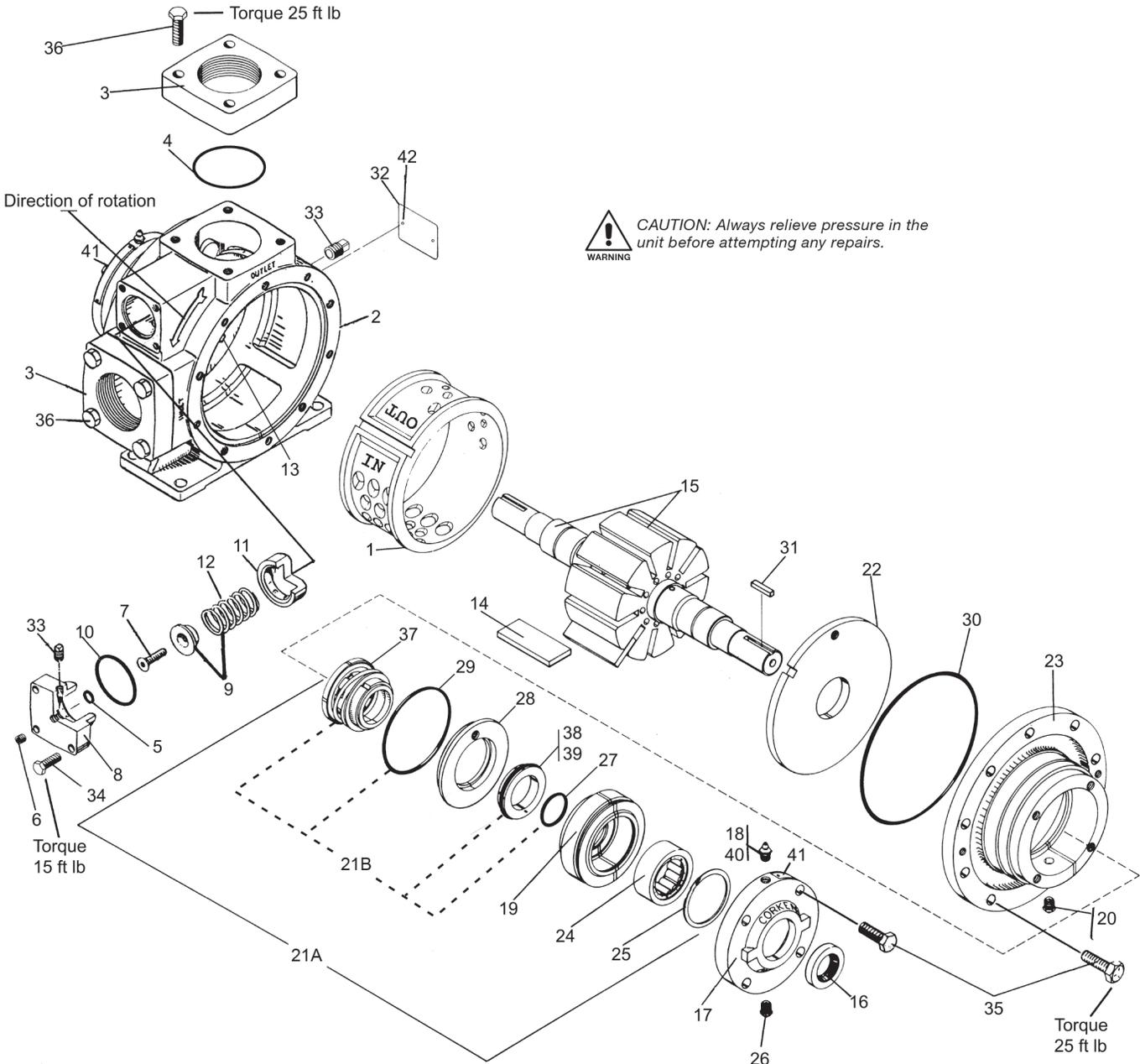
Part #	Ref. No.	Description	Qty.
5248	14 <sup>(4)</sup>	Case clearance shim	1
5239-060	15	060 Cover	1
5239-75	15	075 Cover	1
5239	15	150 Cover	1
7301-140MC040A	16	M14-2 x 40mm hex head bolt	4
3226	17	Shaft key	1
3227	18	Bearing plate	1
2158	19	Grease zerk	1
2159	20	Lubricap	1
2759	21	Single row ball bearing	1
5241-1	22	Shaft	1
5000-281	23	Retainer ring	1
2758	24	Double row ball bearing	1
5102-118	25	Retainer ring	1
1006	26	Grease seal	1
1238	27	Bearing cap	1
5002-281	28	Retainer ring	1
1010-3	29	Mounting frame	1
7301-100MC025A	30	N10-1.5 x 25mm hex head bolt	4
3189-1X_6	31 <sup>(2)</sup>	Seal assembly	1

(1) Registered trademarks of the DuPont company.

(2) \_Denotes O-ring code.

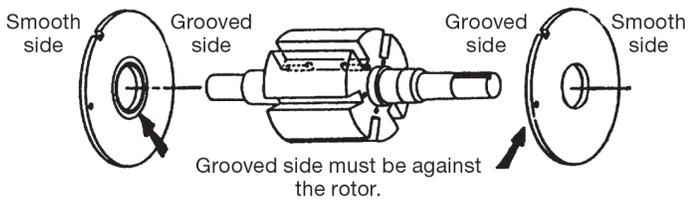
(3) Included in seal assembly kit 3189-1X\_6.2

(4) The case clearance shim only applies to model prior to serial number prefix YU. For a complete explanation of Corken's serial number prefix codes, see "Policy and Prices" section of Corken's sales catalog or service manual.



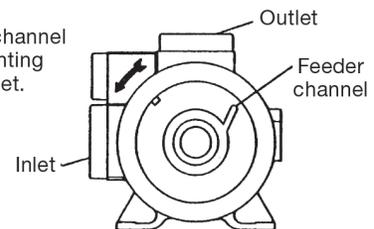
### Sideplate Replacement Instructions

#### Model 521



#### Model 1021

Install with feeder channel against rotor pointing toward the outlet.



Part #	Ref. No.	Description	Qty.
1162-2	1	Cam (521, 522)	1
1201-2	1	Cam (1021, 1022)	1
2832	2	Case (521, 522)	1
2841	2	Case (1021, 1022)	1
1172-2.5	3-b <sup>(3)</sup>	2.5" Flange (521, 522)	1
1172-2	3-b <sup>(3)</sup>	2" Flange (521, 522)	1
1206-3	3-c <sup>(4)</sup>	3" Flange (1021, 1022)	2
2-234_	4 <sup>(2)</sup>	Flange O-ring (521, 522)	2
2-245_	4 <sup>(2)</sup>	Flange O-ring 3" (1021, 1022)	2
2-249_	4 <sup>(2)</sup>	Flange O-ring 4" (1021, 1022)	2
2-112_	5 <sup>(2)</sup>	Adjusting screw O-ring	1
2590	6	Flush seal plug 1/8" NPT	1
2252	7	Relief valve adjusting screw	1
1174	8	Valve Cap (521, 522)	1
1207	8	Valve Cap (1021, 1022)	1
1242-X	9	Relief valve spring & guide (521, 522)	1
1227	9	Relief valve spring & guide (1021, 1022)	1
2-224_	10 <sup>(2)</sup>	Relief valve cap O-ring (521, 522)	1
2-228_	10 <sup>(2)</sup>	Relief valve cap O-ring (1021, 1022)	1
1241	11	Relief valve (521, 522)	1
1224	11	Relief valve (1021, 1022)	1
1242	12	Relief valve spring (521, 522)	1
1226	12	Relief valve spring (1021, 1022)	1
1170	13	Cam key (521, 522)	1
1309	13	Cam key (1021, 1022)	1
1168-7	14	Blade (521, 522)	10
1308-9	14	Blade (1021, 1022)	10
1166-1X1R	15	Rotor & shaft assembly (521, 522)	1
1208-1X1R	15	Rotor & shaft assembly (1021, 1022)	1
1358	16	Grease seal	2
1164-1	17	Bearing cap	2
2158	18	Grease zerk 1/8" NPT	2
1769	19	Bearing housing	2
1343	20	Relief fitting (seal vent)	2
1769-X_	21 <sup>(1,2)</sup>	Seal assembly — replacement	2
1769-XR_	21 <sup>(1,2)</sup>	Seal assembly — replacement	2
1163-2	22 <sup>(7)</sup>	Sideplate (521, 522)	2
1209-1	22 <sup>(7)</sup>	Sideplate (1021, 1022)	2
1161-4	23	Head (521, 522)	2
1205-4	23	Head (1021, 1022)	2
2754-X	24	Roller bearing — complete	2

Part #	Ref. No.	Description	Qty.
2755	24	Bearing inner race	2
2754	24	Bearing outer race	2
2760-244	25	Retainer ring	2
1343	26	Relief fitting (grease)	2
2-128_	27 <sup>(6)</sup>	Shaft O-ring	2
1822	28	Seat adapter plate O-ring	2
2-240_	29 <sup>(2)</sup>	Adapter plate O-ring	2
2-261_	30 <sup>(2)</sup>	Case O-ring (521, 522)	2
2-268_	30 <sup>(2)</sup>	Case O-ring (1021, 1022)	2
2270	31	1/4" key	2
2949	32	Nameplate	1
3442	33	1/4" NPT plug	1
7001-031 NC125A	34	Hex head bolt 5/16-18 x 1-1/4" (521, 522)	4
7001-037 NC125A	34	Hex head bolt 3/8-16 x 1-1/4" (1021, 1022)	4
7001-037 NC125A	35	Hex head bolt 3/8-16 x 1-1/4" (521, 522)	28
7001-037 NC125A	35	Hex head bolt 3/8-16 x 1-1/4" (1021, 1022)	32
7001-037 NC150A	36	Hex head bolt 3/8-16 x 1-1/2"	8
Not Sold Separately	37	Retainer	2
Not Sold Separately	38	Seal seat	2
2-227_	39 <sup>(2)</sup>	Seal seat O-ring	2
2159	40	Lubricap #2	2
1359	41	Lubrication instruction tag	2
7003-004 DR0198	42	Round head plated drive screw 4 x 3/16"	2

(1) Seal assembly kits available in two forms

a. Complete seal kit including bearing housing, seat adapter plate, bearings, retainer ring, seal and O-rings. Part number 1769-X\_ (2)

b. Field replacement seal assembly containing only the seal and O-rings. Part number 1769-XR\_ (2)

(2) \_Denotes O-ring code.

(3) Optional flanges, (521, 522):

1172-1.5	1-1/2" NPT
1172-1.5S	1-1/2" Weld
1172-2	2" NPT
1172-2S2	2" Weld
1172-2.5	2-1/2" NPT
1172-2.5S	2-1/2" Weld

(4) Optional flanges, (1021, 1022):

1206-3S	3" Weld
1206-4	4" NPT
1206-4S	4" Weld

(5) Registered trademarks of the DuPont company.

(6) Available in Buna-N only

(7) Sideplate Instructions

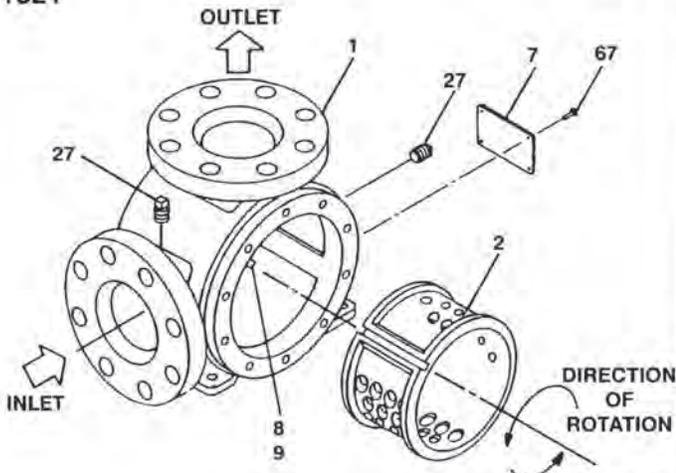
## Models: F1521, T1522

(Discontinued. Replaced by Z4200)

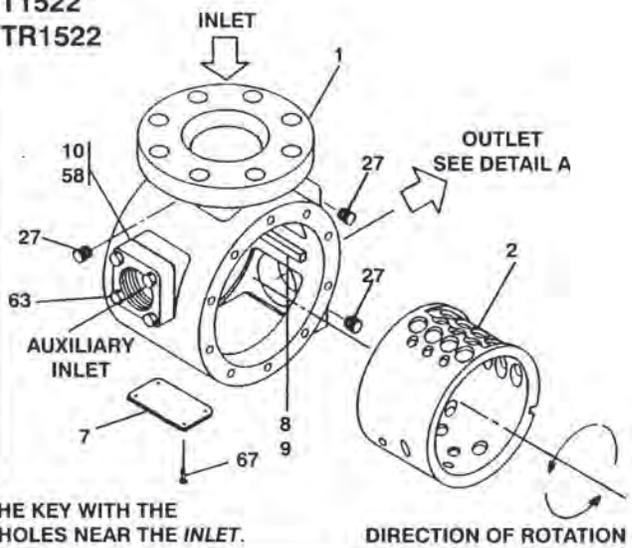


Pump & Compressors

### F1521



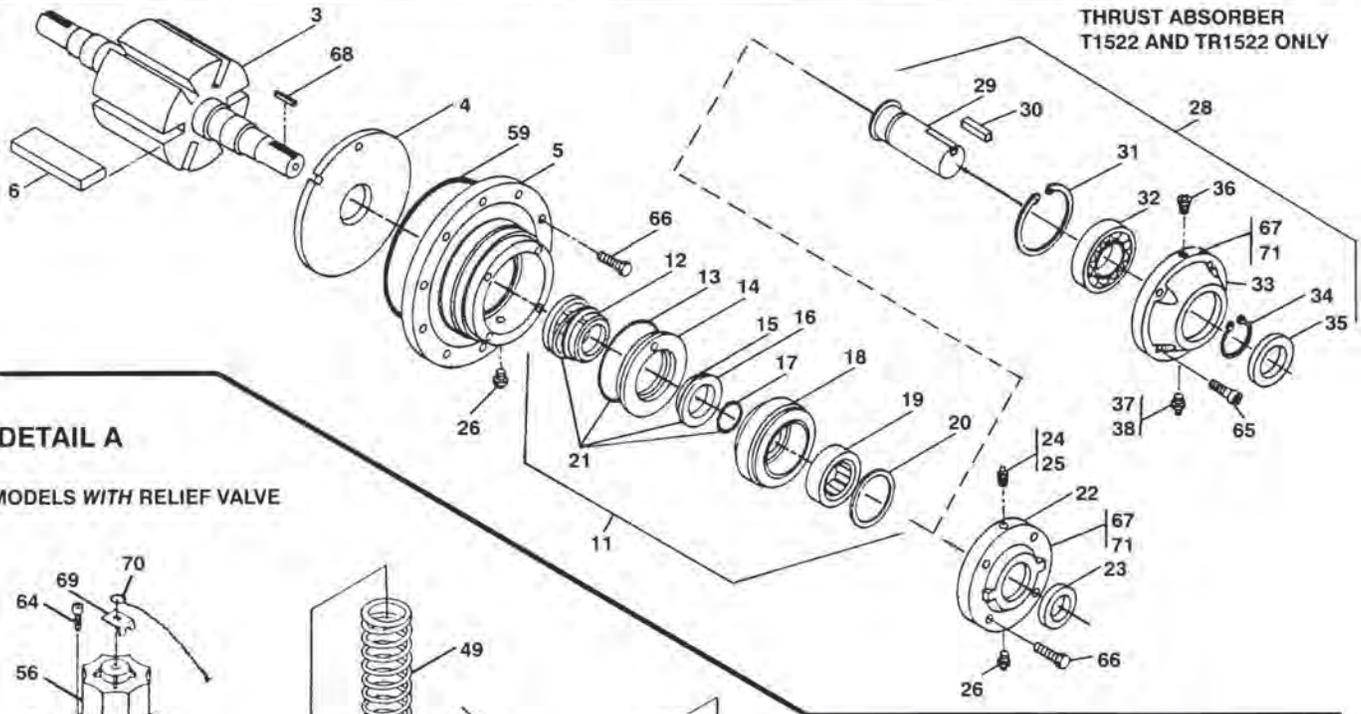
### T1522 TR1522



NOTE: ALIGN THE CAM ON THE KEY WITH THE LARGEST GROUP OF HOLES NEAR THE INLET.

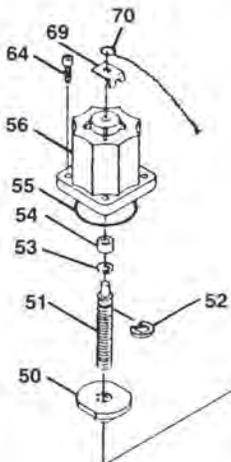
DIRECTION OF ROTATION

### THRUST ABSORBER T1522 AND TR1522 ONLY

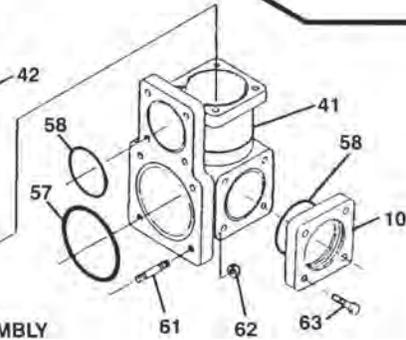


### DETAIL A

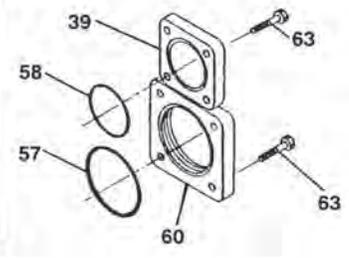
#### MODELS WITH RELIEF VALVE



40 RELIEF VALVE ASSEMBLY



#### MODELS WITHOUT RELIEF VALVE



## Models: F1521, T1522

(Discontinued. Replaced by Z4200)



Part #	Ref. No.	Description
2437	1	Case (T1521)
1923	1	Case (T1522)
1792-1	2	Cam
3350-X1R	3	Rotor-shaft assembly (T1521)
3350-X2R	3	Rotor-shaft assembly (T1522)
3476-R	4	Sideplate
3476-L	4	Sideplate
1205-4	5	Head
3477	6	Blade
2649	7	Nameplate
1880	8	Cam key
3253	9	Cam key pin
1172-2	10 <sup>(b)</sup>	Flange — 2" NPT (T1522)
1769-X	11 <sup>(a)</sup>	Seal assembly
Not Sold Separately	12	Seal retainer
2-240_	13 <sup>(e)</sup>	Adapter plate O-ring
1822	14	Seat adapter plate
2-223_	15 <sup>(e)</sup>	Seal seat O-ring
Not Sold Separately	16	Seat
2-128_	17 <sup>(e)</sup>	Shaft O-ring
1769	18	Bearing housing
2754	19	Bearing outer race
2760-244	20	Retaining ring
1769-X	21 <sup>(a)</sup>	Field replacement seal assembly (includes seal, seat, O-ring)
1164-1	22	Bearing cap
1358	23	Grease seal
2158	24	Grease zerk 1/8" NPT
2159	25	Lubricap #2 (Not shown)
1343	26	Relief fitting
3448	27	1/4" NPT Plug
254-X2	28	Thrust absorber
1958-X2	29 <sup>(d)</sup>	Shaft keyway
2623	30	5/16" Key
5102-177	31	Retainer ring
3209	32	Ball bearing
1957	33	Bearing cap
5002-334	34	Retainer ring
2014	35	Grease seal
1343	36	Relief fitting — thruster absorber
2158	37	Grease Zerk (1/8" NPT)
2159	38	Lubricap #2 (Not Shown)
1920	39	Blind flange
178-X	40	Relief valve assembly
1787	41	Relief valve manifold
1699-X	42	Plunger assembly
1873	43	Nut
1703	44	Retainer plate
1700	45	Set, PTFE
1699	46	Plunger assembly

Part #	Ref. No.	Description
2732	47	Gasket
1872	48	Plunger bolt
1839	49	Spring
1701	50	Spring seat
1878	51	Adjusting screw
5133-87	52	Retainer ring
1789	53	Stem washer
1887	54	Stem seal
2-238_	55 <sup>(b)(e)</sup>	O-ring
1796	56	Relief valve bonnet
2-245_	57 <sup>(e)</sup>	O-ring — 3" Flange or relief valve
2-249_	57 <sup>(e)</sup>	O-ring — 4" Flange
2-234_	58 <sup>(e)</sup>	O-ring — 2" Flange
2-268_	59 <sup>(e)</sup>	O-ring — Case
1206-3	60 <sup>(c)</sup>	Flange — 3" NPT
2018	61	Stud, 3/8" x 2-1/4" Relief valve
7101-037 NC01A	62	Nut, 3/8-16 relief valve
7001-037 NC150A	63	Bolt, 3/8-16 x 1-1/2" hex head
7002-037 NC100A	64	Bolt, 3/8-16 x 1" SOC head
7002-037 NC125A	65	Bolt, 3/8-16 x 1-1/4" SOC head
7001-037 NC125A	66	Bolt, 3/8-16 x 1-1/4" hex head
7012-006 SF025E	67	Drive screw #4 C 3/16" RD head
2270	68	1/4" key
2080	69	Lock
3546	70	Seal wire
1359	71	Lubrication instruction tag

(a) Seal assembly kits available in two forms

Complete seal kit including bearing housing, seat adapter plate, bearings, retainer ring, seal and O-rings. Part number 1769-X\_. (e)

Field replacement seal assembly containing only the seal and O-rings. Part number 1769-XR\_. (e)

(b) Optional flanges:

1172-1.5	1-1/2" NPT
1172-1.5S	1-1/2" Weld
1172-2S	2" Weld
1172-2.5	2-1/2" NPT
1172-2.5S	2-1/2" Weld
1947-1.5	Flanged E11 — 1-1/2" NPT
2008	Flanged E11 — 2" NPT
1920	Blind flange

(c) Optional flanges:

1206-3S	3" Weld
1206-4	4" NPT
1206-4S	4" Weld

(d) Optional:

1958-X1 Shaft — 1-3/8"-6B Spine

(e) \_ Denotes O-ring code.

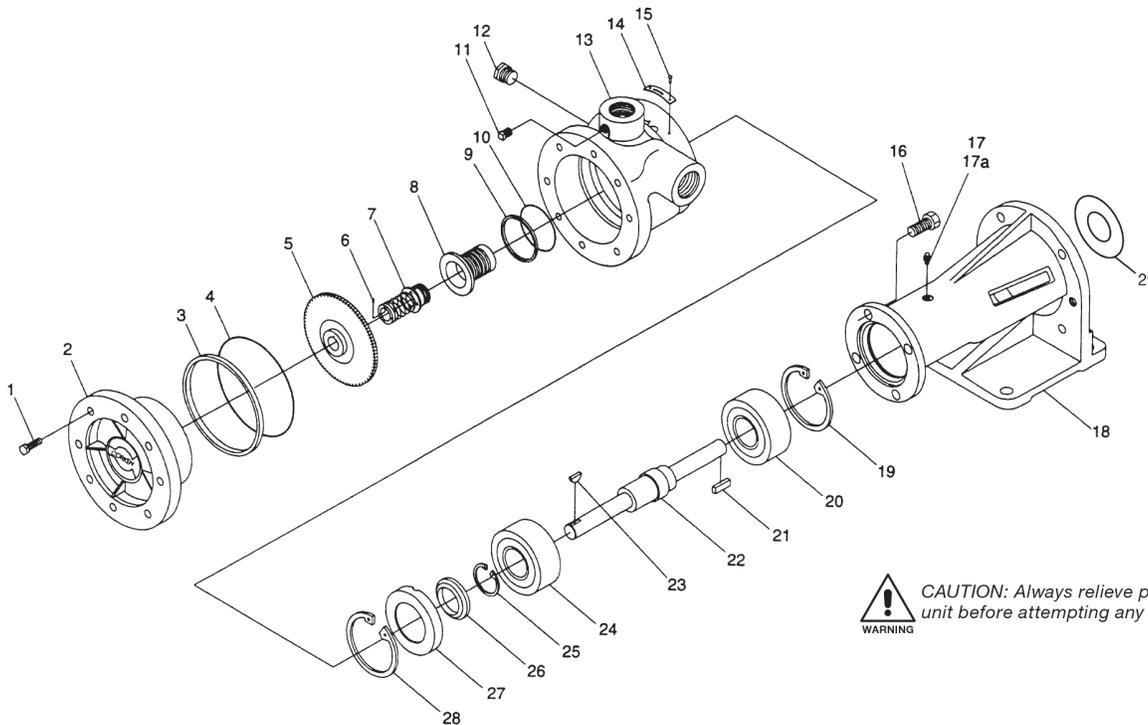
(f) Registered trademarks of the DuPont company.

# Corken Pump Repair

Model: DL16



Pump & Compressors



CAUTION: Always relieve pressure in the unit before attempting any repairs.

Part #	Ref. No.	Description	Qty.
7001-031NC100A	1	Hex head cap screw	8
1001-6	2	Cover - Model 16	1
1014	3 (c)	Case clearance shin (0.002-Red)	As Req.
1014-1	3 (c)	Case clearance shim (0.003-Green)	As Req.
2-246_	4 (a)(c)	Case O-Ring (non PTFE)	1
2-247	4 (a)(c)	Case O-Ring (PTFE)	1
1003-6	5 (d)	Impeller - Model 16	1
1009	6	Seal Pin	1
113-CX_6	7 (a)	Seal assembly (aluminum sleeve)	1
113-CX_6A	7 (a)	Seal assembly (stainless steel sleeve)	1
1004-1X	8	Seal housing steel (for non-PTFE O-rings)	1
1004-11X	8	Seal housing stainless steel (for non-PTFE O-rings)	1
1004-2X	8	Seal housing steel (for PTFE O-rings)	1
1004-21X	8	Seal housing stainless steel (for PTFE O-rings)	1
1013	9	Housing adjustment shim (0.010)	As Req.
1013-1	9	Housing adjustment shim (0.020)	As Req.
2-224_	10 (a)(c)	O-ring (housing)	1
3442	11	Pipe plug 1/4"	1
3444	12	Pipe Plug 3/4"	1
1002-6	13	Case - Model 16	1
1914-1	14	Name plate	1
7012-0065F019E	15	Phillips head scre 6-32 x 1/4"	2
7001-037NC100A	16	Hex head mounting bolts	4

Part #	Ref. No.	Description	Qty.
2158	17	Grease zerck	2
2159	17A	Lubricap	2
4298	18	Mounting frame - DL	1
5002-281	19	Bearing retainer ring	1
4378	20	Bearing	1
3226	21	Key	1
4303	22	Shaft	1
2497	23 (c)	#5 Woodruff key, steel	1
3497-1	23 (c)	#5 Woodruff key, stainless steel	1
2758	24	Bearing	1
5102-118	25	Bearing retainer ring	1
1006	26	Grease seal	1
1238	27	Bearing cap	1
5000-281	28	Bearing retainer ring	1
4377	29	Bearing plate	1

(a) \_denotes O-ring. See O-ring chart for details.

O-RING CODES
A - Buna-N
B - Neoprene®(b)
D - Viton®(b)
E - PTFE
G - Ethylene Propylene
F - Kalrez®(b)

(b) Registered trademark of the DuPont Company.

(c) Included with seal assembly/repair kit.

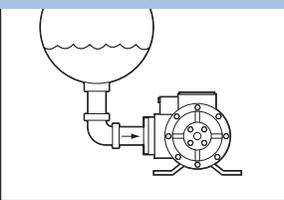
(d) Add a 1 to # for iron or a 2 for stainless steel

## Quick Reference Guide For Trouble Free Operation

Make sure you are thoroughly trained before you attempt any pump installations. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

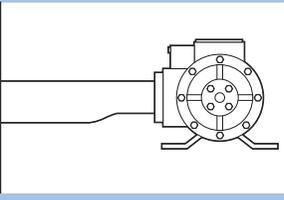
**ALWAYS FOLLOW ORIGINAL EQUIPMENT MANUFACTURER'S GUIDELINES.**

### Inlet Piping



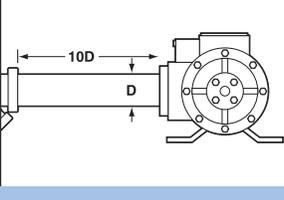
**PUMP LOCATION**

- Underneath and as close to the supply tank as possible.
- Inlet to the pump is very important.



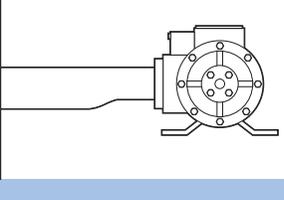
**INLET PIPE SIZE**

- Same as pump inlet connection or one pipe size larger.

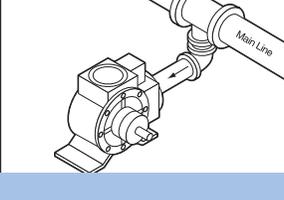


**INLET PIPING**  
**Use full port ball valves.**

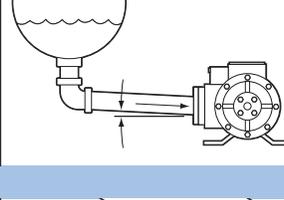
- Use strainer on inlet 10X pipe diameter from pump inlet
- Last valve, fitting, elbow should also be 10X the pipe diameter away from the inlet



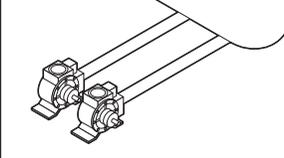
- If using a reducer at the pump inlet, use an eccentric reducer flat side up.



- When using a piping tee off a supply line, come off the bottom of the piping for liquid.



- Have inlet piping slope downward towards the pump inlet.

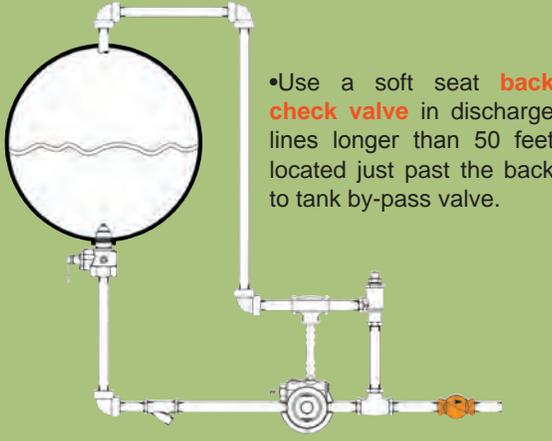


- Use separate liquid lines to supply each pump when using more than one pump at one time.

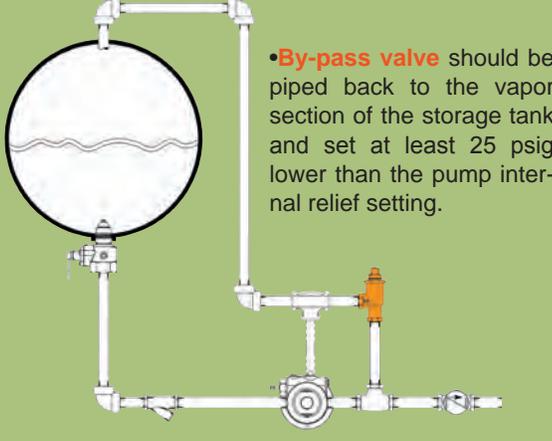
Above illustrations courtesy of Corken, Inc., a Unit of IDEX Corporation.

### Discharge Piping

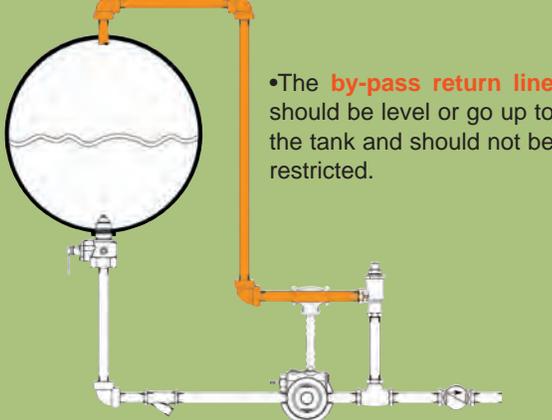
- A differential by-pass valve must always be installed in a pumping system.
- Can use smaller piping on discharge side of the pump - watch total distance from pump to filling point.



- Use a soft seat **back check valve** in discharge lines longer than 50 feet located just past the back to tank by-pass valve.



- By-pass valve** should be piped back to the vapor section of the storage tank and set at least 25 psig lower than the pump internal relief setting.



- The **by-pass return line** should be level or go up to the tank and should not be restricted.

Above illustrations courtesy of Blackmer, PSG, a Dover Company.

## Introduction

Most LP Gas & anhydrous systems use pumps to move liquid from one location to another. Unloading transport trailer tanks into plant storage, loading delivery trucks, filling bulk tanks, engine fuel tanks, portable cylinders, etc. & pressurizing LP Gas vaporizers are only a few applications. A well-designed & properly installed pumping system will perform well for some time, but eventually problems occur requiring attention.

Determining the problem and fixing it will take time and be confusing, unless one knows clearly how to proceed. The purpose of this technical guide is to provide simple, guidelines for correcting LP Gas & anhydrous ammonia pumping difficulties.

The procedure includes a preliminary checklist to help find out if the problem can be fixed without taking anything apart. Then, it shows how to zero in on more serious problems by using a few pressure gauges to pinpoint the cause.

Before trouble occurs, equip the pumping system for easy pressure gauge installation. Small manual shutoff valves can be installed at proper locations, with plugs inserted in the outlets. This allows simple placement of pressure gauges without removing the LP Gas or anhydrous ammonia from the system at the time trouble occurs, saving a lot of time and money. Pressure gauges should be installed temporarily when the system is first installed, and pressure readings recorded while the system is working properly. Then, in many cases, comparing pressures with original readings may tell what the trouble is.

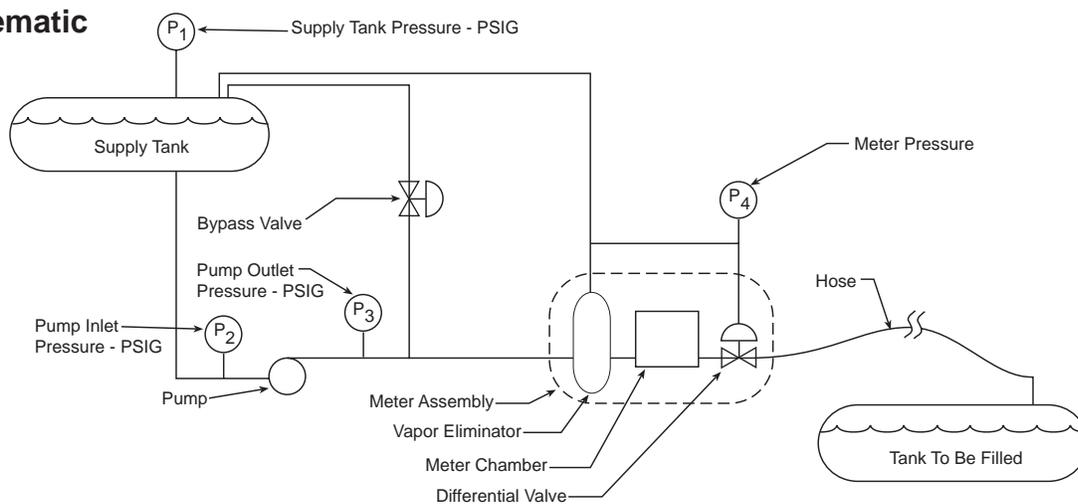
Note: Figure 1 shows where pressure gauges should be installed and provides blank spaces to record pressure gauge readings from the original tests.

The pressure gauges should not be used continuously, because vibrations and the ravages of weather cause their damage or ruin. Therefore, as soon as the initial tests are complete, it is best to close the shutoff valves, remove the gauges, plug the valves and keep the gauges in a safe place, ready for troubleshooting when really needed. Diagnosing a problem is easier if the original test results are available, but not essential. It requires more time and effort.

Be sure to obtain and keep available for quick referral the Manufacturer's Operation and Service Manuals for the valves, pump, meter and all operating equipment in the system. To avoid delays, maintain a complete stock of recommended spare parts on hand for quick repairs.

Follow the steps as shown. Don't assume the answer is known beforehand, or skip any applicable steps. Rather, be thorough and methodical, and in most instances, you will solve the problem. On the other hand, if you have done all of this and still haven't worked out your problem, feel free to call Gas Equipment Company or Engineered Controls International, Inc. direct. We will do our best to help. Perhaps, between us, we will be able to solve your problem and add something new to the procedure which could help everyone in the future.

## Pump System Schematic



**A**

$P_1$

Tank pressure doesn't change

$P_2$

Pump inlet pressure decreases

$P_3$

Pump outlet pressure does not change

**The trouble is most likely in the inlet line. It could be:**

1. The pump may be running at a speed too low to develop differential pressure.
2. An inlet strainer is clogged.
3. A valve is partially closed somewhere in the inlet line.
4. Ice has formed either in the bottom of the supply tank or somewhere in the inlet line. This is common particularly when the tank has been hydrostatically tested or purged with steam & not completely drained & dehydrated.
5. If a Flomatic valve is used, it may not be opening for a number of reasons:
  - a) Pressure in the tank to be filled may be considerably less than that in the supply tank, making it impossible for the pump to develop sufficient differential pressure to open the valve (simply throttle a manual valve on the discharge line to cause the pump to develop enough differential pressure to open the Flomatic valve. As the pressure in the tank to be filled goes up, it will be possible to re-open the valve in the discharge line.)
  - b) The pump by-pass valve may be blocked open or have broken or damaged parts, preventing the pump from developing sufficient differential pressure to open the Flomatic valve. (Pump outlet pressure must rise at least 21 PSI to open the Flomatic valve.)
  - c) The Flomatic strainer, filter, three-way valve or other element in the actuating line is clogged, or the actuating line is kinked.
  - d) The Flomatic valve internal parts may be damaged or worn. (Refer to Rego installation manual #A7884F-301 for flanged valves or #L-451 for diaphragm-type threaded valves for repair instructions.)
6. If an internal valve is used, the main valve may not be opening due to insufficient equalization time, broken or damaged valve parts, valve lever in closed position or insufficient excess flow sizing.

**Note:** Meter pressure is not needed for this condition.

**B**

$P_1$

Tank pressure doesn't change

$P_2$

Pump inlet pressure doesn't change

$P_3$

Pump outlet pressure goes up a little

**The trouble is most likely related to the pump or bypass valve. It could be:**

1. The pump may have excessively worn parts.
2. The internal by-pass valve in the pump may be blocked open by foreign material, or may have broken or damaged parts.
3. The back-to-tank by-pass valve may be blocked open by foreign material or may have broken or damaged parts.
4. The manual by-pass valve, if so equipped, may be open.

**NOTE:** Meter pressure is not needed for this condition.

## Basic Assumption

The pumping system did work OK, but now the transfer rate is considerably less, or the system won't pump at all.

## Preliminary Review

- Check the supply tank liquid level. The transfer rate could be considerably reduced if the level is low, due to bubbles in the line, because of insufficient liquid head, or a vortex effect in the tank. Remember, reduction in the pumping rate from these causes will be more extreme in cold weather (tank pressures are low).
  - Examine the pump drive to make sure the pump is rotating properly. Inspect for loose drive belts, damaged or broken flexible couplings or universal joints, broken drive keys & damaged or inoperative power take-off or pump clutch, etc.
  - If the system is equipped with the Rego Flomatic Valve.
    - Three-way valve handle should be straight out, allowing the valve to open.
    - Check the position indicator on the Flomatic Valve when the pump is running. If the indicator shows that the valve is open, the trouble must be downstream of the valve.
  - Make sure the priming valve is open, allowing pressure to equalize between the tank and pump inlet.
  - If the system is equipped with internal valves, make sure the operating lever moves to a full open position. Repair if needed.
  - Make sure all valves in the system are either open or closed as required for normal operation. Check each valve in sequence, starting from the supply tank, making sure that no valve element is missed.
- If the cause of the problem has not been determined during preliminary review, it will be necessary to conduct diagnostic tests, using pressure gauges at key points in the system.

## Diagnostic Tests

Open all valves as required for proper pumping operation. Gauges should show tank pressure, pump inlet pressure, pump outlet pressure and meter pressure to be equal.

Start the pump and observe all pressure gauges. Match results with conditions A, B, C, or D. Follow the appropriate steps.

## Final Results

Make repairs or adjustments as needed, and test the system's operation. Record a new set of test pressures for future reference, and other replacements for all space parts used. The system now is ready to return to service.

### C



Tank pressure doesn't change



Pump inlet pressure doesn't change



Pump outlet pressure rises substantially



Meter pressure rises substantially

**The trouble is most likely in the meter vapor eliminator or meter differential valve. It could be:**

- The meter's vapor eliminator may be malfunctioning. If the valve at the outlet of the vapor eliminator does not seat when the vapors have been purged, the differential valve downstream of the meter will not open. Such failure could be caused by a damaged vapor eliminator valve seat, foreign material blocking the vapor eliminator valve, a leak in the ball float, or a jammed or binding linkage between the ball and valve.
- The diaphragm could be ruptured, or other parts could be damaged or broken in the differential valve downstream of the meter.

### D



Tank pressure doesn't change



Pump inlet pressure doesn't change



Pump outlet pressure rises substantially



Meter pressure rises substantially

**The problem is probably downstream of the pump. Look for a closed valve, or some type of blockage in the discharge line. It could be:**

- The meter strainer may be clogged.
  - A back check valve at the inlet of the meter may be blocked, closed, or jammed.
  - The meter rotor may be jammed by foreign material, preventing it from moving properly, which would prevent or retard flow.
  - The drive key on the meter gears may be sheared. (In this case, flow would actually be moving through the meter but not registering.)
  - The differential valve downstream of the meter may be closed due to damage, foreign material or ice.
  - If screw type hose fittings are used, it is extremely important that they be installed properly. If not, it is possible that a flap of rubber may be cut from the inside diameter of the hose, acting as a back check. It can flap across the discharge line, effectively stopping the flow.
  - Check the hose nozzle valve, if so equipped. In some brands, a bent handle or other defect may prevent the inner valve from opening sufficiently to allow a proper amount of flow.
  - The problem could be in the valve assemblies in the tank to be filled. If you are dealing with a delivery truck application, move to another tank and see whether the problem still exists. If not, it may be a problem with one specific tank, rather than the pumping system.
  - Some delivery trucks are equipped with a quick-acting valve immediately upstream of the hose reel. Make sure that this valve is open.
  - Some delivery trucks are equipped with excess flow valves between the meter & hose reel. Improper sizing, a weak spring, or other valve damage can cause this valve to close prematurely, effectively stopping the flow.
  - If, with a delivery truck system, the flow reduced considerably while the tank is being filled, it is possible that the back-to-tank by-pass valve is not set high enough to compensate for vapor pressure buildup in the tank being filled. This can be solved merely by adjusting the by-pass valve at a slightly higher level.
- Warning:** Do not raise the back-to-tank by-pass setting high enough to cause the internal relief valve in the pump to actuate. Excessive cavitation, loss of capacity and premature pump wear can occur.

## Final Results

Make repairs or adjustments as needed, and test the system's operation. Record a new set of test pressures for future reference, and other replacements for all space parts used. The system now is ready to return to service.

## SERO Side Channel Pumps

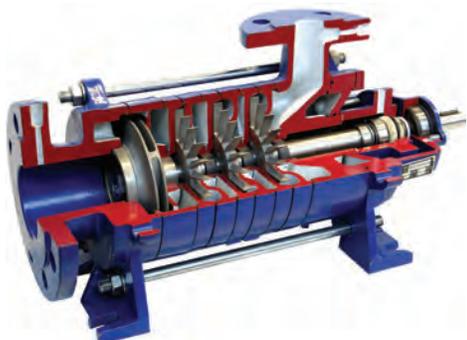
Replaces Corken's SC Series Side Channel Pump



SERO Pumps are a proven state-of-the-art multi-stage, radially split segmented pump that combines the functionality of a low NPSH first stage impeller with the performance of a side channel design.

## Magnetically Driven Side Channel Pump

Sealless Side Channel Pump Designed for Zero Emission Services



Part #	Number of Stages	Suction Flange	Discharge Flange	Max RPM (60Hz)	Maximum Working Pressure (PSI)	Capacity Range GPM (M3/H)	Head Range at Min Flow, FT	Temperature Range	Maximum Allowable Entrained Vapor
SEMA-S110	1 To 8	1-1/2"	3/4"	1750	580	6-12	100-740	-75°F - 410°F	.5
SEMA-S220	1 To 8	2-1/2"	1-1/4"	1750	580	13-24	140-1080	-75°F - 410°F	.5
SEMA-S330	1 To 8	2-1/2"	1-1/4"	1750	580	26-40	110-790	-75°F - 410°F	.5
SEMA-S440	1 To 8	3"	1-1/2"	1750	580	47-64	105-800	-75°F - 410°F	.5
SEMA-S550	1 To 8	4"	2"	1750	580	76-106	130-1000	-75°F - 410°F	.5
SEMA-S660	4	4"	2-1/2"	1750	580	130-186	160-600	-75°F - 410°F	.5

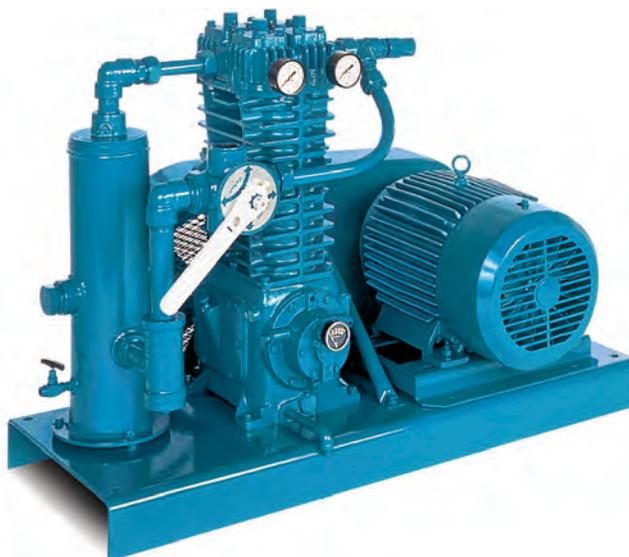
## Multifunction Side Channel Pump

Side Channel Pump Designed for Critical Process Services



Part #	Number of Stages	Suction Flange	Discharge Flange	Max RPM (60Hz)	Maximum Working Pressure (PSI)	Capacity Range GPM (M3/H)	Head Range at Min Flow, FT	Temperature Range	Maximum Allowable Entrained Vapor
SRZS-110	1 to 8	1-1/2"	3/4"	1750	580	6-12	100-740	-10° - 430° F	50%
SRZS-220	1 to 8	2-1/2"	1-1/4"	1750	580	13-24	140-1080	-10° - 430° F	50%
SRZS-330	1 to 8	2-1/2"	1*1/4"	1750	580	26-40	110-790	-10° - 430° F	50%
SRZS-440	1 to 8	3"	1-1/2"	1750	580	47-64	105-800	-10° - 430° F	50%
SRZS-550	1 to 8	4"	2"	1750	580	76-106	130-1000	-10° - 430° F	50%
SRZS-660	1 to 8	4"	2-1/2"	1750	580	130-186	160-1150	-10° - 430° F	50%

## Single-Stage Reciprocating Compressor



Blackmer oil-free compressor for high performance transfer and vapor recovery of Propane, Butane, Anhydrous Ammonia and other liquefied gases.

### Stationary Base Mounting

Compressors are factory mounted for all three of its oil-free compressor models. The stationary base mounting includes liquid trap, four-way valve, belt guard, adjustable motor slide base, V-belt drive assembly including motor sheave and hub, strainer, valves, pressure gauges and interconnecting piping all mounted on a unit base.

Blackmer compressors may be adapted for either direct drive or V-belt drive applications.

### Transport Mounting

Blackmer compressors can be transport-mounted. All models of

Part #	Speed (RPM)	Approx Delivery <sup>1</sup>		Motor HP <sup>2</sup>	Pipe Diameter <sup>3</sup>	
		GPM	LPM		Vapor	Liquid
LB-161-LU	425*	49	186	3	1"	2"
LB-161-LU	560	65	246	5	1"	2"
LB-161-LU	715*	63	314	5	1.25"	2"
LB-161-LU	780	90	341	7.5	1.25"	2"
LB-161-LU	825*	92	348	7.5	1.25"	2"
LB-361A-LU	495*	123	466	7.5	1.25"	2.5"
LB-361A-LU	540	134	507	10	1.25"	2.5"
LB-361A-LU	650*	161	609	10	1.5" - 2"	3"
LB-361A-LU	780	194	734	15	1.5" - 2"	3"
LB-361A-LU	825*	205	761	15	1.5" - 2"	3"
LB-601A-LU	550	245	937	15	2" - 2.5"	4"
LB-601A-LU	640	285	1079	20	2" - 2.5"	4"
LB-601A-LU	735*	327	1238	20	2" - 2.5"	4"
LB-601A-LU	790	351	1329	25	2" - 2.5"	4"
LB-942-LU	470	400	1514	25	3" - 4"	6"
LB-942-LU	565	480	1817	30	3" - 4"	6"
LB-942-LU	750	640	2422	40	3" - 4"	6"
LB-942-LU	825	700	2650	50	3" - 4"	6"

1. Delivery will depend on proper system design, piping size and value capacity.

2. HP is for liquid transfer and vapor recovery in moderate climates. Consult your GEC representative for HP requirements in severe climates. For liquid transfer applications without vapor recovery, multiply by 0.4.

3. Use next larger pipe size if piping exceeds 100 feet.

\* Indicates maximum RPM for respective motor HP.

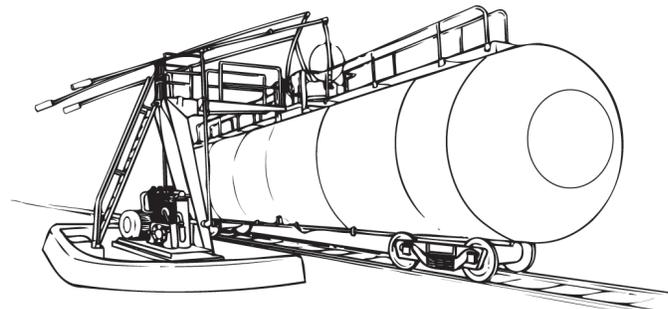
## Propane Vapor Recovery

- 33,000 water gallon capacity (124,915 lts.) tank car.
- Blackmer LB-361 Gas Compressor, 36 CFM Piston Displacement.
- The chart indicates the volume of recoverable liquid and recovery time required at various pressures.

Beginning Tank Pressure	Total Product* (in Vapor Form)		Economically Recoverable Product**	
	PSIG	Gallons	Liters	Gallons
200	1650	6246	1153	4365
175	1485	5621	969	3668
150	1315	497	845	3199
125	1137	4304	713	2699
100	953	3607	580	2196
75	760	2877	441	1659
50	561	2124	419	1586

\* Physical properties based on NFPA #58 data for commercial propane.

\*\* Economically recoverable product based on reduction of tank pressure to 25% of original value. Residual liquid not included.

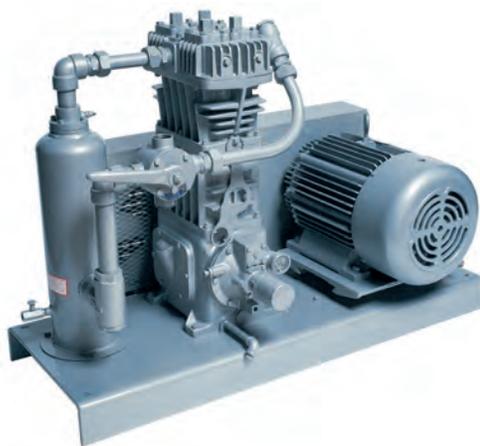


If, for example, after the liquid transfer phase of the unloading operation is complete, the vapor pressure reads 150 psig, there would be approximately 1315 gallons of LP Gas in vapor form remaining in the tank car. Of this, 845 gallons can be economically recovered in less than three hours.

## Corken Compressors

### CORKEN

A compressor unit for liquid transfer and residual vapor recovery of volatile liquids.



**SPECIFY MOTOR HORSE POWER TO BE USED.**

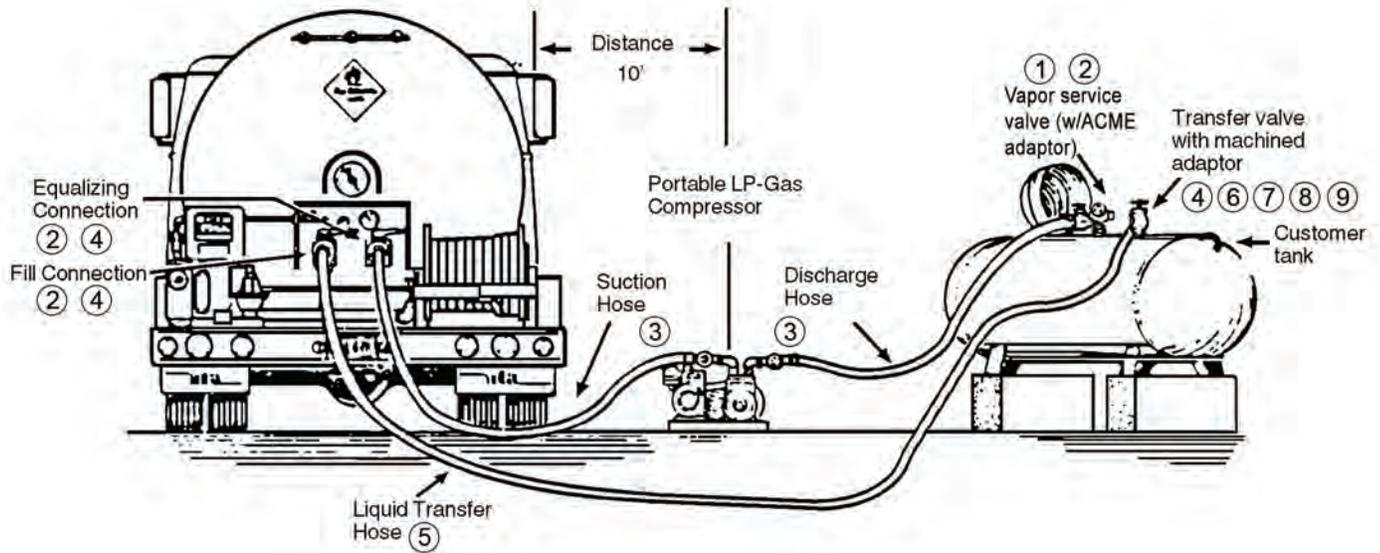
**LP-Gas Compressors - Sized for Liquid Transfer and Vapor Recovery**

Part #	Comp RPM	Approx. Capacity GPM	HP	Phase	Suggested Pipe Size Inlet	Outlet	Hose Size Liquid	Vapor
91-107	640	30	5	3/1	1"	1.5"	1"	1.5"
91-107	800	38	7.5	3	1"	1.5"	1"	1.5"
291-107	640	61	7.5	3	1.25"	2"	1.25"	2"
291-107	800	76	10	3	1.25"	2"	1.25"	2"
491-107	640	130	15	3	1.25"	3"	1.25"	3"
491-107	800	165	20	3	1.25"	3"	1.25"	3"
691-107	640	216	20	3	2"	4"	2"	4"
691-107	800	270	25	3	2"	4"	2"	4"
D791-107*	640	480	30	3	3"	4"	3"	6"
D791-107*	800	598	40	3	3"	4"	3"	6"
891-107	640	415	25	3	3"	4"	3"	6"
891-107	800	518	40	3	3"	4"	3"	6"

NOTE: The capacity shown will vary depending on the length and size of piping and hoses. If piping is complex or over 100' in length, use the next larger pipe size.

\*2-Stage Compressor

## Typical Krug Compressor Installation



## K2-Saver Piping Kit for Compressor

Contains fittings required to connect Krug Compressors to evacuate customer's tank into Bobtail Delivery Truck as shown in the illustration above.

Part #	Ref. No.	Description	Qty.
3171A	1	Brass Vapor Hose Coupling 1/2" MNPT 1-1/4" ACME	1
T-100-012	2	1/2" Fullport Ball Valve - 600 WOG	3
E8LP2X12FT	3	1/2" LP Gas Hose Assembly x 12 feet	2
3175B	4	Brass Filler Coupling 1/2" MNPT x 1-3/4" ACME	3
E8LP2X25FT	5	1/2" LP Gas Hose Assembly x 25 feet	1
FC-012-3M	6	FS Full Coupling - 1/2"	1
5765D	7	Brass Adapter 1-3/4" Male ACME x 3/4" MNPT	1
7550P	8	Angle Transfer Valve 3/4"	1
7572C-14A	9*	Chek-Lok Adapter 3/4" F (Use w/7550 Series)	1
7590U-10	9*	Chek-Lok Adapter 1-5/8" UNF x 3/4" F (Use w/7550 Series)	1

\* Use Appropriate Check-Lok Adapter.

Bobtail liquid connection will require RegO 5776 or equivalent adapter, 3-1/4" F. ACME x 1-3/4" M. ACME (not included in kit).

## Krug Vapor Compressor

For efficient transfer of Butane, Propane or Anhydrous Ammonia.



Part #	Description
K20-3G	Compressor with 4 HP Gasoline Engine
K20-3L	Compressor with 4 HP LP-Gas Engine
16771B	Compressor Only
K380	Belt
K3927	Pulley
LTSGA	Liquid transfer sight glass adapter with 1-3/4" M-ACME x 1-3/4" F-ACME



LTSGA

## Tank Evacuation System

### Ventur-Evac



LTSGA

Part #	Description
Ventur-Evac	Tank Evacuation Valve
Ventur-Evac Hose Kit-25 T	25 ft Hose and Valve Assemblies. Kit includes 2 Hoses - 1 for Vapor and 1 for Liquid
Ventur-Evac Hose Kit-50FT	50 ft Hose and Valve Assemblies. Kit includes 2 Hoses - 1 for Vapor and 1 for Liquid
LTSGA	Liquid transfer sight glass adapter with 1-3/4" M-ACME x 1-3/4" F-ACME

### Ventur-Evac Hose Kit Parts

Part #	Description
3121	Unloading Adapter Angle 1-3/4" F-ACME X 3/4" F-NPT
3165C	Vent Valve 1/4"
3171A	Brass Vapor Hose Coupling 1/2" M-NPT X 1-1/4" F-ACME
3175	Brass Filler Coupling 3/4" M-NPT X 1-3/4" F-ACME
3175B	Brass Filler Coupling 1/2" M-NPT X 1-3/4" F-ACME
5763D	Brass Adapter 1-1/4" M-ACME X 3/4" M-NPT
5765D	Brass Adapter 1-3/4" M-ACME X 3/4" M-NPT
7550P	Angle Transfer Valve 3/4"
7572C-14A	Check-Lok Adapter 3/4" M-NPT x 3/4" F-NPT
7590U-10	Check-Lok Adapter 1-5/8" UNF X 3/4" F-NPT
C5765N	Plug w/Chain & Ring 1-3/4
E12LP2X__FT	3/4" LPG Hose Assmy Parker-Tested/Certified
E8LP2X__FT	1/2" LPG Hose Assmy 1/2" M-NPT Ends
FC-012-3M	FS Full Coupling-1/2"
FC-034-3M	FS Full Coupling-3/4"
T-100-012	1/2" Fullport Ball Valve - 600 WOG

## Krug Hand Pump



Piston type hand pump for filling portable and motor fuel cylinders. Connects to 1" inlet and 3/4" outlet. Weighs 55 lbs. and pumps 6 gallons per minute at 40 strokes per minute.

Part #	Description
K640	Krug Hand Pump

### K6 Piping Kit for Hand Pump

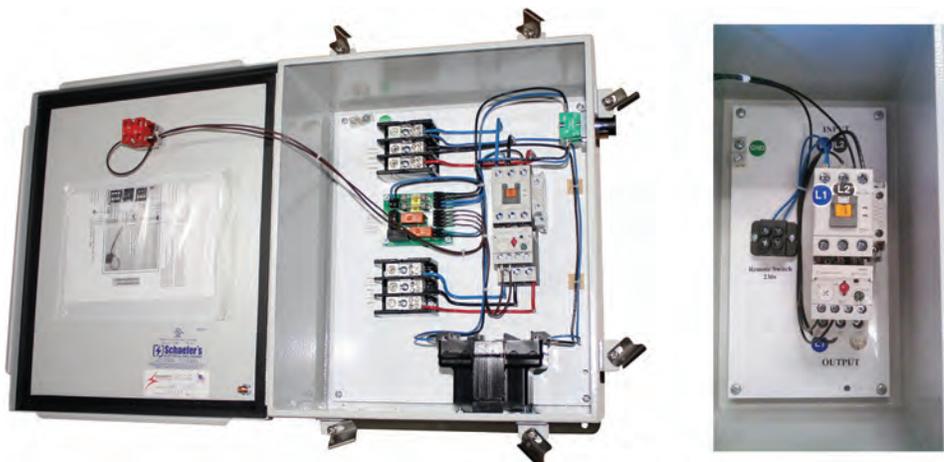
Contains all fittings required to install K640 Krug Hand Pump from 3/4" top liquid opening.

Part #	Description	Qty
K6	Piping Kit for Hand Pump	
7572C-14A	Chek-Lok, old style	1
7590U-10	Chek-Lok, new style	1
7550P	3/4" x 3/4" Transfer Valve	1
E12LP2X6FT	3/4" x 6 ft LPG Hose Assy	1
12M-12UFS	3/4" Female x 3/4" Male Swivel Connector	1
BU100X034-3M	FS Bushing 1" x 3/4"	1
BU034X012-3M	FS Bushing 3/4" x 1/2"	1
E8LP2X12FT	1/2" x 12 ft LPG Hose Assy	1
7704P	1/2" Globe Valve	1
3175B	Hose Coupling, 1-3/4" Female ACME Swivel x 1/2" MNPT	1

## Common Pump Magnetic Starter Packages

### With ESO Switch & NEMA 4 Enclosure

Magnetic starters are designed for full voltage remote starting of electric motors. All starters include a Emergency Shutoff Overload (ESO) Switch and NEMA 4 Enclosure.



Part #	Phase	Motor HP	Volts	Fail Safe Relay
N4CTK22-9-13-ES	1	2	230	No
N4CTK40-3HP-1P-ES	1	3	230	No
N4CTK40-3HP-1PH-ES-FSR	1	3	230	Yes
CTK40-24-36-ES-1P	1	5	230	Yes
CTK40-7-10-ES-3P	3	3	230	No
N4CTK40-3HP-3PH-ES-FSR	3	3	230	Yes
N4CTK22-3HP-3PH-ES-FSR-480	3	3	480	Yes
CTK40-16-22-ES-3P	3	5	230	Yes
CTK40-18-26-ES-3P	3	7.5	230	Yes

## Magnetic Motor Starters

### With NEMA 4 Enclosure

Magnetic Motor Starter with thermal overloads without push button On/Off switch NEMA 4

Part #	Phase	Motor HP	Volt
N4CTK22-5-8	3	2	230
N4CTK22-7-10	3	3	230
N4CTK22-12-18	3	5	230
N4CTK40-18-26	3	7.5	230
N4CTK40-24-36	3	10	230
N4CTK85-34-50	3	15	230
N4CTK85-45-65	3	20	230
N4CTK40480-24-36	3	20	480
N4CTK85-54-74	3	25	230
N4CTK40480-28-40	3	25	480
N4CTK85-63-85	3	30	230
N4CTK40480-34-50	3	30	480

### Explosion Proof

Magnetic Motor Starter with thermal overloads without push button On/Off switch - EXPLOSION PROOF

Part #	Phase	Motor HP	Volt
EXCTK22-5-8	3	2	230
EXCTK22-5-8	3	3	230
EXCTK22-5-8	3	5	230
EXCTK40-18-26	3	7.5	230
EXCTK40-24-36	3	10	230
EXCTK85-34-50	3	15	230
EXCTK85-45-65	3	20	230
EXCTK40480-24-36	3	20	480
EXCTK85-54-74	3	25	230
EXCTK40480-28-40	3	25	480
EXCTK85-63-85	3	30	230
EXCTK85480-34-50	3	30	480

## Manual Starters for C-Series Pumps



Optional manual starters. Thermal overload protection is provided.

Part #	Description	Commonly Used With
2277-X1-28	Motor Mounted Manual Switch Box & Switch w/ P28 heater element	3/4 HP Single Phase 3450 RPM Motor
2277-X2-28	Wall Mounted Manual Switch Box & Switch w/ P28 heater element	3/4 HP Single Phase 3450 RPM Motor
2277-X1-32	Motor Mounted Manual Switch Box & Switch w/ P32 heater element	1 HP Single Phase 3450 RPM Motor
2277-X2-32	Wall Mounted Manual Switch Box & Switch w/ P32 heater element	1 HP Single Phase 3450 RPM Motor
Accessories		
600-TOX5	Internal Switch Only	Corken C-Series Pump
2277-X	Cover & Toggle for Switch Box	Corken C-Series Pump
2277	Cover (only) for Switch Box	Corken C-Series Pump
P28	Heater Element for 3/4 HP Motor	Corken C-Series Pump
P32	Heater Element for 1 HP Motor	Corken C-Series Pump

### When Ordered with Pump

Part #	Description
SM-25	Motor mounted starter for 1 HP motor
S-25	Separate remote wall mounted starter for 1 HP motor
SM-30	Motor mounted starter for 2 HP motor
S-30	Separate remote wall mounted starter for 2 HP motor

## Explosion Proof Switch Box & Switch



Part #	Description	Commonly Used With
929980	Manual Switch Box & Switch	1-1/2 HP Single Phase 1725 RPM Motor (Blackmer LGF1 Series Pump or 2 HP Circuit Switch)
929980SW	Internal Switch only	N/A

## 3 Phase Disconnects



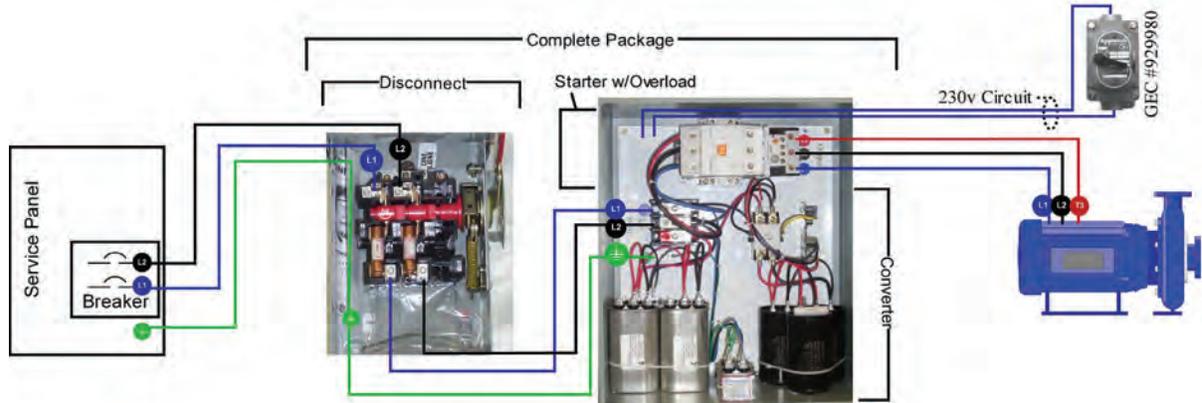
3-Phase 230 & 460 Volt Disconnects NEMA 3 (includes 3 fuses)

Part #	Pump HP	Amps	Volt
GENLTG4221R15	1.5 - 2 - 3 - 5	15	230
GENLTG4221R30	7.5 - 10	30	230
GENLTG4222R40	15	40	230
GENLTG4222R60	20	60	230
GENLTG4223R40	25 - 30	80	230
GENTH3361R30	20 - 25	30	460/480
GENTH3361R40	30	40	460/480

## Phase Converter Packages - Non-Explosion Proof

### For Mounting in Non-Classified Areas

Static phase converters offer an economical solution when three-phase power can not be provided or is cost prohibitive to obtain. Made in the U.S.A., these phase converters will provide years of trouble-free service while allowing pumps to be turned at rated speed. All converters come with a two-year limited warranty. Converter Package includes: Phase Converter, Magnetic Starter with thermal overloads and Fusible Disconnect with fuses.



### Phase Converter Package for Blackmer/Corken VANE PUMPS

When using vane pumps and 3 phase power is not available, it is more economical to operate the 3 phase pump motor on Static Converters.

Part #	Pump HP	Static Converter NEMA4	Magnetic Starter** with Thermal Overloads*	Single Phase Disconnects NEMA 3R		Wire Size <50 ft***	Service Amps	Breaker Amps
				Disconnect Models with Fuses	Amps			
N12-12-18-R15	2	N4CD12	CTK40-12-18	GENLTG3221R15	15	12	20	20
N14-16-22R30	3	N4CD14	CTK40-16-22	GENLTG3221R30	30	10	30	30
N14-24-36-R30	5	N4CD14	CTK85-24-36	GENLTG3221R30		8	40	30
N15-28-40-R30	7.5	N4CD15	CTK85-28-40	GENLTG3221R30		6	60	40
N16-34-50-R40	10	N4CD16	CTK85-34-50	GENLTG3222R40	40	4	80	50
N17-54-75-R60	15	N4CD17	CTK85-54-75	GENLTG3222R60	60	4	100	80
N18-65-100-R80	20	N4CD18	CTK100-65-100	GENLTG3223R80	80	3	100	100
N18-85-125-R100	25	N4CD18	CTK150-85-125	GENLTG3223R100	100	2	125	125
N19-100-150-R125	30	N4CD19	CTK150-100-150	GENLTG3224R125	125	1	150	150

\*Converter and Magnetic Starter with thermal overloads are in the same NEMA 4 box.

\*\*Magnetic Starter installed with standard 230V coil.

\*\*\*Call for wire sizes longer than 50 ft.

### Phase Converter Package for Blackmer/Corken COMPRESSORS

When using a compressor and 3 phase power is not available, it is more economical to operate the 3 phase compressor on Static Converters. For increased horsepower, the compressor motor needs to be increased by approximately 30%. See the guide below. Purchase the larger motor for the pump needed and select the proper converter.

Part #	Pump HP	Increased HP	Static Converter NEMA4	Magnetic Starter** with Thermal Overloads*	Single Phase Disconnects NEMA 3R		Wire Size <50 ft ***	Service Amps	Breaker Amps
					Disconnect Models with Fuses	Amps			
N15-28-40-R30	5	7.5	N4CD15	CTK85-28-40	GENLTG3221R30	30	6	60	40
N16-34-50-R40	7.5	10	N4CD16	CTK85-34-50	GENLTG3222R40	40	4	80	50
N17-54-75-R60	10	15	N4CD17	CTK85-54-75	GENLTG3222R60	60	4	100	80
N18-65-100-R80	15	20	N4CD18	CTK100-65-100	GENLTG3223R80	80	3	100	100
N18-85-125-R100	20	25	N4CD18	CTK150-85-125	GENLTG3223R100	100	2	125	130
N19-100-150-R125	25	30	N4CD19	CTK150-100-150	GENLTG3224R125	125	1	150	150
N21-160-240-R175	30	50	N4CD21	CTK220-160-240	GENLTG3224R175	175	1/0	220	200

\*Converter and Magnetic Starter with thermal overloads are in the same NEMA 4 box.

\*\*Magnetic Starter installed with standard 230V coil.

\*\*\*Call for wire sizes longer than 50 ft.

# Explosion Proof Motors

## Pump Motor Static Phase Converter Packages



Part #	Phase	Volt	HP	Fail Safe Relay
N4CD14-3PH-ES-FSR-R30	1/3	230	3	Yes
N4CD14-3PH-ES-R30	1/3	230	3	No

## Electric 60 Hz. Explosion Proof Motors

### Single Phase



Part #	HP	RPM	NEMA Frame	Mount	Amperes 230V	Shaft Size
1HP-1PH-ED	1	1725	56C	C-Face	6.2	5/8"
1.5HP-1PH-ED	1.5	1725	56C	C-Face	8.0	5/8"
2HP-1PH-EH	2	1725	182T	Rigid Base	11.0	1-1/8"
2HP-1PH-ECD	2	1725	182TC	Rigid Base/C-Face	11.0	1-1/8"
2HP-1PH-ECH	2	1725	184C	C-Face	11.0	7/8"
3HP-1PH-ED	3	1725	215T	Rigid Base	15.0	1-1/8"
5HP-1PH-EH	5	1725	215T	Rigid Base	21.0	1-1/8"
3HP-1PH-3600	3	3600	184TC	Rigid Base/C-Face	15.0	1-1/8"

### 3-Phase



Part #	HP	RPM	NEMA Frame	Mount	Amperes 230V	Shaft Size
1.5HP-3PH-ED	1.5	1800	145T	Rigid Base	5.0	7/8"
2HP-3PH-ED	2	1800	145T	Rigid Base	6.2	7/8"
3HP-3PH-ED	3	1800	182T	Rigid Base	8.6	1-1/8"
5HP-3PH-ED	5	1800	184T	Rigid Base	13.0	1-1/8"
7.5HP-3PH-ED	7.5	1800	213T	Rigid Base	21.0	1-3/8"
10HP-3PH-ED	10	1800	215T	Rigid Base	26.0	1-3/8"
15HP-3PH-ED	15	1800	254T	Rigid Base	38.0	1-5/8"
20HP-3PH-ED	20	1800	256T	Rigid Base	50.0	1-5/8"
25HP-3PH-ED	25	1800	284T	Rigid Base	60.0	1-7/8"
30HP-3PH-ED	30	1800	286T	Rigid Base	72.0	1-7/8"
3HP-3PH-3600	3	3600	182TC	Rigid Base/C-Face	8.6	1-1/8"

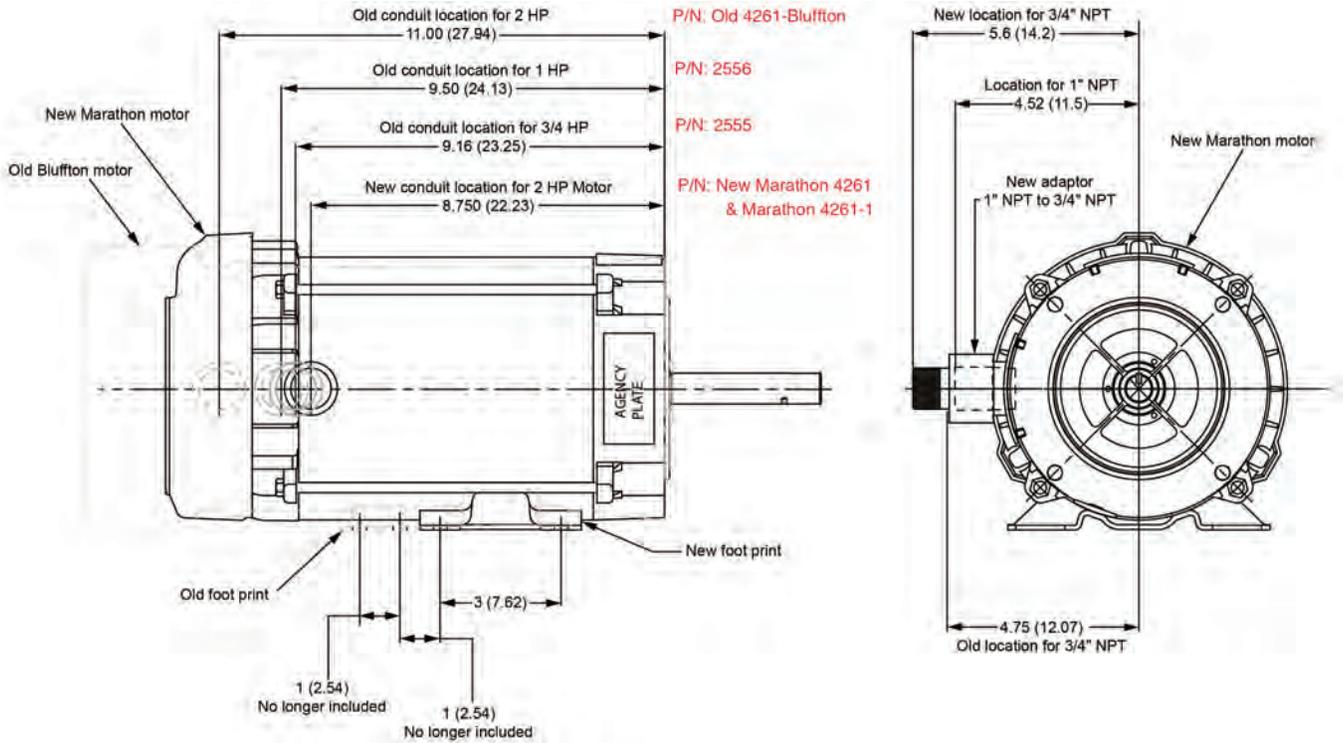
## C-Series Turbine Pump Motor Replacements



Part #	Description
4261-1	1 HP (208/230 Volt only) 50/60 Hz Coro-Flo Motor
4261	2 HP 50/60 Hz Coro-Flo Motor
2557	3 HP 50/60 Hz Coro-Flo Motor

## C-Series Turbine Pump Motor Identification for Replacement

Please identify your existing Corken C-Series Pump Motor using the graphic below.



Motors, Starters & Switches

## Corken Variable Frequency Drive (VFD)



- Converts single phase service to 3-phase service for 3-phase motors.
- Motor starter with overload protection built-in.
- Soft start pre-programmed with ability to control speed.
- VFD programmed for "remote switch".

Part #	For Use with Motor HP	Commonly Used with Pump Models	Voltage/Phase Input
4204-2*	10	FF/DLF150	208/230 - Single Phase
4204*	7.5	FF/DLF075	208/230 - Single Phase
4204-1*	5	FF/DLF060	208/230 - Single Phase
4204-6X1**	3	DL16/17, F16/17, C16	208/230 - Single Phase

\* NEMA-1 Enclosure - Not for outdoor installation

\*\*NEMA 3R Enclosure - weatherproof, includes ESO & Cooling Fan

## L-Type Shaft Couplings

### Half Coupling



These couplings offer standard shaft-to-shaft connection for general industrial duty applications. Standard L-Type coupling hub materials are sintered iron. Sizes range from L035 to L276. These couplings require no lubrication and provide highly reliable service for light, medium, and heavy duty electrical motor and power transmission applications.

Part #	Size	Bore/Shaft Size	Keyway Dimensions W x D
L-090-.625	L090	5/8"	3/16" x 3/32"
L-090-.6875	L090	11/16"	3/16" x 3/32"
L-090-.875	L090	7/8"	3/16" x 3/32"
L-095-.750	L095	3/4"	3/16" x 3/32"
L-095-.875	L095	7/8"	3/16" x 3/32"
L-095-1.00	L095	1"	1/4" x 1/8"
L-095-1.125	L095	1-1/8"	1/4" x 1/8"
L-099-.625	L099	5/8"	3/16" x 3/32"
L-099-.750	L099	3/4"	3/16" x 3/32"
L-099-.875	L099	7/8"	3/16" x 3/32"
L-099-1.125	L099	1-1/8"	1/4" x 1/8"
L-100-1.00	L100	1"	1/4" x 1/8"
L-100-1.25	L100	1-1/4"	1/4" x 1/8"

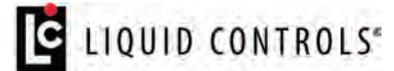
### Coupling Spiders



Part #	Insert Type	Material
L-095-Spider	Solid	Buna N
L-100-Spider	Solid	Buna N
L-110-Spider	Solid	Buna N
L-115-Spider	Solid	Buna N

# Liquid Controls Meter Selection Chart

## LC Meter Selection (by flow rate - NIST Standard)<sup>a</sup>



Maximum nominal flow rate <sup>b</sup>			Flange size	Maximum non-shock working pressure <sup>c</sup>						Construction classes/ typical application <i>see descriptions below</i>
GPM	L/min	m <sup>3</sup> /hr		150 PSI 10.5 BAR	275 PSI 19 BAR	300 PSI 21 BAR	350 PSI 24 BAR	720 PSI 50 BAR	1,440 PSI 100 BAR	
40	151	9	1"				MA-4			10
60	227	14	1½", 2" opt.	M-5	M-5 <sup>d</sup>		MA-5			1, 2, 3, 4, 8, 10, 14, 16, 30
100	380	23	2", 1½" opt.	M-7	M-7 <sup>d</sup>		MA-7			1, 2, 3, 4, 7, 8 <sup>e</sup> , 10, 12, 14, 15, 16, 27, 37
100	380	23	2", 1½" opt.	MS-7	MSAA-7	MSA-7		MSB-7	MSC-7	1, 2, 7, 10, 14, 16, 37
150	570	34	2"	M-10	M-10 <sup>d</sup>					1, 2
200	757	45	3"	M-15	M-15 <sup>d</sup>		MA-15			1, 2, 3, 4, 10, 14, 15, 16
200	757	45	3"	MS-15	MSA-15	MSA-15		MSB-15	MSC-15	1, 2, 8, 10, 14, 16
301	1,140	68	3"	M-25	M-25 <sup>d</sup>					1, 2
348	1,320	79	4", 3" opt.	M-30						1, 2, 3, 4, 7, 14, 15, 16, 27, 37, 47
350	1,325	79	3", 4" opt.	MS-30	MSAA-30	MSA-30		MSB-30	MSC-30	1, 2, 8, 10, 14, 16
450	1,700	102	4", 3" opt.	M-40						1, 2
450	1,700	102	3", 4" opt.	MS-40						1, 2
600	2,271	136	4", 6" opt.	M-60	M-60 <sup>d</sup>					1, 2, 3, 14, 15
700	2,650	159	4"	MS-75	MSAA-75	MSA-75		MSB-75	MSC-75	1, 2, 10, 14
800 <sup>f</sup>	3,000	182	6", 4" opt.	M-80	M-80 <sup>d</sup>					2
1,000	3,785	227	6" or 8"	MS-120	MSAA-120	MSA-120		MSB-120	MSC-120	1, 2, 8, 10, 14

<sup>a</sup> Standard LC meters (with the exception of the M-10, M-25, M-40 and M-80) are suitable for operation on products with viscosities up to 1,000,000 SSU.

<sup>b</sup> Aluminum-body meters are suitable for intermittent overspeed operation at 125% of rating for clean, lubricating fluids. Consult the factory for details.

<sup>c</sup> Maximum, non-shock working pressure ratings are based on products at temperatures below 160°F (71°C). Consult the factory for pressure ratings at elevated temperatures.

<sup>d</sup> 275 working pressure available for meter only.

<sup>e</sup> Recommended operation for Class 8 meters should not exceed 80% of maximum rated capacity. Recommended maximum flowrate may be less depending on viscosity.

<sup>f</sup> M-80 Class 2 meter may be operated at flow rates up to 1,000 GPM for a limited period of time on jet fuel only.

### Construction/application classes

**Class 1** Refined petroleum products, biodiesel

**Class 2** Aviation and jet fuel

**Class 3** Variety of products including: liquid sugars, sweeteners, syrups, vegetable oils

**Class 4** Treated waters and solvents where no red metals are allowed

**Class 7** Chlorinated solvents, ethanol

**Class 8** Acid pH liquids including: nitric, phosphoric, glacial acetic acids, citric juices, vinegar, ethanol

**Class 10** Liquefied petroleum gas (LPG)

**Class 12** Anhydrous ammonia (NH<sub>3</sub>)

**Class 14** Crude oil, heated products, viscous liquids

**Class 15** Oil- or water-based latex products, polyester resins, adhesives, herbicides, nitrogen fertilizers

**Class 16** General solvents, 200 proof alcohol, ethanol

**Class 27** Alkaline pH liquids: latex products, adhesives, liquid fertilizers

**Class 30** Herbicides

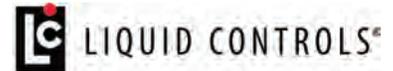
**Class 37** Sodium hydroxide solutions, high sulfur crude oil, alkaline pH liquids

**Class 47** Mildly abrasive liquids

## Liquid Controls

### MA Series Meters

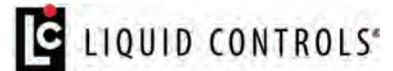
Meters provide exceptionally accurate service when using Liquid Controls' unique positive displacement metering principle, even under variable operating conditions (changes in temperature, pressure and viscosity). Provides the energy efficient and functional performance desired from an economical volumetric measuring instrument. Available with traditional gland seal or glandless magnetic driven pulse output device. A wide range of accessories are available to meet almost every metering need.



- High accuracy and repeatability
- Low maintenance, no metal-to-metal contact in measuring chamber
- Aluminum materials of construction
- Self-contained operation without electrical power or signal conditioning (for units equipped with mechanical registers, printers or presets); no special piping requirements
- Electronic output and registration equipment where enhanced accuracy and electronic communications are needed
- Weights & Measures approval (world-wide) for custody transfer with mechanical or electronic registration systems meeting API standards
- Electronic accessories designed and approved to Class 1 Div. 2 standards

### MA 4 Meters

#### For LPG Motor Fuel Applications



Rate of flow 5 to 40 GPM capacity range. Choice of 3/4", 1-1/2" and 2" companion flanges. UL listed.

Part #	Description
<b>MA-4-CX-10</b>	Standard meter with air eliminato, strainer, differential valve and counter
<b>MA-4-CY-10</b>	Same as MA-4-CX-10 except with temperature volume compensator
<b>MA-4-GX-10</b>	Same as MA-4-CX-10 except with printer
<b>MA-4-GY-10</b>	Same as MA-4-CX-10 except with printer and temperature volume compensator

### MA 7 Meters

#### For Truck & Bulk Loading Applications

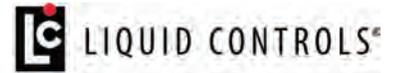


Rate of flow 20 to 100GPM capacity range. Choice of 2" NPT standard, 1-1/2" optional companion flanges. UL Listed.

Part #	Description
<b>MA-7-GY-10</b>	2" meter with mechanical totalizer/ printer, TVC, flow strainer, L-R
<b>MA-7-GY-10-LCR2</b>	2" meter with LCR2, ETVC, flow strainer, L-R, ST221 software
<b>MA-7-GY-10-LCRP</b>	Same as above with preset
<b>MA7-GY-10-LCR2-EV</b>	2" meter with LCR2, ETVC, flow strainer, L-R, ST221 software, electronic vapor eliminator
<b>MA-7-GY-10-LCRPV</b>	Same as above with preset

## MA 15 Meters

For LPG Truck & Bulk Loading

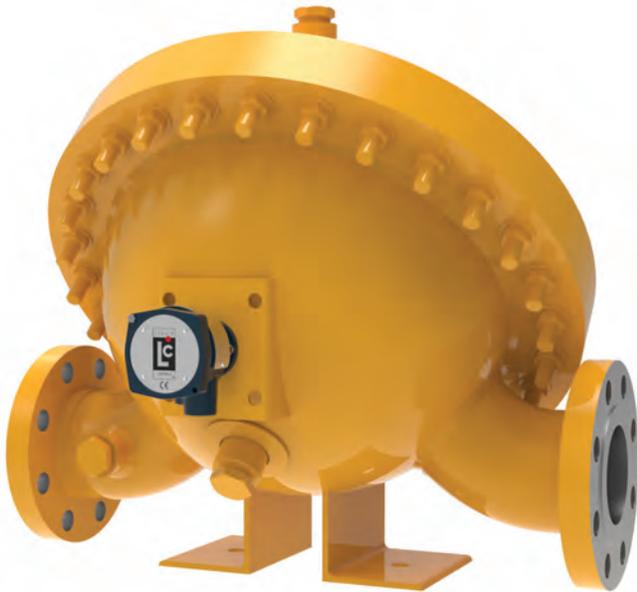


Maximum flow rate 200 gpm. 3" companion flange options standard. Weld flanges optional. UL Listed

Part #	Description
MA-15-GX-10	Standard meter with strainer, air eliminator, differential valve, register and printer
MA-15-GX-10-LCR2	Standard meter with LCR2, strainer, air eliminator, differential valve and printer

## MSA 30 Meters

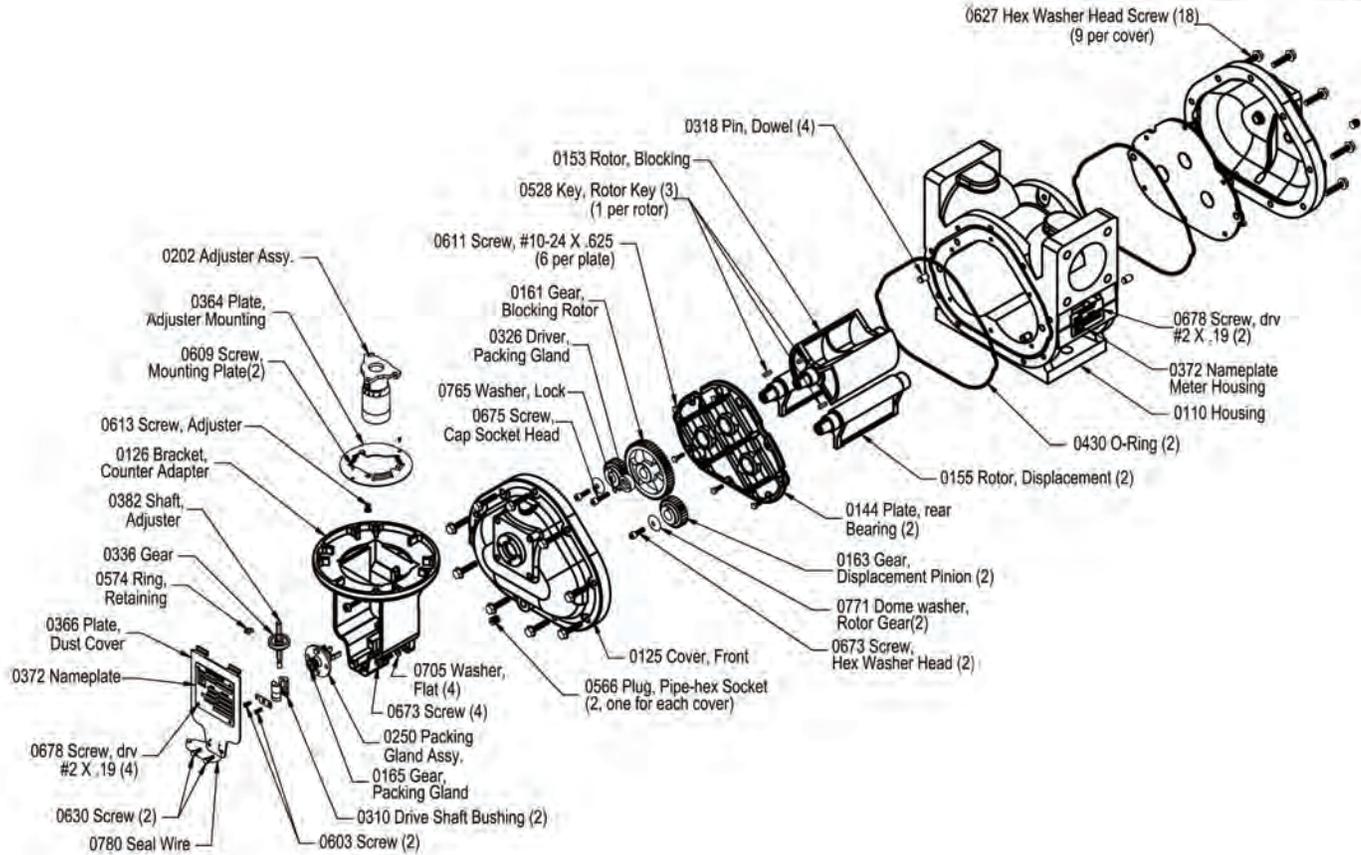
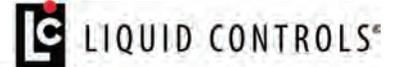
For LPG Bulk Plant Applications



Maximum flow rate 350 gpm. 3" 300 lb ANSI flanges . UL Listed

Part #	Description
MSA30-S-10	Standard meter with POD pulser only

## MA-5-25 Meter Cover & Housing



Applicable for Meters Manufactured after February 5, 1997

Part #	Ref No.	Description	Qty.
<b>Meter Element L2321 (Class 10)</b>			
49445	110	Housing	1
47668	144	Bearing Plate (Front) - Class 10	2
47667	144	Bearing Plate (Front) - Class 12	2
48306	153	Rotor, Assembly, Blocking	1
48366	155	Rotor, Assembly, Displacement	2
47646	161	Gear, Blocking Rotor - Class 10	1
47633	161	Gear Blocking Rotor - Class 12	1
47647	163	Pinion Gear - Class 10	2
47634	163	Pinion Gear - Class 12	2
40665	318	Dowel Pin	4
48756	326	Driver, Packing Gland	1
48332	528	Key, Stainless Steel	3
9079	611	Screw (#10-24 x .625)	10
9027	673	Screw (.25-20 x .75 Lg)	2
7483	675	Screw (.25-20 x 1.00 Lg)	1
6174	765	Lock Washer (.25)	1
48348	771	Rotor Gear Washer (.25 ID x .75 OD SST)	2
49444	372	Nameplate	1
306	678	Drive screw for nameplate	2
48496	200	Parts Manual	1
<b>Cover Seal</b>			
9258	430	O-ring, Buna-N (6.25 ID) - Standard	2
6856	463	O-ring (.88 ID Buna-N)	1
<b>End Covers</b>			
48301	123	Cover, Front	1
48302	125	Cover, Rear	1
6790	566	Pipe Plug, (.250-18 NPT)	2
9080	627	Screw (.312-18 x 1.375)	20
<b>Adjuster</b>			
49403	202	Adjuster Assembly - Standard	1
<b>Packing Gland</b>			
49561	250	Packing Gland Kit, AL-Buna - Standard (Class 10)	1
49588	250	Packing Gland Kit, SS-Neoprene - Standard (Class 12)	1
48283	165	Pinion Gear, 1:1, PM, 24-tooth, Sintered SS - Standard	1
48284	165	Pinion Gear, 2:1, PM, 12-tooth, Sintered SS - Optional	1

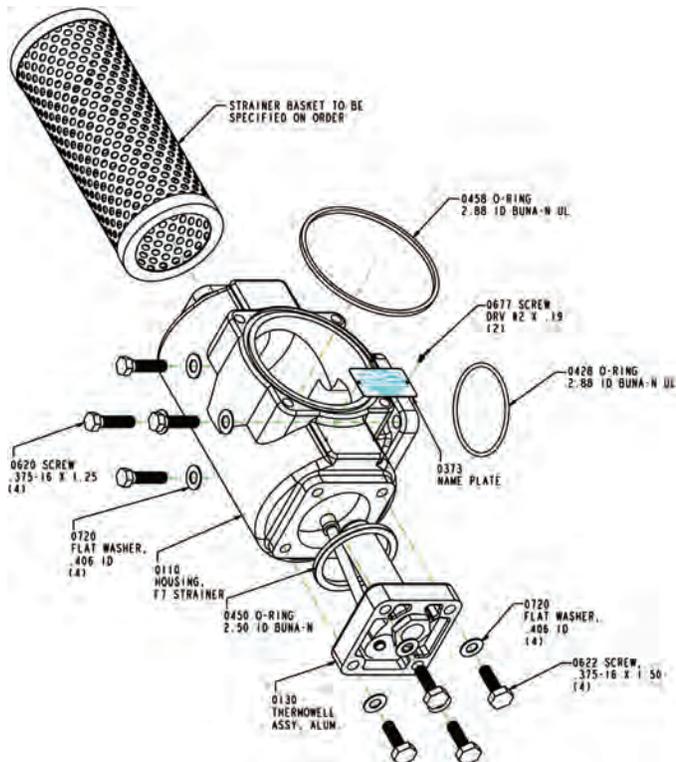
Part #	Ref No.	Description	Qty.
<b>Face Gear</b>			
40122	336	Face Gear, Delrin, 1:1 - Standard	1
40818	336	Face Gear, Delrin, 2:1 - Optional	1
42907	336	Face Gear, SS, 2:1, 12-tooth - Optional	1
42909	336	Face Gear, SS, 1:1, 24-tooth - Optional	1
<b>Drive Shaft</b>			
41786	310	Bushing, Drive Shaft	2
48287	382	Adjuster Shaft	1
2188	574	Retaining Ring, (0.25)	1
<b>Dust Cover</b>			
49390	366	Cover Adjuster Plate	1
9093	630	Screw (10-32 x .50)	1
48864	780	Seal Wire Kit	1
<b>Gear Plate</b>			
G2146		1/10 Gallon, 1:1, 2%, without Preset - Standard	1
G2673		Whole Liters, 2:1, TVC, 2%, without Preset - Optional	1
G2102		Whole Gallon, 2:1, TVC, 2%, without Preset - Optional (Class 12)	1
G2322		5.18 lbs/Gallon, 2%, without Preset - Optional (Class 12)	1
<b>Flange Assembly</b>			
A2283		NI / UL Buna / 2" NPT - Standard	2
6854		O-ring, Buna - Standard	2
<b>Counter</b>			
D1111		1/10 Gallons - Standard	1
D1147		Whole Liters - Optional (Class 10 & 12)	1
D1131		Whole Gallons - Optional (Class 12)	1
D1151		Whole Pounds - Optional (Class 12)	1
<b>Counter Assembly Adaptor</b>			
49434	126	Counter Adaptor Bracket	1
48208	375	Retaining Spring	1
6845	603	Screw (#10-24 x .375)	2
9084	673	Screw (.250-20 x 1")	4
6743	705	Flat Washer	4

Meter components may appear different between models.

## A2343A - FA-7 Aluminum Strainer

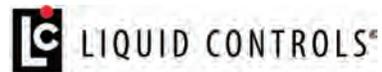


Applicable for Strainers Manufactured after April 2001

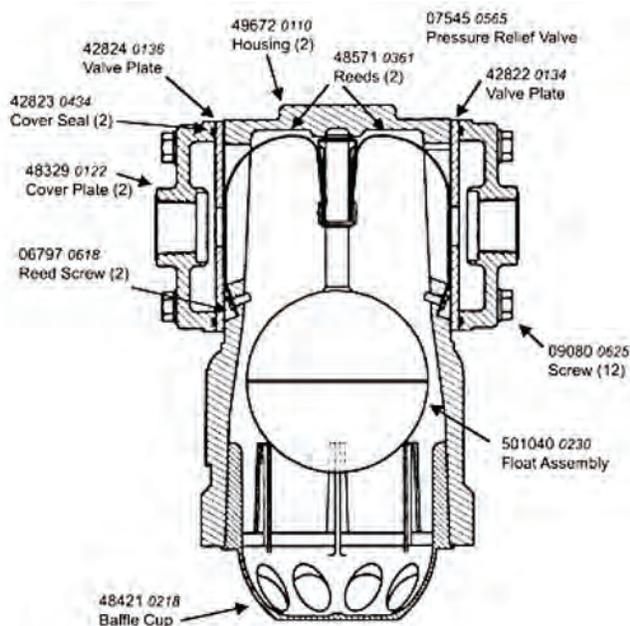


Part #	Ref No.	Description	Qty
A2439	5	Basket, Strainer F-7, 200 Mesh SS - Standard	1
49425	110	Housing, F-7 Strainer, Anodized Aluminum	1
45420	130	Thermowell Assembly, Aluminum, MA5/MA7, Strainer End Mtg.	1
48404	200	Strainer Manual	1
48419	373	Nameplate, Strainer Assembly	1
6854	428	O-Ring, 2.88 ID Buna-N UL, 3.12 OD x .12 Dia Wall	1
9338	450	O-Ring, 2.50 ID Buna-N, 3.00 OD x .25 Sqr Wall	1
9335	458	O-Ring, 4.75 ID Buna-N, 5.00 OD x .12 Sqr Wall	1
4444	620	Screw, .375-16 x 1.25, Hex HD Cap, GR 8	4
6851	622	Screw, .375-16 x 1.50, Hex HD Cap, GR 8	4
306	677	Screw, Drv #2 x .19 Type "U"	2
4498	720	Flat Washer, .406 ID, .812 OD x .062 Thk	8

## A8340A Air Eliminator



Applicable for Air Eliminators Manufactured after August 31, 1998



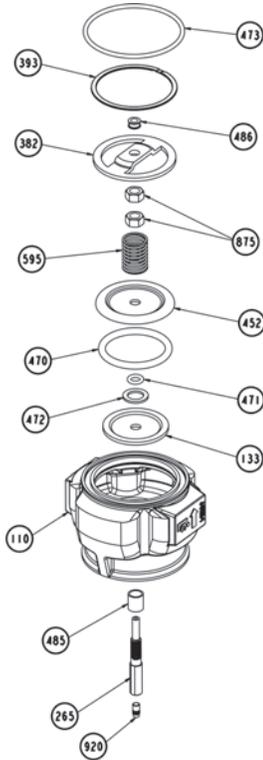
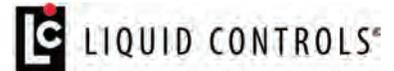
\* 4 cover gaskets (0434) are required on air eliminators with kalrez seals

Part numbers in regular font  
Item numbers in *italics*

Part #	Ref No.	Description	Qty
49672	110	Housing, Air Eliminator	1
48329	122	Cover, Air eliminator Outlet Cover	2
42822	134	Plate, Valve; Standard Vent .25 X .75 Port, UL Buna	1
42824	136	Plate, Valve; Limited Bleed, 1/16 Diameter Vent, UL Buna	1
48406	200	Manual, Vapor / Air Eliminator All Series	1
48421	218	Cup, Baffle; Plastic Air Eliminator / Strainer	1
501040	230	Float and Reed Assembly, LPG Float	1
42823	434	Seal Ring, Outlet Cover; Buna, UL Approved	2
49751	540	Nameplate, Air eliminator; EEC Approval	1
7545	565	Valve, Pressure Relief	1
6797	618	Screw # 8-32 X .375 Slid Bdg Head	2
9080	625	Screw, .312-16 X 1.50 Hex head Cap, GR 8	12
6851	641	Screw, .375-16 X 1.50 Hex head Cap, GR 8	4
306	678	Screw, Drv #2 X .19 Type "U"	2
4498	711	Flas Washer, .406 ID .812 OD X .062 Thk	4
9169	810	Thread Protector, 1" Caplug	2

## A2883 Check Valve Assembly

501566



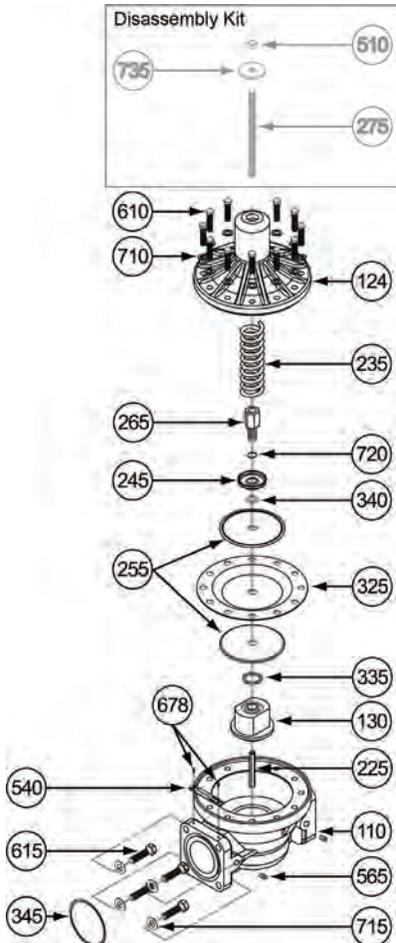
A2883 meters sold BEFORE December 19, 1991 ending with Serial Number 225232

A2885 on meters sold AFTER December 19, 1991 beginning with Serial Number 225233

A2883 (501566)	A2885 (501565)	Ref No.	Description
—	—	486	Bearing
6854	6854	473	Buna-N O-Ring
9137	9137	393	Spiral Retaining Spring
48337	48337	382	Valve Spring Holder
9138	9138	595	Compression Spring
9143	9143	875	Self Locking Nut (2)
47974	47974	452	O-Ring Retainer
9131	9131	470	Buna-N O-Ring
9140	9140	471	Buna-N O-Ring
47295	47295	472	Spacer
47975	47975	133	Piston
—	—	265	Valve Stem
7867	7867	485	Bushing
47994	47973	110	Check Valve Housing
—	—	920	Valve Core

## A2843 Valve Assembly

49971 & 501339



Items specific to te 49971 and 501339 assemblies are indicated as such

Part #	Ref No.	Description
47096	110	Valve Housing Assembly
47302	124	Valve Cover
49947	130	Piston
—	225	Piston Guide Shaft (Part of 47096 Assembly)
47305	235	Compression Spring (A2843, 501339 only]
49970	235	Compression Spring (49971 only]
47307	245	Spring Retainer
47308	255	Back-up Plate (2)
47309	265	Stand-off
47098	275	Rod Assembly
502078	325	Diaphragm
6856	335	Buna-N O-Ring
7900	340	Buna-N O-Ring
7838	345	Buna-N O-Ring
6055	510	Nut
—	540	Nameplate
4759	565	Pipe Plug (4)
4655	610	Screw (12)
6851	615	Screw (4)
00306S	678	Screw (2)
9360	710	Flat Washer (12)
4498	715	Flat Washer (4)
6070	720	Lock Washer
6663	735	Flat Washer

Meters

## Fill Station Meters

### 1" Aluminum LPG Meter - Type 4D MD



Includes vapor eliminator register and differential valve. Aluminum design is 40% lighter than previous ductile iron models.



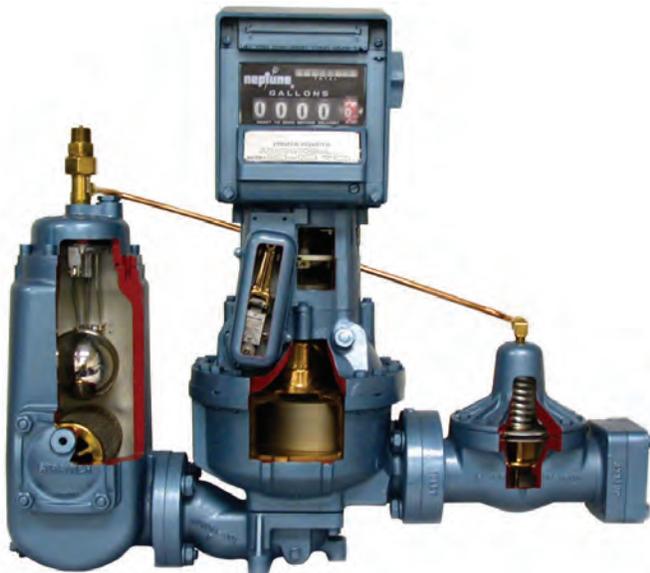
Part #	Description
400051-VR	With Veeder Root register only
400051-002	With register & ATC
400051-600	With Neptune 600 register
400051-LR	Without register

## Bulk Truck/Bulk Plants Meters



### SPECIAL ORDER

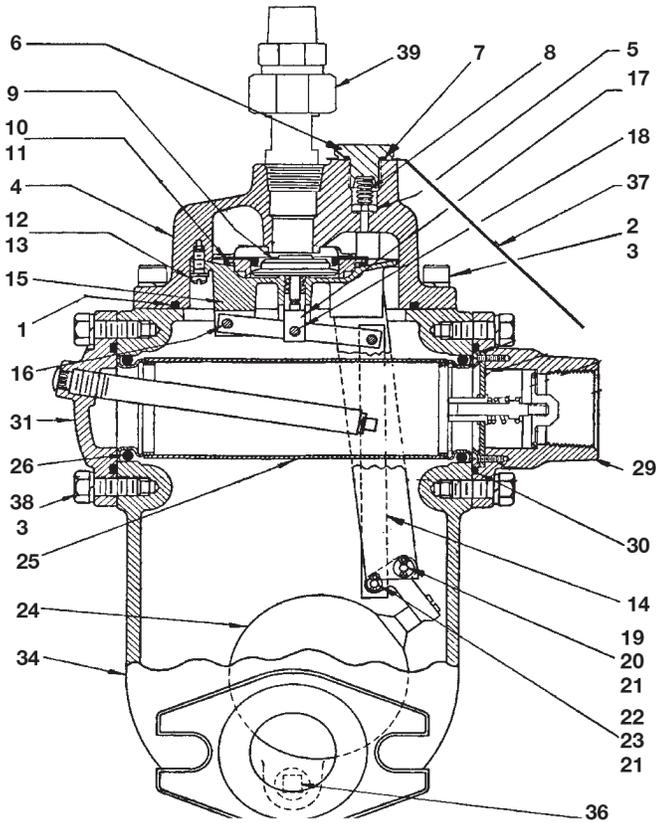
1-1/4", 1-1/2", 2"  
LPG Meter Type 4D



# Red Seal Measurement Neptune Meter Repair

## Vapor Release and Strainer - 1-1/4" & 1-1/2"

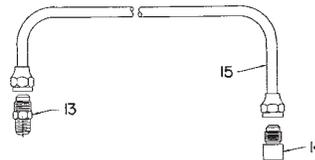
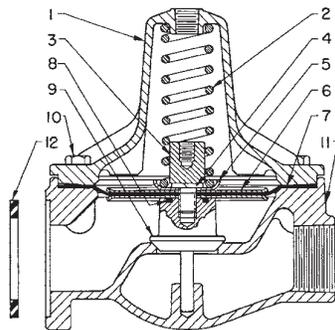
84982-701



Part #	Ref. No.	Description
100139-022	1	Gasket O-ring
8325-014	2	Screw, 3/8-16 x 1, Socket Hd.
45828-001	3	Lockwasher, 3/8 steel
83481-701		Mounting Cover with Float
400077-701	4	Cover Assembly Vapor Release
100237-001	5	Valve Assembly Bypass
100333-001	6	Screw and Plate Assembly
100138-006	7	O-ring, 1/16 sect x 11/16 ID
100024-003	8	Spring Compression
89274-006	9	Main Valve Complete
82446-005	10	Sleeve, Valve
83179-000	11	Piston, Seal
41211-000	12	Lockwasher, No. 10 steel
41221-002	13	Screw, 10-32 x 5/8 fil hd steel
86797-001		Lower Valve Housing Complete
100334-001	14	Link Assembly
82455-000	15	Valve Housing with Extensions
40819-002	16	Rivet, Valve Lever
83127-001	17	Stem, Valve
42941-000	18	Pin, Valve Stem
40820-003	19	Pin, Float Lever (long)
40491-000	20	Washer, Float Lever Pin (long)
41402-000	21	Cotter Pin, 1/16 dia x 1/2, brass
82633-000	22	Pin, Float Lever (short)
41989-000	23	Washer, Float Lever Pin (short)
82476-001	24	Float Complete
101433-704	25	Strainer and Gasket Assembly (80-mesh)
100139-032	26	Gasket, Strainer, O-ring
84983-704	29	Inlet Check Valve Complete (soft seat)
—		Parts Break Down Page 3
100139-010	30	Gasket O-ring
83485-702	31	Strainer Cover (with thermometer well)
83486-705		Strainer Cover (without thermometer well)
—	32	Washer, Plain, 7/16 steel
—	33	Cap Screw, 7/16-14 x 1-3/8, hex hd steel
83495-701	34	Body, Vapor Release and Strainer
—	35	Lockwasher, 7/16 steel
100075-003	36	Plug, Drain
8384-101		Bushing, 1-1/2 x 1-1/4 (for 1-1/4" meter)
100322-001	37	Caution Tag
—	38	Cap Screw, 3/8-16 x 1, hex hd steel
100067-053		(without seal hole)
100068-027		(with seal hole)
84828-000	39	Valve, Vapor Return Check (straight type)

## Differential Valve, 1-1/4" & 1-1/2"

84985-701



Part #	Ref. No.	Description
400000-701	1	Cover
83775-000	2	Spring, Valve
1001571		Diaphragm Complete
83774-002	3	Screw, Diaphragm
41012-002	4	Lockwasher, 7/16 steel
83773-000	5	Retainer, Spring
83772-002	6	Retainer, Diaphragm
1000624	7	Diaphragm
100139-001	8	Gasket, O-ring
83768-002	9	Valve, Stem Assembled
100067-051	10	Screw, 3/8 - 16 x 1, hex hd steel

Part #	Ref. No.	Description
—		Screw, 3/8 - 16 x 1, hex hd steel
—		(with seal hole)
45828-001	10A	Lockwasher, 3/8 steel (not shown)
84986-701	11	Body
82060-000	12	Gasket, Flange
84826-000	13	Fitting, Straight, 3/8 flared tube (male half)
84825-001	14	Fitting, Elbow, 3/8 flared tube (male half)
83937-000	15	Tube, Connecting, with Nuts
—		Tube, Connecting, with Nuts (angle type)

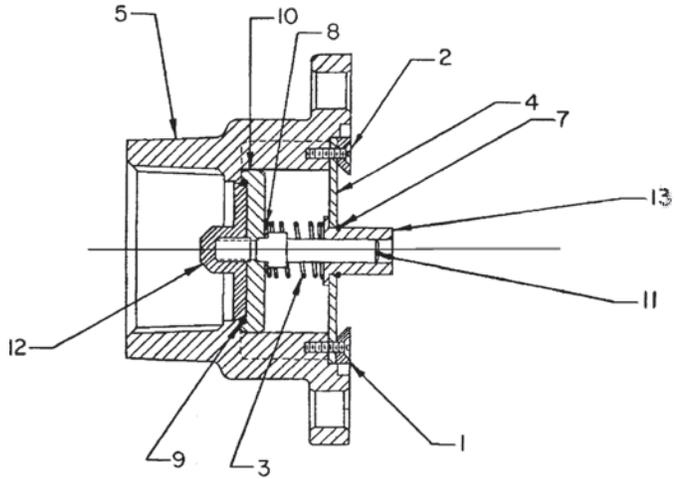
\*If valve stem (ref no. 9) or screw (ref no. 3) are not as shown in drawing, both parts must be replaced.

Meters

# Red Seal Measurement Neptune Meter Repair

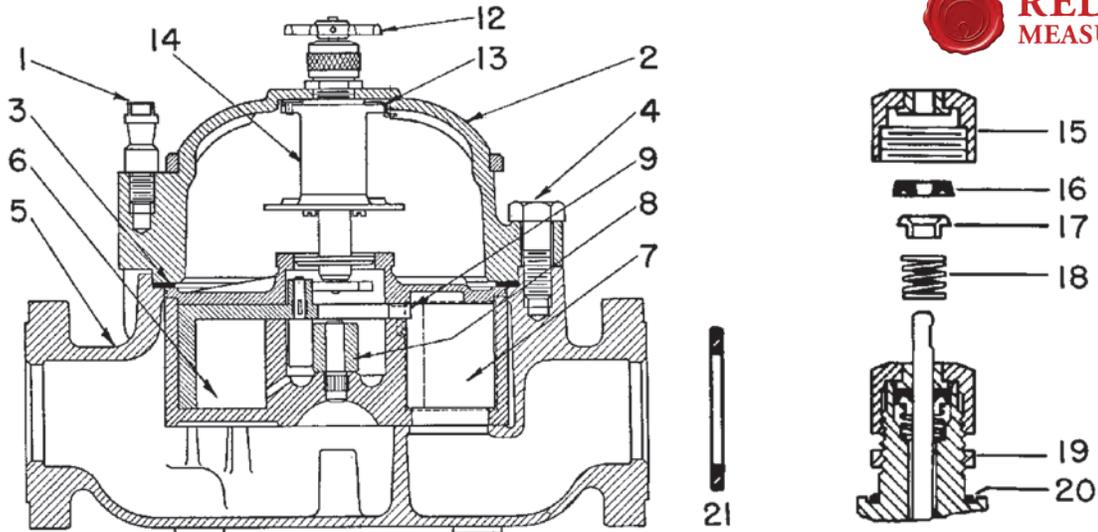
## "Soft Seat" Inlet Check Valve, 1-1/4" & 1-1/2"

84983-704



Part #	Ref. No.	Description
83441-000	1	Ring, Retaining
83442-000	2	Screw
83492-000	3	Spring
83493-003	4	Strap, Inlet Check
84984-005	5	Inlet Flange
86071-000	7	Ring, Retaining, Truarc
41117-000	8	Washer, Lock
100146-003	9	"O" Ring
100423-002	10	Holder, Disk
100896-001	11	Shaft, Inlet Check
100897-001	12	Retainer, Disk
100899-001	13	Bearing

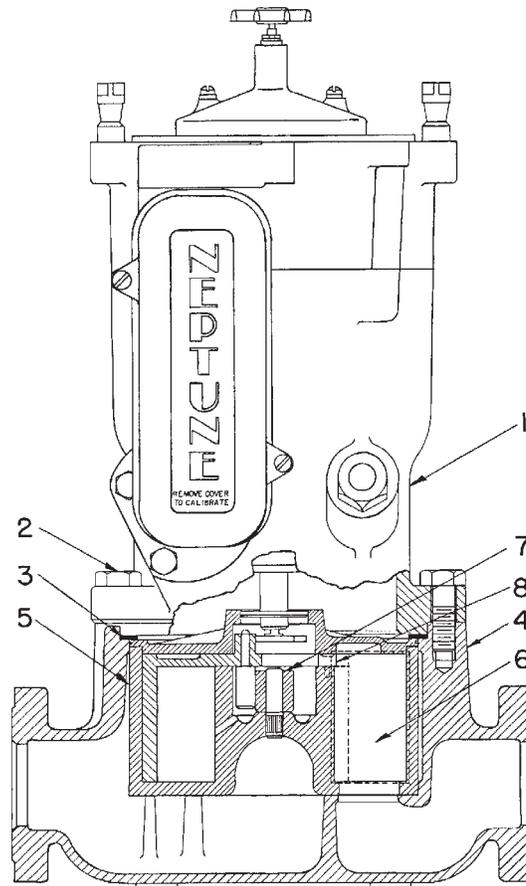
## Flowmeter without Temperature Compensator, 1-1/4" & 1-1/2"



Part #	Part #	Ref. No.	Description
84435-000	84435-000	1	Stud Register Mounting
83479-701	83479-701	2	Cover, Main Case
4862-008	4862-008	3	Gasket, Main Case
795-003	795-003	4	Screw, Cap, Main Case 7/16 - 14 x 1-3/8
795-011	795-011		Screw, Cap, Main Case (with seal hole) 7/16 - 14 x 1-3/8
41012-002	41012-002	4A	Lockwasher, 7/16 Bolt (not shown)
83477-701	84978-002	5	Main Casing with Locating Pin
C43260-101	C83271-101	6	Measuring Chamber Complete
43271-000	83277-000	7	Diaphragm
43275-000	43275-000	8	Roller Control
42792-000	42792-000	9	Pin Seal
—	—	10	Dowel Stud, Seal Pin
—	—	11	Screw, Measuring Chamber
82976-001	82976-001	12	Star Connection with setscrew
85006-000	85006-000	13	Adapter, Gear Train, Non-Swivel
—	—	14	Gear Train Complete
—	84981-000		9.375 Reduction U.S. Gal
—	—		11.6 Reduction IMP Gal

Part #	Part #	Ref. No.	Description
83501-000	—		14.06 Reduction U.S. Gal
—	—		16.5 Reduction IMP Gal
—	83280-052		25.4184 Reduction Liters
82710-054	—		36.41 Reduction Liters
83536-000	83536-000	15	Stuffing Box Nut with Bushing
100025-002	100025-002	16	Seal, U-cup Shaft
83539-000	83539-000	17	Expander Seal
83540-000	83540-000	18	Spring, Stuffing Box
34-000	34-000	19	Nut Clamp
100138-003	100138-003	20	Gasket, O-ring, Gear Train
82060-000	82060-000	21	Gasket, Flange

Meters



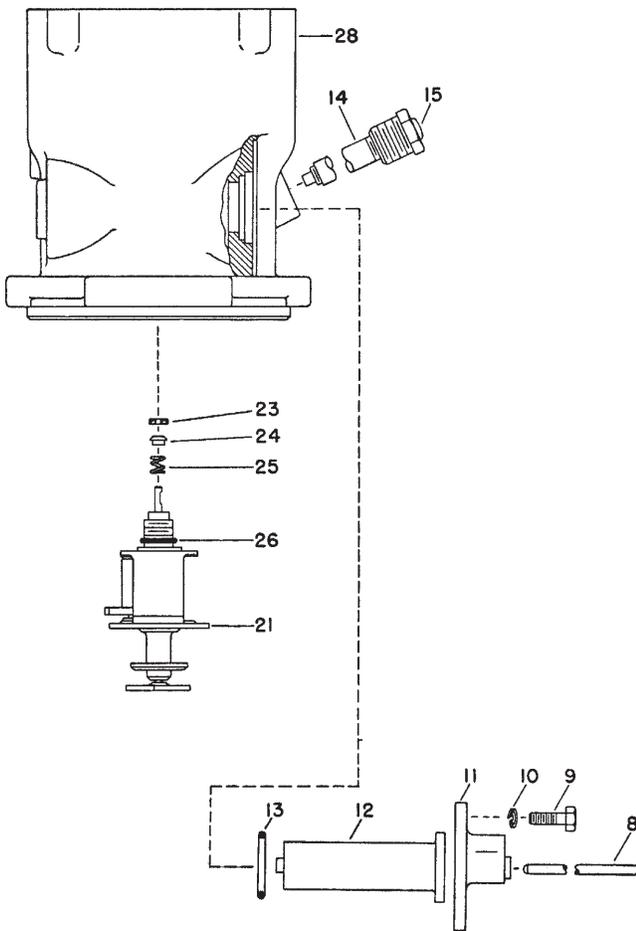
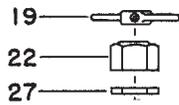
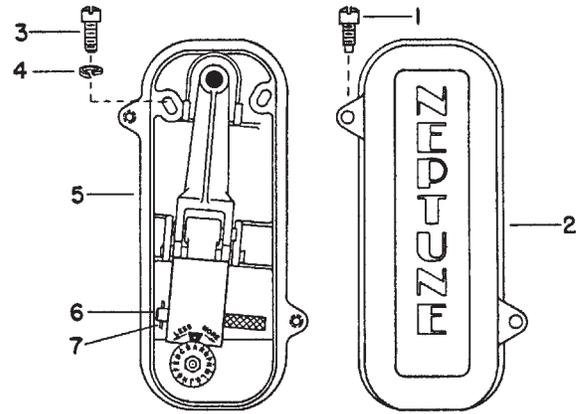
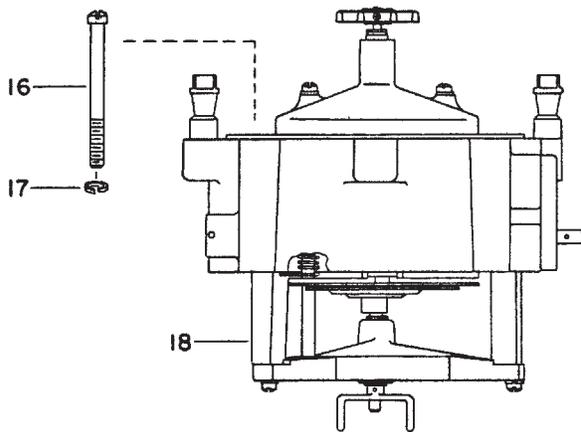
Part #	Part #	Ref. No.	Description
See Note	86600-204	1	LP-Gas Temperature Compensator
795-003	795-003	2	Cap Screw, Main Case 7/16 - 14 x 1-3/8
795-011	795-011		Cap Screw, Main Case (with seal hole) 7/16 - 14 x 1-3/8
41012-002	41012-002	2A	Lockwasher, 7/16 Bolt (not shown)
4862-008	4862-008	3	Gasket
83477-701	84978-702	4	Main Casing with Locating Pin
C43260-101	83271-101	5	Measuring Chamber Complete
43271-000	83277-000	6	Diaphragm
43275-000	43275-000	7	Roller, Control
42792-000	42792-000	8	Pin Seal
—	—	9	Dowel Stud Seal Pin
—	—	10	Screw, Measuring Chamber

Note: Temperature Compensator and Adaptor on next 2 pages

# Red Seal Measurement Neptune Meter Repair

## Temperature Compensator, Type 1 Style 2

86600-00X - 1-1/4", 86600-00X - 1-1/2"



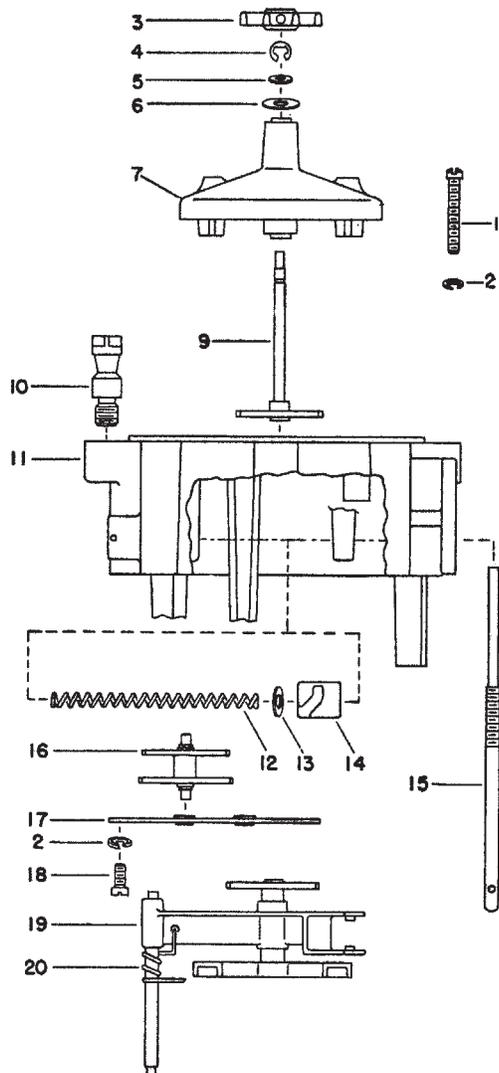
Part #	Part #	Ref. No.	Description
86600-00X	86600-204		
1-1/4"	1-1/2"		
9287-003	9287-003	1	Screw, Cover (10-32 special)
86665-000	86665-000	2	Cover, Lever Arm Mounting Plate
41221-002	41221-002	3	Screw, 10-32 x 5/8, fil hd steel
41211-000	41211-000	4	Lockwasher, No. 10 steel
86649-003	86649-003	5	Mounting Plate and Lever Arm Assembly
86661-001	86661-001	6	Pin, Lever Arm Lock
86973-000	86973-000	7	Cotter Pin, 1/16 dia x 3/8, brass
86648-000	86648-000	8	Pin, Thermostat
83784-000	83784-000	9	Screw, 1/4-20 x 3/4, hex hd steel
41117-000	41117-000	10	Lockwasher, 1/4 steel
86647-001	86647-001	11	Cover, Thermostat
86646-000	86646-000	12	Thermostat (Bellows)
100139-005	100139-005	13	Gasket, O-ring, Thermostat Cover
1001906	1001906	14	Thermometer Well Complete
600443-001	600443-001	15	Cover, Thermometer Well
8302-107	8302-107	16	Screw, 1/4-20 x 2-1/2, fil hd steel
88721-000	88721-000	17	Lockwasher, 1/4 steel, small
86602-705	86602-705	18	Adapter Unit Complete (see page 6)
		19	Driving Arm with Setscrew
82976-001	82976-001	20	Gear Train Complete
—	84981-000	21	9.375 Reduction US Gal
—	083280-051		11.6 Reduction IMP Gal
83501-000	—		14.06 Reduction US Gal
—	—		16.5 Reduction IMP Gal
—	83280-052		25.4181 Reduction Litres
82710-054	—		36.41 Reduction Litres
83536-000	83536-000	22	Nut and Bushing Assy, Stuffing Box
100025-002	100025-002	23	Seal U-cup Shaft
83539-000	83539-000	24	Expander, Seal
83540-000	83540-000	25	Spring, Stuffing Box
100138-003	100138-003	26	Gasket, O-ring
34-000	34-000	27	Nut, Clamp
86601-701	86601-701	28	Housing, Compensator

Meters

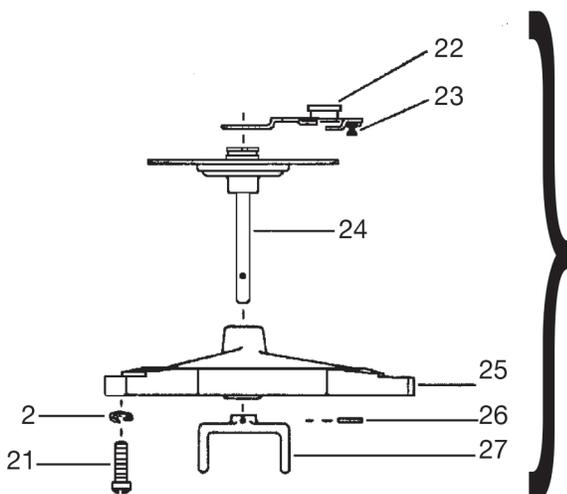
# Red Seal Measurement Neptune Meter Repair

## Temperature Compensator Adaptor

866002-00X



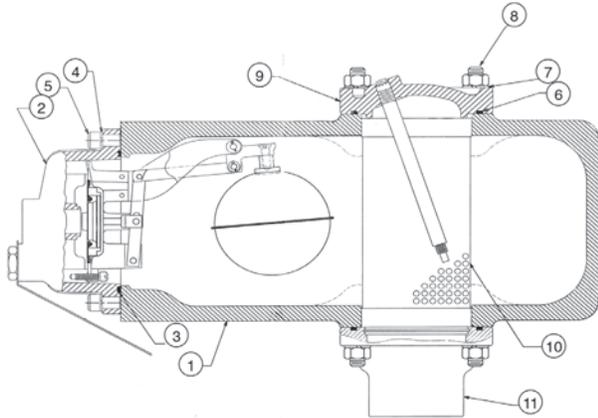
Part #	Ref. No.	Description
89073-000	1	Screw, 10-32 x 1-1/4, fil hd steel
41211-000	2	Lockwasher, No. 10 steel
84890-004		Register Drive Bracket Complete
82976-001	3	Star Connection w/Setscrew
8538-027		Setscrew, 8-32 x 3/16 hollow hd
88462-000	4	Ring, Retaining (Truarc, Type E)
8571-014	5	Washer, Drive Shaft
46652-001	6	Slim, Drive Shaft
—	7	Bracket Assy with Bushings (included in Part # 84890-004)
86554-001	9	Gear Complete, Intermediate (41-tooth)
84435-000	10	Stud, Register Mounting
84921-003	11	Adapter with Plug and Bushing
84888-000	12	Spring, Push Rod
88286-003	13	Washer, Spring Retaining
86612-000	14	Swivel Block Assembled
86611-001	15	Push Rod
84907-001	16	Gears & Shaft Assembly (41 and 35 teeth)
86609-000	17	Plate and Bushing Assembly, Idler Gear Retaining
88524-000	18	Screw, 10-32 x 3/8, fil hd steel
84910-003	19	Arm Complete, Offset Spider (with 31-tooth gear)
86645-000	20	Spring, Offset Spider Arm
41221-002	21	Screw, 10-32 x 5/8, fil hd steel
100922-001	22	Arm Assembly, No. 1, 2 reg.
100922-002	22	Arm Assembly, No. 2, 2 reg.
86063-000	23	Spring, Ratchet Pawl
100915-002	24	Ratchet and Shaft, Assembly
84914-000	25	Drive Bracket Assembled (with Bushings)
100370-003	26	Rollpin, 1/16 dia x 3/8, steel
84192-006	27	Drive Fork
101732-001	—	Kit — Replacement, Metal w/Plastic
101732-001	—	Conversion Kit — Metal to Plastic



Drive Bracket Assy. complete with Ratchet and Arms.  
Part No. 84913-002

## Type 4D-MT Vapor Release and Strainer - 2"

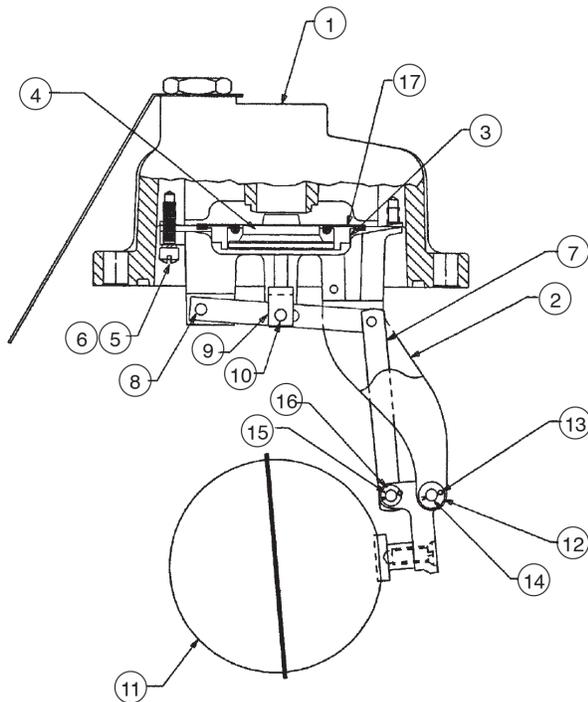
400076-701



Part #	Ref. No.	Description
400086-701	1	Main Body Assembly - 4D-MT Vapor Release
100085-048	—	Bolt, 5/8 11x1 3/4 (Not Shown)
041395-000	—	Washer
100075-010	—	Pipe Plug 3/8" Square Head
400078-001	2	Cover Complete - 2" 4D-MT Vapor Release
100139-022	3	O-Ring 1/8 Dia. x 4-1/2 ID BUNA
100440-001	4	Washer, 3/8 Lock - Hel Spring Hi-Collar
008325-014	5	Screw, 3/8-16 x 1 Soc. Head Cap
100139-018	6	O-Ring 1/8 Dia. x 3-3/4 ID BUNA
041012-002	7	Washer, Lock 7/16 Bolt St. Stl.
000795-003	8	Bolt, 7/16-14 x1 3/8 HRX
400074-001	9	Cover Complete - 2" Type 4D-MT Strainer
101405-004	10	Strainer Complete 80 Mesh 2" Type 4D
084813-702	11	Valve, ASM Inlet Check 2" Type 4D
100139-013	12	O-Ring Outlet Flange (Not Shown)

## Type 4D-MT Vapor Release Cover - 2"

400078-001



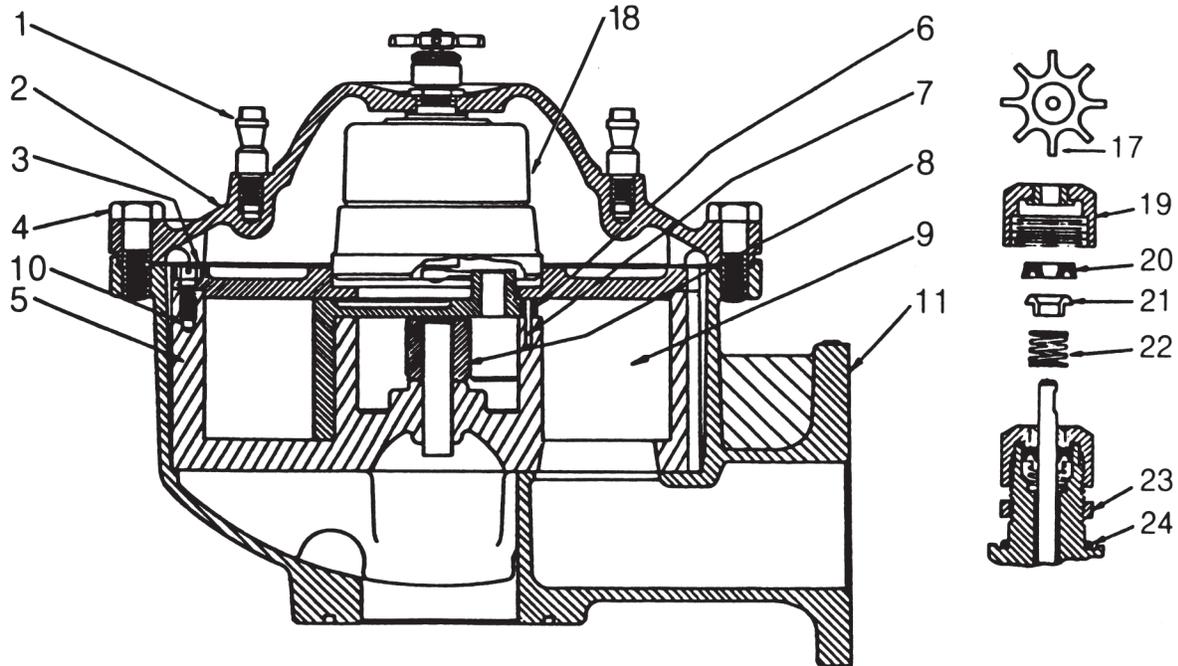
Part #	Ref. No.	Description
400077-701	1	2" 4D-MT Vapor Release Cover Assembly:
004853-008	—	Screw, 5/8 - 18 Hex Hd. Retainer
100024-003	—	Spring, Compression
100138-006	—	O-Ring, 1/16 Sect. x 11/16 ID BUNA N
100237-001	—	Valve Assembly, Bypass Aluminum with BUNA N Seat
100322-001	—	Tag, Precaution
083457-000	2	Housing, ASM Low Volume & Extended
82446-005	3	Sleeve, Air Release, Aluminum
089274-006	4	Valve Assembly, Main A/R (BRZ-BUNA N)
041221-002	5	Screw, 10-32 x 5/8 Fil. Hd. 303 SST
041211-000	6	Washer, Lock No. 10 Spring Steel
080002-002	7	Link Assy., Connect. Stl.
040819-002	8	Pin, 0.187 ODS 21/32 LG
083127-001	9	Stem, Valve PST Type A/Rel. BRZ
042941-000	10	Pin, Valve Lever & Stem Air Release
082476-001	11	Float Complete
040491-000	12	Spacer Drive Gear Hub VSB Reg. Brass
041402-000	13	Pin, Cotter 1/16 Dia. x 1/2 Lg.
040820-003	14	Pin, Float Lever - A/R Valve
082633-000	15	Pin, V Connection 3/16 OD x 11/16 LG., BRZ
041989-000	16	Washer No. 10 Screw
083179-000	17	Seal, Piston Air Release Units

Meters

# Red Seal Measurement Neptune Meter Repair

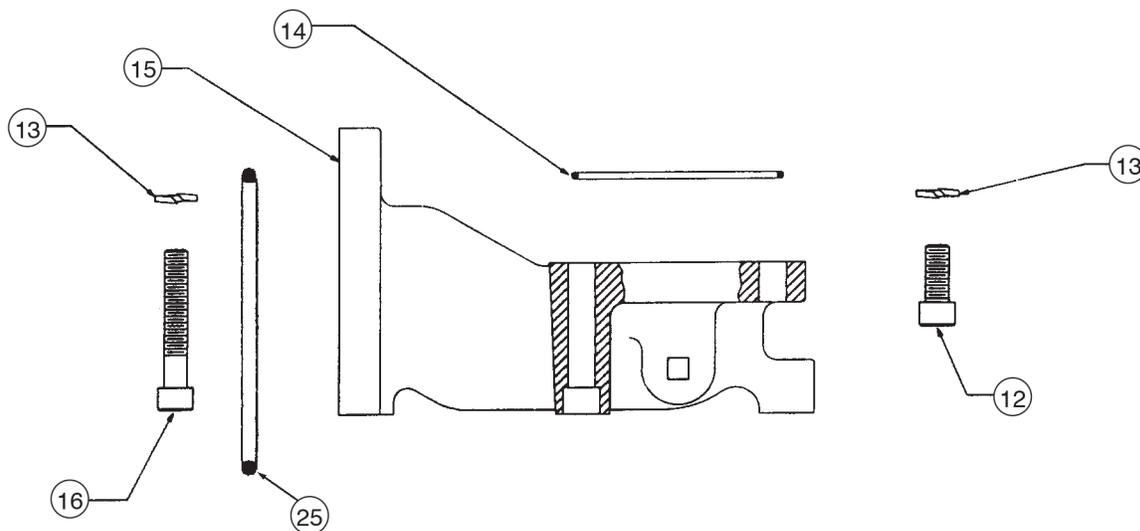
## Flowmeter without Temperature Compensator - 2"

Type 4-MT and Type 4D-MT



Part #	Ref. No.	Description
84435-000	1	Stud Register Mounting
400071-001	2	Cover, Main Case
84806-000	3	Gasket, Main Case
795-003	4	Screw Cap, Main Case
795-011	4	Screw Cap, Main Case (with Seal Hole)
C45806-101	5	Measuring Chamber Complete
42546-000	6	Pin Seal
5211-001	7	Dowel Stud, Seal Pin
42316-001	8	Roller Control
42312-001	9	Diaphragm
88638-000	10	Screw, Measuring Chamber
400072-701	11	Main Case with Locating Pin
8325-041	12	Screw, 7/16-14 x 11-1/2"0 Cap Skt Hd
41012-002	13	Lockwasher, 7/16 steel

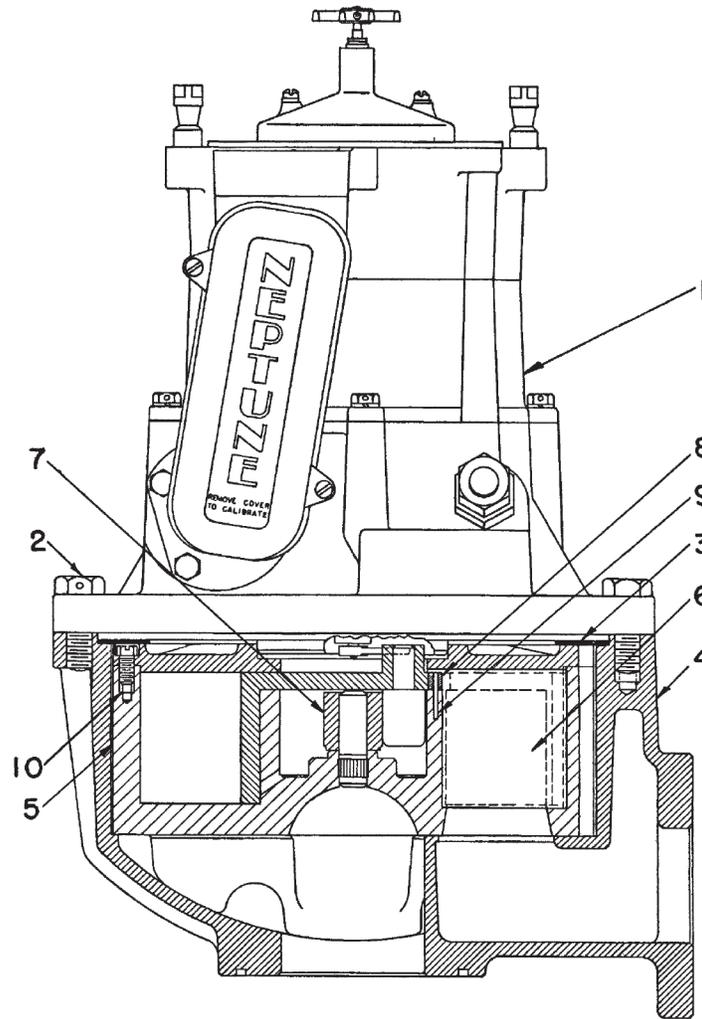
Part #	Ref. No.	Description
100139-018	14	Gasket, Connector
400079-001	15	Connector with plug, Meter-to-Vapor Release
8325-040	16	Screw, Cap Skt Hd. 7/16-14x3"
82976-001	17	Star Connector with Setscrew
—	18	Gear Train Complete
83502-000	18	3.75 Reduction US Gal
80862-055	18	9.93 Reduction Litres
83536-000	19	Stuffing Box Nut with Bushing
100025-002	20	Seal, U-Cup Shaft
83539-000	21	Expander Seal
83540-000	22	Spring, Stuffing Box
34-000	23	Nut Clamp
100138-003	24	Gasket, O-ring, Gear Train
100139-013	25	O-Ring, 1/8 Dia. x 3-3/8 ID BUNA



Meters

## Flowmeter with Temperature Compensator - 2"

Type 4-MT and Type 4D-MT

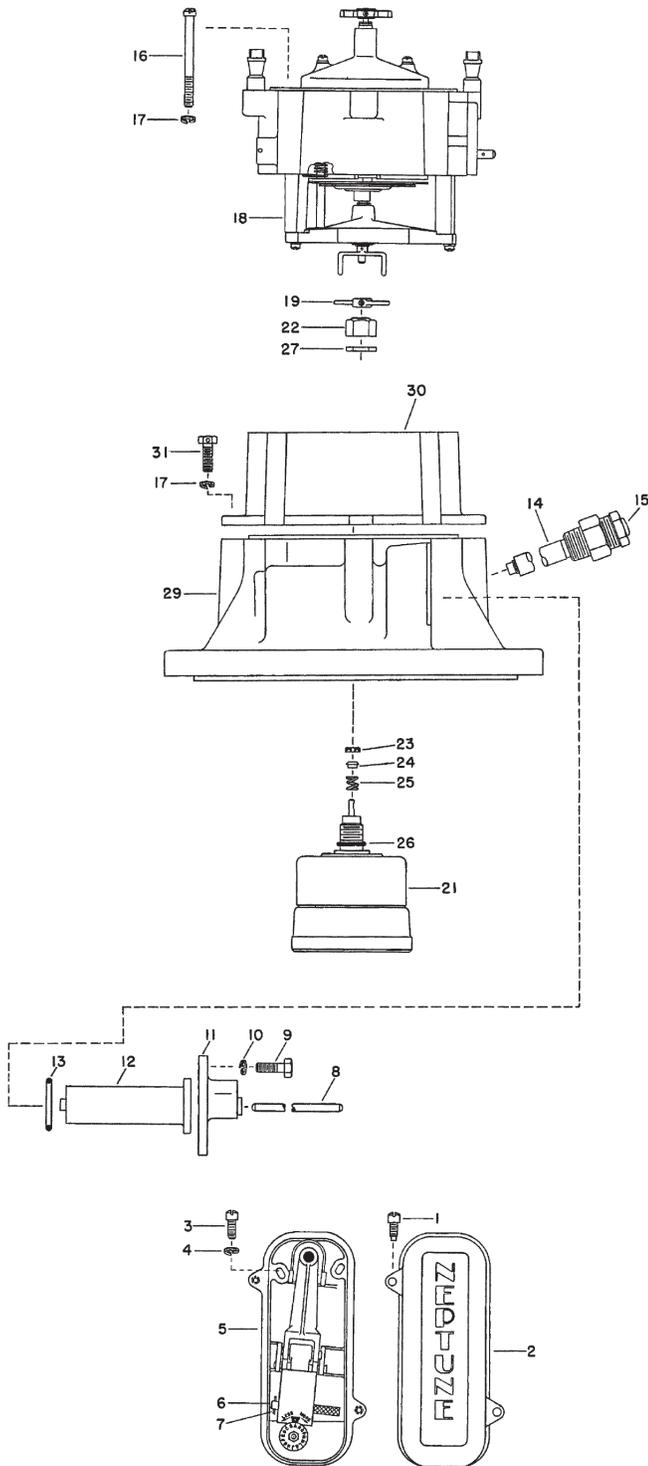


Part #	Ref. No.	Description
See Note	1	LP-Gas Temperature Compensator
795-003	2	Cap Screw, Main Case
795-011	—	Cap Screw, Main Case (with seal hole)
84806-000	3	Gasket
400072-701	4	Main Casing with Locating Pin
C45806-101	5	Measuring Chamber Complete
42312-001	6	Diaphragm
42316-001	7	Roller, Control
42546-000	8	Pin Seal
5211-001	9	Dowel Stud Seal Pin
88638-000	10	Screw, Measuring Chamber

NOTE: Temperature Compensators on next 2 pages

# Red Seal Measurement Neptune Meter Repair

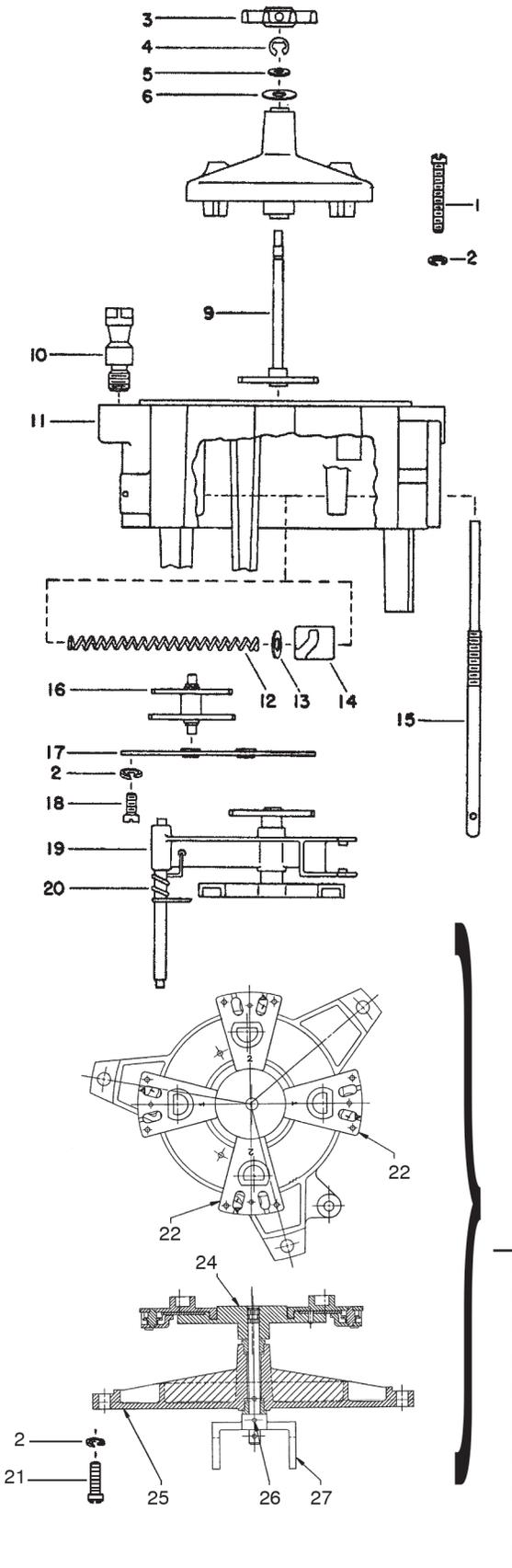
## Temperature Compensator, Type 1 Style 2 - 2"



Part #	Part #	Description
9287-003	1	Screw, Cover (10-32 special)
86665-000	2	Cover, Lever Arm Mounting Plate
41221-002	3	Screw, 10-32 x 5/8, fil hd steel
41211-000	4	Lockwasher, No. 10 steel
86649-003	5	Mounting Plate & Lever Arm Assy. (4D-MT)
87650-001	5	Mounting Plate & Lever Arm Assy. (4-MT)
86661-001	6	Pin, Lever Arm Lock
86973-000	7	Cotter Pin, 1/16 dia. x 3/8, brass
86648-000	8	Pin, Thermostat
83784-000	9	Screw, 1/4 dia. x 3/8, brass
88721-000	10	Lockwasher, 1/4 steel
400010-701	11	Cover, Thermostat
86646-000	12	Thermostat (Bellows)
100139-005	13	Gasket, O-ring, Thermostat Cover
1001906	14	Thermometer Well complete
600443-001	15	Cover, Thermometer Well
8302-107	16	Screw, 1/4-20- x 2-1/2, fil hd steel
88721-000	17	Lockwasher, 1/4 steel, small
86602-705	18	Adapter Unit Complete
82976-001	19	Driving Arm with Setscrew
—	21	Gear Train Complete
83502-000	21	3.75 Reduction US Gal
80862-055	21	9.93 Reduction Litres
83536-000	22	Nut and Bushing Assy., Stuffing Box
100025-002	23	Seal U-cup Shaft
83539-000	24	Expander, Seal
83540-000	25	Spring, Stuffing Box
100138-003	26	Gasket, O-ring
34-000	27	Nut, Clamp
400081-002	29	Main Case Cover with Locking Pin
1002043	30	Spacer
1002044	31	Screw, 1/4-20x1-1/8 socket hex hd steel

## Temperature Compensator Adaptor Unit Complete - 2"

86602-705

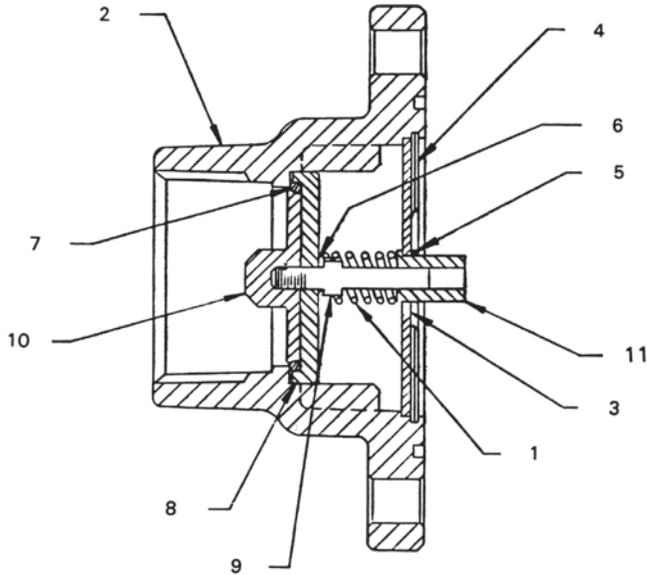


Part #	Part #	Description
89073-000	1	Screw, 10-32 x 1-1/4, fil hd steel
41211-000	2	Lockwasher, No. 10 steel
84890-004	—	Register Drive Bracket Complete
82976-001	3	Star Connection w/Setscrew
8538-027	—	Setscrew, 8-32 x 3/16 hollow hd
88462-000	4	Ring, Retaining (Truarc, Type E)
8571-014	5	Washer, Drive Shaft
46652-001	6	Shim, Drive Shaft
86554-001	9	Gear Complete, Intermediate (41 tooth)
84435-000	10	Stud, Register Mounting
84921-003	11	Adapter with Plug and Bushing
84888-000	12	Spring, Push Rod
88286-003	13	Washer, Spring Retaining
86612-000	14	Swivel Block Assembled
86611-001	15	Push Rod
84907-001	16	Gears & Shaft Assembly (41 and 35 teeth)
86609-000	17	Plate and Bushing Assembly, Idler Gear Retaining
88524-000	18	Screw, 10-32 x 3/8, fil hd steel
84910-003	19	Arm Complete, Offset Spider (with 31-tooth gear)
86645-000	20	Spring, Offset Spider Arm
41221-002	21	Screw, 10-32 x 5/8, fil hd steel
100922-001	22	Arm Assembly, No. 1, 2 reg.
100922-002	22	Arm Assembly, No. 2, 2 reg.
86063-000	23	Spring, Ratchet Pawl (not shown)
100914-002	24	Ratchet and Shaft, Assembly
84914-000	25	Drive Bracket Assembled (with Bushings)
100370-003	26	Rollpin, 1/16 dia x 3/8, steel
84192-006	27	Drive Fork
101732-001	—	Kit - Replacement, Metal w/Plastic
101732-001	—	Conversion Kit - Metal to Plastic

Drive Bracket Assy. complete with Ratchet and Arms.  
Part No. 84913-002

## "Soft Seat" Inlet Check Valve - 2"

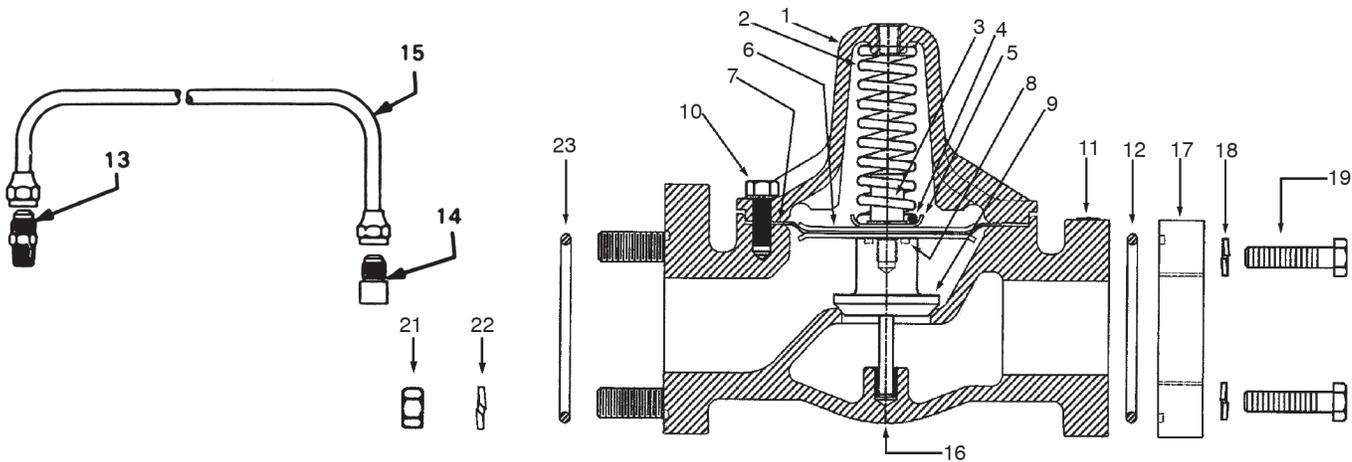
Type 4D-MT - 084813-702



Part #	Ref. No.	Description
83492-000	1	Spring
84814-003	2	Flange, Inlet
84816-001	3	Strap, Inlet
84817-000	4	Ring, Retaining
86071-000	5	Ring, Retaining, Truarc
041117-000	6	Washer, Lock
100139-032	7	"O" Ring
100374-002	8	Holder
100896-001	9	Shaft
100898-001	10	Retainer
100899-001	11	Bearing

## Differential Valve - 2" with Companion Flange

Type 4D-MT - 400070-701



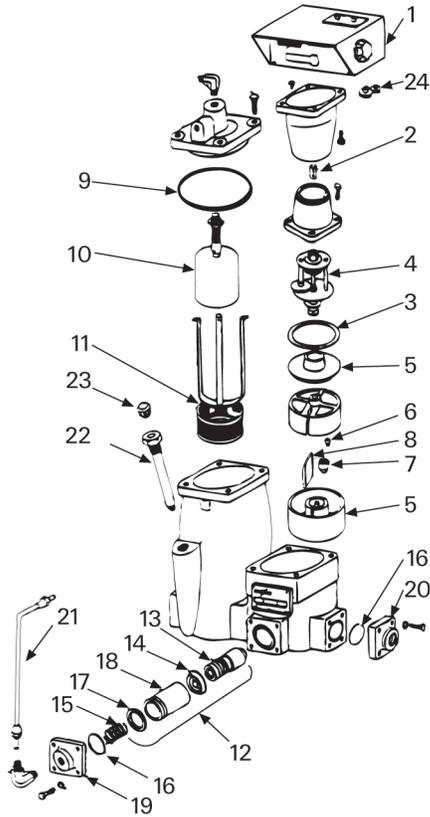
Part #		Description
400000-001	1	Cover
83775-000	2	Spring, Valve
1001569	—	Diaphragm Complete
83774-002	3	Screw, Diaphragm
41012-002	4	Lockwasher, 7/16 steel
83773-000	5	Retainer, Spring
83772-002	6	Retainer, Diaphragm
1000624	7	Diaphragm
100139-001	8	Gasket, O-ring
83927-002	9	Valve Stem Assembled
100067-051	10	Screw, 3/8 - 16 x 1-1/4, hex hd steel
100068-050	10	Screw, 3/8 - 16 x 1-1/4, hex hd steel (with seal hole)
45828-001	10A	Lockwasher, 3/8 steel (not shown)
400013-703	11	Body (stud)
1931-000	—	(stud)
100139-018	12	Gasket, O-Ring 1/8 x 3-3/4
84826-000	13	Fitting, Straight, 3/8 flared tube (male half)
84825-001	14	Fitting, Elbow, 3/8 flared tube (male half)
84823-000	15	Tube, Connecting, with Nuts
84821-000	15	Tube, Connecting, with Nuts (Angle configuration)
8343-001	16	Bushing

Part #		Description
86814-001	17	Flange, 2" NPT
86814-002	17	Flange, 1-1/2" NPT
41012-002	18	Lockwasher
100071-101	19	Screw
84828-000	20	Ventline Check Valve (not shown)
41224-000	21	Nut 5/8-11
41395-000	22	Lockwasher
100139-013	23	Gasket, O-Ring

Meters

## 4D Style Dispenser Meter

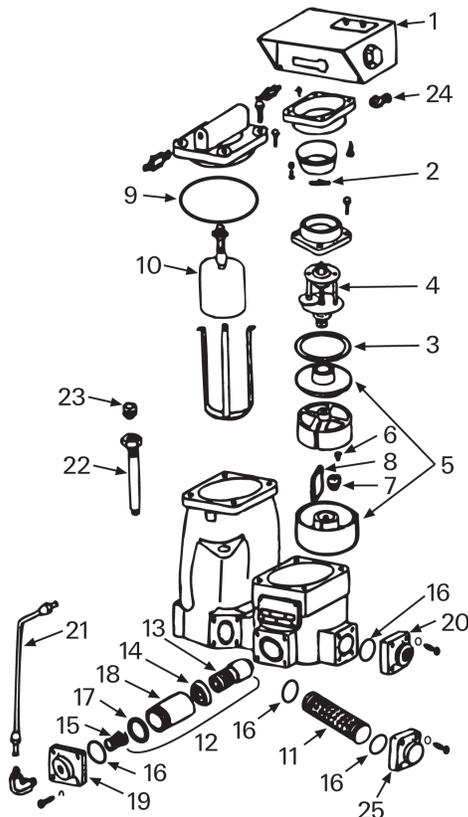
3/4" Style N, Nodular Iron



Part #	Ref. No.	Description
100498-009	1	Register complete 600 series/ gal..
100711-004	2	Coupling & key assy.
601522-001	3	Main case gasket
80905-012	4	Gear train complete
42075-101	5	Measuring chamber complete
42792-000	6	Seal pin
42086-000	7	Control roller
42791-000	8	Diaphragm
42075-702	8A	Diaphragm Kit, Includes # 7 & 8
100139-012	9	O-ring
400026-701	10	Vapor release cover & float assy
8 7185-000	11	Strainer
100028-001	12	Differential valve kit complete
100160-002	13	Piston
100025-002	14	U cup, seal
100024-001	15	Spring
100139-007	16	Cover o-ring
100139-006	17	Sleeve sealing o-ring
100027-003	18	Valve sleeve
400020-002	19	Cover flange
600057-000	20	Flange, inlet or outlet
87196-001	21	Tube assembly
1001906	22	Thermometer well assy.
600443-001	23	Cover, thermometer well
81230-XXX	24	Change gear
—	25	Strainer cover
101756-00	—	Complete gasket set

## 4D Style Dispenser Meter

1" Style MD, Aluminum



Part #	Ref. No.	Description
100498-016	1	Register complete 600 series/ gal..
82976-001	2	Coupling & key assy.
601522-001	3	Main case gasket
80905-017	4	Gear train complete
101748-001	5	Measuring chamber complete
42792-000	6	Seal pin
42086-000	7	Control roller
42791-000	8	Diaphragm
42075-702	8A	Diaphragm Kit, Includes # 7 & 8
100139-012	9	O-ring
400026-701	10	Vapor release cover & float assy
101738-001	11	Strainer
100028-001	12	Differential valve kit complete
100160-002	13	Piston
100025-002	14	U cup, seal
100024-001	15	Spring
100139-007	16	Cover o-ring
100139-006	17	Sleeve sealing o-ring
100027-003	18	Valve sleeve
400020-002	19	Cover flange
600057-001	20	Flange, inlet or outlet
87196-001	21	Tube assembly
1001906	22	Thermometer well assy.
600443-001	23	Cover, thermometer well
81230-XXX	24	Change gear
400025-701	25	Strainer cover
—	—	Complete gasket set

Meters

## Red Seal Measurement Neptune Meter Troubleshooting Guide

To guarantee that your Neptune meter performs at its best, always use Genuine Neptune Parts.

### Register Does Not Run When Meter Is In Operation

A. Loosen the two square-head clamp screws at the front base of the register. Remove the register & look into the bottom at the change gears. Each change gear has a shear strip in the center hub. If broken, replace complete gear with another that has the same number of teeth (part #81230 - Teeth No.)

B. While the register is off the meter, check the star drive gear on the meter to make sure it is not slipping on the gear train shaft. If loose, tighten the alien set screw. Also, check the gear train by rotating the star gear with your fingers. You should be unable to turn the star gear a full revolution unless the gear train is broken and must be replaced.

### Meter Flow Rate Decreasing Or Completely Stopped

The Differential Valve on the discharge side of the meter is designed to require **AT LEAST 18 POUNDS MORE PRESSURE** on the inlet side of the meter than the discharge side. This "Differential Pressure" must be present for the meter to operate properly. Check by installing pressure gauges on both sides of the meter and comparing the readings. Insufficient differential pressure can be caused in the following ways:

- A. 1) A worn pump, indicated by fluctuating needle on pressure gauge.  
2) Wrong size pump.  
3) Pump bypass not set properly.  
4) Restrictions in suction or supply lines.

CAUTION: Before opening any part of the meter, close valve between supply tank and meter. Disconnect coupling in vent line in vapor release cover. Perform the following outdoors, away from building or sources of ignition: Open valve slowly at end of delivery hose or other outlet piping. After pressure is dissipated, unscrew vent valve (hex. nut) slowly (maximum 3 turns) on top of vapor release to depressurize product in meter.

B. **A defective float or main valve in the vapor release, or ruptured diaphragm (U-cups on 3/4") in the differential valve.** To check for either of these possibilities, engage pump as if a delivery is to be made and shut off vapor line to storage by disconnecting backcheck coupling on top of the vapor release or by manual shutoff valve (if one is installed in the line). Then disconnect the tubing that connects the top of the differential valve to the top of the vapor release.

After the trapped LPG in this line has been expelled, there should be no evidence of LPG. If LPG continues to escape from the differential side of this line, the diaphragm, U-cups on 3/4", in the differential is ruptured and needs replacement. If LPG continues to escape from the vapor release side, the rubber seat of the main valve is worn or has trash on it and needs replacing. Or, the float ball could be collapsed from shock pressure or is filling up with liquid, & it needs to be replaced.

C. **Clogged strainer in the vapor release.** This can cause excessive vaporization of the LPG which would prevent the vapor release from closing. Cleaning or replacement of the strainer will correct this problem;

D. **Improper vapor return line routing.** The vapor line should be connected only to the vapor space of the supply tank. Connection with other vapor lines should be done as close to supply tank as possible. Never connect the vapor return line to the pump bypass as this can cause erratic meter performance.

### Measuring Chamber Repair

If none of these checks correct flow rate decrease or stoppage, check the measuring chamber in the meter for foreign matter that caused sticking or jamming of the piston. Clean out all foreign matter and smooth down any score marks on the piston and chamber housing with a 3-sided machinist scraper, and then lightly polish both assemblies with very fine emory cloth. Check the center control roller, the diaphragm, and the seal pin (Ref. Meter Parts List) for wear, and replace those parts as needed. Then reassemble chamber and rotate piston to assure there are no sticking points remaining.

**WHEN PLACING CHAMBER BACK IN THE METER HOUSING, BE SURE TO GET THE LOCATING PIN IN THE HOUSING ALIGNED PROPERLY WITH LOCATING SLOT ON THE BOTTOM OF THE CHAMBER TO PREVENT CHAMBER DAMAGE.**

### Register Creeping

If the meter creeps a few tenths when the pump is engaged, it is probably caused by a worn out or metal-seat inlet check valve. This assembly is found where the supply piping enters the vapor release unit. Replace old assembly with a new rubber seat assembly, which gives a positive seal that prevents bleed back of LPG from the meter.

If the problem exists after replacing the inlet, check valve assembly, check the delivery hose and nozzle for leaks. If the meter creeps continuously with the pump engaged and delivery nozzle closed, the diaphragm (U-cups on 3/4") in the differential valve most likely has a hole in it and needs replacing. This hole would allow LPG to circulate through the meter & back to storage through the connector and vapor return line (see above).

**NOTE: IT IS NOT RECOMMENDED TO REUSE OLD GASKETS**

## Veeder-Root Registers

### Large Numeral Counter (Register)

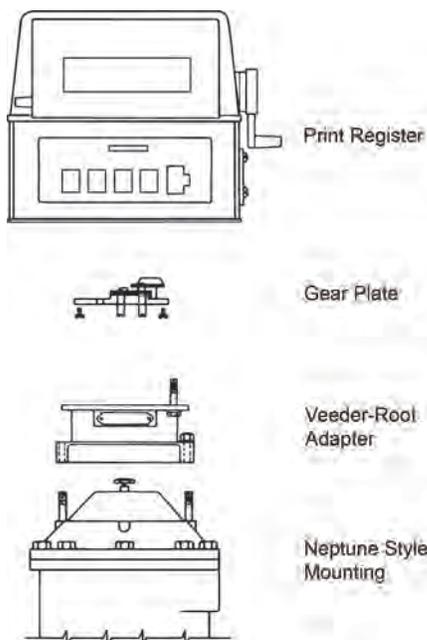


A large numeral counter registers the amount of each delivery or batch and provides a five-figure reset totalizer.

Part #	Description
789002-002	Register/printer for Neptune style ticket - 1/10 Gallon
788700-002	Register only - 1/10 Gallon
E788700-702	Exchange register - 1/10 Gallon
E789002-002	Exchange print register

## Veeder-Root Registers

### Adapters & Gear Plates to Convert 1-1/4" Through 2" Neptune Meters to Veeder-Root Register Heads



### Exchange Service Available

Part #	Description
117900-232	Adapter for 1-1/4" through 2" Neptune meter
117900-233	Adapter for 1-1/4" through 2" Neptune meter with temperature compensation
310450-421	Gear plate for 1-1/4" through 2" Neptune meter
310450-422	Gear plate 1-1/4" through 2" Neptune meter with temperature compensation
370020-017	Adapter and gear plate to convert 1" Neptune with/600 series register to Veeder-Root
370020-018	Adapter and gear plate to convert 1" Neptune with/600 series register to Veeder-Root with temperature compensator
312020-747	Adapter and gear plate to convert 3/4" Neptune to Veeder Root

## Change Gears

When ordering change gears, the last two numbers of the part number need to be the number of teeth on the gear. (ex. Veeder-Root change gear 32996-024)

Part #	Description
32996-0__	Veeder-Root change gear
81230-0__	Neptune change gear

## Neptune Registers



Neptune registers provide high reliability and readability.

Part #	Models #	Description
100498-009	631	Direct Read non-print register for 3/4" long shaft
100498-016	631	Direct Read non-print register for 1" short shaft
880030-000	833	Direct Read with ticket printing register for 1-1/4" and above
100447-101	833	Weather shield

# Vapor Meter

## Metris Vapor Meter



Part #	Description	Maximum Working Pressure	Connection	Requires
<b>METRIS250TC</b>	Temperature Compensated Vapor Meter	5#	20LT	Connector or Meter Bar

## Vapor Meter Accessories



6610-B/6620-B



METRIS-CONNECT



4815-507



4816-509

Part #	Description	Size
<b>6610-B</b>	Cast Iron Meter Bar	1" FNPT x 1" FNPT x 1" FNPT
<b>6620-B</b>	Cast Iron Meter Bar With Integral Swivels	1" FNPT x 1" FNPT x 20LT
<b>METRIS-CONNECT</b>	Meter Connecting Nipple (2 required)	20LT x 3/4" M.NPT
<b>4815-507</b>	Nipple Nut	20LT
<b>4816-509</b>	Nipple Swivel	20LT x 1" MNPT x 2-3/4" Straight

## Meter Capacity at Various Inlet Pressures for Propane 1.53 sp. gr

Inlet Pressure	Capacity CFH	Approx. BTU	Replacement Index Face
<b>11" w.c.</b>	202	508,000	Metris Index 11
<b>2 psi</b>	534	1,343,000	Metris Index 2
<b>5 psi</b>	607	1,528,000	Metris Index 5

Gas	Specific Gravity	Cubic Feet	BTU
<b>Natural Gas</b>	0.6	250	250,000
<b>Propane</b>	1.53	156	392,496

To convert cubic feet of propane to gallons, divide cubic feet by 36.39 (assuming 1.53 sp. gr.)

## LCR II



LCR2 The LectroCount LCR-II is the electronic register of choice for those who have experienced its performance in the field. The LCR-II earned its sterling reputation because of its simple design and sturdy construction, which provide easy operation and longevity in the most challenging environments.

The ideal choice for both mobile and fixed flow measurement applications. The LectroCount LCR2 is an electronic register designed as an alternative to mechanical registration and calibration equipment. It features sophisticated electronics yet is simple to operate - just turn a switch from "Run" to "Print".

LCR2 features include:

- Simple 'Pump & Print' delivery system
- Weights & Measures custody transfer (product delivery and ticket generation)
- Metrological data collection
- Four product calibrations
- Multi-point and Single-point Calibration
- Printed delivery, shift, and diagnostic tickets
- Security settings
- Two auxiliary programmable outputs
- No-flow timer
- Electronic temperature volume compensation (ETVC) optional
- Electronic presetting by volume
- Electronic valve control
- Electronic air or vapor elimination
- 10-digit totalizer
- NEMA 4X enclosure
- Available in Class I, Div 1 or Div 2 enclosure, Groups C & D

LectroCount LCR2's come standard with RS 232, RS 485 and/or calibrated pulse outputs which allow interfacing to an external computer at any time.

## LCR.iQ

Designed with the future in mind, the LCR.iQ™ introduces new potential to OEMs and end users to fully customize the fueling experience with configurable screens and tickets, adaptable software, real-time on-screen diagnostics, and remote data access with controls via embedded Wifi and Bluetooth -- opening the door to near-infinite platform expand-ability.

LCR.iQ® is designed to simplify fueling operations offering process configurability, intuitive operation, and real-time fueling diagnostics and data connectivity to maximize up-time and daily throughput.

### HIGH-RESOLUTION DISPLAY WITH DAY/NIGHT MODES

7" ultra bright video display designed for extreme climates and rigorous fueling environments.

### LARGE SCALABLE DIGITS FOR EASY VIEWING

Large digits provide easy viewing, day or night, up to 100 feet (30 m) away.

### CONFIGURABLE FUELING DATA

The LCR.iQ® allows users complete control over the fueling data fields displayed on the detailed delivery screen.

### SMART KEYS FOR GUIDED OPERATION

Smart keys guide the operator through the next available steps in the operation to minimize risk of error.

### LARGE KEYS FOR EASY OPERATION

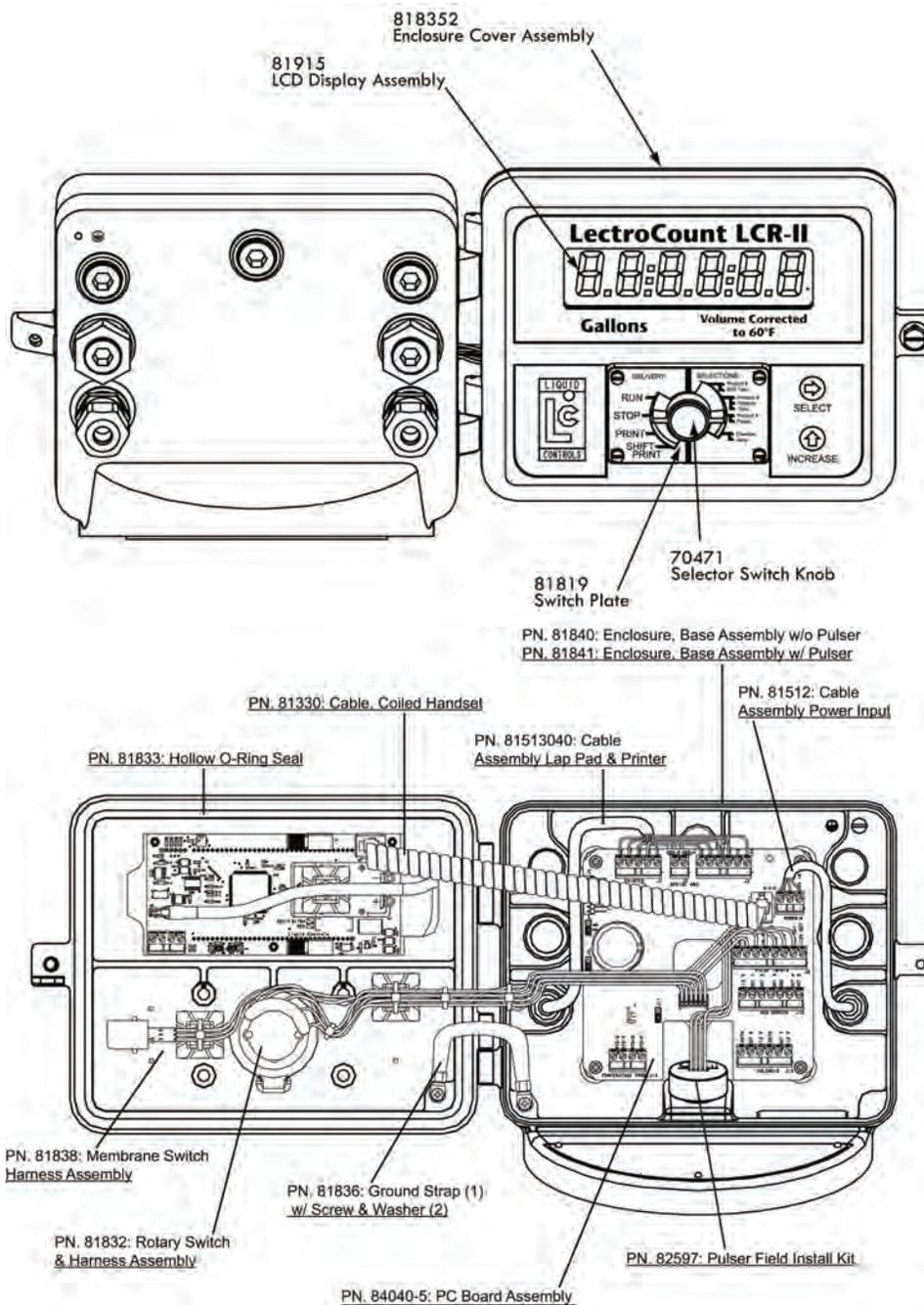
Large, petroleum and UV resistant elastomeric keys provide confident feel and consistent operation.

### METER MOUNT BASE

Liquid Controls standard meter-mount base with integrated pulser allows easy mount-and-connect retrofit.



## LCR II Parts



## Commonly Ordered LCR2 Parts & Accessories

Item#	Description
LCR2	LCR2 register head, complete
81513040	40' black communication cable (LCR2 to printer)
81512	40' gray LCR2 power cable
825001	Printer power cable
84040-5	Main computer board
82597	Pulsar, internal
70471	Red selector knob
81838	Select/Increase button
81527	3-way solenoid (silver)
81585	15" SS flex line for 3-way solenoid

Item#	Description
8158525	25" SS flex line for 3-way solenoid
71130	Temperature probe
81514	Lap-pad adapter
E49004	Epson slip-style printer
EMT110	200-pk slip-style tickets (triplicate) for Shift Tickets
512-5017	Black set screws for 81513040 cable head
E49004-1082706	Silver set screws for E49004 printer
ERC-27P	Ribbon for slip-style printer
TMV-220D	Epson roll-style printer

## DMS Data Management System

The DMS is an in-cab data management system designed for fuel delivery vehicles. After each delivery, the DMS gathers the metrological data from the electronic register, combines it with customer and transaction data, and transfers a complete record of delivery activity to your office computer.

- Simultaneously manage deliveries from up to three meter systems
- Two auxiliary ports for custom devices
- Three programmable outputs for injectors, warning lamps, and other devices
- Rugged construction provides longevity and operation in extreme environments

- Data transfer via RF, cellular, or USB
- Two support software programs pre-installed
- Controls all LectroCount register functions and settings



## Facility Wireless Emergency Stop Systems

Base Engineering's combination wireless and fixed location E-Stop / emergency shutdown systems were developed to eliminate costly hard wiring of multiple fixed location emergency stop switches. Any number of wireless remote E-Stop switches can be installed within the plant facility and communicate with one receiver/controller unit.

These systems will work in conjunction with existing, hard-wired, manual E-Stop switches and plant safety controls. Operator worn E-Stop remotes can also be added to these systems.

### Fixed Location Transmitters



Item#	Description
ASKF200TX	Emergency Shut Down Mushroom Button

### Replacement Batteries & DC Charger



Item#	Description
BAT4999	Replacement Battery (Black Clip)
BAT5000	Replacement Battery (White Clip)
CHG1006	DC Charger for DSSD/Ranger Style Transmitter

### Cases for Handhelds



Item#	Description
CAS1000	Leather Case for ASK/RVC Style Transmitter
CAS2000	Leather Case for RCU Transmitter
CAS3000	Leather Case for DSSD/Ranger Style Transmitter

### Portable Hand-held Transmitters



Item#	Description
ASK100TX E	1 Function Transmitter - Emergency Stop
ASK200TX PE	2 Function Transmitter - PTO, Emergency Stop
ASK200TX QE	2 Function Transmitter - Query, Emergency Stop
ASK200TX TE	2 Function Transmitter - Throttle, Emergency Stop
ASK300TX PTE	3 Function Transmitter - PTO, Throttle, Emergency Stop
ASK400TX PTQE	4 Function Transmitter - PTO, Throttle, Query, Emergency Stop
ASK400TX RPTE	4 Function Transmitter - Reel, PTO, Throttle, Emergency Stop
ASK500TX RPTQE	5 Function Transmitter - Reel, PTO, Throttle, Query, Emergency Stop

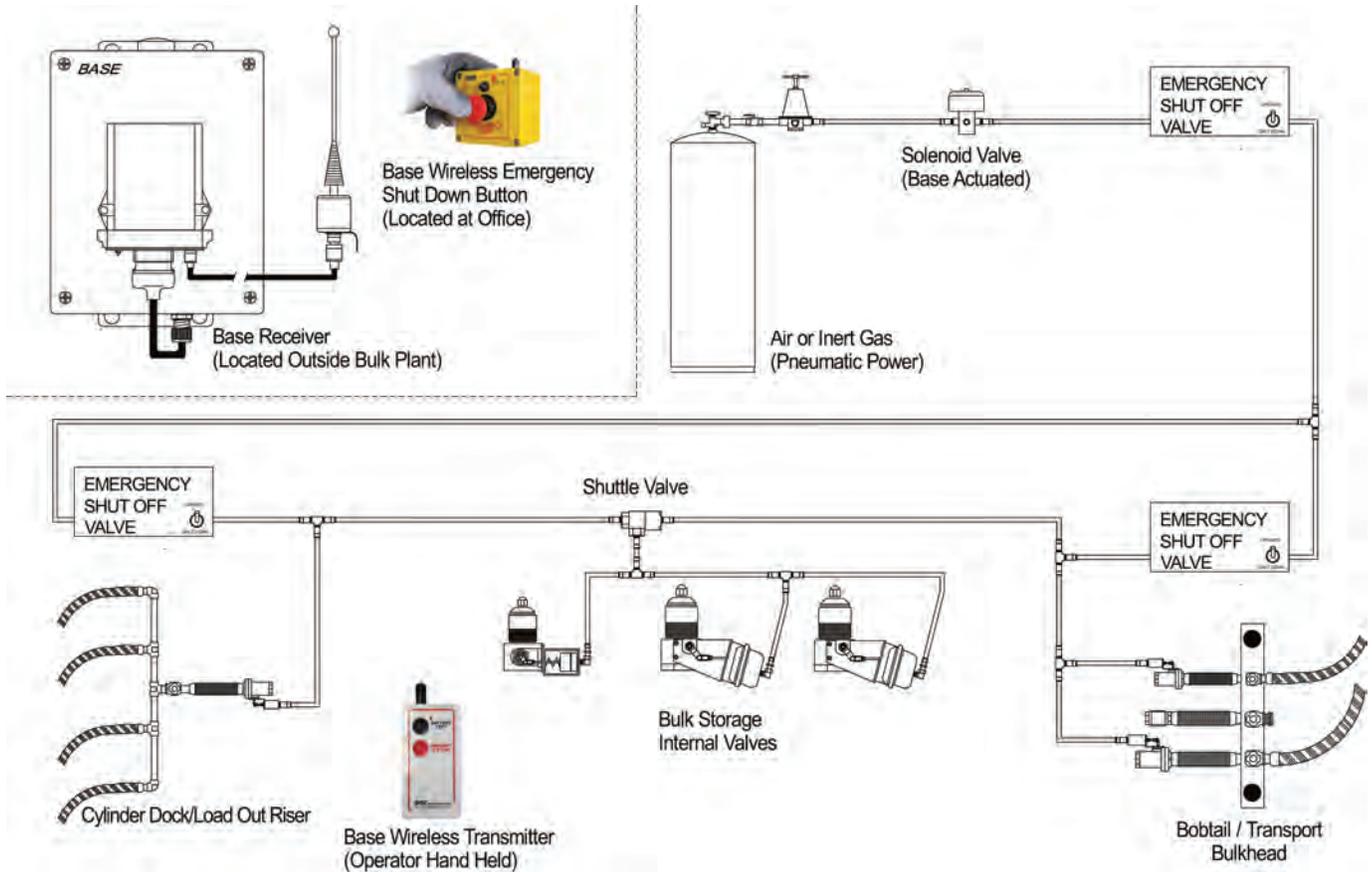
### Antennas & Coaxial Cables



Item#	Description
ANT1000	Replacement Antenna for ASK/RVC Systems
ANT6000	Replacement Antenna for DSSD Systems
COAXT-15	15 ft. Coaxial Cable
COAXT-30	30 ft. Coaxial Cable
84371	10' Coaxial Roof Mount Antenna & Bracket

## Wireless Remote Emergency Shutdown System

- Developed to eliminate costly hard-wiring of manual emergency-shutdown switches.
- Any number of radio transmitter units can be installed within 1000 ft of a receiver control unit.
- The ASK system can also be ordered to work in conjunction with existing BASE Truck Remote Units if required. Transmitter devices are low-voltage intrinsically safe units suitable for use in Class 1, Div 2, Group "D" hazardous environments. Receiver units are designed to interface and trip electrical (pumps/compressors), pneumatic, nitrogen, or mechanical plant shut-off equipment (ESV & valve actuators).



Part #	Description	# of Stationary Remotes	# of Handheld Remotes
ASK1F1WAX200A-AC	BASE Wireless Emergency Shutdown kit with 1 stationary and 1 hand held remote, also includes 1 non-classified pneumatic solenoid and electrical wiring for use with NH3 or LPG bulk plant	1	1
ASK1F2WAX200A-AC	BASE Wireless Emergency Shutdown kit with 1 stationary and 2 hand held remote, also includes 1 non-classified pneumatic solenoid and electrical wiring for use with NH3 or LPG bulk plant	1	2

## Vehicle Safety Shutdown System



The 3300 Series Shutdown System has a plug-in antenna plus a line-of-sight 600 ft. range. The smaller receiver includes an 8-point terminal block. This timesaving addition will make testing and troubleshooting easier, taking less time for installation due to having all wire connections and colors at one point. When using a circuit tester, everything is at one location. No tape or wire connectors needed.

Item#	Description
3300-FGL	System includes 2-Channel Receiver, 2-Channel Transmitter Fob, Antenna, and Wiring Harnesses
3300-FG	Shut-off Receiver Module Only
VAP327G	2-Channel Transmitter Fob

## DISPENSER ORDERING STEP 1 OF 4

### Select Your Cabinet Style with Blackmer & Corken Pump Options from the CYLINDER & AUTOGAS Package Offerings

All dispensers include pre-plumbed assembly connecting pump and meter on base with all valves and an explosion-proof on/off switch assembly. Standard configuration has outlet for cylinder filling (CFH) before the meter and motor fueling outlet (MFH) after the meter. All Dispenser Cabinets include a pull-away hose assembly & RegO A2141A6 pull-away valve.

### No Cabinet Cylinder



Part #	Pump	Meter Included
ED1	Blackmer LGF1P	No
DU12	Corken C12	Yes
ED12	Corken C12	No

Part #	Pump	Meter Included
DU1	Blackmer LGF1P	Yes

### Single Door Aluminum Diamond Plate Cabinet Cylinder



Dimensions 50"H" x 40"H x 20"D  
Shown with option: MFH Economy Installed

Part #	Pump
DCS50DP.B1	Blackmer LGF1P
DCS50DP.C12	Corken C12

### Double Door Aluminum Diamond Plate Cabinet Cylinder



Dimensions 59"H" x 36"H x 20"D  
Shown with options: MFH & CFH Installed

Part #	Pump
DCS48DP.B1	Blackmer LGF1P
DCS48DP.C12	Corken C12

## 3-Section Galvanized Cabinet Cylinder



Dimensions 59"H" x 36"H x 20"D

Part #	Pump
<b>DCS59GAL.B1</b>	Blackmer LGF1P
<b>DCS59GAL.C12</b>	Corken C12

## Large Aluminum Diamond Plate Cabinet Cylinder



Dimensions 51"H" x 47.5"H x 39.5"D

Will hold scale.

Shown with options: MFH Standard & CFH Installed

Part #	Pump
<b>DCL51DP.B1</b>	Blackmer LGF1P
<b>DCL51DP.C12</b>	Corken C12

## Walk-In Aluminum Diamond Plate Cabinet Cylinder



Dimensions 75"H" x 48"H x 54"D

Will hold scale.

Shown with options: MFH Standard & CFH & 1124 Scale Installed

Part #	Pump
<b>DCWI75DP.B1</b>	Blackmer LGF1P
<b>DCWI75DP.C12</b>	Corken C12

## No Cabinet Autogas



Includes the SBU.HD Unit per Pump/Motor Designation

Part #	Pump	Phase
MFDU.HD.LGL156.3PH	Blackmer LGL156	3
MFDU.HD.DLF075.3PH	Corken DLF075	3
MFDU.HD.LGL156.1PH	Blackmer LGL156	1
MFDU.HD.DLF075.1PH	Corken DLF075	1

## Single Door Aluminum Diamond Plate Cabinet Autogas

Autogas



Includes the SBU.HD Unit per Pump/Motor Designation  
Dimensions 50"H x 40"W x 20"D  
Pump Slide Base Unit (SBU) adds 18" in Depth

Part #	Pump	Phase
DCS50DP.LGRLF114.1PH	Blackmer LGRLF 114	1
DCS50DP.LGL156.3PH	Blackmer LGL156	3
DCS50DP.DLF075.3PH	Corken DLF075	3
DCS50DP.LGL156.1PH	Blackmer LGL156	1
DCS50DP.DLF075.1PH	Corken DLF075	1

## 3-Section Galvanized Cabinet Autogas

Autogas



Includes the SBU.HD Unit per Pump/Motor Designation  
Dimensions 59"H x 36"W x 20"D  
Pump Slide Base Unit (SBU) adds 18" in Depth  
(Graphics are not included.)

Part #	Pump	Phase
DCS59GAL.LGL156.3PH	Blackmer LGL156	3
DCS59GAL.DLF075.3PH	Corken DLF075	3
DCS59GAL.LGL156.1PH	Blackmer LGL156	1
DCS59GAL.DLF075.1PH	Corken DLF075	1

## Large Aluminum Diamond Plate Cabinet Autogas

Autogas



Dimensions 51"H x 47.5"W x 39.5"D  
Will hold Scale.

Part #	Pump	Phase
DCL51DP.HDPDL16.VFD	Corken DL16	3 with VFD
DCL51DP.HDPDL16.3PH	Corken DL16	3
DCL51DP.RC20.3PH	Blackmer RC20	3
DCL51DP.LGL156.3PH	Blackmer LGL156	3
DCL51DP.DLF075.3PH	Corken DLF075	3
DCL51DP.RC20.1PH	Blackmer RC20	1
DCL51DP.HDPDL16.1PH	Corken DL16	1
DCL51DP.LGL156.1PH	Blackmer LGL156	1
DCL51DP.DLF075.1PH	Corken DLF075	1

## DISPENSER ORDERING STEP 2 OF 4

### Select Your Delivery Hose Assembly(s)

If you want both the CFH & MFH metered, be sure to select the optional 3-Way valve (DU-3Way) for the CFH & MFH to be configured downstream of the meter to comply with weights and measures regulations. Otherwise the CFH is installed upstream of the meter.

### Delivery Hose Options

#### For Autogas and Cylinder Dispensing Units



CFH-Standard

MFH Standard

MFH Economy

MFH GasGuard

MFH-Euro

Part #	Description
<b>CFH-STANDARD</b>	1/2" Parker Motor Fuel Hose Assembly 6' long with RegO 7901TB Quick Acting Valve & 7193D-10 Fill Connector
<b>CFH-LONG</b>	1/2" Parker Motor Fuel Hose Assembly 10' long with RegO 7901TB Quick Acting Valve & 7193D-10 Fill Connector
<b>MFH-STANDARD</b>	3/4" Parker Motor Fuel Hose Assembly with RegO A7793A nozzle - 15' Hose
<b>MFH-ECONOMY</b>	3/4" Parker Motor Fuel Hose Assembly with RegO 7554LV Quick-Acting Valve - 15' Hose
<b>MFH-GASGUARD</b>	3/4" Parker Motor Fuel Hose Assembly with Gasguard Nozzle - 15' Hose
<b>MFH-EURO</b>	3/4" Parker Motor Fuel Hose Assembly with ZVG2 Euro Nozzle - 15' Hose
<b>DU-3WAY</b>	Option 3-Way Valve for CFH & MFH to be configured downstream of meter.

### Delivery Hose Accessories

#### Hose Retractor and Holsters For Autogas and Cylinder Dispensing Units



6102-1078P



GasGuard Holster-Mod  
Nozzle Not Included

Part #	Description
<b>6102-1078P</b>	Pomeco 102 Spring Balance Hose Retractor
<b>PB-1396</b>	Hose Clamp for use with 6102-1078P Hose Retractor
<b>GasGuard Holster-Mod</b>	Lockable Holster for use with GasGuard GG20 & ZVG2 Nozzles

## Options For Delivery Hoses

### Adapters For Autogas and Cylinder Dispensing Units



16.0320



16.0331



66.1327



16.0363



68.0065

Part #	Description
16.0320	Female EURO to Male ACME Connection Adapter
16.0331	Female ACME to Male EURO Adapter
66.1327	EURO Style Filler Valve For Forklift Cylinders
16.0363	Snapfill Adapter 1-3/4" ACME for Bobtails
68.0065	EURO Remote Filler Valve with Enclosure

## Options For Delivery Hoses

### Replacement Nozzles For Autogas and Cylinder Dispensing Units



ZVG2



ZVG2-T



GG20HSL



NOZZLE NOT INCLUDED

GG-Splashguard

Part #	Description
ZVG2	Euro low emission UL listed nozzle 3/4" NPT with latch
ZVG2-T	Euro low emission UL listed nozzle 3/4" NPT with latch and nozzle talker
EA866E	Orange scuff guard with nozzle talker for ZVG2
GG20HSL	Low emission nozzle 3/4" NPT with strainer and latch assembly
GG-SPLASHGUARD	Splashguard for GG20HSL

## Dispenser Ordering Step 3 of 4

Select Your Tank-To-Pump Installation Piping Kit(s)

### Tank to Pump Piping Kit Options

For Autogas and Cylinder Dispensing Units



Part #	Kit Includes
T2P-1	1-1/4" Internal Valve & Piping with 1" Pump Connection & Strainer
T2P-114	1-1/4" Internal Valve & Piping with 1-1/4" Pump Connection & Strainer
T2P-112	1-1/4" Internal Valve & Piping with 1-1/2" Pump Connection & Strainer
T2P-114X112	1-1/4" Internal Valve & 1-1/2" Piping with 1-1/2" Pump Connection & Strainer
T2P-114X200	1-1/4" Internal Valve & 2" Piping with 2" Pump Connection & Strainer

### Remote Shutoff Options

For Autogas and Cylinder Dispensing Units



Part #	Description
PK	Pneumatic Remote Shutoff Kit
DURESS KIT	Cable Remote Shutoff Sign Kit

## DISPENSER ORDERING STEP 4 OF 4

### Select Your Options & Accessories

#### Dispensing Unit Purge Kit

For Autogas and Cylinder Dispensing Units



Part #	Description
DUPK	Cylinder vapor purging kit with purge exhaust pipe and tank regulator/fittings

#### Pre-Installed Conduit Kits

For Autogas and Cylinder Dispensing Units



Part #	Description
ECK-SM CABINET	Electrical Conduit Kit
ECK-LG CABINET	Electrical Conduit Kit

#### Fuel Filtration

For Autogas Dispensing Units Only



Part #	Description
FST-634	Blue Moon Filter 1" Ports
FST-63	Blue Moon Disposable Filter 1" Ports
FST-124	Blue Moon Filter Vessel 2" Ports with Replaceable Filter Cartridge (RF-4)
RF-4	Blue Moon Replaceable Filter Cartridge for FST-124

#### Tank Legs, Skids & Mounting Plates

For Autogas and Cylinder Dispensing Units



Part #	Description
TL36	Tank Leg Stands for use with 500 & 1,000 WG tanks only
TL-2KA	Tank Leg Stands for use with 2,000 WG tanks only
TS500DH37.5-SKID	Autogas Dispenser Skid for use with 500 WG tanks only
TS1000DH41-SKID	Autogas Dispenser Skid for use with 1,000 WG tanks only
GEC MINISKID 36	Gas Equipment Autogas Dispenser Skid
GEC MINISKID 36 MTG. PLATE	Gas Equipment Autogas Dispenser Skid with Mounting Plate

#### Scale

For Autogas and Cylinder Dispensing Units



Part #	Description	Beam	Dimensions	Capacity	Weight
1124	Portable Platform Scale	Single	Platform: 17-3/4" x 23-1/2" Base: 21" x 36" Overall Height: 43"	1,000 lbs.	165 lbs.

## Dispensing Cabinets Only



Part #	Description
DCAB-D1A-MOD	50-3/4"H x 40"W x 20"D, Aluminum Diamond Plate, Single Door. Will not hold scale
DCAB-A48	48"H x 36"W x 20"D, Aluminum Diamond Plate, Double Door. Will not hold scale
DCAB-GALV ALUM BASE ASSY	59"H x 36"W x 20"D Galvanized Vertical 3 Level Cabinet with Aluminum Base Assembly. Will not hold scale.
DCAB-ADP1	51"H x 47.5"W x 39.5"D, Aluminum Diamond Plate with Steel Tube Frame & Aluminum Base. Will hold 1124 beam scale.
DD-WALK IN CABINET	75"H x 48"W x 48"D, Aluminum Diamond Plate. Will hold 1124 beam scale.

## Dispensing System with Skid Total Package With or Without Tank



Package consists of 51" Diamond Plate Cabinet, Pump, All Plumbing for Pump/Bypass/Vapor/Purge/Electrical. Also includes Cable Actuation and Skid Assembly with or without Tank.

Options include 1124 Fairbanks Scale, Cylinder Filling and Motor Fuel Hose Assemblies

Part #	Pump	Size	With Tank
PDS-51DP-B1-1000	Blackmer LGF1P	Domestic Trinity 1,000 WG-AG tank with lifting rings	Yes
PDS-51DP-B1-1000-LT	Blackmer LGF1P	Domestic Trinity 1,000 WG-AG tank with lifting rings	No
PDS-51DP-B1-500	Blackmer LGF1P	Domestic Trinity 500 WG-AG tank with lifting rings	Yes
PDS-51DP-C12-1000	Corken C12	Domestic Trinity 1,000 WG-AG tank with lifting rings	Yes
PDS-51DP-C12-1000-LT	Corken C12	Domestic Trinity 1,000 WG-AG tank with lifting rings	No
PDS-51DP-C12-500	Corken C12	Domestic Trinity 500 WG-AG tank with lifting rings	Yes
PDS-51DP-C12-500-LT	Corken C12	Domestic Trinity 500 WG-AG tank with lifting rings	No

## Skid Package Options



Part #	Description	Application
MFH-STANDARD	3/4" Parker Motor Fuel Hose Assembly 18' long with RegO A7793A nozzle	Autogas
CFH-STANDARD	1/2" Parker Fuel Hose Assembly 6' long with RegO 7901TB Quick Acting Valve & 7193D-10 Fill Connector	Cylinder
1124	Portable Platform Scale	N/A

# Autogas Electronic Dispenser & Accessories

Dispensing

## Parafour Electronic Dispensers

Includes ATC and FMS Interface. Order Hose Kit with Nozzle separately in Options Section.



Part #	Description	UL Listed
P4-100	Single Hose Dispenser, Single Meter, 1 Autogas Hose Connection	No
P4-100-L	Single Hose Dispenser, Single Meter, 1 Autogas Hose Connection	Yes
P4-150	Two Hose Dispenser, Single Meter, 1 Autogas Hose Connection, 1 Cylinder Hose Connection	No
P4-150-L	Two Hose Dispenser, Single Meter, 1 Autogas Hose Connection, 1 Cylinder Hose Connection	Yes
P4-200	Dual Hose Dispenser, 2 Autogas Hose Connections, Island Orientation	No
P4-200-L	Dual Hose Dispenser, 2 Autogas Hose Connections, Island Orientation	Yes

## Parafour Electronic Dispenser Options

### Options



GEC Autogas Hose Kit



HK-0003



HK-0004



Receipt Printer

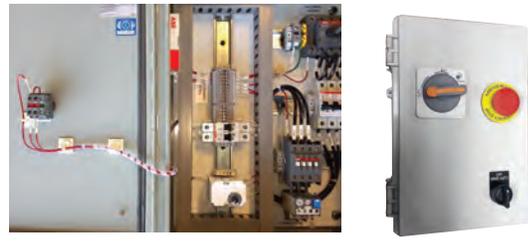
Part #	Description
GEC Autogas Hose Kit	15' Hose, GG20 Nozzle, 3' Whip-Hose with Pullaway
HK-0003	P4 Knock Over Protection (requires elevated frame)
HK-0004	Hose Retractor Kit - Vertical
LC Meter Option	Liquid Controls MA4 Meter with Pod-5 Pulsar
Receipt Printer	Printer Option, 2-1/4" Thermal roll, Dispenser specific design for use in outdoor applications

## Fuel Management



Part #	Description
P4-PV100	PetroVend PV100 Fuel Control System (pedestal extra)
P4-K800 Hybrid	PetroVend K800 Hybrid FMA (requires setup by OPW)
P4-ParaFUEL	Integrated Fuel Management System

## Electrical Control Panels (ECP)



Part #	Description
P4-SECP-1P	Economy Station Electrical Control panel, Single phase, for 3-5 HP motors.
P4-SECP-3P	Economy Station Electrical Control panel, 3 Phase, for 5-7.5 HP motors.
P4-SFCP-3P	Full Size Station Electrical Control panel, 3 phase, for 5-10 HP motors.
P4-SVFCP-1P	VFD Electrical Control panel, Single phase, for 5-7.5HP motors.

## Vertical Dispensing Package



### Vertical Tank Package includes:

- Tank, LP dispenser, X-frame for mounting tank, crash post and railing, valves & fittings.
- Motor fuel dispensing unit DU1VB (Blackmer) or DU1VC (Corken)
- Tank to pump piping kit
- Bypass piping kit
- Vapor return piping kit
- Cable kit
- Motor fuel hose assembly & cylinder fill hose assembly

### Other Equipment Options

- 4 Tanks sizes - 660, 1150, 1600, 1999
- Fairbanks Scale

### Features

- Only 10 foot diameter circle required for tank
- Highly visible package unit requires less installation time
- Other configurations available.

## Contego Intumescent Latex (thin film) Passive Fire Barrier Paint



Contego Passive Fire Barrier is a heavy-bodied, single-part latex fire-proofing paint material. It is a water based product with no volatile organic compounds, is not classified as a hazardous material, and will clean up with soap and water. It is an alternative solution to Carboline Pyrocrete cementitious material that can be used to fire-proof and provide a 2-hour fire protection rating (with sufficient coats) on LPG installations (re: vertical tank legs).

### Features:

- Water based paint with no VOC's.
- Is not classified as a hazardous material.
- Will clean up with soap and water.
- Is an optional solution to Carboline's Pyrocrete for fire-proofing.
- Can provide a 2-hour fire protection rating on LPG installations (re: vertical tank legs) with sufficient coats.
- Available in 1 or 5 gallon containers.

Part #	Description
PFB-001W	1 Gallon Bucket
PFB-005W	5 Gallon Pail

### Method:

When activated by heat or flame, a dense carbon char is formed separating and shielding the substrate from heat while off gassing displaces oxygen from the treated surface; thus eliminating two of the three components needed for combustion.

## Sumter Coatings



Specialty coatings for protecting propane tanks and related equipment.

Part #	Description	Size
880N2209	Foot Ring Protector Black Primer	1 Gallon Bucket
880W2201	No. 7 Silicone Alkyd Enamel White Finish Coat	1 Gallon Bucket
880W2201-5GAL	No. 7 Silicone Alkyd Enamel White Finish Coat	5 Gallon Pail
880W2203	No. 5 Tank Enamel White Finish Coat	1 Gallon Bucket
888S2006	SC2110 Strontium Chromate Aluminum Finish Coat	1 Gallon Bucket

## HOSE – SAFETY AND TECHNICAL INFORMATION

### WARNING – SAFETY NOTE

Failure to follow recommended application information and recommended procedures for selection, installation, care, maintenance and storage of hose, couplings or hose assemblies may result in failure to perform properly and may result in damage to property and serious bodily injury. Make sure that hose selected for any application is recommended for that service. Application information is given with each hose or coupling listing in the Dayco catalog. Refer to the Safety and Technical Data section of this catalog for information regarding safety, care, maintenance and storage. Contact your local Distributor for assistance.

In any application, there may be inherent risk of bodily injury or property damage and the user is responsible for implementation of adequate safety precautions.

**LP Gas Hose:** This discussion again emphasizes the importance of hose selection. LP Gas has volatile characteristics that require special hose construction. The rubber compounds must be designed to handle LP Gas, and the cover must be perforated to prevent gas build-up among the various layers of the hose. Use of the wrong hose may lead to early and sudden failure. In particular, anhydrous ammonia hose is not recommended for LP Gas service. This is important to emphasize because both types of hose are often used in the same area and care must be taken they do not become accidentally switched. DO NOT USE LP GAS HOSE FOR ANHYDROUS AMMONIA. Couplings are also a concern in this service; permanent crimp steel couplings are recommended, as well as high-pressure steel inserts attached with interlocking, bolt-on clamps.

Couplings with male swivel end styles are not recommended. DO NOT USE WITH SCREW-TOGETHER REATTACHABLE COUPLINGS. (Refer to RMA Publication IP-10 "Liquid Petroleum Gas, Specifications for").

**WARNING:** For LP Gas use ONLY. Do not use for anhydrous ammonia. Do not use with any fluid or vapor other than the intended use for which the hose was designed. Do not use with male swivel couplings. Do not use with screw-together reattachable couplings.

## SAFETY

**General:** Safety in the application and use of industrial hose is a major concern because of the many potentially dangerous products conveyed, and because so many people are involved. Handling these products can be accomplished safely if a few simple precautions are strictly observed. Some of the most important of these are:

- All operators must be thoroughly trained.
- The correct hose must be selected to handle the application.
- The couplings must be correct for the application and also must be securely attached.
- Both hose and couplings should be well maintained and inspected regularly.

## Safety, Care, Maintenance and Storage (REPRINTED FROM RMA HOSE HANDBOOK IP-2 NINTH EDITION 2015)

Hose has a limited life and the user must be alert to signs of impending failure, particularly when the conditions of service include high working pressures and/or the conveyance or containment of hazardous materials.

**SAFETY WARNING:** Failure to properly follow the manufacturer's recommended procedures for the care, maintenance and storage of a particular hose might result in its failure to perform in the manner intended and might result in possible damage to property and serious bodily injury.

Please refer to RMA (Rubber Manufacturer's Association) HOSE HANDBOOK IP-2 NINTH EDITION 2015, or later for more on the proper use, care and maintenance of hose.

### General Test and Inspection Procedures for Hose

\*REFERENCE NPGA TECHNICAL BULLETIN T145 AND T114 T145 "Hoses and Flexible Connectors used in Plants and Cargo Vehicles" T114 "Guide to Hose Inspection"

An inspection and hydrostatic test should be made at periodic intervals to determine if a hose is suitable for continued service.

A visual inspection of the hose should be made for loose covers, kinks, bulges or soft spots which might indicate broken or displaced reinforcement. The couplings or fittings should be closely examined and, if there is any sign of movement of the hose from the couplings, the hose should be removed from service. The periodic inspection should include a hydrostatic test for one minute at 150% of the recommended working pressure of the hose. During the hydrostatic test, the hose should be straight, not coiled or in a kinked position. Water is the usual test medium and, following the test, the hose may be flushed with alcohol to remove traces of moisture. A regular schedule for testing should be followed and inspection records maintained.

**SAFETY WARNING –** Before conducting any pressure tests on hose, provisions must be made to ensure the safety of the personnel performing the tests and to prevent any possible damage to property. Only trained personnel using proper tools and procedures should conduct any pressure tests.

PLEASE REFER TO NPGA TECHNICAL BULLETIN T145 ON "HOSES AND FLEXIBLE CONNECTORS USED IN PLANTS AND CARGO VEHICLES" and T114 "GUIDE TO HOSE INSPECTION".

## Tech Update

### Subject: LP Gas Hose/Assemblies Permeation Concerns

Date: March 30, 2004

In recent years there have been concerns about the permeation of LP Gas through LP Gas hose. While wet or sitting in water, bubbling has been observed from the pinprick holes in the cover. Others have observed gas slowly escaping from the area where the ferrule attaches to the coupling insert. Some users have wrongly assumed this to be excessive permeation or leakage.

One source of perceived leakage is the escape of air that is trapped in the reinforcement of the hose. This type of perceived leakage is most commonly noticed during the pressure testing of a hose assembly. When LP Gas hose is pressurized, air that has been trapped in the reinforcement of the hose can be squeezed out through the venting/pinprick holes in the cover, or out the cut end of the hose. In the presence of moisture, this may be apparent as bubbling at the pinprick holes in the cover or as air escaping out the area where the ferrule is attached to the insert. This escape of trapped air through the pinholes and the coupling should diminish over time and should disappear after 1-4 hours of pressurization. Generally, the air escaping from the pinprick holes will dissipate at a much more rapid rate than the air escaping at the coupling.

The most common perceived leakage is the "normal" escape of permeating gas through the hose wall. The pinprick holes concentrate the permeation to specific areas of the cover. Due to the presence of moisture, this concentration of permeation can be observed as bubbling. In some instances this permeating gas may travel down the reinforcement of the hose and escape out the end of the hose. This gas may then escape out the area where the ferrule is attached to the insert. Both of these phenomena may be wrongly assumed to be leakage of LP gas.

It is important to note that pinpricking of hoses that are exposed to high-pressure gas is a common practice (i.e., Steam, Anhydrous Ammonia, LP Gas). The purpose of the pinprick holes in the cover is to allow the normal permeation of gas to escape from the hose cover. Without the pinpricking of the cover, gas can become trapped between the reinforcement and the cover, creating blistering and premature failure.

The question that remains is how to determine whether a hose is leaking, or if the suspect leak is permeating LP gas or trapped air?

When testing a new assembly there is only the potential for escaping trapped air to be mistaken for leakage. Two methods for assuring that the escaping air is not from a leak are 1) Use water as the test media. If there is a "true" leak it will be a water leak and not an air leak, and 2) Increase the test time to a length that will allow the escaping air to be purged. Additionally, the use of a rubber cement or epoxy to seal the hose end may eliminate any escaping air from the coupling lock-on area. (Note: The LAR coupling in the 1" size is designed to prevent gas from escaping in the lock-on area)

It is much more difficult to determine if escaping gas from a hose in service is permeation or leakage. Generally, leaking propane will create a frosting or icing on the surface of the hose or coupling. Permeation is generally at such a low rate that it can only be detected by the slow escape of bubbles. It is important to note that the rate of permeation is dependent on temperature. As the temperature goes up so does the rate at which the gas permeates through the hose. Therefore, on hot, rainy, summer days, the likelihood of observing permeation is much higher. If the rate of escaping gas is high enough to cause concern, the only sure way of determining whether a hose is leaking or not is to remove it from service and perform a hydrostatic pressure test.

Permeation of high-pressure gas (such as propane) through a rubber hose is a common but often unknown phenomenon. However, in the transfer of LP Gas the allowable permeation rate is controlled by the Underwriters Laboratory Standard for LP Gas Hose (UL 21). Per UL 21, the "Maximum Allowable Permeation Rate" for LP Gas hose is 171cm<sup>3</sup>/ft/hr. Testing has shown that the standard Parker LP Gas hose has permeation rates which are 5 times better than the maximum allowable.

**Parker Hannifin Corporation**  
Industrial Hose Division

# Liquid Transfer Hose Assemblies

## LP Gas Liquid Transfer Hose Assemblies

### "E" Series



For conveyance of LP Gas products, liquid or vapor. Complete range of sizes for all stages of LPG production and delivery.

The "E" Series assemblies are hydraulically pre-coupled with male pipe threads on each end and available in various lengths.

**WARNING!!:** For LP Gas use only. Do not use in anhydrous ammonia or refrigeration applications. Do not use male swivel couplings or screw-together reattachable fittings. Can be used for natural gas service with application specific criteria. **IMPORTANT:** REFER TO THE SAFETY AND TECHNICAL DATA INFORMATION SECTION FOR THE PROPER USE OF THIS HOSE.

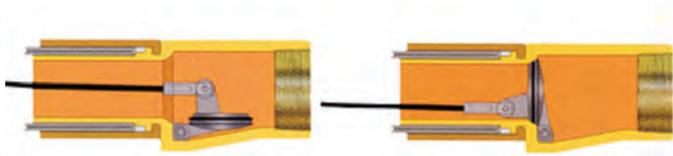
Hoses

Part #	Hose I.D.	Length	Approx Wt. (lbs/ea)
<b>1/2" Hose I.D.</b>			
E8LP2X6FT	1/2"	6'	2.52
E8LP2X8FT	1/2"	8'	3.17
E8LP2X10FT	1/2"	10'	3.81
E8LP2X12FT	1/2"	12'	4.46
E8LP2X15FT	1/2"	15'	5.42
E8LP2X18FT	1/2"	18'	6.39
E8LP2X20FT	1/2"	20'	7.03
E8LP2X25FT	1/2"	25'	8.64
E8LP2X50FT	1/2"	50'	16.68
E8LP2X100FT	1/2"	100'	32.75
<b>3/4" Hose I.D.</b>			
E12LP2X1FT	3/4"	1'	1.31
E12LP2X2FT	3/4"	2'	1.83
E12LP2X3FT	3/4"	3'	2.34
E12LP2X6FT	3/4"	6'	3.87
E12LP2X10FT	3/4"	10'	5.92
E12LP2X12FT	3/4"	12'	6.95
E12LP2X15FT	3/4"	15'	8.63
E12LP2X18FT	3/4"	18'	10.02
E12LP2X20FT	3/4"	20'	11.37
E12LP2X25FT	3/4"	25'	13.61
E12LP2X50FT	3/4"	50'	26.12
E12LP2X100FT	3/4"	100'	52.03
E12LP2X125FT	3/4"	125'	64.84
E12LP2X150FT	3/4"	150'	77.65
E12LP2X175FT	3/4"	175'	89.02

Part #	Hose I.D.	Length	Approx Wt. (lbs/ea)
<b>1" Hose I.D.</b>			
E16LP2X6FT	1"	6'	3.95
E16LP2X10FT	1"	10'	7.28
E16LP2X15FT	1"	15'	10.07
E16LP2X19FT	1"	19'	12.43
E16LP2X20FT	1"	20'	14.75
E16LP2X25FT	1"	25'	16.52
E16LP2X100FT	1"	100'	65.06
E16LP2X125FT	1"	125'	80.98
E16LP2X150FT	1"	150'	96.9
E16LP2X175FT	1"	175'	117.36
<b>1-1/4" Hose I.D.</b>			
E20LP2X6FT	1-1/4"	6'	5.95
E20LP2X10FT	1-1/4"	10'	10.13
E20LP2X15FT	1-1/4"	15'	14.95
E20LP2X18FT	1-1/4"	18'	17.44
E20LP2X25FT	1-1/4"	25'	23.75
<b>2" Hose I.D.</b>			
E32LP3X6FT	2"	6'	15.36
E32LP3X10FT	2"	10'	23.23
E32LP3X15FT	2"	15'	33.15
E32LP3X19FT	2"	19'	40.23

**Additional or unique lengths can be special ordered upon request.**

## Smart-Hose for Truck and Bulk Plant Hose Assemblies



Smart-Hose® assemblies are designed and engineered with a valve integrated in each end fitting. If the hose assembly experiences a catastrophic hose failure, the Smart-Hose® Safety System is designed to instantaneously shut off the flow in both directions. Designed as a passive safety device, the Smart-Hose® Safety System needs no human intervention to activate.

Part #	Hose I.D.	Working Pressure PSI	Burst Pressure PSI	Length	Used with	Style
<b>NON DOT FACILITY HOSE</b>						
L3-32LP3X6FT	2" FNPT	350	1750	6'	LP - Not DOT Certified	Lifeline 3
L3-32LP3X10FT	2" FNPT	350	1750	10'	LP - Not DOT Certified	Lifeline 3
L3-32LP3X15FT-F	2" FNPT	350	1750	15'	LP - Not DOT Certified	Lifeline 3
<b>DOT CERTIFIED HOSE</b>						
L16LP2X15FT	1" FNPT	350	1750	15'	LP - Bulk Storage	
L16LP2X19FT	1" FNPT	350	1750	19'	LP - Transport	
L20LP2X15FT	1-1/4" FNPT	350	1750	15'	LP	
L3-32LP3X19FT	2" FNPT	350	1750	18'6"	LP - DOT Certified	Lifeline 3
<b>NH3 HOSE</b>						
L3-32NH3X19FT	2" FNPT	350	1750	18'6"	NH3	

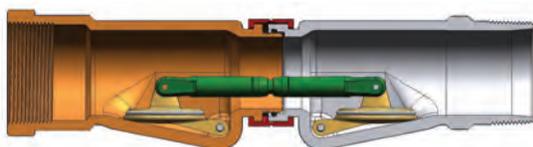
## Smart-Hose for Truck and Bulk Plant Breakaway Hose Assemblies



The Smart-Hose® Metal Break-away hose assembly has been designed to protect your plant's piping and bulkhead from pull-away incidents. Designed to integrate with the Smart-Hose® Safety System and engineered with a predetermined break point. The Smart-Hose® Break-away can add an additional layer of protection inside your hose assembly while protecting your facility from the devastating consequences of a pull-away accident.

Part #	Hose I.D.	Working Pressure PSI	Burst Pressure PSI	Length	Used with	Style
<b>NON DOT FACILITY HOSE</b>						
L3-32LP3X15FT-FBA	2" FNPT	350	1750	15'	LP-Non DOT	Lifeline 3
<b>DOT CERTIFIED HOSE</b>						
L3-32LP3X19FT-BA	2" FNPT	350	1750	18'6"	LP-DOT	Lifeline 3

## Smart-Hose Break-Away Coupler



The Smart Break-Away Coupler is designed for any hazardous transfer application that has a potential for a pull-away incident.

- Full Flow Break-Away
- Custom design break-points
- Significant Cost Savings
- No Annual maintenance
- Re-buildable

Part #	Size	Ends	Model	Seal	Material	Length	Application
L3-32LP3-FBA	2"	FNPT X FNPT	LL3-BA	Nitrile	316 SS	12"	LPG
L3-32LP3-MBA	2"	MNPT X MNPT	LL3-BA	Nitrile	316 SS	12"	LPG
A80-016-95-0012-0-00-00	2"	FNPT X MNPT	LL3-BA	Nitrile	316 SS	12"	
A80-024-97-0018-0-00-00	3"	MNPT X MNPT	LL3-BA	Nitrile	316 SS	18"	LPG/NH3
A80-024-97-0018-0-1121-1121	3"	FNPT X FNPT	LL3-BA	Nitrile	316 SS	18"	LPG/NH3
L3-32NH3-FBA	2"	FNPT X FNPT	LL3-BA	Nitrile	316 SS	12"	NH3
L3-32NH3-MBA	2"	MNPT X MNPT	LL3-BA	Nitrile	316 SS	12"	NH3

## Pig's Tail Hose Guard



- 100% Virgin Polyethylene - Strong, flexible and durable with excellent memory and abrasion resistance
- Beveled Edges - Smooth edges won't cut user during installation
- Multiple Sizes - Broad size range to wrap any hose or use it for bundling
- UV Resistant - Black pig's tail protects against UV rays

Part #	I.D.	Wall	Helix - Band Width	Min. Hose O.D.	Length
R50SSG-11FT	1.5"	0.12"	1.38"	1-3/4"	11'
R50SSG-BOX	1.5"	0.12"	1.38"	1-3/4"	66'
R63SSG-11FT	2.0"	0.14"	1.57"	2-1/4"	11'
R63SSG-BOX	2.0"	0.14"	1.57"	2-1/4"	66'
R75SSG-11FT	2.4"	0.15"	1.6"	2-5/8"	11'
R75SSG-BOX	2.4"	0.15"	1.6"	2-5/8"	66'

## Stainless Steel Wire Braid Hose and Fittings

Developed for applications wherever a strong, corrosion resistant LPGas hose is desired. The special low extract tube handles propane or butane in liquid and gas form. Ideal for construction heater hoses.



**WARNING!!:** For LP and Natural Gas use only! Do not use in anhydrous ammonia or refrigeration applications! Do NOT use male swivel couplings or any type of couplings that use O-Ring sealing surfaces!

Part #	I.D.	O.D.	Approx Wt (lbs/ft)	Maximum Rec WP (psi)
SS25UL-4	3/16"	0.581"	.13	350
SS6-UL	5/16"	0.675"	.18	350
SS25UL-8	13/32"	0.766"	.21	350
SS25UL-10	1/2"	0.922"	.29	350

## Hose Ends for Wire Braid Hose



Part #	Hose I.D.	Flare Size	Type	Use with Hose
6-FS-4	3/16"	1/4"	Straight	SS25UL-4
6-FS	5/16"	3/8"	Straight	SS6-UL
6-FS-90	5/16"	3/8"	90 Degree	SS6-UL
6-FS-45	5/16"	3/8"	45 Degree	SS6-UL
6-4MP	5/16"	1/4" MNPT	Straight	SS6-UL
6-FS-8	13/32"	1/2"	Straight	SS25UL-8
6-FS-8-10	1/2"	1/2"	Straight	SS25UL-10
6-FS-10	1/2"	5/8"	Straight	SS25UL-10

## Swivel Adapter



Part #	Description
8M-8UFS	1/2" FNPT X 1/2" MNPT
12M-12UFS	3/4" FNPT X 3/4" MNPT
16M-16UFS	1" FNPT X 1" MNPT
20M-20UFS	1-1/4" FNPT X 1-1/4" MNPT
24M-24UFS	1-1/2" FNPT X 1-1/2" MNPT
32M-32UFS	2" FNPT X 2" MNPT

## Pull-Away Valves

### For Transfer Operations



Designed especially to provide pull-away protection for LP-Gas and anhydrous ammonia transfer operations including transport and delivery truck loading and unloading, engine fuel container filling and miscellaneous cylinder filling operations.

Part #*	Inlet/Outlet Connections F.NPT	Disconnect Force Approx-lbs	Reconnect Force Approx-lbs	Length of Valve	LP-Gas Liquid Flow Capacity at Various Differential Pressures (GPM)**			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A2141A6	3/4"	130	80	3-7/8"	11	16	25	36
A2141A6L	3/4"	130	80	3-7/8"	11	16	25	36
A2141A8	1"	75	50	4-9/16"	21	30	47	67
A2141A8L	1"	75	50	4-9/16"	21	30	47	67
A2141A10	1-1/4"	160	25	5-1/4"	52	75	120	170
A2141A16	2"	300	50	14-5/16"	250	350	550	750

\* "L" denotes lanyard style. All others bracket style.

\*\* To determine NH3 liquid flow capacity, multiply by .90

# Vapor Hose Assemblies

## VHA Series



LP Gas Vapor Hose Assemblies are factory assembled in 3/8" hose I.D. and 1/4" hose I.D. in various lengths and end fitting configurations. These hose assemblies are rated for 350 PSI working pressure. Vapor service only.

For low pressure appliances to be connected to low pressure regulators.

Part #	Hose I.D.	Swivel Flare Ends	Length
VHA401FF	1/4"	3/8" Female	1'
VHA402FF	1/4"	3/8" Female	2'
VHA403FF	1/4"	3/8" Female	3'
VHA404FF	1/4"	3/8" Female	4'
VHA405FF	1/4"	3/8" Female	5'
VHA406FF	1/4"	3/8" Female	6'
VHA408FF	1/4"	3/8" Female	8'
VHA410FF	1/4"	3/8" Female	10'
VHA412FF	1/4"	3/8" Female	12'
VHA415FF	1/4"	3/8" Female	15'
VHA420FF	1/4"	3/8" Female	20'
VHA450FF	1/4"	3/8" Female	50'

Part #	Hose I.D.	Swivel Flare Ends	Length
VHA601FF	3/8"	3/8" Female	1'
VHA602FF	3/8"	3/8" Female	2'
VHA603FF	3/8"	3/8" Female	3'
VHA604FF	3/8"	3/8" Female	4'
VHA605FF	3/8"	3/8" Female	5'
VHA606FF	3/8"	3/8" Female	6'
VHA608FF	3/8"	3/8" Female	8'
VHA610FF	3/8"	3/8" Female	10'
VHA612FF	3/8"	3/8" Female	12'
VHA615FF	3/8"	3/8" Female	15'
VHA620FF	3/8"	3/8" Female	20'
VHA625FF	3/8"	3/8" Female	25'
VHA650FF	3/8"	3/8" Female	50'
VHA6100FF	3/8"	3/8" Female	100'

Commonly used on most weed burners, torches and fish cookers.



Part #	Hose I.D.	Connections	Length
VHA405MXF 1/4	1/4"	1/4" FNPT x 1/4" MNPT	5'
VHA415MXF 1/4	1/4"	1/4" FNPT x 1/4" MNPT	15'

Commonly used on most weed burners, torches and fish cookers.



Part #	Hose I.D.	Connections	Length
VHA402MXF 3/8	1/4"	3/8" Female Flare x 3/8" MNPT	2"
VHA405MXF 3/8	1/4"	3/8" FNPT x 3/8" MNPT	5'

Low Pressure appliance hose assembly with regulator and Type 1 connection



Part #	Hose I.D.	Connections	Length
VHA402FFREGT1	1/4"	3/8" Female Flare x Regulator with Appliance End Fitting - ACME	2"

## VHA Series Con't



Ideal for use with LP Gas Grills.

Part #	Hose I.D.	Connections	Length
VHA405FFREGP	1/4"	3/8" Female Flare x Regulator with Restricted Flow Soft Nose P.O.L. and Hand Wheel	5'



Connects low pressure propane appliances to a 20 lb. cylinder using a 3/8" female swivel flare. Low Pressure appliance hose assembly with regulator and POL connection

Part #	Hose I.D.	Connections	Length
VHA405P 1/20	1/4"	Excess Flow Soft Nose P.O.L. with Hand Wheel x 1"-20 Male Thread Swivel	5'
VHA412P 1/20	1/4"	Excess Flow Soft Nose P.O.L. with Hand Wheel x 1"-20 Male Thread Swivel	12'



Used with most distribution posts or "T" and "Y" connectors as well as 1 lb. disposable cylinders. Hand tighten.

Part #	Hose I.D.	Connections	Length
VHA405MXF 1/20	1/4"	Swivel 1"-20 Female Thread x 1"-20 Male Thread Swivel	5'
VHA412MXF 1/20	1/4"	Swivel 1"-20 Female Thread x 1"-20 Male Thread Swivel	12'



Hose Tee Assembly used for R.V. applications to provide additional fuel source to high pressure appliances. May also be used as a dual source off a 20 lb. cylinder.

Part #	Hose I.D.	Connections	Length
VHA412T 1/20	1/4"	Tee Assembly Swivel 1"-20 Female Thread x Swivel 1"-20 Male Thread	12'



Quick Disconnect Hose Assembly for propane or natural gas grill.  
FOR OUTDOOR USE ONLY.

Part #	Hose I.D.	Connections	Length
VHA612QD	3/8"	3/8" Female Pipe Thread x 3/8" Male Flare Quick Connect	12'

## Thermoplastic Pigtails U.L. and C.G.A. Listed

The flexible thermoplastic hose material used on pigtails and high pressure hoses is rated at 350 lbs. working pressure and has a burst rating of 1750 PSI. end fittings are crimped in place. Together they offer an assembly that meets all applicable U.L. and C.G.A. tests and requirements. All assemblies up to 60 inches in length are dual (U.L. and C.G.A. Listed).



Commonly used to connect a bulk cylinder on a camper to a regulator

Part #	Hose I.D.	Connections	Length
71138-8	1/4"	F. ACME Nut x 1/4" MPT	8"
71138-15	1/4"	F. ACME Nut x 1/4" MPT	15"
71138-20	1/4"	F. ACME Nut x 1/4" MPT	20"



Connects to propane tank and auto change-over dual stage regulator

Part #	Hose I.D.	Connections	Length
71158-12	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	12"
71158-15	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	15"
71158-18	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	18"
71158-24	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	24"
71158-30	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	30"
71158-36	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	36"
71158-48	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	48"
71158-60	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	60"
71158-144	1/4"	F. ACME Nut x 1/4" Inverted Male Flare	144"



Commonly used to connect an auxillary bulk propane tank to a motor home

Part #	Hose I.D.	Connections	Length
71144-12	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	12"
71144-15	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	15"
71144-18	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	18"
71144-24	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	24"
71144-30	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	30"
71144-36	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	36"
71144-48	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	48"
71144-60	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	60"
71144-72	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	72"
71144-120	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	120"
71144-144	1/4"	Excess Flow Soft Nose P.O.L. x 1/4" Inverted Male Flare	144"

## Low Pressure

For PSI or less in Vapor Service ONLY

**CAUTION!:** This hose was designed for LPGas - VAPOR ONLY type service. Not to be used for LPGas liquid or barbecue grills - NOT UL listed.

To be used with low pressure hose fittings.

## Parker Hose Series 7122



Part #	Description	Hose I.D.	Maximum Working Pressure
6HH-R	Red nitrile hose	3/8"	125 PSI

## Steel Hose Nipples



Part #	Hose I.D.	M.NPT
ME4232	1/4"	1/4"
ME4252	3/8"	1/4"
ME4253	3/8"	3/8"
ME4254	3/8"	1/2"

## Brass Female Flare Swivel x Hose Barb



Part #	Hose I.D.	Internal Thread	Connection
4119	1/4"	3/8" Flare	Swivel & Hose Barb
4115	3/8"	3/8" Flare	Swivel & Hose Barb

## Brass Hose Coupler



Part #	External Thread
C51LH	9/16" 18LH x 9/16" 18LH
B29LH	1/4" NPT x 9/16" 18LH

## Brass Replacement Inlet Fitting



Part #	External Thread
73729	1/4" F. Inverted Flare x 1/4" M. NPT

## Band-It Preformed Clamps - Stainless Steel



Part #	Hose O.D.	Band Width
J201	13/16"	3/8"
J240	3/4"	1/4"

## Band-It Tool for Preformed Clamps



Part #	Description
C001	Band-It Tool
J001	Jr. adapter for preformed clamps - use with C001

## Stainless Steel Swivels for Hose-end Filler Valves Type



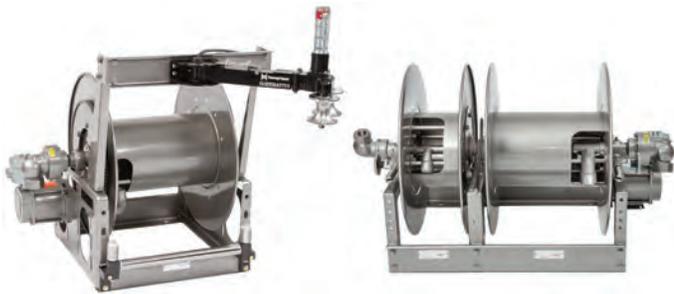
Part #	Size and Description	Type	Repair Kit
JO-1L	1" MNPT x 1" FNPT	LPG	JO-1LSK
JO-34L	3/4" MNPT x 3/4" FNPT	LPG	JO-34LSK
JO-1N	1" MNPT x 1" FNPT	NH3	JO-1NSK
JO-34N	3/4" MNPT x 3/4" FNPT	NH3	JO-34NSK

## Swivels for Hose Reel, Bulkhead and Loading Arm Applications



Part #	Size	Description	Type	Repair Kit
SMAC-190L	1" FNPT x 1" FNPT	Swivel Elbow	LPG	
SMAC-114L	1 1/4" FNPT x 1 1/4" FNPT	Swivel Elbow	LPG	SMAC-114LSK
SMAC-114STL	1 1/4" FNPT x 1 1/4" FNPT	Straight Swivel	LPG	SMAC-114STLSK
SMAC-112L	1 1/2" FNPT x 1 1/2" FNPT	Swivel Elbow	LPG	SMAC-112LSK
SMAC-112STL	1 1/2" FNPT x 1 1/2" FNPT	Straight Swivel	LPG	SMAC-112STLSK
SMAC-200L	2" FNPT x 2" FNPT	Swivel Elbow	LPG	SMAC-200LSK
SMAC-200STL	2" FNPT x 2" FNPT	Straight Swivel	LPG	SMAC-200STLSK
SMAC-190N	1" FNPT x 1" FNPT	Swivel Elbow	NH3	SMAC-190NSK
SMAC-114N	1 1/4" FNPT x 1 1/2" FNPT	Swivel Elbow	NH3	SMAC-114NSK
SMAC-114STN	1 1/4" FNPT x 1 1/4" FNPT	Straight Swivel	NH3	SMAC-114STNSK
SMAC-112N	1 1/2" FNPT x 1 1/2" FNPT	Swivel Elbow	NH3	SMAC-112NSK
SMAC-112STN	1 1/2" FNPT x 1 1/2" FNPT	Straight Swivel	NH3	SMAC-112STNSK
SMAC-200N	2" FNPT x 2" FNPT	Swivel Elbow	NH3	SMAC-200NSK
SMAC-200STN	2" FNPT x 2" FNPT	Straight Swivel	NH3	SMAC-200STNSK

## Explosion-Proof Electric Rewind Reel



Electric rewind reel available for 6, 12 or 24 Volt-DC service. A vapor-proof junction box, a stationary explosion-proof, box-mounted switch and a remote solenoid are supplied with this series.

Part #	3/4"	1"	1-1/2"
EPB 24-23-24	175	125	50
EPB 30-23-24	250	225	75
EPB 24-25-26	200	150	75
EPB 28-25-26	300	200	110
EPB 22-30-31	325	250	100
EPB 18-33-34	275	200	75

## The Anatomy of a Hannay Hose Reel

### 1 Bearings

Weight of spool and cable is supported by bearings.

**1a Back bearing**    **1b Front bearing**

### 2 Disc

Rolled edges prevent cable damage and add rigidity to disc. Additional strength is provided by a concentric rib.

### 3 Drum

Roll formed steel with full-length weld.

### 4 Tie rods

Join discs and drum to form spool, reinforced with pipe spacers for rigidity and strength.

### 5 Chain and sprocket drive

Provides smooth positive rewinding on powered reels.

### 6 Hub assembly

Provides wiring access to the slip ring assembly and serves as the reel axle. Cable is connected to the slip ring assembly, passes through hub and exits drum through a grommeted hole.

### 7 Collector ring

Provides electrical continuity through reel as cable is payed out or retrieved.

### 8 Collector ring cover

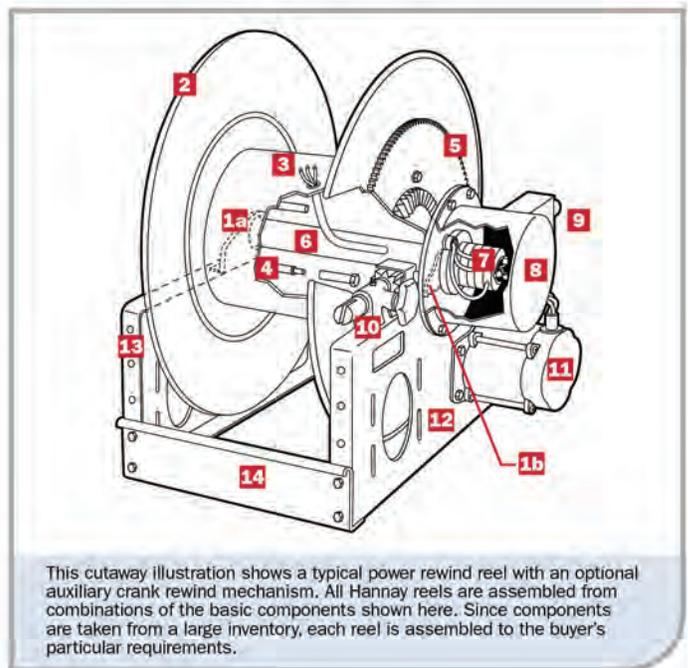
Provides protection from current carried through collector ring assembly as well as keeping out contamination.

### 9 Wiring junction box

Provides connection of reel to incoming power source.

### 10 Brake/rewind assembly

Bevel gear rewind has an adjustable tension brake. Rewind and brake devices vary with different models.



This cutaway illustration shows a typical power rewind reel with an optional auxiliary crank rewind mechanism. All Hannay reels are assembled from combinations of the basic components shown here. Since components are taken from a large inventory, each reel is assembled to the buyer's particular requirements.

### 11 Rewind motor

Electric rewind motor is shown. Compressed air or hydraulic motors can be used.

### 12 Front frame

### 13 Back frame

### 14 Front foot

### 15 Back foot (not shown)

## How to Order a Hannay Hose Reel

# Hose Reel Spec Worksheet

To specify Hannay reels, fill out this simple form and mail, fax or email it to your GEC Inside Sales Office. Photocopy this page or download and print from [hannay.com](http://hannay.com)

### 1. Who is the reel for?

Contact	Date / /		
Company	Position		
Street Address			
City	State	Zip	Country
Phone ( )	Fax ( )	Email	

### 2. What is the reel for?

**HOSE** (check one):  Storage only  Live Single hose  Live Dual hose

Inside diameter:	Hose length:	Bend radius:	Flat hose dimensions:
Outside diameter:	Hose weight:	Coupling spacing:	

#### Type of product handled live application (check one):

<input type="radio"/> Liquid (specify):	<input type="radio"/> Temperature:	<input type="radio"/> Oxygen/Acetylene:	<input type="radio"/> Other (specify):
<input type="radio"/> Gases (specify):	<input type="radio"/> Pressure:	<input type="radio"/> Hydraulic fluid (specify):	

**Fluid path type** (check one):  Steel (standard)  Aluminum  Stainless Steel  Other

**Reel inlet type** (check one):  Swivel joint 90° (standard)  Straight

**Reel outlet type** (riser): Size:

<b>Thread</b> (check one):	<input type="radio"/> National Pipe Thread (NPT)	<input type="radio"/> Joint Industry Committee (JIC)	<input type="radio"/> Other (specify):
	<input type="radio"/> National Standard Thread (NST)	<input type="radio"/> British Standard Pipe (BSP)	

Indicate your custom specifications

### 4. Specifying Location of Components

#### Optional Location of Components:

Location of the inlet, outlet riser, and rewind mechanism can be varied to meet your requirements and **must be specified on your order**. Unless otherwise specified, most reels will be shipped as **Right Top Rewind** with the inlet, outlet riser, and rewind mechanism on the operator's right.



**RT – Right Top Rewind**  
Standard – Always look at your reel from this position to determine right hand or left hand.



**RB – Right Bottom Rewind**



**LT – Left Top Rewind**



**LB – Left Bottom Rewind**

**Note:** Use component location initials as suffix after model number (ie: EPB24-25-26 LT)

### 3. What features does the reel need? Check type of rewind:

**MANUAL REWIND**

<input type="radio"/> Disc rewind (hand over hand)	<input type="radio"/> Gear-driven crank	<input type="radio"/> Direct crank (permanent or removable)	<input type="radio"/> Chain-driven crank
--	---	---	--

**POWER REWIND**

<input type="radio"/> Spring	<input type="radio"/> Air	<input type="radio"/> Electric (voltage):	<input type="radio"/> Hydraulic
------------------------------	---------------------------	---	---------------------------------

**Type of installation** (check one):  Floor  Wall  Overhead  Vehicle

Temperature Range:	Environment:
Accessories (if any):	Hose Stop: <input type="radio"/> Yes <input type="radio"/> No

Roller Assemblies:

**Finish:**  Painted steel (standard)  Aluminum  Polished  Unpolished  Stainless steel  Polished  Unpolished

#### Check type of installation and roller position for spring reels:

<input type="radio"/> Drag Position <b>SR</b>	<input type="radio"/> Lift Position <b>VR</b>	<input type="radio"/> Stretch (no roller) Position <b>TR</b>	<input type="radio"/> Wall Mount Position <b>TR</b>	<input type="radio"/> Recovery (pick-up) (no roller)
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Constant tension available on all roller positions

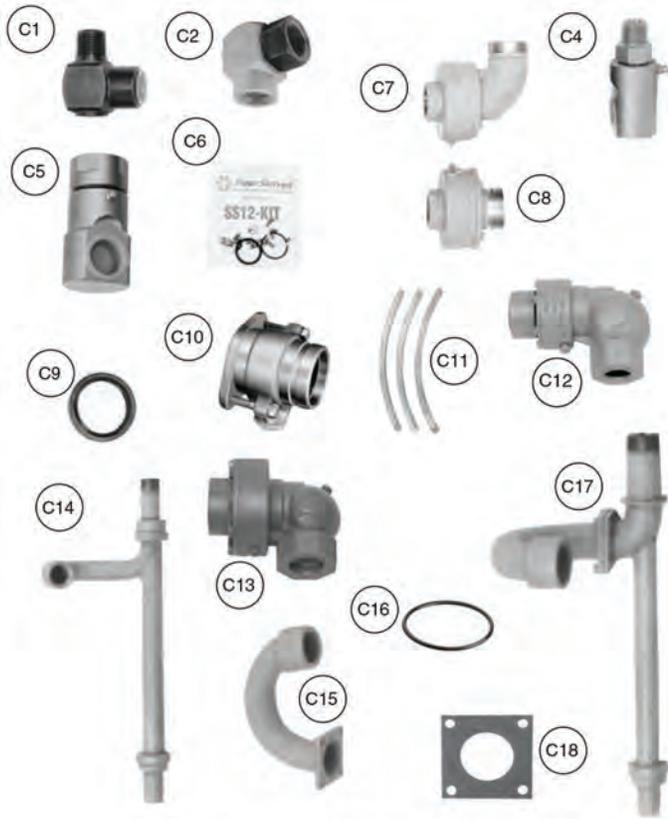
### 5. Please note size and/or weight limitations for your installation

**SPECIFICATIONS**

Depth:	
Height:	
Width:	
Weight:	

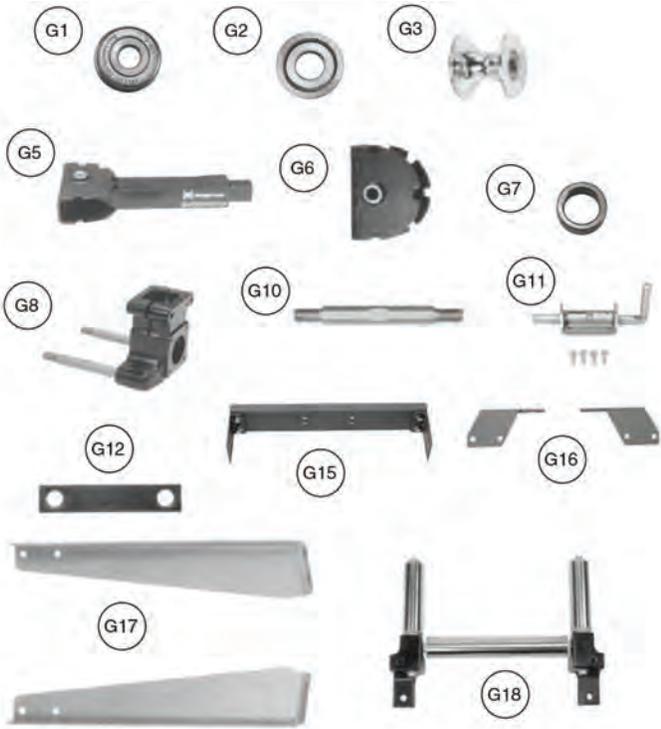
**For custom applications not found in our catalog, call our Inside Sales Group.**

## Swivel Joints, Risers, Hub Assemblies



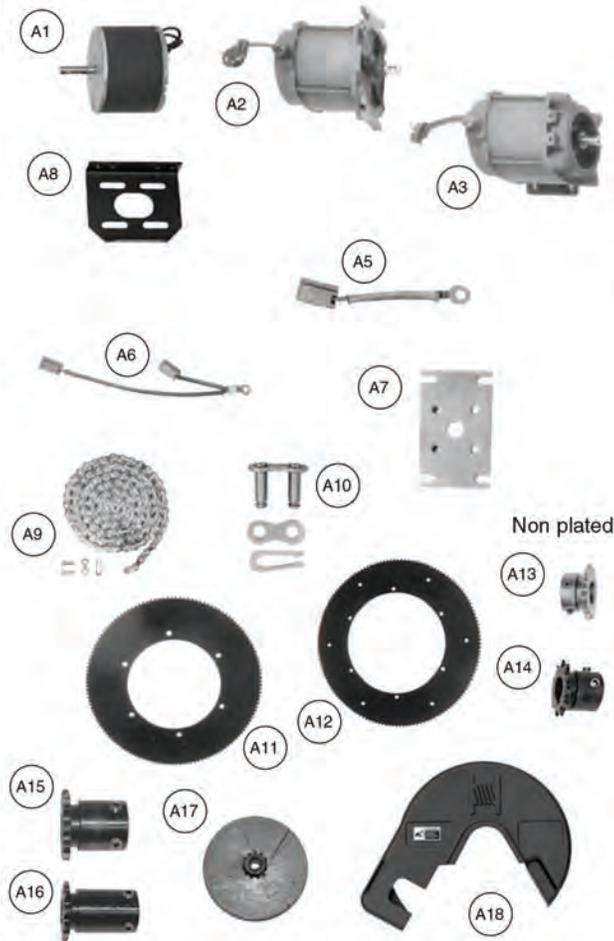
Part #	Ref. No.	Description
9927.8138	C1*	1/2" 90° MxF BP Super Swivel
9929.8538	C2*	1" 90° FxF BP Super Swivel
9927.8151	C4*	1/2" 90° MxF Super Swivel (FxF also Avail., 9927.8551)
9929.8551	C5	1" 90° FxF Super Swivel (Buna)
<b>Specify</b>	C6*	Super Swivel Repair Kit (Specify Size)
9930.4210	C7*	1-1/2" 90° FxFxV Swivel (WHJ1590)
9930.4610	C8*	1-1/2" Straight FxFxV Swivel (WHJ15180)
9936.0642	C9*	1-1/2" PK-1 BUNA-N Packing (Merkel)
9930.5703	C10*	1-1/2" Straight Victaulic H-5 Joint
9936.0659	C11*	H-5C Rope Packing Seal for H-5 Joint
SMAC-190L	C12	1" 90° Full Circle Swivel
SMAC-112L	C13	1-1/2" 90° FxF Full-Circle Swivel
9901.1600	C14	1" FIPT Iron Welded Hub Assembly (Specify Model)
9901.37600	C15	1-1/2" FIPT Iron Flanged Riser
9965.0025	C16	O-Ring for 3" Riser ( 3-3/4" Diam.)
9901.2840	C17	1-1/2" Hub Assy Complete (Specify Model)
9965.0021	C18	1-1/2" Riser Gasket, High Grade Buna-N

## Guidemaster Parts and Brackets



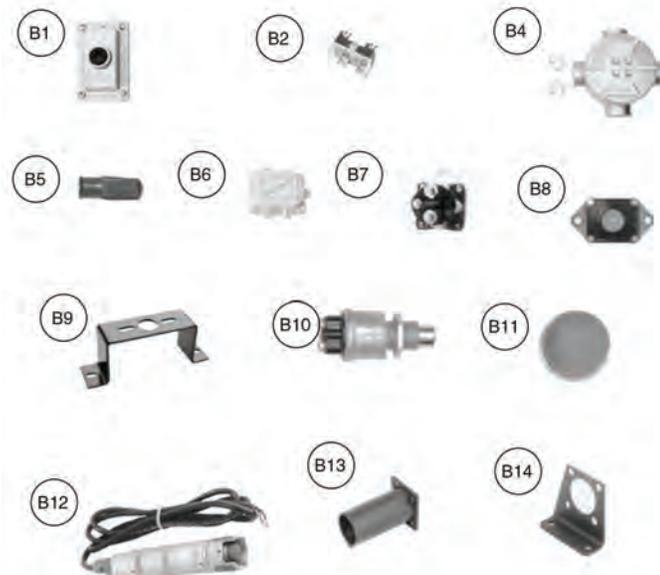
Part #	Ref. No.	Description
9945.0026	G1	GM Ball Bearing (For GM Roller)
9945.0044	G2	GM-108 Ball Bearing (For GM-109 Roller)
9945.1000	G3	GM Roller w/GM Bearing
9944.0040	G5	GM-700 Guide Arm Body Assy w/Mtg. Yoke
9945.0009	G6	GM Mounting Yoke w/Bronze Bushing
9945.0011	G7	GM Oil-Impregnated Bronze Bushing
9945.1001	G8	GM Roller Body w/Mtg. Bolts
9945.1005	G10	GM Roller Mtg. Bolt
9945.1003	G11	Pinlock Assy for GM 700
9945.1004	G12	GM Roller Bolt Mounting Plate
9945.0035	G15	GM Cross Member Assembly (3 Pieces) (Specify Model)
9945.0036	G16	GM Bottom-Wind Brackets (Pair)
9945.0037	G17	GM Top-Wind Brackets (Pair)
9939.0069	G18	Assy. "B" Roller for Bottom-Wind Guidemaster Reels (specify model)

## Motors, Sprockets, Chain



Part #	Ref. No.	Description
9915.0042	A1	12 Volt Flange Mount Non-Exp-Proof Motor
9915.0003	A2	12 Volt Flange Mount 1/2 HP Explosion-Proof Motor
9915.0009	A2	12 Volt Flange Mount 2/3 HP Explosion-Proof Motor
9915.0014	A3	12 Volt Base Mount Explosion-Proof Motor
9916.0071	A5	Pair of Brushes for 12 Volt Non-Exp-Proof Motor (#572008)
9916.0070	A6	Two Pairs of Brushes for 12 Volt Explosion Proof Motor (#572000)
9923.0008	A7	Flange Mount Motor Plate for Non-Exp-Proof Motor
9923.0006	A8	P66A-00090 Motor Mounting Plate Right Angle for Non-Exp-Proof Motor
9912.0001	A9	10' Length #35 Chain w/Connecting Link
9912.0002	A9	10' Length #40 Chain w/Connecting Link
9912.0010	A10	Connecting Link for #35 Chain
9912.0009	A10	Connecting Link for #40 Chain
9910.1423	A11	138T35 Disc Sprocket, 16-5/8" Diameter (E-Coated)
9910.3128	A12	146T40 Disc Sprocket, 23-1/2" Diameter (E-Coated)
9910.1321	Not Shown	112T35 Disc Sprocket, 13-3/8" Diameter (E-Coated)
9910.1116	A13	11T35 Motor Sprocket, 3/4" Long
9910.1117	A14	11T35 Motor Sprocket, 1-1/16" Long
9910.1118	A15	11T35 Motor Sprocket, 1-5/16" Long
9910.0917	A15	9T40 Motor Sprocket, 1-5/16" Long
9910.1119	A16	11T35 Motor Sprocket, 1-3/4" Long
9910.2219	A17	Disc & Sprocket for Caliper Brake (#35 Chain)
9910.2100	Not Shown	Disc & Sprocket for Caliper Brake (#40 Chain)
<b>Specify</b>	A18	Molded Chain Guard (left or right)

## Switches and Electrical



Part #	Ref. No.	Description
9917.0001	B1	Red Dot EXPD-2a Switch (12 Volt)
9917.0012	B2	Red Dot Internal Switch
9917.0061	B4	Red Dot 5-Port Round Junction Box/Cover
9917.0062	B5	#6 Wire Nut (For Red Dot Junction Box)
9917.0063	B6	Insulated "Bug" Connector
9917.0025	B7	12 Volt Solenoid (Diode-Suppressed)
<b>Specify</b>	B8	SDLM Circuit Breaker (Specify Amperage)
9917.0024	B9	CB-2 Mounting Bracket (for Circuit Breaker)
9917.0006	B10	Push-Button 12 Volt Switch (Less Cap)
9917.0008	B11	Rubber Cap (For Push Button Switch)
9917.0200	B12	EPS-1 Switch (Used with Guidemaster)
9917.0207	B13	EPS-2 Mounting Bracket (Used with EPS-1)
9917.0208	B14	Extension Bracket for ESP-2

## Roller Assemblies, Cable Guides, Hose Stops



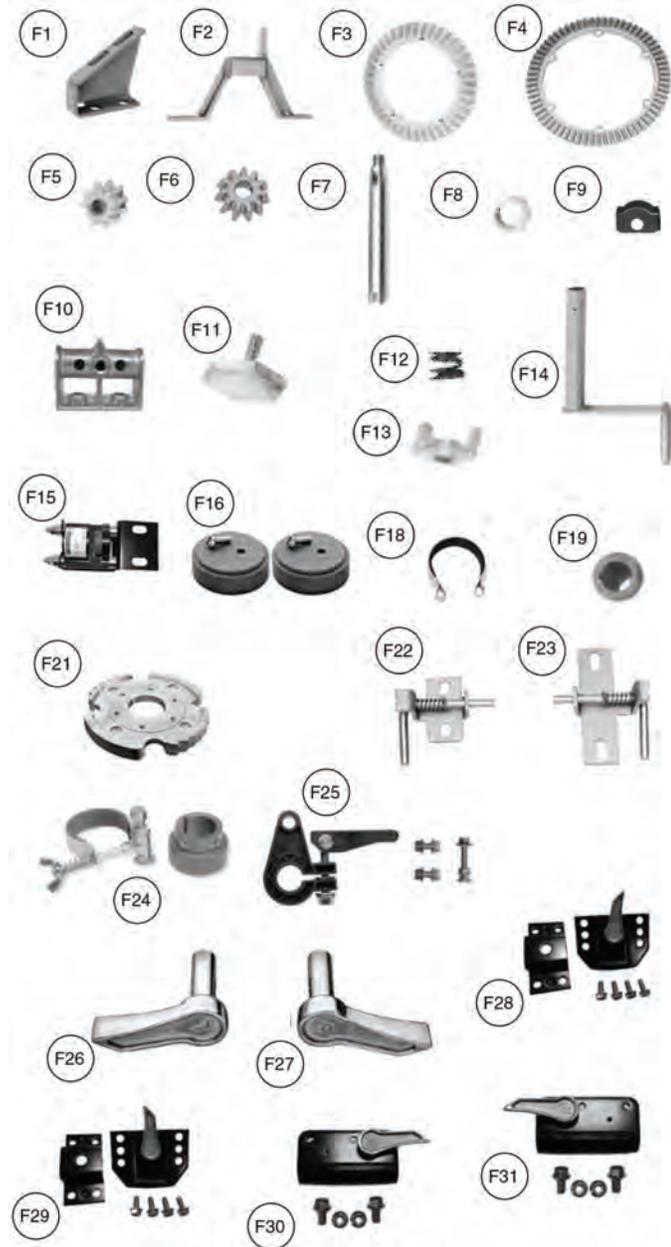
Part #	Ref. No.	Description
<b>Specify</b>	D1	Top Wind FH-3 Mtg. Brkt. (Specify Model)
<b>9939.0042</b>	D2	FH-3 Roller & Spool Assy. (Specify Model)
<b>9940.0012</b>	D3	FH-307 Delrin-Over-Steel Step Bolt
<b>9940.0002</b>	D4	FH-309-P Black Plastic Cap
<b>9940.0005</b>	D5	FH-301 Spool
<b>9940.0006</b>	D6	FH-302 Block
<b>9940.0007</b>	D7	FH-303-15 (1.5") Trunnion Bearing
<b>9940.0008</b>	D8	FH-303-2 (2") Trunnion Bearing
<b>9939.0062</b>	D9	Utility Hose Roller Assy. "C" (Spec. Model)
<b>9940.0076</b>	D10	EH-650 Mounting Block (Plated)
<b>9939.0003</b>	D11	EH-714 Roller Assembly
<b>9922.0111</b>	D12a	HS-3 Hose Stop (Specify OD of Hose)
<b>9922.0200</b>	D12b	HS-35 Stop for Single Hose (Specify OD of Hose)
<b>9922.0210</b>	Not Shown	HS-35 Stop for Twin Hoses (Specify OD of Hose)
<b>9922.0012</b>	D13	HS-45 Hose Stop (Specify OD of Hose)
<b>9951.0009</b>	D14	GR-4A Guide Arm Positioner
<b>9951.0010</b>	D15	GR-4 Guide Arm
<b>9951.0012</b>	D16	GR-5 Scoop Cable Guide
<b>Specify</b>	D17	"R200" Series Roller Assembly
<b>Specify</b>	D18	"N200" Series Roller Assembly
<b>Specify</b>	D19	"R300" Series Roller Assembly
<b>Specify</b>	D20	Roller Mounting Arm (2) per reel (For "N" Series Spring Reels)
<b>9940.0016</b>	D21	FH-303 1-1/2" Trunnion Bearing (New Style) (No Through Hole)
<b>9940.0010</b>	D22	FH-305 2" SST Roller Tubing
<b>9940.0003</b>	D23	1-1/2" SST Roller Tubing
<b>9940.0009</b>	D24	FH-304 Roller Rod
<b>9940.0071</b>	D25a	LEFT Hand Roller Mounting Block (Painted)
<b>9940.0072</b>	D25b	RIGHT Hand Roller Mounting Block (Painted)
<b>9939.1062</b>	D26	Assy C2 Roller with 1-1/2" Diam Roller (Style 2) (Specify Model)

## Bearings



Part #	Ref. No.	Description
<b>9902.1200</b>	E3	1/2" S.A. Ball Bearing Complete
<b>9902.1300</b>	E4	1/2" S.A. Ball Bearing Insert
<b>9902.1400</b>	E5	1" S.A. Ball Bearing Complete
<b>9902.1500</b>	E6	1" S.A. Ball Bearing Insert
<b>9902.1612</b>	E7	1-1/2" Split Bronze Bearing Complete (E-coated)
<b>9902.1620</b>	Not Shown	1-1/2" S.A. Bronze Bearing Complete (304 S.S.)
<b>9902.1710</b>	E8	1-1/2" Split Bronze Bearing Insert
<b>9902.1730</b>	E9	1" S.A. Bronze Bearing insert

## Rewind Assemblies, Brakes, Ratchets



Part #	Ref. No.	Description
<b>Specify</b>	F1	30" Rewind Bracket (specify right or left)
<b>9914.0233</b>	F2	Vertical Rewind Bracket Only
<b>9914.0372</b>	F3	H-26 Ring Gear
<b>9914.0382</b>	F4	H-28 Ring Gear
<b>9914.0393</b>	F5	H-27 Pinion Gear
<b>9914.0403</b>	F6	H-29 Pinion Gear
<b>Spec. Model</b>	F7	Pinion Shaft
<b>9914.0351</b>	F8	Pinion Shaft Collar
<b>9914.0618</b>	F9	Pinion Gear Guard (E-Coated)
<b>9914.0243</b>	F10	H-2A Pinion Shaft Bearing
<b>9914.0413</b>	F11	H-30A Brake Wheel
<b>9914.0451</b>	F12	H-31 Brake Spring
<b>9914.0433</b>	F13	H-3 Brake Pad
<b>9914.0011</b>	F14	H-18 Hand Crank
<b>9947.0020</b>	F15	Air Caliper Brake
<b>9947.0001</b>	Not Shown	Manual Caliper Brake
<b>9947.0024</b>	F16	Pair of Brake Pads (For Air Caliper Brake)
<b>9947.0036</b>	F18	Comet Brake Strap Only (IV Style)
<b>9947.0038</b>	F19	Comet Brake Iron Hub (IV Style)
<b>9922.0015</b>	F21	Ratchet Wheel (new 2 position)
<b>9965.003</b>	F22	PL-1 Pinlock
<b>9965.0036</b>	F23	PL-4 Pinlock with Extended Mounting Ears
<b>9947.0090</b>	F24	Comet Brake Assembly (Bearing Mounted Style)
<b>9947.0043</b>	Not Shown	Comet Brake Assembly (Bearing Mounted Style with Stub Shaft)
<b>9947.0130</b>	F25	Cam Lever Drag Brake Kit 3-Position Lever (including Mounting Hardware)
<b>9922.0008</b>	Not Shown	Ratchet Locking Spring
<b>9922.0301</b>	F26	LEFT Hand Pawl & Pin (.304 SST)
<b>9922.0302</b>	F27	RIGHT Hand Pawl & Pin (.304 SST)
<b>9922.0311</b>	F28	LEFT Hand Ratchet Locking Assy for HGR, SCR, SGCR, Reverse N-Series
<b>9922.0312</b>	F29	RIGHT Hand Ratchet Locking Assy for HGR, SCR, SGCR, Reverse N-Series
<b>9922.0321</b>	F30	LEFT Hand Ratchet Locking Assy for Reverse Rollform Reels
<b>9922.0322</b>	F31	RIGHT Hand Ratchet Locking Assy for Reverse Rollform Reels

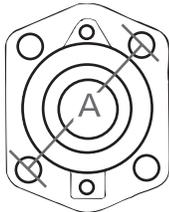
## How to Order a Gauge

Tank configuration shown is appropriate for tanks built since the mid-1970's. If yours does not match, please call the Gas Equipment Company location nearest you and we will be glad to help.

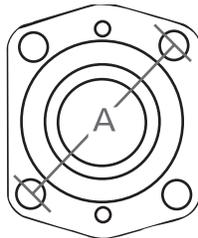
### 1. Determine Tank Type

- Above Ground
- Under Ground

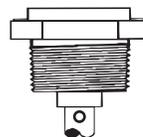
### 2. Determine Gauge Head Type



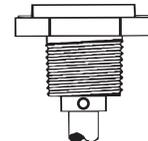
JR - 4 bolt  
A = 2-1/32



SR - 4 bolt  
A = 2-1/2



1-1/4" NPT  
Threaded



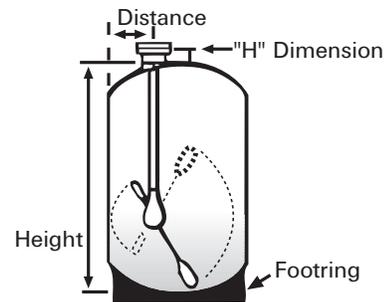
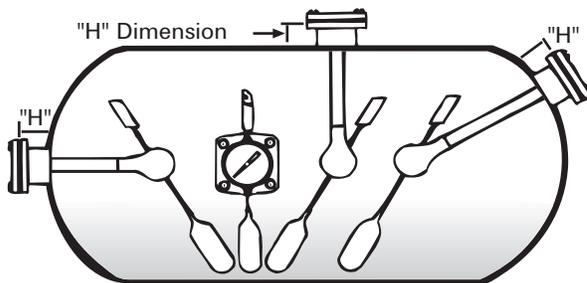
1" NPT  
Threaded

### 3. Determine Tank Diameter: D = \_\_\_\_\_ "

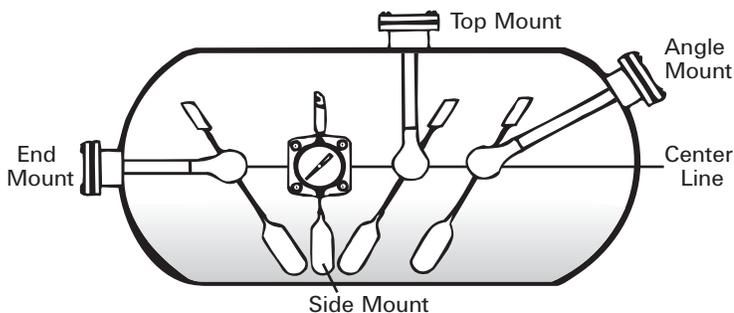
From Tank Data Plate or  
Measure Circumference (in inches)  
and divide by 3.14

### 4. Determine Riser Height: H = \_\_\_\_\_ "

Note: Riser height is the distance, in inches, from tank  
surface to top of mounting flange or coupling for gauge.



### 5. Determine Mounting Position



- Top Mount
- Angle Mount
- Side Mount
- End Mount

Note: Pivot point of float must be at center line of tank.

## Adjustable Liquid Level Gauges



Here is an adjustable, magnetic, liquid-level gauge which makes it a snap to quickly and economically replace non-functional LP Gas gauges in the field. Because one size adjustable gauges fit many tanks, the 'One' Gauge greatly reduces the number of spare gauges you need to stock. The 'One' Gauge is UL listed for LP gas service.

## Senior 4-Bolt Adjustable Gauges

Part #	Adj. Stem Length	Application	Head
0049S02207	12-1/2" to 19-3/4"	Above Ground	Aluminum
0049S02208	19-1/2" to 33-1/4"	Above Ground	Aluminum

## Junior 4-Bolt Adjustable Gauges

Part #	Adj. Stem Length	Application	Head
B0049S02159	12-1/2" to 19-3/4"	Above Ground	Brass
B0049S02170	19-1/2" to 33-1/4"	Above Ground	Brass

## Junior 1-1/4" NPT Threaded Adjustable Gauges

Part #	Adj. Stem Length	Application	Head
B0049S02203	12-1/2" to 19-3/4"	Above Ground	Brass
B0049S02204	19-1/2" to 33-1/4"	Above Ground	Brass

## Junior 1" NPT Threaded Adjustable Gauges

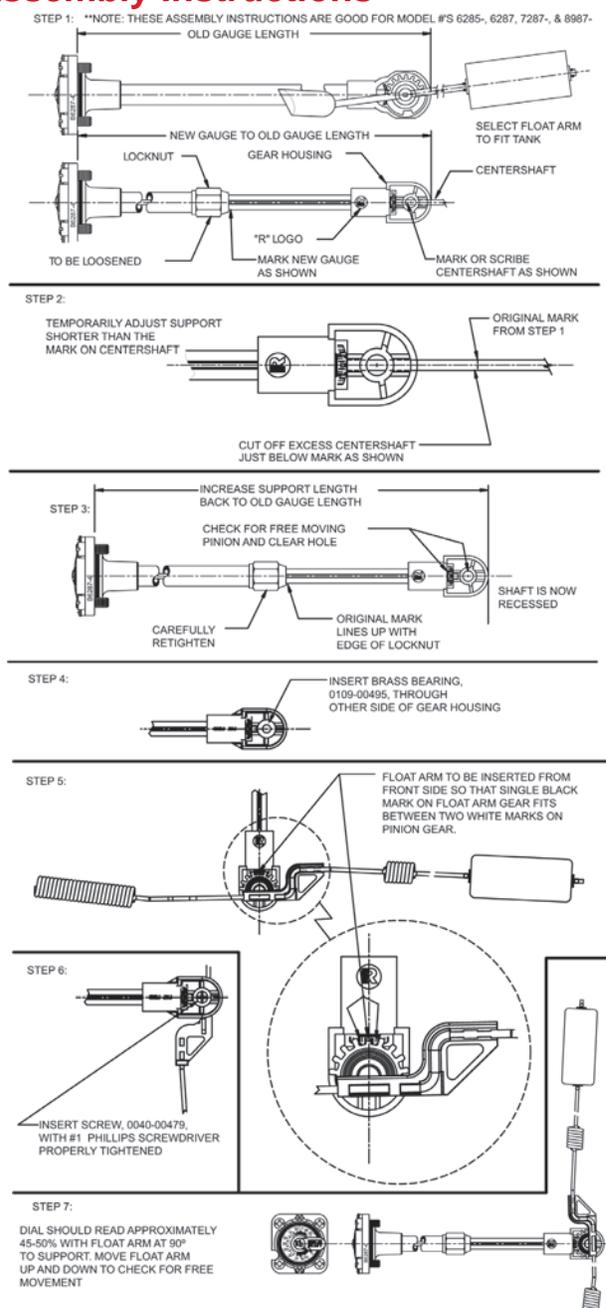
Part #	Adj. Stem Length	Application	Head
B0049S02160	12-1/2" to 19-3/4"	Above Ground	Brass
B0049S02167	19-1/2" to 33-1/4"	Above Ground	Brass

## Common Float Assemblies - Top Mount

### Junior & Senior

Part #	Tank Diameter
6857S11009	24"
6857S13759	30"
6810S14379	32"
6857S17009	37.5"
6857S18509	41"

## Assembly Instructions



## ASME Tank & DOT Cylinder Gauges

Rochester gauges are the standard of excellence for measuring LPG levels. Stainless steel bearing surfaces and self-aligning bevel gears ensure extremely long life. The one-piece, die-cast plastic gear housing is designed to protect gear operation. The nitrile float is another exclusive development of Rochester engineers. This lighter float lets Rochester use a lighter counter weight which lengthens gauge life particularly where vibration is a factor. Dial chambers are hermetically-sealed, moisture-proof and easily replaced without exposing the contents of the tank. The one-piece gauge head is die-cast from a high-tensile strength aluminum alloy. All Rochester 6200 Series gauges are UL listed for LP gas service.

## ASME 4-Bolt Gauges



### Junior

Part #	Tank Diameter	Orientation	Bolt Circle	Mounting Bolts	Head
6281-12.5-24T	24"	Top Mount	2-1/32"	1/4" - 28	Aluminum
6281-15.5-30T	30"	Top Mount	2-1/32"	1/4" - 28	Aluminum
6281-19.25-37T	37"	Top Mount	2-1/32"	1/4" - 28	Aluminum
6281-21-41T	41"	Top Mount	2-1/32"	1/4" - 28	Aluminum
6281-85	420# Vertical	Top Mount	2-1/32"	1/4" - 28	Aluminum
6284-34	33# Cylinder	Universal Mount	2-1/32"	1/4" - 28	Aluminum

### Senior

Part #	Tank Diameter	Orientation	Bolt Circle	Mounting Bolts	Head
6280-15.5-30T	30"	Top Mount	2-1/2"	5/16" - 24	Aluminum
6280-19.25-37 45CCW	37"	Top Mount - Head Rotated 45 degree CCW	2-1/2"	5/16" - 24	Aluminum
6280-21-41T	41"	Top Mount	2-1/2"	5/16" - 24	Aluminum

## Junior ASME/DOT NPT Threaded



### Junior 1-1/4" NPT Threaded

Part #	Tank Diameter	Orientation	Bolt Circle
B7281-124	24"	Top Mount	Brass
B7281-130	30"	Top Mount	Brass
B7281-137	37"	Top Mount	Brass
B7281-141	41"	Top Mount	Brass
B7281-386	420# Vertical	Top Mount	Brass

### Junior 1" NPT Threaded

Part #	Tank Diameter	Orientation	Head Construction
B8981-04024	24"	Top Mount	Brass
B8981-04030	30"	Top Mount	Brass
B8981-04037	37"	Top Mount	Brass
B8981-04041	41"	Top Mount	Brass
B8981-04010	420# Vertical	Top Mount	Brass
B8981-04015	200# Vertical	Top Mount	Brass

### Junior 3/4" NPT Threaded

Part #	Tank Diameter	Orientation	Head
7381-1016	30"	Top Mount	Zinc
7381-1013	37"	Top Mount	Zinc
7384-1035	30"	End Mount	Zinc
7384-1031	36"	End Mount	Zinc
7384-1032	41"	End Mount	Zinc



## Lift Truck Gauges

Rochester's gauges are ideal for rugged, trouble-free, lift truck service. Features include the hermetically-sealed, magnetically coupled, easily-replaceable dial. Stainless steel gears & bearings guarantee longer service. There is a gauge for all size containers and any mounting position.

### Junior 4-Bolt Aluminum Head Lift Truck Gauges



Part #	Cylinder Size	Diameter	Orientation	Dial #
6284-33	20 lb	12"	Universal	5343S01816
6284-24	20 lb	12"	Horizontal	5323S01789
6284-34	33.5 lb	12"	Universal	5343S01791
6284-24	33.5 lb	12"	Horizontal	5323S01789
6284-35	43.5 lb	12"	Universal	5343S01824
6284-24	43.5 lb	12"	Horizontal	5323S01789
6281-49	43.5 lb	12"	Vertical	5323S01821

### Junior NPT Threaded Lift Truck Gauges



#### 1-1/4" NPT Threaded, Brass Head

Part #	Cylinder Size	Diameter	Orientation	Dial #
B7284-33	20 lb	12"	Universal	5343S01815
B7284-24	20 lb	12"	Horizontal	5323S01789
B7281-45	20 lb	12"	Vertical	5343S01818
B7284-34	33.5 lb	12"	Universal	5343S01791
B7284-24	33.5 lb	12"	Horizontal	5323S01789
B7281-48	33.5 lb	12"	Vertical	5323S01820
B7284-35	43.5 lb	12"	Universal	5343S01824
B7284-24	43.5 lb	12"	Horizontal	5323S01789
B7281-49	43.5 lb	12"	Vertical	5323S01820

#### 3/4" NPT Threaded, Aluminum Head

Part #	Cylinder Size	Diameter	Orientation	Head
7381-1002	20 lb.	12"	Vertical	Aluminum
7384-1028	20 lb.	12"	Horizontal	Aluminum
7384-1006	33.5 lb.	12"	Universal	Aluminum
7384-1028	33.5 lb.	12"	Horizontal	Aluminum
7384-1007	43.5 lb.	12"	Universal	Aluminum
7384-1028	43.5 lb.	12"	Horizontal	Aluminum

### Junior Polymer Construction Lift Truck Gauges

This gauge measures the liquid contents of a horizontally mounted lift truck cylinder. The gauge has a second scale for use when the tank is stored vertically which reads "OK" or "ADD". The gauge head accepts a snap-on Junior dial and has 1-3/8" 35! hex wrenching flats. The gauge support, center shaft and float arm are constructed of a propane compatible thermoplastic polymer material. This construction reduces the number of parts and improves reliability and accuracy.



Part #	Cylinder Size	Diameter	Orientation	Dial #	Head
7384-4021	20, 33.5, 43.5 lb.	12"	Universal	5714S02591	Aluminum

## NH<sub>3</sub> Gauges

The A6200 series gauges are designed to withstand the corrosive rigors of NH<sub>3</sub> service. The A6400 series is all-stainless-steel construction designed to withstand NH<sub>3</sub> with chemical additives. All "A" prefix gauges are UL listed for NH<sub>3</sub> service. These gauges come standard with direct-reading percentage dials.

### 4-Bolt NH<sub>3</sub> Gauges



#### Senior

Furnished with gasket, dial, and 4 mounting bolts.

Part #	Tank Diameter	Orientation	Head
A6280-1-41	41"	Top Mount	Stainless Steel
A6280-1-46	46"	Top Mount	Stainless Steel
A6280-1-48	48"	Top Mount	Stainless Steel
A6283-1-41	41"	Side/Center Mount	Stainless Steel

#### Junior

Furnished with gasket, dial, and 4 mounting bolts.

Part #	Tank Diameter	Orientation	Head
A6281-1-37	37"	Top Mount	Stainless Steel
A6281-1-41	41"	Top Mount	Stainless Steel
A6281-1-46	46"	Top Mount	Stainless Steel

### Senior N-Serve Gauges



Furnished with gasket, dial, and 4 mounting bolts. All stainless steel construction.

Part #	Tank Diameter	Orientation	Head Construction
A6480-00013	41"	Top Mount	Stainless Steel
A6480-00012	46"	Top Mount	Stainless Steel

### NH<sub>3</sub> Replacement Dials



Part #	Description
5323S01848	Junior
5002S00002	Senior

## Motor Fuel Gauges

Zinc head gauge with heavy-duty magnet. Ideal with remote reading replaceable Twinsite® Sender.



Part #	Tank Diameter	Tank Mfg.	Gauge Head Stamp	Mounting Angle	Dial Type	Head
6244-00600B	8"	Manchester	H8LN	320	DR	Brass
6244-00353	10"	Manchester	H10C	CENTER	DR	Zinc
6244-00054	12"	Manchester	H12C	CENTER	DR	Zinc
6244-00384	13"	Manchester	H13LN	320	DR	Zinc
6244-00334	14"	Manchester	H14A	45	DR	Zinc
6244-00599	14"	Manchester	H14LN	320	DR	Zinc
6244-00338	16"	Manchester	H16A	45	DR	Zinc
6244-00604B	16"	Manchester	H16A	30	DR	Brass
6244-00040	18"	Manchester	H18A	45	DR	Zinc
6244-00357	18"	Manchester	H18C	CENTER	DR	Zinc
6244-00342	20"	Manchester	H20A	45	DR	Zinc
6244-00358	20"	Manchester	H20C	CENTER	DR	Zinc
6244-00181	24"	Manchester	H24A	45	DR	Zinc
6244-00371	24"	Manchester	H24C	CENTER	DR	Zinc

\*DR=Direct Read

## Farm Tank Gauges

These lever-action gauges are designed for use in stationary farm tanks or other tanks with flat heads. They are to be mounted on the centerline in then middle of the head. The maximum recommended float length is 48".



Part #	Description	Type	Float	Fuel Type
F7183-00027	1-1/4"	Lever Action	48" Float	Gasoline & Diesel
5001S00605	Fractional Dial	Stationary Tanks	—	—

## Magnetel® Electronic Dial

Rochester digital gauge indicator of temperature compensated tank volumes and temperature through Bluetooth e-wireless communication with e-Temp temperature sensor (Sold separately). Digital gauge indicator also displays tank content specific gravity and dual programmable alarm indicators that can be set up remotely using the e-Dial™ App (Available on iTunes and Google Play).

E-dial comes with 24' cable and safety barrier with 5' cable.



Part #	Size	Liquid	Range
6317-00001	4"	Combo for LPG & NH3	5% - 95% Transport/Boat Tail 3% - 97% Stationary/Bulk Storage
Accessories			
1250-E0001		Temperature Sensor	

## Magnetel® Gauges for Bulk Storage & Mobile Applications

### When Ordering Specify

- Liquid product and specific gravity.
- Type vessel, inside diameter (in inches) & head type (ellipsoidal, semi elliptical, hemispherical).
- Prefix (see chart).
- Model # for mounting location (top, side, 8" or 4" dial).
- Trim # according to product compatibility requirements.\*
- Bolt hole location of mounting flange
- If other than standard percent of total volume dial is required.
- Top-mounted gauges require dimension from mounting flange face to tank shell plus shell thickness.
- Angle-mounted gauges require tank drawings for computing proper gauge dimensions.

### Specify Prefix for Appropriate Diat & Mounting

#### Dial Prefix

"C" = Combination LPG/NH3.

"D" = Insulated extension for CO2 and other cryogenic liquids.

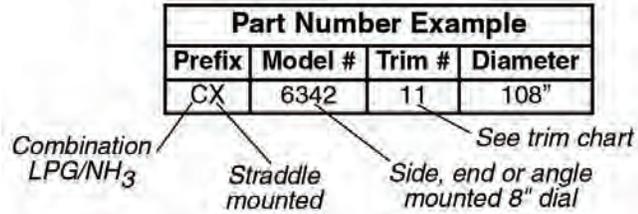
#### Mounting Prefix

"X" = When straddle mounting is required.

"Y" = When ordering gauge for 2" opening.

"M" = Special mobile.

"V" = Vertical tank.



## Materials Code/Trim Number Chart

Trim #	Type Service	Gauge Flange	Float Counter Balance	Bearing Support Block	Float & Support Block	Stem Drive Magnet	All Other Parts
-11	LPG or NH3	Type 316 Stainless Steel	Cold-roll Steel - Zinc Plated	Type 303 Stainless Steel	Type 303 Stainless Steel	Alnico VI	300 Sries Stainless Steel

Trim -11 should be used on containers of 3500 WG or more. Gauges for vertical tanks require drawing for computing proper gauge dimensions & mounting locations. More trim levels available for other products.

## Magnetel® Bulk Storage Gauges

Rochester Gauges Magnetel® Liquid Level Gauges are available in 4" and 8" dial sizes. Standard calibration is percent of total tank volume.



### Magnetel Models

Model #	Mounting	Dial Size
6336-11	Top	4"
6339-11	Side, End or Angle	4"
6342-11	Side, End or Angle	8"
6360-11	Top	8"

### Common Magnetel Configurations

Part #	Diameter of Tank	Mounting	Dial Size
C6342-11-84	84"	Side, End or Angle	8"
C6342-11-104	104"	Side, End or Angle	8"
C6342-11-108	108"	Side, End or Angle	8"
C6342-11-130	130"	Side, End or Angle	8"

Special calibration dials are available at extra cost.

Please state requirements.

Other sizes available by special order.

## Magnetel® RoughRider® Transport Gauges



The RoughRider is designed to withstand the vibration and shock inherent in mobile service. Their service life in over-the-road and off-road transports carrying liquids including LP Gas, NH3, and cryogenic liquids is unsurpassed. These gauges provide accurate indications of liquid level at a glance, making inconvenient rotary gauges obsolete. RoughRider gauges are equipped with an exclusive spring steel shock absorber on the float arm which substantially reduces the stress that can quickly destroy conventional gauges.

Part #	Diameter of Tank	Dial
CM6339-11-72	72"	4"
CM6339-11-79	79"	4"
CM6339-11-84	84"	4"
CM6339-11-96	96"	4"

Also available with 8" dial upon request.

Other size supports available by special order.

## RoboGauge



For mobile or stationary applications with manway. Make the change from your 1" NPT rotary type gauges to a direct-reading float gauge without tank alterations. LPG and NH3 tanks can change over to a direct reading float gauge by using Rochester Gauges ROBOGAUGE. This direct reading float gauge can be mounted in containers that have a 1" NPT opening and a manway. This is accomplished through the unique design that allows the gauge to be disassembled into two segments, inserting the head assembly from the outside of the container, then reattaching the support and float assembly inside the container.

Part #	Diameter of Tank
RRCM6339-11-72	72"
RRCM6339-11-84	84"
RRCM6339-11-86	86"

4" Dial not included. Must be ordered separately.

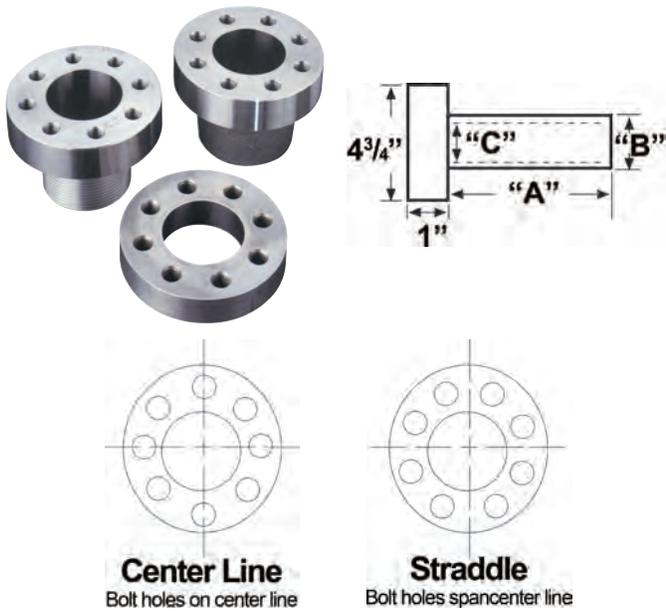
## Eliminator Rotogauge Replacement



A direct-reading float gauge that is a direct replacement for rotary-type, dip-tube gauges in LP and NH3 storage tanks. Only intended for use in tanks with fixed, liquid-level gauges.

Part #	Application	Tank Diameter Range
P6293-R6000	Mobile or Stationary	44" to 60"
P6293-R7200	Stationary	60" to 72"
P6293-R8400	Stationary	72" to 84"
5013S02051	Replacement Dial	Universal

## Magnetel® Mounting Flanges



Tank-mounting flanges are not included with Magnetel gauges and should be ordered separately. NOTE: Flanges welded to tank with top and bottom holes on the vertical centerline are standard with Rochester Gauges. When the flange is attached so that the bolt holes span the centerline (see drawing at the right), add the pre fix "X" to the Magnetel gauge model number.

Part #	Description	"A"	"B"	"C"
0022-00029	Forged Steel 2-1/2" NPT Threaded Neck Flange	2-3/8"	2-1/2" NPT	2-5/16"
0022-00030	Forged Steel Donut Type - No Neck Weld Flange	—	—	—
0022-00500	Forged Steel Weld Neck Flange	2-3/8"	Weld	2-5/16"

## Magnetel® Replacement Parts

Part #	Description
0003-00005	Glass crystal for 8" dial
0003-00408	Tempered glass crystal for 4" dial
0015-00010	Gasket under 8" crystal, two required
0015-00451	Channel gasket for 4" crystal
0015-00019	Mounting flange gasket – Spiral-wound stainless steel, Teflon filled
0040-00413	Stainless steel dial screw for 4" dial
0093S00001	4" dial chamber mounting bracket for RoughRider®
0093S00002	4" dial chamber mounting bracket for Stationary Applications
0093S00403	8" dial chamber mounting bracket
0059-00299	Easy View Angle Mount Dial Kit with 4" Direct Read Dial and angle brackets
0059-00300	Easy View Angle Mount Dial Kit with 4" Fluorescent Direct Read Dial and angle brackets

## Magnetel® Light Module



Provides dial illumination.

Part #	Description	Use with
0023S00031	Magnetel Light Module with 10 ft Cable*	4" Fluorescent R3D Dial
0023S00033	Magnetel Light Module with 10 ft Cable*	4" Black/Silver R3D Dial

\*Dial not included

## Magnetel® R3T



Provides on-demand digital display of tank levels to hand-held devices using the Rochester Gauges R3T App.

Part #	Description	Use with	Application
6316	R3T Wireless Transmitter with 1.5 ft of Module Cable	4" Dial	Mobile Applications Only

## Magnetel® Transmitter



This transmitter is designed to fit Rochester model 6342 and 6360 Magnetel float gauges with 8" dials. The transmitter provides a current output of 4-20 mA proportional to the liquid volume in a horizontal storage tank. Safety barrier provides intrinsic safe outputs.

Part #	Description
R6315-12	4-20mA Transmitter
0146S00001	Safety Barrier

## Magnetel® Replacement Dials

### Direct Read



5015S01403



5ARYS03066



5137S01262



5ARXS03045

Part #	Size	Liquid	Range
5015S00480	8" Dial Chamber	Any Liquid - 3% to 97%	3% to 97%
5015S01403	8" Dial Chamber	Combo for LPG & NH3 - 3% to 97%	3% to 97%
5ARYS03066	8" FLUORESCENT Dial Chamber	Combo for LPG & NH3 - 3% to 97%	3% to 97%
5016S00445	4" Dial Chamber	Any Liquid - Rough Rider	5% to 95%
5137S01262	4" Dial Chamber	Combo for LPG & NH3 - Rough Rider	5% to 95%
5ARXS03045	4" FLUORESCENT Dial Chamber	Combo for LPG & NH3 - Rough Rider	5% to 95%

### R3D Ready



5AACS02783



5ARWS03066



5ABPS02906



5APKS03045

Part #	Size	Liquid	Range
5AACS02783	Magnetel R3D Ready 8" Dial Chamber less TS Sender & Wire	Combo for LPG & NH3	3% to 97%
5ANGS03044	Magnetel R3D Ready 8" Dial Chamber less MR Module & Wire	Combo for LPG & NH3	3% to 97%
5ARWS03066	Magnetel R3D Ready 8" FLUORESCENT Dial Chamber less MR Module & Wire	Combo for LPG & NH3	3% to 97%
5ABPS02906	Magnetel R3D Ready 4" Dial Chamber less TS Sender & Wire	Combo for LPG & NH3	5% to 95%
5ANTS03047	Magnetel R3D Ready 4" Dial Chamber less MR Module & Wire	Combo for LPG & NH3	5% to 95%
5APKS03045	Magnetel R3D Ready 4" FLUORESCENT Dial Chamber less MR Module & Wire	Combo for LPG & NH3	5% to 95%

## Rochester Gauges Junior ASME/DOT Gauge Replacement Dials

Not All Dials are Represented



5909S02733



5909S02799



5909S02772



5AAAS02733



5AAAS02772



5364S01951

### Junior 4-Bolt for ASME/DOT

Part #	Tank Type	Dial Type	Gauge Series	Gas Type
5909S02733	Above Ground	R3D	6281	LPG
5909S02799	Below Ground	R3D	6281	LPG
5909S02733	Above Ground	R3D	6284	LPG
5909S02733	Above Ground	R3D	6284	LPG
5909S02772	Vertical Cylinder	R3D	6281	LPG
5323S01848	Above Ground	Direct Read	A6200/A6400	NH3

### Junior 1-1/4" NPT ASME/DOT

Part #	Tank Type	Dial Type	Gauge Series	Gas Type
5909S02733	Above Ground	R3D	7281	LPG
5909S02733	Above Ground	R3D	7284	LPG
5909S02733	Above Ground	R3D	7284	LPG

### Junior 1" NPT ASME/DOT

Part #	Tank Type	Dial Type	Gauge Series	Gas Type
5909S02733	Above Ground	R3D	8981	LPG
5909S02772	Vertical Cylinder	R3D	8981	LPG

### Junior 1" NPT Snap On ASME/DOT

Part #	Tank Type	Dial Type	Gauge Series	Gas Type
5AAAS02733	Above Ground Snap-On	R3D	8981	LPG
5AAAS02772	Vertical Cylinder Snap-On	R3D	8981	LPG
5364S01951	Above Ground or Vertical Cylinder Snap-On	Direct Read	8981	LPG

## Rochester Gauges Lift Truck/Mobile Gauge Replacement Dials

Not All Dials are Represented



5323S01789



5343S01791



5343S01992



5714S02591

### Junior 4-Bolt for Lift Truck/Mobile

Part #	Tank Type	Dial Type	Gauge Series	Gas Type
5323S01789	Horizontal	Direct Read	6200	LPG
5323S01852	Vertical	Direct Read	6200	LPG
5343S01815	20 lb Cylinder	Direct Read	6200/7200	LPG
5343S01791	33.5 lb Cylinder	Direct Read	6200/7200	LPG
5343S01824	43 lb Cylinder	Direct Read	6200/7200	LPG

### Junior 3/4" NPT for Lift Truck/Mobile

Part #	Tank Type	Dial Type	Gauge Series	Gas Type
5343S01992	33.5 lb Cylinder	Direct Read	7384	LPG
5343S01993	43 lb Cylinder	Direct Read	7384	LPG
5374S02445	20 lb Cylinder	Direct Read	7384-04	LPG
5374S02445	33.5 lb Cylinder	Direct Read	7384-04	LPG
5714S02591	Universal	Direct Read	7384-04	LPG

### Senior ASME 4-Bolt

Not All Dials are Represented



5986S02799



5986S02772

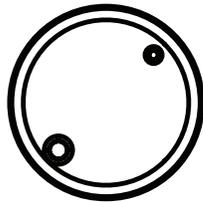


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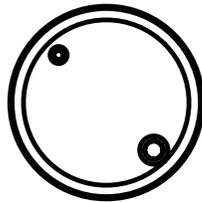
Part #	Tank Type	Dial Type	Gauge Series	Gas Type
5986S02733	Above Ground	R3D	6280	LPG
5986S02799	Below Ground	R3D	6280	LPG
5986S02772	Vertical Cylinder	R3D	6280	LPG
5986S02733	Above Ground	R3D	6283	LPG
5986S02733	Above Ground	R3D	6283	LPG
5844S01749	Above Ground	Direct Read	6283	LPG
5844S01848	Above Ground	Direct Read	A6200	NH3

Gauges

## Taylor Style Replacement



Style A



Style B

Part #	Tank Type	Style
5987S02787	Above Ground	A Backside detent lines up with the "E" mark on the front of dial
5988S02788	Above Ground	B Backside detent lines up with the "30%" mark on the front of dial

## Universal Dial Kit



Fits any LPG Float Gauge ever built. Complete instructions with each kit.

Part #	Description
3181-01749	Universal Dial Kit for Junior Style
3180-17001	Universal Dial Kit for Senior Style
3181-01848	NH3 Universal Dial Kit for Junior Style
3180-18002	NH3 Universal Dial Kit for Senior Style

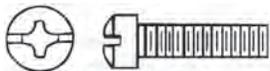
## Advanced Matrix Twinsite®

The TwinSite® is a magnetically-driven, variable-resistance sender with plotted lead wires. Senders are utilized on both mobile and stationary applications where direct reading plus an electrical signal to a remote receiver are required. Models are available to fit all Rochester Junior, liquid-level gauges equipped with our large Alnico drive magnet.

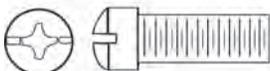


Part #	Description	Range
IP5628S02537	Junior TwinSite™ Sender (For GM)	0-90Ω
IP5630S02851	Junior TwinSite™ Sender (For Ford & Chrysler)	7.0-10Ω
P5638S02851	Junior TwinSite™ Sender (For Ram Van)	105-10Ω
IP5663S02527	Junior TwinSite™ Sender (For Ford)	20-15Ω
P5632S02539	Junior TwinSite™ Sender Switch	240-30Ω
IP5752S02599	Junior TwinSite™ Sender (For GM)	40-240Ω
9750-00005	Reed Switch Module with Wiring Harness	15-25% Resistance
9750-00007	Reed Switch Module with Wiring Harness	25-30% Resistance

## Screws



Junior



Senior

Part #	Style	Description
0040-00414	Junior	Screw - Combination Slotted or Phillips
0040-00415	Senior	Screw - Combination Slotted or Phillips
0040-00413	Junior	Screw - Stainless Steel for 4" Dial
0040-00416	Junior & Senior	Screw - For Dial Mounting
0040-00438	Senior	Stainless Steel Head Screws 5/16" - 24 x 7/8"
0040-00445	Junior	Stainless Steel Head Screws 1/4" - 28 x 7/8"
0040-00478	Senior	Screw - For N-Serv A6480 Gauge
0040-00675	Junior	Stainless Steel Screws for Brass Gauge Head 1/4" - 28 x 7/8"

## Gaskets



Part #	Description
0015-00004	Senior Gauge Gasket
0015-00007	Junior Gauge Gasket
0015-00019	Spiralwound Gasket, Teflon Filled for SS Head
0015-00022	Senior Gauge O-ring
0015-00021	Junior Gauge O-ring

# Pressure Gauges & OPD Valve Gauge Assembly

## Pressure Gauges

Especially designed in a variety of sizes and construction for the LP Gas & anhydrous ammonia industry.



Part #	Pressure Range	Dial Size	Case Material	Connection
J1640	0-15#	2"	Brass	1/4" Bottom
2411	0-30#	2"	Brass	1/4" M. NPT
J1442	0-30#	2"	Steel	1/4" Bottom
J2042	0-30#	2"	Steel	1/4" Back
2434-2	35" w.c. & 20 oz. (dual)	2-1/2"	Steel	1/8" hose
2434A-2	35" w.c. & 20 oz. (dual)	2-1/2"	Steel	1/4" hose
29276	0-35" w.c.	2-1/2"	Brass	1/4" M. NPT
5575	0-60#	2"	Brass	1/4" M. NPT
J1446	0-60#	2"	Steel	1/4" Bottom
J1448	0-100#	2"	Steel	1/4" Bottom
5576	0-100#	2"	Brass	1/4" M. NPT
J1456	0-300#	2"	Steel	1/8" Bottom
J1458	0-300#	2"	Steel	1/4" Bottom
948	0-300#	2"	Brass	1/4" M. NPT
J2058	0-300#	2"	Brass	1/4" Back
J5563	0-300#	4-1/2"	Brass	1/4" Bottom

## Liquid Filled Pressure Gauges



Part #	Pressure Range	Dial Size	Case Material	Connection
1008AL-30	0-30#	2-1/2"	Steel	1/4" Bottom
1008AL-300	0-300#	2-1/2"	Steel	1/4" Bottom
1008AL-400	0-400#	2-1/2"	Steel	1/4" Bottom
1008SB-400	0-400#	2-1/2"	Steel	1/4" Back
1008SSB-400	0-400#	2-1/2"	Stainless Steel	1/4" Back
1008SS-400	0-400#	2-1/2"	Stainless Steel	1/4" Bottom

## Pressure Gauge Snubber



Protects pressure gauge from shocks and pulsations.

Part #	Description	Size	Material
PL631-54	54# Orifice	1/4" F.NPT x 1/4" M.NPT	Brass

## OPD Valve Gauge Assembly

Includes all safety features of standard OPD valves with the added benefit of a visual gauge. Designed for installation in DOT cylinders.



Part #	Description
OPD-5	5 lb. Cylinder OPD Valve, 3.0" dip tube
OPD-10	10 lb. Cylinder OPD Valve, 3.6" dip tube
OPD-40	40 lb. Cylinder OPD Valve, 6.4" dip tube
OPD-20-GAUGE	20 lb. Cylinder OPD Valve with Dial, 4.0" dip tube
OPD-30-GAUGE	30 lb. Cylinder OPD Valve with Dial, 4.7" dip tube
OPD-DIAL	Dial Only for OPD-20-Gauge & OPD-30-Gauge
CYL20-OPD-SG	20 lb. Steel DOT Cylinder with Sight Gauge - SureFlame
907-12	Cap for Type II Cylinder Valve

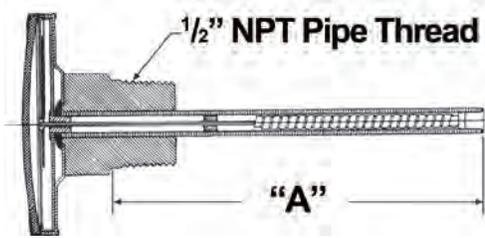
## LP & NH3 Bimetal Thermometers



These 2" bimetallic thermometers are commonly used on LP-Gas & NH3 storage tanks, bobtails, and transports. They are recommended for use only with thermowells. The thermometer is made of type 304 stainless steel, and the crystal is made out of extra-heavy, curved glass. The aluminum dial has a white face with large black numbers for easy readability. Actuation is by means of a highly sensitive bimetal element, dampened to minimize vibration, attached to a pointer. The unit is hermetically sealed.

### Standard Features

- 1/2" MNPT
- Dual Scale Calibration: -90° to +130°F, -70C to +50C, other ranges available.



Part #	Description	"A"
1750-00114	2" Bimetal Thermometer	4"
1750-00115	2" Bimetal Thermometer	6"
1750-00009	2" Bimetal Thermometer	9"
1750-00012	2" Bimetal Thermometer	12"

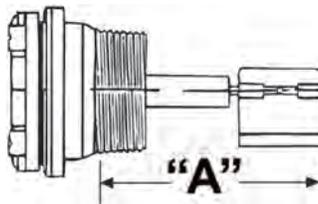
## Flow Indicator



Indicates direction of flow of compatible liquids in pipe lines at working pressures up to 600 psig up to 160°F. The indicator must be installed in pipe line tees. Specify Part Number and "A" Dimension

Part #	Length
6286-00325	3-1/4"
6286-00475	4-3/4"

Other lengths available on special order.



Tee Size	"A"
1-1/4" x 1-1/4" x 1-1/4"	3-1/4"
2" x 2" x 2"	3-1/4"
2-1/2" x 2-1/2" x 2-1/2"	3-1/4"
3" x 3" x 3"	4-3/4"
2-1/2" x 2-1/2" x 2-1/2" with 2-1/2" x 2" Bushing	4-3/4"
3" x 3" x 3" with 3" x 2" Bushing	4-3/4"

The distance from the top of the mounting adapter to the end of the vane is the "A" dimension. This dimension is dependent on the tee size, as shown.

## Flow Indicator Replacement Dial



Part #	Description
5013S00048	Flow Indicator Dial

## Blue Cap T-204 Series

- 2 Piece - 600 WOG
- 2 Viton® o-rings
- 100% leak tested
- Leakproof stem - Lifetime Warranty
- Valve can be locked in the closed position by reversing the handle

### FIP x FIP\*



Part #	Size	Type	Handle
<b>T-Handle</b>			
T-204-038T	3/8"	FIP x FIP	T-Handle
T-204-012T	1/2"	FIP x FIP	T-Handle
T-204-034T	3/4"	FIP x FIP	T-Handle
<b>Teardrop</b>			
T-204-038	3/8"	FIP x FIP	Teardrop
T-204-012	1/2"	FIP x FIP	Teardrop
T-204-034	3/4"	FIP x FIP	Teardrop

### Flare x FIP\*



Part #	Size	Type	Handle
<b>T-Handle</b>			
T-204-038FX012T	3/8" x 1/2"	Flare x FIP	T-Handle
T-204-012FX012T	1/2" x 1/2"	Flare x FIP	T-Handle
<b>Teardrop</b>			
T-204-038FX012	3/8" x 1/2"	Flare x FIP	Teardrop
T-204-012FX012	1/2" x 1/2"	Flare x FIP	Teardrop

### Flare x MIP\*



Part #	Size	Type	Handle
T-204-012FX012M	1/2" x 1/2"	Flare x MIP	T-Handle



Part #	Size	Type	Handle
T-204-038F	3/8"	Flare x Flare	Teardrop
T-204-012F	1/2"	Flare x Flare	Teardrop
T-204-058F	5/8"	Flare x Flare	Teardrop

## Blue Cap T-203 Series with Side Tap

- Eliminates need for test tee and labor to install
- Removable plug enables port for pressure gauge
- 2 Viton® o-rings
- 1/8" side tap
- 100% leak tested
- Ideal for use outside in extremely cold climates
- Valve can be locked in the closed position by reversing the handle
- Leakproof stem - Lifetime Warranty

### FIP x FIP\*



Part #	Size	Type
T-203-012	1/2"	FIP x FIP
T-203-034	3/4"	FIP x FIP

### Flare x Flare



Part #	Size	Type
T-203-038F	3/8"	Flare x Flare
T-203-012F	1/2"	Flare x Flare
T-203-058F	5/8"	Flare x Flare

\*FIP=Female Iron Pipe  
MIP=Male Iron Pipe

## Blue Cap T-204DU Series with Dielectric Union

- 2 Piece - Dielectric Union End - 600 WOG • Leakproof stem - Lifetime Warranty • Meets NFPA 58, Section 6.9.3.16 dielectric union requirement • 2 Viton® o-rings • Valve can be locked in the closed position by reversing the handle • 100% leak tested

### FIP x FIP\* DU



Part #	Size	Type
T-204DU-012	1/2" x 1/2"	FIP x FIP DU
T-204DU-034	3/4" x 3/4"	FIP x FIP DU

### Flare x MIP\* DU



Part #	Size	Type
T-204DU-012FX012	1/2" x 1/2"	Flare x MIP DU

### MIP DU x FIP\*



Part #	Size	Type
T-204DU-012MX012F	1/2" x 1/2"	MIP DU x FIP
T-204DU-034MX034F	3/4" x 3/4"	MIP DU x FIP

## T-SS-2000N

- 2 Piece - Standard Port - Threaded Connection - 2000 WOG with Lockable Handle



Part #	Size	Type	Material
T-100SS-014	1/4"	Threaded	Stainless Steel

\*FIP=Female Iron Pipe  
MIP=Male Iron Pipe

## T-100 Series

- 2 Piece - Full Port - 600 WOG • Blow-out proof stem • Triple sealing stem with 2 Viton® o-rings and Teflon® seal • 100% leak tested • Leakproof stem - Lifetime Warranty



Part #	Size
T-100-014	1/4"
T-100-038	3/8"
T-100-012	1/2"
T-100-034	3/4"
T-100-100	1"
T-100-114	1-1/4"
T-100-112	1-1/2"
T-100-200	2"

## T-CS-2000N-SS

- 2 Piece - Standard Port - 2000 WOG - Carbon Steel Body with Stainless Steel Trim with Lockable Handle.



Part #	Size
T-CS2000SS-014	1/4"
T-CS2000SS-012	1/2"
T-CS2000SS-034	3/4"
T-CS2000SS-100	1"
T-CS2000SS-114	1-1/4"
T-CS2000SS-112	1-1/2"
T-CS2000SS-200	2"

# Ball Valves

## T-SS-1000N

- 3 Piece 4 Bolt - Swing Out Body - Full Port - 1000 WOG with Lockable Handle - Stainless Steel Construction



Item #	Size	Type
500-304	3/4"	Threaded
500-305	1"	Threaded
500-306	1-1/4"	Threaded
500-307	1-1/2"	Threaded
500-308	2"	Threaded
500-310	3"	Threaded
500-311	4"	Threaded

## 3-Way Ball Valves

- Standard Port Blow-out Proof Stem Design 400 WOG



Part #	Size	Type
70-603	1/2"	Bronze F. NPT threads
70-604	3/4"	Bronze F. NPT threads

## 3" Brass Body Ball Valve

- 2 Piece - Standard Port - 2000 WOG - with Stainless Steel Trim



Part #	Description
BV100-48	3" 100% Full Port

## 175-LWN

- Utility Gas Ball Valve - Full Port - 175 PSIG



Part #	Size	Type
240-003B	1/2"	Lockwing
240-004B	3/4"	Lockwing

## Barrel Lock

High Security Lock for Utility Valves and Meters



Part #	Description
267253	Barrel Lock Heads 25/PACK USE W/ #267237
267237	Barrel Lock Studs 25/PACK USE W/ #267253
267254	Key for Barrel Lock

## Accessories



Part #	Description	Size
899-705	Yellow Lever Handle Fits T-100	1", 1-1/4"
899-708	Yellow Lever Handle Fits T-100	1-1/2", 2"

## Repair Kits

Part #	Description
899-916	Repair Kit for T-CS-1000
899-917	Repair Kit for T-SS-1000
899-918	Repair Kit for T-CS-10004B-200
899-920	Repair Kit for 3" JOMAR SS BALL VALVE

# Needle Valves

## Needle Valve



Part #	Inlet Connection	Outlet Connection	Height	Length
1224WA	1/4" M.NPT	1/4" M.NPT	1-9/16"	1-3/4"

Brass Seat Shut-Off Valve for Non-Corrosive Gases



Part #	Inlet Connection	Outlet Connection	Material	Max. Working Pressure PSIG
V-332	1/4" F.NPT	1/4" F.NPT	Brass	3,000
V-333	1/4" M.NPT	1/4" M.NPT	Brass	3,000
V-334	1/4" F.NPT	1/4" M.NPT	Brass	3,000
V-335	1/4" M.NPT	1/4" F.NPT	Brass	3,000
V-3055P	1/4" F.NPT	1/4" M.NPT	Brass	3,000

Carbon Steel Needle Valves Suitable for NH3



Part #	Inlet Connection	Outlet Connection	Material	Flow Through
V-334CS-90	1/4" M.NPT	1/4" F.NPT	Carbon Steel	Straight
V-334CSFM	1/4" F.NPT	1/4" M.NPT	Carbon Steel	90 Degree

## Type L Copper Tubing



Part #	O.D. Size	Length
1/4 TYPE L 60	3/8"	60 FT
1/4 TYPE L 100	3/8"	100 FT
3/8 TYPE L 60	1/2"	60 FT
3/8 TYPE L 100	1/2"	100 FT
1/2 TYPE L 60	5/8"	60 FT
1/2 TYPE L 100	5/8"	100 FT

## Flare Bonnet



Part #	Size
B1-6	3/8"
B1-8	1/2"
B1-10	5/8"

## J Tubing Clip



Part #	Size
J-6-8-M	3/8" & 1/2"
J-10-M	5/8"

## Copper Refrigeration Tubing



Part #	O.D. Size	Length
38032-50	3/8"	50 FT
38032-100	3/8"	100 FT
12032-50	1/2"	50 FT
12032-100	1/2"	100 FT
58035-50	5/8"	50 FT
58035-100	5/8"	100 FT

## Short Forged Flare Nut



Part #	Size
NS4-6	3/8"
NS4-8	1/2"
NS4-10	5/8"

## Flare to Male Pipe Union



Part #	Size
U1-4A	1/4" x 1/8"
U1-4B	1/4" x 1/4"
U1-4C	1/4" x 3/8"
U1-6A	3/8" x 1/8"
U1-6B	3/8" x 1/4"
U1-6C	3/8" x 3/8"
U1-6CL	3/8" x 3/8" NPT LONG
U1-6D	3/8" x 1/2"
U1-6DL	3/8" x 1/2" NPT LONG
U1-6E	3/8" x 3/4"
U1-6EL	3/8" x 3/4" NPT LONG
U1-8B	1/2" x 1/4"
U1-8C	1/2" x 3/8"
U1-8CL	1/2" x 3/8" NPT LONG
U1-8D	1/2" x 1/2"
U1-8DL	1/2" x 1/2" NPT LONG
U1-8E	1/2" x 3/4"
U1-8EL	1/2" x 3/4" NPT LONG
U1-10C	5/8" x 3/8"
U1-10D	5/8" x 1/2"
U1-10DL	5/8" x 1/2" NPT LONG
U1-10E	5/8" x 3/4"
U1-10EL	5/8" x 3/4" NPT LONG

## Coated Copper Refrigeration Tubing



Part #	O.D. Size	Length
CRF06-50	Coated - 3/8"	50 FT
CRF06-100	Coated - 3/8"	100 FT
CRF08-50	Coated - 1/2"	50 FT
CRF08-100	Coated - 1/2"	100 FT
CRF10-50	Coated - 5/8"	50 FT
CRF10-100	Coated - 5/8"	100 FT

## Short Forged Reducing Flare Nut



Part #	Size
NSR4-86	1/2" x 3/8"
NSR4-106	5/8" x 3/8"
NSR4-108	5/8" x 1/2"

## Space Heater Union



Part #	Size
U2CT-6	3/8" Peanut x 3/8" Peanut

## Flare to Female Pipe Union



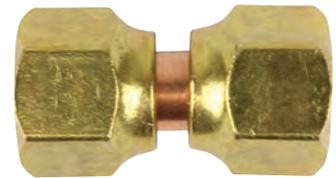
Part #	Size
U3-4B	1/4" x 1/4"
U3-6A	3/8" X 1/8"
U3-6B	3/8" x 1/4"
U3-6C	3/8" x 3/8"
U3-6D	3/8" x 1/2"
U3-6E	3/8" x 3/4"
U3-8C	1/2" x 3/8"
U3-8D	1/2" x 1/2"
U3-8E	1/2" x 3/4"
U3-10D	5/8" x 1/2"
U3-10E	5/8" x 3/4"

## Flare to Female Pipe Elbow



Part #	Size
E3-6B	3/8" x 1/4"
E3-6C	3/8" x 3/8"
E3-6D	3/8" x 1/2"
E3-6E	3/8" x 3/4"
E3-8C	1/2" x 3/8"
E3-8D	1/2" x 1/2"
E3-8E	1/2" x 3/4"
E3-10D	5/8" x 1/2"
E3-10E	5/8" x 3/4"

## Swivel Flare Connection



Part #	Size
US4-6	3/8" x 3/8"
US4-8	1/2" x 1/2"
US4-10	5/8" x 5/8"

## Reducing Swivel Flare Connection



Part #	Size
US4-86	1/2 x 3/8
US4-108	5/8 x 1/2

## Flare to Male Pipe Elbow



Part #	Size
E1-4B	1/4" x 1/4"
E1-6A	3/8" x 1/8"
E1-6B	3/8" x 1/4"
E1-6C	3/8" x 3/8"
E1-6D	3/8" x 1/2"
E1-6E	3/8" x 3/4"
E1-8C	1/2" x 3/8"
E1-8D	1/2" x 1/2"
E1-8E	1/2" x 3/4"
E1-10C	5/8" x 3/8"
E1-10D	5/8" x 1/2"
E1-10E	5/8" x 3/4"

## Flare Union



Part #	Size
U2-4	1/4" x 1/4"
U2-6	3/8" x 3/8"
U2-8	1/2" x 1/2"
U2-10	5/8" x 5/8"

## Reducing Flare Union



Part #	Size
UR2-64	1/4" x 3/8"
UR2-86	1/2" x 3/8"
UR2-106	5/8" x 3/8"
UR2-108	5/8" x 1/2"

## Reducing Flare Elbow



Part #	Size
ER2-106	5/8" x 3/8"
ER2-108	5/8" x 1/2"

## Flare Elbow



Part #	Size
E2-6	3/8" x 3/8"
E2-8	1/2" x 1/2"
E2-10	5/8" x 5/8"

## Cross



Part #	Size
102A-B	1/4"

## 45° Elbow Flare



Part #	Size
E1-45-6B	3/8" x 1/4"

## Flare Tee



Part #	Size
T2-6	3/8" x 3/8" x 3/8"
T2-8	1/2" x 1/2" x 1/2"
T2-10	5/8" x 5/8" x 5/8"

## Reducing Flare Tee



Part #	Size
TR2-6610	3/8" x 3/8" x 5/8"
TR2-668	3/8" x 3/8" x 1/2"
TR2-10106	5/8" x 5/8" x 3/8"
TR2-10108	5/8" x 5/8" x 1/2"
TR2-868	1/2" x 3/8" x 1/2"
TR2-886	1/2" x 1/2" x 3/8"
TR2-8810	1/2" x 1/2" x 5/8"

## Flare to Male Pipe Tee



Part #	Size
T1-6B	3/8" x 3/8" x 1/4"
T1-6C	3/8" x 3/8" x 3/8"
T1-6D	3/8" x 3/8" x 1/2"
T1-8D	1/2" x 1/2" x 1/2"

## Flare Cap



Part #	Size
N5-4	1/4"
N5-6	3/8"
N5-8	1/2"
N5-10	5/8"
N5-GA-10	15/16"

## Dielectric Union



Part #	Description
703-102	1/2" MIP x 3/8" Flare
703-103	1/2" MIP x 1/2" Flare
703-104	1/2" MIP x 5/8" Flare
704-102	3/4" MIP x 3/8" Flare
704-103	3/4" MIP x 1/2" Flare
704-104	3/4" MIP x 5/8" Flare

## POL Plug



Part #	Description
POL-P2	POL Plug

## Flare Plug



Part #	Size
P2-4	1/4"
P2-6	3/8"
P2-8	1/2"
P2-10	5/8"

## POL to Flare



Part #	Size
POL-U2-6	POL X 3/8"
2906F	POL X 3/8"
POL-U2-8	POL X 1/2"
2906E	POL X 1/2"
POL-U2-10	POL X 5/8"

## POL Cap



Part #	Size
POL-N5	.880-14LH Thread

## Coupling



Part #	Size
103A-B	1/4" x 1/4"

## Hex Nipple



Part #	Size
122A-A	1/8"
122A-B	1/4"

## Reducing Adapter



Part #	Size
120A-BA	1/4" x 1/8"

## Street Elbow



Part #	Size
116AL-B	1/4" x 1/4"

## Female Pipe Tee



Part #	Size
101A-A	1/8" x 1/8" x 1/8"
101A-B	1/4" x 1/4" x 1/4"

## Permasert 2.0 Installation Procedure

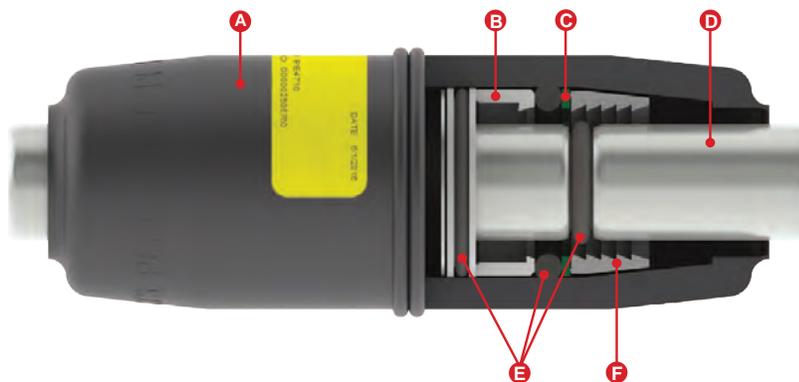
The following guide is for Permasert 2.0 installation procedure reference only. Permasert 2.0 couplings require training on the complete installation procedure before installing any Permasert 2.0 product. Please refer to Honeywell Permasert 2.0 installation instruction document P/N 57640 Rev. A for proper installation procedures.

### Standard Couplings 1-1/4" CTS or Smaller

1. Cut the tubing so that the end is square.
2. Wipe the tubing with a dry clean cloth.
3. Inspect Tubing for surface defects.  
If excessive scratches or gouges are visible, cut off the defective area and repeat steps 1-3.
4. Using the Honeywell chamfer tool, insert the tube and rotate the tool to chamfer both the outer diameter (O.D.) and the inner diameter (I.D.) of the tube. Continue until the tube bottoms out.
5. Using a soft marking tool (felt tip, pen, crayon or grease pencil) mark the tube at the end of the chamfer. This process will mark the stab depth. Remove chamfer tool.
6. Stab tubing into the coupling until it bottoms out. The reference mark will be:
  - Within 1/8" of moisture seal on 1/2 CTS through 1 CTS sizes.
  - Within 1/4" on 1" IPS and 1-1/4 CTS.
7. Pressure test the finished joint according to your standard operating procedure. The reference mark can move outward up to an additional 3/8" during pressure testing.



## Permasert 2.0 Mechanical Gas Couplings



- A** Permasert 2.0 Coupling: Molded from PE4710 resin. Meets or exceeds US DOT Part 192; ASTM D2513, Category 1; ASTM F1924; NFPA 58; CSA 137.4. IAPMO/UPC listed.
- B** Spacer Retainer Ring: Centers pipe and provides a redundant activation mechanism for the collet.
- C** Thrust Washer: Provides even distribution of force on the collet.
- D** Stiffener: Zinc-plated steel stiffener guarantees proper alignment and adds support for full restraint.
- E** Seals: BUNA-N (Nitrile) elastomers provide a redundant sealing system.
- F** Collet: Tapered gripping collet prevents pipe pull-out.

### Specifications

#### **BODY**

Gas Grade Polyethylene (PE4710)

**Collet:** Acetal (POM)

**Thrust Washer:** Polyethylene (PE)

**Seals:** BUNA-N (Nitrile)

**Spacer Retainer Ring:** Acetal (POM)

**Stiffener:** Zinc-Plated Carbon Steel

#### **TESTING**

**Pull-Out Resistance:** ASTM D2513 Category 1

- 0.2 ipm
- 20 ipm
- Full Seal + Full Restraint, PE Yields

**Hydrostatic:** ASTM D1598

- 670 psi (4.6 MPa) Hoop Stress
- 176°F (80°C)
- Pass

**Quick Burst:** ASTM D1599

- Pass

#### **PRESSURE RATINGS**

Couplings are designed to meet or exceed the maximum allowable operating pressure (MAOP) requirements of the piping system: 125 psig MAOP, or the rating of the installed tubing.

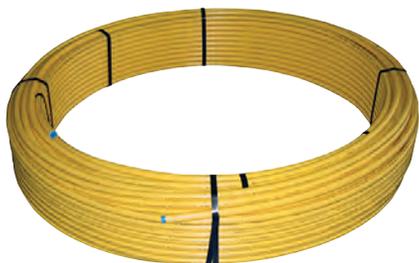
#### **SIZES**

½ in. CTS through 2 in. IPS

## IMPORTANT NOTICE

Qualified Training Requirements for Perfection Permasert Mechanical Couplings Installation  
 The Code of Federal Regulation (CFR), Title 49, - Transportation, has been interpreted by various Authorities Having Jurisdiction (AHJ) to require all installers of mechanical fittings for use on polyethylene (PE) piping for fuel gas distribution systems to meet the Part 192 qualified installer requirements; including certification training and annual re-certification training.  
 In addition, for installations that may not fall under 49 CFR 192 authorizations; NFPA 58 also requires Qualification of Personnel in Section 4.4.3 (2014 ed.) with refresher training provided at least every 3 years and initial and subsequent refresher training shall be documented.  
 The qualified training/certification requirement is generally interpreted as the responsibility of the operator, not the manufacturer or distributor, meaning the operator or installer is responsible for keeping their certification up-to-date.

## Plastic Polyethylene Piping



Part #	Coil Length	I.D.	Nominal O.D.	SDR/Wall	Minimum Wall Thickness
012-CTS-500FT	500 ft	1/2"	0.625"	7	.090"
034-IPS-500FT	500 ft	3/4"	1.050"	11	.095
100-IPS-500FT	500 ft	1"	1.315"	11	.120"
114-IPS-M-500FT	500 ft	1-1/4"	1.660"	10	.166"
200-IPS-M-250FT	250 ft	2"	2.375"	11	.216"

## Metallic Locator Tape & Wire



Part #	Description	Size
MAGNATEC	Metallic Tape	2" x 1,000 ft. Roll
TW-500#14-CH	Tracer Wire PE Coated	500 ft Spool

## Permasert Elbows



Part #	Size	SDR/Wall
PC50294	1/2" CTS	.090"
PC51620	3/4" IPS	SDR11
PC50636	1" IPS	SDR11
PC50325010	1-1/4" IPS	SDR10

## Permasert Mechanical Couplings



Part #	Size	SDR/Wall
PC50100	1/2" CTS	.060"
PC50030	3/4" IPS	SDR11
PC50103	1" CTS	.099/.102"
PC50601	1" IPS	SDR11
PC50035010	1-1/4" IPS	SDR10
PC50314	2" IPS	SDR11

## Permasert Blind End Caps



Part #	Size	SDR/Wall
PC50016	1/2" CTS	.090"
PC50026	3/4" IPS	SDR11
PC50033	1-1/4" IPS	SDR 9.3/10
PC50317	2" IPS	SDR11

## Permasert Blind End Stubs



Part #	Size	SDR/Wall
PC50612	1" IPS	SDR11

## Permasert Reducing Couplings



Part #	Size	SDR/Wall	Size	SDR/Wall
PC50969	3/4" IPS	SDR11	1/2" CTS	.090"
PC51432	1" IPS	SDR11	3/4" IPS	SDR11
PC50343010	1-1/4" IPS	SDR10	1" IPS	SDR11
PC50333010	2" IPS	SDR11	1-1/4" IPS	SDR10

## Permasert Repair Couplings



Part #	Size	SDR/Wall	Overall Length
PC50056	1/2" CTS	.090"	12"
PC50175	3/4" IPS	SDR11	12"
PC50640	1" IPS	SDR11	13"
PC50341	2" IPS	SDR11	15-1/2"

## Permasert Three-Way Tees



Part #	Size	SDR/Wall
PC50199	1/2" CTS	.090"
PC50929	3/4" IPS	SDR11
PC50634	1" IPS	SDR11
PC50327010	1-1/4" IPS	SDR10
PC50316	2" IPS	SDR11

## Permasert Three-Way Reducing Tees



Part #	Size	SDR/Wall	Size	SDR/Wall	Size	SDR/Wall
PC50461	3/4" IPS	SDR11	3/4" IPS	SDR11	1/2" CTS	.090"
PC50635	1" IPS	SDR11	1" IPS	SDR11	3/4" IPS	SDR11
PC50557	1-1/4" IPS	SDR10	1-1/4" IPS	SDR10	1" IPS	SDR11

## Servi-Sert Field Assembled Risers

With Liners, Swivel Connector/Union



Part #	Outlet	Inlet	SDR/Wall	Overall Length	Type
PT71353	1/2" M.NPT	1/2" CTS	.090"	84"	All-Flex
PT71354	1/2" M.NPT	1/2" CTS	.090"	36"	All-Flex
PT71355	3/4" M.NPT	1/2" CTS	.090"	84"	All-Flex
PT71461	3/4" M.NPT	1/2" CTS	.090"	60"	All-Flex
PT71356	3/4" M.NPT	1/2" CTS	.090"	36"	All-Flex
PT71412	3/4" M.NPT	3/4" IPS	SDR11	84"	All-Flex
PT71411	3/4" M.NPT	3/4" IPS	SDR11	60"	All-Flex
PT71410	3/4" M.NPT	3/4" IPS	SDR11	36"	All-Flex
PT71731	1" M.NPT	1" IPS	SDR11	18"/36"	Stub Flex

## Anodeless Service Line Risers - Transition Fittings

Anodeless Service Line Risers - Permasert® Mechanical Ends



Part #	Outlet	Inlet	SDR/Wall	Vertical	Horizontal
PM77205	1/2" M.NPT	1/2" CTS	.090"	18"	18"
PM77195	3/4" M.NPT	1/2" CTS	.090"	18"	18"
PM77201	3/4" M.NPT	1/2" CTS	.090"	22"	18"
PM77181	3/4" M.NPT	1/2" CTS	.090"	30"	24"
PG79354	3/4" M.NPT	3/4" IPS	SDR11	30"	24"
PG79350	1" M.NPT	1" IPS	SDR11	30"	24"
PG75901	1-1/4" M.NPT	1-1/4" IPS	SDR10	30"	24"
PG75906	2" M.NPT	2" IPS	SDR11	34"	16"

## Transition Fittings



Part #	Description	Size	SDR/Wall
PE700004	Threaded	1/2" M.NPT x 1/2" CTS	.090"
PE700205	Threaded	3/4" M.NPT x 1/2" CTS	.090"
PE700802	Threaded	3/4" IPS x 3/4" IPS	SDR11
PE701202	Threaded	1" IPS x 1" IPS	SDR11
PE702204	Threaded	1-1/4" IPS x 1-1/4" IPS	SDR10
PE702602	Threaded	2" IPS x 2" IPS	SDR11

## Servi-Sert Fittings



Part #	NPT Male (Outlet)	PE Size	SDR/Wall	NPT Female (Inlet)
PT71110*	1/2"	1/2" CTS	.090"	3/4"
PT71161	3/4"	3/4" IPS	SDR11	1-1/4"

## PermaSert PSV Polyethylene Shut-off Valves — PermaSert Outlet Ends



Part #	Size	SDR/Wall
PV45200	1" IPS	SDR11
PV46011	2" IPS	SDR11

## Coppersert Copper-to-PE Transition Couplings



Part #	Copper Size	PE Size	SDR/Wall
PS41007	3/8" O.D.	1/2" CTS	.090"
PS41013	1/2" O.D.	1/2" CTS	.090"
PS41002	5/8" O.D.	1/2" CTS	.090"
PS41130	5/8" O.D.	3/4" IPS	SDR11

## Tools & Accessories

### Cutting Tools



Part #	Description	Size
PE55225	Plastic Cutter	Capacity: 1-1/4" CTS
PE55225B	Blade Replacement	
PE55227	Plastic Cutter	Capacity: 2" IPS

## PermaLock Mechanical Tapping Tees



Part #	Main Size	Outlet Size	SDR/Wall
PL55901	2" IPS	3/4" IPS	SDR11
PL55982	2" IPS	1-1/4" IPS	SDR10

## Tools & Accessories

### Chamfering Tools



Part #	Description	Size
PE58500	ID/OD Chamfering Tool	1/2" CTS
PE58503	ID/OD Chamfering Tool	3/4" IPS
PE58505	ID/OD Chamfering Tool	1" IPS
PE58507	ID/OD Chamfering Tool	1-1/4" IPS
PE58509	ID/OD Chamfering Tool	2" IPS



The following information is excerpted from the FlashShield™ Design & Installation Guide - January 2019. For the complete and most up-to-date FlashShield™ Design & Installation Guide, please visit the Gastite website at [www.gastite.com](http://www.gastite.com).

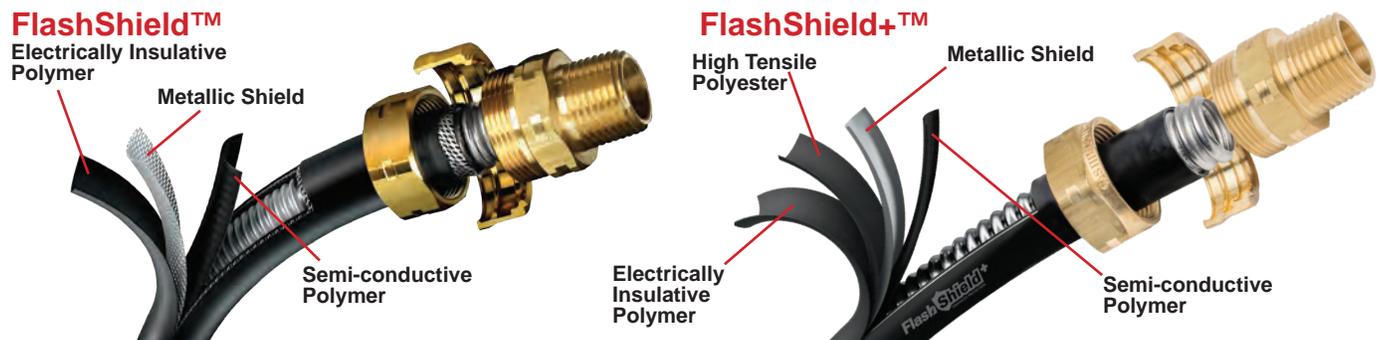
Throughout the following information, the term FlashShield™ will apply to both FlashShield™ and FlashShield+™ except where FlashShield+™ is specifically referenced.

## FlashShield™ INSTALLER INFORMATION & UPDATES

- 1) The XR3-series fitting is designed to work on Gastite and FlashShield CSSTs. However, CSST end prep varies by CSST product type. Reference the chart below for proper CSST end-prep and bushing replacement for the product you have selected.

Product	CSST End-Prep	Bushing Placement
Two-Step End Prep FlashShield CSST		
One-Step End Prep FlashShield+™ or Gastite CSST		

- 2) **Licensed Installers Only.** Every installer of FlashShield™, FlashShield+™, or Gastite® must first meet all applicable qualifications in accordance with state and/or local requirements as established by the administrative authorities that enforce the plumbing or mechanical codes where gas piping is installed.
- 3) **Qualified Installers Only.** In addition to be licensed in the jurisdiction, FlashShield™, FlashShield+™, or Gastite® corrugated stainless steel tubing (CSST) flexible gas piping material must only be installed by an installer who has been successfully trained through the FlashShield™ and Gastite® training program.
- 4) **Check for Updates.** Installers must check with their local distributor or at [www.gastite.com](http://www.gastite.com) for technical bulletins or updated Design & Installation Guides for FlashShield™, FlashShield+™, or Gastite® every year.
- 5) **Proper Installation.** Sound engineering principles and practices must be exercised for the proper design of fuel gas piping systems, in addition to compliance with local codes. The installation instructions and procedures contained in this Design & Installation Guide must be strictly followed in order to provide a safe and effective flexible fuel gas piping system or system modification. All installations must pass inspections by the local official having authority prior to having the gas service turned on. All requirements of the local natural gas utility or propane supplier must also be met.



## FlashShield™ GENERAL USER WARNINGS

**The installation of FlashShield™ Flexible Gas Piping must be performed by a qualified installer who has successfully completed the FlashShield™ training program. Certification training is available through qualified distributors, and at [www.gastite.com](http://www.gastite.com). The installer must meet all qualifications and requirements to install gas piping as required by the local administrative authority. Improper installation or operation of a FlashShield™ Flexible Gas Piping system may result in fire, explosion or asphyxiation.**

The complete FlashShield™ Design and Installation Guide (D&I Guide) provides the user with general guidance when designing and installing fuel gas piping using FlashShield™ Flexible Gas Piping. This guideline must be used in conjunction with all applicable building standards and codes. In the event that there is a conflict between this guideline and local code the more stringent requirement will take precedence.

 **WARNING:** This product can expose you to chemicals including Lead and Nickel, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to: [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

The use of fuel gas can be dangerous. Special attention must be given to the proper design, installation, testing and application of the gas piping system. Sound engineering practices and principles must be exercised, as well as diligent adherence to the proper installation procedures to ensure the safe operation of the piping system. All installed systems must pass customary installation inspections by the local building official having authority prior to being placed into service.

Only the components provided or specified by Gastite, as part of the FlashShield™ flexible fuel piping system are to be used in the installation. Use of components from other flexible gas piping systems other than those specified as part of the FlashShield™ system is prohibited and may result in poor system performance and serious bodily injury or property damage. Where additions, repairs or replacements involve corrugated stainless steel tubing systems from manufacturers other than Gastite Division, the systems should be joined using standard pipe fittings at the interface.

The FlashShield™ D&I Guide cannot take into account all situations or locations in which FlashShield™ flexible gas piping will be installed. Accordingly, installers should also take into account guidance provided by the National Fuel Gas Code, ANSI Z223.1/NFPA-54, National Standard of Canada, Natural Gas and Propane Installation Code B149.1, the Uniform Plumbing Code, the International Code Series, the Federal Manufactured Home Construction and Safety Standards, 24 CFR Part 3280, the Manufactured Housing Construction and Safety Standards, ICC/ANSI 2.0 or the Standard on Manufactured Housing, NFPA 501. Gastite Division shall have no responsibility for any misinterpretation of the information contained in the FlashShield™ D&I Guide or any improper installation or repair work or other deviation from procedures recommended in the FlashShield™ D&I Guide, whether pursuant to local building codes or engineering specifications or otherwise.

Gastite Division makes no representation or warranty, and nothing contained in the FlashShield™ D&I Guide shall imply that the guide contains the best or the only approved method for installing corrugated stainless steel piping systems or that the D&I Guide's contents are appropriate for all circumstances.

In the event that there is a conflict between this guideline and local code the more stringent requirement will take precedence. Performance of accessory devices, such as pressure regulators and shut off valves should be reconfirmed by contacting the accessory device manufacturer and receiving the latest technical data on sizing, installation and performance.

A FlashShield™ Flexible Gas Piping system offers advantages over other gas delivery systems because of its corrugated design. In contrast to rigid steel pipe, FlashShield™ does not require intermediate joints in most installations because the tubing is capable of being installed in one continuous run, reducing not only the total number of joints, but also the potential for leaks at joints. FlashShield's flexibility also affords more installation options because an installer can avoid existing obstacles, and it eliminates the repetitive measuring, cutting, threading and joint assembly that is common with installation of rigid steel piping systems. FlashShield™ flexibility offers even further safety advantages in geographic areas that are prone to seismic activity because the tubing is able to move as the ground or the structure shifts.

While FlashShield™ provides significant advantages over more rigid gas delivery systems, its flexible design may make it more likely than steel pipe to be punctured by a nail or other sharp objects, or damaged by other extraordinary forces such as lightning strike, depending on the circumstances.

**Corrosive substances:** Steel piping, brass fittings and valves can be corroded by various chemical substances which may be present on a jobsite or in a structure. Chlorinated compounds can cause pitting and crevice corrosion of stainless steel. Ammonia and other nitrogenous compounds can cause stress corrosion cracking of brass. FlashShield's jacket system provides protection from many harmful substances and should remain intact over the lengths of stainless steel tubing to maintain this protection.

While not exhaustive, the list below provides guidance of substances which should not come into contact with stainless steel or brass. If there is a question about the suitability of a certain substance in the environment, the user should refer to the ingredient list or contact the manufacturer.

Chlorinated compounds (chloride, chlorite, chloric, chlorous, chloro, chlorate):

- Some household soaps\*
- Masonry cleaner (Muriatic acid)
- Soldering flux
- Bleach
- Pool chemicals
- Ice melt
- Soils, soil water, concrete

Ammonia and ammonium containing compounds:

- Household cleaners
- Fertilizers

Nitrogenous compounds, such as amines:

- Herbicides, pesticides, fungicides, insecticides

\* Some household soaps that contactors have used to make leak check solution may contain chlorides which can cause corrosion to metallic components. Only use leak test solution which are labeled as non-corrosive, for gas piping systems.

**Caution:** Tube ends are sharp, use care when handling

## LIMITATIONS OF THE GUIDELINES for FlashShield™

The FlashShield™ Design and Installation Guide is intended to aid the professional gas installer in the design, installation and testing of fuel gas piping systems using corrugated stainless steel tubing (CSST) for residential housing, commercial and industrial buildings. It would be impossible for this guideline to anticipate and cover every possible variation in building configurations, construction styles, appliance loads and code restrictions. Therefore, there will be applications that will not be covered by this guideline. For applications that go beyond the scope of this guideline, the installer should exercise sound engineering principles and practices and/or contact Gastite for engineering assistance.

The techniques outlined within this guideline are recommended practice for generic applications. These practices must be reviewed for compliance with all applicable local fuel gas and building codes. In the event that there is a conflict between this guide and local code, the more stringent requirement will take precedence.

Using components from other flexible gas piping systems other than those specified as part of the FlashShield™ system is prohibited and may result in poor system performance and serious bodily injury or property damage. Additional information pertaining to gas piping systems is available from your local gas utility or propane supplier. **Please visit the Gastite web site at [www.gastite.com](http://www.gastite.com) for additional updates and technical bulletins.**

## FlashShield™ INSTALLATION CHECKLIST DESCRIPTION

Corrugated Stainless Steel Tubing (CSST) has been design certified by the Canadian Standards Association since 1990 for use as a fuel gas piping system. Gastite./FlashShield™ CSST has been tested per ANSI LC1/CSA 6.26 as required for approval and as an approved gas piping material in the National Fuel Gas Code-NFPA 54 & 58, the International Fuel Gas Code-ICC, and with the Uniform Plumbing Code-IAPMO, and Natural Gas & Propane installation code B149.1.

## FlashShield™ STANDARDS, LISTINGS AND CODES

The FlashShield™ corrugated stainless steel tubing system complies with the following standards, listings and model codes.

### STANDARDS

ANSI LC1/CSA 6.26 – Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)  
ANSI LC1/CSA 6.26 – 25 PSI operating pressure rating  
ANSI LC1/CSA 6.26 – Arc Resistant (AR) Jacket Rating  
ICC-ES PMG LC1027 - Protective Jacketed CSST, A Minimum 36-Coulomb Charge Transfer

### LISTINGS

- CSA – CSA International - Certificate No. 2728525
- ICC – International Code Council – Evaluation Report Number PMG-1019, PMG-1066, PMG-1155
- IAPMO – International Association of Plumbing and Mechanical Officials – File Number 3250, Report #0239

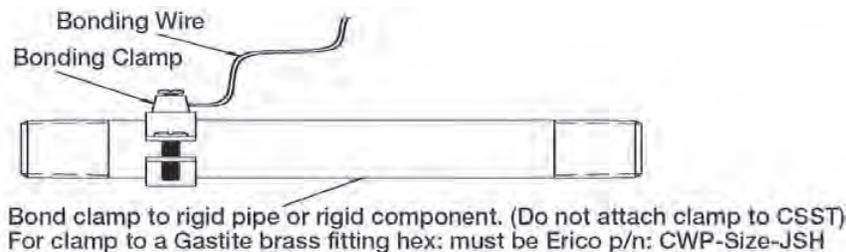
### CODE COMPLIANCE

- ICC – International Code Series
- Canada – National Gas & Propane Installation Code B149.1
- NFPA – National Fuel Gas Code (NFPA 54)
- UMC – Uniform Mechanical Code
- UPC – Uniform Plumbing Code

While every effort has been made to prepare the FlashShield™ D&I Guide in accordance with all regional model codes in effect at its printing, Gastite cannot guarantee that the local administrative authority will accept the most recent version of these codes. It is the ultimate responsibility of the installer to determine suitability and acceptance of any building component including gas piping. Gastite assumes no responsibility for labor or material for installations made without prior determination of local code authority acceptance.

## ELECTRICAL BONDING OF FlashShield™ CSST

- a) There are no additional bonding requirements for FlashShield™ imposed by the manufacturer's installation instructions. FlashShield™ is to be bonded in accordance with the National Electrical Code NFPA 70 Article 250.104, Canadian Electrical Code, CSA-C22.1, in the same manner as the minimum requirements for rigid metal piping. However, installers must always adhere to any local requirements that may conflict with these instructions.
- b) If the authority having jurisdiction requires that all CSST systems shall be bonded, the gas piping system shall be considered to be direct and bonded when installed in accordance with the following:
  - A single bond clamp attachment to rigid pipe or rigid component at any point within the gas piping system
    - Bond clamp attachment downstream of individual gas meter or 2nd stage regulator for propane systems, and in accessible location
    - Metallic contact is required (remove paint or plating on steel pipe)
    - Bonding clamp listed to UL 467



- Bonding conductor is #6 AWG copper (minimum) or equivalent, and not exceeding 75 feet in length
  - The shortest practical bond wire length will improve the effectiveness of the direct bond
- The bonding conductor is permanently and directly connected to the electrical service grounding electrode system of the premises. This connection can be made at either:
  - Bonding buss
  - Grounding electrode conductor
  - Grounding electrode
- Any additional grounding electrodes used shall be bonded to the electrical service grounding electrode system
- Direct bonding to be performed by a person qualified to do so per local ordinances
- The bonding conductor shall be installed and protected in accordance with:
  - National Electrical Code, NFPA 70, (NEC)
  - Canadian Electrical Code, CSA-C22.1, (CEC)

## FlashShield™ APPROVAL: CONDITIONS AND REQUIREMENTS

A flexible gas piping system using FlashShield™ CSST must be installed in accordance with all local building codes and the manufacturer's instructions. The following checklist is designed to assist the local administrative authority to perform an inspection of a fuel gas piping system using corrugated stainless steel tubing.

- 1) FlashShield™ flexible gas piping may only be installed by a qualified installer who has successfully completed the manufacturer's certification training program. A manufacturer's certification card is required to purchase and install FlashShield™ flexible gas piping.
- 2) FlashShield™ CSST routed in a location which is concealed, constrained and within 3 inches of a potential threat must be protected against damage using protection devices listed in the manufacturer's Design and Installation Guide.
- 3) FlashShield™ CSST should not be connected to moveable appliances. Connections to moveable appliances such as ranges and clothes dryers should be accomplished with a flexible appliance connector.
- 4) Regulators are suitable for multi-poise mounting. When using a vent-limiting device however, the regulator must be mounted in a horizontal upright position.
- 5) The external protective jacket system shall remain intact on the CSST.
- 6) For installations buried underground, under concrete/asphalt or embedded in concrete, FlashShield™ CSST must be routed in a non-metallic watertight conduit which has an inside diameter at least 1/2 in. larger than the outside diameter of the tubing. Under concrete/asphalt slab, sleeved CSST must be buried in accordance with all local codes. No mechanical joints are permitted within the conduit.
- 7) Installation must be properly supported to not only keep the job professional and organized but also to prevent excess strain on the bends and fittings. Supports installed in addition to the practices outlined by Gastite Division, restricts the tubing and increases susceptibility to nail or screw strike damage.
- 8) Gas piping systems must be properly bonded to the structure's electrical service. A qualified professional following the NEC approved methods as outlined in Section 4.10 shall perform the bonding installation.

## FIELD FITTING ASSEMBLY PROCEDURE: XR3 FITTING (REV 2) TO FLASHSHIELD+™ CSST (single layer jacket)



### STEP 1 CUT-TO-LENGTH (FIG. 1)

Cut tubing to desired length using tubing cutter. Cut should be centered in a corrugation valley. Use light roller pressure with extra rotations in one direction to leave tubing round and free of burrs on cut.

To ensure a quality flare, all cuts should be made on a straight section of tubing.

*Note: Tube ends are sharp use caution when handling.*

### STEP 2 STRIP JACKET (FIG. 2, FIG. 3)

Using a utility knife, cut jacket back to the second valley from tubing end.

Do not cut the jacket in such a way that the steel tubing end is scored (this could affect seating).

Remove the short section of jacket which will expose one full corrugation valley of the tubing.

Optionally, use side-1 of FlashShield™ stripping tool for jacket strip.



### STEP 3 INSTALL NUT AND BUSHINGS (FIG. 4)

Thread fitting body (NPT thread) into valve or appliance connection. Slide nut onto CSST and back a few inches.

Separate bushings and position on tubing as shown, locating large bump into the valley of the first corrugation leaving one corrugation-peak exposed between the end of the bushing and tubing.

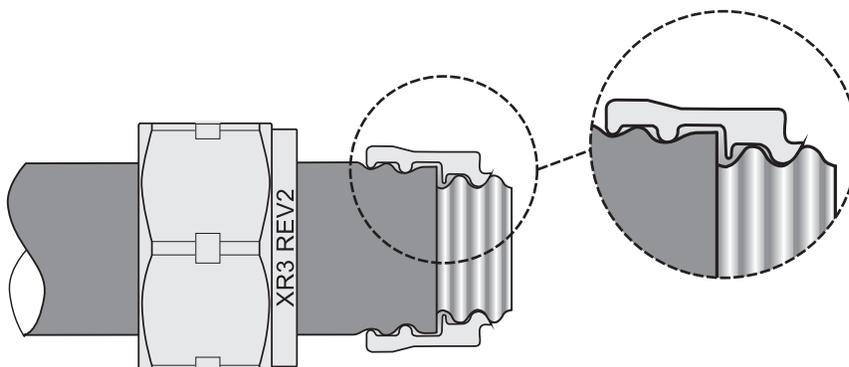


FIG. 1



FIG. 2



FIG. 3



FIG. 4

## FIELD FITTING ASSEMBLY PROCEDURE Con't: XR3 FITTING (REV 2) TO FLASHSHIELD+™ CSST (single layer jacket)



### STEP 4 POSITION BUSHINGS (FIG. 5)

Insert bushings into fitting body. A small amount of resistance indicates the bushings are being compressed to further capture the jacket.

Note: Pipe dope or sealant is not to be used inside the fitting.

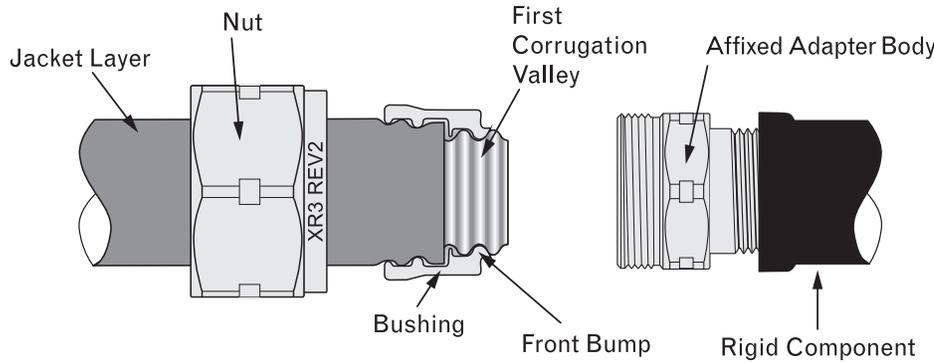


FIG. 5

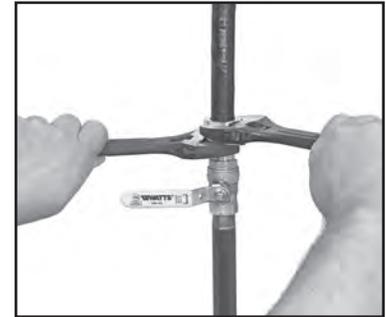


FIG. 6

### STEP 5 WRENCH FITTING (FIG. 6)

Slide nut over bushings and thread onto fitting body. Some resistance will be experienced as the nut begins to compress the tubing and create the double-wall flare. Continue to wrench the nut until the resistance increases greatly and the double-wall flare is tightly seated.

Note: Rotate the nut only during the tightening process. Do not rotate the fitting body.

CSST & Fittings

### RECOMMENDED TORQUE VALUES

SIZE	EHD	*TORQUE
3/8"	13	25 ft-lbs
1/2"	19	35 ft-lbs
3/4"	23	45 ft-lbs
1"	31	65 ft-lbs
1-1/4"	37	95 ft-lbs
1-1/2"	48	120 ft-lbs
2"	60	150 ft-lbs

Fitting is factory lubricated to reduce field torque requirements. Lubrication must be chloride free.

\* Minimum torque values supplied for lab testing reference only. Field installation requirements: system must pass pressure/leak test (See Section 6 of FlashShield™ Design & Installation Guide).

## FIELD FITTING ASSEMBLY PROCEDURE: XR3 FITTING TO FLASHSHIELD™ CSST (multi-layer jacket)



### STEP 1 CUT-TO-LENGTH (FIG. 1)

Cut tubing to desired length using tubing cutter. Cut should be centered in a corrugation valley. Use light roller pressure with extra rotations in one direction to leave tubing round and free of burrs on cut.

To ensure a quality flare, all cuts should be made on a straight section of tubing.

Note: Tube ends are sharp use caution when handling.



FIG. 1

### STEP 2 CUT & STRIP JACKET LAYERS (FIG. 2, FIG. 3, FIG. 4) Place cut-end of FlashShield™ tubing into Side 1 of the stripping tool up to the tube stop.

Cut 1: Close the stripping tool around tubing. Begin rotating the tool back and forth on the CSST (3 – 5, 200° twists) while applying pressure until the blades cut through all 3 jacket layers.

Strip: To remove jacket section, release pressure and grasp the tool from the end. Pull tool straight away from tubing while allowing the tool to open slightly so that the blades can clear the peaks of the corrugations. Remove and discard the stripped jacket layer(s) from the tool.

Cut 2: Turn stripping tool around to side 2 and place the stripped tubing end back in the tool up to the tube stop. While maintaining the tube against the tube stop, apply firm closing pressure and rotate the tool back and forth on the CSST (3-5, 200° twists) until the blades have cut through the outer plastic jacket layer only.

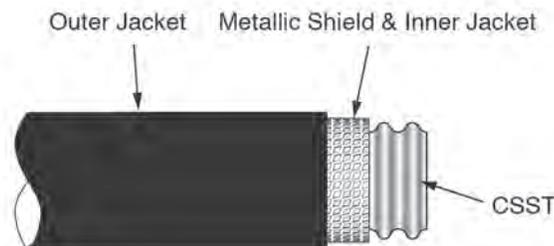
Strip: Maintain firm closing pressure and pull the tool straight away from the tube to use the blades to strip off the outer coating. Occasionally, a small portion of material may prevent complete stripping. Use the pliers feature at the corner of the tool to grab the material and pull it away.



FIG. 2



FIG. 3



Note: Accidentally cutting through the aluminum shield below the point of the outer jacket cut/strip location will reduce the effectiveness of the fitting to-shield electrical continuity, and FlashShield's electrical performance.



FIG. 4

## FIELD FITTING ASSEMBLY PROCEDURE Con't: XR3 FITTING TO FLASHSHIELD™ CSST (multi-layer jacket)



### STEP 3 INSTALL NUT AND BUSHINGS (FIG. 5)

Thread fitting body (NPT thread) into valve or appliance connection. Slide nut onto CSST and back a few inches. Separate bushings and position on tubing as shown, locating large bump into the valley of the first corrugation leaving one corrugation-peak exposed between the end of the bushing and tubing.

Note: Metallic shield contact feature must be utilized with FlashShield.

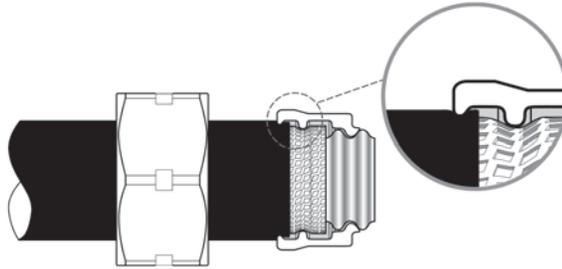


FIG. 5

### STEP 4 POSITION BUSHINGS (FIG. 6)

Insert bushings into fitting body. A small amount of resistance indicates the bushings are being compressed to further capture the jacket.

Note: Pipe dope or sealant is not to be used inside the fitting.



FIG. 6

### STEP 5 WRENCH FITTING (FIG. 7)

Slide nut over bushings and thread onto fitting body. Some resistance will be experienced as the nut begins to compress the tubing and create the double-wall flare. Continue to wrench the nut until the resistance increases greatly and the double-wall flare is tightly seated.

Note: Rotate the nut only during the tightening process. Do not rotate the fitting body.

Note: The use of XR3 series fittings in combination with Gastite yellow tubing is an acceptable practice.

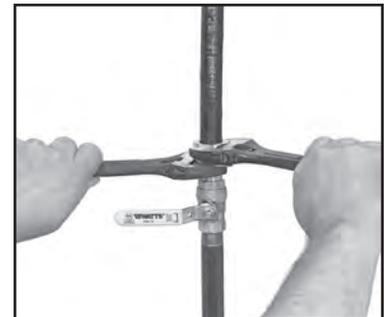


FIG. 7

FLASHSHIELD™ RECOMMENDED TORQUE VALUES		
SIZE	EHD	*TORQUE
3/8"	13	25 ft-lbs
1/2"	19	35 ft-lbs
3/4"	23	45 ft-lbs
1"	31	65 ft-lbs
1-1/4"	37	95 ft-lbs
1-1/2"	48	120 ft-lbs
2"	60	150 ft-lbs

Fitting is factory lubricated to reduce field torque requirements. Lubrication must be chloride free.

\* Minimum torque values supplied for lab testing reference only. Field installation requirements: system must pass pressure/leak test (See Section 6 of FlashShield™ Design & Installation Guide)

## Corrugated Stainless Steel Tubing (CSST)



### APPLICATION:

- CSST flexible gas piping supplies natural gas or liquefied petroleum gas to appliances.

### MATERIAL / SPECIFICATIONS:

- Tubing: ASTM A240 Type 304, Stainless Steel.
- Jacket: Electrically insulative and UV resistant polymer, complying with requirements of ASTM E84 and CAN/ULC-S102.2 25/50
- Protective jacket system complies with ICC-ES PMG LC1027.

### FEATURES AND BENEFITS:

- Electrically insulative polymer cover.
- Metallic shielded CSST.
- Protective shield is electrically continuous through fitting joints (Arc-Trap™).
- Metal shield layer dissipates and conducts electricity.
- No manufacturer required bonding.
- Flexibility means quick and easy installations. FlashShield+™ installs 30-70% faster than traditional piping methods.
- Pre-marked by the foot, there's no measuring, rigid pipe cutting or threading. This means less waste and fewer fittings.
- 75% fewer fittings in the average installation means a safer system, less leak potential and reduced callbacks.
- FlashShield+™ CSST is lightweight.

Part #	Description	Pkg. Qty.	Lbs.	Reel Size (Dia x Width)
<b>1/2" Tubing</b>				
FSP-8-50	1/2"	50 Ft/Box	8.3	21" x 6"
FSP-8-125	1/2"	125 Ft/Coil	28.8	20" x 12-1/2"
FSP-8-250	1/2"	250 Ft/Coil	49.5	20" x 12-1/2"
FSP-8-500	1/2"	500 Ft/Coil	95	24" x 25"
FSP-8-1000	1/2"	1,000 Ft/Coil	187	32" x 21-1/2"
FSP-8-1500	1/2"	1,500 Ft/Coil	270	32" x 21-1/2"
<b>3/4" Tubing</b>				
FSP-11-50	3/4"	50 Ft/Box	10.5	21" x 6"
FSP-11-125	3/4"	125 Ft/Coil	34.1	20" x 12"
FSP-11-250	3/4"	250 Ft/Coil	64.3	24" x 25"
FSP-11-500	3/4"	500 Ft/Coil	116.5	24" x 25"
FSP-11-1000	3/4"	1,000 Ft/Coil	230	32" x 21"
<b>1" Tubing</b>				
FSP-16-50	1"	50 Ft/Box	23.4	20" x 12"
FSP-16-75	1"	75 Ft/Coil	31	20" x 12"
FSP-16-150	1"	150 Ft/Coil	58.1	24" x 25"
FSP-16-300	1"	300 Ft/Coil	104.1	24" x 25"
FSP-16-500	1"	500 Ft/Coil	174.5	32" x 21"

CSST & Fittings

## Regulators

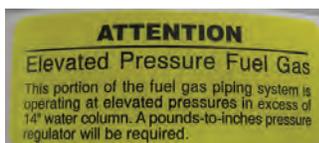
Application: For use in elevated pressure systems (in excess of 1/2 psi) to reduce pressure to standard appliance use levels.



Part #	Description	Max. Individual Load	Total Load of Multiple Appliances Combined	Max. Inlet Pressure	Outlet Pressure	NPT
GT-325-3L	Maxitrol	225,400 Btu/hr	805,000 Btu/hr	2 PSI	7-11 w.c.	1/2"
GT-325-5AL	Maxitrol	684,250 Btu/hr	966,000 Btu/hr	2 PSI	7-11 w.c.	3/4"
GT-325-7AL	Maxitrol	2,012,500 Btu/hr	2,012,500 Btu/hr	2 PSI	7-11 w.c.	1-1/4"

## System Identification

Adhesive Labels for are offered to identify elevated pressure systems.



Part #	Description
GT-EPAL-1-100	Adhesive Labels for elevated pressure identification

## XR3-Series Fittings

### APPLICATION:

- Straight Fittings connect the flexible gas tubing to gas supply, distribution manifolds or gas appliances.
- Couplings allow for the splicing and additions to the flexible gas tubing.
- Termination Fittings create a fixed point "stub-out" on a wall or floor surface.
- Termination Bracket Fittings provide a secure attachment point for key-valves and as an alternate termination point.

### MATERIAL / SPECIFICATIONS:

- Fitting adapter, bushings and nut – Brass.
- Square Flange – Steel with zinc coating or cast bronze.

### FEATURES AND BENEFITS:

- Metal-Lock for continuous conductivity.
- Tool-less flare design; Simple hand tools such as tubing cutters, wrenches and the Jacket Stripping Tool are all that are needed to work with the FlashShield components.
- Metal-to-metal seat, with no split rings, O-rings or gaskets.
- Self-guiding assembly to ensure a perfectly even flare.
- Exclusive, patented Jacket-Lock fitting eliminates exposed stainless steel beyond the nut.
- All components are fully reusable.



## XR3 Straight Fitting

**APPLICATION:** Connect the flexible gas tubing to gas supply, distribution manifolds, or gas applications.



Part #	Description
XR3FTG-8-24	1/2" XR3 Straight Fitting - 1/2" NPT
XR3FTG-11-24	3/4" XR3 Straight Fitting - 3/4" NPT
XR3FTG-16-12	1" XR3 Straight Fitting - 1" NPT
XR3FTG-20-6	1-1/4" XR3 Straight Fitting - 1-1/4" NPT
XR3FTG-24-4	1-1/2" XR3 Straight Fitting - 1-1/2" NPT
XR3FTG-32-4	2" XR3 Straight Fitting - 2" NPT

## XR3 Reducing Fitting

**APPLICATION:** Allow for the slicing and additions to the flexible gas tubing.



Part #	Description
XR3REDFTG-11-08-24	3/4" XR3 Reducing Fitting - 1/2" NPT
XR3REDFTG-16-12-12	1" XR3 Reducing Fitting - 3/4" NPT

## XR3 Coupling Fittings

**APPLICATION:** Allow for the slicing and additions to the flexible gas tubing.



Part #	Description
XR3CPL-8-12	1/2" XR3 Coupling
XR3CPL-11-12	3/4" XR3 Coupling
XR3CPL-16-6	1" XR3 Coupling
XR3CPL-20-6	1-1/4" XR3 Coupling
XR3CPL-24-4	1-1/2" XR3 Coupling
XR3CPL-32-4	2" XR3 Coupling

## XR3 Straight Female Fitting

**APPLICATION:** Connect the flexible gas tubing to gas supply, distribution manifolds or gas appliances.



Part #	Description
XR3FTGFM-8-24	1/2" XR3 Straight Fitting - 1/2" Female NPT
XR3FTGFM-11-8-24	3/4" XR3 Straight Fitting - 1/2" Female NPT
XR3FTGFM-11-24	3/4" XR3 Straight Fitting - 3/4" Female NPT

## XR3 Termination Fitting

**APPLICATION:** Creates a fixed point “stub-out” on a wall or floor surface.



Part #	Description
XR3TRM-8-12	1/2" XR3 Term. Fitting w/ Square Flange - 1/2" NPT
XR3TRM-11-12	3/4" XR3 Term. Fitting w/ Square Flange - 3/4" NPT
XR3TRM-16-6	1" XR3 Term. Fitting w/ Square Flange - 1" NPT
XR3TRM-20-6	1-1/4" XR3 Term. Fitting - 1-1/4" NPT
XR3TRM-24-4	1-1/2" XR3 Term. Fitting w/ Square Flange - 1-1/2" NPT
XR3TRM-32-4	2" XR3 Term. Fitting w/ Square Flange - 2" NPT

## XR3 Termination Fitting with Bronze Flange

**APPLICATION:** Creates a fixed point “stub-out” on a wall or floor surface.



Part #	Description
XR3TRM-8-CB-12	1/2" XR3 Term. Fitting w/ Bronze Flange - 1/2" NPT
XR3TRM-11-CB-12	3/4" XR3 Term. Fitting w/ Bronze Flange - 3/4" NPT
XR3TRM-16-CB-6	1" XR3 Term. Fitting w/ Bronze Flange - 1" NPT
XR3TRM-20-CB-6	1-1/4" XR3 Term. Fitting w/ Bronze Flange - 1-1/4" NPT
XR3TRM-24-CB-4	1-1/2" XR3 Term. Fitting w/ Bronze Flange - 1-1/2" NPT

## XR3 Termination Fitting with No Flange



Part #	Description
XR3TRM-8-NF-12	1/2" XR3 Term. Fitting - 1/2" NPT
XR3TRM-11-NF-12	3/4" XR3 Term. Fitting - 3/4" NPT
XR3TRM-16-NF-6	1" XR3 Term. Fitting - 1" NPT
XR3TRM-20-NF-6	1-1/4" XR3 Term. Fitting - 1-1/4" NPT
XR3TRM-24-NF-4	1-1/2" XR3 Term. Fitting - 1-1/2" NPT
XR3TRM-32-NF-4	2" XR3 Term. Fitting - 2" NPT

## XR3 Termination Bracket Fitting

**APPLICATION:** Provides a secure attachment point for key-valves and as an alternate termination point.



Part #	Description
XR3TRMBKT-8-12	1/2" XR3 Term. Bracket Fitting - 1/2" NPT
XR3TRMBKT-11-12	3/4" XR3 Term. Bracket Fitting - 3/4" NPT
XR3TRMBKT-16-6	1" XR3 Term. Bracket Fitting - 1" NPT
XR3TRMBKT-20-6	1-1/4" XR3 Term. Bracket Fitting - 1-1/4" NPT
XR3TRMBKT-24-4	1-1/2" XR3 Term. Bracket Fitting - 1-1/2" NPT
XR3TRMBKT-32-4	2" XR3 Term. Bracket Fitting - 2" NPT

## XR3 Tee Fittings

**APPLICATION:** Allow for the splicing and additions to the flexible gas tubing.



Part #	Description
XR3T-8-12	1/2" Run x 1/2" Run x 1/2" Tee - Tee Fitting
XR3T-11-12	3/4" Run x 3/4" Run x 3/4" Tee - Tee Fitting
XR3T-16-6	1" Run x 1" Run x 1" Tee - Tee Fitting
XR3T-11-8-8-6	3/4" Run x 1/2" Run x 1/2" Tee - Tee Fitting
XR3T-11-11-8-6	3/4" Run x 3/4" Run x 1/2" Tee - Tee Fitting
XR3T-16-11-8-6	1" Run x 3/4" Run x 1/2" Tee - Tee Fitting
XR3T-16-11-11-6	1" Run x 3/4" Run x 3/4" Tee - Tee Fitting
XR3T-16-16-8-6	1" Run x 1" Run x 1/2" Tee - Tee Fitting
XR3T-16-16-11-6	1" Run x 1" Run x 3/4" Tee - Tee Fitting

## XR3 Series Appliance Stub-Outs

**APPLICATION:** Creates a fixed point "stub-out" on a wall or floor surface for meter and appliance attachment.



Part #	Description
XR3-APSTUB-8-10	1/2" XR3 x 1-1/2" Stub Length x 1/2" NPT
XR3-L-APSTUB-8-10	1/2" XR3 x 2-1/4" Stub Length x 1/2" NPT
XR3-APSTUB-11-10	3/4" XR3 x 1-1/2" Stub Length x 1/2" NPT
XR3-L-APSTUB-11-10	3/4" XR3 x 2-1/4" Stub Length x 1/2" NPT
XR3-APSTUB-11-11-10	3/4" XR3 x 1-1/2" Stub Length x 3/4" NPT
XR3-L-APSTUB 11-11-10	3/4" XR3 x 2-1/4" Stub Length x 3/4" NPT

## Modular Stub System

**APPLICATION:** All Stubs create a fixed point "stub-out" on a wall or floor surface for meter and appliance attachment.



Part #	Description
GT-1/2X6STUB-10	1/2"M x 6"L Straight Stub-Out
GT-1/2X12STUB	1/2"M x 12"L Straight Stub-Out
GT-3/4X6STUB-10	3/4"M x 6"L Straight Stub-Out
GT-3/4X12STUB-10	3/4"M x 12"L Straight Stub-Out
GT-1X6STUB-10	1"M x 6"L Straight Stub-Out
GT-1X12STUB-10	1"M x 12"L Straight Stub-Out
GT-STUB-BRACE	Stub Bracket (optional) – Fits All

## Pipe Support

**APPLICATION:** Strap anchors metal tubing.



Part #	Description
GT-MBRACE-1	Manifold Mounting Kit - Fits all manifolds
GT-MSTRAP-6-250	Metal Tubing Strap – Fits 3/8" CSST
GT-MSTRAP-8-250	Metal Tubing Strap – Fits 1/2" CSST
GT-MSTRAP11-150	Metal Tubing Strap – Fits 3/4" CSST

## Multi-Port Manifolds

**APPLICATION:** Provides central distribution point for individual runs to each appliance.



Part #	Description
GT-4-PORTMAN	Cast 4 port – 3/4"F x 4 @ 1/2"F x 1/2"F
GT-5-PORTMAN	Cast 5 port – 3/4"F x 1 @ 3/4"F x 4 @ 1/2"F x 1/2"F
GT-111596-08	Coated Steel 4 Port – 3/4"F x 4 @ 1/2" F x 3/4"M

## XR3 Series Outlet Boxes

**APPLICATION:** Creates a secure recessed termination point for connection to moveable appliances.



Part #	Description
FSOUTLET-BOX-FR8	Firestop gas outlet box kit with 1/2" XR2 Fitting

## Striker Plates

**APPLICATION:** Striker plates used for protection where flexible gas piping passes through structural members and is restricted from moving to avoid nails, screws and other potential puncture threats.



Part #	Description
GT-TFM204	Quarter Striker Plate – 3" x 2"
GT-TFM201	Half Striker Plate – 3" x 7"
GT-TFM203	Three-Quarter Striker Plate – 3" x 8"
GT-TFM205	Full Striker Plate – 3" x 12"
GT-TFM210	6" x 17" Striker Plate

## Bonding Clamps

**APPLICATION:** For attachment to the FlashShield™ CSST gas piping system, a single bonding clamp must be attached to either a segment of steel pipe, a rigid pipe component or to the XR3 brass hex fitting.

Bonding clamps are listed to UL467 for use on XR3 hex fittings.



Part #	Description
CWP1JSH	Bonding Clamp for 3/8" and 1/2" CSST
CWP2JSH	Bonding Clamp for 3/4", 1" and 1-1/4" CSST
CWP3JSH	Bonding Clamp for 1-1/2" and 2" CSST

## Jacket Stripper Tool

**APPLICATION:** Jacket Stripping Tool for cutting and removal of outer CSST jackets & metal shield before connecting fitting. Allows for clean, quick and proper fitting assembly.



Part #	Description
STRP3-8-24	1/2" Jacket Stripper
STRP3-11-24	3/4" Jacket Stripper
STRP3-16-24	1" Jacket Stripper

## Tubing Cutters

**APPLICATION:** Tubing Cutters, fitted with cutting wheel designed to cut stainless steel, create clean cuts for optimal flaring of tubing.



Part #	Description
GT-CUTTER-SM	Cutter with flat rollers – 3/8" – 1" FlashShield CSST
GT-BLADE-SM-5	Replacement blade for GTCUTTER-SM (19 mm diam.)
GT-CUTTER-LG	Cutter with flat rollers – Up to 1-1/2" FlashShield CSST

# Low Pressure Malleable Black Pipe Fittings

## Nipples



Part #	IPS	Length
N-038XC-STD	3/8"	Close
N-038X2-STD	3/8"	2"
N-038X4-STD	3/8"	4"
N-038X6-STD	3/8"	6"
N-012XC-STD	1/2"	Close
N-012X2-STD	1/2"	2"
N-012X3-STD	1/2"	3"
N-012X4-STD	1/2"	4"
N-012X5-STD	1/2"	5"
N-012X6-STD	1/2"	6"
N-012X8-STD	1/2"	8"
N-012X10-STD	1/2"	10"
N-012X12-STD	1/2"	12"
N-034XC-STD	3/4"	Close
N-034X2-STD	3/4"	2"
N-034X3-STD	3/4"	3"
N-034X4-STD	3/4"	4"
N-034X5-STD	3/4"	5"
N-034X6-STD	3/4"	6"
N-034X8-STD	3/4"	8"
N-034X10-STD	3/4"	10"
N-034X12-STD	3/4"	12"
N-100XC-STD	1"	Close
N-100X2-STD	1"	2"
N-100X3-STD	1"	3"
N-100X4-STD	1"	4"
N-100X6-STD	1"	6"

## Caps & Tees



Part #	Description	Size
038CAP-STD	Cap - black std.	3/8"
038TEE-STD	Tee - black std.	3/8"
012CAP-STD	Cap - black std.	1/2"
012TEE-STD	Tee - black std.	1/2"
034CAP-STD	Cap - black std.	3/4"
034TEE-STD	Tee - black std.	3/4"
100CAP-STD	Cap - black std.	1"
100TEE-STD	Tee - black std.	1"

## Reducing Elbow



Part #	Size
REL90-034X012-STD	3/4" x 1/2"
REL90-100X034-STD	1" x 3/4"

## 90° Elbow



Part #	Size
EL90-038-STD	3/8"
EL90-012-STD	1/2"
EL90-034-STD	3/4"
EL90-100-STD	1"

## 90° Street Elbow



Part #	Size
STEL90-038-STD	3/8"
STEL90-012-STD	1/2"
STEL90-034-STD	3/4"
STEL90-100-STD	1"

## Drip Leg Sediment Trap



Part #	Size
DLK06	3/8"
DLK08	1/2"

## Bell Reducers



Part #	Size
BR-012X014-STD	1/2" x 1/4"
BR-012X038-STD	1/2" x 3/8"
BR-034X012-STD	3/4" x 1/2"
BR-100X034-STD	1" x 3/4"

## Full Couplings



Part #	Size
FC-038-STD	3/8"
FC-012-STD	1/2"
FC-034-STD	3/4"
FC-100-STD	1"

## Unions



Part #	Size
AAR-038-STD	3/8"
AAR-012-STD	1/2"
AAR-034-STD	3/4"
AAR-100-STD	1"

## Dielectric Union - STD



Part #	Size
AAR-012-INS	1/2" FIP x 1/2" FIP
AAR-034-INS	3/4" FIP x 3/4" FIP
AAR-100-INS	1" FIP x 1" FIP

# Forged Steel Heavy Duty Pipe Fittings

## Nipples



Part #	IPS	Length
N-014XC	1/4"	Close
N-014X2	1/4"	2"
N-014X3	1/4"	3"
N-014X4	1/4"	4"
N-014X6	1/4"	6"
N-014X8	1/4"	8"
N-038XC	3/8"	Close
N-038X2	3/8"	2"
N-038X4	3/8"	4"
N-038X6	3/8"	6"
N-038X8	3/8"	8"
N-012XC	1/2"	Close
N-012X2	1/2"	2"
N-012X3	1/2"	3"
N-012X4	1/2"	4"
N-012X6	1/2"	6"
N-012X8	1/2"	8"
N-012X12	1/2"	12"
N-034XC	3/4"	Close
N-034X2	3/4"	2"
N-034X212	3/4"	2-1/2"
N-034X3	3/4"	3"
N-034X4	3/4"	4"
N-034X5	3/4"	5"
N-034X6	3/4"	6"
N-034X8	3/4"	8"
N-034X9	3/4"	9"
N-034X10	3/4"	10"
N-034X12	3/4"	12"
N-100XC	1"	Close
N-100X2	1"	2"
N-100X3	1"	3"
N-100X4	1"	4"
N-100X5	1"	5"
N-100X6	1"	6"
N-100X8	1"	8"
N-100X10	1"	10"
N-100X12	1"	12"

## Nipples



Part #	IPS	Length
N-114XC	1-1/4"	Close
N-114X2	1-1/4"	2"
N-114X3	1-1/4"	3"
N-114X4	1-1/4"	4"
N-114X6	1-1/4"	6"
N-114X8	1-1/4"	8"
N-114X10	1-1/4"	10"
N-114X12	1-1/4"	12"
N-112XC	1-1/2"	Close
N-112X2	1-1/2"	2"
N-112X3	1-1/2"	3"
N-112X4	1-1/2"	4"
N-112X6	1-1/2"	6"
N-112X8	1-1/2"	8"
N-112X12	1-1/2"	12"
N-200XC	2"	Close
N-200X3	2"	3"
N-200X4	2"	4"
N-200X6	2"	6"
N-200X7	2"	7"
N-200X8	2"	8"
N-200X10	2"	10"
N-200X12	2"	12"
N-200X14	2"	14"
N-300XC	3"	Close
N-300X3	3"	3"
N-300X4	3"	4"
N-300X5	3"	5"
N-300X6	3"	6"
N-300X8	3"	8"
N-300X10	3"	10"
N-300X12	3"	12"
N-400X6	4"	6"

## Tee



Part #	Size
014TEE-2M	1/4"
038TEE-2M	3/8"
012TEE-2M	1/2"
034TEE-2M	3/4"
100TEE-2M	1"
114TEE-2M	1-1/4"
112TEE-2M	1-1/2"
200TEE-2M	2"
300TEE-2M	3"

## 90° Elbow



Part #	Size
EL90-014-2M	1/4"
EL90-038-2M	3/8"
EL90-012-2M	1/2"
EL90-034-2M	3/4"
EL90-100-2M	1"
EL90-114-2M	1-1/4"
EL90-112-2M	1-1/2"
EL90-200-2M	2"
EL90-300-2M	3"

## Y-Type Strainers



Part #	Size	Plug Size
STYLE B-DI-012	1/2"	1/2"
STYLE B-DI-034	3/4"	1/2"
STYLE B-DI-100	1"	3/4"
STYLE B-DI-114	1-1/4"	3/4"
STYLE B-DI-112	1-1/2"	1"
STYLE B-DI-200	2"	1"
STYLE C-DI-300	3"	1-1/4"
STYLE C-DI-400	4"	1-1/4"

## Full Couplings



Part #	Size
FC-014-3M	1/4"
FC-038-3M	3/8"
FC-012-3M	1/2"
FC-034-3M	3/4"
FC-100-3M	1"
FC-114-3M	1-1/4"
FC-112-3M	1-1/2"
FC-200-3M	2"
FC-300-3M	3"

## 45° Elbow



Part #	Size
EL45-034-2M	3/4"
EL45-100-2M	1"
EL45-114-2M	1-1/4"
EL45-200-2M	2"
EL45-300-2M	3"

## 90° Street Elbow



Part #	Size
STEL90-014-3M	1/4"
STEL90-012-3M	1/2"
STEL90-034-3M	3/4"
STEL90-100-3M	1"
STEL90-114-3M	1-1/4"
STEL90-200-3M	2"

## Reducing Elbow



Part #	Size
REL90-200X114	2" x 1-1/4"

## Crosses



Part #	Size
CR-114-2M	1-1/4"
CR-200-2M	2"
CR-300-2M	3"

# Forged Steel Heavy Duty Pipe Fittings

## Reducing Coupling



Part #	Size
RC-038X014-3M	3/8" x 1/4"
RC-012X038-3M	1/2" x 3/8"
RC-034X012-3M	3/4" x 1/2"
RC-100X034-3M	1" x 3/4"
RC-114X100-3M	1-1/4" x 1"
RC-112X114-3M	1-1/2" x 1-1/4"
RC-200X114-3M	2" x 1-1/4"

## Bushings



Part #	Pipe Size
BU014X018-3M	1/4" x 1/8"
BU038X014-3M	3/8" x 1/4"
BU012X014-3M	1/2" x 1/4"
BU012X038-3M	1/2" x 3/8"
BU034X014-3M	3/4" x 1/4"
BU034X038-3M	3/4" x 3/8"
BU034X012-3M	3/4" x 1/2"
BU100X014-3M	1" x 1/4"
BU100X012-3M	1" x 1/2"
BU100X034-3M	1" x 3/4"
BU114X014-3M	1-1/4" x 1/4"
BU114X012-3M	1-1/4" x 1/2"
BU114X034-3M	1-1/4" x 3/4"
BU114X100-3M	1-1/4" x 1"
BU112X012-3M	1-1/2" x 1/2"
BU112X034-3M	1-1/2" x 3/4"
BU112X100-3M	1-1/2" x 1"
BU112X114-3M	1-1/2" x 1-1/4"
BU200X014-3M	2" x 1/4"
BU200X012-3M	2" x 1/2"
BU200X034-3M	2" x 3/4"
BU200X100-3M	2" x 1"
BU200X114-3M	2" x 1-1/4"
BU200X112-3M	2" x 1-1/2"
BU212X100-3M	2-1/2" x 1"
BU212X200-3M	2-1/2" x 2"
BU300X114-3M	3" x 1-1/4"
BU300X200-3M	3" x 2"
BU300X212-3M	3" x 2-1/2"

## Pipe Plugs



Part #	Size
018 HXP	1/8"
014 HXP	1/4"
038 HXP	3/8"
012 HXP	1/2"
034 HXP	3/4"
100 HXP	1"
114 HXP	1-1/4"
112 HXP	1-1/2"
200 HXP	2"
300 HXP	3"

## Unions



Part #	Size
AAR-014-3M	1/4"
AAR-012-3M	1/2"
AAR-034-3M	3/4"
AAR-100-3M	1"
AAR-114-3M	1-1/4"
AAR-112-3M	1-1/2"
AAR-200-3M	2"
AAR-212-3M	2-1/2"
AAR-300-3M	3"

## Dielectric Union



Part #	Size
AAR-012-INS-3M	1/2" FIP x 1/2" FIP
AAR-034-INS-3M	3/4" FIP x 3/4" FIP
AAR-100-INS-3M	1" FIP x 1" FIP

## Concentric Swage Nipples



Part #	Size
SN-034X012	3/4" x 1/2"
SN-100X034	1" x 3/4"
SN-114X012	1-1/4" x 1/2"
SN-114X034	1-1/4" x 3/4"
SN-114X100	1-1/4" x 1"
SN-112X114	1-1/2" x 1-1/4"
SN-200X034	2" x 3/4"
SN-200X100	2" x 1"
SN-200X114	2" x 1-1/4"
SN-200X112	2" x 1-1/2"
SN-300X200	3" x 2"

## Flanges



Part #	Flange Size & Bolt Style	Flange Diameter	Thread/Pipe Size	Type of Flange
W30FT34	3/4" RF 4-BOLT	4.62"	NPT 3/4"	300# Threaded
W30FT1	1" RF 4-BOLT	4.88"	NPT 1"	300# Threaded
W30FT114	1-1/4" RF 4-BOLT	5.25"	NPT 1-1/4"	300# Threaded
W30FT112	1-1/2" RF 4-BOLT	6.12"	NPT 1-1/2"	300# Threaded
W30FT2	2" RF 8-BOLT	6.50"	NPT 2"	300# Threaded
W30FT3	3" RF 8-BOLT	8.25"	NPT 3"	300# Threaded
W30FT4	4" RF 8-BOLT	10.00"	NPT 4"	300# Threaded
WFT34	3/4" RF 4-BOLT	3.88"	NPT 3/4"	300# Threaded
WFT1	1" RF 4-BOLT	4.25"	NPT 1"	300# Threaded
WFT114	1-1/4" RF 4-BOLT	4.62"	NPT 1-1/4"	300# Threaded
WFT112	1-1/2" RF 4-BOLT	5.00"	NPT 1-1/2"	300# Threaded
WFT2	2" RF 4-BOLT	6.00"	NPT 2"	300# Threaded
WFT3	3" RF 4-BOLT	7.50"	NPT 3"	300# Threaded
WFT4	4" RF 8-BOLT	9.00"	NPT 4"	300# Threaded
WBL34	3/4" RF 4-BOLT	4.62"/3.88"	300#/150#	Blind
WBL1	1" RF 4-BOLT	4.89"/4.25"	300#/150#	Blind
WBL114	1-1/4" RF 4-BOLT	5.25"/4.62"	300#/150#	Blind
WBL112	1-1/2" RF 4-BOLT	6.12"/5.00"	300#/150#	Blind
WBL2	2" RF 8 or 4-BOLT	6.50"/6.00"	300#/150#	Blind
WBL3	3" RF 8 or 4-BOLT	8.25"/7.50"	300#/150#	Blind
WBL4	4" RF 8-BOLT	10.00"/9.00"	300#/150#	Blind

## Flange Gaskets



Part #	Flange Size	Weight	I.D.	O.D.
GAS30FLEX304GRAF34	3/4"	300#	1"	2-5/8"
GAS30FLEX304GRAF1	1"	300#	1-14"	2-7/8"
GAS30FLEX304GRAF114	1-1/4"	300#	1-7/8"	3-1/4"
GAS30FLEX304GRAF112	1-1/2"	300#	2-1/8"	3-3/4"
GAS30FLEX304GRAF2	2"	300#	2-3/4"	4-3/8"
GAS30FLEX304GRAF3	3"	300#	4"	5-7/8"
GAS30FLEX304GRAF4	4"	300#	5"	7-1/8"

## Flange Studs & Nuts

Includes one stud and 2 nuts



Part #	Flange Size	Stud Size	Number of Studs
BLT-B7 5/8"X3"	3/4"	5/8" x 3"	4-150# or 300#
BLT-B7 5/8"X3"	1"	5/8" x 3"	4-150# or 300#
BLT-B7 5/8"X3"	1-1/4"	5/8" x 3"	4-150# or 300#
BLT-B7 3/4"X3-1/2"	1-1/2"	3/4" x 3-1/2"	4-150# or 300#
BLT-B7 3/4"X3-1/2"	2"	3/4" x 3-1/2"	4-150# or 8-300#
BLT-B7 3/4"X4"	3"	3/4" x 4"	4-150# or 8-300#
BLT-B7 3/4"X4-1/2"	4"	3/4" x 4-1/2"	8-150# or 300#

## Flex Connectors

**Not for mobile use.**

Heavy-duty Stainless Steel Flex Connectors.



Part #	Size	Length
FH034X12	3/4"	12"
FH034X18	3/4"	18"
FH034X24	3/4"	24"
FH100X12	1"	12"
FH100X18	1"	18"
FH100X24	1"	24"
FH114X12	1-1/4"	12"
FH114X18	1-1/4"	18"
FH114X24	1-1/4"	24"
FH112X12	1-1/2"	12"
FH112X18	1-1/2"	18"
FH112X24	1-1/2"	24"
FH200X12	2"	12"
FH200X18	2"	18"
FH200X24	2"	24"
FH300X18	3"	18"
FH300X24	3"	24"

## Flex Connectors with Union

**Not for mobile use.**

Heavy-duty Stainless Steel Flex Connectors with Union. Not for mobile use.



Part #	Size	Length
FH100X18-union	1"	18"
FH114X18-union	1-1/4"	18"
FH112X18-union	1-1/2"	18"
FH200X18-union	2"	18"
FH300X18-union	3"	18"

## Anode

### Forged Steel Heavy Duty

Magnesium anode bag with attached 10' #12 electric wire. The anode must be activated with water before backfilling.



Part #	Size
H1-17	17 lb Anode Bag
H1-9	9 lb Anode Bag

## Dielectric Union

### Black Pipe



Part #	Size	Type
AAR-012-INS-3M	1/2" FIP x 1/2" FIP	Heavy Duty - Forged Steel
AAR-034-INS-3M	3/4" FIP x 3/4" FIP	Heavy Duty - Forged Steel
AAR-100-INS-3M	1" FIP x 1" FIP	Heavy Duty - Forged Steel
AAR-012-INS	1/2" FIP x 1/2" FIP	Standard - Low Pressure
AAR-034-INS	3/4" FIP x 3/4" FIP	Standard - Low Pressure
AAR-100-INS	1" FIP x 1" FIP	Standard - Low Pressure

## Dielectric Union

### Brass



Part #	Description
703-102	1/2" MIP x 3/8" Flare
703-103	1/2" MIP x 1/2" Flare
703-104	1/2" MIP x 5/8" Flare
704-102	3/4" MIP x 3/8" Flare
704-103	3/4" MIP x 1/2" Flare
704-104	3/4" MIP x 5/8" Flare

## Copper Dielectric Pigtails O.D.



Part #	Connections	Length
D912J12	POL X 1/4" MPT	12"
D912J20	POL X 1/4" MPT	20"
D912J30	POL X 1/4" MPT	30"
D912P12	POL X POL	12"
D912P20	POL X POL	20"
D912P30	POL X POL	30"

## Blue Cap T-204DU Series with Dielectric Union

- 2 Piece - Dielectric Union End - 600 WOG
- Leakproof stem - Lifetime Warranty
- Meets NFPA 58, Section 6.9.3.16 dielectric union requirement
- 2 Viton® o-rings
- Valve can be locked in the closed position by reversing the handle
- 100% leak tested

**FIP x FIP DU\***



Part #	Size	Type
T-204DU-012	1/2" x 1/2"	FIP x FIP DU
T-204DU-034	3/4" x 3/4"	FIP x FIP DU

## Flare x MIP DU\*



Part #	Size	Type
T-204DU-012FX012	1/2" x 1/2"	Flare x MIP DU

## MIP DU x FIP\*



Part #	Size	Type
T-204DU-012MX012F	1/2" x 1/2"	MIP DU x FIP
T-204DU-034MX034F	3/4" x 3/4"	MIP DU x FIP

\*FIP=Female Iron Pipe  
MIP=Male Iron Pipe

## Tank Test Kits & Accessories



Part #	Description
30101	Underground Tank Test Kit: Multimeter, sulfate electrode, leads, copper sulfate crystals and case.



Part #	Description
30189	Anode test probe with telescoping pole, multimeter with leads, copper sulfate and additional 20' lead wire



Part #	Description
ETM	Underground Tank Test Kit: A voltage meter & copper sulfate electrode combined in one easy to use unit.



Part #	Description
JN-CP Test Kit	Test Kit to test pipe to soil potentials for adequate cathodic protection. Kit includes: DM 133 Multimeter with Test Leads; Copper Sulfate Half Cell Electrode; Heavy Duty "Clamp" Style Test Leads

## Accessories



Part #	Description
RE-5C	Replacement Copper Sulfate Electrode
16906	Copper Sulfate Crystals .75 lbs.
17105	Anti-freeze Solution 8 oz. bottle

## Underground Tank Anode Test Decal


**NFPA 58 - UG Tank Anode Test**

Initial Installation Date												
MONTH	1	2	3	4	5	6	7	8	9	10	11	12
YEAR	18	19	20	21	22	23	24	25	26	27	28	29

Initial Installation Test Reading

12 to 18 Month Test Date	Test Reading
36 Month Test Date	Test Reading

# of Anodes: 1 2 3 4

Anode Size: 9 lb. 17 lb. 32 lb.

Is Tank DI-ELECTRICALLY Isolated  
YES NO

X

Part #	Description
UG-Anode-Test	Underground tank anode test decal on 7940 matte silver 4" x 4" black

## Leak Detector

Use this Leak Detector on Gas and Air Line Connections, Tanks, Tank & Cylinder Valves, Cylinders, Condensers or any system that can be leak tested with air or gas. Low temperature leak detector designed for use above and below freezing.



Part #	Description	Size	Application	Color
LD-1	Economy Refill	1 gallon	Low Temp	Pink
LD-128R	Economy Refill	1 gallon	Regular	Blue
LD-8	Container with Dauber Cap	8 oz	Low Temp	Pink
LDPD-E	Spray Bottle (empty)	16 oz	N/A	N/A
Dispenser	Container with Dauber Cap (empty)	1 pint	N/A	N/A



Part #	Description	Size	Application
SHERLOCK 8 OZ	Container with Dauber cap	8 oz	Low Temp
SHERLOCK 1 GAL	Economy Refill	1 gallon	Low Temp

## Rectorseal

Slow dry - soft set. Non-seizing - breaks out easily without stripping, galling, or damaging threads. 3 sizes available all with brush top can.



Part #	Size
RS5C-4	1/4 Pint
RS5C-2	1/2 Pint
RS5C-1	1 Pint

## Teflon Sealant

FPC Gasoila Soft-Set with Teflon. Brush top can.



Part #	Size
SS04	1/4 Pint
SS08	1/2 Pint
SS16	1 Pint

## Tru Blu Pipe Sealant Vibration Resistant

RectorSeal® Tru-Blu™ pipe thread sealant with PTFE is a fast-dry, flexible set thread sealant designed for high vibration environments such as refrigeration and industrial applications. Brush top can.



Part #	Size
31551	1/2 Pint
31431	1 Pint

## Plastic Seal

John Crane PLS-2 Plastic Seal for every pipe joint service. Leak proof, seize proof, non-hardening, insoluble. With brush cap. UL listed.



Part #	Size
401-00203	1/4 Pint
401-00225	1 Pint

## Teflon Thread Tape

For Pipe Sizes Not to Exceed 1-1/2"



Part #	Size	Description
121-520	1/2" x 520"	Standard Density 3 mil,
M520-12	3/4" x 500"	Standard Density 3 mil,
TT61	1/2" x 520"	Medium Density 3.5 mil,

## SENSIT TECHNOLOGIES TRAC-IT3 Combustible Gas Detector



Trak-IT@III CGI with its durable design and easy operation will make finding gas leaks fast and accurate. The bright LCD display shows all gas concentrations simultaneously fulfilling any confined space entry requirements. A bar-hole test feature helps accurately locate below-ground leaks. High-resolution display, 0.1% LEL (Lower Explosive Limit), in combination with the high volume rotary pump helps to quickly locate hard-to-find leaks.

Calibration is easily accomplished in the field with Trak-IT@III CGI. The high-tech sensors provide a long life with the lowest accomplished cost. Trak-IT@III CGI has the lowest cost of operation of any instrument in its class.

Part #	Size	Weight	Operational Temp	Battery Life
JN-TRAC-IT3-A	6.5" x 4" x 4.25"	2.8 lb	-4 to 104° F	Alkaline: Approximately 25+ hrs Continuously

Type	Resolution	Range	Accuracy
LEL	0.1% up to 2%	0-100% LEL	±10%
% Nat Gas	0.1%	5.0-100% Gas	±5%

## Probe Bar



For boring test holes near buried gas lines or underground tank. 44" bar allows for sufficient depth in order to drop a gas detector probe into the ground for testing. Use with Sensit Technologies Track-IT III with sampling hose.

Part #	Description	Length
28-44	M-PACT-O Probe Bar	44"

## SENSIT TECHNOLOGIES Sensit CO Carbon Monoxide Detector



A portable, state-of-the-art carbon monoxide analyzer designed to determine the level of CO in residential and commercial environments from 0 to 2000ppm.

Unlike traditional CO analyzers, the SENSIT CO utilizes a rotary vane pump to draw in the correct amount of sample air to analyze. This method provides a sensor accuracy of ± 5ppm or ± 5% of the reading, whichever is greater.

- 3 year warranty (excluding calibration and batteries)
- Sensor warranty for 2 years
- Hard carrying case
- Flue probe
- 5 ft. of flexible tubing
- Particle filter
- Batteries included
- Instrument manual

Part #	Size	Weight	Operational Temp	Battery Life
JN-SSCO0500-SN	3" 10" x 2.4"	1.1 lb	-4 to 104° F	Alkaline: Approx 30 hrs. Continuous

Sensor Type	Sensor Resolution	Sensor Range	Sensor Accuracy
CO	1 ppm	0-2,000 ppm	±5ppm or 5% (whichever is greater)

## SENSIT TECHNOLOGIES TKX Combustible Gas Leak Detector



- High sensitivity.
- Audio and visual leak detector.
- Adjustable tick rate for fast leak pin-pointing.
- Low maintenance.
- Low initial cost
- One year limited warranty
- Carry pouch
- Batteries Included
- Instruction Manual

Gases Sensed (Partial List)  
Acetone, Alcohol, Ammonia, Butane, Ethylene Oxide, Gasoline, Hydrogen, Industrial Solvents, Jet Fuel, Lacquer Thinner, Methane, Natural Gas, Propane.

Part #	Product Size	Product Weight	Operational Temp	Battery Life
JN-TKX-7	3.5" x 10" x 1.6"	1.3 lb	0 to 120° F	Alkaline: Approx 30 hrs Continuous

Sensor Type	Detection Limit	Sensor Range
PPM	20 ppm	20-50,000

## SENSIT TECHNOLOGIES Sensit Gold CGI Combustible Gas Indicator



Durable design and easy operation makes finding gas leaks fast and accurate. The bright LCD display shows all gas concentrations simultaneously fulfilling any confined space entry requirements. Detects propane and methane. Other gas sensors available.

- Standard Kit includes:
- Hard Carrying Case
  - 3 "C" Batteries
  - 2 Piece Bar Hole Probe
  - Extra Sensor Cap
  - Wrist Strap
  - Instruction Manual

Part #	Size	Product Weight	Operational Temp	Battery Life
JN-SG00600-A	11.5" x 3" x 2.32"	1.2 lb	-4 to 122° F	Alkaline: Approx 12 hrs Continuous

Type	Resolution	Range	Accuracy
LEL	0.1% up to 2%	0.100% LEL	±10%
% Nat Gas	0.1%	5-100% GAS	±5%
% Propane	0.1%	2.2-100%	±5%
Special Order			
O2	0.1%	0-25%	±0.2% or 10%*
CO	1 ppm	0-2000 ppm	±5 ppm or 5%*
H2S	1 ppm	0-100 ppm	±2 ppm or 5%*
HCN	1 ppm	0-30 ppm	±5%

Calibration Kit Available as a Special Order

### Symptoms of Carbon Monoxide Exposure

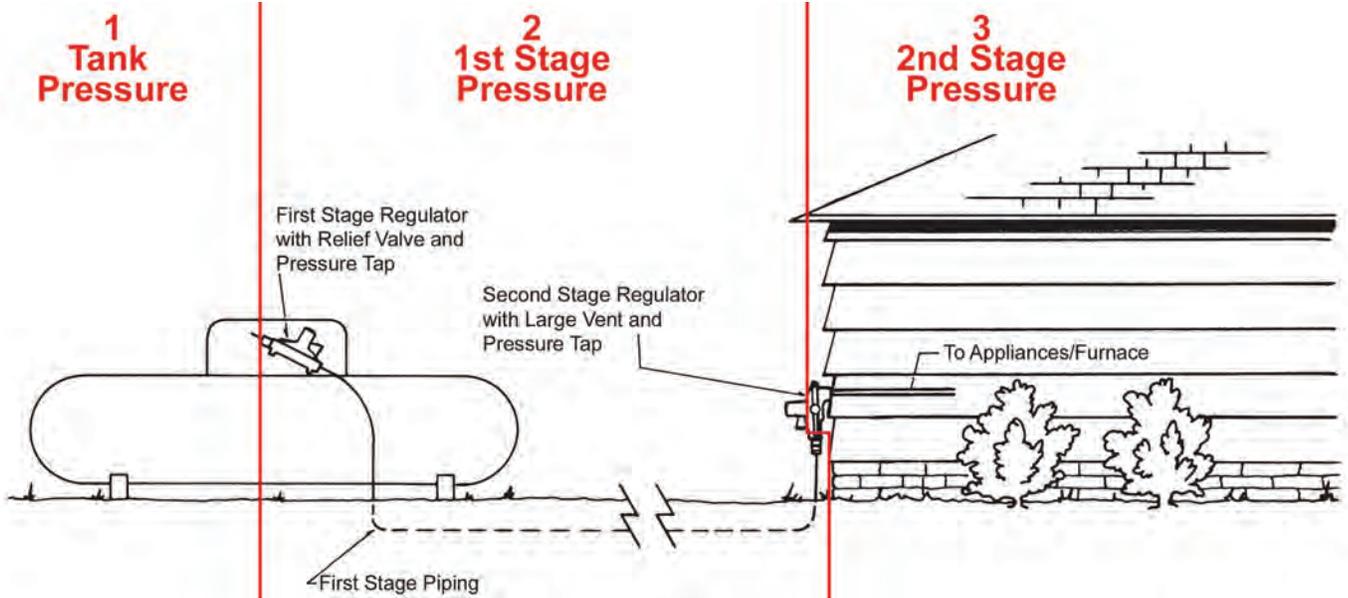
Level (PPM)	Effects*
0	Desirable level
9	Acceptable level in living space
50	Maximum concentration for continuous exposure in any 8 hour period
400	Frontal headaches in 1 to 2 hours, life threatening after 3 hours
800	Nausea and convulsions, death within 2 hours
1,600	Nausea within 20 minutes, death within 1 hour
12,800	Death within 1 to 3 minutes

\*Effects vary based on age, sex, weight and overall health.

# Presto-Tap Leak Testing System

## Presto-Tap Leak Testing System

Presto-Tap Leak Testing System To Maintain Safer Propane Installations



\* Spring loaded gauges will need to be recalibrated on a frequent basis. This is done by comparing the gauge readings to those of an actual water manometer (for ounce gauges) or test gauge.

NOTE: It is extremely important that recalibration be done on a frequent basis to assure accurate testing and adjustment of the regulator delivery and lock-up pressure.

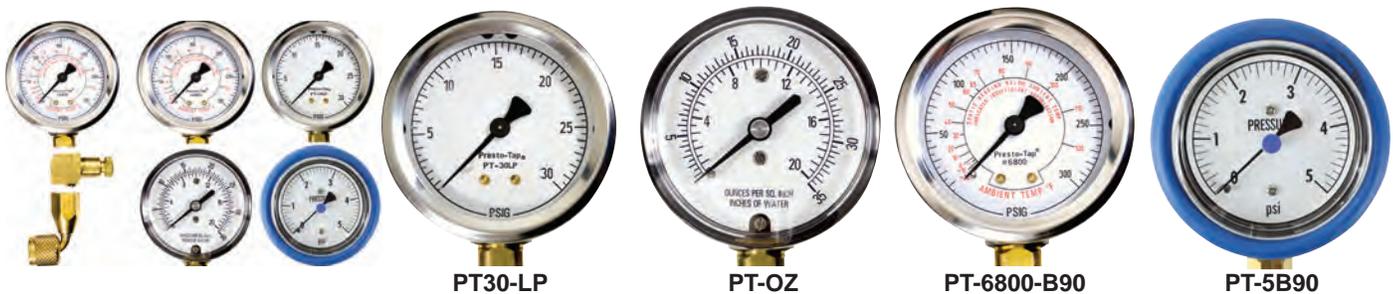
By utilizing the Presto-Tap Leak Test System the Marketer can:

- Conduct Easy, Quick, Accurate System Tests
- Increase Driver and Service Personnel Efficiency as well as Productivity
- Potential Source of New Revenue
- Charge an "Out-of-Gas" Service Charge that includes installation of a Presto-Tap Leak Detection System.
- Bundle a Presto-Tap Leak Detection System into every "new tank set".
- Install a Presto-Tap Leak Detection System anytime a system has to be "broken" for any reason.
- Less Expensive Service Costs
- Competitive Advantage by Promoting Propane Safety & System Inspections
- PEACE OF MIND - required leak testing and documentation procedures are so easy to perform, there is no reason they should not be done correctly.

### WHERE DO YOU START?

The Presto-Tap Leak Testing System can be incorporated into any one or combination of the three segments of a propane gas distribution system. Leak testing can be performed in the high pressure (tank pressure), first stage pressure (traditionally 5-10 psig), or second stage pressure (traditionally 11"WC) segments of a system. But you must select the correct equipment and test gauge for each segment.

## Test Gauges



Part #	Description	Adapter	Gauge Bleeder	PSI	Application	Belt Loop Holster
PT-30LP	Presto-Tap Low Pressure Test Gauge	90° Quick Adapter	Included	30#	1st Stage Pressure	Included
PT-OZ	Presto-Tap Low Pressure Test Gauge	90° Quick Adapter	Included	0 - 35" WC	2nd Stage Pressure	Included
PT-6800-B90	Presto-Tap High Pressure Test Gauge	90° Quick Adapter	Included	300#	Tank Pressure	Included
PT-5B90	Presto-Tap Low Pressure Test Gauge	90° Quick Adapter	Included	5#	2# Systems	Included

## Pigtail



PT-913PS12  
PT-913JS12  
PT-912PS12  
PT-912JS12

Part #	Connections	Length	Tube Size	Nipple	Application
PT-912JS12	1/4" M.NPT x M.POL	12"	1/4"	7/8" Hex Short	Tank Pressure
PT-912JS20	1/4" M.NPT x M.POL	20"	1/4"	7/8" Hex Short	Tank Pressure
PT-912PS12	M.POL x M.POL	12"	1/4"	7/8" Hex Short	Tank Pressure
PT-912PS20	M.POL x M.POL	20"	1/4"	7/8" Hex Short	Tank Pressure
PT-912PS48	M.POL x M.POL	48"	1/4"	7/8" Hex Short	Tank Pressure
PT-913JS12	1/4" M.NPT x M.POL	12"	3/8"	7/8" Hex Short	Tank Pressure
PT-913PS12	M.POL x M.POL	12"	3/8"	7/8" Hex Short	Tank Pressure

## Pressure Fittings



The patented Presto-Tap PT-RV and RVL are designed to obtain pressure readings and perform system leak testing using tank pressure without ever breaking the system. Meets NFPA 54 & 58 requirements regarding excess flow. Compatible with all Presto-Tap gauge product when used at correct locations.

Part #	Description	Thread	Core	#54 Orifice	Application
PT-RV	Presto-Tap Tank Pressure Fitting	1/8" NPT	Viton	Yes	Tank Pressure
PT-RVL	Presto-Tap Regulator & Appliance Fitting	1/8" NPT	Viton	No	Low Pressure

## Tank Pressure Fitting



Low cost, permanently installed fitting between tank service valve and first stage regulator providing leak test capability without the use of tools. Eliminates the need to discard pigtail to access tank pressure. Easily installed with adapter such as male POL x 1/4" F.NPT and 1/4" female POL x 1/4" M.NPT.

Part #	Description	Inlet	Outlet	Application
PT-TPF	Tank Pressure Fitting	1/4" F.NPT	1/4" M.NPT	Tank Pressure

## Adapters



Part #	Description	Application
PT-RVQA-90	Presto-Tap Quick Couple Adapter 90°	For testing with non Presto-Tap gauges and other instruments.
PT-MHA	Straight Manometer Adapter	For connecting water manometer

## Universal Service Tech Kit



Leak detection system diagnostics from Tank Pressure to Domestic Water Column.

Includes: 300# Tank Pressure Test Gauge, 30# First Stage Test Gauge, 0-35# 2nd Stage Test Gauge, 5# Two Pound System Test Gauge, (6) PT-RV Pressure Fittings, (3) various sized Pig-tails, Universal Flex Hose with Bleed, (2) Replacement Gaskets, Manometer Adapter, 3/16" Hex Wrench and 7/16" Ratcheting Wrench.

Part #	Description
Univ Serv Tech Kit	Presto-Tap Universal Service Tech Kit

## Magnehelic® Differential Pressure Gauge



Magnehelic® gauge is highly accurate with a guarantee within 2% of full scale. Using simple, frictionless Magnehelic movement, it quickly indicates low air or non-corrosive gas pressures — either, negative (vacuum) or differential. The design resists shock, vibration and over-pressures. No manometer fluid to evaporate, freeze or cause toxic or leveling problems.

Portable Unit Includes: Magnehelic Gauge, 9 ft of 3/16" I.D. rubber tubing, stand-hang bracket and terminal tube with holder. Standard Accessories: Two 1/8" NPT plugs for duplicate pressure taps, two 1/8" pipe thread to rubber tubing adapter and three flush mounting adapters with screws.

Part #	Pressure Range	Accuracy	Overpressure	Temperature Limits	Dial Size	Case Material	Mounting Orientation	Connection
2020	0-20" of Water	±2% of Full Scale	25 PSIG	-20 to 140°	4"	Die Cast Aluminum	Vertical	1/8" F. NPT
<b>Accessory</b>								
A432	Carrying Case							

## Electric Manometer



The EM151 provides a simple, time-saving alternative to U-tube pressure measurements. The EM151 measures positive and negative pressure to 20" water gauge. Perfect for gas supply and draft pressures in residential or light commercial properties.

Part #	Description
EM152	Electronic Manometer
AC319	Soft Carrying Case

## Low Pressure Test Set



This kit provides the equipment necessary for checking regulator delivery pressure (low pressure) at the appliances. The basic set contains a 2424A-2 low pressure gauge and a 3 foot 3/16" O,D, flexible synthetic rubber tube. Adapters are also available.

Part #	Contents
2434A	Test Kit

## Water Manometer Kits



The water manometer kit is especially suited for use with low pressure LP-Gas systems. It is ideal for pressure checks downstream of the low pressure regulator and at the appliances.

Part #	Description
1212KIT	Flexibe Tube Water Manometer Kit
005	Green Replacement Fluid - 3/4 oz bottle
A-201	9 ft Piece Rubber Tubing
B808	Rigid Tube Water Manometer without Manifold
C808	Rigid Tube Water Manometer with Manifold

## Low Pressure Test Set Adapters



Part #	Description	Size
1328	2434A Series Adapter	3/8" OD
1331	2434A Series Adapter	1/2" OD
1332	2434A Series Adapter	5/8" oD

## Test Gauge Block Assembly



Part #	Description	Connection	Gauge Included
G64-030	Test Gauge Assy	3/4" F. NPT	30 PSI 2" Gauge
G66-030	Test Gauge Assy	3/4" F. NPT	30 PSI 2" Gauge
G66-060	Test Gauge Assy	3/4" F. NPT	60 PSI 2" Gauge

## Female Tee



Part #	Inlet Connection	Outlet Connection	Pressure Gauge Range (PSIG)
2962	Soft Nose M. POL	F. POL	0 - 300

## Test Gauge Assemblies



Part #	Description	# of Hoses
Leak Test Kit-Dual Hose	Flexible Block Test Apparatus with 0-300 psi Pressure Gauge, Vent Valve, Shut-Off Valve and M.POL X F.POL connection.	2
Leak Test Kit-Single Hose	Flexible Block Test Apparatus with 0-300 psi Pressure Gauge, Vent Valve, Shut-Off Valve and M.POL X F.POL connection.	1

## Cable Hound



- Electronic device designed to accurately locate and determine depth of buried cable or metallic pipe Improved depth and distance capabilities
- New receiver utilizes state-of-the-art Digital Signal Processing for a sharper, more defined signal while filtering out electrical interference
- Auto-Off switch on the Transmitter and Receiver improves battery life
- Quality padded headphones - for use in noisy environments - are included in each DSP Kit

Part #	Description
99-0118	Transmitter, DSP Receiver, Tone Probe, Ground Rod, CH Headphones, and Carrying Case

## E-Z Trench



E-Z Trench is a fast, professional, cost-effective tool for burying tubing. It is designed to increase your productivity & give you a competitive edge. A 9HP Briggs & Stratton engine provides plenty of power to cut clean, 100 ft. long, 8", 11", or 13" deep, by 2 1/2" wide trenches in minutes. The dual-belt design delivers twice the power to the digging edge and cushions sudden impacts. The unique hood places dirt in a neat pile beside the trench for quick, easy back-fill with minimum disturbance to the turf; and the solid metal construction with carbide blades are designed for long life. E-Z Trench is worth the investment because one man can do the job of two!

Part #	Description
EZ9100	Groundsaw with 6.5 HP Honda engine and "wetted" centrifugal clutch drive
EZ9036C	Complete set of teeth for EZ9000 and EZ9100
EZ3036C	Complete set of teeth for EZ3000
EZ9100-BELT	Belt for EZ9100 Trencher
EZ9100BIT-LH	Left hand bit for EZ9100 Trencher blade
EZ9100BIT-RH	Right hand bit for EZ9100 Trencher blade
EZ9100BIT-STRT	Straight bit for EZ9100 Trencher blade
EZ9100BIT-PIN	Roll pin for EZ9100 Trencher blade bits

## Ansell Edmont Gloves



Part #	Description	Length	Size
GL-52-547 #10	Hyd-Tuf Jersey Lined with Nitrile Impregnated Coating	11"	Large



Part #	Description	Length	Size
GL-27-805	Hycron Jersey Lined Heavy Duty Nitrile Dipped Coating	10"	Large



GL-23-173

GL-23-193

Part #	Description	Length	Size
GL-23-173	Monkey Grip Jersey Lined Cold Weather Gloves PVC Coating With Wing Thumb	10"	Large
GL-23-193	PVC Smooth Finish	10"	Large



Part #	Description	Length	Size
GL-23-202-L	VersaTouch chemical resistant, mediumweight PVC supported glove	11.8"	Large
GL-23-202-XL	with cotton & acrylic double lining.	11.8"	X- Large

## Ansell Edmont Gloves



Part #	Description	Length	Size
GL-97-681-09	ActivArmr combines warmth and dexterity in a liquid-proof glove. Protects against Cold & Liquid.	10"	#9 Medium
GL-97-681-10		11"	#10 Large

## Safety Headgear and Accessories



Part #	Description	Size
M2925	UVEX Flex Seal Safety Goggles	—
672171	Ratchet headgear (does not include visor)	—
672172	Polycarbonate visor to be used with 672171 ratchet headgear	—
28-102ALUM	Faceshield attachment for hard hat - aluminum trim	—

### Accessories

Part #	Description	Size
SB1-1	C-Clear Brand Anti-Fog, Anti-Static Spray Cleaner for faceshield	1 oz.
SB2-1	C-Clear Brand Anti-Fog, Anti-Static Spray Cleaner for faceshield	2 oz.
SB4-1	C-Clear Brand Anti-Fog, Anti-Static Spray Cleaner for faceshield	4 oz.
SB8-1	C-Clear Brand Anti-Fog, Anti-Static Spray Cleaner for faceshield	8 oz.
GC01	C-Clear Brand Anti-Fog Gel Cup	1 oz.

## Flashlight



Part #	Description	Battery Size
IN2-MS	Industrial 2D Intrinsically Safe Orange Flashlight - 8 Lumens	2 D Cell

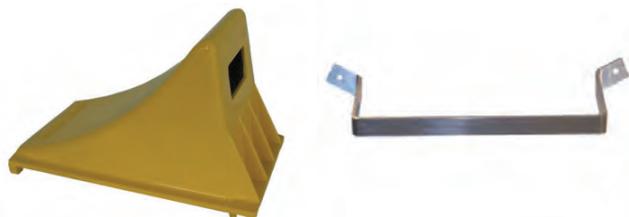
## Heavy Duty Cleaning Wipes

### Tub O Towels



Part #	Description
TW90	Heavy Duty Multi-Surface Cleaning Wipes - 90 Count

## Chock Blocks



Lightweight aluminum construction make these easy to handle. "Double Grip" safety feature.

Part #	Description
CB-BRACKET	Double Bracket
CB-ALUM	Aluminum Chock Block

## Tank Saddle



Aluminum angled tank saddle with white non marking rubber bumpers. Fits up to 1000 gallon tank. Set of 2

Part #	Description
X-Saddle	Tank Saddle

## Methanol & Methanol Injector



Prevents and overcomes freeze ups. Check valves prevent back flow of propane pressure. For use in the field on containers suspected of containing moisture or with which regulator freeze-ups have occurred.

Part #	Description
LC-1	Alcohol Tank with 1-1/4" F. ACME Vapor Fittings
Methanol-5GAL	Methyl Alcohol 5 Gallon Container
Methanol55-GAL	Methyl Alcohol 55 Gallon Container

## Valve Wrench Tools



Part #	Description
M3235	Wrench for valve A8436G
M7835	Wrench for G8475RV/W fill valves
M13835	Wrench for valve A8434G

## Multivalve Wrench



- Eliminate excavation at customer site when repairing/replacing RegO Multivalve.
- Use with standard 3/4" drive and extension.
- Cast steel and heat treated for long service life.
- Designed by a Serviceman for Servicemen.

Part #	Description
MVWrench	Wrench attachment for Multivalve

## ACME Wrench



Part #	Description
J Wrench	3-1/4" ACME J Wrench
MEP120B	Spanner Wrench

## Parker Rolo-Flare Tool



Part #	Description
945TH	Swing release type for 3/16" through 5/8" O.D. tubing

## Papco Swing Release Flare Tool



Part #	Size Range/Description
420	3/16", 1/4", 5/16", 1/2", 5/8"
Replacement Parts	
42000	Roller pin
41900	Roller
41300	Yoke
40800	Flare Cone
40502	Tee Handle - Threaded Stem

## Cutting Tool



Part #	Size Range/Description
512	3/16" to 1-1/8"
Replacement Parts	
52512	Cutter Wheel for cutting tool
51240	Retaining Ring
51250	Pin, Wheel

## Imperial Cutting Tool



Part #	Size Range/Description
TC-1000	1/8" to 1-1/8"
Replacement Parts	
75015	Cutter wheel

## Perfection Chamfering Tools



Part #	Description	Size
PE58500	ID/OD Chamfering Tool	1/2" CTS
PE58503	ID/OD Chamfering Tool	3/4" IPS
PE58505	ID/OD Chamfering Tool	1" IPS
PE58507	ID/OD Chamfering Tool	1-1/4" IPS
PE58509	ID/OD Chamfering Tool	2" IPS

## Perfection Plastic Cutter



Part #	Description	Size
PE55225	Plastic Cutter	Capacity: 1-1/4" CTS
PE55225B	Blade	
PE55227	Plastic Cutter	Capacity: 2" IPS

## Gastite Tubing Cutters



Part #	Description
GT-CUTTER-SM	Cutter with flat rollers - 3/8" - 1" FlashShield CSST
GT-CUTTER-SM-5	Replacement blade for GTCUTTER-SM (19 mm diam.)
GT-CUTTER-LG	Cutter with flat rollers - Up to 1-1/2" FlashShield CSST

## Jacket Stripper Tool



Part #	Description
STRP3-8-24	1/2" Jacket Stripper
STRP3-11-24	3/4" Jacket Stripper
STRP3-16-24	1" Jacket Stripper

## Weather Caps



- Easy installation. Simply position and tighten one bolt. No holes to drill. No clamps needed.
- Weathercap's proven design opens to full vertical position. The slightest pressure inside the stack operates Weathercap® so engine breathes freely.
- Closes instantly when exhaust pressure stops. Proper counter-balancing and hinge point, allow Weathercap® to close tightly even in abnormal parking angles.

Part #	Description	Minimum O.D.	Maximum O.D.
11013	4" Steel Weather Cap for Vent Piping	4"	4-3/16"
11011	3-1/2" Steel Weather Cap for Vent Piping	3-1/2"	3-11/16"
11006	2-1/4" Steel Weather Cap for Vent Piping	2-1/4"	2-7/16"
11005	2" Steel Weather Cap for Vent Piping	2"	2-3/16"

## Lock Cap for Fill Valves



Designed to fit over Fill Valve to eliminate unauthorized filling or tampering. Has 1-1/2" shaft opening.

Part #	Description
22KA	Keyed-Alike Lock for use with Lock Cap
#1 LOCK CAP	Filler Valve Lock Cap
#4 LOCK CAP	Cylinder Valve Lock Cap

## Saf-T-Lok for POL Service Valves

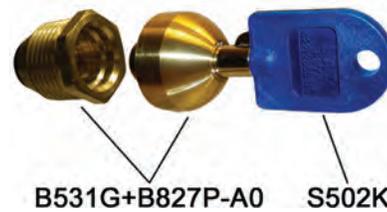


Securely locks POL service valves to help prevent unauthorized hookups, reduces pilferage and increases security.

Part #	Description
511	Saf-T-Lok
511-K	Saf-T-Lok Key

NOTE: For orders of 12 or more locks, one key is included, otherwise keys are sold separately.

## Lock America Valve Locks



B531G+B827P-A0 S502K

Part #	Description
B531G+B827P-A0	POL Lock Complete with Lock & Plug for LP Outlet Valve Keyed Alike (key not included)
B545B-A0	Pad Lock 45MM with Boron Shackle Medium Security Keyed Alike (key not included)
S502K-C-BLUE*	Key (when ordered with lock order) Cut Uniquely with Code for Each Company

\*Other colors available



S533G-LLVC-A0 S502K

Part #	Description
S533G-LLVC-A0	1 3/4" ACME Valve Cap Lock with Brass Cap & Slip Ring with Lock Keyed Alike (key not included)
S533G-H-LLVC-A0	1 3/4" ACME Valve Cap Lock with Hardened Steel Cap & Slip Ring with Lock Keyed Alike (key not included)
S502K-C-BLUE*	Key (when ordered with lock order) Cut Uniquely with Code for Each Company
B800C-T104**	Dust Cover with Spring Action Cap for S533G Series 1 3/4" ACME Valve Locks

\*Other colors available

\*\*Order with S533G series valve cap locks or can be ordered separately as retrofit to previously purchased S533G series valve cap locks.



## Customization Available

## Drill & Tap Kit for Jr. & Sr. Head Percentage Gauges



Part #	Description
TAPKIT	Drill and Tap Kit for Jr. & Sr Gauges

## Manual Propane Flare



The RED DRAGON Manual Propane Flare allows you to evacuate bulk tanks, bobtails and other tanks any where quickly, safely and without venting raw propane into the atmosphere. This compact, durable unit is quick to set up, very simple to use and requires no electricity making it perfect for emergency crews, haz mat teams and fire departments who need to act fast and in remote locations. Keep one on hand in case emergency flare-off is necessary. Also great for propane distributors and dealers flaring off tanks so that valves and gauges may be changed out, saving you time and money. Comes with everything necessary except the vapor cylinder for pilot torch operation.

Part #	Description
FE-PFM-16LPS	1/2" Manual Flare, 48,300 BTU/hr Max, Flares up to 529 gas/hr Control Box, 25' U.L. Evacuation Hose with Bulk Adapter, 10' U.L. Listed Pilot Hose & Regulator, Stable Triangular Base, and Carry Bag.
FE-PFM-Accessory Kit	Adapters, Hoses, Fitting Kit for Alternate Connections to Tanks & Hose Extension

## Contego Intumescent Latex (thin film) Passive Fire Barrier Paint



Contego Passive Fire Barrier is a heavy-bodied, single-part latex fire-proofing paint material. It is a water based product with no volatile organic compounds, is not classified as a hazardous material, and will clean up with soap and water. It is an alternative solution to Carboline Pyrocrete cementitious material that can be used to fire-proof and provide a 2-hour fire protection rating (with sufficient coats) on LPG installations (re: vertical tank legs).

### Features

- Water based paint with no VOC's.
- Is not classified as a hazardous material.
- Will clean up with soap and water.
- Is an optional solution to Carboline's Pyrocrete for fire-proofing.
- Can provide a 2-hour fire protection rating on LPG installations (re: vertical tank legs) with sufficient coats.
- Available in 1 or 5 gallon containers.

Part #	Description
PFB-001W	1 Gallon Bucket
PFB-005W	5 Gallon Pail

### Method:

When activated by heat or flame, a dense carbon char is formed separating and shielding the substrate from heat while off gassing displaces oxygen from the treated surface; thus eliminating two of the three components needed for combustion.

## Gauging Drill Kit

These gauging drills are a must have for the service technician. The most popular gauging drills have been combined into individual kits and these kits are offered at a considerable cost savings! Each kit is provided in a durable heavy gauge plastic case with a tight claps and features easy drill removal and replacement. The drills fit snugly and cannot fall out.



Part #	Contents of Kit	Kit Case
<b>G-1939</b>	21 Gauging Drills with Handles #19 - #39	Standard Plastic Case
<b>G-1960</b>	42 Gauging Drills with Handles #19 - #39	Standard Plastic Case
<b>G-4080P</b>	41 Gauging Drills with Handles #40 - #80 plus GB 3020 tapered broach with handle	Standard Plastic Case
<b>G-6080</b>	21 Gauging Drills with Handles #60 - #80	Standard Plastic Case

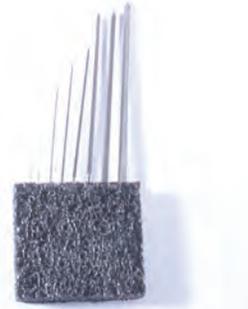
## Large Reamer



Reams proper diameter hole to allow press fit for MI100 Adaptor. Two fast cutting edges. Use TO061 Reamer Hand piece. Turn handle in one direction when reaming.

Part #	Description
<b>TL-070</b>	Reamer (Large) 5/32"

## Gauging Reamer Kit



Kit contains the reamers in a slim plastic case.

Part #	Description	Size
<b>G5000</b>	Set of 8 five-corned reamers	from .003" to .145"

## Tapered Broach



The tapered broaches offered in a three cornered style with or without handle.

Part #	Handle	Size
<b>G-3015</b>	Without	Tapered from .003" to .013"
<b>G-3020</b>	With	Tapered from .003" to .013"

## Orifice Adapter

The MI-100 brass adaptor will renew from 80% to 90% of all orifices, enabling them to use a higher B.T.U gas. Obsolete as well as modern appliance orifices can be renewed efficiently at a minimum cost.



Part #	Description	Size
<b>MI-100-72</b>	Master Orifice Adapter	#72

## Orifice Adapter Kit

Kit includes the parts and tools necessary to install the MI-100 adapter



Part #	Description	Size	Piece Count
<b>MI-100-K</b>	Master Orifice Adapter Kit		
<b>Kit Include</b>			
MI-100-72	Master Orifice Adapter	72	100
TL-061	Handle for Reamer & Broach		1
TL-062	Crimping Tool for Large Plugs		1
TL-063	Driving Tool		1
TL-064	Crimping Tool for Smaller Plugs		1
TL-070	Larger Reamer	5/32" Diameter	1
TL-074	Safety Anvil		1

## Orifice Kit



Have the right orifice at the right time! Save a trip back to the shop! Kit comes in steel case. A chart describing and illustrating each item is just inside the cover. Case is made of heavy gauge steel with durable baked enamel finish and radiused bottom sections for easy removal.

Part #	Description	Includes	Total Pieces
MI131LP	Serviceman's Orifice Assortment Kit	23 of the most commonly used orifices	Over 300
MI132LP	Master Pilot Orifice Assortment Kit	32 of the most needed pilot orifices	Over 100

## Compression Fitting



Part #	Description	Tube Size	Hex Size	Decimal Length	Threads
CF-641	Break-Away Nut & Sleeve	1/4"	7/16"	.6560	7/16-27 UNF

Part #	Description	Tube Size	Diameter	Decimal Length
CF500	Ferrule Sleeve	1/8"	.13	.188

## Pin Vise

For holding large and small gauging drills securely while reaming, preventing spinning. This tool is a must when using gauging drills.



Part #	Description
TL-072	Pin Vise for Gauging Drills

## Universal Thermocouples

Reams proper diameter hole to allow press fit for MI100 Adaptor. Two fast cutting edges. Use TO061 Reamer Hand piece. Turn Handle in one direction when reaming.



Part #	Description	Length
A1970-018	RobertShaw Replacement Thermocoupler	18"
A1970-024	RobertShaw Replacement Thermocoupler	24"
A1970-030	RobertShaw Replacement Thermocoupler	30"
A1970-036	RobertShaw Replacement Thermocoupler	36"
A1970-048	RobertShaw Replacement Thermocoupler	48"

# Plug Orifices

## Plug Orifice



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-501	Flat Tip Plug with Chamfer	5/16"	.3440	0.286-36 Special	No
PO-501-72	Flat Tip Plug with Chamfer	5/16"	.3440	0.286-36 Special	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-502-75	Hex Barrel Plug Orifice	5/16"	.625	0.265-36 Special	75



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-505-72	Round Barrel Plug Orifice w/ Barrel Diameter .43	1/2"	1.18	1/8-27 NPT	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-507-72	Bullet Tip Plug Orifice	1/4"	.3440	1/4-28 UNF	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-508-72	Flat Tip Plug Orifice	1/4"	.3440	1/4-28 UNF	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-515-72	Flat Tip Plug with Chamfer	5/16"	.3440	1/4-32 UNEF	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-518	Flat Tip Plug Orifice	3/8"	.313	11/32-32 Special	No
PO-518-72	Flat Tip Plug Orifice	3/8"	1.3130	11/32-32 Special	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-519-72	Flat Tip Plug Orifice - Round	7/16" Round	.4680	1/8-27 NPT	72

# Plug Orifices

## Plug Orifice



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-520-72	Flat Tip Plug Orifice - Round	9/16" Round	.5310	1/4-18 NPT	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-523-72	Flat Tip Plug Orifice	7/16"	.438	1/8-27 NPT	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-525-72	Flat Tip Plug Orifice	9/16"	.5940	1/4-18 NPT	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-527-80	Flat Tip Plug Orifice	3/8"	.219	6/16-32 UNEF	80



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-529-72	Flat Tip Plug with Chamfer	3/8"	.375	5/16-27 UNS	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-530-72	Flat Tip Plug Orifice	5/16"	.3440	5/16-24 UNF	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-531-72	Flat Tip Plug Orifice	3/8"	.438	11/32-27	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-533-72	Bullet Tip Plug Orifice	3/8"	.375	5/16-32 UNEF	72

# Plug, Cap & Pilot Orifices

## Plug Orifice



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-536-72	Flat Tip Plug with Chamfer	7/16"	.438	3/8-27 UNS	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-538-72	Flat Tip Plug Orifice	7/16"	.4060	3/8-32 UNEF	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-543-72	Flat Tip Plug Orifice	1/2"	.375	7/16-24 UNS	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-554-72	Flat Tip Plug Orifice	9/16"	.438	1/2-24 UNS	72



Part #	Desc.	Hex Size	Decimal Length	Threads	Pre-Drilled
PO-557-72	Flat Tip Plug Orifice	5/8"	.5	9/16-18 UNF	72

Orifices

## Cap Orifice



Part #	Desc.	Hex Size	Decimal Length	Threads	Barrel Diameter
CO-400-72	Regular Cap	1/2"	.7249	1/8-27 NPT	.4279



Part #	Desc.	Hex Size	Decimal Length	Threads	Barrel Diameter
CO-406-72	Regular Cap	1/2"	.8120	3/8-27 UNS	.43

## General Controls Pilot Orifice



Part #	Replaces	Connection	Hex Size	Decimal Length	Threads
GE-753-011	1260, 26T, PC, PG9, PG1, T model	1/4" Compression Connection with aluminum insert	7/16"	.79	5/16-32 UNEF



Part #	Replaces	Connection	Hex Size	Decimal Length	Threads
GE-754-010	26-T and PD-99	1/4" Compression Connection with aluminum insert	1/2"	.905	5/16-32 Ext. UNEF 7/16-24 Int. UNS

## Robertshaw Pilot Orifice



Part #	Replaces	Material	Connection	Round O.D.	Decimal Length
GR-803-009	#A1800(9B)	Aluminum	1/4" Compression	3/8"	.5



Part #	Replaces	Material	Connection	Round O.D.	Decimal Length
GR-804-008	#A1840(2B Target)	Aluminum	1/4" Compression	3/8"	.875



Part #	Replaces	Material	Connection	Round O.D.	Decimal Length
GR-806-008	#1810(2B)	Aluminum	3/16" Compression	5/16"	.5629



Part #	Replaces	Material	Connection	Round O.D.	Decimal Length
GR-813-00	#A1820(2C) & #1830 (2CH)	Aluminum	1/4" Tubing	3/8"	.535



Part #	Round O.D.	Decimal Length
GR-821-010	3/8"	.51



Part #	Replaces	Connection	Decimal Length
GR-814-008	#A1810(2B)	1/4" Compression	.25

## Honeywell Pilot Orifice - Hex



Part #	Replaces	Connection	Hex Size	Decimal Length	Threads
MH-851-011	Q-327, 388146AF, KR, AC,A-11	Includes CF641 insert for 1/4" Compression Connection	1/2"	1.5	1/4-28 UNF 7/16-24 Int. UNS



Part #	Replaces	Connection	Hex Size	Decimal Length	Threads
MH-854-010	#388468H	Includes CF641 insert for 1/4" Compression Connection	1/2"	1.175	7/16-27 Ext. UNS 7/16-27 Int. UNS

## Honeywell Pilot Orifice - Round



Part #	Replaces	Material	Round Size	Decimal Length
MH-856-010	Power Pile type	Aluminum	3/8"	.4150



Part #	Replaces	Material	Round Size	Decimal Length
MH-857-010	Power Pile #388256G	Aluminum	3/8"	.3950



Part #	Replaces	Material	Round Size	Decimal Length
MH-858-010	#Q-308, Q-314	Aluminum	.342	.6

# Pilot Orifices

## Pen-Base Pilot Orifice



Part #	Used for/Replaces	Connection	Hex Size	Decimal Length	Threads
BA-702-010	Series 19119 (22FLP)	1/4" Compression	1/2"	1.5	7/16-27 External UNS



Part #	Hex Size	Decimal Length	Threads
BA-703-010	1/2"	1.5	1/8-27 FNPT to 7/16-27 UNS



Part #	Used for/Replaces	Hex Size	Decimal Length	Threads
BA-715-012	#Y90HA	1/2"	1.75	7/16-27 External UNS 7/16-24 Internal UNS



Part #	Hex Size	Decimal Length	Threads
BA-718-012	1/2"	1.25	7/16-27 External UNS 7/16-24 Internal UNS



Part #	Hex Size	Decimal Length	Threads
BA-719-012	1/2"	1	1/8-27 FNPT to 7/16-27 UNS



Part #	Hex Size	Decimal Length	Threads
BA-720-012	1/2"	1.125	1/8-27 FNPT to 7/16-27 UNS

## Pilot Orifice



Part #	Connection	Hex Size	Decimal Length	Threads
PS-691-010	1/4" Compression	1/2"	1.1599	1/4-28 External UNEF 7/16-24 Internal UNS

## Stainless Steel Appliance Connectors

**1/4" I.D. x 3/8" O.D. with 3/8" Flare**



Part #	I.D.	O.D.	FNPT	MNPT	Flare Size	Length	Material
SSHC-12	1/4"	3/8"	3/8"	3/8"	3/8"	12"	Stainless Steel
SSHC-18	1/4"	3/8"	3/8"	3/8"	3/8"	18"	Stainless Steel
SSHC-24	1/4"	3/8"	3/8"	3/8"	3/8"	24"	Stainless Steel
SSHC-36	1/4"	3/8"	3/8"	3/8"	3/8"	36"	Stainless Steel
SSHC-48	1/4"	3/8"	3/8"	3/8"	3/8"	48"	Stainless Steel
SSHC-60	1/4"	3/8"	3/8"	3/8"	3/8"	60"	Stainless Steel
SSHC-72	1/4"	3/8"	3/8"	3/8"	3/8"	72"	Stainless Steel



Part #	I.D.	O.D.	FNPT	MNPT	Flare Size	Length	Material
SSHC-12B	1/4"	3/8"	3/8"	3/8"	3/8"	12"	Stainless Steel with Hi-Temp Black Coating
SSHC-18B	1/4"	3/8"	3/8"	3/8"	3/8"	18"	Stainless Steel with Hi-Temp Black Coating
SSHC-24B	1/4"	3/8"	3/8"	3/8"	3/8"	24"	Stainless Steel with Hi-Temp Black Coating
SSHC-36B	1/4"	3/8"	3/8"	3/8"	3/8"	36"	Stainless Steel with Hi-Temp Black Coating

**3/8" I.D. x 1/2" O.D. with 1/2" Flare**



Part #	I.D.	O.D.	FNPT	MNPT	Flare Size	Length	Material
SSFC-12	3/8"	1/2"	1/2"	1/2"	1/2"	12"	Stainless Steel
SSFC-18	3/8"	1/2"	1/2"	1/2"	1/2"	18"	Stainless Steel
SSFC-24	3/8"	1/2"	1/2"	1/2"	1/2"	24"	Stainless Steel
SSFC-36	3/8"	1/2"	1/2"	1/2"	1/2"	36"	Stainless Steel
SSFC-48	3/8"	1/2"	1/2"	1/2"	1/2"	48"	Stainless Steel
SSFC-60	3/8"	1/2"	1/2"	1/2"	1/2"	60"	Stainless Steel



Part #	I.D.	O.D.	FNPT	MNPT	Flare Size	Length	Material
SSFC-12B	3/8"	1/2"	1/2"	1/2"	1/2"	12"	Stainless Steel with Hi-Temp Black Coating
SSFC-18B	3/8"	1/2"	1/2"	1/2"	1/2"	18"	Stainless Steel with Hi-Temp Black Coating
SSFC-24B	3/8"	1/2"	1/2"	1/2"	1/2"	24"	Stainless Steel with Hi-Temp Black Coating



Part #	I.D.	O.D.	FNPT	MNPT	Flare Size	Length	Material
SSFC-18GC	3/8"	1/2"	1/2"	1/2"	1/2"	18"	Stainless Steel - Gray PVC Coated
SSFC-30GC	3/8"	1/2"	1/2"	1/2"	1/2"	30"	Stainless Steel - Gray PVC Coated
SSFC-36GC	3/8"	1/2"	1/2"	1/2"	1/2"	36"	Stainless Steel - Gray PVC Coated
SSFC-48GC	3/8"	1/2"	1/2"	1/2"	1/2"	48"	Stainless Steel - Gray PVC Coated
SSFC-60GC	3/8"	1/2"	1/2"	1/2"	1/2"	60"	Stainless Steel - Gray PVC Coated
SSFC-72GC	3/8"	1/2"	1/2"	1/2"	1/2"	72"	Stainless Steel - Gray PVC Coated

## Stainless Steel Appliance Connectors

**3/8" I.D. x 1/2" O.D. with 1/2" Flare**



Part #	I.D.	O.D.	FNPT	MNPT	Flare Size	Length	Material
<b>SSRC-24</b>	1/2"	5/8"	3/4"	3/4"	15/16"	24"	Stainless Steel
<b>SSRC-36</b>	1/2"	5/8"	3/4"	3/4"	15/16"	36"	Stainless Steel
<b>SSRC-48</b>	1/2"	5/8"	3/4"	3/4"	15/16"	48"	Stainless Steel
<b>SSRC-60</b>	1/2"	5/8"	3/4"	3/4"	15/16"	60"	Stainless Steel
<b>30-3131-24</b>	1/2"	5/8"	1/2"	1/2"	15/16"	24"	Stainless Steel
<b>30-3131-36</b>	1/2"	5/8"	1/2"	1/2"	15/16"	36"	Stainless Steel
<b>30-3131-48</b>	1/2"	5/8"	1/2"	1/2"	15/16"	48"	Stainless Steel

**3/4" I.D. x 1" O.D.**



Part #	I.D.	O.D.	FNPT	MNPT	Length	Material
<b>SSWH-24</b>	3/4"	1"	3/4"	3/4"	24"	Stainless Steel - Gray PVC Coated
<b>SSWH-36</b>	3/4"	1"	3/4"	3/4"	36"	Stainless Steel - Gray PVC Coated

## Range Connector Fittings



Part #	Pipe Thread Connection	Flare Size	Material
<b>BCM-5</b>	1/2" M.NPT	15/16"	Zinc Plated Carbon Steel
<b>BCM-7</b>	3/4" M.NPT	15/16"	Zinc Plated Carbon Steel
<b>BCF-5</b>	1/2" F.NPT	15/16"	Zinc Plated Carbon Steel
<b>BCF-7</b>	3/4" F.NPT	15/16"	Zinc Plated Carbon Steel

## Steel ASME Cylinders



Part #	Size	Description	Height	Diameter
CYL100-ASME-W	100 lb.	ASME Cylinder - Squat	35"	18"
CYL200-ASME-W	200 lb.	ASME Cylinder	40"	24"
CYL420-ASME-W	420 lb.	ASME Cylinder	52"	30"

## Aluminum Fork Lift Truck Cylinders



Standard cylinder fitted with liquid service valve, relief valve, float gauge, 20% outage valve. Filler valve and safety coupling installed

Part #	Size	Description	Brand
CYL9315-M	33.5 lb.	Aluminum Forklift cylinder with fill valve & safety coupling	Manchester
CYL9315-W	33.5 lb.	Aluminum Forklift cylinder with fill valve & safety coupling	Worthington
CYL9161-M	43.5 lb.	Aluminum Forklift cylinder with fill valve & safety coupling	Manchester
CYL9161-W	43.5 lb.	Aluminum Forklift cylinder with fill valve & safety coupling	Worthington

## Steel Fork Lift Truck Cylinders



Standard cylinder fitted with liquid service valve, relief valve, float gauge, 20% outage valve. Filler valve and safety coupling installed.

Part #	Size	Description	Brand
CYL5560-M	20 lb.	Forklift cylinder with fill valve & safety coupling	Manchester
CYL5560-W	20 lb.	Forklift cylinder with fill valve & safety coupling	Worthington
CYL5580-M	33.5 lb.	Forklift cylinder with fill valve & safety coupling	Manchester
CYL5580-W	33.5 lb.	Forklift cylinder with fill valve & safety coupling	Worthington
CYL5595-M	43.5 lb.	Forklift cylinder with fill valve & safety coupling	Manchester
CYL5595-W	43.5 lb.	Forklift cylinder with fill valve & safety coupling	Worthington

## Steel Horizontal Cylinders



Includes front & rear mounting bracket.

Part #	Size	Description	Brand
CYL30 HOR-M	30 lb.	Cylinder with OPD Valve and Gauge	Manchester

## Aluminum Portable DOT Cylinders



Part #	Size	Description	Brand
CYL9060-M	20 lb.	Cylinder with OPD Valve	Manchester
CYL9060-W	20 lb.	Cylinder with OPD Valve	Worthington
CYL9150-W	30 lb.	Cylinder with OPD Valve	Worthington
CYL40-A-W	40 lb.	Cylinder with OPD Valve	Worthington

## Steel Portable DOT Cylinders



Part #	Size	Description	Brand
CYL5-OPD-M	5 lb.	Cylinder with OPD Valve	Manchester
CYL11-OPD-S-M	11 lb.	Squatty Cylinder with OPD Valve	Manchester
CYL11-OPD-T-W	11 lb.	Tall Cylinder with OPD Valve	Worthington
CYL20-OPD-M	20 lb.	Cylinder with OPD Valve	Manchester
CYL20-OPD-W	20 lb.	Cylinder with OPD Valve	Worthington
CYL30-OPD-M	30 lb.	Cylinder with OPD Valve	Manchester
CYL30-OPD-W	30 lb.	Cylinder with OPD Valve	Worthington
CYL40-OPD-M	40 lb.	Cylinder with OPD Valve	Manchester
CYL40-OPD-W	40 lb.	Cylinder with OPD Valve	Worthington
CYL43-2-W	43 lb.	Cylinder without OPD Valve	Worthington
CYL50-2-M	50 lb.	Cylinder without OPD Valve	Manchester
CYL60-2-M	60 lb.	Cylinder without OPD Valve	Manchester
CYL60-2-W	60 lb.	Cylinder without OPD Valve	Worthington
CYL100-5-M	100 lb.	Cylinder without OPD Valve	Manchester
CYL100-5-W	100 lb.	Cylinder without OPD Valve	Worthington
CYL100-7-M	100 lb.	Cylinder with 8555D11.6 Valve	Manchester
CYL100-7-W	100 lb.	Cylinder with 8555D11.6 Valve	Worthington
CYL200-M	200 lb.	DOT Cylinder	Manchester
CYL200-W	200 lb.	DOT Cylinder	Worthington
CYL420-M	420 lb.	DOT Cylinder	Manchester
CYL420-W	420 lb.	DOT Cylinder	Worthington

## Vapor Buffer Cylinders



Standard valves include Vapor Service Valve, Universal Float Gauge, & 10% Valve. For use in applications such as Stand-Up Trucks, Floor Buffers, Scrubbers, & Golf Carts.

Part #	Size	Description	Manufacturer
CYL9285-M	20 lb.	Aluminum Buffer Cylinder	Manchester
CYL9285-W	20 lb.	Aluminum Buffer Cylinder	Worthington
CYL5456-M	20 lb.	Steel Buffer Cylinder	Manchester
CYL5456-W	20 lb.	Steel Buffer Cylinder	Worthington

## Beam Scales

Portable Beam Scales for Cylinder filling operations. The Fairbanks Portable Beam Scale is constructed to meet all requirements of Handbook 44, issued by the National Institute of Standards & Technology.



Part #	Description	Beam	Dimensions	Capacity	Weight
1124	Portable Platform Scale	Single	Platform: 17-3/4" x 23-1/2" Base: 21" x 36" Overall Height: 43"	1,000 lbs.	165 lbs.

## ParaSCALE

### Automatic Cylinder Filling Safety System



If integrated with the P4-050-2 Electronic register, the Parascale can also facilitate options such as:

- Automatic Temperature Compensation
- Receipt Printer
- Flow control with both cylinder and Auto-gas/RV/Forklift solenoids
- POS and Fuel Management connectivity including ParaFUEL and ParaFLEET
- Remote Sales Display
- Functional with both PD and Mass Flow Meters

The ParaSCALE system is the most advanced means of safely controlling cylinder filling to prevent overfilling, while ensuring the customer receives a complete fill. Available as a stand alone unit to connect to any electronic load-cell scale base, as a package with the scale base with or without flow control solenoid, or fully integrated into the P4-050 Electronic scale, offering ALL of the options, capabilities, communications and convenience of a Parafour Autogas dispenser, in a UL495 Listed, NTEP certified package, the ParaSCALE system is in a class by itself. It may be installed in a typical dispensing cabinet, with remote power supply, or externally on a pedestal.

Part #	Description
P4-ParaSCALE	Basic system includes controller, power supply, scale base, and 12' harness.

## ParaSCALE Lite

### Electronic Autostop Cylinder Filling Kit for Mechanical Scale



Parafour brings a new level of safety assurance to cylinder filling, whether a single scale station or multiple manual filling points. With positive flow stop when full, you can take comfort in knowing that you will never have an over-fill situation again. OPD's fail, not everyone uses a bleeder. Fill station operator oversight is not always perfect. So whether a single dispenser scale at your gas office, multiple scales on a filling dock, or even at your re-sellers location, the ParaSCALE Lite-SL will let you fill with confidence. Installation takes about 30 minutes. Does not affect scale operation. It mounts to standard Fairbanks filling scales (more applications coming).

Part #	Description
ParaSCALE-Lite	Includes ParaSCALE Micro Controller with associated conduit, junction box and proximity switch
ParaSCALE-Lite-S	Includes ParaSCALE Micro Controller with associated conduit, junction box, proximity switch and 1/2" solenoid.
ParaSCALE-Lite-SL	Includes ParaSCALE Micro Controller with associated conduit, junction box, proximity switch, 1/2" solenoid and stop indicator light.

## Cylinder Carts



Part #	Description
CD100	Cylinder Cart 20 lb. - 40 lb.
HT7325S	Cylinder Cart 100 lb.
HT7-900-4P	Cylinder Cart 200 lb. & 420 lb.

## Cylinder Accessories



Part #	Description
EZGO	EZGO Propane Tank Holder/Stabilizer

## Cylinder Caps & Collars



Part #	Description
CYLCAP-312	3-1/2" for 100 lb.
CYLCOL	Collar Ring for 3-1/2"
CYLCAP-318	3-1/8" for 100 lb. - Old Style

## Tank Dome Accessory



Part #	Description	Colors Available
Pro-Dome-Seal	Propane Tank Dome Critter Seal Fits most propane tank lids with an opening of 3" width x 4" height.	Orange, White, Gray

## E-Z Stamp Air Hammer Set



Stamps the date clearly as required by DOT regulations. Takes less than 30 seconds to stamp complete date on a cylinder. Dies are 3/8" square and print 1/4" characters. Requires only 60 psi air pressure for operation.

Part #	Description
EZ Stamp	Air Hammer Set includes 0-9 and letter "E"
06091	Steel Stamp Set 0-9
"E"	Steel Stamp Letter "E"

## Bot-L-Rench



Special tools for removing or installing valves in DOT Cylinders.

Part #	Description
20-1	POL Plug for Removing Cylinder Valves
20-2	Wrench for POL Plug to Remove Cylinder Valves
20-3	Handle
20-4	Chain Vise Assembly
20-6	Forklift Valve Wrench
20-8	Wrench for OPD and QCC Cylinder Valves

# Cylinder Anchoring System

## Minute Man Tank Anchors

### Upright Tank



Part #	Description	Qty
2365	Coated Sling with 2 Sheathed Straps	1 ea.
2375	Galvanized Strapping	1 pc.*
1346	36" Auger Anchors	2 ea.
2010	Strap Bolt & Nut	4 ea.

\* Cut to required length

### Side Mounted Tank



Part #	Description	Qty
2375	Galvanized Strapping	2 pcs.*
2382	Vinyl Strap Sheathing	2 pcs.*
1346	36" Auger Anchors	4 ea.
2010	Strap Bolt & Nut	4 ea.

\*Cut to required length

### Installation Tools



Part #	Description
2730	120 volt electric Drive Machine used to turn tension head anchors into the soil
2741	Drive Machine Adapter

### Parts Listed Above



## OPD Valve Gauge Assembly



Includes all safety features of standard OPD valves with the added benefit of a visual gauge. Designed for installation in DOT cylinders.

Part #	Description	Dip Tube Length
OPD-5	5 lb.	3.0"
OPD-10	10 lb.	3.6"
OPD-20-GAUGE	Gauge for 20 lb. OPS Valve w/ Dial	4.0"
OPD-30-GAUGE	Gauge for 30 lb. OPS Valve w/ Dial	4.7"
OPD-40	40 lb.	6.4"
OPD-Dial	Dial only for OPD-20-GAUGE and OPD-30-GAUGE	—
907-12	Cap for Type II Cylinder Valve	

## Lift Truck Cylinder Brackets



Part #	Description
TB-2	Horizontal 33-1/2 lb. & 43-1/2 lb. Bracket
TB-3	Vertical 20 lb. Bracket
TB2-60	Toggle Latch Assembly for TB2
TB-28	Vertical 33-1/2 lb. Bracket

## Tank Evacuation Fitting



Part #	Description
ME-517EV	Female 1-5/16" ACME x No Thread

## QCC Adapters



Part #	Description	Connection	Color
ME517	QCC Adapter 35 SCFM/ 70,000 BTU/HR Max	Female 1-5/16" ACME x 1/4" M. NPT	Black
ME518	QCC Adapter 1 45 SCFM/ 200,000 BTU/HR Max	Female 1-5/16" ACME x 1/4" M. NPT	Green
ME393-1	QCC Installation Adapter	Male 1-5/16" ACME x 1/4" F. NPT Adapter	—

## ACME Fittings



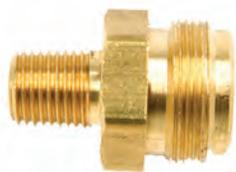
Part #	Description
7142LF	1-1/4" LH F. ACME x 1/4" F.NPT Quick Closing Vapor Service Motor Fuel Valve (LH Vapor Lawncare Cylinder)
7142LM	1-1/4" LH M. ACME x 3/8" F.NPT Quick Closing Vapor Service Motor Fuel Valve (LH Vapor Lawncare Cylinder)

## Cylinder & RV Regulators



Part #	Description	Inlet	Outlet
MEGR-253	Changeover Regulator UL Listed for RV Applications	1/4" Female Inverted Flare	3/8" F. NPT
MEGR-295	2-Stage Regulator with 9:00 Vent, POL with Excess Flow	1" F. NPT	3/8" F. NPT
MEGR-350	High Pressure 0-10 PSI Adjustable Regulator	1/4" F. NPT	3/8" F. NPT
302	Single Stage Regulator	1/4" F. NPT	3/8" F. NPT
302V9	Single Stage Regulator	1/4" F. NPT	3/8" F. NPT
302V9LS	Single Stage Regulator	Soft POL without Orifice	3/8" F. NPT

## Cylinder Connectors



Part #	Description
F276130	9/16" Left Hand Male Thread x 1"-20 Male Throwaway Cylinder Thread w/ Shutoff
F273755	1/4" Male Pipe Thread x 1"-20 Male Throwaway Cylinder Thread



Part #	Description
F273754	1/4" Male Pipe Thread x 1"-20 Female Throwaway Cylinder Thread



Part #	Description
F273758	Propane Bulk Cylinder Adapter with Handwheel
F276132	Propane Bulk Cylinder Adapter without Handwheel (1" x 20 Throwaway Cylinder Thread x POL)



Part #	Description
F276152	1/4" Male Pipe Thread x 9/16" Left Hand Male Thread
F276153	3/8" Male Pipe Thread x 9/16" Left Hand Male Thread

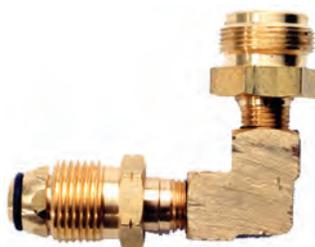
## Cylinder Connectors



Part #	Description
F276140	Propane Male Throwaway Adapter



Part #	Description
F273751	Propane Adapter Tee



Part #	Description
F273760	90 Degree Elbow



Part #	Description
F276400	Propane Brass Cap

## Quick Connectors



Part #	Description
F276186	1/4" Male Pipe Thread x 1/4" Female Pipe Thread



Part #	Description
F276187	3/8" Male Pipe Thread x 3/8" Female Pipe Thread



Part #	Description
5LPA11C	Gas Mate II Male Plug



Part #	Description
ME393-2	Female POL x 1-5/16" Male ACME Type II - Quick Fill Connector



Part #	Description
ME393HD	1-5/16" M. Acme x Soft Nose POL Connection - Heavy Duty Forged Handwheel



Part #	Description
ME393-1	1/4" F.NPT x 1-5/16" M.ACME

# Cylinder Storage Cabinets

## Cylinder Storage Cabinets

- 2 exceptional material & coatings options
  - Powder Coated Galvanized or Hot-Dipped Galvanized
- Tamper resistant welded frame
- Shelving versatility on certain models. Can be arranged to store either 20# cylinders or 33.5# forklift cylinders.

- Galvanized powder coat models are made from zinc galvanized material, then powder coated.
- HD Galvanized models are hot-dipped after fabrication.
- Tamper resistant lockable door for Puck Lock.

- Leg levelers.
- Loading hooks
- Reinforced hinges.
- Replacement parts available.
- Includes propane sign kit.

## Aluminum - 20# Cylinders



Part #	Material	Description	H x W x D	Weight
<b>CEC-20#-18-ALM</b>	Aluminum	Exchange Cylinder 18 count for 20 lb.	70" x 44" x 30"	335 lbs.

## Galvanized Powder Coated White - Forklift Cylinders



Part #	Material	Description	H x W x D	Weight
<b>FCC33#-9-WHT</b>	Galvanized Powder Coated White	Forklift	53" x 44" x 30"	230 lbs.

## Galvanized Powder Coated White - 20# Cylinders



Part #	Material	Description	H x W x D	Weight
<b>CEC-20#-18</b>	Galvanized Powder Coated White	Exchange Cylinder 18 count for 20 lb.	70" x 44" x 30"	335 lbs.

# Cylinder Storage Cabinets

## Cylinder Storage Cabinets

- 2 exceptional material & coatings options
- Powder Coated Galvanized or Hot-Dipped Galvanized
  - Tamper resistant welded frame
  - Shelving versatility on certain models. Can be arranged to store either 20# cylinders or 33.5# forklift cylinders.

- Galvanized powder coat models are made from zinc galvanized material, then powder coated.
- HD Galvanized models are hot-dipped after fabrication.
- Tamper resistant lockable door for Puck Lock.

- Leg levelers.
- Loading hooks
- Reinforced hinges.
- Replacement parts available.
- Includes propane sign kit.

## Galvanized Powder Coated White - 20# Cylinders



Part #	Material	Description	H x W x D	Weight
<b>CEC-20#12</b>	Galvanized Powder Coated White	Exchange Cylinder 12 count for 20 lb.	53" x 44" x 30"	300 lbs.

## Galvanized Powder Coated Yellow - 33# Cylinders



Part #	Material	Description	H x W x D	Weight
<b>FCC-33#-12-YWL</b>	Galvanized Powder Coated Yellow	Forklift Cylinder 12 count for 33 lb.	70" x 44" x 30"	340 lbs.

## Hot Dipped Galvanized - 33# Cylinders



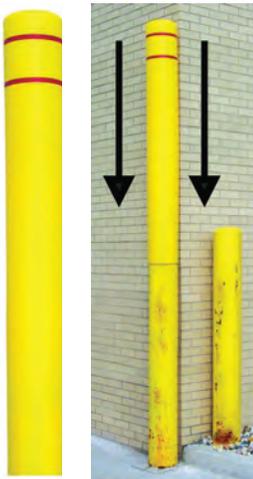
Part #	Material	Description	H x W x D	Weight
<b>FCC33#-12-HDG</b>	Hot Dipped Galvanized	Forklift Cylinder 12 count for 33 lb.	70" x 44" x 30"	340 lbs.

## Bollard Protection



Part #	Stop Pole H x W	Material	Base Size	Weight
110-436-PCY	32" x 4"	Powder Coated Yellow	8" x 8"	30 lbs.
110-442-PCY	36" x 4"	Powder Coated Yellow	8" x 8"	35 lbs.
110-642-PCY	42" x 4"	Powder Coated Yellow	8" x 8"	40 lbs.

## Post Guard



Post Guard is a protective sleeve that easily fits over posts. It saves time and costs by eliminating constant scraping and repainting. The plastic part contains ultraviolet and anti-static additives that withstand extreme temperatures. Custom colors, symbols and company logos are available.

Part #	Description	Color	Diameter	Height
452YR	Post Guard Bollard Cover	Yellow with Red Tape	4.5"	52"
462YR	Post Guard Bollard Cover	Yellow with Red Tape	4.5"	64"
760YR	Post Guard Bollard Cover	Yellow with Red Tape	7"	60"
772YR	Post Guard Bollard Cover	Yellow with Red Tape	7"	72"
872YR	Post Guard Bollard Cover	Yellow with Red Tape	8-7/8"	72"

For our complete line of heaters, logs, fireboxes and fireplaces, please contact the closest GEC sales office to request Manufacturer's Brochures.

## Direct Vented Heaters



- Up to 84% Efficient Stainless Steel Heat Exchanger
- Integral Humidifier
- Programmable Thermostat and Frost Protection
- Easy Installation
- Cool-to-the-Touch Cabinet
- Child Safety Lock

## Vent-Free Gas Logs



- Choose From Several Different Log Sets
- 18" Models to 36" Models Available
- Ceramic Fiber or Traditional Refractory Concrete Available
- Multi-Sided Model Available
- Remote Controls Featured on Most Series

## Fireplaces (Vent-Free, Vented, Wood Burning)



- Many Models and Sizes Available
- Manual Control or Remote Control Models
- Blower Kits - Trim Kits
- Mantels Available for Most Models

## Fireboxes



- 32", 36", 42", and 50" Front Opening Sizes
- See-Thru and Peninsula Fireboxes
- Blower Kits - Trim Kits
- Mantels Available for 32" and 36" Fireboxes

## Empire Vent-Free SR Radiant Heaters

American Made



- 99.9 Percent Efficient
- LP or Natural Gas
- Safe Operation with Auto Shut-Off Safety Controls
- Manual and Hydraulic Thermostat Controls
- Matchless Piezo Igniter
- All Models Heat without Electricity
- Mounts on Wall or Floor (requires optional floor stand)
- Optional Blower (choose manual or automatic)
- 5-year Limited Warranty on Parts and Labor
- Made in the USA

### Propane

Item #	Infrared Temperature Control	Ignition System	BTU
SR6WLP	Manual 1- Heat Setting	Standing Pilot, Piezo	6,000
SR10WLP	Manual 1- Heat Setting	Standing Pilot, Piezo	10,000
SR10TWLP	Hydraulic T-Stat	Standing Pilot, Piezo	10,000
SR18WLP	Manual 3- Heat Setting	Standing Pilot, Piezo	18,000
SR18TWLP	Hydraulic T-Stat	Standing Pilot, Piezo	18,000
SR30WLP	Manual 3- Heat Setting	Standing Pilot, Piezo	30,000
SR30TWLP	Hydraulic T-Stat	Standing Pilot, Piezo	30,000

### Natural Gas

Item #	Infrared Temperature Control	Ignition System	BTU
SR6WNAT	Manual 1- Heat Setting	Standing Pilot, Piezo	6,000
SR10WNAT	Manual 1- Heat Setting	Standing Pilot, Piezo	10,000
SR10TWNAT	Hydraulic T-Stat	Standing Pilot, Piezo	10,000
SR18WNAT	Manual 3- Heat Setting	Standing Pilot, Piezo	18,000
SR18TWNAT	Hydraulic T-Stat	Standing Pilot, Piezo	18,000
SR30WNAT	Manual 3- Heat Setting	Standing Pilot, Piezo	30,000
SR30TWNAT	Hydraulic T-Stat	Standing Pilot, Piezo	30,000

### Accessories

Item #	Description
SRB18W	Manual Blower for SR18
SRB18TW	Automatic Blower for SR18T
SRB30W	Manual Blower for SR30
SRB30TW	Automatic Blower for SR30T
SRS10W	Stand for Floor Installation SR6, SR10, SR10T
SRS-18W	Stand for Floor Installation SR18, SR1T
SRS30W	Stand for Floor Installation SR30, SR30T

## Empire Vent-Free BF Blue-Flame Heaters

American Made



- 99.9 Percent Efficient
- LP or Natural Gas
- Safe Operation with Auto Shut-Off Safety Controls
- Manual and Hydraulic Thermostat Controls
- Matchless Piezo Igniter
- All Models Heat without Electricity
- Mounts on Wall or Floor (requires optional floor stand)
- Optional Blower (choose manual or automatic)
- 5-year Limited Warranty on Parts and Labor
- Made in the USA

### Propane

Item #	Infrared Temperature Control	Ignition System	BTU
BF10WLP	Hydraulic T-Stat	Standing Pilot, Piezo	10,000
BF20WLP	Mod. Hydraulic T-Stat	Standing Pilot, Piezo	20,000
BF30WLP	Mod. Hydraulic T-Stat	Standing Pilot, Piezo	30,000

### Natural Gas

Item #	Infrared Temperature Control	Ignition System	BTU
BF10WNAT	Hydraulic T-Stat	Standing Pilot, Piezo	10,000
BF20WNAT	Mod. Hydraulic T-Stat	Standing Pilot, Piezo	20,000
BF30WNAT	Mod. Hydraulic T-Stat	Standing Pilot, Piezo	30,000

### Accessories

Item #	Description
SRB18TW	Automatic Blower for BF10, BF20
SRB30TW	Automatic Blower for BF30
SRS18W	Stand for Floor Installation BF10, BF20
SRS30W	Stand for Floor Installation BF30

## HearthRite Vent-Free Radiant Heaters

Imported



- 99.9 Percent Efficient
- LP or Natural Gas
- Pushbutton Piezo Ignition and Standing Pilot
- Heats Even When Electric Power Fails
- Every Heater is Test-fired at the Factory.
- Wall-mount (Optional floor stand available.)
- 3-year Limited Warranty on Parts and Labor
- Imported for Empire from China

### Propane

Item #	Infrared Temperature Control	Ignition System	BTU
HRW10ML	Manual 1- Heat Setting	Standing Pilot, Piezo	10,000
HRW10TL	T-Stat	Standing Pilot, Piezo	10,000
HRW17ML	Manual 3- Heat Setting	Standing Pilot, Piezo	17,000
HRW17TL	T-Stat	Standing Pilot, Piezo	17,000
HRW25ML	Manual 3- Heat Setting	Standing Pilot, Piezo	25,000
HRW25TL	T-Stat	Standing Pilot, Piezo	25,000

### Natural Gas

Item #	Infrared Temperature Control	Ignition System	BTU
HRW10MN	Manual 1- Heat Setting	Standing Pilot, Piezo	10,000
HRW10TN	T-Stat	Standing Pilot, Piezo	10,000
HRW18MN	Manual 3- Heat Setting	Standing Pilot, Piezo	18,000
HRW18TN	T-Stat	Standing Pilot, Piezo	18,000
HRW30MN	Manual 3- Heat Setting	Standing Pilot, Piezo	30,000
HRW30TN	T-Stat	Standing Pilot, Piezo	30,000

### Accessories

Item #	Description
HABLR	Blower fits 15,000 to 30,000 BTU
HABF	Stand fits all HearthRite Heaters 2020 or Newer

## HearthRite Vent-Free Blue Flame Heaters

Imported



- 99.9 Percent Efficient
- LP or Natural Gas
- Pushbutton Piezo Ignition and Standing Pilot
- Heats Even When Electric Power Fails
- Every Heater is Test-fired at the Factory.
- Wall-mount (Optional floor stand available.)
- 3-year Limited Warranty on Parts and Labor
- Imported for Empire from China

### Propane

Item #	Infrared Temperature Control	Ignition System	BTU
HBW10ML	Manual	Standing Pilot, Piezo	10,000
HBW10TL	T-Stat	Standing Pilot, Piezo	10,000
HBW20ML	Manual	Standing Pilot, Piezo	20,000
HBW20TL	T-Stat	Standing Pilot, Piezo	20,000
HBW30ML	Manual	Standing Pilot, Piezo	30,000
HBW30TL	T-Stat	Standing Pilot, Piezo	30,000

### Natural Gas

Item #	Infrared Temperature Control	Ignition System	BTU
HBW10MN	Manual	Standing Pilot, Piezo	10,000
HBW10TN	T-Stat	Standing Pilot, Piezo	10,000
HBW20MN	Manual	Standing Pilot, Piezo	20,000
HBW20TN	T-Stat	Standing Pilot, Piezo	20,000
HBW30MN	Manual	Standing Pilot, Piezo	30,000
HBW30TN	T-Stat	Standing Pilot, Piezo	30,000

### Accessories

Item #	Description
HABLR	Blower fits 15,000 to 30,000 BTU
HABF	Stand fits all HearthRite Heaters 2020 or Newer

## Mr. Heater Gas Appliances



North America's Most Popular Portable Propane Heater! This patented radiant Liquid Propane heater connects directly to 1 lb. cylinders. The expertly engineered design gives this heater maximum output while retaining a minimalistic footprint.

Item#	Description	BTU/hr
<b>MH9B*</b>	Portable Buddy Heater	4,000 - 9,000
<b>MH18B*</b>	Big Buddy Portable Heater	4,000, 9,000 or 18,000

\* Check all local, state and federal codes before using indoors.

## Mr. Heater Gas Appliances



Item #	Description	BTU/hr
<b>MH15T</b>	Single Element	8,000 - 15,000
<b>MH30T</b>	Double Element	8,000 - 15,000
<b>MH45T</b>	Triple Element	8,000 - 45,000

## L.B. White Classic™ Forced Air Pilot Ignition Heaters



- Pilot light ignition - simple and dependable operation.
- "Tri-shield" Paint System - excellent protection with 3 layers of protective finish.
- Fully protected gas valve - molded caps on solenoid and pilot protect from dust, dirt & moisture. Eyebolt & chain mounting system - all hardware included.
- Internal gas pressure tap.
- Ten year warranty on case and combustion chamber for rust through.
- Includes unit mounted thermostat.
- Does not include hose and regulator assembly.
- Other L.B. White models available for Special Order

Item#	Capacity BTU/hr	Fuel Consumption	Air Output (Heated) CFM	Electrical	Motor Amp. Draw	10 ft. Gas Hose	Gas Regulator Operating Pressure
346-4	60,000	60 cu. ft./hr	250	115/60/1	3 amps	1/4" ID	11" WC
377-4	115,000	115 cu. ft./hr	480	115/60/1	3 amps	1/2"	11" WC

## L.B. White Guardian™ Forced Air Hot Surface Ignition Heaters



- For indoor or outdoor applications.
- Adjustable heat output.
  - AGA/CGA certified.
  - All models shipped with a sediment trap and 10 ft. power cord. (Power cord not included with AS325LP)
  - All models incorporate an integral gas regulator in the gas valve with a maximum inlet pressure of 1/2 PSIG.
  - Gas valve includes manual gas flow shut-off.
  - CSA U.S./Canada Certification

Item#	BTU/hr Rating		Heated Air Output (CFM)	Inlet Gas Supply Pressure Propane min/max (in WC)	Natural Gas min./max. (in WC)	Cabinet Material
	Minimum Input (variable from)	Maximum Input				
AW100LP	50,000	100,000	400	11.5/13.5	7.0/13.5	Steel with Tri-Shield Coating <sup>8</sup>
AW250LP	160,000	250,000	1,050	11.5/13.5	7.0/13.5	Galvanized Steel**
AW325LP	200,000	325,000	1,700	11.5/13.5	7.0/13.5	Galvanized Steel**

NOTE: Natural Gas models available for special order

<sup>8</sup>Tri-Shield coating consists for 3 unique protective layers including a non-corrosive hot-dipped galvanized steel, and oven-cured epoxy primer and a baked, thermosetting polyester.

\*\*Exclusive Tri-Shield coating available.

## L.B. White Workman™ Convection Heater



Item#	BTU/hr Rating	Fuel Consumption lbs/hr	Ignition Type	Inlet Gas Supply Pressure Propane min/max	Burner Type	Case Material
CH225V	225,000	10.4	Piezo Pilot	10.2 PSIG	Stainless	Aluminized Steel

## Garage Shop Heater



- Simple operation, efficient & effective convection workshop heater
- Requires only 1" clearance from ceiling
- Spark ignition - self diagnostic
- CSA Certified
- Approved for residential & commercial use

Item#	BUT/HR
HSU50	50,000
HSU80	80,000

## High Intensity Workshop Heater



- Requires no electricity
- Great for use in workshops or garages

Item#	Gas	BTU/hr
HS22L	Propane	22,000
HS25N	Natural Gas	25,000

## Enerco Portable Radiant



- Heats up to 3,125 sq. ft.
- Rugged, durable construction
- No electricity required
- Welded frame, heat shield, safety shut-off, regulator
- O.O.L. connection with 20' hose included (F170800)
- Recommended for operation on tanks 100 lbs. and larger
- Runs up to 17 hrs. on a 100 lb tank
- CSA certified

Item#	Output (BTU/HR)	Propane Consumption (LBS/HR)	Heating Area (SQ. FT.)	Ignition Type	Pressure Regulator Setting	Flame Safety	Hose/Regulator
HS125LP	125,000	5.8 max	3125	Piezo Pilot	13.5 w.c.	Thermocouple Operated Gas Valve	20' with Regulator
HS125NG	125,000	—	3125	Piezo Pilot	13.5 w.c.	Thermocouple Operated Gas Valve	—

## Enerco Forced Air



- For use with Propane Gas
- Rugged and durable steel construction
- Economical, efficient and clean burning
- Heavy duty high output fan
- Hose and Regulator included

Item#	BTU/h Rating	Propane Consumption (LBS/HR)	Heating Area (SQ. FT.)	Ignition Type	Inlet Gas Pressure	Hose/Regulator
HS85FAV	85,000	3.90	2,125	Continuous	28" w.c.	20' with Regulator
HS125FAV	125,000	5.80	3,125	Continuous	28" w.c.	20' with Regulator
HS170FAV	170,000	7.80	4,250	Continuous	28" w.c.	20' with Regulator

## HeatStar High Intensity Infrared Heaters



- Efficient, Cost Effective Radiant Heaters 30,000 - 140,000 BTU/HR
- Instant Heat — Quiet, Clean, Odor Free Operation
- Maintenance Free
- No Direct Venting Required
- Warranty: Pro-rated 10-year (burner assembly), limited 1-year (gas control)

Item#	BTU/HR	Converts to BTU/HR	Mounting Clearance to Combustibles				Typical Mounting Height
			Top	Sides	Back	Below	
HS4040	40000	30000	34"	30"	30"	68"	10-12'
HS8060	60000	50000	40"	30"	30"	84"	13-15'
HS9100S	100000	80000	48"	46"	46"	118"	15-28'
HS9120	120000	100000	46"	46"	46"	114"	18' +

### Control Systems

Item#	Description
SP	Automatic spark ignition on pilot with safety burner shut-off, 24VAC with intermittent pilot, Thermostat is shipped with unit. (Pilot is off when heater is off.)
PP	Power pile (self-generating) millivolt control. No outside electrical source is required to operate unit. Manually lit pilot, safety shut-off on pilot and burner

### Decorative Kits

Easily convert restaurant / patio installations

Item#	Description	Kit Contains
F104440	4000 Series Decorative Grid Kit	Grid, screws, retention clip
F104441	4000 Series Decorative Grid Kit, retro-fit	New reflector, grid, screws, retention clip
F104445	8000 Series Decorative Grid Kit	Grid, screws, retention clip
F104446	8000 Series Decorative Grid Kit, retro-fit	New reflector, grid, screws, retention clip

## HeatStar Radiant Tube Heater



- 10-Year Warranty
- Available in 10 to 60 ft. System Lengths
- Sealed Burner Control Box
- Full Cover Polished Aluminum Reflector
- Stainless Steel Couplers

### Single Stage Tube Heater Burner Boxes



Item#	BTU/HR
ERXL40-LP	40000
ERXL60-LP	60000
ERXL80-LP	80000
ERXL100-LP	100000
ERXL125-LP	125000
ERXL150-LP	150000
ERXL175-LP	175000

### 2 Stage Tube Heater Burner Boxes



Item#	BTU/HR
ER2STG100-LP	60,000 Low - 100,000 High
ER2STG125-LP	80,000 Low - 125,000 High
ER2STG175-LP	125,000 Low - 175,000 High

### Tube Sets - ERXL & ER2STG Burner



Tube sets include: Tubes, Reflectors, Hangers, Couplers, Vent Adapter, Plus Turbulator Where Necessary.

Item#	Use with Burner Box	Length	Top Horizontal	Top 45° Angle Straight Below	Sides	Typical Mounting Height	Mounting Clearance to Combustibles
F106408XL	ERXL40 (10' Tubulator)	10'	6"	12"	55"	30"	90
F106404XL	ERXL60/80 (10' Tubulator)	20'	6"	18"	55"	36"	110
F106405XL	ERXL80 (10' Tubulator)	30'	6"	18"	55"	36"	110
F106401XL	ERXL100 (5' Tubulator) or ER2STG100	30'	6"	18"	74"	36"	130
F106406XL	ERXL100/125 or ER2STG125	40'	6"	18"	87"	36"	150
F106407XL	ERXL125/150/175 or ER2STG125	50'	6"	18"	87"	36"	170
F106403XL	ERXL150/175 or ER2STG175	60'	6"	18"	87"	36"	190

### Accessories

Item#	Description
F106414	180° U-Tube Kit
F106415	90° Elbow Kit
438	Side Reflector Kit

Item#	Description
10371	24V ERXL Thermostat
14585P	Hanger Kit (1 per 10')
17370	Chain Kit (1 per 10')
F102601	ER2STG Thermostat

## Red Dragon Vapor Torch Kits

### Light Duty



Item#	Description	Kit Contains	Burner Capacity BTU/HR
HT11/2-10CR	Ideal for the serious Do-It-Yourself worker needing a hand torch.	10 ft. of hose, POL fitting, Needle valve, Pipe thread compound, Spark ignitor	50,000
VT11/2-12C	Ideal for the smaller jobs where a larger torch proves too awkward.	POL fitting, Needle valve, Pipe thread compound	50,000

### Heavy Duty



Item#	Description	Kit Contains	Burner Capacity BTU/HR
VT21/2-30C	Excellent utility torch kit for around the farm and home.	28" handle, 10 ft. of hose, POL fitting, Needle valve, Pipe thread compound, Spark ignitor	400,000
VT3-30C	Ideal for burning weeds, stumps, clearing irrigation ditches, heating and thawing, plus numerous other agricultural and industrial uses.	28" handle, 10 ft. of rubber hose, POL fitting, Needle valve, Pipe thread compound	500,000

### Economy



Item#	Description	Kit Contains	Burner Capacity BTU/HR
VT2 1/2-24CE	Perfect for where continuous operation is required Excellent economy torch	23" handle, 10 ft. of Thermoplastic hose, POL fitting, Needle valve, Pipe thread compound	500,000

## Red Dragon Liquid Torch Kits

### Liquid Torch Kits



Item#	Description	Kit Contains	Burner Capacity BTU/HR
LT21/2-30C	Excellent kit for road repair, surface drying, preheating castings for welding, weed burning and many other jobs	26" handle, 10 ft. of LP Gas hose, POL fitting, Needle valve, Pipe thread compound, spark ignitor	250,000
LT3-60C	Excellent kit for paying repairs, extended weed burning or melting snow or ice.	49" handle, 25 ft. of LP Gas hose, POL fitting, Needle valve, Pipe thread compound, spark ignitor	750,000

## Rinnai Tankless Water Heaters

- Never think about your hot water needs again. Available in multiple sizes, our innovative technology provides an endless supply of hot water whenever and wherever it's needed—even for simultaneous uses at multiple fixtures.
- Designed for efficiency. With an energy factor of up to .82, Rinnai's Luxury and Value Series units use up to 40 percent less energy than a traditional tank.
- Maximum output, minimum space. About the size of a small suitcase, the Rinnai can be tucked in a small crawl space, attic or basement. These wall-mounted units can be installed on the interior wall of the home to free up valuable space.
- Earth-friendly efficiency. Compact heat exchanger design, longer product lifespan compared to a traditional tank and recyclable parts means less waste in landfills.

## Tankless Water Heaters - Commercial/Residential

### HE+ Series



Part #	Description	BTU	Isolation Valves Included	ULNOx Compliant	Gas Type
RL94i-P	Interior	10,300/199,000	Yes	N/A	Propane
RL94i-N	Interior	10,300/199,000	Yes	N/A	Natural Gas
RLX94i-N	Interior	10,300/192,000	Yes	Yes	Natural Gas
RL94e-P	Exterior	10,300/199,000	Yes	Yes	Propane
RL94e-N	Exterior	10,300/199,000	Yes	Yes	Natural Gas
RL75i-P	Interior	10,300/180,000	Yes	Yes	Propane
RL75i-N	Interior	10,300/180,000	Yes	Yes	Natural Gas
RL75e-P	Exterior	10,300/180,000	Yes	Yes	Propane
RL75e-N	Exterior	10,300/180,000	Yes	Yes	Natural Gas

## Tankless Water Heaters - Residential

### HE Series



Part #	Description	BTU	ULNOx Compliant	Gas Type
V94i-P	Interior	10,300/199,000	N/A	Propane
V94i-N	Interior	10,300/199,000	N/A	Natural Gas
V94Xi-N	Interior	10,300/192,000	Yes	Natural Gas
V94e-P	Exterior	10,300/199,000	Yes	Propane
V94e-N	Exterior	10,300/199,000	Yes	Natural Gas
V75i-P	Interior	10,300/180,000	Yes	Propane
V75i-N	Interior	10,300/180,000	Yes	Natural Gas
V75e-P	Exterior	10,300/180,000	Yes	Propane
V75e-N	Exterior	10,300/180,000	Yes	Natural Gas
V65i-P	Interior	10,300/150,000	Yes	Propane
V65i-N	Interior	10,300/150,000	Yes	Natural Gas
V65e-P	Exterior	10,300/150,000	Yes	Propane
V65e-N	Exterior	10,300/150,000	Yes	Natural Gas
V53de-P	Exterior	19,000/120,000 (NG) 20,200/120,000 (LP)	N/A	Propane
V53de-N	Exterior	19,000/120,000 (NG) 20,200/120,000 (LP)	N/A	Natural Gas

•All Luxury Interior, V94i, V94Xi, V75i and V65i units include an integrated MC-91-2US controller, 98°-140° (Factory Setting 120°)  
 •All Luxury Exterior, V94e, V75e and V65e units include an MC-91-2US controller in the box, 98°-140° (Factory Setting 120°)  
 •All Luxury units used for applications requiring temperatures above 140° will require a MCC-91-2W remote controller (sold separately).  
 Certifications: AHRI, UPC, CSA, UMC, AB1953, NSF (Model V53e not NSF-certified)

## Rinnai Tankless Water Heater Accessories

Part #	Description
<b>RWM101</b>	Rinnai Wi-Fi Module (Available April 2016)
<b>RWMPB01</b>	Rinnai Wireless Push Button (Available April 2016)
<b>RWMMS01</b>	Rinnai Wireless Motion Sensor (Available April 2016)
<b>RWMKT01</b>	Standard Wireless Demand Recirc Kit (Available April 2016)
<b>RWMKT01P</b>	Standard Wireless Demand Recirc Kit w/ External Pump (Available April 2016)
<b>RWMKT03</b>	Title 24 Compliant Wireless Demand Recirc Kit (Available April 2016)
<b>RWMKT03P</b>	Title 24 Compliant Wireless Demand Recirc Kit w/ External Pump (Available April 2016)
<b>GTK15</b>	Grundfos® Pump with Timer Kit w/Flange Kit for Circ Logic (Excluding Value Series)
<b>MC-195T-US</b>	Timer Controller for Recirculation
<b>103000038</b>	ScaleCutter® System 3/4" Feed
<b>103000039</b>	ScaleCutter® System Refill
<b>MC-91-2S</b> Replaces MC-91-1S	Standard Remote Controller – Residential or Commercial, 98°-140°F (silver)
<b>MC-91-2W</b> Replaces MC-91-1W	Standard Remote Controller – Residential or Commercial, 98°-140°F (white)
<b>MCC-91-2W</b> Replaces MCC-91-1W	Commercial Controller (for temperatures > 140°F)
<b>MC-91-1US-S-RK</b>	Integrated Controller Relocation Kit (Not compatible with VC Luxury Models)
<b>MC-100V-1S</b>	Deluxe Remote Controller – Clock and Call features, 98°-140°F (silver)
<b>MC-100V-1W</b>	Deluxe Remote Controller – Clock and Call features, 98°-140°F (white)
<b>BC-100V-1S</b>	Bath Fill Remote Controller 98°-140°F (silver)
<b>BC-100V-1W</b>	Bath Fill Remote Controller 98°-140°F (white)
<b>REU-MSB-M</b>	Multi-Unit Controller Kit (One unit needed for each set of 5 units, up to 25 units total)
<b>REU-MSB-C1</b>	Cable to connect Ultra, Luxury Series (Excluding Values Series)
<b>REU-MSB-C2</b>	Cable to connecting MSB-M Control Units (Cable length 25.2 ft)
<b>103000037</b>	Domestic Priority Switch for Hydronic Air Handler/Maintenance Indication Switch
<b>REU-EZC-1-US</b>	EZConnect® Cable for connecting 2 units (Luxury Series and Value Series V94i/e, V75i/e, V65i/e)
<b>REU-PVA-4</b>	Pressure Activated Valve for manifolding RV53e/V53e (1 PVA needed between each pair of units)
<b>RGB-20U</b>	Recess Box for RV53e/V53e
<b>RGB-25U-MSAL-C</b>	Universal Moisture Seal Recess Box for VA, VB, VC (RL94e, RL75e, V94e, V75e, V65e)
<b>RGB-25U-C</b>	Universal Recess Box for VA, VB, VC (RL94e, RL75e, V94e, V75e, V65e)
<b>109000283</b>	RGB-25U/MSAL Replacement Door Kit (for fitting VC units into old RGB-25U/MSAL boxes)

Part #	Description
<b>104000050</b>	RGB-25W Replacement Door Kit (for fitting R63LSe2, R94/R75LSe units into RGB-25W/MS recess boxes)
<b>104000055</b>	RGB-25MSW Replacement Door Kit (for fitting R63LSe2, R94/R75LSe units into RGB-25MSW recess boxes)
<b>PC-20-W</b>	Pipe Cover Enclosure for V53e/RV53e
<b>PCD03-SM2</b>	Pipe Cover Enclosure for the Luxury Series
<b>PCD03-SM2-BP</b>	Bottom Plate for PCD03-SM2 pipe cover and PDC03-EWV
<b>PCD03-EWV</b>	Pipe Cover Enclosure for the V94/V65/V75 Units
<b>MIVK-T-LW</b> Replaces WRIK-LF-F	Plumbing Isolation Valve Kit, Compact design, Ease in Tankless Flushing, Threaded, Lead-Free
<b>104000059</b>	Freeze Protection Solenoid Valve Kit for Outdoor Units in Cold Regions

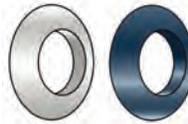
# Tankless Water Heater Venting Materials

## Rinnai Tankless Water Heater Concentric Venting Material for Non-Condensing

Heaters, Torches & Cookers



Part #	Description
224046	Raised Horizontal Termination Kit ("Snorkel")



Part #	Description
710342	Wall Plate (white)
710602	Wall Plate (black)



Part #	Description
223191	8.7" Universal Non-Condensing Horizontal Termination Kit

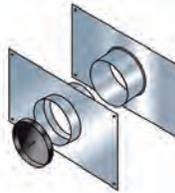


Part #	Description
222053	Condensate Trap



Part #	Description
223181	11.5" Universal Non-Condensing Horizontal Termination Kit

SUPERCEDES STDKITVA-S/STDKITVA-A



Part #	Description
224045	Thimble (1 kit per box)



Part #	Description
223183	11.5" Universal Non-Condensing Horizontal Termination

SUPERCEDES 223157/223161



Part #	Description
224049	Vent Support Bracket

SUPERCEDES 224097

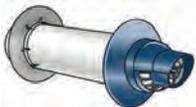


Part #	Description
223182	21" Universal Non-Condensing Horizontal Termination Kit

SUPERCEDES STDKITVA-S/STDKITVA-A21



Part #	Description
224051	10" Vent Pipe Extension
224052	19.5" Vent Pipe Extension
224053	39" Vent Pipe Extension



Part #	Description
223184	21" Universal Non-Condensing Horizontal Termination

SUPERCEDES 223152/223171



Part #	Description
185342	Roof Termination Ext Kit for Luxury and Value Series



Part #	Description
223187	21" Non-Condensing Horizontal Termination Diverter Kit Termination for Minimal Clearance



Part #	Description
224054	Telescoping Vent Length



Part #	Description
224063	90 Degree Elbow



Part #	Description
184118-S	Roof Discharge Termination 18" (above roof)
184119	Roof Discharge Termination 38" (above roof); cold climate

# Tankless Water Heater Venting Materials

## Rinnai Tankless Water Heater Concentric Venting Material for Non-Condensing

Heaters, Torches  
& Cookers



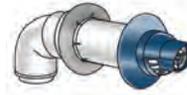
Part #	Description
146141	Roof Flashing Assembly-Flat



Part #	Description
224050	45 Degree Elbow (Qty of 2)



Part #	Description
102000012	Horizontal Flashing Panel



Part #	Description
223188	12" Universal Termination Metal Kit (Luxury/Value Series)



Part #	Description
189950	Shingle Roof Flashing - 1/12 to 6/12 pitch (Plastic)
189951	Shingle Roof Flashing - 6/12 to 12/12 pitch (Plastic)
189952	Shingle Roof Flashing - 8/12 to 16/12 pitch (Plastic)



Part #	Description
184127	Roof Discharge Termination 18" (above roof) SUPERCEDES 223167



Part #	Description
50171949	Tile/Shingle Roof Flashing - 1/12 to 6/12 pitch (Coated Metal)
50171954	Tile/Shingle Roof Flashing - 8/12 to 16/12 pitch (Coated Metal)
50171961	Tile/Shingle Roof Flashing - 6/12 to 12/12 pitch (Coated Metal)



Part #	Description
224255	90 Degree Elbow (Metal)



Part #	Description
224245	Condensate Collector (Metal)



Part #	Description
242141	Flashing for Metal Roof



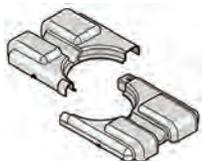
Part #	Description
224250	45 Degree Elbow (2 pieces) (Metal)



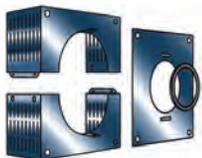
Part #	Description
169044	Pipe Clamp



Part #	Description
224260	10" Vent Pipe Extension (Metal)
224265	19.5" Vent Pipe Extension (Metal)
224270	39" Vent Pipe Extension (Metal)

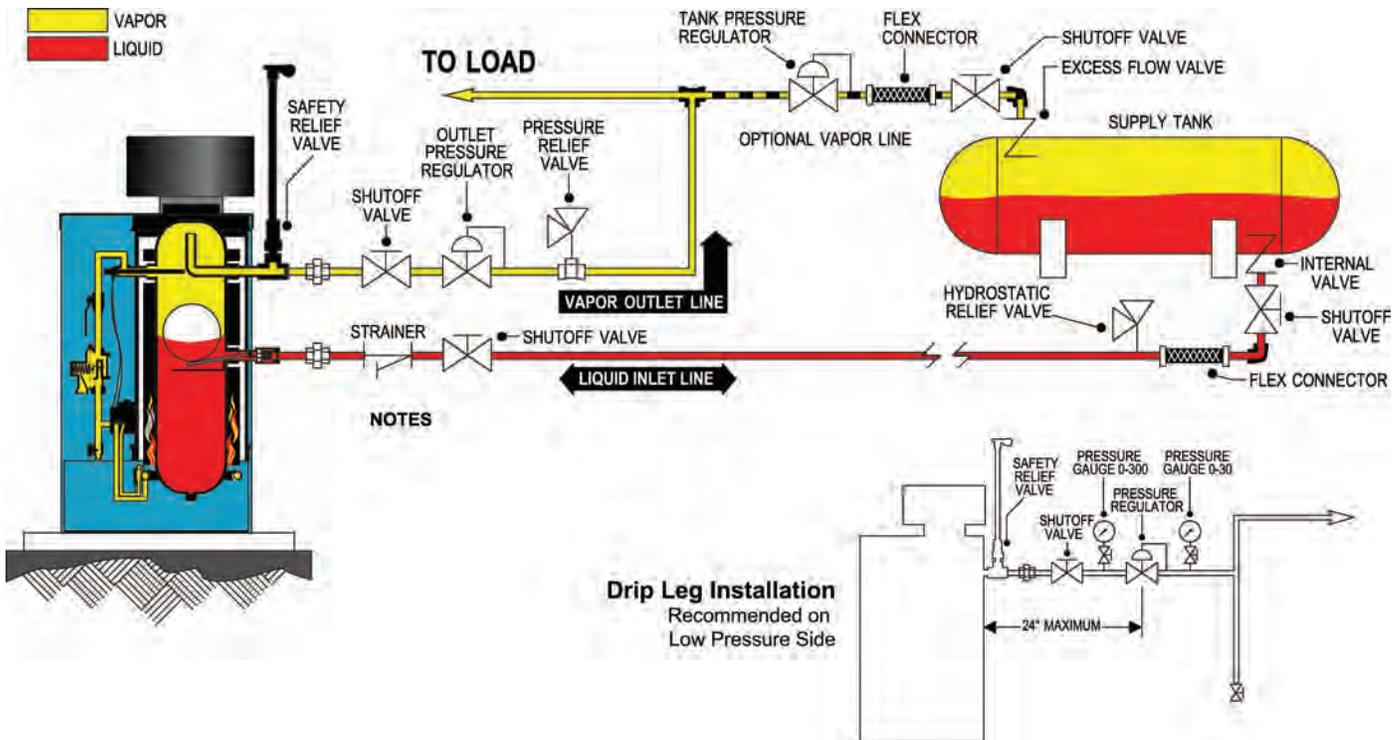


Part #	Description
224040	NSF Cover (for commercial applications)



Part #	Description
224042	Universal Bug Guard

## Typical Vaporizer Installation - Principal Features



## Direct-Fired LPG Vaporizer

### Dragon Shield



- Protective coating on anti-corrosive cabinet
- Chimney with wind trap for extreme climates
- ASME certified heat exchanger
- Thermal box to protect the electronic ignition system from extreme weather
- The most advanced, reliable, and safest system for the operation of your business
- Every vaporizer includes a cage for easy transportation and installation
- Lowest maintenance costs in the market
- Auto ignition system for guaranteed autonomy
- Does not require electricity
- Protective Insulation on cabinet floor & walls

Part #	GPH Propane	Millions of BTU/hr.	Shipping Weight (lbs.)	Inlet	Outlet
DS-80 WG	80	7	445	1-1/4"	1"
DS-120 WG	120	9.4	503	1-1/4"	1"

### Common Repair Parts - Dragon Shield

Part #	Description
GA51477121	Cavagna Regulator 998TW-15
GA51484062	RegO Pressure Relief Valve 250 PSI 3131-G
GA51214157-U	Dragon Shield Electronic Ignition System 80 WG
GA51214158-U	Dragon Shield Electronic Ignition System 120 WG
1890906996-U	Energizer Lithium Battery 9vts
1890907024	Dragon Shield Thermostat 600 AC2 0.600.187 SPA
GA51193159-U	Dragon Shield Welded Burner Assy Cadminized
3540907045-U	Dragon Shield Thermostat Line Pilot 80 WG
3540907049-U	Dragon Shield Thermostat Line Pilot 120 WG
3540907043-U	Dragon Shield Thermocouple Line 80 WG
3540907047-U	Dragon Shield Thermocouple Line 120 WG
GA51193120-U	Dragon Shield Liquid Inlet Valve
GA51193128-U	Dragon Shield Capacity Control Valve

## Direct-Fired LPG Vaporizer

### RH Series



- Mechanical liquid inlet valve provides positive control of LP Gas liquid level on all RH 50, 80, and RH 120 sizes. Larger sizes use reliable float switch and electronic inlet valve to prevent liquid carryover.
- Millivolt-powered gas control system maintains consistent vapor temperature under changing load conditions.
- Modular design provides maximum capacity in a compact, rectangular unit.
- All sizes are capable of infinite turndown and maintain a ready supply of vapor from zero load to full capacity. At no load, only enough heat will be generated to maintain vapor temperature and prevent condensation.
- “E” option available for electronic ignition.

Models are available in a complete range of sizes from 50 GPH to 1,000 GPH propane capacity.

Part #	GPH Propane	CF/hr.	Millions of BTU/hr.	Shipping Weight (lbs.)	Inlet Connection	Outlet Connection
RH50	50	1,823	4.58	205	3/4" FNPT	1" FNPT
RH80	80	2,916	7.32	245	3/4" FNPT	1" FNPT
RH120	120	4,374	10.98	285	3/4" FNPT	1" FNPT
RH200	200	7,290	18.30	380	1" FNPT	1" FNPT
RH400	400	14,580	36.60	920	1" FNPT	2" FNPT
RH600	600	21,870	54.90	1,380	1" FNPT	2" FNPT
RH800	800	29,160	73.20	1,820	1" FNPT	2" FNPT
RH1000	1000	36,450	91.50	2,300	1" FNPT	2" FNPT

### Common Repair Parts - RH Series

Part #	Description
HW-Q313A	Thermal Generator
HW-VS820A	Burner Gas Control Valve
JC-KIT	Pilot Assembly Complete
KF-PRLW*	Lead Wire for Relighter
KF-120F	Vapor Temperature Switch
CP-PR120V*	Pilot Relighter

\*For units equipped with and “E” option only.

## Direct-Fired LPG Vaporizer

### RH Series - 240 Gallon



- Introducing the Newly Designed Ransome RH240 Direct-Fired LP-Gas Vaporizer.
- Ransome’s RH240 Series provides an economical, dependable source of Liquefied Petroleum (LP) gas vapor for a wide range of applications up to 240 gallons per hour.
- The RH240 (240 gallon capacity) is one of the nine different size options to choose from in our Direct-Fired Series line of Vaporizers.
- RH240 units are completely self-contained and require no outside power source.
- Installed optionally, the Ransome 9V Relight System protects against pilot outage to unusually turbulent atmospheric conditions. Unit operated by four 9V batteries and two Solar Panels.
- The 9V Relight System option is for use in the field where 110V line power is unavailable.

Part #	GPH Propane	CF/hr.	Millions of BTU/hr.	Shipping Weight (lbs.)	Inlet	Outlet
RH240	240	8748	21.96	640	1" FNPT	1" FNPT

## Direct-Fired LPG Vaporizer-Mixers

### PAM Series - Ransome



PAM Series Direct-Fired Vaporizer-Mixers provide an economical, dependable source of propane-air mixture to replace natural gas for any industrial or commercial use up to 73,500 SCFH at as high as 30 PSI.

Applications include factories, hospitals, schools, office buildings, small utilities and many others. They are individually factory-tested and calibrated on propane and shipped ready for use.

#### Why a Mixer?

LP-Gas is a highly concentrated source of energy, with 2516 BTU's per cubic foot gross heat content. It is too rich to use as a substitute for natural gas without dilution. The Ransome mixer blends in just the right amount of air for an equivalent mixture. A mixture with specific gravity of 1.31 (1480 BTU/Cu. Ft.) will approximately match 0.6 specific gravity natural gas with 1000 BTU/Cu. Ft. gross heat content.

Part #	Mixer Only	If your Peak Load Requirements are up to <sup>1</sup>			Air Required SCFM (for 10 - 30 PSI Only)	Vaporization Capacity Required (for M Series Only) GPM Propane
		Millions of BTU/hr.	Thousands of SCFH Natural Gas <sup>2</sup>	Thousands of SCFH Mixed Gas <sup>3</sup>		
PAM200-10	M10	14.75	14.75	10	75	180
PAM400-20	M20	29.50	29.50	20	150	360
PAM600-30	M30	44.25	44.25	30	225	540
PAM800-40	M40	59.00	59.00	40	300	720
PAM1000-50	M50	73.75	73.75	50	375	500

1. Units maybe paralleled to achieve greater capacities.

2. Natural Gas; S.G.U. = .6 Gross Heat content 1000 BTU/Cu.Ft.

3. Mixed Gas; Propane-Air, S.G.U. = Gross Heat content 1450 BTU/Cu.Ft.

## Waterbath Vaporizer

### RW Series - Ransome



The RW Series vaporizer consists of a vertical ASME rated pressure vessel which is submerged in a water bath. The water is heated by a gas fired burner which consumes a small amount of vapor from the vessel to develop the heat required for vaporization.

As liquid enters the vessel, it begins to vaporize, absorbing the heat stored in the water causing its temperature to decrease.

The operating temperature switch monitors water temperature and signals the gas control valve to fire the burner when water temperature drops below set point (175° F).

The circulating pump keeps the water and glycol properly mixed and assists in heat transfer by circulating the water throughout the tube, eliminating hot spots.

Ransome Model RW100 uses a mechanical liquid inlet valve that is actuated by a stainless steel ball located inside the vessel. If the liquid level rises above the inlet connection, the float will lift off the inlet valve allowing it to close, stopping the liquid flow. Once the liquid drops, the valve will re-open.

Ransome Models RW180 thru RW900 use an external float switch and electrically operated solenoid valve to stop the liquid flow. Once the liquid drops to a safe level, the float switch will reopen the valve.

Part #	Gallon/hr	CF/hr.	Millions of BTU/hr.	Shipping Weight (lbs.)
RW100	100	3645	9.16	450
RW180	180	6561	16.49	750
RW360	350	13122	32.98	1390
RW540	540	19683	49.46	1950
RW720	720	26244	65.95	2510
RW900	900	32805	82.44	3070

Units maybe paralleled to achieve greater capacities.

## Waterbath Vaporizer - Horizontal

### ID Series - Ransome



The industry's most complete line of large-capacity LP-Gas vaporizers combine safety and reliability. Ransome ID Series water-bath immersion tube vaporizers range in size from 500 to 10,000 gallons per hour propane capacity to produce the precise amount of vapor for your industrial or commercial LP-Gas requirement.

Ransome ID Series vaporizers are ideally suited for lumber kilns, aggregate and gravel or grain dryers, heat treating furnaces, industrial boilers and heating equipment, stand-by fuel systems, peak shaving plants, food drying and processing plants, and any operation requiring an uninterrupted, reliable supply of LP-Gas vapor. All models are fully automatic, designed for unattended use in all climates.

Part #	Gallon/hr	CF/hr.	Millions of BTU/hr.	Shipping Weight (lbs.)
ID500	500	18.3	45.8	4,500
ID750	750	27.5	68.8	5,800
ID1000	1,000	36.6	91.7	6,450
ID1500	1,500	54.9	138	9,200
ID2000	2,000	73.3	183	15,000
ID2500	2,500	91.6	229	17,000

## Direct-Fired LPG Vaporizer

### DF Series - Algas-SDI



- Simple to Install - small & lightweight with only two piping connections required for installation.
- No electricity required.
- Steady gas supply over a broad temperature range.
- Sturdy all weather construction provides for maximum durability and resistance to the elements and eliminates the need for a shelter.
- Easy access to operating controls.
- Capacity control valve included on standard unit.
- Versatile modular construction allows additional vaporizers to be added to the system as demand grows.
- Operates at low temperatures.
- Capacity remains the same for propane or any LPG Supply.
- Complete with all operating and safety controls.
- Includes 3/4" inlet strainer with all models.
- Design pressure 250 psig.

Part #	GPH Propane	Millions of BTU/hr.	Shipping Weight (lbs.)	Inlet Connection	Outlet Connection
40/40H	40	3.6	170	3/4" FNPT	1" FNPT
80/40H	80	7.2	250	3/4" FNPT	1" FNPT

### Common Repair Parts - Algas Direct Gas-Fired LP Gas Vaporizer

Part #	Description
ALG-41073	Thermostat Control Valve 9 Volt
60681	Knurled Screw 6-32 x 1/2"
40449	Pilot Assembly Kit for 160H
ALG-3-0013	Pilot Orifice and Thermocouple Kit
37503	Re-Igniter 9 Volt Module
ALG-41021	Pilot Assembly 80/40H New Style Post

## Small Electric Vaporizer

### Zimmer Series - Algas-SDI



#### Features:

- Simple, wall mount installation or tank mount with optional tank mounting kit.
- One model tolerates 100-240 volts AC or DC.
- Explosion-proof design allows for limited space installation.
- Self limiting heating elements require no additional electrical controls or thermostats.
- Metal to metal inverted valve seat prevents clogging.
- Light weight and easy to handle.
- Easy, low cost installation.
- Injection molded outer plastic shell with anti-static ground.
- Thermodynamic control valve modulates LPG or propane flow to ensure a minimum level of superheat.
- Reliable, very few parts to maintain or fail.
- Lower maintenance requirements than any other vaporizer.
- Replaceable heaters.
- Add more Zimmer vaporizers with no special parts needed.
- Non UL/CE marked units are supplied standard with factory explosion-proof electrical seal.
- UL/CUL/Demko Approved. CE and ATEX marked. Pressure Equipment Directive - SEP.

Part #	GPH Propane	Millions of BTU/hr.	Shipping Weight (lbs.)
<b>Z40P</b>	20	1.82	55
<b>Z100P</b>	50	4.5	145
<b>Z150P</b>	75	6.8	145

## Waterbath Vaporizer - Vertical

### Aquavaire Series - Algas-SDI



- Meets the design requirements of NFPA Pamphlet 58 for gas fired waterbath vaporizers.
- The LPG heat exchanger is designed and constructed to conform with ASME Pressure Vessel Code, Section VIII, Division 1.
- All wiring, controls, electrical components, and their installation comply with recognized standards defined in NFPA 58 and 70.
- Industrial duty fixed air forced draft power burner provides optimum exhaust stack temperatures and fast response to load changes.
- Float activated high LPG liquid level shutdown switch.
- LPG heat exchanger design pressure rating: 250 psig at 650°F (17.6 kg/cm<sup>2</sup> at 343°C).
- Minimum 15°F 8.4°C! Superheat @ 100% capacity.
- Water level sight gauge.
- Powder coated enclosure for durability with fully insulated waterbath for greater efficiency.
- Lifting lugs provided for ease of field installation.
- Water circulation pump standard on all models to eliminate thermal stratification and increase vaporizer efficiency.
- Electronic flame safeguard assures positive and safe ignition.
- Two electronically operated main fuel safety shutoff valves in gas train.

Part #	Gallon/hr	Millions of BTU/hr.	Shipping Weight (lbs.)
<b>Q320V</b>	320	29.1	1,770
<b>Q480V</b>	480	43.7	2,025
<b>Q640V</b>	640	58.2	2,690
<b>Q800V</b>	800	72.8	2,900
<b>Q960V</b>	960	87.4	2,900

## Single Core Electric Vaporizer

### Torrex Series - Algas-SDI



The standard Torrex is a single core, dry, electric vaporizer. No start/stop switches are used. When power is applied, the vaporizer is ON and ready for operation within seconds!

Heating elements are cast "in-situ" in the aluminum core. Two thermocouples housed in a common sheath, directly control normal operation and provide over-temperature protection. Operational set-points are factory set, however, field adjustments can be performed. Fusible links installed in the Control System Housing provide additional over-temperature protection.

Torrex is available in all common voltages. Explosion proof designs are available to meet either Class I, Division 1, Group D (per NFPA Pamphlet 70) or, ATEX marked to comply with CE type Zone I applications. Either design allows Torrex to be installed adjacent to a tank or building with no minimum separation requirement.

- 98% thermal efficiency
- Corrosion-free
- Simple and compact
- No water-glycol
- Liqui-SAFE™ Valve
- Heavy-duty contractor or hermetic relay
- Temperature controller is simple to replace
- Easily fits inside cabinet
- Thermocouple temperature sensor
- Auto-restart after power interruption

Part #	Gallon/hr	Millions of BTU/hr.	Shipping Weight (lbs.)
<b>TX25</b>	12.5	1.1	130
<b>TX50</b>	25	2.2	130
<b>TX100</b>	50	4.5	135
<b>TX160</b>	80	7.2	145
<b>TX240</b>	120	10.9	170
<b>TX320</b>	160	14.5	180

## Packaged Natural Gas Replacement System

### QM Series



The Algas-SDI QM natural gas replacement system is a combination gas fired waterbath LPG vaporizer and atmospheric venturi LPG/air mixer. All QM models feature an Eclipse Combustion ThermAir forced draft burner and Algas-SDI optimized venturi mixers. Operation of these units has been proven in -40 F climates. PLC controls with an easy to use operator interface are provided in a temperature controlled enclosure to ensure long-term reliable operation. A "Smart-Start" cold start feature automatically senses and controls the inlet propane pressure to make sure only vapor is fed to the burner until the bath is warm enough for full vaporization. When the bath has reached operating temperature an output is switched by the PLC that turns on the LPG pump (STABLAIRE). A maintenance program tracks the hours used, venturi cycles, and burner cycles to allow the user to schedule service accordingly. Flow totalization is also provided for convenience.

Part #	Mixed Gas Pressure	Min. LPG Pressure	Number of Venturi's	Vaporizer Model	Shipping Weight (lbs.)	Required Accumulator Tank Capacity (gallons)
<b>QM84-8</b>	8	90	6	Q960V	3,100	240
<b>QM100-8</b>	8	73	4	Q1120V	3,900	500
<b>QM125-8</b>	8	73	5	Q1375V	3,900	500

1. Other models and configurations available.
2. Capacity is based on a nominal mixed gas gross heating value of 1450 BTU/SCF ± 5% with commercial grade propane. Actual capacity and mixed gas heating value may vary slightly base on installation and operating conditions.
3. Delivery pressures shown are valid up to 2,000 ft elevation. Contact Gas Equipment Company for information regarding applications at higher elevations.
4. Various voltage available on request. Contact factory for additional information.
5. Capacities are based on 100% propane. For butane models, contact Gas Equipment Company.

## Flameless Catalytic Tank Heater

### Second Sun Series - Algas-SDI



Second Sun™ is a flameless catalytic tank heater designed to safely and efficiently augment natural vaporization in propane, LPG and anhydrous ammonia storage tanks.

**Key Points.**

- Safe.
- No flame.
- Simple to install.
- No AC power.
- Self-contained. Meets hazardous location requirements

Catalytic heating is a flameless process that involves chemical reactions aided by a catalyst. The primary byproduct of this catalytic process is heat. Second Sun emits this heat against the surface of the tank as infrared waves similar to a radiant heater. This warm, low intensity heat mimics the energy from the sun. Since catalytic heating is flameless, Second Sun meets hazardous location requirements.

Part #	Heat Input	Added Vaporization to Tank	Mounts to	Tank Diameters	Unit Weight (lbs.)	Shipping Weight (lbs.)
<b>SS-30</b>	30,000 BTU/hr	2.2 MMBTU/h @ -20°F	1,000-12,000 US Gal Tanks	41" - 84"	114	141
<b>SS-10</b>	10,000 BTU/h	0.5 MMBTU/h @ -20°F	500-3,900 US Gal. Tanks	37" - 41"	42	60

## Maintenance Checklist

### Basic Vaporizer Maintenance Checklist Items

A clean and tested vaporizer will operate more efficiently, SAFELY and with longer life.

#### Thermostat Operation:

- Did burner(s) cycle on?
- Did the burner(s) & pilot extinguish after a short period of time when turned off?

#### Thermocouple:

- Clean and operating correctly

#### Pilot Assembly:

- Pilot assembly inspected for corrosion?
- Pilot orifice cleaned?

#### Burner Assembly:

- Burner tips and orifices cleaned?

#### Relief Valve:

- Inspected for corrosion?
- Is rain cap present?
- Manufacture date checked for replacement?

#### Drip Leg:

- Drained of all contaminants and oils?

#### Vaporizer Tubing:

- All tubing checked for pitting or flaking and blown free of debris?
- All Fittings tightened?

#### Heat Exchanger:

- Flue inspected?
- Debris removed from and around heat exchanger?
- Heat exchanger head thickness tested?
- Heat exchanger drained of heavy ends?

#### Vaporizer Cabinet:

- Are door, enclosure, inlet louvers and rain caps cleared of debris such as grain chaff, bird nests and other combustible materials?

## Line Sizing Chart for Liquid Propane

### Based on Pressure Drop of 1 PSI

#### To Use Chart

1. Having determined the required flow at point of use, locate this flow in the left hand column. If this fall between two figures, use the larger of the two.
2. Determine total length of piping required from source to point of use.
3. Read across chart from left (required flow) to right to find the total length which is equal to or exceeds the distance from source to use.
4. From this point red up to find the correct size of pipe required.

Liquid Propane Flow GPH	Iron Pipe (Feet)																
	1/4"		3/8"		1/2"		3/4"		1"		1-1/4"		1-1/2"		2"		
	Schedule 40	80	Schedule 40	80	Schedule 40	80	Schedule 40	80	Schedule 40	80	Schedule 40	80	Schedule 40	80	Schedule 40	80	
10	729	416															
15	324	185															
20	182	104	825	521													
40	46	26	205	129	745	504											
60	20	11	92	58	331	224											
80	11	6	51	32	187	127	735	537									
100	7	4	33	21	119	81	470	343									
120			23	15	83	56	326	238									
140			15	9	61	41	240	175	813	618							
160			13	8	47	32	184	134	623	473							
180					37	25	145	106	491	373							
200					30	20	118	86	399	303							
240					21	14	81	59	277	211							
280					15	10	60	44	204	155							
300					13	9	52	38	177	135	785	623					
350							38	28	130	99	578	459					
400							30	22	99	75	433	344	980	794			
500							19	14	64	49	283	225	627	508			
600									44	33	197	156	435	352			
700									32	24	144	114	320	259			
800									25	19	110	87	245	198	965	795	
900									19	14	87	69	194	157	764	630	
1000									16	12	71	56	157	127	618	509	
1500											31	25	70	57	275	227	
2000											18	14	39	32	154	127	
3000											8	6	17	14	69	57	
4000													10	8	39	32	
5000															25	21	
10000															6	5	

## First Stage Regulator

### Spring Loaded - High Pressure



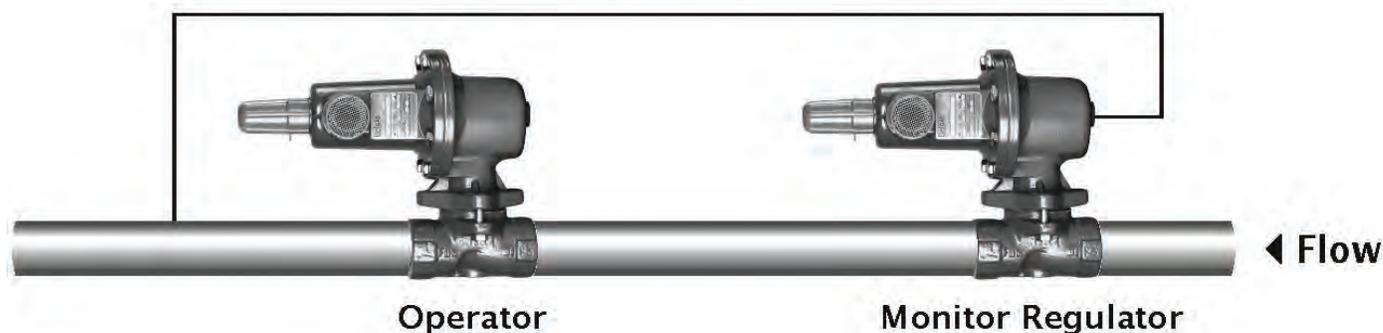
The PG627 is a spring loaded, direct-operated regulator for both low and high pressure applications in the oil and gas industries. These regulators provide durability, from the powder-coated epoxy exterior finish, as well as installation versatility, from the multi-positioned body and spring case configuration.

Part #	Port Size	Orifice Size	Max. Inlet Pressure	Max. Outlet Pressure	Capacity
<b>P627CA-100</b>	1"	1/2"	250 PSI	5 PSI to 20 PSI	Up to 45.5 MBTUH
<b>P627CA-200</b>	2"	1/2"	250 PSI	5 PSI to 20 PSI	Up to 45.5 MBTUH
<b>P627CB-200</b>	2"	1/2"	250 PSI	15 PSI to 40 PSI	Up to 45.5 MBTUH

\*Also available as Monitor Regulator (add 'M' suffix).

## Principle of Operation

### When used in an Operator/Monitor Installation



The Operator/Monitor installation is designed to protect against over-pressurization of downstream piping and equipment in the event the normally throttling regulator (Operator) cannot function properly. In any Operator/Monitor installation, the Operator will be the regulator with the lower set point and the Monitor will be the regulator with the higher set point. The upstream regulator must always be an "M" version with an o-ring sealed valve stem and a threaded connection on the lower diaphragm case for a downstream sensing line. In the event the Operator cannot function properly, the downstream pressure will rise to the set point of the Monitor at which time the Monitor will begin throttling at its set-point. For example, suppose the Operator has a set-point of 10 PSIG and the Monitor has a set-point of 11 PSIG. Since both regulators are attempting to regulate the pressure at the same location (downstream of the second regulator) the Monitor will remain "wide-open" during normal operation because the Operator is limiting the downstream pressure to 10 PSIG. If the Operator fails to control the pressure at 10 PSIG, the downstream pressure will rise to 11 PSIG and the Monitor will begin regulating.

## First Stage Regulator

### High Pressure Direct Acting



The P99 regulator is designed for commercial and industrial applications such as agriculture, dryers, large boilers, furnaces, asphalt plants, etc.

Downstream sensing line required to obtain maximum accuracy. The seat and orifice can be inspected without removing the body from the pipeline. Pilot Operation keeps outlet pressure constant despite varying inlet pressure.

Over Pressure Protection should be considered for all first stage high pressure regulators. A relief valve or regulators installed as a monitor set are optimal protection for over pressure.

Part #	Port Size	Max. Inlet Pressure	Max. Outlet Pressure	Maximum Capacity
<b>P99</b>	2"	250 PSI	5 PSI - 15 PSI	60 MBTUH
<b>P99-Flange Kit</b>	Includes: 1- N-200 X 3, 2- WFT2 2" Flange 150# 4- BLT-B7 5/8"X3" Studs and Nuts, 1 - 2" #100 Gasket Filter			

## Second Stage Regulators

### Spring Loaded



The Type P143 pressure regulator is ideal for propane. Uses include commercial, residential and light industrial for burners and unit heaters. The P143 has an internal relief device and is available in the low pressure cut off (LPCO) version.

The P200 and P300 Series pressure regulators are manual self-operating, spring loaded, adjustable regulators. They can be used in applications where pressure reduction is required. Both regulators will reduce the risk of "shock" from abrupt changes in downstream conditions. This can help prevent safety equipment from shutting an operation down.

Part #	Inlet/Outlet	Max. Inlet Pressure	Max. Outlet Pressure	Capacity
<b>P143</b>	3/4", 1", 1-1/4"	125 PSI	11" WC - 5 PSI	Up to 5 MBTUH
<b>P202</b>	2"	125 PSI	11" WC - 5 PSI	Up to 31 MBTUH
<b>P302</b>	1-1/4", 1-1/2", 2"	125 PSI	11" WC - 3 PSI	Up to 7 MBTUH

## Second Stage Regulators

### Spring Loaded



The American Meter 1800C Series gas pressure regulators are designed for use in residential, light commercial, and small industrial applications.

The 1813C can be used as a service or line pressure regulator for flows up to 2500 CFH (depending on inlet pressure). The 1813C comes equipped with the safety of full capacity internal relief.

Part #	Inlet/Outlet	Orifice Size	Factory Delivered Pressure	Adj. Range	Bonnet Vent Position	Capacity
<b>1813C-20-3</b>	1-1/4"	5/8"	11" WC at 10 PSIG Inlet	8.5" WC - 14" WC	Over Inlet	3,900,000 BTUH

## Relief Valve

### Back Pressure Regulator Relief Valve



The Type P289 Back Pressure Regulator functions as a high flow relief valve with an adjustable set point. The P289 can be used in place of a standard relief valve to provide protection against over pressurization in the downstream system. The design of a large diaphragm area and a pitot tube booster allow the valve to respond quickly and relieve the excessive pressure smoothly, especially in low-pressure settings.

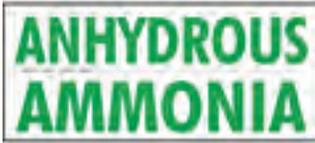
Use with PG627 regulator.

Part #	Port Size	Max. Inlet Pressure	Max. Outlet Pressure
<b>P289-1</b>	1"	100 PSI	Various spring ranges offered.
<b>P289-2</b>	2"	25 PSI	

**Other Regulator Sizes and Styles Available.**

**Commercial and Industrial Gas Systems are to be installed according to Federal, State, and Local Codes.**

**Please verify system requirements with an authority having jurisdiction.**



Part #	Description	Application	Material	Size	Colors
V-5	Anhydrous Ammonia	Anhydrous Ammonia	Vinyl	24" x 10" Can be cut along dotted line to be sized to 7" by 48"	Green or Red on White



Part #	Description	Application	Material	Size	Colors
V-2A	Anhydrous Ammonia	Anhydrous Ammonia	Vinyl	24" x 3"	Green on White



Part #	Description	Application	Material	Size	Colors
V-2B	Inhalation Hazard	Anhydrous Ammonia	Vinyl	36" x 3"	Green on White



Part #	Description	Application	Material	Size	Colors
A-82	Ammonia Emergency Shutoff - Push to Close	Anhydrous Ammonia	Vinyl	10" x 12"	Red on White



Part #	Description	Application	Material	Size	Colors
V-90-5	Liquid	Bulk Storage	Vinyl	Five 4" x 1" per sheet	Red on White



Part #	Description	Application	Material	Size	Colors
V-91-5	Vapor	Bulk Storage	Vinyl	Five 4" x 1" per sheet	Red on White



Part #	Description	Application	Material	Size	Colors
V-302BB	Liquefied Petroleum Gas	Bulk Storage	Vinyl	26" x 4" - 3" Letters	Red on White
V-302C	Liquefied Petroleum Gas	Bulk Storage	Vinyl	24" x 3" - 2" Letters	Red on White



Part #	Description	Application	Material	Size	Colors
V-28A	Propane	Bulk Storage	Vinyl	27.25" x 6.75" - 6" Letters	Red on White
V-28B	Propane	Bulk Storage	Vinyl	18" x 5" - 4" Letters	Red on White
V-28BB	Propane	Bulk Storage	Vinyl	14" x 4" - 3" Letters	Red on White
V-28C	Propane	Bulk Storage	Vinyl	12" x 3" - 2" Letters	Red on White
M-28B	Propane	Bulk Storage	Metal	18" x 5" - 4" Letters	Red on White

## FLAMMABLE GAS

Part #	Description	Application	Material	Size	Colors
V-17A	Flammable Gas	Bulk Storage	Vinyl	30" x 8" - 6" Letters	Red on White
V-17B	Flammable Gas	Bulk Storage	Vinyl	24" x 6" - 4" Letters	Red on White
V-17C	Flammable Gas	Bulk Storage	Vinyl	12" x 3" - 2" Letters	Red on White

## FLAMMABLE

Part #	Description	Application	Material	Size	Colors
V-24A	Flammable	Bulk Storage	Vinyl	28" x 7" - 6" Letters	Red on White
V-24B	Flammable	Bulk Storage	Vinyl	22" x 5" - 4" Letters	Red on White
V-24C	Flammable	Bulk Storage	Vinyl	14" x 3" - 2" Letters	Red on White

## NO SMOKING

Part #	Description	Application	Material	Size	Colors
V-23A	No Smoking	Bulk Storage	Vinyl	27.5" x 6.75" - 6" Letters	Red on White
V-23B	No Smoking	Bulk Storage	Vinyl	27.25" x 4.75" - 4" Letters	Red on White
V-23C	No Smoking	Bulk Storage	Vinyl	14" x 3" - 2" Letters	Red on White
M-23B	No Smoking	Bulk Storage	Metal	27.25" x 4.75" - 4" Letters	Red on White

## NO FUMAR

Part #	Description	Application	Material	Size	Colors
V-23CE	No Fumar	Bulk Storage	Vinyl	12" x 3" - 2" Letters	Red on White

## NO SMOKING OR OPEN FLAMES WITHIN 50 FEET

Part #	Description	Application	Material	Size	Colors
V-26B	No Smoking or Open Flames within 50 Feet	Bulk Storage	Vinyl	18" x 12"	Red on White
M-26B	No Smoking or Open Flames within 50 Feet	Bulk Storage	Metal	18" x 12"	Red on White



Part #	Description	Application	Material	Size	Colors
V-128	Caution. This Container is Not Equipped with an OPD - for Horizontal Tanks	Bulk Storage	Vinyl	3.75" x 4"	Red on White

## NQT

Part #	Description	Application	Material	Size	Colors
V-66	NQT	Bulk Storage	Vinyl	6.5" x 2.75"	Red on White



Part #	Description	Application	Material	Size	Colors
V-45	Label Sheet for Bulk Truck Transports	Bulk Truck Transport	Vinyl	6" x 1" on 10" x 10" sheet	Red on White

# Decals & Signs



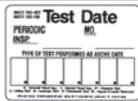
Part #	Description	Application	Material	Size	Colors
V-134	Emergency Shutoff	Bulk Truck Transport	Vinyl	6" x 2.5"	Red on White

WE STOP AT ALL RR CROSSINGS

Part #	Description	Application	Material	Size	Colors
S-22B	We Stop at All RR Crossings	Bulk Truck Transport	Reflective	36" x 4"	Red on Reflective



Part #	Description	Application	Material	Size	Colors
S-22C	We Stop at Railroad Crossings	Bulk Truck Transport	Reflective	12" x 8"	Red on Reflective



11223344K  
55667788T  
99000VPILU

Part #	Description	Application	Material	Size	Colors
05-V-31	Periodic Inspection Kit	Bulk Truck Transport	Vinyl	18" x 6"	Black on White



11223344K  
55667788T  
99000VPILU

Part #	Description	Application	Material	Size	Colors
05-V-32	5 Year Inspection Kit	Bulk Truck Transport	Vinyl	18" x 6"	Black on White



Part #	Description	Application	Material	Size	Colors
AA-16	Liquefied Petroleum Gas - UN 1075 - Flammable Gas	Cylinder	Vinyl	4" x 1.5"	Red & Black on White

Not Available in Curved



Part #	Description	Application	Material	Size	Colors
CS-33	Liquefied Petroleum Gas - UN 1075 - Flammable Gas	Cylinder	Vinyl	5" x 1.25"	Red & Black on White
12-AA14	No Cylinders Allowed Indoors	Cylinder	Vinyl	6" x 2"	Red & Black on White

Curved Only



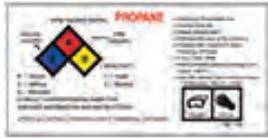
Part #	Description	Application	Material	Size	Colors
V-206	Recommended Procedures for Filling DOT (ICC) and ASME LP Gas Container	Cylinder	Vinyl	21.25" x 14"	Red on White
P-206	Recommended Procedures for Filling DOT (ICC) and ASME LP Gas Container	Cylinder	Polyethylene	21.25" x 14"	Red on White



Part #	Description	Application	Material	Size	Colors
V-44	3 in 1 - D.O.T. 1075, NFPA Hazard Rating, Warning ANSI/NFPA Pamphlet 58	Cylinder	Vinyl	6.75" x 4.75"	Red, Blue, Yellow and Black



Part #	Description	Application	Material	Size	Colors
V-55R	2 in 1 - D.O.T. 1075, Warning ANSI/NFPA Pamphlet 58	Cylinder	Vinyl	7.375" x 3.375" Curved	Red and Black on White



Part #	Description	Application	Material	Size	Colors
HZ-116	NFPA Hazard Rating	Cylinder	Vinyl	5" x 2.25"	Red, Blue, Yellow and Black



Part #	Description	Application	Material	Size	Colors
SP53R	Danger - Flammable Gas Under Pressure - Customer Warnings	Cylinder	Vinyl	9" x 4"	Black on Yellow



Part #	Description	Application	Material	Size	Colors
V-92	Various Labels	Cylinder	Vinyl	16 per page .375" x 1.75" each	Red on Yellow



Part #	Description	Application	Material	Size	Colors
M97A	Propane Filling Station - Single Faced	Cylinder	Aluminum	2' x 4'	Blue on White
M97-B	Propane Filling Station - Single Faced	Cylinder	Aluminum	3' x 6'	Blue on White
M97-AD	Propane Filling Station - Double Faced	Cylinder	Aluminum	2' x 4'	Blue on White
M97-BD	Propane Filling Station - Double Faced	Cylinder	Aluminum	3' x 6'	Blue on White
M97-C	Propane Sold Here - Single Faced	Cylinder	Aluminum	2' x 4'	Blue on White
M97-AX	Propane Cylinders Exchanged - Single Faced	Cylinder	Aluminum	2' x 4'	Blue on White
M97-AXD	Propane Cylinders Exchanged - Double Faced	Cylinder	Aluminum	2' x 4'	Blue on White
M97-FR	Frame	Cylinder	Metal	2' x 4'	



Part #	Description	Application	Material	Size	Colors
C163	Visual Requalifier ID Number	Cylinder	Vinyl	3" x 1.875"	Black on White

# Decals & Signs



Part #	Description	Application	Material	Size	Colors
ESV-SIGN-R	Propane Emergency Shutoff - Toggle Off	Emergency Shutoff	Metal	18" x 24"	Red on White



Part #	Description	Application	Material	Size	Colors
ESV-SIGN	Propane Emergency Shutoff - Toggle Off	Emergency Shutoff	Metal	5.5" x 9.5"	Red on White



Part #	Description	Application	Material	Size	Colors
ESV-SIGN-CABLE-PULL	Propane Emergency Shutoff - Pull to Close - Cable	Emergency Shutoff	Metal	5.5" x 9.5"	Red on White



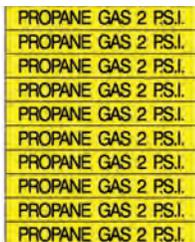
Part #	Description	Application	Material	Size	Colors
V-81	Propane Emergency Shutoff - Pull to Close	Emergency Shutoff	Vinyl	10" x 12"	Red on White
P-81	Propane Emergency Shutoff - Pull to Close	Emergency Shutoff	Polyethylene	10" x 12"	Red on White



Part #	Description	Application	Material	Size	Colors
V-82	Propane Emergency Shutoff - Push to Close	Emergency Shutoff	Vinyl	10" x 12"	Red on White
P-82	Propane Emergency Shutoff - Push to Close	Emergency Shutoff	Polyethylene	10" x 12"	Red on White



Part #	Description	Application	Material	Size	Colors
VGS100	Gas Line	Gas Pipe Marking	Vinyl	5" x 1" Roll of 100	Black on Yellow



Part #	Description	Application	Material	Size	Colors
V-62	Propane Gas 2 PSI	Gas Pipe Marking	Vinyl	10 per page .375" x 3"	Black on Yellow



Part #	Description	Application	Material	Size	Colors
G-1075	Liquefied Petroleum Gas 1075 - 2	Placards	Magnetic Blanket	10.875" x 10.675"	Red & Black on White
V-1075	Liquefied Petroleum Gas 1075 - 2	Placards	Vinyl	10.875" x 10.675"	Red & Black on White
S-1075	Liquefied Petroleum Gas 1075 - 2	Placards	Reflective	10.875" x 10.675"	Red & Black on White
P-1075	Liquefied Petroleum Gas 1075 - 2	Placards	Polyethelene	10.625" x 10.625"	Red & Black on White



Part #	Description	Application	Material	Size	Colors
V-52	Flammable Gas - 2	Placards	Vinyl	10.875" x 10.675"	Red on White



Part #	Description	Application	Material	Size	Colors
V-1005	Anhydrous Ammonia Liquefied 1005 - 2	Placards	Vinyl	10.875" x 10.675"	Green & Black on White



Part #	Description	Application	Material	Size	Colors
NFPA-704-1	Storage Tank Diamond for Propane 2 - 4 - 0	Placards	Vinyl	7.5" x 7.5" (100' Legibility)	Blue, Red, Yellow & Black on White
NFPA-704-3	Storage Tank Diamond for Propane 2 - 4 - 0	Placards	Vinyl	15" x 15" (300' Legibility)	Blue, Red, Yellow & Black on White



Part #	Description	Application	Material	Size	Colors
S500-9-90	Propane	Placards	Reflective	4.5" x 3"	Black on Reflective
S500-9-90BLUE	Propane	Placards	Reflective	4.5" x 3"	Blue on Reflective



Part #	Description	Application	Material	Size	Colors
MPH-69	Placard Holder	Placards	0.050 Aluminum with Baked Enamel Finish and Stainless Steel Clips	11" x 11"	White

# Decals & Signs



Part #	Description	Application	Material	Size	Colors
RSP	Placard Holder	Placards	Metal	14" x 14"	Red & Black on White



4 Directional placarding system that fits 120 to 1000 gallon sized tanks with non-marking bumpers

Part #	Description
DOT PLACARDING SYSTEM	Placard System



Part #	Description	Application	Material	Size	Colors
P-83	Hazardous Materials Shipping Documents - One Truck Load	Shipping Documents	Rigid Vinyl	7" x 9"	Red on White

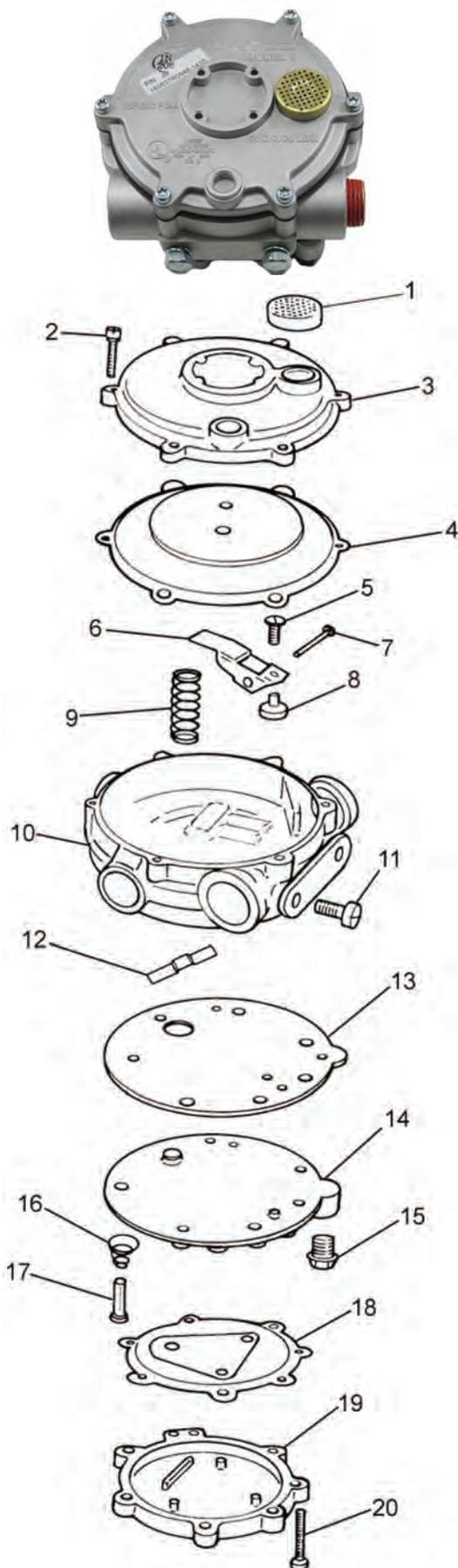


Part #	Description	Application	Material	Size	Colors
P-83-CYL	Hazardous Materials Shipping Documents - No. of Cylinders	Shipping Documents	Rigid Vinyl	7" x 9"	Red on White

Part #	Description
UG-Anode-Test	Underground tank anode test decal on 7940 matte silver 4" x 4" black

## Model J Series

100 HP LP Gas



Part #	Ref. #	Description
NSS	1	Screen, atmosphere vent (Model J only)
NSS	2	Screw, 8-32 x 5/8" SEMS (6)
NSS	3	Cover assy., secondary
NSS*	4	Diaphragm assy., secondary, Hydrin (RK-J, RK-J-C, RK-JC-734)
NSS*	4	Diaphragm assy., secondary, Silicone (RK-J-2)
NSS*	4	Diaphragm assy., secondary, Silicone (RK-J-3)
NSS	5	Screw, 8-32 x 3/8" SEMS
L1-37	6	Lever, secondary regulator
NSS	7	Pin, secondary fulcrum
S4-27*	8	Seat, secondary
S2-35	9	Spring, blue secondary, standard
S2-38**	9	Spring, orange secondary, optional
NSS	10	Body assy., with jet
S1-5	11	Screw, 1/4" - 20 x 5/8" SEMS (2)
NSS*	12	Seat, primary regulator
NSS*	13	Gasket, body to plate
P2-26	14	Plate, converter body cover
P3-13	15	Plug, 1/8" pipe, hex head
S2-36	16	Spring, primary regulator
NSS*	17	Pin, primary valve
NSS*	18	Diaphragm assy., primary
C1-93	19	Cover, primary regulator
NSS	20	Screw, 8-32 x 1" SEMS (7)

NSS = Not Serviced Separately

\* Indicates repair kit components.

\*\* Two vapor outlet pressures are available. Orange secondary spring gives negative 1/2" water column. Blue secondary spring gives negative 1 1/2" water column. To change any JB converter to JO, change blue secondary spring to orange.

## Model J Series

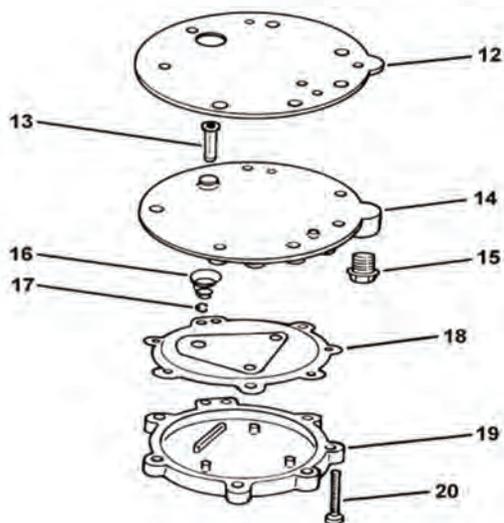
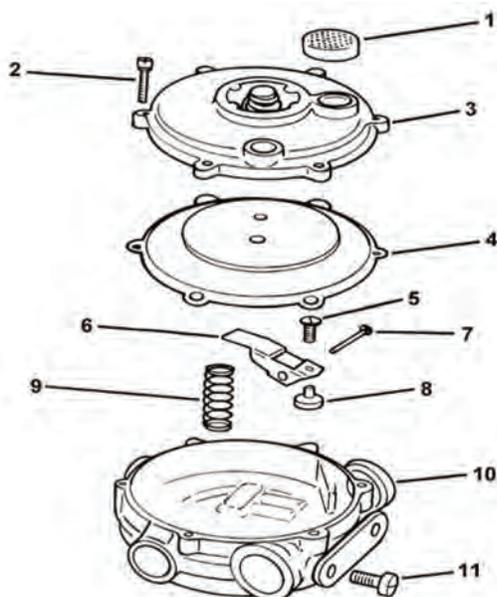
### Repair Kits



Part #	Description
RK-J	Buna
RK-J-2	Silicon

## Model Cobra Series

100 HP LP Gas



Part #	Ref. #	Description
NSS	1	Screen, atmospheric vent
NSS	2	Screw, 8-32 x 7/8" Tork style (6)
NSS	3	Cover Assy, secondary
AD1-27-5	4	Diaphragm Ass, secondary, flourosilicone
NSS	5	Screw, 8-32 x 1/2" Tork style
L1-37	6	Lever, secondary
P1-8	7	Pin, secondary fulcrum
S4-27*	8	Seat, secondary
S2-35	9	Spring, blue secondary, -0.37 kPa standard
S2-38	9	Spring, orange secondary, -0.12 kPa optional
NSS	10	Body assy, with jet
NSS	11	Plug, vapor outlet
S1-5	12	Screw, 1/4-20 x 5/8" (2)
NSS	13	Pin, valve primary
NSS	14	Plate, body cover
P3-13	15	Plug, 1/8 NPT hex head
NSS	16	Spring, primary
NSS	17	E-ring, external
NSS	18	Diaphragm assy, primary
NSS	19	Cover, primary
NSS	20	Screw, 8-32 x 1-1/8" Tork style (7)

NSS = Not Serviced Separately

\*Included in Repair Kit

## Model Cobra Series

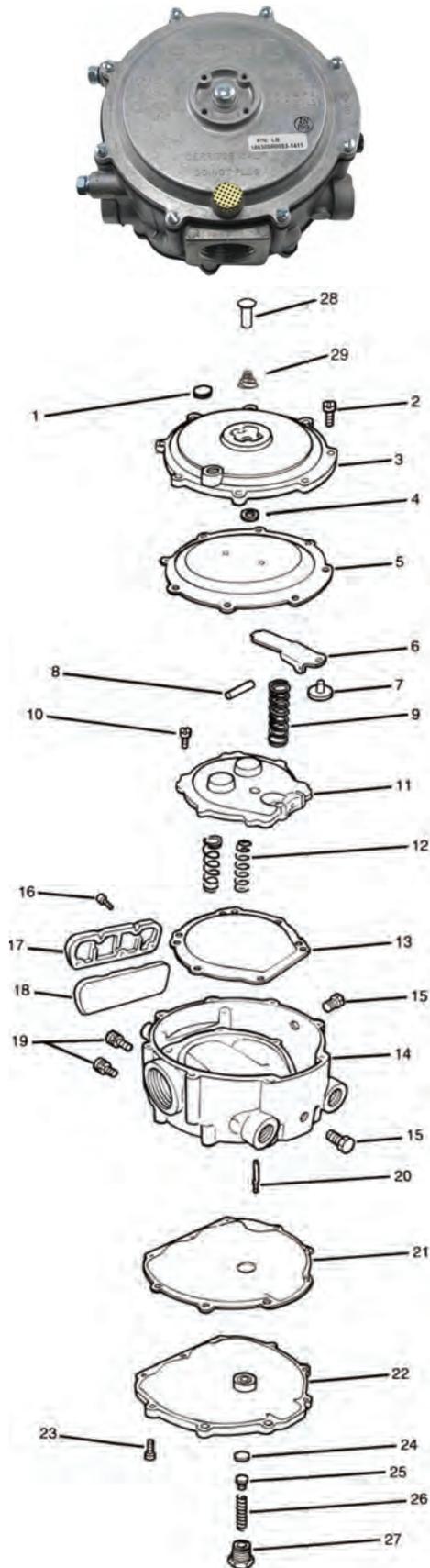
### Repair Kits



Part #	Description
RK-Cobra	Repair Kit

## Model L Series

325 HP LP Gas



Part #	Ref. #	Description
S7-1	1	Screen, atmosphere vent
S1-59*	2	Screw, 8-32 x 5/8" SEMS (8)
NSS	3	Cover assy., secondary
W1-27*	4	Washer, hand primer
NSS*	5	Diaphragm assy., secondary, Hydrin
NSS*	5	Diaphragm assy., secondary, Silicone
L1-87	6	Lever, secondary
S4-37*	7	Seat, secondary (new)
NSS	8	Pin, secondary lever fulcrum
S2-97	9	Spring, secondary regulator (blue)
S1-59*	10	Screw, 8-32 x 3/8" SEMS (6)
NSS	11	Cover, primary diaphragm
S2-92	12	Spring, primary regulator (2)
NSS*	13	Diaphragm assy., primary
NSS	14	Body assy.
P3-13	15	Plug, 1/8" pipe, hex head (2)
S1-59*	16	Screw, 8-32 x 5/8" SEMS (5)
C1-61	17	Cover, water passage
NSS*	18	Gasket, water passage
S1-5	19	Screw, 1/4"-20 x 5/8" SEMS (2)
P1-34	20	Pin, primary valve
NSS*	21	Gasket, vaporizing chamber
AC1-64	22	Cover, vaporizing chamber: C1-64, J1-17
S1-3*	23	Screw, 10-24 x 5/8" SEMS (9)
NSS*	24	Seat, primary
NSS*	25	Seat support, primary
S2-93	26	Spring, primary valve
B3-25551	27	Bushing assy., fuel inlet
NSS	28	Pin, primer
NSS	29	Spring, primer

NSS = Not Serviced Separately:

In colder climates, the Model L vaporization capacity will be reduced by 20% during WOT operation. Due to lower rate of water flow in industrial application, Model L is rated at 200 H.P. in these installations.

\* Indicates repair kit components.

## Model L Series

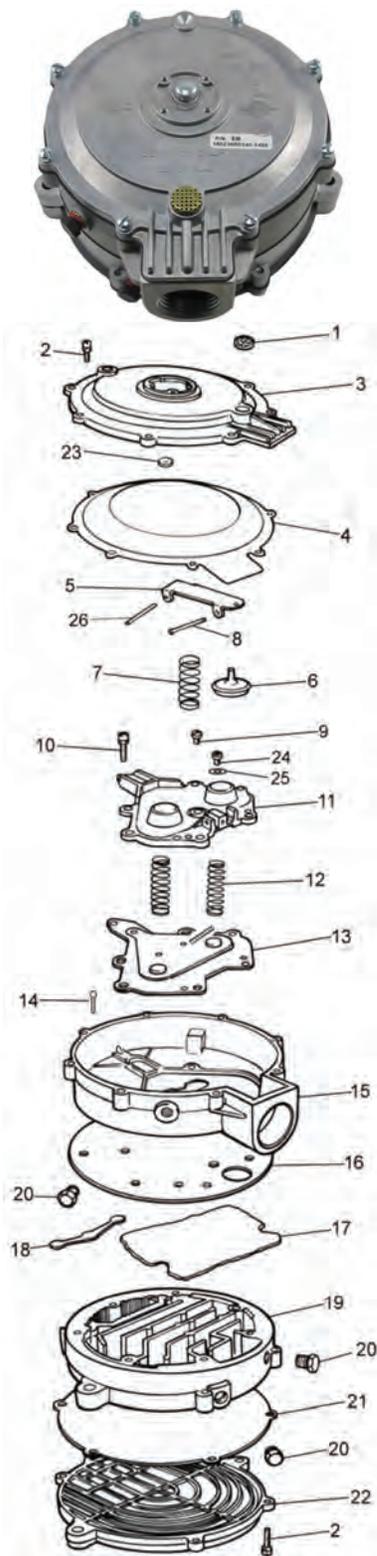
### Repair Kits



Part #	Description
RK-L	Buna
RK-L-2	Silicon

## Model E & PE Series

325 HP LP Gas



Part #	Ref. #	Description
NSS	1	Screen, atmosphere vent
S1-3*	2	Screw, 10-24 x 5/8" SEMS (8)
NSS	3	Cover assy., secondary
NSS*	4	Diaphragm assy., secondary, Hydrin
NSS*	4	Diaphragm assy., secondary, Silicone
NSS*	5	Lever, secondary
S4-25*	6	Seat, secondary (new)
S2-22	7	Spring, secondary regulator (blue), standard
S2-23***	7	Spring, secondary regulator (orange), optional
NSS	8	Pin, secondary lever fulcrum (Early Model)
NSS	8	Pin, secondary lever fulcrum (Later Model)
NSS*	9	Screw, 10-24 x 3/8" SEMS (2)
NSS*	10	Screw, 12-24 x 1-1/8" SEMS (7)
NSS	11	Cover, primary diaphragm (Early Model)
NSS	11	Cover, primary diaphragm (Later Model)
NSS	12	Spring, primary regulator (2)
NSS	13	Diaphragm assy., primary
NSS	14	Pin, primary valve
NSS	15	Body, regulator E Series
NSS*	16	Gasket, regulator body
NSS	17	Sponge
NSS*	18	Seat, primary
NSS	19	Body, assy., heat exchanger
NSS	20	Plug, hex head, 1/8 NPT (3)
NSS	21	Gasket, heat exchanger cover
NSS	22	Cover, heat exchanger
NSS*	23	Washer, hand primer
NSS	24	Screw, 8-32 x .25" (Later Model)
NSS	25	Flat washer (Later Model)
NSS*	26	Pin, lever diaphragm link

NSS = Not Serviced Separately

\*\* Two vapor outlet pressures are available. Orange secondary spring gives negative 1/2" water column. Blue secondary spring gives negative 1-1/2" water column.

To change any B regulator to O, change blue secondary spring to orange. Due to lower rate of water flow in industrial applications, Model E is rated at 200 H.P. in these installations.

\* Indicates repair kit components.

NOTE: PE Series does not carry UL approval.

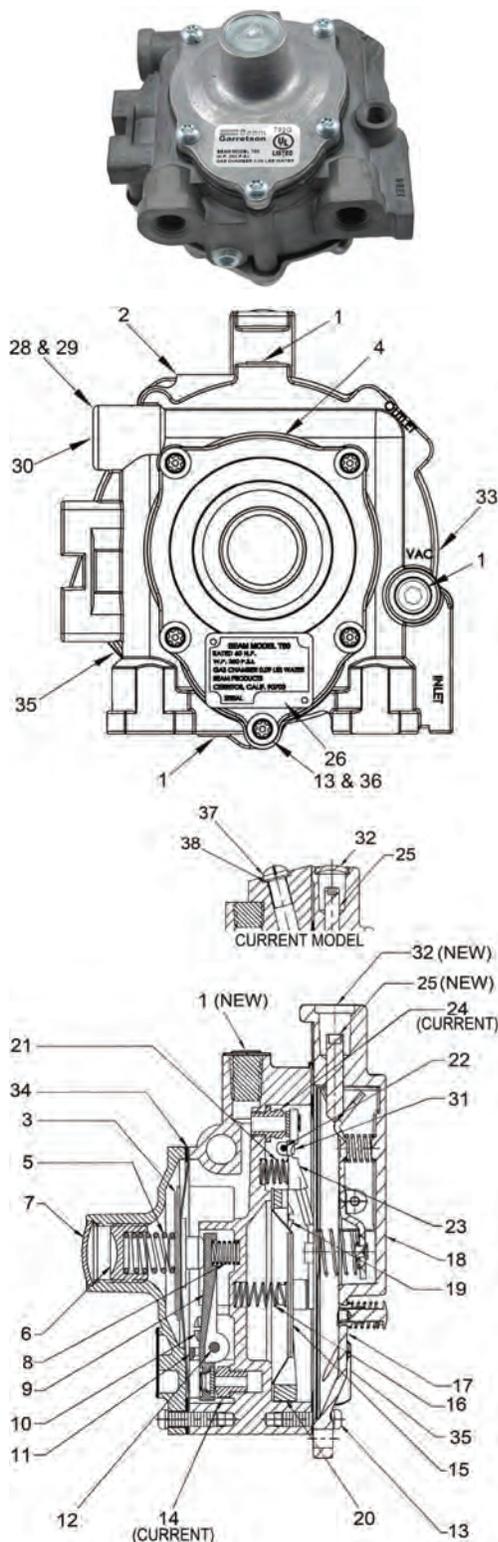
## Model E & PE Series

### Repair Kits



Part #	Description
RK-E	Buna
RK-E-2	Silicon

## Model T60

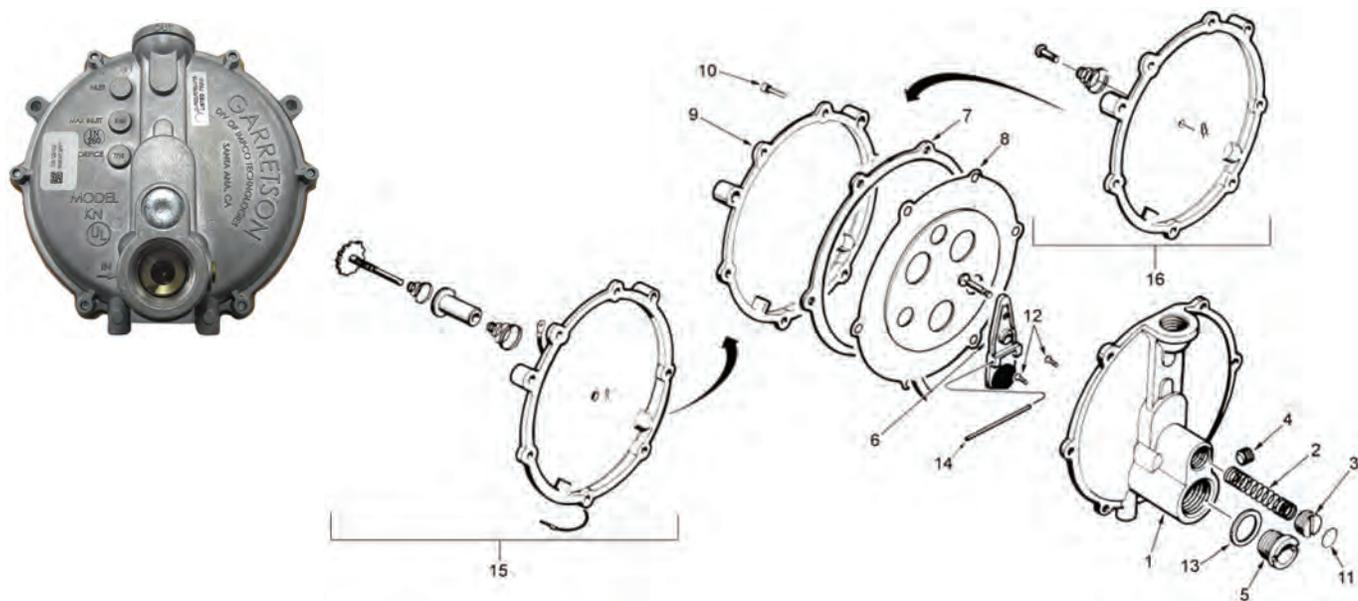


Part #	Ref. #	Description
P316699-001	1	Plug, 1/8 Socket Head Steel (New)
P3-13	1	Plug, 1/8-27 NPT* (1) (Early)
NSS	2	Casting, Regulator Body
NSS	3	Diaphragm Assembly* (1) (2)
NSS	4	Cover, Primary Regulator
NSS	5	Spring, Primary* (1)
NSS	6	Screw, Retainer Adjustabel Spring
P3-17956-8	7	Plug, Expansion* (1) (2)
60-4	8	Spring, Primary Lever* (1)
NSS	9	Lever Assy, Primary* (1) (2)
NSS	10	Screw, FIL HD, 10-32 UNF-2A x .31 L (Early)
NSS	10	Screw, M5 x 0.8 7.9 FIL HD, Torx (New)
NSS	11	Bridge, Primary
NSS	12	Pin, Primary Pivot* (1)
NSS	13	Screw, 10-32 x .62 Torx* (1)
NSS	13	Screw, Torx Tamp Res M5 x 16mm (New)
NSS	14	Orifice, Primary Regulator (Current)
60-15A	15	Diaphragm Assembly, Vac Lock* (1) (2)
NSS	16	Spring, Vac Lock* (1)
60-22A	17	Diaphragm, Secondary* (1) (2)
AC1-50001-004	18	Cover Assy (Current)
AC1-500001-004A	18	Cover Assy W/Primer (Current)
AC1-51985-001	18	Cover Assy (New)
AC1-51985-001A	18	Cover Assy W/Primer (New)
AC1-50001-001A	18	Cover Assy W/Primer & Mounting Tabs (New)
AC1-50001-003	18	Cover Assy W/Mounting Tabs (New)
NSS	19	Screw, Pan HD 10-32 x .38* (1)
NSS	19	Screw, Torx Tamp Res M5 x 16mm (New)
60-16	20	Ring, Vac Lock
NSS	21	Spring, Secondary Lever* (1)
NSS	22	Pin, Secondary Pivot* (1)
AL1-51097	23	Lever Assy, Secondary* (1) (2) (Current)
60-19B	23	Lever Assy, Secondary (New)
NSS	24	Orifice, Secondary Regulator (Current)
S1-17367	25	Screw, Adjustment* (1)
NSS	25	Screw, Adjustment (New)
NSS	26	Label
NSS	27	Deleted
400-25	28	Plug, Relief* (1) (2) (Current)
P3-50929-001	28	Plug, Freeze .50 Dis. x .38 (New)
G-25	29	Gasket, Plug* (1) (2) (Current)
NSS	30	Plug, Water Core
NSS	31	Screw, Pan HD, 10-32 UNF-2A x .25 L* (1)
NSS	31	Screw, Torx Tamp Res M5 x 16mm (New)
P3-17956-1	32	Plug, Expansion* (1) (2)
NSS	33	Label, Warning* (1) (2)
NSS	34	Gasket, Diaphragm* (1) (2)
NSS	35	Label, Ident-Silver
W1-5	36	Washer, Split Lock* (1) (Current)
NSS	37	Screw, FIL HD 1/4-28 UNF-2A* (1) (Current)
NSS	38	Washer, Copper-Special

NSS = Not Serviced Separately

\*Repair Kit: (1)=T60-RBK; (2)=T60-RK

## Model KN



Part #	Ref. #	Description	Qty.
NSS	1	Body, Regulator Model KN	1
039-00-12	2	Spring, 4 Oz. Model KN (Red)	1
039-00-13	2	Spring, 4 Oz. Model KN (Green)	1
NSS	3	Screw, Adjusting	1
NSS	4	Fitting, 1/8 NPT Hex Sch Plug	1
NSS	5	Orifice, 1/2" Id, KN Regulator	1
NSS*	6	Lever & Seal Assy	1
NSS*	7	Gasket, Secondary Diaphragm	1
NSS*	8	Diaphragm, Assy Reg Vmq	1
NSS	9	Cover, Regulator Diaphragm	1
NSS*	10	Screw, 10-32 x 5/8 Torx Pan Stlzn	6
P3-17956-10*	11	Plug, Expansion	1
NSS*	12	Screw, 4-40 x 1/4 Torx Ph Tt Stlzn	2
NSS	13	Gasket, Orifice	1
NSS*	14	Pin, Pivot	1
039-00-52	15	Cover, Auto Prime Assy	1
NSS	16	Cover, Manual Prime Assy	1

NSS = Not Service Separately

\*Included in Repair Kit 039-99

### Options & Accessories

Part #	Description	Qty.
039-00-12	Spring, 4 Oz. Model KN (Red)	1
039-00-13	Spring, 6 Oz. Model KN (Green)	1
039-00-41	Pin, Primer Mod KN	1
039-00-42	Spring, Primer .38" O.D. .19" I.D. .02"	1
039-99	Repair Kit, KN	1
039-00-43	Clip, Primer Pin	1

## Model IMP Series

### Natural & LP Gas

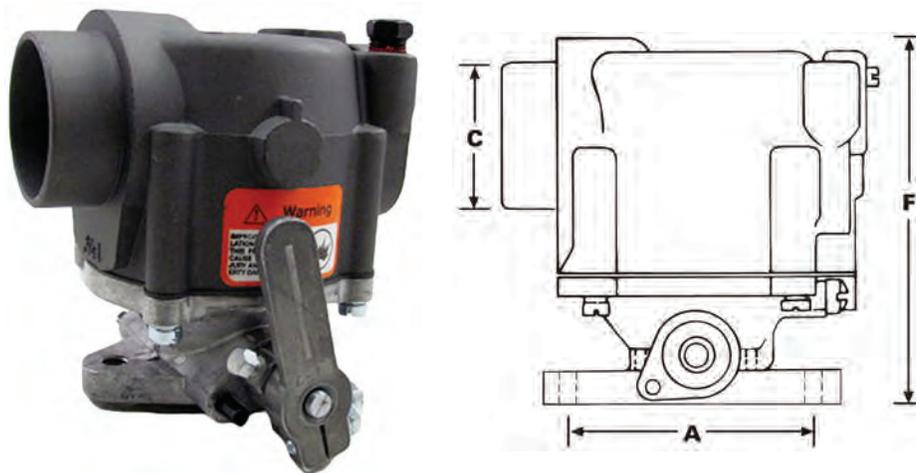


The IMPCO IMP Series of Regulators are low pressure, dry gas regulators intended for use with propane or natural gas. Typical applications include all types of stationary, gas-fired appliances and equipment utilizing a low-pressure gas supply. The IMP Series regulators feature a unique conical valve design, which permits low resistance straight-through flow. This design provides high flow at low pressures and enable the regulator to handle large capacity appliances with limited supply pressure.

Part #	Fuel Type	Inlet Pressure Max.	Outlet Pressure	HP	Operating Temperature Range	Fuel Filtration	Mounting Position	Applications
IMP52	LPG Vapor or Natural Gas	20" w.c.	3" to 6" w.c.	100 hp	-40°F to 250°F	40 micron	Vertical	Stationary and Industrial
IMP53	LPG Vapor or Natural Gas	20" w.c.	3" to 6" w.c.	180 hp	-40°F to 250°F	40 micron	Vertical	Stationary and Industrial
IMP61	LPG Vapor or Natural Gas	20" w.c.	3" to 6" w.c.	350 hp	-40°F to 250°F	40 micron	Vertical	Stationary and Industrial
IMP81	LPG Vapor or Natural Gas	20" w.c.	3" to 6" w.c.	550 hp	-40°F to 250°F	40 micron	Vertical	Stationary and Industrial
IMP91	LPG Vapor or Natural Gas	20" w.c.	3" to 6" w.c.	850 hp	-40°F to 250°F	40 micron	Vertical	Stationary and Industrial

## Model CA55

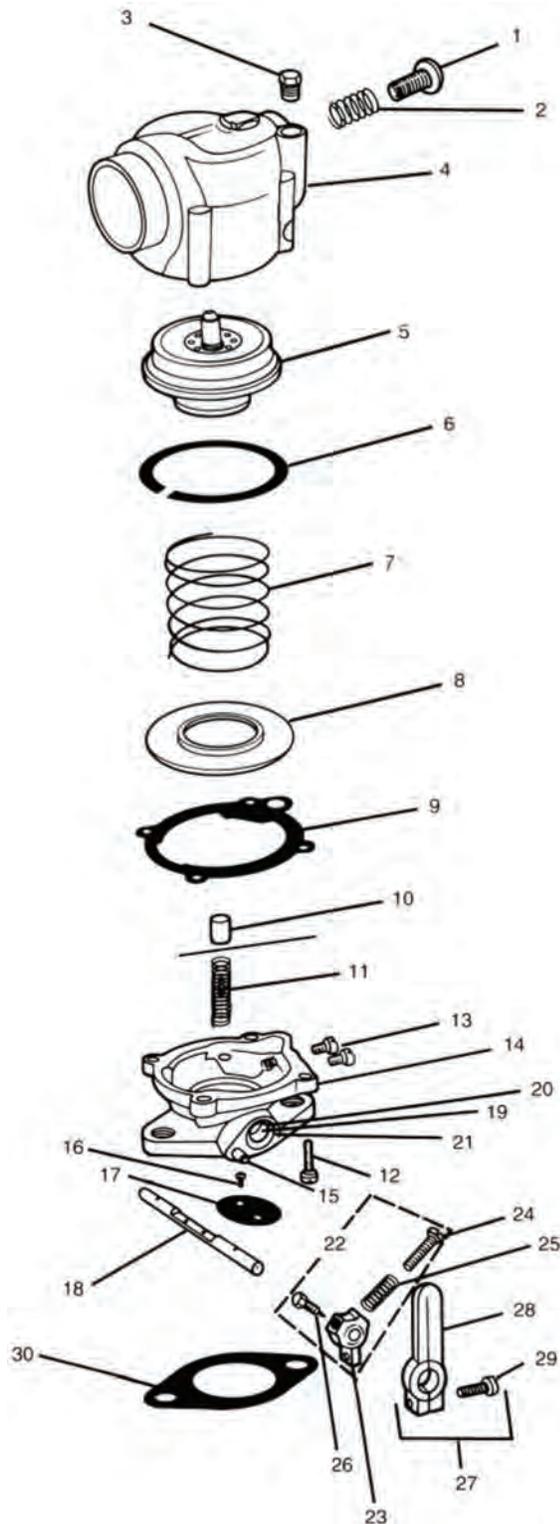
### Standard Series Carburetors for Natural & LP Gas



Impco's CA55 Series carburetors are offered in four design variations, providing proven, effective solutions for optimum metering and delivery of either alternative fuel or, in dual fuel configurations, gasoline in engines up to 75 horsepower. The standard model can be mounted in either an updraft or downdraft orientation, feeding either LPG or natural gas to engines from 1.5 to 70 horsepower. The maximum flow rate is 115 cfm. Various SAE flanges and airhorn sizes are available.

Part #	Mixer	Throttle Body	SAE Flange	NPT Fuel Inlet	A Center-to-Center Bolt Spacing	C Mixed Air Horn Diameter	F Overall Height
CA55-4	CA55M-2	AT2-25	3/4"	3/8"	2-1/4"	1-5/8"	3-3/4"
CA55-6	CA55M-4	AT2-26	1"	3/8"	2-3/8"	1-7/8"	3-3/4"
CA55-8	CA55M-5	AT2-27	1-1/4"	3/8"	2-11/16"	2-1/16"	3-3/4"
CA55-10	CA55M-3	AT2-26	1"	3/8"	2-3/8"	1-3/4"	3-3/4"
CA55-12	CA55M-1	AT2-25	3/4"	3/8"	2-1/4"	1-1/2"	3-3/4"
CA55-14	CA55M-1	AT2-26	1"	3/8"	2-3/8"	1-1/2"	3-3/4"
CA55-20	CA55M-2	AT2-26	1"	3/8"	2-3/8"	1-5/8"	3-3/4"
CA55-40	CA55M-5	AT2-26	1"	3/8"	2-3/8"	2-1/16"	3-3/4"
CA55-40-2	CA55M-5	AT2-26	1"	3/8"	2-3/8"	2-1/16"	3-3/4"
CA55-58	CA55M-3	AT2-26	1"	3/8"	2-3/8"	1-3/4"	3-3/4"
CA55-64	CA55M-2	AT2-26	1"	3/8"	2-3/8"	1-5/8"	3-3/4"
CA55-66	CA55M-2	AT2-26	1"	3/8"	2-3/8"	1-5/8"	3-3/4"

## Model CA55 Standard Series



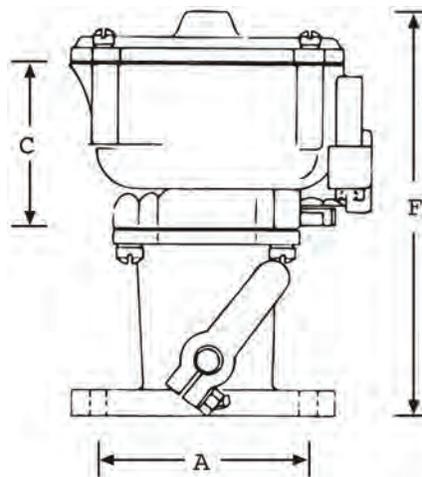
Part #	Ref. #	Description
S1-74	1	Idle screw
NSS	2	Spring, idle screw
NSS	3	Plug, 1/8" NPT
NSS	4	Body assy.
NSS*	5	Air valve assy. (std.)
AV1-14926	5	Air valve assy. (lean)
NSS	6	Sealing ring, air valve
NSS	7	Spring, air valve
S2-14681	7	Spring, air valve, light tension
NSS*	8	Check-valve plate assy.:
G1-92*	9	Gasket, throttle body to mixer
NSS	10	Piston, idle cut-off
NSS	11	Spring, idle cut-off
NSS	12	Screw, 10-24 x 5/8" SEMS (4)
S1-69*	13	Screw, 1/4"-28 x 5/16" (2)
NSS	14	Throat, 1/2" SAE flange
NSS	14	Throat, 3/4" SAE flange
NSS	14	Throat, 1" SAE flange
NSS	14	Throat, 1-1/4" SAE flange
NSS	15	Pin, throttle stop
NSS	16	Screw, 6-32 x 1/4" SEMS (2)
NSS	17	Fly, 1/2"
NSS	17	Fly, 3/4"
NSS	17	Fly, 1"
NSS	17	Fly, 1-3/4"
S5-6	18	Throttle shaft, 1/4" diameter
NSS	19	Bearing, Oilite, 1/2" i.d. (2)
NSS	19	Bearing, needle, 1/4" i.d. optional (2)
NSS	20	Seal, 1/4" shaft (2)
NSS	21	Ring, seal retainer
AL1-8-1	22	Throttle stop assy., 1/4" i.d.
NSS	23	Throttle stop lever
NSS	24	Stop screw, 10-32 x 3/4"
S2-15	25	Spring, idle stop screw
S1-18	26	Pin screw, throttle stop
AL1-7-1	27	Throttle lever, w/screw
NSS	28	Throttle lever
NSS	29	Screw, 10-24 x 5/8"
NSS	30	Gasket, 1/2" SAE flange
G1-16	30	Gasket, 3/4" SAE flange
G1-17	30	Gasket, 1" SAE flange
G1-18	30	Gasket, 1-1/4" SAE flange
G1-120	30	Gasket, flange

NSS = Not Service Separately

\*Included in Repair Kit

## Model 100 Series

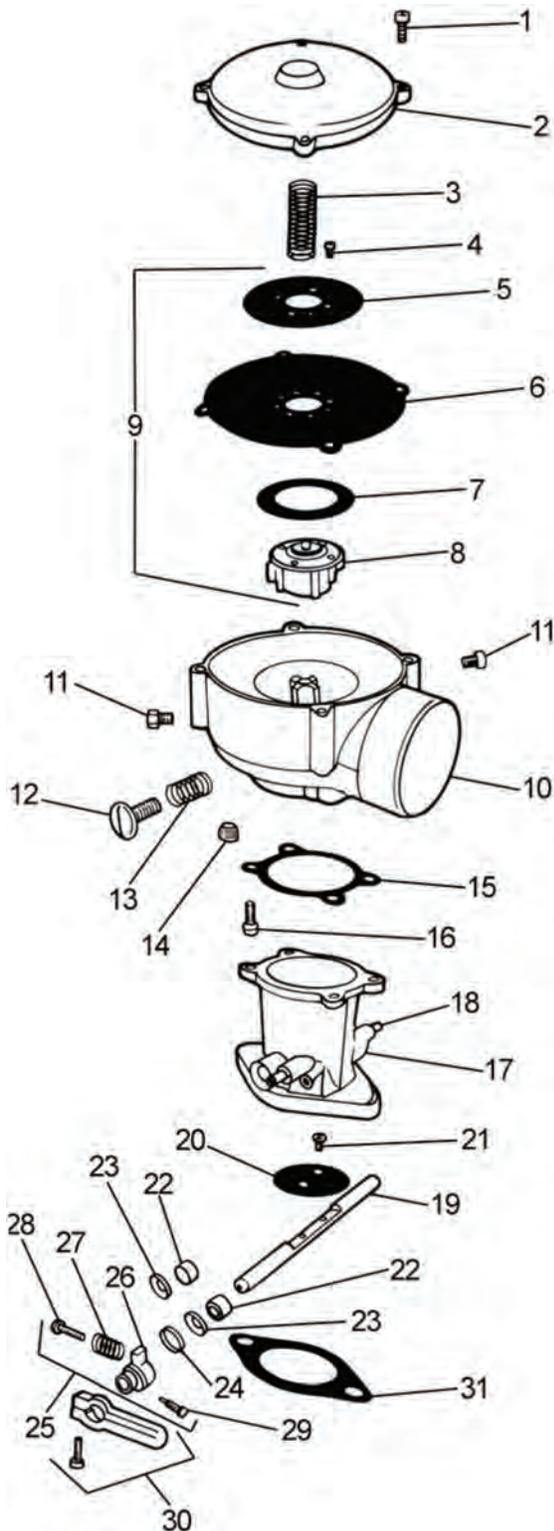
### Standard Series Carburetors for Natural & LP Gas



The Model 100 is a single diaphragm air-gas valve carburetor/mixer. It offers a 90 degree air inlet to provide low overhead clearance, and is available with several Air Horn and throttle body options. This unit is available for LPG Vapor and Natural Gas applications with air flow requirements up to 197 CFM. The Model 100 is also available for feedback applications with the 'FB' designation. The 100 mixer provides a convenient 1/8 NPT balance port and two separate air valve vacuum ports. Additional low speed, idle mixture control can be obtained to lean air/fuel mixtures through the use of optional shims.

Part #	Mixer	Throttle Body	A Center-to-Center Bolt Spacing	C Mixed Air Horn Diameter	F Overall Height
CA100-2	CA100M-1	AT2-1	2-1/4"	1-1/2"	4-5/8"
CA100-4	CA100M-1	AT2-2	2-3/8"	1-1/2"	4-5/8"
CA100-6	CA100M-2	AT2-2	2-3/8"	1-7/8"	4-5/8"
CA100-8	CA100M-3	AT2-3	2-11/16"	2-1/16"	5-7/8"
CA100-10	CA100M-4	AT2-3	2-11/16"	2-5/16"	5-7/8"
CA100-12	CA100M-4	AT2-4-1	2-15/16"	2-5/16"	6-1/16"
CA100-26	CA100M-3	AT2-2	2-3/8"	2-1/16"	4-5/8"
CA100-44	CA100M-1	AT2-3	2-11/16"	1-1/2"	5-7/8"
CA100-45	CA100M-2	AT2-3	1-11/16"	1-7/8"	5-7/8"
CA100-46	CA100M-4	AT2-4-3	3-5/16"	2-5/16"	6"
CA100-58	CA100M-5	AT2-1	2-1/4"	1-5/8"	4-5/8"

## Model 100 Series

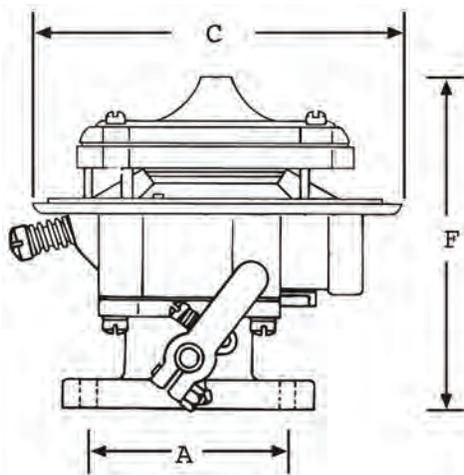


Part #	Ref. #	Description
S1-3	1	Screw, 10-24 x 5/8" SEMS (4)
C1-17	2	Cover
S2-85	3	Spring, air valve
S1-22	4	Screw, 6-32 x 1/4" SEMS (4)
P2-22	5	Plate, backup
D1-17	6	Diaphragm
D1-17-2	6	Diaphragm, silicone
R1-19	7	Ring, air valve
NSS	8	Air gas valve assy.
AV1-14	9	Valve and diaphragm assy., complete
AV1-14-2-962	9	Air Valve 30/35
NSS	10	Body, CA100M & 110M 2-5/6" AH
S1-69	11	Screw, 1/4"-28 x 5/16" (3)
S1-74	12	Screw idle
S2-88	13	Spring, idle screw
NSS	14	Plug, 1/8" pipe, brass
G1-11	15	Gasket, throttle body to mixer
S1-19	16	Screw, 12-24 x 5/8" SEMS (4)
NSS	17	Throttle body
NSS	18	Pin, throttle stop (2)
S5-1	19	Throttle shaft, 1/4" dia.
NSS	20	Fly, 3/4"
NSS	20	Fly, 1"
NSS	20	Fly, 1-1/4"
NSS	20	Fly, 1-1/2"
NSS	21	Screw, 6-32 x 1/4" SEMS (2)
NSS	22	Bearing, Oilite, 1/2" i.d. (2)
NSS	22	Bearing, Oilite, 5/16" i.d. (2)
NSS	22	Bearing, needle, 5/16" i.d. optional (2)
NSS	23	Seal, 1/4" shaft (2)
NSS	23	Seal, 5/16" shaft (2)
NSS	23	Seal, internal 5/16" i.d., optional (2)
R1-9	24	Ring, seal retainer (2)
AL1-8-1	25	Throttle stop assy., 1/4" i.d.
AL1-8-2	25	Throttle stop assy., 5/16" i.d.
NSS	26	Throttle stop lever 1/4" i.d.
S1-21	27	Spring, idle stop screw
S2-15	28	Screw, 10-32 x 3/4"
S1-18	29	Pin screw, throttle stop
NSS	30	Throttle lever, short, w/screw
NSS	30	Throttle lever, long, w/screw 1
G1-16	31	Gasket, 3/4" flange
G1-17	31	Gasket, 1" flange
G1-18	31	Gasket, 1-1/4" SAE flange
NSS	31	Gaskets, 1-1/4" lange

NSS = Not Serviced Separately

## Model 125 Series

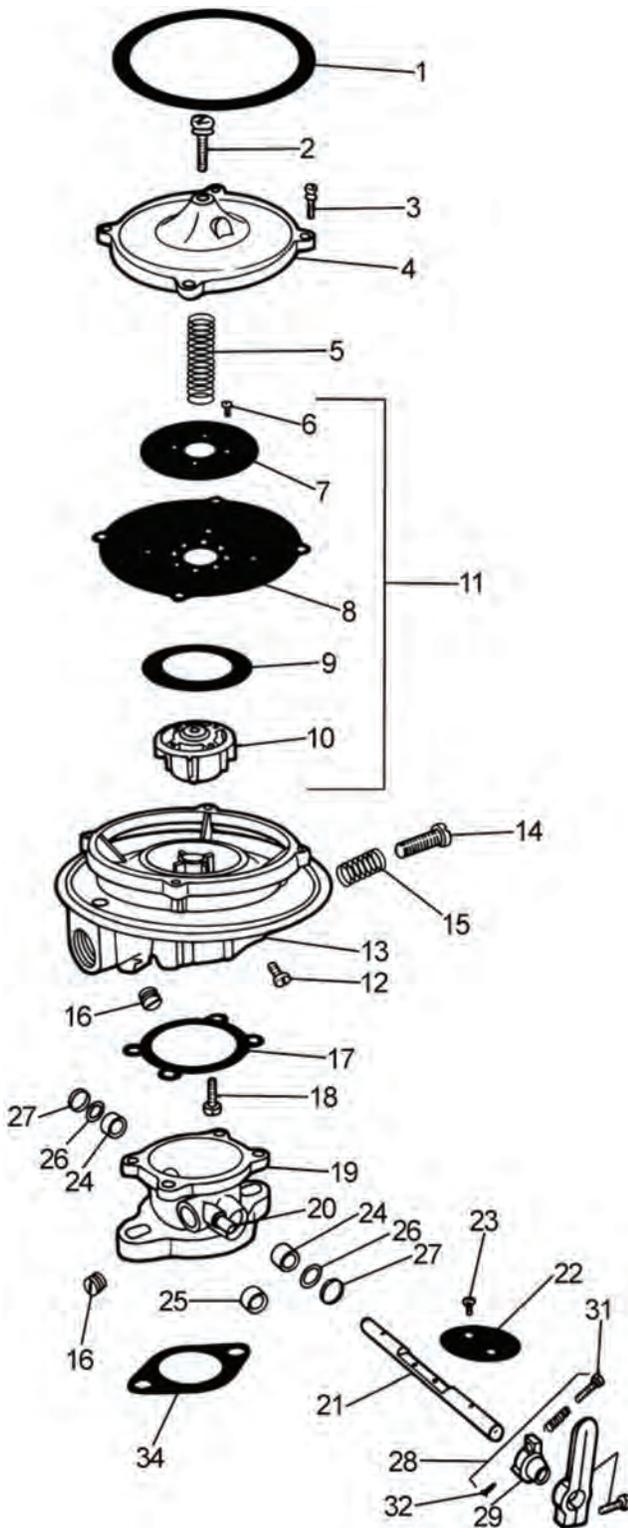
For Natural & LP Gas



The Model 125 carburetor is a single-diaphragm air valve carburetor/mixer for applications requiring air flow up to 235 CFM. It offers a down draft air inlet that can be used for remote air filtration or open element type air filters. This unit is available for LPG Vapor and Natural Gas Vapor applications. The Model 125 is also available for feedback applications with the "FB" designation. Two separate air valve vacuum supplies are available with this mixer. Additional low speed mixture control can be obtained to lean air/fuel mixtures with optional shims.

Part #	Mixer	Throttle Body	A Center-to-Center Bolt Spacing	C Mixed Air Horn Diameter	F Overall Height
CA125-2	CA125M	AT-2	2-3/8"	2-15/16"	5-9/16"
CA125-6	CA125M	AT2-16-1	2-13/16"	2-15/16"	5-9/16"
CA125-12	CA125M	AT2-16-1	2-13/16"	2-5/8"	5-9/16"
<b>Additional Standard Throttle Bodies</b>					
—		AT2-1	2-1/4"		—
		AT2-3	2-11/16"		
		AT2-4-1	2-15/16"		
		AT2-23	1-1/4" X 2-11/16"		

## Model 125 Series

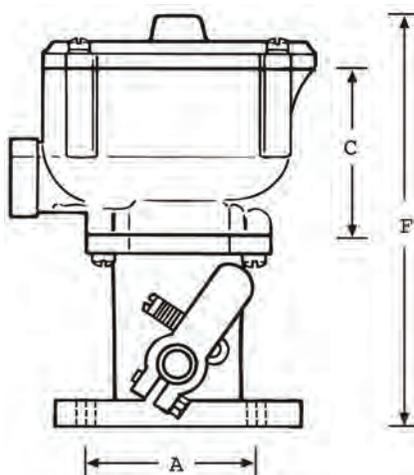


Part #	Ref. #	Description
G1-66	1	Gasket, mixer to air horn
NSS	2	Screw, 1/4"-20 x 1" SEMS
S1-3	3	Screw, 10-24 x 5/8" SEMS (4)
C1-26	4	Cover, air valve
S2-85	5	Spring, air valve
S1-22	6	Screw, 6-32 x 1/4" SEMS (4)
P2-22	7	Plate, backup
D1-17	8	Diaphragm
D1-17-2	8	Diaphragm, silicone
R1-19	9	Ring, air valve
BV1-14	10	Air gas valve assy.
AV1-14	11	Std. valve and diaphragm
AV1-14-3	11	Std. valve and diaphragm, Silicone
S1-69	12	Screw, 1/4"-28 x 5/16" (3)
NSS	13	Body assy.
NSS	14	Idle screw
S2-16	15	Spring, idle screw
NSS	16	Plug, 1/8" pipe, brass
NSS	17	Gasket, throttle body to mixer
S1-19	18	Screw, 12-24 x 5/8" SEMS (4)
NSS	19	Throat, 3/4" SAE flange
NSS	19	Throat, 1" SAE flange
NSS	19	Throat, 1-1/4" SAE flange
NSS	19	Throat, 1-1/2" SAE flange
NSS	19	Throat, 1-3/4" SAE flange
NSS	19	Throat, 1-1/4" & 1-1/2" SAE flange, short
NSS	19	Throat, 1-1/4" SAE flange, short
NSS	20	Pin, throttle stop (2)
S5-1	21	Throttle shaft, 1/4" dia.
S5-2	21	Throttle shaft, 5/16" dia.
NSS	22	Fly, 3/4"
NSS	22	Fly, 1"
NSS	22	Fly, 1-1/2"
NSS	22	Fly, 1-3/4"
NSS	23	Screw, 6-32 x 1/4" SEMS (2)
S1-12	23	Screw, 8-32 x 5/16" SEMS (2)
NSS	24	Bearing, Oilite, 1/2" i.d. (2)
NSS	24	Bearing, Oilite, 5/16" i.d. (2)
NSS	25	Bearing, needle, 1/4" i.d. optional (2)
NSS	26	Seal, 1/4" shaft (2)
NSS	26	Seal, 5/16" shaft (2)
S3-25	26	Seal, internal 5/16" i.d., optional (2)
R1-9	27	Ring, seal retainer (2)
NSS	28	Throttle stop assy., 5/16" i.d
NSS	29	Throttle stop lever
S2-15	30	Spring, idle stop screw
S1-21	31	Screw, 10-32 x 3/4"
S1-18	32	Pin screw, throttle stop
AL1-7-3	33	Throttle lever, short, w/screw
AL1-7-1	33	Throttle lever, long, w/screw
G1-16	34	Gasket, 3/4" flange
G1-17	34	Gasket, 1" flange
NSS	34	Gasket, 1-1/4" flange
NSS	34	Gasket, 1-1/2" flange
G1-23	34	Gasket, 1-3/4" flange
G1-56	34	Gaskets, 1-1/4" - 1-1/2" flange

NSS = Not Serviced Separately

## Model 200 Series

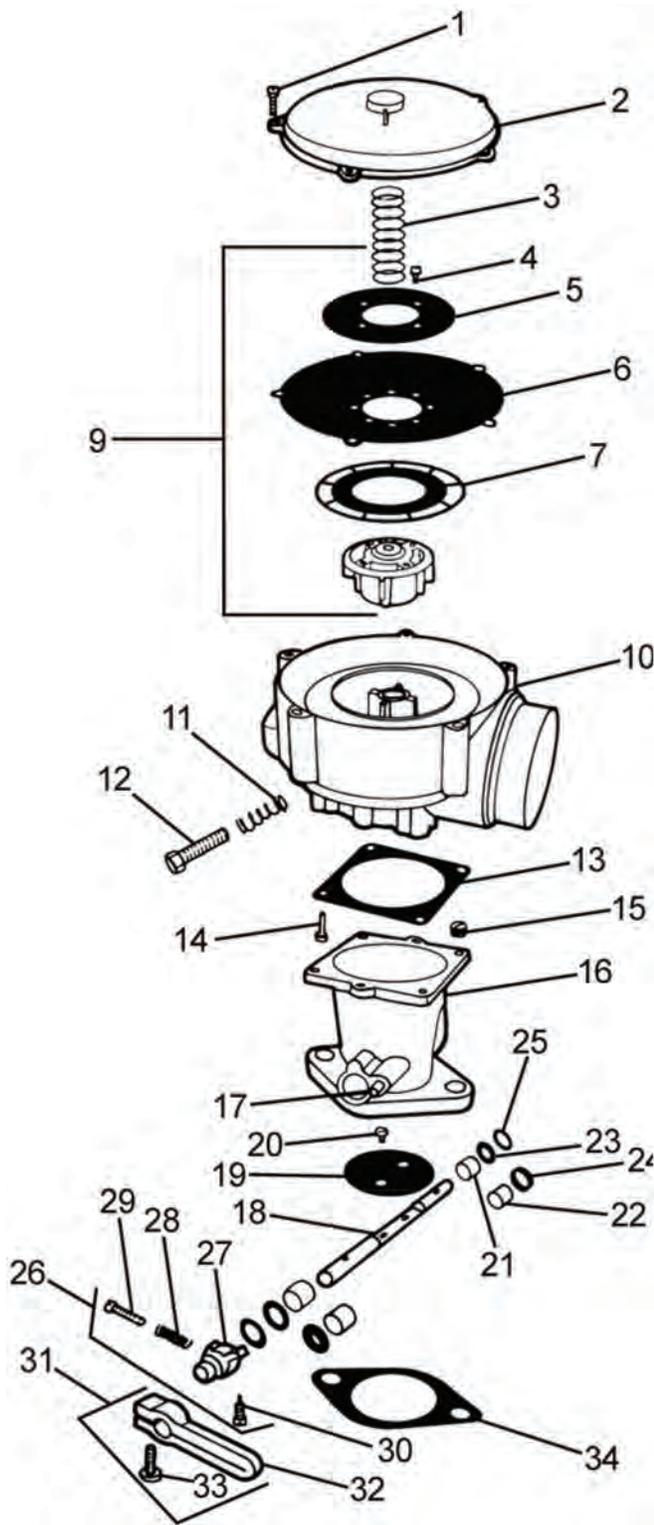
### Standard Series Carburetors for Natural & LP Gas



The Model 200 is a single diaphragm air-valve carburetor/mixer. It offers a 90° air inlet to provide low overhead clearance, and is available with several air horn and throttle valve options. This unit is available for LPG Vapor or Natural Gas for applications with air flow requirements up to 345 CFM. All DG model mixers reduce air flow by 30%. The Model 200 is also available for feedback applications with the 'FB' designation. The 200 mixer provides a convenient 1/8" balance port at the air inlet. Additional low speed idle mixture control can be obtained to lean air/fuel mixtures through the use of optional shims.

Part #	Mixer	Throttle Body	A Center-to-Center Bolt Spacing	C Mixed Air Horn Diameter	F Overall Height
<b>200-2</b>	200M-1	AT2-4-2	2-15/16"	2-5/8"	6-7/8"
<b>200-2-2</b>	200M-1-2	AT2-4-2	2-15/16"	2-5/8"	6-7/8"
<b>200-4</b>	200M-1	AT2-5	2-5/16"	2-5/8"	7-3/8"
<b>200-6</b>	200M-2	AT2-6	3-9/16"	3-1/16"	7-3/8"
<b>200-6-2</b>	200M-2-2	AT2-6	3-9/16"	3-1/16"	7-3/8"
<b>200-8</b>	200M-2	AT2-5	3-5/16"	3-1/16"	7-3/8"
<b>200-8-2</b>	200M-2-2	AT2-5	3-5/16"	3-1/16"	7-3/8"
<b>DG200-29</b>	NSS	NSS	3-9/16"	3-1/16"	7-3/8"

## Model 200 Series

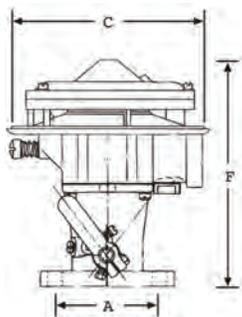


Part #	Ref. #	Description
S1-3	1	Screw, 10-24 x 5/8" SEMS (4)
C1-18	2	Cover
S2-17	3	Spring, air valve
S1-12	4	Screw, 8-32 x 5/16" SEMS (4)
P2-21	5	Plate, backup
D1-16-1	6	Diaphragm
D1-16-2	6	Diaphragm, silicone
R1-17	7	Ring, air valve
NSS	8	Air gas valve assy.
AV1-12	9	Air gas valve assy. w/ diaphragm
DG-AV1-12-2	9	Digester air gas valve assy. w/ Silicone diaphragm
NSS	10	Body assy., 2-5/8" air horn
AB1-11-2	10	Body assy., 3 1/16" air horn
S2-16	11	Spring, idle screw
NSS	12	Idle screw
G1-21	13	Gasket, throttle body to mixer
S1-19	14	Screw, 12-24 x 5/8" SEMS (4)
NSS	15	Plug, 1/8" pipe, brass
NSS	16	Throat, 1-1/2" SAE flange
NSS	16	Throat, 1-1/4" SAE flange
NSS	16	Throat, 2" SAE flange
NSS	17	Pin, throttle stop (2)
S5-2	18	Throttle shaft, 5/16" diameter (T2-4-2)
S5-3	18	Throttle shaft, 3/8" diameter (T2-5, T2-6)
NSS	19	Fly, 1-1/2"
NSS	19	Fly, 1-3/4"
NSS	19	Fly, 2"
S1-12	20	Screw, 8-32 x 5/16" SEMS (4)
B2-13	21	Bearing, Oilite, 3/8" i.d. (2)
B2-7	22	Bearing, needle, 5/16" i.d. (2)
NSS	22	Bearing, needle, 3/8" i.d. (2)
NSS	23	Seal, 5/16" shaft (2)
S3-11	23	Seal, 3/8" shaft (2)
S3-20	24	Seal, internal, 3/8" i.d. optional
R1-9	25	Ring, seal retainer, 5/16" shaft (2)
R1-8	25	Ring, seal retainer, 3/8" shaft (2)
AL1-8-2	26	Throttle stop assy., 5/16" i.d.
AL1-10	26	Throttle stop assy., 3/8" i.d.
NSS	27	Throttle stop lever 5/16" i.d.
NSS	27	Throttle stop lever 3/8" i.d.
S2-15	28	Spring, stop screw
S1-21	29	Stop screw, 10-32 x 3/4"
S1-18	30	Pin screw, throttle stop
AL1-7-1	31	Throttle lever with S1-17, L1-7-1
AL1-9-1	31	Throttle lever with S1-26, L1-9-1
AL1-9-1A	31	9/16" mounting i.d.
NSS	32	Throttle lever
NSS	33	Screw, 10-24 x 5/8"
NSS	33	Screw, 12-24 x 5/8"
G1-19	34	Gasket, 1-1/2" flange
G1-23	34	Gasket, 1-3/4" flange
G1-24	34	Gasket, 2" flange

NSS = Not Service Separately

## Model 225 Series 1V

### Standard Series Carburetors for Natural & LP Gas



The Model 225 carburetor is a single-diaphragm air valve carburetor/mixer. It offers a down-draft air inlet that can be used for remote air filtration or open-element type air filters. This unit is available for LPG Vapor or Natural Gas applications with air flow requirements up to 380 CFM (179.3 L/s). The Model 225 is also available for feedback applications with the 'FB' designation. Note: All DG model mixers reduce air flow by 30%. Two separate air valve vacuum supplies are available with this mixer. Additional low speed mixture control can be obtained to lean air/fuel mixtures with optional ring spacers/shims.

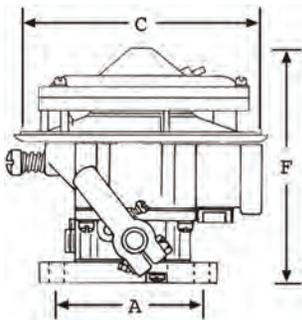
Part #	Mixer	Throttle Body	A Center-to-Center Bolt Spacing	C Mixed Air Horn Diameter	F Overall Height
225-52	225M	AT2-4-2	2-15/16"	5-13/16"	7-1/4"
225-54	225M	AT2-5	3-5/16"	5-13/16"	7-1/2"
225-56	225M	AT2-6	3-9/16"	5-13/16"	7-1/2"
CA225-52	CA225M	AT2-4-2	2-15/16"	5-13/16"	7-1/4"
CA225-54	CA225M	AT2-5	3-5/16"	5-13/16"	7-1/2"
CA225-56	CA225M	AT2-6	3 9/16	5-13/16"	7-1/2"
DG225-52	DG225M	AT2-4-2	2-15/16"	5-13/16"	7-1/4"
DG225-54	DG225M	AT2-5	3-5/16"	5-13/16"	7-1/2"
DG225-56	DG225M	AT2-6	3-9/16"	5-13/16"	7-1/2"

NOTES:

- (1) Order air cleaner assembly separately.
- (2) Order air horn separately, refer to optional equipment for specific air horn.

## Model 225 Series 2V

### Standard Series Carburetors for Natural & LP Gas



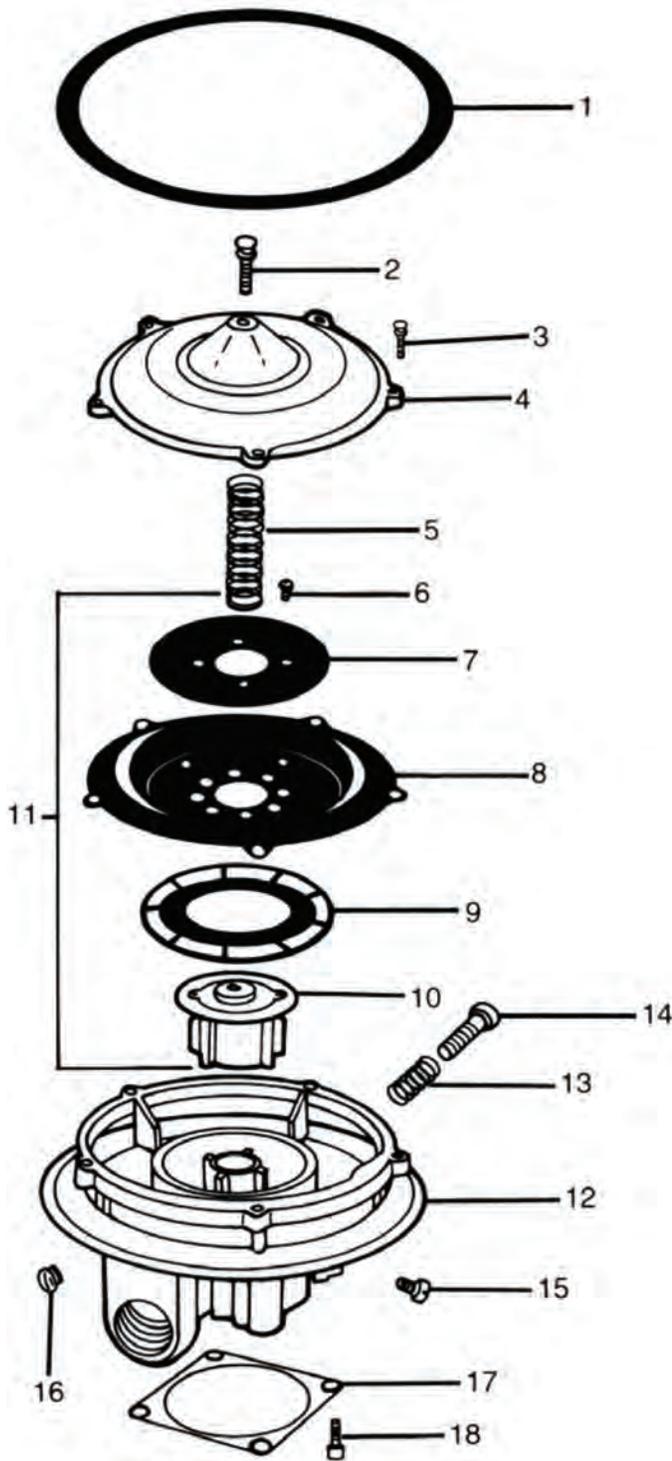
The Model 225 carburetor is a single-diaphragm air valve carburetor/mixer. It offers a down-draft air inlet that can be used for remote air filtration or open-element type air filters. This unit is available for LPG Vapor or Natural Gas applications with air flow requirements up to 380 CFM (179.3 L/s). The Model 225 is also available for feedback applications with the 'FB' designation. Note: All DG model mixers reduce air flow by 30%. Two separate air valve vacuum supplies are available with this mixer. Additional low speed mixture control can be obtained to lean air/fuel mixtures with optional ring spacers/shims.

Part #	Mixer	Throttle Body	A Center-to-Center Bolt Spacing	C Mixed Air Horn Diameter	F Overall Height
225-11	225M	AT2-11-1	1-7/8" x 3-1/4"	5-13/16"	6-1/2"
225-12	225M	AT2-12	2" x 3-11/16"	5-13/16"	6-1/2"
225-13	225M	AT2-13-1	3-15/32" x 5-5/32"	5-13/16"	6-1/2"
225-15	225M	AT2-15	(2)	5-13/16"	6-1/2"
CA225-11	CA225M	AT2-11-1	1-7/8" x 3-1/4"	5-13/16"	6-1/2"
CA225-12	CA225M	AT2-12	2" x 3-11/16"	5-13/16"	6-1/2"
CA225-13	CA225M	AT2-13-1	3-15/32" x 5-5/32"	5-13/16"	6-1/2"
CA225-15	CA225M	AT2-15	(2)	5-13/16"	6-1/2"

NOTES:

- (1) Order air filter separately.
- (2) Refer to optional equipment for dimension information.

## Model 225 Series

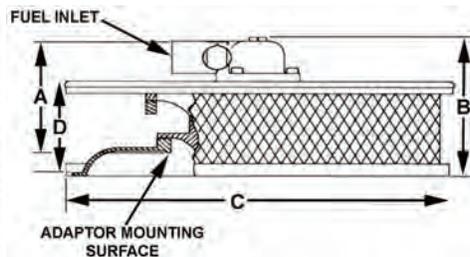


Part #	Ref. #	Description
G1-73	1	Gasket, mixer to air horn
S1-47	2	Screw, 1/4"-20 x 1" SEMS
S1-3	3	Screw, 10-24 x 5/8" SEMS (5)
NSS	4	Cover, air valve
S2-17	5	Spring, air valve
S1-12	6	Screw, 8-32 x 5/16" SEMS (4)
P2-21	7	Plate, backup
D1-16-1	8	Diaphragm
D1-16-2	8	Diaphragm, silicone
R1-17	9	Ring, air valve
BV1-12	10	Air gas valve assy., propane
DV1-12	10	Air gas valve assy., natural gas
AV1-12	11	Air gas valve assy., complete w/diagram, propane
CV1-12	11	Air gas valve assy., complete w/diagram, natural gas
NSS	12	Body assy.
S2-16	13	Spring, idle screw
NSS	14	Idle screw
S1-69	15	Screw, 1/4"-28 x 5/16" (3)
NSS	16	Plug, 1/8" pipe, brass
G1-21	17	Gasket, throttle body mixer
S1-19	18	Screw, 12-24 x 5/8" SEMS (4)

NSS = Not Service Separately

## Model 300A Series

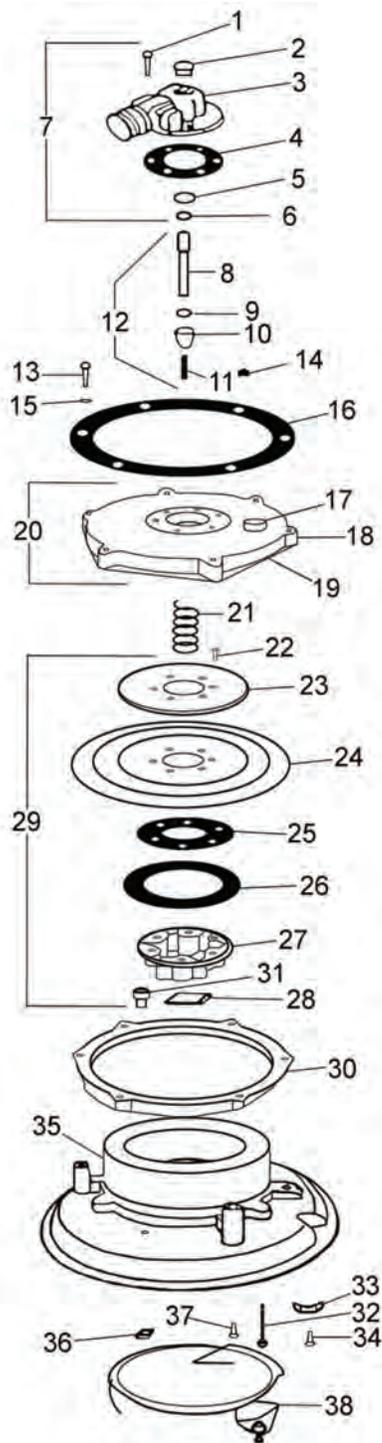
### Standard Series Carburetors for Natural & LP Gas



The Model 300A mixer is a single-diaphragm air valve for applications. It offers a down-draft air inlet that can be used for remote air filtration or open-element type air filters. This unit is available for LPG Vapor and Natural Gas applications with air flow requirements up to 348 CFM or 432 CFM depending on the part number. The 300A has numerous adapters to allow the installer to fit the 300A into most under hood vehicle applications. The Model 300A is also available for feedback applications with the 'FB' designation. The 300A can also be equipped with a cam mechanism to allow the air valve to be raised to its full open position to minimize any restriction in the base vehicle air stream. Optional air cleaner assemblies are also available for engines which require higher CFM air flow.

Part #	C Mounting Surface to Top of Fuel Inlet	F Overall Height
CA300A-M	3-1/2"	4-1/8"
CA300A-M-2	3-1/2"	4-1/8"
CA300A-1	3-1/2"	4-1/8"
CA300A-1-2	3-1/2"	4-1/8"
CA300A-20M	3-1/2"	4-1/8"
CA300A-20M-2	3-1/2"	4-1/8"
CA300A-21	3-1/2"	4-1/8"
CA300A-21-2	3-1/2"	4-1/8"
CA300A-22	3-1/2"	4-1/8"
CA300A-22-2	3-1/2"	4-1/8"
CA300AM-50-2	3-1/2"	4-1/8"
CA300AM-51-2	3-1/2"	4-1/8"
CA300A-52-2	3-1/2"	4-1/8"
CA300AM-70-2	3-1/2"	4-1/8"
CA300A-71-2	3-1/2"	4-1/8"
CA300A-72-2	3-1/2"	4-1/8"
FB300AM-2	3-1/2"	4-1/8"
FB300AM-50-2	3-1/2"	4-1/8"

## Model 300A Series 1 & 50



Part #	Ref. #	Description
S1-3	1	+ Screw, 10-24 x 5/8" SEMS (3)
P3-2	2	Plug, idle adjustment
AE1-4	3	Elbow with power adjustment: E1-4, V2-9, W1-12
G1-2	4	*+ Gasket, gas elbow
R1-93	5	*+ Ring, seal retainer
S3-	6	*+ Seal, idle screw
BE1-4-1	7	Elbow assembly complete: P3-2, AE1-4, R1-9, S3-3
S1-15	8	Screw, idle adjustment
NSS	9	* Seat, gas valve
NSS	10	Valve Gas Mixer, 300A Series.
V2-49	10	Valve Gas Mixer, FB300A.
V2-50		Valve Gas Mixer, FB300A.
S2-3	11	Spring, gas valve
NSS	12	+ Gas valve assy. complete
NSS	12	Gas valve assy. complete
NSS	13	+ Screw, 10-24 x 1" (3)
NSS	14	*+ Nut, dome 10-24 (3)
NSS	15	+ Washer, No. 10 light flat (6)
NSS	16	*+ Gasket, filter cover
NSS	17	+ Rivet, vent valve
NSS	18	+ Valve, cover vent
NSS	19	Cover, diaphragm
NSS	20	Cover assy., diaphragm w/vent valve
NSS	20	+ Cover assy., diaphragm w/vent valve
S2-2	21	+ Spring, air valve
S1-12	22	Screw, 8-32 x 5/16" SEMS (4)
P2-1	23	Plate, diaphragm backup
NSS	24	* Diaphragm, air valve
NSS	24	* Diaphragm, air valve, silicone
NSS	25	* Gasket, air valve
R1-2	26	Ring, air valve
NSS	27	Valve, air metering: V1-10, L1-3, B3-24
NSS	28	* Lock, nylon idle adjustment
NSS	29	+ Air valve assy., w/diaphragm
NSS	29	+ Air valve assy., Silicone, w/diaphragm
NSS	30	Ring, diaphragm support
S1-5	31	Screw, 1/4"-20 x 5/8" hex head SEMS (3)
NSS	32	+ Screw, 10-24 x 1/2" SEMS (3)
NSS	33	Clamp, Boden wire
NSS	34	Screw, 10-32 x 5/8" SEMS (3)
NSS	35	Base assy., complete
NSS	36	Nut, square, 1/4"-20
S1-69	37	Screw, 1/4" x 5/16" (plug)
AC2-2	38	Cam assembly: C2-2, W1-2, S1-7

NSS = Not Service Separately

\* Indicates components of minor repair kit.

+ Indicates components of major repair kit.

## Model 300A Series 1 & 50

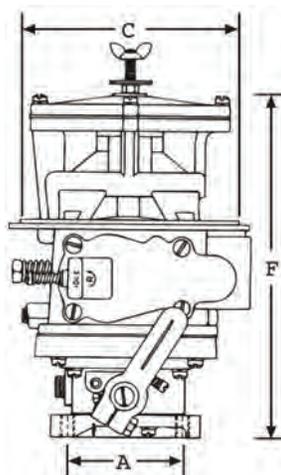
### Repair Kits



Part #	Description
RK300MI - 1/20-2	Minor repair kit
RK300MI - 50/70-2	Minor repair kit
RK300MA - 1/20-2	Major repair kit
RK300MA - 50/70-2	Major repair kit

## Model 425 Series

### Standard Series Carburetors for Natural & LP Gas



The Model 425 carburetor is a single-diaphragm air valve carburetor/mixer. It offers a down draft air inlet that can be used for remote air filtration or open-element type air filters. This unit is available for LPG Vapor and Natural Gas for applications requiring up to 460 CFM (217.1 L/s). The Model 425 is also available for feedback applications with the 'FB' designation. These FB mixers are available in a tamper resistant configuration, indicated by the "-CT" in the part number.

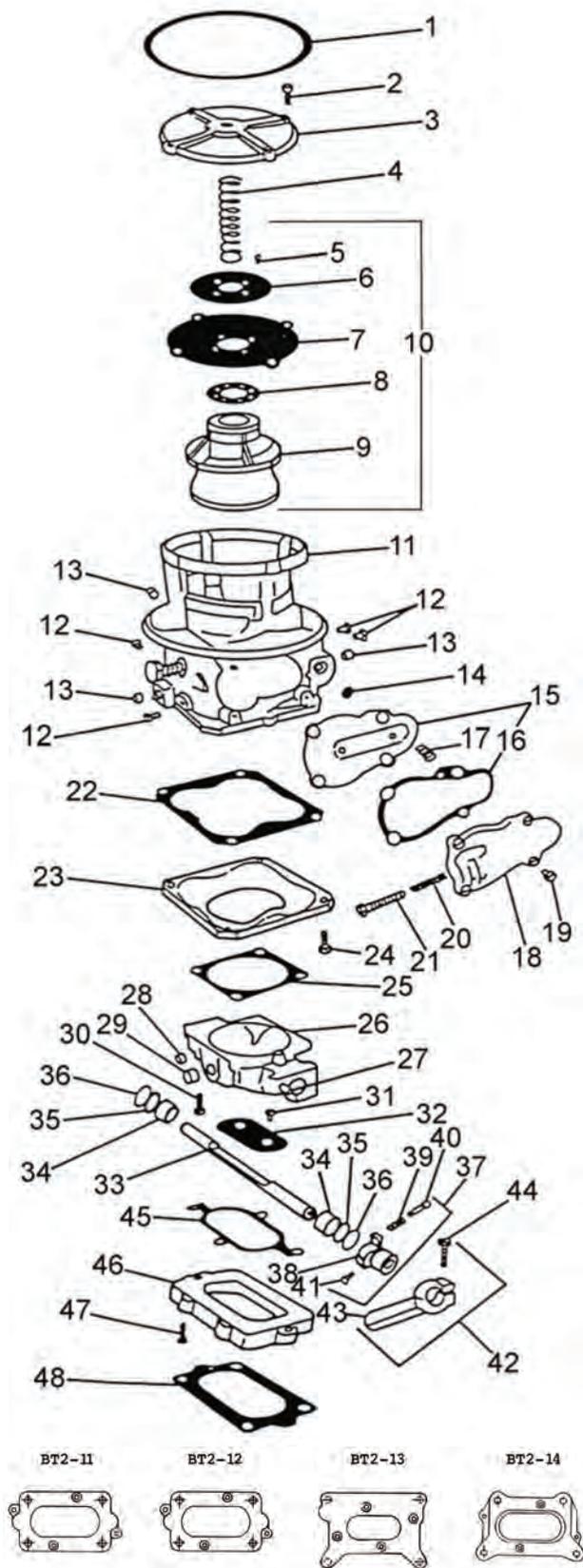
Part #	Voltage	Mixer	Throttle Body	A Center-to-Center Bolt Spacing	C Mixed Air Horn Diameter	F Overall Height
CA425-2	1V	CA425M	AT2-7	2-7/8"	5-1/8"	8-3/8"
CA425-4	1V	CA425M	AT2-8	3-1/4"	5-1/8"	8-3/8"
CA425-10	2V	CA425M	AT2-15	See Note	5-1/8"	7-3/4"
CA425-12	2V	CA425M	AT2-11-1	1-7/8" x 3-1/4"	5-1/8"	7-3/4"
CA425-14	2V	CA425M	AT2-12	2" x 3-11/16"	5-1/8"	7-3/4"
CA425-16	2V	CA425M	AT2-13-1	3-15/32" x 5-5/32"	5-1/8"	7-3/4"

(1) Reference diagram pg.3

(2) Indicates silicon diaphragm

(3) 2V applications require additional adapter between throttle body and CA425M Mixer

## Model 425 Series - 2V

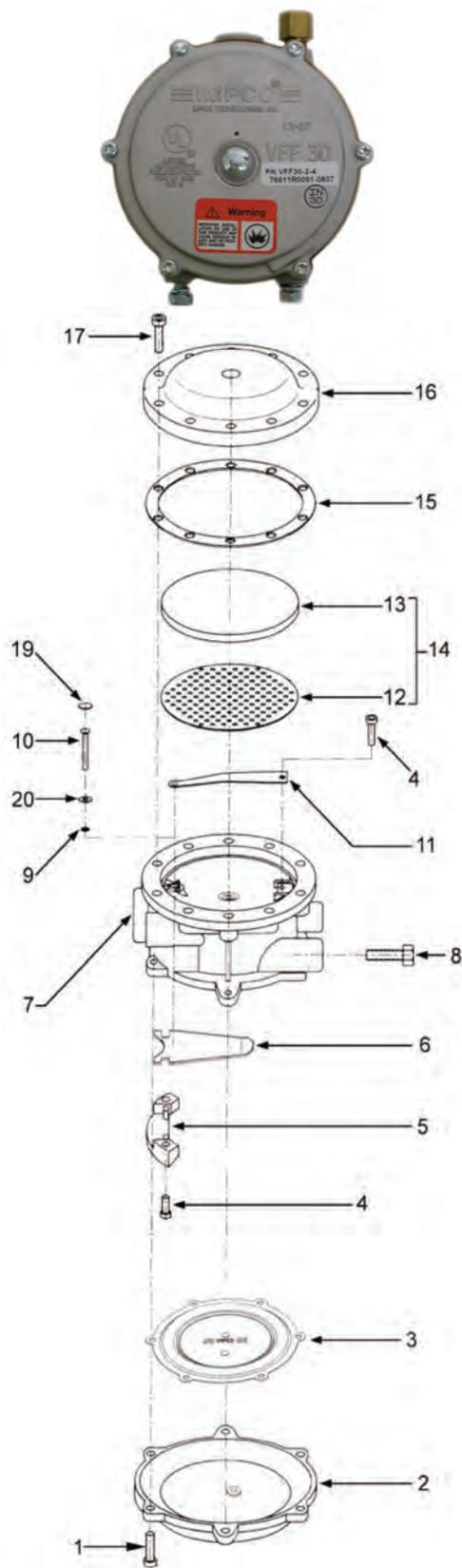


Part #	Ref. #	Description
G1-66	1	Gasket, air horn
S1-3	2	Screw, 10-24 x 5/8" SEMS (5)
C1-30	3	Cover, air valve diaphragm
S2-30	4	Spring, air valve
NSS	5	Screw, 6-32 x 1/4" SEMS (4)
NSS	6	Plate, backup
D1-18	7	Diaphragm, air valve
D1-25	7	Diaphragm, air valve, silicone
NSS	8	Gasket, air valve
BV1-16	9	Air gas valve
AV1-16	10	Air gas valve assy.
AB1-27	11	Gas body assy. (High BTU)
AB1-67-3	11	Gas body assy. (Low BTU)
S1-69	12	Screw, 1/4"-28 x 5/16" (4)
NSS	13	Plug, 1/8" pipe (3)
S4-13	14	Seat, idle screw
AD1-28-1	15	Idle diaphragm assy. (Includes #16)
NSS	16	Gasket, idle diaphragm
S2-24	17	Spring, idle valve
C1-31	18	Cover, idle valve
S1-40	19	Screw, 10-24 x 3/8" SEMS (4)
S2-89	20	Spring, idle adjustment
S1-51	21	Screw, 10-32 x 1 1/4" idle adjustment
G1-74	22	Gasket, mixer to adapter
A3-47	23	Adapter, mixer to throttle body
S1-19	24	Screw, 12-24 x 5/8" SEMS (4)
G1-21	25	Gasket, adapter to throttle body
NSS	26	Body, 2B throttle
NSS	27	Pin, throttle stop (2)
NSS	28	Plug 1/8" pipe
P3-5	29	Plug 1/4" pipe
S1-19	30	Screw, 12-24 x 5/8" SEMS (4)
NSS	31	Screw, 10-32 x 5/16" SEMS (2)
NSS	32	Fly, 2B
NSS	33	Throttle shaft, 7/16" diameter
B2-9	34	Bearing, needle 7/16" i.d. (2)
S3-12	35	Seal, 7/16" shaft (2)
S3-19	35	Seal, internal (optional), 7/16" i.d. (2)
R1-1	36	Ring, seal retainer (2)
AL1-11-1	37	Throttle stop assy., 7/16" i.d.
NSS	38	Throttle stop lever, 7/16" i.d.
S2-15	39	Spring, stop screw
S1-21	40	Stop crew, 10-32 x 3/4"
S1-8	41	Pin screw, throttle stop
AL1-12-3	42	Throttle lever, long, with screw
L1-12-3	43	Throttle lever, long
S1-32	44	Screw, 1/4"-20 x 7/8" hex head
G1-44	45	Gasket, throttle body to flange
BT2-11	46	Flange, 1 1/4" 2B, with gasket
BT2-12	46	Flange, 1 1/2" 2B, with gasket
BT2-13	46	Flange, Holley 2B, with gasket
BT2-15	46	Flange, 1 1/2" GMC 2B, with gasket
S1-19	47	Screw, 12-24 x 5/8" SEMS (4)
G1-45	48	Gasket, 1 1/4" 2B Flange
G1-46	48	Gasket, 1 1/2" 2B Flange
G1-47	48	Gasket, Holley 2B Flange
G1-49	48	Gasket, 1 1/2" GMC 2B Flange

NSS = Not Serviced Separately

## Model VFF30 Series

325 HP LP Gas



Part #	Ref. #	Description
S1-59*	1	Screw, 8-32 Taptite (6)
C1-37	2	Cover, diaphragm (VFF30 only)
NSS*	3	Diaphragm assy., Silicone
NSS*	4	Screw, 8-32 x 1/4" (2)
F3-2	5	Fulcrum
NSS	6	Lever, valve operating
NSS	7	Body assy.
S1-5	8	Screw, 1/4"-20 x 5/8" SEMS (2)
S3-116*	9	Seal, lip pin
NSS*	10	Pin, valve operating
S2-40	11	Spring, valve
NSS*	12	Screen, filter backup
NSS*	13	Filter
NSS*	14	Filter assy. (includes filter & screen)
NSS*	15	Gasket, filter cover
C1-38	16	Cover, filter
NSS	17	Screw, 12-24 Taptite (10)
AF4-66	18	Fitting, ball check, assy. (not shown VFF30-2-4 only)
NSS*	19	Seal, VFF30
NSS*	20	Washer, seal retaining

NSS = Not Service Separately

\*Repair Kit Components. Note extra screws (both slotted and torx) are included in the repair kit to replace any that maybe damaged.

NOTE: O-ring must be secured with washer when service is required. Washer is installed through LP-gas outlet and locked in slot by pin. Silicone grease will let pin slide easily. Be sure to properly lubricate "O" ring. Refer to Service Manual for further information.

## Model VFF30 Series

### Repair Kits



Part #	Description
RK-VFF30-2	Vacuum Fuellock-Filter Repair Kit

## A1 Series Adapters



300A and 175A Mixers to Gasoline Carburetor Air Horn

Part #	Description	Diameter	Height
A1-3-1	300A & 175A to 4 3/16" air horn	4-3/16"	1-1/4"
A1-4	300A & 175A to Chevrolet V8 1 1/4" duplex air horn	2-5/8"	1-1/4"
A1-6	300A & 175A to 1 1/4" duplex air horn	3-1/16"	1-7/16"
A1-16-1	300A & 175A to 5 1/8" air horn (Gann A9-20)	5-1/8"	3-3/8"
A1-16-2	300A & 175A to 5 1/8" air horn (Gann A9-21)	5-1/8"	2-7/8"
A1-39	300A & 175A to 2 5/8" air horn, high profile	2-5/8"	1-1/2"
AA1-40	300A & 175A to 2 5/8" air horn, w/clamp nuts, A1-38, N1-12 (3), S1-23 (3)	2-5/8"	1-1/2"
A1-41	300A & 175A to 2 5/16" air horn	2-5/16"	1-1/4"
A1-50-2	300A & 175A to 5 1/8" air horn offset; For GM & Chrysler requires spacer A2-73	5-1/8"	1-1/2"
A9-22	300A to gasoline carburetor with 5 1/8" air horn	5-1/8"	2-3/8"

## Adapter



Part #	Description
AA1-64-3	300A & 175A to 1982 and later Ford 5.0L throttle body EFI (Gann A9-26)

## Adapter



Part #	Description
AA2-46	Adapter assembly, 90 degrees, 5" to CA425M (low profile)

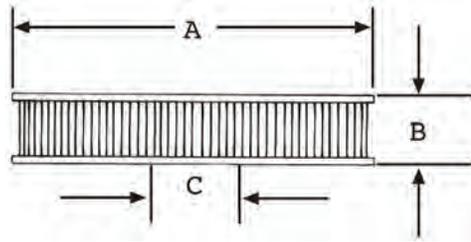
## Adapter



Part #	Description
AA2-40-2	Adapter assembly, 90 degrees, 5" CS to CA425M

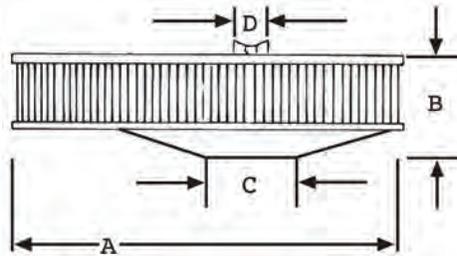
# Carburetion - Air Filter Assemblies

## AF1 Series



Part #	Air Flow	Applications	Filter Part #	Cover Part #	Base Part #	Stud Part #	Dimensions		
							A	B	C
AF-1-1	350 CFM	CA300A	F1-1	C1-4	*	—	9-7/8"	2-3/4"	7-1/2"
AF1-5	150 CFM	CA125	F1-5	C1-28	*	AS3-33	6-3/4"	2-3/8"	7-1/2"
AF1-11	500 CFM	CA300A	F1-9	C1-40	A2-26	—	14"	3-1/8"	7-1/2"
AF1-15	400 CFM	CA425	F1-15	C1-28	*	AS3-32	6-13/16"	6-5/8"	7-1/2"
F1-21	250 CFM	CA175A	F1-21	C1-73	*	—	8-1/16"	1-5/16"	7-1/2"

\* Filter assembly fits on mixer



Part #	Air Flow	Applications	Filter Part #	Cover Part #	Base Part #	Stud Part #	Dimensions		
							A	B	C
AF-14	500 CFM	CA125/CA425	F1-1	C1-48	A2-47	AS3-51	9"	7-1/2"	5-1/16"
AF1-16-2	550 CFM	CA425	F1-9	C1-60	A2-54	AS3-41	14"	4-3/16"	5-1/16"
AF1-17-2	550 CFM	CA225	F1-9	C1-60	A2-55	AS3-52	14"	4-3/16"	5-27/32"

## Vacuum Power Valve



Part #	Description
FCV-54700-001	Vacuum Power Valve

## Start Assist Valve



Part #	Description
SV	Start Assist Valve

## Model ET98

### Fuel Shutoff/Lockoff



The Model ET98 is an electrically operated safety shutoff valve suitable for high pressure up to 315 PSI for LPG liquid, LPG Vapor or Natural Gas Vapor. It is normally closed Straight-Through Lockoff, opened with 12V DC.

Part #	Description	Inlet x Outlet
ET98-50362-001	Safety shutoff valve	1/4" F.NPT x 1/4" M.NPT
ET98-51315-001	Safety shutoff valve with integrated filter.	1/4" F.NPT x 1/4" F.NPT

## Fuelock



Part #	Description
2384B	Filter fuelock for LPG 1/4" FNPT in/out, 12V. Chamois pack filter.
286-1794	Replacement filter kit for part # 2384B
FL206	Fuelock for gasoline. 1/8" FNPT in/out.
323-562	Replacement coil for part # 2543A, 12V
2341	Fuelock for LPG forklift application. 1/4" MNPT x 1/4" FNPT, 12V.
323-520	Replacement coil for part # 2341, 12V

## Fuelock

### Repair Kits



Part #	For Fuelock Part #	Description
310-6	2384B	Repair kit with plunger
323-526	2384B	Coil only, 12V
323-529	2384B	Coil & cover assembly, 12V
323-520	2341	Replacement coil & cover, 12V
323-562	2543A	Replacement coil & cover, 12V

## Universal Bulkhead Filter



Part #	Description
2655	Universal bulkhead - Filter for LPG. Two Openings for inlet side to accommodate hydro stat relief valve. 12V. Chamois pack filter.
286-1794	Replacement filter kit

## In-line Fuel Filter



Part #	Description
PF0532	Trapit Filter

## Century Converters

Century offers a complete line of straight fuel carburetors for highway and industrial use. Call for additional information on your particular application. Additional literature is available.

Century offers a full range of converters to cover every application need. These converters can be used for either straight fuel or dual fuel installations. All units are available with solenoid primer.

### Model G-85



Part #	Description	Repair Kit
2335B	Applications up to 85 HP	286-1554

### Model G-85A



Part #	Description	Repair Kit
2380	Air heated converter for engines up to 85 HP	286-1554

### Model M-6



Part #	Description	Repair Kit
2504A	Large engine applications up to 350 HP	286-1688

### Model H



Part #	Description	Repair Kit
1477B	Small engine applications up to 135 HP	286-1301

## Century Converter Repair Kits



Part #	For Converter Model #
286-1301	H
286-1234	M4
286-1332	M5
286-1554	G-85
286-1688	M6

## Nylon Elbows



Part #	Hose - NPT
53EN	5/8" x 3/8"
54EN	5/8" x 1/2"
84EN	1" x 1/2"
86EN	1" x 3/4"
88EN	1" x 1"
1008EN	1-1/4" x 1"

## Nylon Crankcase Vent Fitting Assembly



Part #	Hose - NPT
54EN-12	5/8" x 1/2"

## Nylon Straight



Part #	Hose - NPT
53SN	5/8" x 3/8"
86SN	1" x 3/4"
88SN	1" x 1"

## Nylon Fuel Pump Plate



Gasket is included.

Part #	Hose - NPT
622N	1-3/4" bolt center

## Zinc Straight Hose Nipples



Zinc material, die-cast and machined.

Part #	Hose - NPT
86SZ*	1" x 3/4"
88SZ*	1" x 1"

\*Also available in nylon

## Zinc Hose Elbows



Die-cast, machined zinc material unless otherwise noted.

Part #	Hose - NPT
44EZ	1/2" x 1/2"
53EZ*	5/8" x 3/8"
54EZ*	5/8" x 1/2"
56EZ*	5/8" x 3/4"
84EZ*	1" x 1/2"
88EZ*	1" x 1"

\*Also available in nylon

## Crankcase Vent Fitting Assemblies



Illustrated is the Impco 300 Mixer with Gann 54EN-12 fitting to adapt crankcase ventilator hose. Includes 2 jam nuts and gasket. Zinc material unless otherwise noted.

Part #	Hose - NPT
54EN-12*	5/8" x 1/2"
64E-12	3/4" X 1/2"

\*Nylon

## Brass Hose Elbows



All brass fittings produced from extruded bar stock.

Part #	Hose - NPT
52EB	5/8" x 1/4"
53EB*	5/8" x 3/8"
54EB*	5/8" x 1/2"

\*Also available in nylon

## Brass Straight Hose Nipples



All brass fittings produced from extruded bar stock.

Part #	Hose - NPT
53SB*	5/8" x 3/8"
54SB*	5/8" x 1/2"

\*Also available in nylon

## Bulkhead Fittings



Part #	Description
T443	1/4" NPT 2 ways x 3/8" flare
T444	"T" 1/4" NPT 3 ways
STF-33	Straight bulkhead fitting 3/8" flare x 3/8" flare
PV-3866	Bulkhead tee with relief selpac

## Vapor Hose



Neoprene lined, oil and heat resistant, coil wire support permits free flow regardless of degree of bend. This is a non-porous vapor hose for LP gas and natural gas.

Part #	I.D.
CVH-058	5/8"
CVH-100	1"
CVH-114	1-1/4"

Note: CVH-100 in 25 ft. or 50 ft. coils.

## Water Heater Hose



Single braid of nylon reinforcement, oil and grease resistant.

Part #	I.D.
4230T-058	5/8"

## Vacuum Hose



Part #	I.D.
60-465	3/16"

## Vacuum Y



Part #	I.D.
60-3015	1/4" x 1/4" x 3/16"

## Stainless Steel Wire Braid Hose and Fittings



Developed for applications wherever a strong, corrosion resistant LP Gas hose is desired. The special low extract tube handles propane or butane in liquid and gas form.

**WARNING!!:** For LP and Natural Gas use only! Do not use in anhydrous ammonia or refrigeration applications! Do NOT use male swivel couplings or any type of couplings that use O-Ring sealing surfaces!

U.L. 21 Dayco. Series 7243 with Cloth Cover.

Part #	Size I.D.
SS25UL-4	3/16"
SS6-UL	5/16"
SS25UL-8	13/32"
SS25UL-10	1/2"

Use only with Parker series BN hose end fittings

## Hose Ends for Parker Series 7243 Wire Braid Hose



Part #	Hose I.D.	Flare Size	Type	Use with Hose
6-FS-4	3/16"	1/4"	Straight	SS25UL-4
6-FS	5/16"	3/8"	Straight	SS6-UL
6-FS-90	5/16"	3/8"	90 Degree	SS6-UL
6-FS-45	5/16"	3/8"	45 Degree	SS6-UL
6-4MP	5/16"	1/4" M.NPT	Straight	SS6-UL
6-FS-8	13/32"	1/2"	Straight	SS25UL-8
6-FS-8-10	1/2"	1/2"	Straight	SS25UL-10
6-FS-10	1/2"	5/8"	Straight	SS25UL-10

## Plastic Primary Wire



Smooth finish thermoplastic insulation, stranded copper conductor. Provides good flexibility and color permanence. Impervious to oil, grease and diesel fumes.

Part #	Description
1160-BLUE	16 Gauge
826165	16/2 Parallel Wire, 16 Gauge
83165	16/3 Parallel Wire, 16 Gauge

## Boden Wire Control Cable



Part #	Description
C2-32	6' with Chrome "T" Handle (not shown)

## Control Brackets for Dash Mounting



Part #	Description
144A	LP Gas/Gasoline Switch Bracket
244	For Boden Wire and Lockoff Switch, 2 Mounting Screws Included
344	Hold Diameter 3/8" x 1/2" x 1/2"

## Solderless Terminals



Part #	Description
44-5210	Ring Terminal
44-3200	Push-on Terminal Male Spade
44-6210	Spade or Fork Terminal

## Primer Switch



Heavy-duty, for either 6 or 12- volts. Has two binding head screw terminals. Mounting stem has 7/16-28 thread, is 3/8" long

Part #	Description
9279	Primer Switch

## Rocker Switch



3 positions, on-off-on, 6 terminals.

Part #	Description
5596-R	3 Positions, On-Off-On, 6 Terminals

## 3-Way Switches



Part #	Description
5586	3 Positions, On-Off-On, 3 Screw Terminals U.L. Approved for 15 amps at 125 VAC, 10 amps at 250 VAC
5592	3 Positions, On-Off-On, 6 Terminals for 2 Circuits
5592-1	3 Positions, On-Off-On, 6 Spade Terminals for 2 Circuits
82614	3 Positions, On-Off-On, 9 Terminals
014-4023	3 Positions, On-Off-On, 12 Terminals

## Benefits of Fresh Air

Horsepower is directly related to the temperature of the air introduced into the carburetor. For every 10° F of temperature increase above 60° F you will lose 1% of available horsepower. The opposite is also true.

Example:

A vehicle producing 100HP at 160°F intake air. Reducing the air temperature to 100°F by bringing in outside air will increase horsepower by 6%. The net increase would be 6HP.

## Fresh Air Canisters



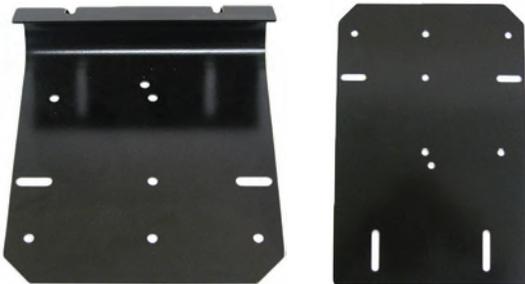
Part #	Description
AF9-2	IMPCO CA 300A

## Fresh Air Inlet Shroud



Part #	Description
S6-1	4" Shroud

## Converter Mounting Brackets



All brackets include mounting hardware.

Part #	Description
GB80	Mounts Century G85. Most Forklift Applications
GB86	Mounts Century G85 Converter on the Engine Carburetor Mounting Flange
GB87*	Accommodates: Beam 400, 120; Century M4, M5, H; IMPCO Model E. Slots are 1/4" x 1-1/2". Includes Strap Brace.
GB88*	For Farm Tractor, Industrial, Large Forklifts. Mounts: Beam 400, 120; Century M4, M5, H; IMPCO Model E. Includes Strap Brace.
GB88-SP	Similar to GB88 with Cut-out for alternator bracket mounting on Ford Pick-ups (Not Shown)
GB89	Eight-position bracket mounts IMPCO J-VFF-30 on GB87, GB88 brackets or separately.
GB95	Mounts IMPCO Model L on GB87 and GB88

\*Pivot point to permit upright position on fender shield.

## 4" Flexible Duct



Part #	Description
H5-1	4" x 48" Flexible Duct

## Remote Fill Receptacle and Accessories



Part #	Description
2700-R-BSS	Remote fill receptacle
7647SC	Double check filler valve 3/4" FNPT.
SS25UL-10	Wire braid hose 1/2" ID
SS25UL-4	Wire braid hose 3/16" ID
6-FS-10	Female hose swivel 5/8"
6-FS-4	Female hose swivel 1/4"
E1-4B	1/4" x 1/4" x Male elbow
E1-10D	5/8" x 1/2" x Male elbow
U1-10E	5/8" x 3/4" x Male half union
U1-4B	1/4" x 1/4" x Male half union
3165CP	Vent Valve 1/4" NPT w/warning plate
PL-631-54	1/4" MNPT x 1/4" x FNPT brass fitting with #54 orifice

Note: Actual components may vary depending upon tank model and vehicle application.

Please call the GEC sales department for assistance.

## Pressure Relief Valve

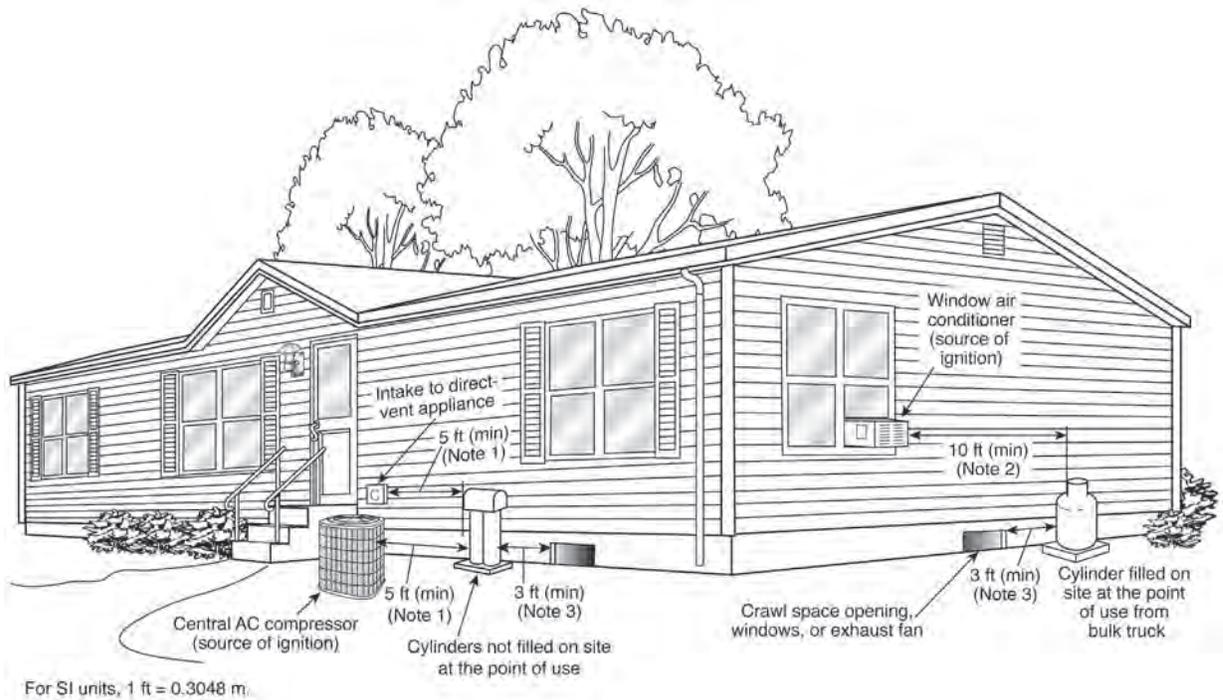


Pop-up relief vent assembly consists of nipple assembly, lock-nut, rubber gaskets, spring and hex nut. Easily installed on a flat surface of auto body above trunk.

Part #	Description
2995-P	Pop-up Relief Valve Assembly - Vertical

Figures I.1(a), (b) and (c) of NFPA 58, Liquefied Petroleum Gas Code\*

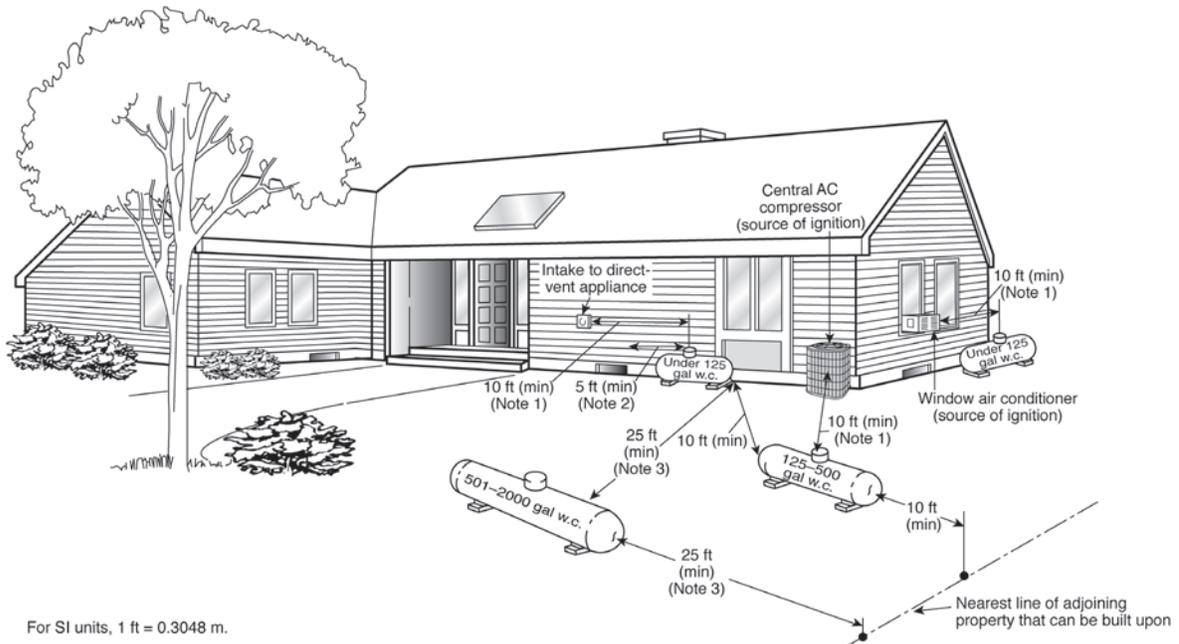
(a)



NOTES:

- (1) 5 ft minimum from relief valve in any direction away from any exterior source of ignition, openings into direct-vent appliances, or mechanical ventilation air intakes. Refer to Table 6.3.4.3.
- (2) If the cylinder is filled on site at the point of use from a cargo tank motor vehicle, the filling connection and vent valve must be at least 10 ft from any exterior source of ignition, openings into direct-vent appliances, or mechanical ventilation air intakes. Refer to 6.3.4.4.
- (3) Refer to 6.3.4.3.

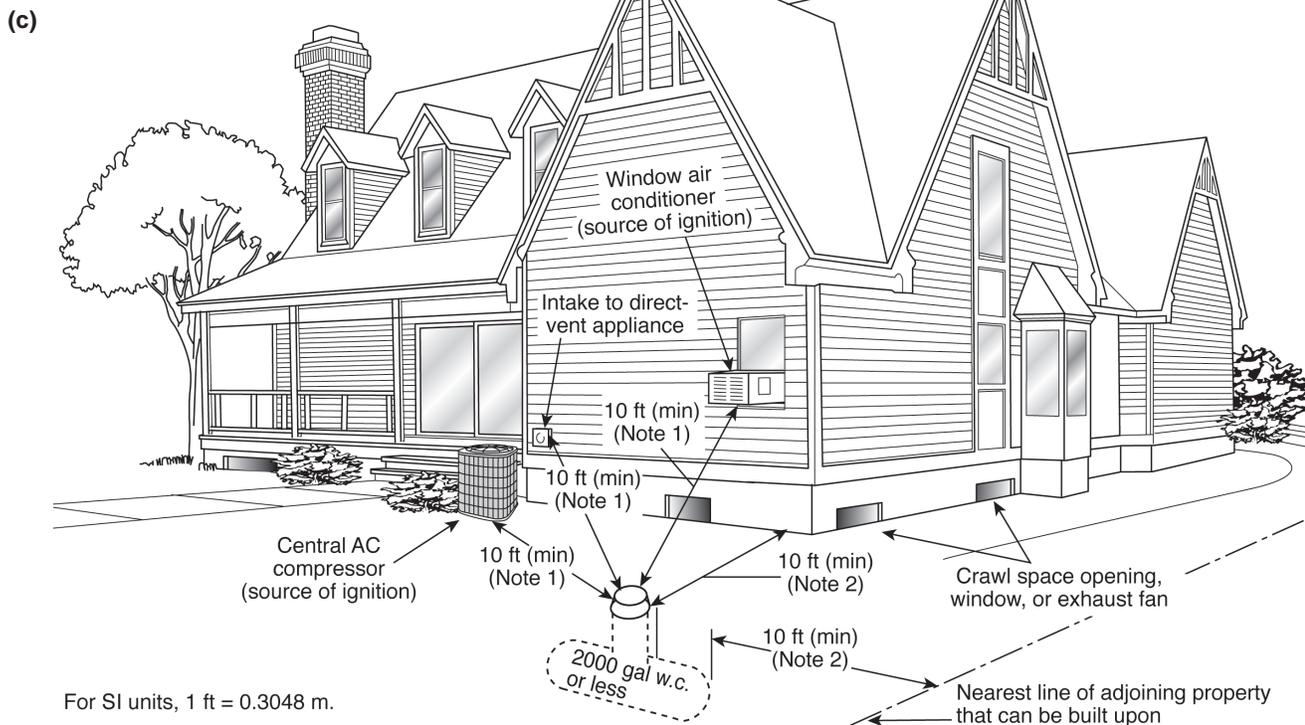
(b)



NOTES:

- (1) Regardless of its size, any ASME container filled on site must be located so that the filling connection and fixed maximum liquid level gauge are at least 10 ft from any external source of ignition (e.g., open flame, window AC, compressor), intake to direct-vented gas appliance, or intake to a mechanical ventilation system. Refer to 6.3.4.4.
- (2) Refer to 6.3.4.3.
- (3) This distance can be reduced to no less than 10 ft for a single container of 1200 gal (4.5 m<sup>3</sup>) water capacity or less, provided such container is at least 25 ft from any other LP-Gas container of more than 125 gal (0.5 m<sup>3</sup>) water capacity. Refer to 6.3.1.3.

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**NOTES:**

- (1) The relief valve, filling connection, and fixed maximum liquid level gauge vent connection at the container must be at least 10 ft from any exterior source of ignition, openings into direct-vent appliances, or mechanical ventilation air intakes. Refer to 6.3.4.4.
- (2) No part of an underground container can be less than 10 ft from an important building or line of adjoining property that can be built upon. Refer to 6.3.2.3

## General Information About LP Gases

Information	Propane	Butane
Formula	C <sub>3</sub> H <sub>8</sub>	C <sub>4</sub> H <sub>10</sub>
Boiling Point, °F	-44.0	32.0
Specific Gravity of Gas (Air = 1.00)	1.53	2.00
Specific Gravity of Liquid (Water = 1.00)	0.51	0.58
Lbs. per Gallon of Liquid at 60°F	4.24	4.81
BTU per Gallon of Gas at 60°F	91,690	102,032
BTU per Lb. of Gas	21,591	21,221
BTU per Cu. Ft. of Gas at 60°F	2,516	3,280
Cu. Ft. of Vapor at 60°F/Gal. of Liquid at 60°F	36.39	31.26
Cu. Ft. of Vapor at 60°F/Lb. of Liquid at 60°F	8.547	6.506
Latent Heat of Vaporization at Boiling Point BTU/Gal.	785.0	808.0
Combustion Data		
Cu. Ft. Air Required to Burn 1 Cu. Ft. Gas	26.8	31.02
Flash Point, °F	-156°	-
Ignition Temperature in Air, °F	920 - 1,020	900 - 1,000
Maximum Flame Temperature in Air, °F	3,595	3,615
Limits of Inflammability, Percentage of gas in air mixture		
At Lower Limit - %	2.4	1.9
At Upper Limit - %	9.6	8.6
Octane Number (ISO-Octane = 100)	Over 100	92

## Vapor Pressures Of LP Gases

Temperature (°F)	Approximate Pressure (PSIG)		
	Propane	Butane	
-40	1.3	-	
-30	5.5		
-20	10.7		
-10	16.7		
0	23.5		
10	31.3		
20	40.8		
30	51.6		
40	63.3		3.0
50	77.1		6.9
60	92.5	11.5	
70	109.3	16.5	
80	128.1	22.0	
90	149.3	29.0	
100	172.3	37.0	
110	197.3	46.0	

## Resistance of Valves & Fittings in Equivalent Feet of Pipe

Valves & Fittings	Pipe Size						
	1	1 1/4	1 1/2	2	2 1/2	3	4
Elbow 90°	4	4.5	5	6	8	9	11
Elbow 45°	1	2	2	2.5	3	4	5
Tee thru side	6	8	9	12	14	17	22
Y Strainer same size as pipe	25	25	25	42	42	42	60
Y Strainer next size larger	16	16	16	16	14	20	N/A
Globe Valve	28	35	45	60	65	85	120
Angle Valve	15	19	22	28	35	42	57
Ball Valve	1/2						
Quick-closing Gate	3						

Above values are approximate and will vary from one manufacturer to another.

## LPG & Natural Gas Flow Through Fixed Orifices\*

Orifice or Drill Size	Propane	Natural Gas (3.5" w.c.)	Orifice or Drill Size	Propane	Natural Gas (3.5" w.c.)
.008	519	-	51	36,531	12,770
.009	656		50	39,842	13,920
.010	812		49	43,361	15,200
.011	981		48	46,983	16,360
.012	1,169		47	50,088	17,520
80	1,480	520	46	53,296	18,570
79	1,708	590	45	54,641	19,150
78	2,080	760	44	60,229	21,010
77	2,629	950	43	64,369	22,390
76	3,249	1,130	42	71,095	24,950
75	3,581	1,250	41	74,924	25,980
74	4,119	1,440	40	78,029	27,030
73	4,678	1,630	39	80,513	28,200
72	5,081	1,770	38	83,721	29,250
71	5,496	1,970	37	87,860	30,630
70	6,375	2,220	36	92,207	32,140
69	6,934	2,430	35	98,312	34,950
68	7,813	2,720	34	100,175	25,050
67	8,320	2,910	33	103,797	36,080
66	8,848	3,090	32	109,385	38,300
65	9,955	3,390	31	117,043	40,850
64	10,535	3,680	30	134,119	46,870
63	11,125	3,920	29	150,366	52,330
62	11,735	4,080	28	160,301	55,920
61	12,367	4,340	27	168,580	58,830
60	13,008	4,550	26	175,617	61,270
59	13,660	4,760	25	181,619	63,580
58	14,333	5,030	24	187,828	65,670
57	15,026	5,230	23	192,796	67,070
56	17,572	6,130	22	200,350	70,080
55	21,939	7,680	21	205,525	71,830
54	24,630	8,590	20	210,699	73,680
53	28,769	10,040	19	223,945	77,980
52	32,805	11,460	18	233,466	81,570

Calculation based on:

Natural = 1,000 BTU Gas, 0.60 Spec Gr

LP = 2,516 BTU Gas, 1.52 Spec Gr

Approximate sizes based on avg. data for all orifice types.

\* Refer to NFPA pamphlet 54 for more information.

## Approximate Vaporization Capacities

Various sized containers at 0°F with varying amounts of fuel in tanks

250 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	331,200	3.7	134	331
50	298,080	3.2	116	298
40	264,960	2.9	105	265
30	231,840	2.5	90	232
20	198,720	2.2	79	199
10	149,040	1.6	58	149

500 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	426,900	4.6	166	426
50	383,376	4.2	152	383
40	341,120	3.7	134	341
30	298,480	3.3	119	298
20	255,840	2.8	109	256
10	191,880	2.1	76	192

1,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	799,500	8.7	313	780
50	720,000	7.8	289	720
40	640,000	7.0	254	640
30	560,000	6.1	225	560
20	480,000	5.2	188	480
10	360,000	3.9	141	360

6,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	2,664,000	29.0	1050	2664
50	2,397,600	26.0	940	2398
40	2,131,200	23.0	830	2131
30	1,864,800	20.0	725	1865
20	1,598,400	17.5	632	1598
10	1,198,000	13.0	470	1199

8,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	3,159,800	34.3	1240	3159
50	2,850,000	31.0	1120	2850
40	2,530,000	27.5	995	2530
30	2,220,000	24.2	875	2220
20	1,900,000	20.6	745	1900
10	1,420,000	15.5	560	1420

10,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	3,894,000	42.4	1540	3894
50	3,504,600	38.2	1385	3504
40	3,115,200	33.9	1230	3115
30	2,725,800	29.6	1070	2725
20	2,336,400	25.3	915	2336
10	1,752,300	19.0	705	1752

12,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	4,628,300	50.2	1820	4628
50	4,160,000	45.3	1640	4160
40	3,700,000	40.3	1460	3700
30	3,240,000	35.2	1274	3240
20	2,700,000	29.3	1060	2700
10	2,080,000	22.6	816	2080

15,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	5,040,000	54.7	1980	5040
50	4,550,000	49.5	1790	4550
40	4,040,000	44.0	1590	4040
30	3,530,000	38.4	1390	3530
20	3,030,000	33.0	1190	3030
10	2,227,000	25.0	905	2227

18,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	5,209,750	56.7	2050	5209
50	4,760,000	51.8	1870	4760
40	4,250,000	46.2	1670	4250
30	3,700,000	40.2	1460	3700
20	3,180,000	34.6	1250	3180
10	2,380,000	25.9	936	2380

20,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	5,931,000	64.5	2340	5931
50	5,350,000	58.1	2102	5350
40	4,750,000	51.5	1860	4750
30	4,150,000	45.0	1630	4150
20	3,560,000	38.7	1390	3560
10	2,680,000	29.0	1050	2680

30,000 Gallon Above Ground Tank				
% of container filled	Propane vaporization capacity at 0°F (in BTU's/hr.)	Equivalent in gallons	Equivalent propane ft. <sup>3</sup>	Equivalent natural gas ft. <sup>3</sup>
60	7,471,200	81.2	2940	7471
50	6,700,000	73.0	2640	6700
40	5,990,000	65.0	2360	5990
30	5,220,000	56.7	2050	5220
20	4,470,000	48.6	1770	4470
10	3,360,000	36.7	1320	3360

Vaporization Capacities For Other Air Temperatures	
Prevailing air temperatures	Multiplier
-15°	0.25
-10°	0.50
-05°	0.75
0°	1.00
+05°	1.25
+10°	1.50
+15°	1.75
+20°	2.00

## Vaporization Rate in BTU/Hr. (Continuous Draw)

Tank Size:	500 G.W.C	1,000 G.W.C	1,800 G.W.C	2,350 G.W.C	3,360 G.W.C
Temperature	BTU/Hr.				
-20	60,000	127,000	180,000	240,000	300,000
-10	130,000	250,000	430,000	550,000	750,000
0	240,000	400,000	650,000	850,000	1,300,000
+10	300,000	550,000	925,000	1,400,000	1,600,000
+20	380,000	700,000	1,350,000	1,500,000	2,000,000
+30	465,000	850,000	1,450,000	1,800,000	2,400,000
+40	550,000	1,000,000	1,700,000	2,200,000	2,700,000
+50	630,000	1,300,000	1,850,000	2,500,000	3,300,000
+60	700,000	1,400,000	2,200,000	2,700,000	3,700,000

Tank Size:	12,000 G.W.C	18,000 G.W.C	30,000 G.W.C*	30,000 G.W.C**
Temperature	BTU/Hr.			
-20	650,000	750,000	1,100,000	1,200,000
-10	1,500,000	1,700,000	2,500,000	2,800,000
0	2,800,000	2,660,000	3,800,000	4,500,000
+10	3,200,000	3,700,000	5,200,000	6,000,000
+20	4,000,000	4,600,000	6,500,000	7,800,000
+30	4,800,000	5,800,000	8,000,000	9,300,000
+40	5,800,000	6,800,000	9,500,000	11,000,000
+50	6,800,000	7,800,000	11,000,000	13,000,000
+60	7,200,000	9,000,000	13,000,000	14,500,000

\*30,000 G.W.C Short: 36 ft., 3 in. Seam-to-Seam 10 ft., 9-5/6 in I.D.

\*\*30,000 G.W.C Long: 57 ft., 0 in. Seam-to-Seam 9 ft., 0 in I.D.

## Tank Volume Factors

25% x 1.00	30% x 1.072	35% x 1.15	40% x 1.22	45% x 1.20	50% x 1.35
55% x 1.42	60% x 1.49	65% x 1.57	70% x 1.64	75% x 1.71	80% x 1.79

**Number of gallons of propane remaining in vapor form in a drained tank of 30,000 gallons water capacity at various gauge pressures.**

Gauge PSI	Gals.
225	1793
224	1786
223	1778
222	1771
221	1763
220	1756
219	1748
218	1741
217	1733
216	1726
215	1718
214	1711
213	1703
212	1696
211	1688
210	1681
209	1673
208	1666
207	1658
206	1651
205	1644
204	1636
203	1629
202	1621
201	1614
200	1606
199	1599
198	1591
197	1584
196	1576
195	1569
194	1561
193	1554
192	1546
191	1539
190	1531
189	1524
188	1516
187	1509
186	1501
185	1494
184	1486
183	1479
182	1471
181	1464
180	1456
179	1449
178	1441
177	1434
176	1426
175	1419
174	1412
173	1404
172	1397
171	1389
170	1382
169	1374
168	1367
167	1359
166	1352
165	1344

Gauge PSI	Gals.
164	1337
163	1329
162	1322
161	1314
160	1307
159	1299
158	1292
157	1284
156	1277
155	1269
154	1262
153	1254
152	1247
151	1239
150	1232
149	1224
148	1217
147	1210
146	1202
145	1195
144	1187
143	1180
142	1172
141	1165
140	1157
139	1150
138	1142
137	1135
136	1127
135	1120
134	1112
133	1105
132	1097
131	1090
130	1082
129	1075
128	1067
127	1060
126	1052
125	1045
124	1037
123	1030
122	1022
121	1015
120	1007
119	1000
118	992
117	985
116	978
115	970
114	963
113	955
112	948
111	940
110	933
109	925
108	918
107	910
106	903
105	895
104	888

Gauge PSI	Gals.
103	880
102	873
101	865
100	858
99	850
98	843
97	835
96	828
95	820
94	813
93	805
92	798
91	790
90	783
89	775
88	768
87	761
86	753
85	746
84	738
83	731
82	723
81	716
80	708
79	701
78	693
77	686
76	678
75	671
74	663
73	656
72	648
71	641
70	633
69	626
68	618
67	611
66	603
65	596
64	588
63	581
62	573
61	566
60	558
59	551
58	544
57	536
56	529
55	521
54	514
53	506
52	499
51	491
50	484
49	476
48	469
47	461
46	454
45	446
44	439
43	431

Gauge PSI	Gals.
42	424
41	416
40	409
39	401
38	394
37	386
36	379
35	371
34	364
33	356
32	349
31	341
30	334
29	326
28	319
27	312
26	304
25	297
24	289
23	282
22	274
21	267
20	259
19	252
18	244
17	237
16	229
15	222
14	214
13	207
12	199
11	192
10	184
9	177
8	169
7	162
6	154
5	147
4	139
3	132
2	124
1	117
0	110

**Number of gallons of propane remaining in vapor form in a drained tank of 18,000 gallons water capacity at various gauge pressures.**

Gauge PSI	Gals.
225	1076
224	1071
223	1067
222	1062
221	1058
220	1053
219	1049
218	1044
217	1040
216	1035
215	1031
214	1026
213	1022
212	1017
211	1013
210	1008
209	1004
208	999
207	995
206	990
205	986
204	981
203	977
202	972
201	968
200	964
199	959
198	954
197	950
196	945
195	941
194	937
193	932
192	928
191	923
190	919
189	914
188	910
187	905
186	901
185	896
184	892
183	887
182	883
181	878
180	874
179	869
178	865
177	860
176	856
175	851
174	847
173	842
172	838
171	833
170	829
169	824
168	820
167	815
166	811
165	806

Gauge PSI	Gals.
164	802
163	797
162	793
161	788
160	784
159	779
158	775
157	770
156	766
155	761
154	757
153	752
152	748
151	743
150	739
149	734
148	730
147	726
146	721
145	717
144	712
143	708
142	703
141	699
140	694
139	690
138	685
137	681
136	676
135	672
134	667
133	663
132	658
131	654
130	649
129	645
128	640
127	636
126	631
125	627
124	622
123	618
122	613
121	609
120	604
119	600
118	595
117	591
116	586
115	582
114	577
113	573
112	568
111	564
110	559
109	555
108	550
107	546
106	541
105	537
104	532

Gauge PSI	Gals.
103	528
102	523
101	519
100	514
99	510
98	505
97	501
96	497
95	492
94	488
93	483
92	479
91	474
90	470
89	465
88	461
87	456
86	452
85	447
84	443
83	438
82	434
81	429
80	425
79	420
78	416
77	411
76	407
75	402
74	398
73	393
72	389
71	384
70	380
69	375
68	371
67	366
66	362
65	357
64	353
63	348
62	344
61	339
60	335
59	330
58	326
57	321
56	317
55	312
54	308
53	303
52	299
51	294
50	290
49	285
48	281
47	277
46	272
45	268
44	263
43	259

Gauge PSI	Gals.
42	254
41	250
40	245
39	241
38	236
37	232
36	227
35	223
34	218
33	214
32	209
31	205
30	200
29	196
28	191
27	187
26	182
25	178
24	173
23	169
22	164
21	160
20	155
19	151
18	146
17	142
16	137
15	133
14	128
13	124
12	119
11	115
10	110
9	106
8	101
7	97
6	93
5	88
4	84
3	80
2	75
1	70
0	66

**Number of gallons of propane remaining in vapor form in a drained tank of 12,000 gallons water capacity at various gauge pressures.**

Gauge PSI	Gals.
225	718
224	715
223	712
222	709
221	706
220	703
219	700
218	697
217	694
216	691
215	688
214	685
213	682
212	679
211	676
210	673
209	670
208	667
207	664
206	661
205	658
204	655
203	652
202	649
201	646
200	643
199	640
198	637
197	634
196	631
195	628
194	625
193	622
192	619
191	616
190	613
189	610
188	607
187	604
186	601
185	598
184	595
183	592
182	589
181	586
180	583
179	580
178	577
177	574
176	571
175	568
174	565
173	562
172	559
171	556
170	553
169	550
168	547
167	544
166	541
165	538

Gauge PSI	Gals.
164	535
163	532
162	529
161	526
160	523
159	520
158	517
157	514
156	511
155	508
154	505
153	502
152	499
151	496
150	493
149	490
148	487
147	484
146	481
145	478
144	475
143	472
142	469
141	466
140	463
139	460
138	457
137	454
136	451
135	448
134	445
133	442
132	439
131	436
130	433
129	430
128	427
127	424
126	421
125	418
124	415
123	412
122	409
121	406
120	403
119	400
118	397
117	394
116	391
115	388
114	385
113	382
112	379
111	376
110	373
109	370
108	367
107	364
106	361
105	358
104	355

Gauge PSI	Gals.
103	352
102	349
101	346
100	343
99	340
98	337
97	334
96	331
95	328
94	325
93	322
92	319
91	316
90	313
89	310
88	307
87	304
86	301
85	298
84	295
83	292
82	289
81	286
80	283
79	280
78	277
77	274
76	271
75	268
74	265
73	262
72	259
71	256
70	253
69	250
68	247
67	244
66	241
65	238
64	235
63	232
62	229
61	226
60	223
59	220
58	217
57	215
56	212
55	209
54	206
53	203
52	200
51	197
50	194
49	191
48	188
47	185
46	182
45	179
44	176
43	173

Gauge PSI	Gals.
42	170
41	167
40	164
39	161
38	158
37	155
36	152
35	149
34	146
33	143
32	140
31	137
30	134
29	131
28	128
27	125
26	122
25	119
24	116
23	113
22	110
21	107
20	104
19	101
18	98
17	95
16	92
15	89
14	86
13	83
12	80
11	77
10	74
9	71
8	68
7	65
6	62
5	59
4	56
3	53
2	50
1	47
0	44

**Number of gallons of propane remaining in vapor form in a drained tank of 1,000 gallons water capacity at various gauge pressures.**

Gauge PSI	Gals.
225	60
224	59.75
223	59.5
222	59.25
221	59
220	58.75
219	58.5
218	58.25
217	58
216	57.75
215	57.5
214	57.25
213	57
212	56.75
211	56.5
210	56.25
209	56
208	55.75
207	55.5
206	55.25
205	54.99
204	54.74
203	54.49
202	54.24
201	53.99
200	53.74
199	53.49
198	53.24
197	52.99
196	52.74
195	52.49
194	52.24
193	51.99
192	51.74
191	51.49
190	51.24
189	50.99
188	50.74
187	50.49
186	50.24
185	49.99
184	49.74
183	49.49
182	49.24
181	48.99
180	48.74
179	48.49
178	48.24
177	47.99
176	47.73
175	47.48
174	47.23
173	46.98
172	46.73
171	46.48
170	46.23
169	45.98
168	45.73
167	45.48
166	45.23
165	44.98

Gauge PSI	Gals.
164	44.73
163	44.48
162	44.23
161	43.98
160	43.73
159	43.48
158	43.23
157	42.98
156	42.73
155	42.48
154	42.23
153	41.98
152	41.73
151	41.48
150	41.23
149	40.98
148	40.73
147	40.48
146	40.22
145	39.97
144	39.72
143	39.47
142	39.22
141	38.97
140	38.72
139	38.47
138	38.22
137	37.97
136	37.72
135	37.47
134	37.22
133	36.97
132	36.72
131	36.47
130	36.22
129	35.97
128	35.72
127	35.47
126	35.22
125	34.97
124	34.72
123	34.47
122	34.22
121	33.97
120	33.72
119	33.47
118	33.22
117	32.96
116	32.71
115	32.46
114	32.21
113	31.96
112	31.71
111	31.46
110	31.21
109	30.96
108	30.71
107	30.46
106	30.21
105	29.96
104	29.71

Gauge PSI	Gals.
103	29.46
102	29.21
101	28.96
100	28.71
99	28.46
98	28.21
97	27.96
96	27.71
95	27.46
94	27.21
93	26.96
92	26.71
91	26.46
90	26.21
89	25.96
88	25.7
87	25.45
86	25.2
85	24.95
84	24.7
83	24.45
82	24.2
81	23.95
80	23.7
79	23.45
78	23.2
77	22.95
76	22.7
75	22.45
74	22.2
73	21.95
72	21.7
71	21.45
70	21.2
69	20.95
68	20.7
67	20.45
66	20.2
65	19.95
64	19.7
63	19.45
62	19.2
61	18.95
60	18.7
59	18.45
58	18.19
57	17.94
56	17.69
55	17.44
54	17.19
53	16.94
52	16.69
51	16.44
50	16.19
49	15.94
48	15.69
47	15.44
46	15.19
45	14.94
44	14.69
43	14.44

Gauge PSI	Gals.
42	14.19
41	13.94
40	13.69
39	13.44
38	13.19
37	12.94
36	12.69
35	12.44
34	12.19
33	11.94
32	11.69
31	11.44
30	11.19
29	10.93
28	10.68
27	10.43
26	10.18
25	9.93
24	9.67
23	9.43
22	9.18
21	8.93
20	8.67
19	8.43
18	8.18
17	7.93
16	7.68
15	7.43
14	7.18
13	3.93
12	6.68
11	6.43
10	6.18
9	5.93
8	5.68
7	5.43
6	5.18
5	4.93
4	4.68
3	4.43
2	4.18
1	3.93
0	3.68

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