



Powering Business Worldwide

Aerospace Group
Conveyance Systems Division

Carter® Brand Ground Fueling Equipment

SM64502

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Applicable addition manuals:

None

Maintenance & Repair Manual

Fuel Operated Inline Pressure Control Valves - 3 & 4 Inch

Models 64502 & 64512

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NOTE: The information in this manual is to the latest revision of the products listed above at the time of this printing. Eaton reserves the right to change this manual at its discretion.

**Maintenance, Overhaul & Test Instructions
Models 64502 & 64512 3 & 4 Inch Fuel Operated
Inline Pressure Control Valves**

1.0 INTRODUCTION

This manual furnishes detailed instructions covering the maintenance and overhaul of Eaton's Carter® brand Model 64502, 3 inch & Model 64512, 4 inch fuel operated

inline pressure control valves and the various options listed in Section 3.0.

2.0 EQUIPMENT DESCRIPTION

Models 64502 and 64512 are the latest versions of the 3 & 4 inch fuel operated inline pressure control valves that replace the older 64130 and 64140 models. Because they have many characteristics in common, a single manual is used to present both units.

A minimum line size 3/8 inches should be used as a fuel sense line. Stainless tubing for this line is recommended. If two venturis are used, a three-way valve with at least a 1/4-inch internal orifice should be used to obtain proper surge control.

The valves listed above are designed to provide a constant nominal pressure at a remote sense point using fuel pressure generated within the system. The valves are direct operating spring loaded piston type valves. When reference fuel pressure is applied to the proper port on the manifold, the fuel control pressure can be increased or decreased by the adjustment knob on the manifold. Deadman control is accomplished using the integral solenoid valve and a deadman switch.

The opening and closing time of the valve is fixed at the industry standard. Either can be changed only by changing a fixed orifice screw in the manifold. Contact Carter for information on obtaining different orifice screws. The check valve under the fuel sense port of the manifold allows restricted flow out of the piston chamber and relatively unrestricted flow into the piston chamber. When a change of approximately 1.5 psi downstream pressure is created, the check valve will open and flood the piston chamber, causing the valve to close rapidly.

If the valves are to be used at a flow rate below approximately 100 gpm, the reference pressure may have to be increased to obtain the desired fuel pressure. The reference pressure may vary slightly from unit to unit. Changing the reference pressure is the only way of adjusting fuel discharge pressure.

The bleeders on the manifold allow bleeding of air from both the fuel sense line and internally within the manifold. The valve should be installed with the bleeders in the upward position to facilitate proper bleeding.

3.0 TABLE OF OPTIONS AND ORDERING INFORMATION

Model 64502 and 64512 have common options as listed below.

and outlet are Victaulic connections proper bracing must be provided.

Eaton recommends that at least one end of the valve be flange mounted to the piping system, if both inlet

Options to be added to Model 64502 or Model 64512 Fuel Operated Inline Pressure Control Valves

Option Letter	Description	Option Letter	Description
A	Adds 12 VDC Solenoid Valve	E	Adds two Victaulic Adapter Assemblies for use both the inlet and outlet of the unit. (The parts are shipped as loose parts to be used on either end). Mounting fasteners are not provided.
B	Adds 24 VDC Solenoid Valve		
D	Adds one Victaulic Adapter Assembly for use on either the inlet or outlet of the unit. (The parts are shipped as loose parts to be used on either end). Mounting fasteners are not provided.	F	Adds Relief Valve Cap
Example:	64502AD – Basic 3 inch fuel operated inline pressure control valve with a kit of parts to convert the standard ASA flange on either end to mate a Victaulic fitting and a 12 VDC solenoid valve.		
	64502E - Basic 3 inch inline fuel operated pressure control valve with a kit of parts to convert the standard ASA flange both ends to mate Victaulic fittings.		

4.0 DISASSEMBLY

4.1 Models 64502 & 64512 – Note that, due to the similarity between the units, this manual covers both units. The appropriate part numbers for the same type of part are noted in Section 8.0.

the O-ring (from a Carter furnished fitting) or the gasket that is used to seal the fitting to the valve.

Refer to Figure 1 for this operation. The valve consists of two basic items, the Valve Assembly (1-1) and the Manifold Assembly (1-2). If a Victaulic fitting is present on the outlet of the valve assembly remove it. Discard

4.2 MANIFOLD ASSEMBLY - Refer to Figure 2. Remove the Manifold Assembly (1-2) from the unit by removing Bolt (2-15) and pulling the manifold from the unit being careful to not lose any of the four (4) Retainers (2-13). Discard O-rings (2-14) when removed.

Note: Repairs to the Manifold Assembly (1-2) can be accomplished without removing the main valve from the vehicle system. Be sure that the pressure is relieved before doing this.

- 4.2.1 Remove Housing Check Valve (2-6) and then remove all of the internal parts contained by it. Remove and discard O-rings (2-4) and (2-5).
- 4.2.2 Do not remove Bleeder Assemblies (2-12) unless one or the other is to be replaced due to leakage from its threaded fastener or from the bleeder valve itself. If either are removed, it can be disassembled by removing the Retainer Ring (2-12F) with the proper pliers and all other parts will then come out.
- 4.2.3 Do not remove Orifice Screws (2-10) or (2-17) unless they are to be replaced to change the opening and closing times. If they are removed note the orifice from which they were removed and place them in separate bags with the proper identification since they are very similar.
- 4.2.4 Unless there is leakage apparent between the solenoid and manifold, it is not necessary to remove the solenoid valve. To remove the Solenoid Valve (2-18) first unscrew the connector retaining screw on the top of the solenoid assembly. This will provide access to the two screws holding the solenoid to the manifold. There are three O-rings (2-20) used to seal the interface between the solenoid and the manifold. Remove and discard them.
- 4.2.5 Do not remove the Relief Valve (2-9) unless there is a problem with it. Then, if the Relief Valve (2-9) is lock wired to Screw (2-16) and it needs servicing, cut the wire. Do not remove Screw (2-16), it is used only to safety the relief valve to stop tampering. Remove and discard the entire assembly.
- 4.2.6 Remove Screw (2-8) and O-ring (2-7) and discard the O-ring.
- 4.2.7 Do not remove Plug (2-19) unless there is leakage from around the thread.
- 4.3 3 INCH VALVE ASSEMBLY – Refer to Figure 3 for this operation.
- 4.3.1 Rotate Outer Piston (3-25) to access 4 Screws (3-5) these screws are a self locking type screws that utilize a nylon insert in the threads to affect resistance and keep the screw locked in place. They can be reused a number of times before losing their locking ability. Using a torque wrench, remove the screws. If the torque is less than 2 inch lbs. replace during reassembly.
- 4.3.2 Discard O-Rings (3-8).
- 4.3.3 Grasp Outer Piston (3-25) and remove the entire piston/shaft assembly from the outlet of the valve.
- 4.3.4 Remove and discard O-rings (3-7) and (3-6) from the shoulder and groove of the Piston Retainer (3-21).

WARNING:

Before proceeding further beware that the outer piston and attaching parts are heavily spring loaded and a vise or similar should be used to safely disassemble the piston assembly.

- 4.3.5 As indicated above, a vise or woodworkers clamp is required to proceed further. Wood blocks should be used to secure the piston
Assemble such that an axial load is exerted yet allows access to both Nuts (3-16).

NOTE:

Shaft (3-27) and nut (3-16) are both stainless steel. Nut (3-16) also includes a locking element. Due to this combination there is the possibility when these items are disassembled that the threads may gall or become damaged beyond repair. If it is necessary to disassemble these items replace both nuts (3-16) and consider replacing the shaft (3-27).

CAUTION:

Be certain the piston assembly is securely held in place and cannot slip, allowing the unit to forcibly separate when the first nut (16) is removed. Forcible separation may cause personal injury. Be careful not to damage the sealing surface of the inner or outer piston

- 4.3.6 Remove and discard Seal (3-10) and O-ring (3-9).
- 4.3.7 With the assembly securely clamped in place, carefully remove Nut (3-16) from the piston assembly, use Lockase or similar as an aid in removing the nut. Remove Washer (3-17) from piston assembly. Slowly open the clamping device allowing the spring force to cause the inner piston assembly to follow the clamp until all spring force is relieved. Then carefully remove the clamp and lift the Inner Piston (3-20) from the Spring (3-26). Remove the two bronze Washers (3-29) from the Inner Piston (3-20) then remove Spring (3-26) and Teflon Washer (3-30) from the Guide (3-22). Remove O-ring (3-18) and Washer (3-19) from the end of Shaft (3-27). Discard O-ring (3-18).
- 4.3.8 Using two thin 3/8-24 UNF-2B nuts as jam nuts on the shaft (3-27) where Nut (3-16) was removed above, remove Nut (3-16) and Washer (3-17) retaining the outer Piston (3-25) from the Shaft (3-27).
- 4.3.9 Remove Screws (3-28) from spring Guide (3-22) to remove Seal (3-23) and O-ring (3-24) from retainer.
- 4.3.10 On older versions of the 3 inch valve, it will be necessary to remove Screws (3-12) and remove Seal Housing (3-11) from Body (3-1). Remove and discard O-ring (3-13).
- 4.3.11 Remove and discard Seal (3-10) and O-ring (3-9).
- 4.3.12 Remove Screws (3-14) and then pull out Seal Housing Retainer (3-4) and Housing (3-15) with Seals (3-2) and O-rings (3-3). Discard seals (3-2) and O-rings (3-3).
- 4.3.13 **Note: It is recommended the user upgrade to the new seal cartridge. The new design with the energized Seal (3-2) and O-Ring (3-3) are included in the overhaul kit KD64500-5. These seals will not work with the old-style cartridge. Request a -8 kit for hardware items (3-4 & 3-15) to complete the upgrade. This configuration provides a more robust seal, reducing leakage and frequency for overhaul of the seal cartridge.**
- 4.3.14 Newer versions are equipped with a check valve. To remove, carefully remove check valve Stop (3-31) taking care to capture Ball (3-33), Spring (3-34) and check valve Seat (3-35) then remove and discard O-ring (3-32).
- 4.4 4 INCH VALVE ASSEMBLY – Refer to Figure 4 for this operation.
- 4.4.1 Rotate Outer Piston (4-25) to access 4 Screws (4-5) these screws are a self locking type screws that utilize a nylon insert in the threads to affect resistance and keep the screw locked in place. They can be reused a number of times before losing their locking ability. Using a torque wrench, remove the screws. If the torque is

less than 2 inch lbs. replace during reassembly. Remove the four Screws (4-5) and Washers (4-8).

4.4.2 Grasp Outer Piston (4-25) and remove the entire piston/shaft assembly from the outlet of the valve.

4.4.3 Remove and discard O-rings (4-7) and (4-6) from the shoulder and groove of the Piston Retainer (3-21).

WARNING:

Before proceeding further beware that the outer piston and attaching parts are heavily spring loaded and a vise or similar should be used to safely disassemble the piston assembly.

4.4.4 As indicated above, a vise or woodworkers clamp is required to proceed further. Wood blocks should be used to secure the piston

Assemble such that an axial load is exerted yet allows access to both Nuts (4-16).

NOTE:

Shaft (4-27) and nut (4-16) are both stainless steel. Nut (4-16) also includes a locking element. Due to this combination there is the possibility when these items are disassembled that the threads may gall or become damaged beyond repair. If it is necessary to disassemble these items replace both nuts (4-16) and consider replacing the shaft (4-27).

CAUTION:

Be certain the piston assembly is securely held in place and cannot slip, allowing the unit to forcibly separate when the first nut (16) is removed. Forcible separation may cause personal injury. Be careful not to damage the sealing surface of the inner or outer piston.

4.4.5 With the assembly securely clamped in place, carefully remove Nut (4-16) from the piston assembly, use

Lockease or similar as an aid in removing the nut. Remove Washer (4-17) from piston assembly. Slowly open the clamping device allowing the spring force to cause the inner piston assembly to follow the clamp until all spring force is relieved. Then carefully remove the clamp and lift the Inner Piston (4-20) from the Spring (4-26). Remove the two bronze Washers (4-29) from the Inner Piston (4-20) then remove Spring (4-26) and Teflon Washer (4-30) from the Guide (4-22). Remove O-ring (4-18) and Washer (4-19) from the end of Shaft (4-27). Discard O-ring (4-18).

4.4.6 Using two thin 3/8-24 UNF-2B nuts as jam nuts on the shaft (4-27) where Nut (4-16) was removed above, remove Nut (4-16) and Washer (4-17) retaining the outer Piston (4-25) from the Shaft (4-27).

4.4.7 Remove Screws (4-28) from spring Guide (4-22) to remove Seal (4-24) and O-ring (4-23) from retainer.

4.4.8 Remove and discard Seal (4-10) and O-ring (4-9).

4.4.9 Remove Screws (4-14) and then pull out Seal Housing Retainer (4-4) and Housing (4-15) with Seals (4-2) and O-rings (4-3). Discard seals (4-2) and O-rings (4-3).

Note: It is recommended the user upgrade to the new seal cartridge. The new design with the energized Seal (4-2) and O-Ring (4-3) are included in the overhaul kit KD64500-6. These seals will not work with the old-style cartridge. Request a -8 kit for hardware items (4-4 & 4-15) to complete the upgrade. This configuration provides a more robust seal, reducing leakage and frequency for overhaul of the seal cartridge.

4.4.10 Newer versions are equipped with a check valve. To remove, carefully remove check valve Stop (3-31) taking care to capture Ball (3-33), Spring (3-34) and check valve Seat (3-35) then remove and discard O-ring (3-32).

5.0 INSPECTION

It is recommended that all O-rings and seals be replaced at every overhaul. Inspect all metal parts for dings, gouges, abrasions, etc. On the inner and outer piston use 320 grit paper to remove any sharp edges if required be careful not to remove the hard anodize finish on these pistons. Check the knife-edge of the outer piston where it meets O-ring (3-7 or 4-12A). This edge should be smooth and free of any imperfections. If any imperfections are found that cannot be polished

from the surfaces or the knife-edge the part should be replaced.

Inspect all metal parts for dings, gouges, abrasions, etc. Use 320 grit paper to smooth and remove sharp edges. Replace any part with damage exceeding 15% of local wall thickness. Use alodine 1200 to touch up bared aluminum.

Note: Nuts (3-16) & (4-16) should not be reused.

6.0 REASSEMBLY

Reassembly is accomplished in essentially the reverse order of disassembly. A light coat of petroleum jelly may be used during overhaul but do not use any other type of lube, **ONLY PETROLEUM JELLY.**

Note: Lightly lubricate all O-rings except O-Ring (3-8) or (4-8) and O-Ring (3-2A) or (4-2A) [old seal cartridge design] to be installed dry).

6.1 Make certain all components are clean and free from oil, grease, or any other corrosion resistant compound on all interior or exterior surfaces. Wash all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly with a clean, lint-free cloth or

Warning

Use cleaning solvent in a well-ventilated area. Avoid breathing of fumes and excessive solvent contact with skin. Keep away from open flame.

6.2 3 INCH VALVE ASSEMBLY Refer to Figure 3 for this operation.

6.2.1 Seal Cartridge older units: Place O-rings (3-3) into the grooves of the Seal Housing (3-4A) outside diameter. Install O-rings (3-2A) in o-ring grooves on inside diameter of Housing. DO NOT LUBRICATE. Next install Piston Seals (3-15A) in inside diameter grooves over O-rings (3-2A) per Figure 5A. Smooth the combination of the Seal and O-ring (3-2A) with the finger to assure that they are installed completely in the seal grooves. Apply a light coat of lube and then insert the assembly into the main Housing (3-1) with the "notch" on (3-4A) oriented as shown on Figure 3.

6.2.2 Install Screws (3-14) and torque to 18 ± 2 in.-lb. (21 ± 2 kg-cm). Condition seals with seal run-in tool AF42208-1 [use instructions from the SM64800 manual.]

Note: It is recommended the user upgrade to the new seal cartridge. The new design with the energized Seal (3-2) and O-Ring (3-3) are included in the overhaul kit KD64500-5. These seals will not work with the old-style cartridge. Request a -8 kit for hardware items (3-4 & 3-15) to complete the upgrade. This configuration provides a more robust seal, reducing leakage and frequency for overhaul of the seal cartridge.

- 6.2.3 Seal Cartridge newer units: O-rings (3-3) should be fitted onto the grooves of Seal Housing (3-15). The lubricated Inner Piston Seals (3-2) should be installed on the inside diameter of the Seal Housing (3-15) per Figure 5B. Now insert the assembly into the main Housing (3-1) with the "notch" on (3-4A) oriented as shown on Figure 3. Be careful not to damage the seals during installation.
- 6.2.4 Install the Seal Housing Retainer (3-4) into the main Housing (3-1) and install Screws (3-14). Torque Screws (3-4) to 18 ± 2 in.-lb. (21 ± 2 kg-cm). When properly installed, it is not necessary to polish the new type seals.

NOTE:

Shaft (3-27) and nut (3-16) are both stainless steel. Nut (3-16) also includes a locking element. Due to this combination there is the possibility when these items are disassembled that the threads may gall or become damaged beyond repair. If it is necessary to disassemble these items replace both nuts (3-16) and consider replacing the shaft (3-27).

- 6.3 Assemble Outer Piston (3-25) onto Shaft (3-27) using Washer (3-17) and Nut (3-16). Use two thin nuts 3/8-24 UNF-2B nuts as jam nuts on the opposite end of the Shaft (3-27) and tighten the Nut (3-16) 195 ± 10 in.-lb. (225 ± 12 kg-cm).
- 6.3.1 Install O-ring (3-24) on Seal (3-23) and install in Retainer (3-21). The leg or hook end of the seal should point toward the Outer Piston (3-25). Press the seal into place very carefully in the retainer. Install Screws (3-28) through spring Guide (3-22) and tighten screws equally.
- 6.3.2 Apply a light coat of lube to inside ID of Seal (3-23) and slide the Retainer (3-21) onto Shaft (3-27).
- 6.3.3 Install Teflon Washer (3-30) on the shoulder of the spring Guide (3-22).
- 6.3.4 Place Washer (3-19) over the end of the Shaft (3-27) and install O-ring (3-18) above the washer.
- 6.3.5 Install Spring (3-26) onto Guide (3-22). Place the two bronze Washers (3-29) on top of the spring and hold them in place by placing the Inner Piston (3-20) over Spring (3-26). Insert assembly into the clamping device used during disassembly. Compress the assembly and allow access to install the Washer (3-17) and Nut (3-16) on the end of the shaft and tighten to 195 ± 10 in.-lb. (225 ± 12 kg-cm).
- 6.3.6 Install the O-ring (3-6) into groove in Retainer (3-21). Install O-ring (3-7) over the end of the Retainer (3-21) to where it rests against the retainer's shoulder.
- 6.3.7 Insert the non-lubricated O-ring (3-9) into the groove in the outlet of Housing (3-1) Install Seal (3-10) over O-ring (3-9) (Refer to Figure 6).
- 6.3.8 On older versions, if equipped, place O-ring (3-13) over Retainer (3-11) and install the assembly into the main housing fully without cutting the O-ring (3-13). Rotate the retainer to line up the four holes with the mating holes in the housing and install Screws (3-12).

- 6.3.9 Insert piston assembly into the housing and rotate Outer Piston (3-25) to line up the four holes with the mating holes in the housing. Place O-rings (3-8) over Screws (3-5) and tighten in a cross manner.
- 6.3.10 On newer units with a check valve install or ensure valve Seat (3-35) is in the cavity in Housing (3-1). Install Spring (3-34) with Ball (3-33) over the spring. Place O-ring (3-32) onto check valve Stop (3-31) and thread into housing until seated.
- 6.4 4 INCH VALVE ASSEMBLY- Refer to Figure 4 for this operation.
- 6.4.1 Seal Cartridge older units: Place O-rings (4-3) into the grooves of the Seal Housing (4-4A) outside diameter. Install O-rings (4-2A) in O-ring grooves on inside diameter of Housing. DO NOT LUBRICATE. Next install Piston Seals (4-15A) in inside diameter grooves over O-rings (4-2A) per Figure 5A. Smooth the combination of the Seal and O-ring (4-2A) with the finger to assure that they are installed completely in the seal grooves. Apply a light coat of lube and then insert the assembly into the main Housing (3-1) with the "notch" on (4-4A) oriented as shown on Figure 3.
- 6.4.2 Install Screws (4-14) and torque to 18 ± 2 in.-lb. (21 ± 2 kg-cm). Condition seals with seal run-in tool AF42208-1 [use instructions from the SM64800 manual.]

Note: It is recommended the user upgrade to the new seal cartridge. The new design with the energized Seal (4-2) and O-Ring (4-3) are included in the overhaul kit KD64500-6. These seals will not work with the old-style cartridge. Request a -8 kit for hardware items (4-4 & 4-15) to complete the upgrade. This configuration provides a more robust seal, reducing leakage and frequency for overhaul of the seal cartridge.

- 6.4.3 Seal Cartridge newer units: O-rings (4-3) should be fitted onto the grooves of Seal Housing (4-15). The lubricated Inner Piston Seals (4-2) should be installed on the inside diameter of the Seal Housing (4-15) per Figure 5B. Now insert the assembly into the main Housing (4-1) with the "notch" on (4-4A) oriented as shown on Figure 3. Be careful not to damage the seals during installation.
- 6.4.4 Install the Seal Housing Retainer (4-4) into the main Housing (4-1) and install Screws (4-14). Torque Screws (4-4) to 18 ± 2 in.-lb. (21 ± 2 kg-cm). When properly installed, it is not necessary to polish the new type seals.

NOTE:

Shaft (4-27) and nut (4-16) are both stainless steel. Nut (4-16) also includes a locking element. Due to this combination there is the possibility when these items are disassembled that the threads may gall or become damaged beyond repair. If it is necessary to disassemble these items replace both nuts (4-16) and consider replacing the shaft (4-27).

- 6.4.5 Assemble Outer Piston (4-25) onto Shaft (4-27) using Washer (4-17) and Nut (4-16). Use two thin nuts 3/8-24 UNF-2B nuts as jam nuts on the opposite end of the Shaft (4-27) and tighten the Nut (4-16) 195 ± 10 in.-lb. (225 ± 12 kg-cm).
- 6.4.6 Install O-ring (4-24) on Seal (4-23) and install in Retainer (4-21). The leg or hook end of the seal should point toward the Outer Piston (4-25). Press the seal into place very carefully in the retainer. Install Screws (4-28) through spring Guide (4-22) and tighten screws equally.

- 6.4.7 Apply a light coat of lube to inside ID of Seal (4-23) and slide the Retainer (4-21) onto Shaft (4-27).
- 6.4.8 Install Teflon Washer (4-30) on the shoulder of the spring Guide (4-22).
- 6.4.9 Place Washer (4-19) over the end of the Shaft (4-27) and install O-ring (4-18) above the washer.
- 6.4.10 Install Spring (4-26) onto Guide (4-22). Place the two bronze Washers (4-29) on top of the spring and hold them in place by placing the Inner Piston (4-20) over Spring (4-26). Insert assembly into the clamping device used during disassembly. Compress the assembly and allow access to install the Washer (4-17) and Nut (4-16) on the end of the shaft and tighten to 195 ± 10 in.-lb. (225 ± 12 kg-cm).
- 6.4.11 Install the O-ring (4-6) into groove in Retainer (3-21). Install O-ring (4-7) over the end of the Retainer (4-21) to where it rests against the retainer's shoulder.
- 6.4.12 Insert the non-lubricated O-ring (4-9) into the groove in the outlet of Housing (4-1) Install Seal (4-10) over O-ring (4-9) (Refer to Figure 6).
- 6.4.13 Insert piston assembly into the housing and rotate Outer Piston (4-25) to line up the four holes with the mating holes in the housing. Place O-rings (4-8) over Screws (4-5) and tighten in a cross manner.
- 6.4.14 On newer units with a check valve install or ensure valve Seat (4-35) is in the cavity in Housing (3-1). Install Spring (4-34) with Ball (4-33) over the spring. Place O-ring (3-32) onto check valve Stop (4-31) and thread into housing until seated.
- 6.5 MANIFOLD ASSEMBLY
 - 6.5.1 Assemble in the reverse order.
 - 6.5.2 If the Plug (2-19) was removed from the manifold then install it in the port marked "To Flow Control".
 - 6.5.3 Place O-ring (2-7) over Screw (2-8) and install in the opening below the port for the relief valve.
 - 6.5.4 If the Relief Valve (2-9) was removed then install a new one. After the Relief Valve has been adjusted, during flow testing, safety wire the valve to the Screw (2-16) to prevent tampering.
- 6.5.5 If the Solenoid Valve (2-18) was removed during disassembly, first, secure the O-rings (2-18) to the bottom of the Solenoid Valve (2-18) by applying a small amount of petroleum jelly to the bottom of the valve to help hold the three interface o-rings in place, then install on the Manifold (2-1) using the solenoid mounting screws. Mount the connector onto the solenoid and secure in place by use of the connector retaining screw.
- 6.5.6 If either Orifice Screw (2-10) or (2-17) were removed reinstall them at this time. Each screw must be installed in its correct location for proper functioning of the valve to occur.
- 6.5.7 If either bleed valve was disassembled begin by placing O-ring (2-12C) over the Poppet (12B). Lay Plug (2-12A) upside down and insert assembled (2-12B) [Reference Figure 2]. Place Spring (2-12D) over the shaft of Poppet (2-12B). Place the Washer (2-12E) on the Spring (2-12D). Compress assembled unit thus far and use snap or lock ring pliers to separate the Retainer (2-12F) and install in the retainer groove on the inside diameter of the bleeder Plug (2-12A).
- 6.5.8 Use a product similar to Vibra Seal (2-11) on the pipe threads on item(s) (2-12A) and install Bleeder Assembly (2-12) in bleeder port(s) of manifold.

NOTE:
Do not use Teflon tape on any threads in this product. Loose pieces of tape can cause failure of the product.

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- 7.0 **TEST**
 - 7.1 The following test procedures will be accomplished after overhaul:
 - 7.2 **TEST CONDITIONS**
Test media shall be JP-8 MIL-T-83133, Jet A, an odorless kerosene or Stoddard type solvent MIL-PRF-7024E Type II.
 - 7.3 **VALVE BODY AIR-TIGHTNESS TEST**
Note that the various ports noted below are identified by engraved markings, "TO PUMP INLET", "FUEL", "VENTURI PRESSURE ADJ and "BLEED". The TO FLOW CONTROL port is not used currently.
 - 7.3.1 Adjust the venturi pressure adjustment regulator such that it is fully closed.
 - 7.3.2 Apply 40-psi air pressure to the fuel sensing port while positioning the unit such that the outlet faces upward. Fill the valve outlet with test fluid and maintain air pressure for one minute. Visually check for air leakage into the fuel path by observing air bubble formation. There shall be no leakage that exceeds 1 cc/minute.
 - 7.3.3 Connect a 0-300-psig test fluid source to the valve inlet and outlet. Connect the valve outlet to a fitting equipped with a shutoff valve.
 - 7.3.4 Energize the solenoid valve. Slowly increase fuel pressure to the valve inlet to open the piston. Fill the valve from the inlet with test fluid while bleeding all air from the valve through the outlet valve. Keep the valve outlet at the highest point while bleeding. De-energize the solenoid valve.
 - 7.3.5 When the test setup is full and bled, pressurize the valve inlet and outlet simultaneously with the test fluid pressure at 125-psi and maintain for one minute while visually inspecting the valve for indication of external leakage. There shall be none.
 - 7.3.6 Reduce the test pressure to 4-6-psig and maintain for one minute while visually inspecting for external leakage. There shall be none.

BLEEDING VALVE!
Before testing or use, the valve must be bled of all trapped air. After pressurizing the unit, use a plastic rod to depress Poppet 2-12B) with a rag around the unit to absorb fuel flow from the bleeder. This should be done long enough to assure all trapped air is exhausted from the valve.

- 7.3.7 Energize the solenoid valve and pressurize the valve at inlet and outlet simultaneously with test fluid pressure at 125-psi and maintain for one minute while observing for leakage. There should be not evidence of external leakage.
- 7.3.8 Release internal pressure and drain the test fluid.
- 7.4 FUNCTIONAL TEST

Functional testing can be accomplished on the vehicle unless there is a complete test rig available. If there is contact Carter for more details on how to test for full function. Adjustment of the pressure at the Venturi is accomplished by using the integral regulator on the side of the manifold. After adjustment is completed, lockwire it to the provided screw to prevent tampering.

8.0 ILLUSTRATED PARTS CATALOG

Tables 1.0 – 4.0 tabulate the parts and sub-assemblies comprising Models 64502 & 64512 inline pressure control valves. The item numbers of the table are keyed to the exploded views of the nozzle diagrammed in Figures 1 - 4.

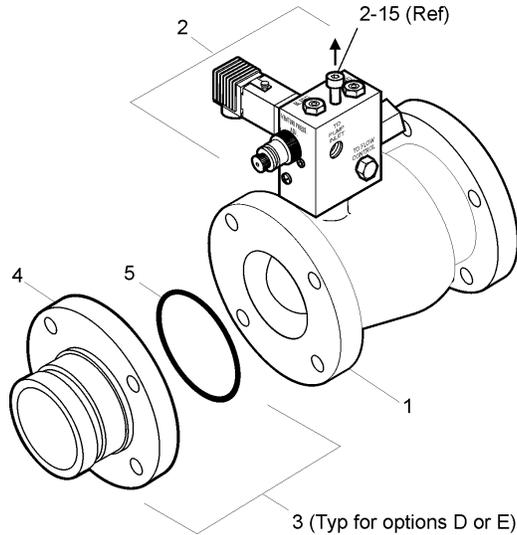


Figure 1 – Fuel Operated Inline Valve

TABLE 1.0
Ref. Figure 1

Fig.	Item	Part Number	Description	Units/ Assy	Used On	Spares/10 Units/Yr
1	1	47510-1	Valve assembly – 3 inch inline	1	64502	-
		47511-1	Valve assembly – 4 inch inline	1	64512	-
2		47502-1	Manifold assembly	1	64502 & 64512	-
3		47512	Victaulic adapter assembly – 3 inch valves	1 or 2	64502D or E	-
4		221596	Victaulic/ANSI flange adapter – 3 inch	1	47512	-
5		MS29513-245	O-ring	1	47512	10
3		47513	Victaulic adapter assembly – 4 inch valves	1 or 2	64512D or E	-
4		221597	Victaulic/ANSI flange adapter – 4 inch	1	47513	-
5		MS29513-255	O-ring	1	47513	10

Kits to overhaul the main valve assembly and the manifold are available (see below). If the entire valve is to be overhauled, a minimum of two kits will be required, one for the main valve and one for the manifold assembly.

- KD64500-2 Kit - Contains the parts needed to overhaul the above manifold assembly – contains items 2-4, 2-5, 2-7, 2-12C, 2-14 & 2-20.
- KD64500-5 Kit – Contains the parts needed to overhaul the 47510-1 3 inch valve assembly – Contains items 3-2, 3-3, 3-6, 3-7, 3-8, 3-9, 3-10, 3-13, 3-18, 3-23 & 3-24.
- KD64500-6 Kit – Contains the parts needed to overhaul the 47511-1 4 inch valve assembly – Contains items 4-2, 4-3, 4-6, 4-7, 4-9, 4-10, 4-18, 4-23 & 4-24.
- KD64500-7 Kit – Contains the interface o-rings used on the Victaulic Adapters option D or E. Contains items- 1-5 for both 3 & 4 inch adapters.
- KD64500-8 Kit – Contains the housing and retainer necessary to upgrade to the now standard seal cartridge design. Contains items – 3-4 and 3-15 (or 4-4 and 4-15).

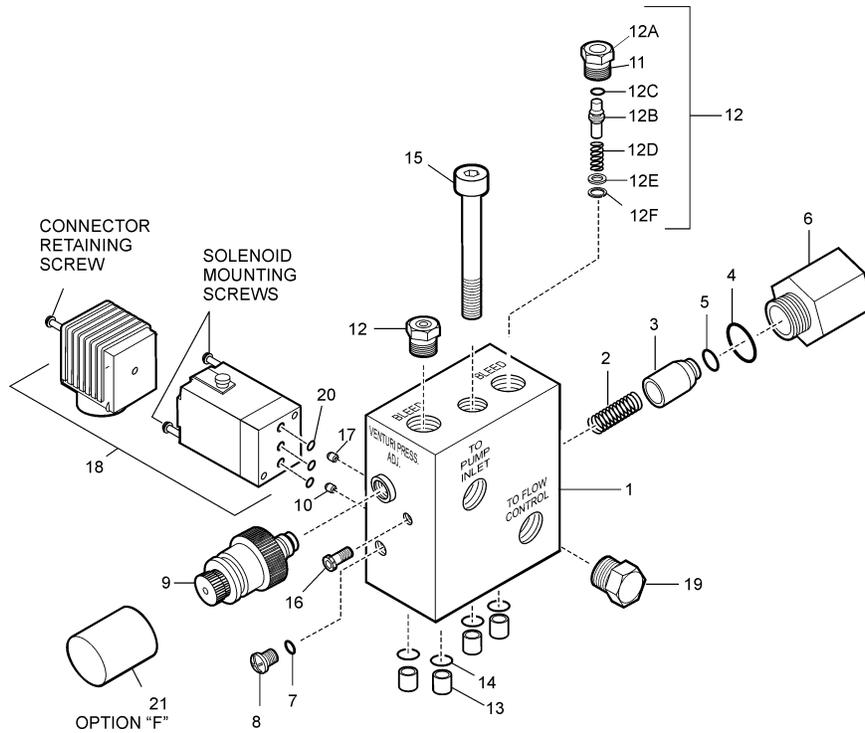


Figure 2 – Manifold Parts Breakdown

TABLE 2.0
Reference Figure 2

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr
2		47502-1	Manifold assembly	1	A	-
		47502-2	Manifold assembly	1	B	-
	1	221582	Manifold	1	All	-
	2	200791	Spring	1	All	-
	3	205772	Check valve	1	All	-
	4	MS29512-08	Gasket	1	All	10
	5	MS29513-009	O-Ring	1	All	10
	6	205765-2	Housing, check	1	All	-
	7	MS29513-010	O-Ring	1	All	10
	8	GF35206-276	Screw	1	All	-
	9	47454	Relief valve	1	All	-
	10	29224-2	Orifice screw	1	All	-
	11	503*	Vibra- Seal (or equal)	AR	All	-
	12	47414	Bleeder	2	All	-
	12A	221554	Plug	2	All	-
	12B	26664	Poppet	2	All	-
	12C	201201-006	O-Ring	2	All	20
	12D	222047	Spring	2	All	-
	12E	5710-152-30	Washer	2	All	-
	12F	N5000-31-H	Retainer	2	All	-
	13	221592	Retainer	4	All	-
	14	MS29513-012	O-Ring	4	All	10
	15	GF16997-109	Screw	1	All	-
	16	NAS1352C08H4	Screw	1	All	-
	17	29224-6	Orifice screw	1	All	-
	18	47455-1	Solenoid valve – 12 VDC	1	A	-
		47455-3	Solenoid valve – 24 VDC	1	B	-
	19	5406-P-04	Pipe plug	1	All	-
	20	100004B	O-Ring	3	All	30
	21	222104	Cap, valve	1	F	-

* DO NOT USE TEFLON TAPE!

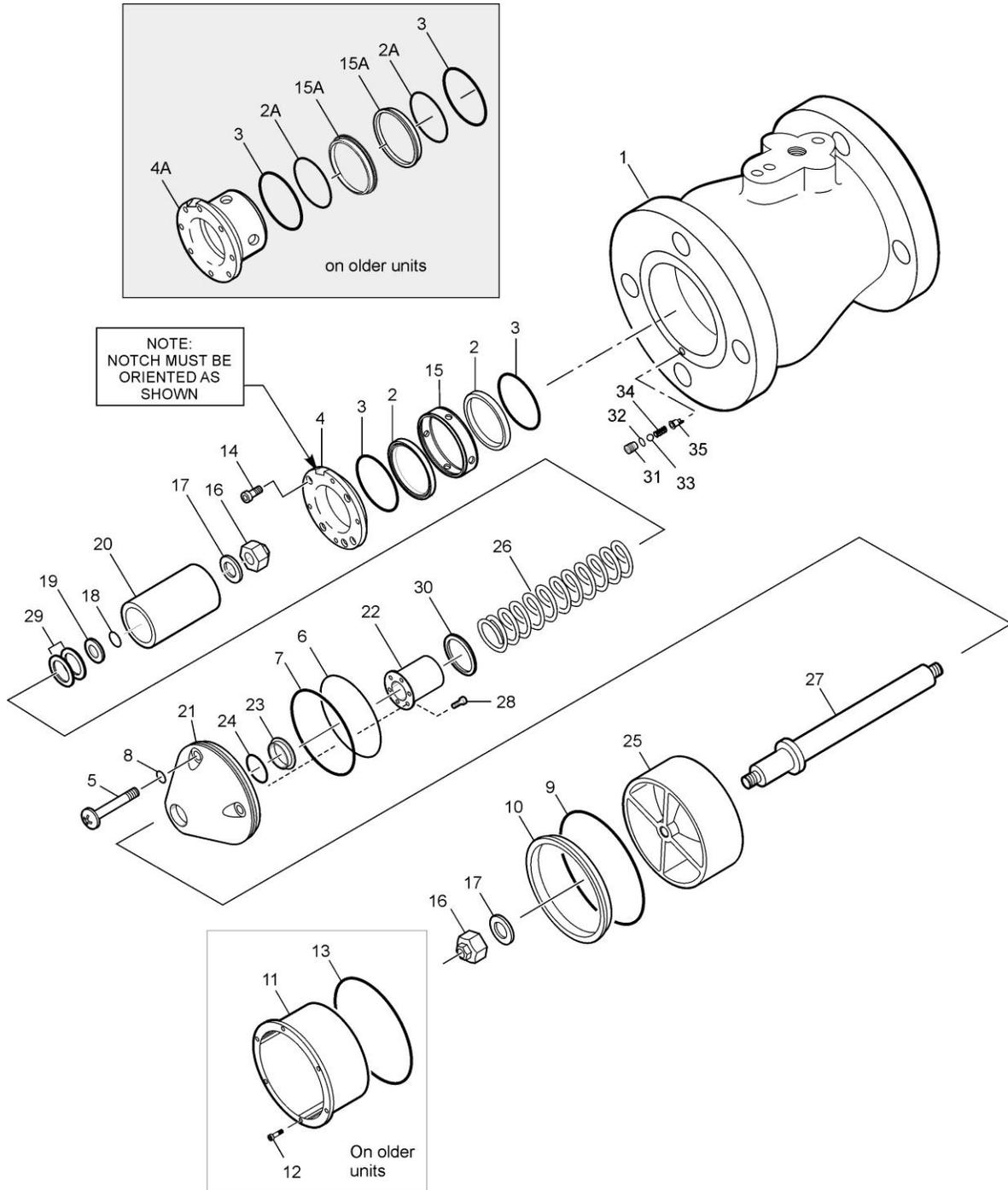


Figure 3
3 Inch Valve Assembly – Used on Model 64502

TABLE 3.0
3" Valve Assembly
Used on 64502
Reference Figure 3

Fig.	Item	Part Number	Description	Units/ Assy	Spares/10 Units/Yr
3		47510-1	Valve assembly, 3 inch	1	1
	1	47506	Valve housing	1	-
	2	222165	Seal, inner piston	2	10
	2A	MS29513-129	O-Ring	2	10
	3	MS29513-134	O-Ring	2	10
	4	222161	Retainer, seal housing	1	-
	4A	221307	Seal housing	1	-
	5	220685-1250	Screw	4	-
	6	MS29513-038	O-Ring	1	10
	7	201201-231	O-Ring	1	10
	8	MS29513-008	O-Ring	4	10
	9	MS29513-151	O-Ring	1	10
	10	220665	Seal, outer piston	1	10
	11	221193	Seal housing	1	-
	12	GF16997-18	Screw	6	-
	13	MS29513-042	O-Ring	1	10
	14	GF16997-32L	Screw	4	-
	15	222160	Housing, seal	1	-
	15A	200758	Seal, inner piston	2	10
	16-30	47508-1	Piston assembly, 3 inch	1	1
	16	38NST188	Nut self-locking	2	20
	17	GF960C616L	Flat washer	2	-
	18	MS29513-012	O-Ring	1	10
	19	202291	Washer	1	-
	20	200759	Inner piston	1	-
	21	221607	Seal retainer	1	-
	22	221594	Guide	1	-
	23	221595	Seal, piston shaft	1	10
	24	203565	O-Ring	1	10
	25	220666	Outer piston	1	-
	26	220005	Spring	1	-
	27	202290	Shaft	1	-
	28	NAS1351C04-4	Screw	6	-
	29	5720-158-25	Washer, bronze	2	-
	30	5610-381-50	Washer, Teflon	1	-
	31	222017	Seat, check valve	1	-
	32	MS29513-007	O-Ring	1	10
	33	220417	Ball	1	-
	34	C0180-012-0620S	Spring	1	-
	35	222019	Stop, check valve	1	-

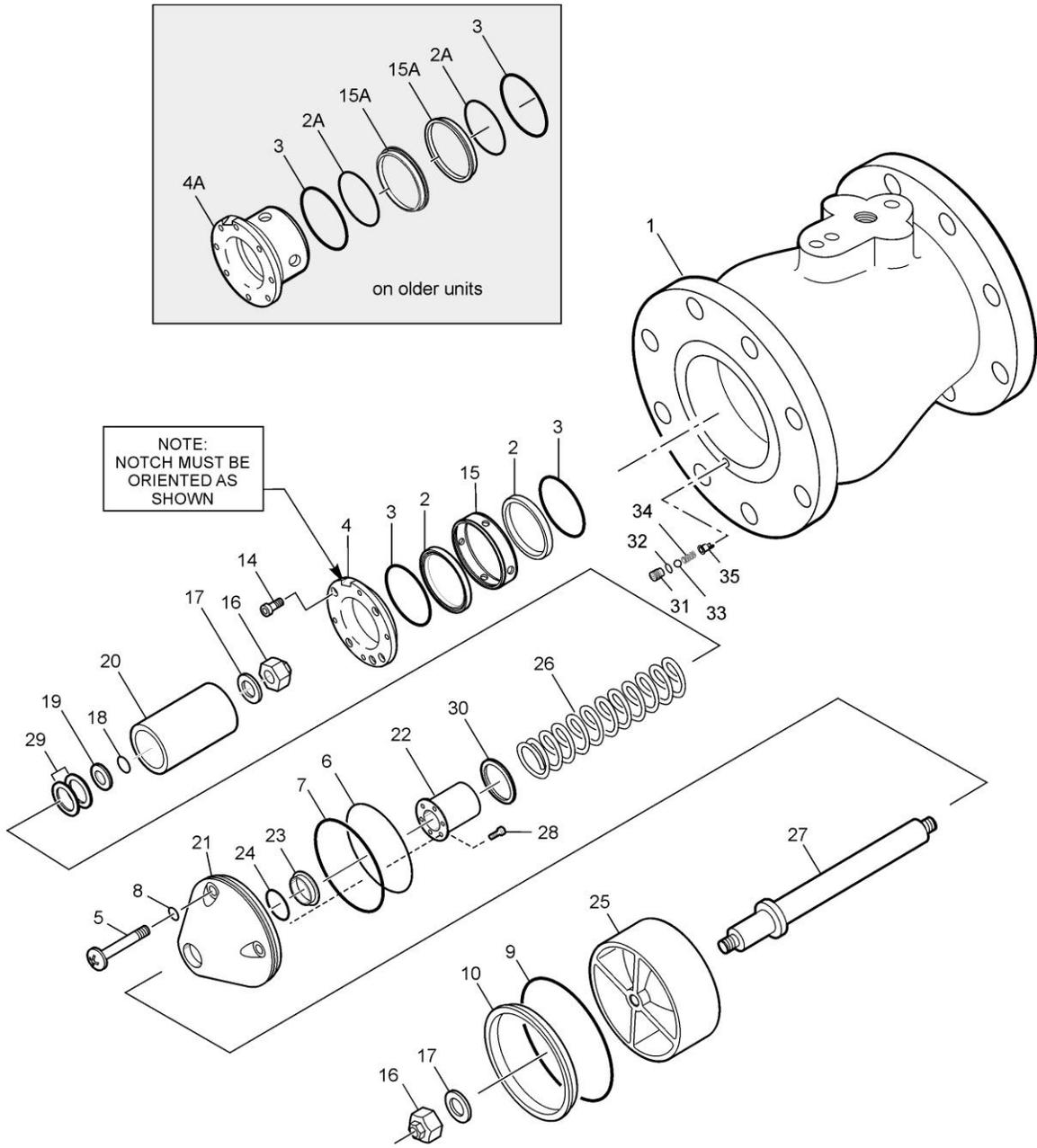


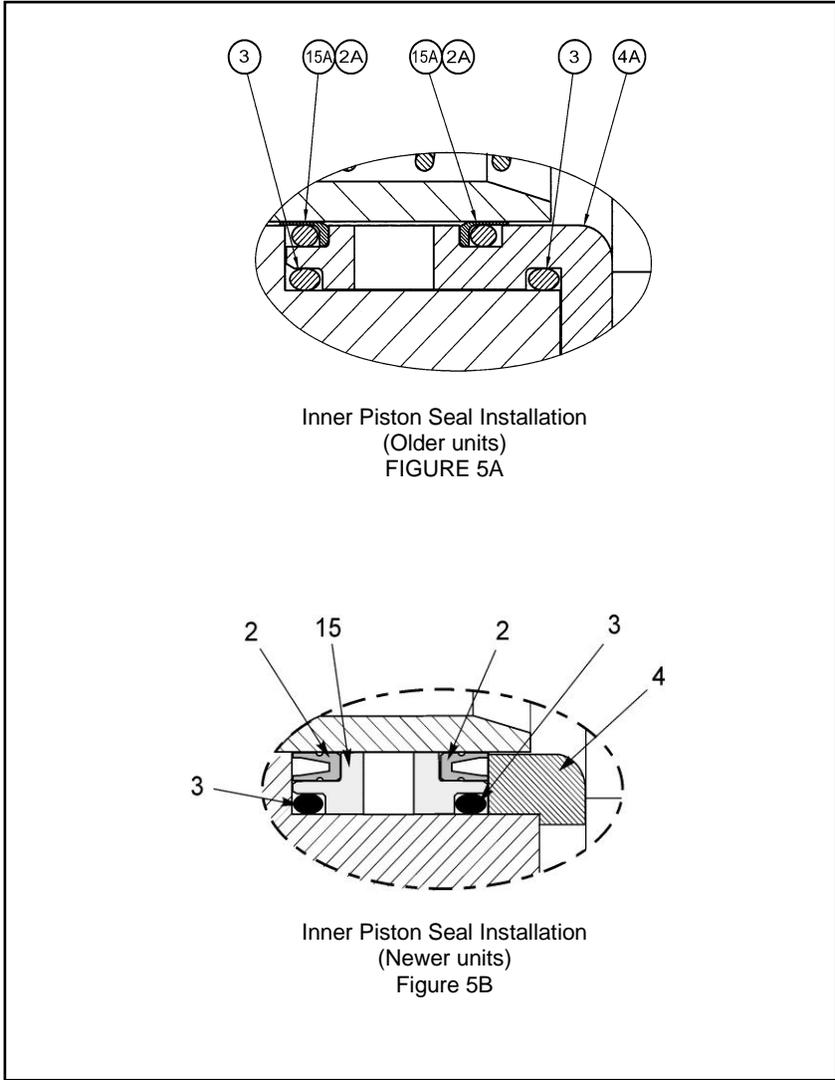
Figure 4
4 Inch Valve Assembly – Used on Model 64512

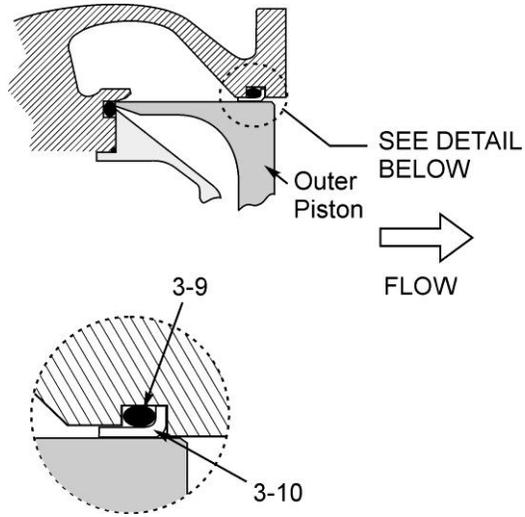
TABLE 4.0
4 Inch Valve Assembly
Used on 64512
Reference Figure 4

Figure	Item	Part Number	Description	Units / Assy	Spares/10 Units/Yr
4		47511-1	Valve assembly, 4 inch	1	1
	1	47507	Valve housing	1	-
	2	222165	Seal, inner piston	2	10
	2A	MS29513-129	O-Ring	2	10
	3	MS29513-134	O-Ring	2	10
	4	222161	Retainer, seal housing	1	-
	4A	221307	Seal housing	1	-
	5	LP51958-64	Screw	4	-
	6	MS29513-149	O-Ring	1	10
	7	201201-240	O-Ring	1	10
	8	NAS620C10L	Washer	4	-
	9	MS29513-155	O-Ring	1	10
	10	200754	Seal	1	10
	11-13	Left Intentionally Blank			
	14	GF16997-32L	Screw	4	-
	15	222160	Housing, seal	1	-
	15A	200758	Seal, inner piston	2	10
	16-30	47509-1	Piston assembly, 4 inch	1	1
	16	38NST188	Nut	2	20
	17	GF960C616L	Washer	2	-
	18	MS29513-012	O-Ring	1	10
	19	202291	Washer	1	-
	20	200759	Inner piston	1	-
	21	221608	Retainer	1	-
	22	221594	Guide	1	-
	23	221595	Seal, piston shaft	1	10
	24	203565	O-Ring	1	10
	25	202334	Piston, outer	1	-
	26	220005	Spring	1	-
	27	202290	Shaft	1	-
	28	NAS1351C04-4	Screw	6	-
	29	5720-158-25	Washer, bronze	2	-
	30	5610-38-50	Washer, Teflon	1	-
	31	222017	Seat, check valve	1	-
	32	MS29513-007	O-Ring	1	10
	33	220417	Ball	1	-
	34	C0180-012-0620S	Spring	1	-
	35	222019	Stop, check valve	1	-

Table 5.0
Torque Specifications 64500

Fig.	Item	Part Number	Description	Torque in.-lb.
3 or 4	14	GF16997-32L	Screw(s)	18 ± 2 in.-lb. (21 ± 2 kg-cm)
3 or 4	16	38NST188	Nut(s)	195 ± 10 in.-lb. (225 ± 12 kg-cm)





Outer Piston Seal Installation
Figure 6

Aerospace Group
Conveyance Systems Division
9650 Jeronimo Road
Irvine, CA 92618
Ph (949) 452-9500
Fax (949) 452-9992



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