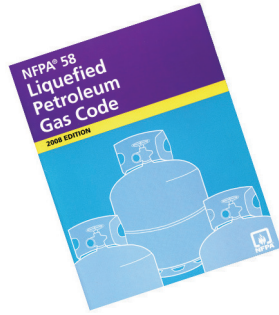


LP-Gas Cylinder and Service Valves

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.

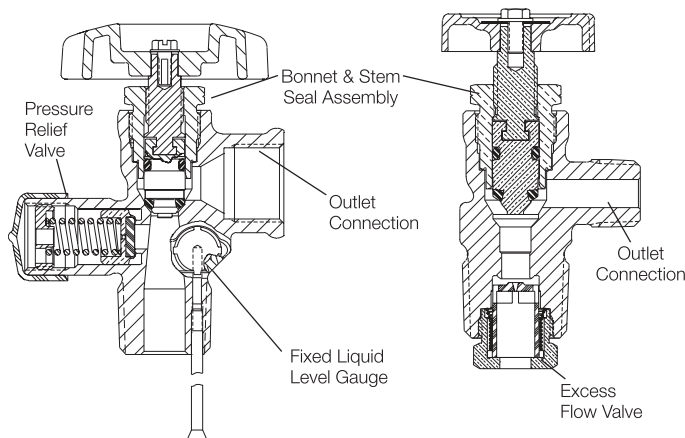
The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes 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.

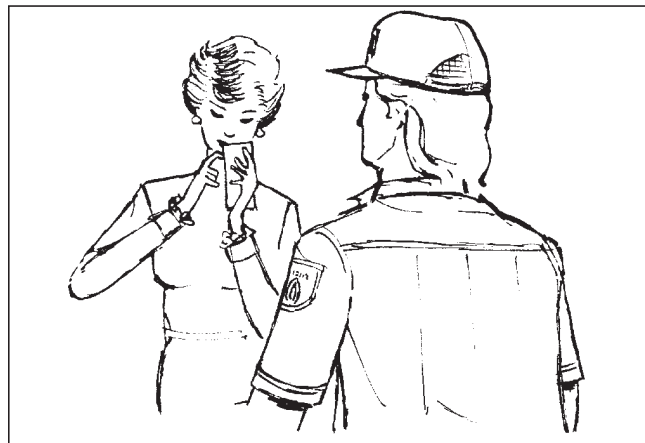
4. The pressure relief valve is of critical importance: Its proper operation is vital in avoiding excessive pressures during emergencies, such as overfilling or exposure to excessive heat. No repair of this device is allowable. Relief valve should be visually inspected and checked for leaks each time 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.



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.

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.**

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.

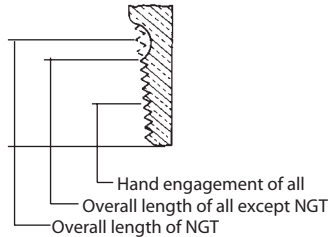
The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential. Because RegO Products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a cylinder valve is 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.

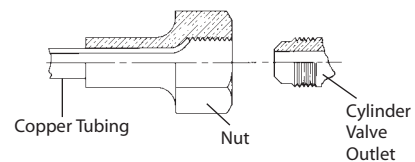
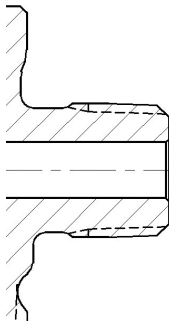
Outlet Connections

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.

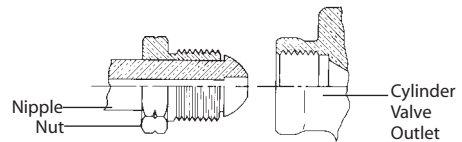
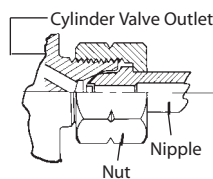


CGA 182, or SAE Flare

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 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 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

Valve Stems On 901, 9101, 9102 and 9103 Valves

Are machined with a double lead thread for quick opening and closing as well as high lift.

Forged Brass Body

Pressure Relief

Provides quick discharge of excess pressure. Relief seat disc is special resilient composition rubber.

Tapered Seat Openings On 9101, 9102 and 9103 Valves

Permit increased flow rates resulting in faster charging.

Back Seat On 901, 9101, 9102 and 9103 Valves

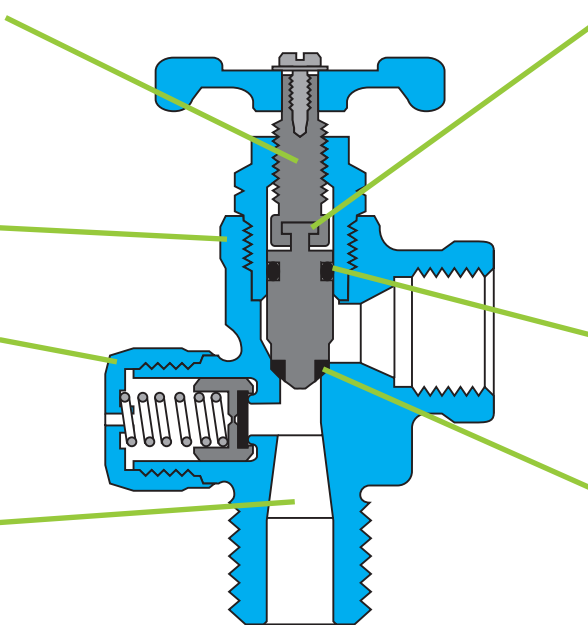
Is metal-to-metal seating to provide added protection against leakage while the valve is open. Back seat the valve while in operation.

O-Rings

For positive leak-proof seals under temperature and pressure variations.

Seat Disc

Is a tapered nylon in a fully confined seat to ensure easy, leak-free, positive shutoffs. Seat disc also provides a separate swivel action to minimize scoring by impurities.



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				POL Plug
							10 PSIG	25 PSIG	50 PSIG	100 PSIG	
*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.



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.



9107K8A

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.

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				8.8	12.4	15.8	21.7						
*9101D11.1				Yes	8.6	12.7	16.3	22.3					
*9101D11.7													
9101R1	MultiBonnet			No	7.6	11.7	15.2	20.6					
*9101R11.1				Yes									
*9101R11.7									No				
9102D11.1													
9102R11.7													Plugged
*PT9102R1				No									Yes
*PT9102R11.1		Yes											
*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

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*																
9101P5H			1/4" NPT	550	1050	2.6	4.5	7.2	10.3	14.8						
9101P5HT*																
9101P6				430	900	1.5										
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

