



Powering Business Worldwide

Aerospace Group
Conveyance Systems Division
Carter® Brand Ground Fueling Equipment

SM64500

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Applicable addition manuals:
None

Maintenance & Repair Manual

3" & 4" Inline Pressure Control Valves

Models 64500 & 64510

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION	3
2.0 EQUIPMENT DESCRIPTION.....	3
3.0 TABLE OF OPTIONS AND ORDERING INFORMATION.....	3
4.0 DISASSEMBLY	4
5.0 INSPECTION.....	6
6.0 REASSEMBLY	6
7.0 TEST.....	8
8.0 ILLUSTRATED PARTS CATALOG	10
FIGURE 1 - INLINE VALVE ILLUSTRATION.....	11
FIGURE 2 - MANIFOLD PARTS BREAKDOWN	12
FIGURE 3 - 3" VALVE ASSEMBLY.....	13
FIGURE 4 - 4" VALVE ASSEMBLY.....	15
FIGURE 5A - INNER PISTON SEAL INSTALLATION - OLDER UNITS	17
FIGURE 5B - INNER PISTON SEAL INSTALLATION - NEWER UNITS	17
FIGURE 6 - OUTER PISTON SEAL INSTALLATION.....	18

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
CARTER PART NUMBERS 64500 & 64510
3 & 4" INLINE PRESSURE CONTROL VALVES**

1.0 INTRODUCTION

This manual furnishes detailed instructions covering the maintenance and overhaul of Carter part numbers

64500, 3" & 64510, 4" Inline Pressure Control Valves and the various options listed in Section 3.0.

2.0 EQUIPMENT DESCRIPTION

The Carter part numbers 64500 and 64510 are the latest versions of the 3" & 4" Inline Air Reference Pressure Control Valves that replace the older 64080 and 64124. Because they have many characteristics in common, a single manual is used to present both units.

The valves listed above are designed to provide a constant nominal pressure at a remote sense point as a function of reference AIR pressure. The valves are direct operating spring loaded piston type valves. When reference AIR pressure is applied to the proper port on the manifold the fuel pressure will increase.

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.

A minimum line size of 3/8 inch 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 opening and closing time of the valve is adjusted by a control screw located in the manifold. 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. The valve has a vent port located on the manifold. This port provides the capability of draining any internal leakage and prevents fuel from entering the air system on air reference type valves. We recommend this port be plumbed to a slop tank, pump inlet or the product tank.

The bleeder on the manifold allows bleeding of air from the fuel sense line. The valve should be installed with the bleeder in the upward position to facilitate proper bleeding.

3.0 TABLE OF OPTIONS AND ORDERING INFORMATION

The 64500 and 64510 have common options as listed below.

system, if both inlet and outlet are Victaulic connections, proper bracing must be provided.

Carter recommends that at least one end of the valve be flange mounted to the piping

OPTIONS TO BE ADDED TO 64500 or 64510 INLINE PRESSURE CONTROL VALVES

OPTION LETTER	DESCRIPTION	OPTION LETTER	DESCRIPTION
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.	E	Adds two Victaulic Adapter Assemblies for use on both the inlet and outlet of the unit. (The parts are shipped as loose parts to be used on both ends). Mounting fasteners are not provided.

Example: 64500D – Basic 3" Inline Pressure Control Valve with a kit of parts to convert the standard ASA flange on either end to mate a Victaulic fitting.

64500E - Basic 3" Inline 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 64500 & 64510 Valves – 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 Section 8.0.

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

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 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 Plug (2-16) need not be removed unless there has been a leak from its thread.

4.2.3 Do not remove Bleeder Assembly (2-12) unless it is to be replaced due to leakage from its threaded fastener or from the bleeder valve itself. If it is removed then it can be disassembled by removing the retainer ring with the proper pliers and all other parts will then come out.

4.2.4 Remove Plug (2-9) and then discard O-ring (2-10). The opening/closing time Control Screw (2-7) and its Spring (2-8) can then be removed.

4.3 3" 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 Lockease 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 the 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" 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).

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.

- 4.3.13 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" 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 the spring Guide (4-22) to remove Seal (4-23) and O-ring (4-24) 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 4-7). 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 lubricant, **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 compressed air.

6.1.2 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.

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" VALVE ASSEMBLY- Refer to Figure 3 for this operation.

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.

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.

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" 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 Install the Spring (2-8) into the Manifold (2-1) cavity for opening/closing time adjustment.

Install the timing Screw (2-7) and bottom the screw out, then back the screw off 3 to 4 turns.

This should adjust the closing time 2 to 3 seconds. Finer adjustment may be required during Flow Test.

- 6.5.3 Install O-ring (2-10) over Plug (2-9) and thread into opening/closing time adjustment in housing (2-1).
- 6.5.4 Use a product similar to Vibra Seal (2-11) on the pipe threads on items (2-16) and (2-12A).
- 6.5.5 If check valve was disassembled begin by placing Spring (2-2) into the cavity marked "fuel". Next, place O-ring (2-5) over the top of the Check Valve (2-3) and place over the spring. Install Gasket (2-4) onto the Check Valve Housing (2-6) and install in the fuel port of the manifold.
- 6.5.6 If 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).
- 6.5.7 Use a product similar to Vibra Seal (2-11) on the pipe threads on item (2-12A) and install Bleeder Assembly (2-12) in bleeder port of manifold.

CAUTION:

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

- 6.5.8 Be careful to install Retainers (2-13) and O-rings (2-14) in the proper places. A coating of petroleum jelly may be used to hold them in place while assembling the manifold to the main valve.
- 6.5.9 Place the manifold assembly onto the valve and retain with Screw (2-15) tightening to hold securely in place.

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, odorless kerosene or Stoddard type solvent MIL-PRF-7024E Type II.

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 FUNCTIONAL TEST

- 7.3.1 Flange both ends of the unit with shut off valves: Connect a 0-300 psi test fluid source to the inlet of the unit and to the fuel sense port on the manifold. Connect a 0-75 psi air reference to the air reference port on the manifold through a deadman control valve.

Actuate the deadman control valve to supply 75 psi to the valve. Open the outlet shutoff valve approximately halfway. Slowly apply 300 psi to the inlet and fill the unit. Push the bleed port poppet and bleed all the air from the unit. Close the outlet valve and release the deadman and maintain 300 psi for a minimum of one minute and check for external leakage. Reduce pressure to 5 psi and recheck for external leakage.

- 7.3.2 Open outlet valve and relieve pressure. Remove the outlet flange. Rotate the outlet so the vent is on top. Cover the outlet so fuel does not flow. Apply 60 psi air through the deadman control. Release and re-apply air several times and observe the outer piston movement. The piston should move full stroke with no indication of binding.
- 7.3.3 Drain the fluid from the outlet side of the valve. Increase the fuel inlet pressure to 5 psi and hold for 1 minute. Increase pressure to 150 psi and measure any leakage at the outlet port. Maximum allowable is 10 cc/min.

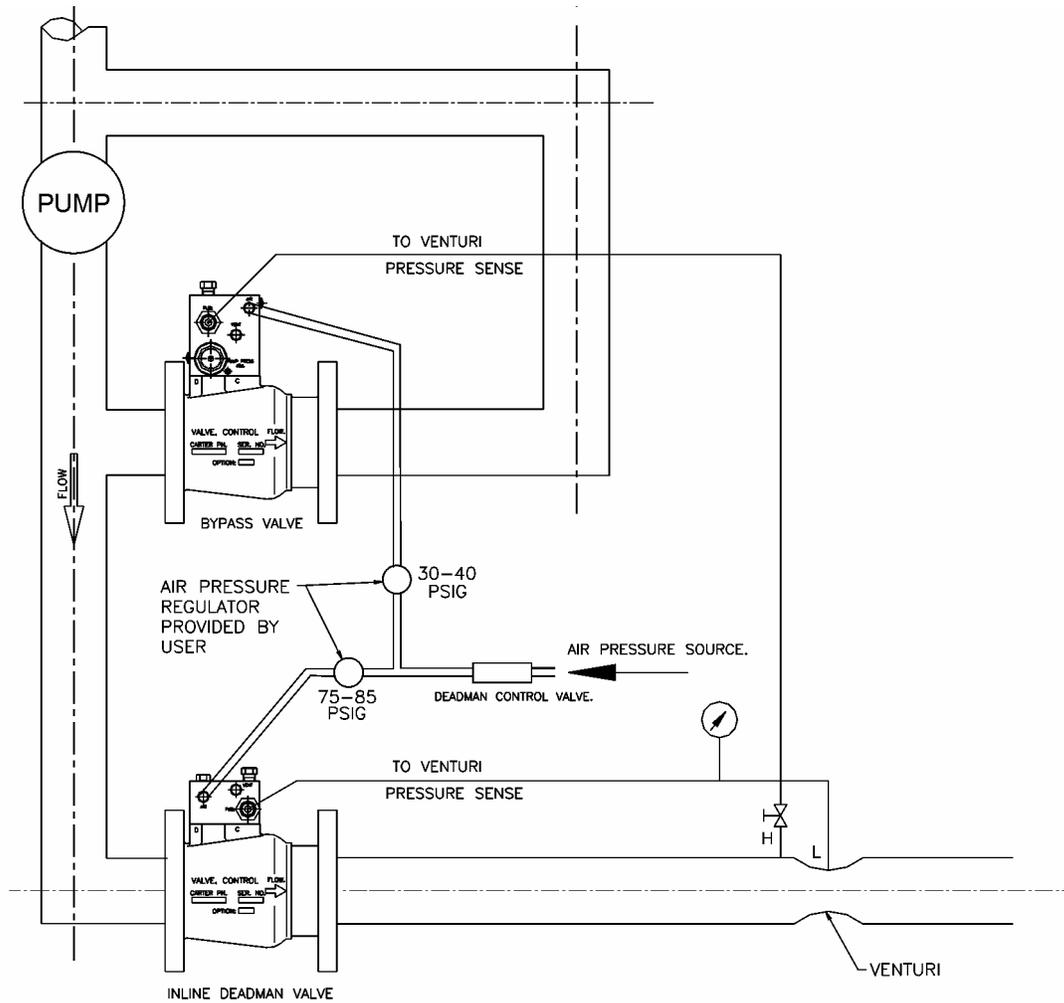
7.4 FUNCTIONAL TEST

Testing for functionality can be accomplished on the vehicle unless there is a complete test rig

available. If there is, use the test setup and procedure below:

Install the unit in a system capable of 300-600 gpm, with a deadhead pressure of 150 psi. The fuel sense line should be connected to a downstream sense point with a gauge installed to determine control pressure. The unit should be installed such that the bleed port on the manifold is facing up. Start flowing through the unit by actuating the deadman device and flow at full flow for 1 or 2 minutes to bleed the air out of the main line. Then partially close the valve downstream of the sense point. Open the bleeder on the manifold and bleed all the air from the fuel sense line. Open and close the downstream valve two or three times and bleed the fuel sense line again at the bleeder. Open the downstream valve to obtain approximately 300 gpm, 75 psi air pressure and 120 psi deadhead fuel pressure. While flowing at 300 gpm release the deadman device and measure the time it takes the flow to reach zero. This should be 2-5 second or not to exceed 5% of flow rate. The orifice screw on the manifold can be adjusted if necessary to obtain the proper closing time.

Also measure the opening time which should be 5-10 seconds to 300 gpm. Establish a flow rate of 300 gpm and throttle down to approximately 50 gpm in 5 increments. The pressure should stabilize at each flow point 25-35 psi lower than the air reference pressure. Surge pressure may exceed this figure, but should come back to 25-35 psi below the air reference pressure.



NOTE: THE INLINE AND BYPASS VALVES SHALL BE INSTALLED IN SUCH WAY THAT THE PRESSURE SENSE PORTS SHALL BE LOCATED IN THE TOP POSITION OF BOTH VALVES TO ACHIEVE SATISFACTORY BLEEDING OF TRAPPED AIR.

FIGURE A – TEST SETUP

8.0 ILLUSTRATED PARTS CATALOG

Tables 1.0 – 4.0 tabulate the parts and sub-assemblies comprising the 64500 & 64510 Inline Pressure Control Valves. The item numbers of the tables are keyed to the exploded views of the valve diagrammed in Figures 1 - 4.

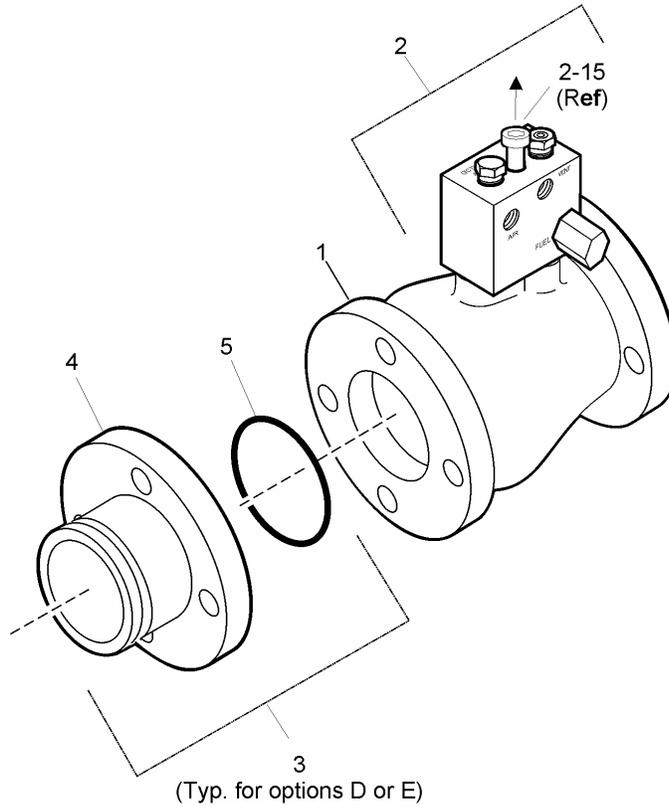


FIGURE 1 – INLINE VALVE ILLUSTRATION

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” Inline	1	64500	-
		47511-1	Valve Assembly – 4” Inline	1	64510	-
	2	47500	Manifold Assembly	1	64500 & 64510	-
	3	47512	Victaulic Adapter Assembly – 3” Valves	1 or 2	64500 D or E	-
	4	221596	Victaulic/ANSI Flange Adapter – 3”	1	47512	-
	5	MS29513-245	O-ring	1	47512	10
	3	47513	Victaulic Adapter Assembly – 4” Valves	1 or 2	64510 D or E	-
	4	221597	Victaulic/ANSI Flange Adapter – 4”	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.

- KD64500-0 Kit - Contains the parts needed to overhaul the above manifold assembly – contains items 2-4, 2-5, 2-10, 2-12C & 2-14.
- KD64500-5 Kit – Contains the parts needed to overhaul the 47510-1 3” 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” 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” and 4” 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).

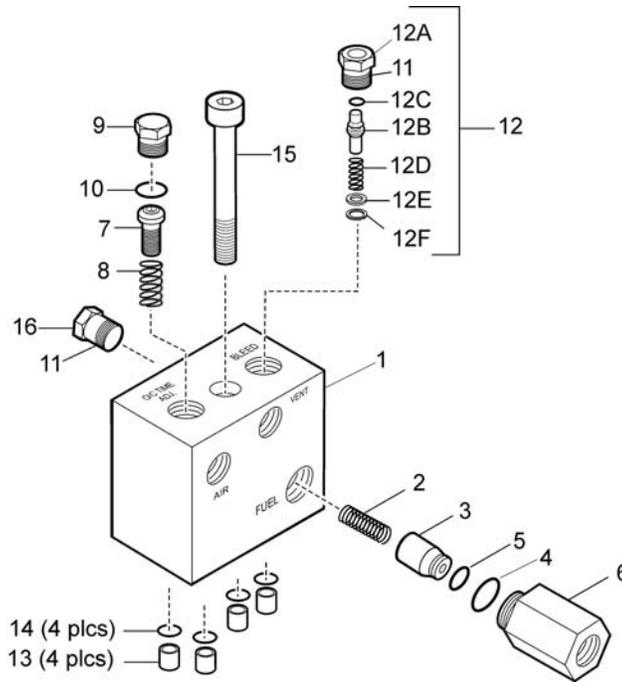


Figure 2
Manifold Parts Breakdown

TABLE 2.0
Manifold used on the 64500 & 64510
Reference Figure 2

Fig.	Item	Part Number	Description	Units/ Assy	Used on option	Spares/10 Units/Yr
2		47500	Manifold, Assembly.....	1	All	1
	1	221580	Manifold.....	1	All	1
	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	205756-2	Housing, Check Valve.....		All	-
	7	220413	Control Screw	1	All	-
	8	C0300-030-0500S	Spring	1	All	-
	9	GF51840-23	Plug.....	1	All	-
	10	MS29512-04	Gasket	1	All	10
	11	503*	Vibra-Seal (or equal)	AR	All	-
	12	47414	Bleeder	1	All	-
	12A	221554	Plug	1	All	-
	12B	26664	Poppet	1	All	-
	12C	201201-006	O-Ring	1	All	10
	12D	222047	Spring.....	1	All	-
	12E	5710-152-30	Washer	1	All	-
	12F	N5000-31-H	Retainer.....	1	All	-
	13	221592	Retainer.....	4	All	-
	14	MS29513-012	O-Ring	4	All	10
	15	GF16997-103	Screw.....	1	All	-
	16	5406-P04	¼ " Pipe Plug.....	1	All	-

* DO NOT USE TEFLON TAPE!

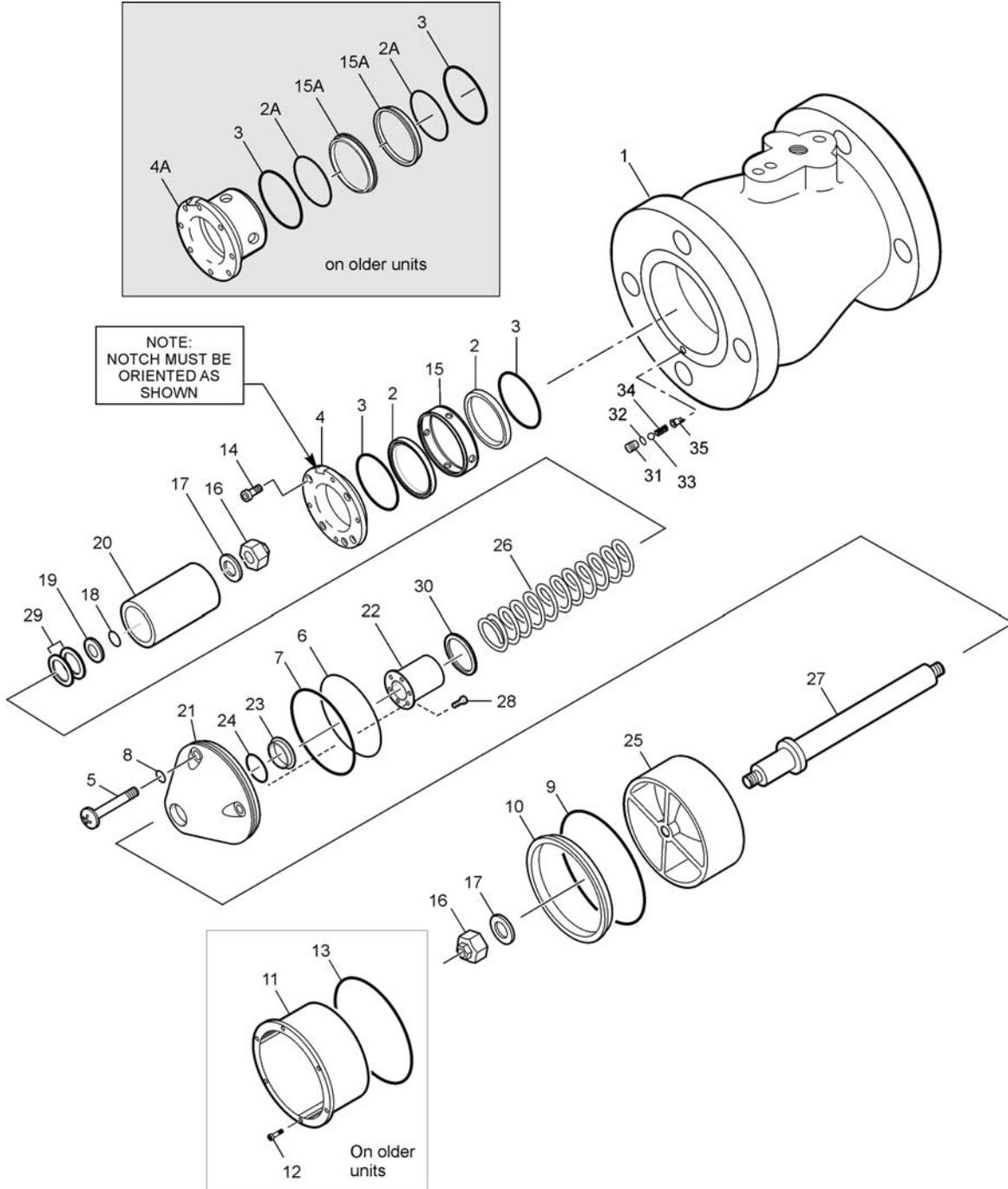


FIGURE 3

47510-1 3" Valve Assembly - Used on 64500

TABLE 3.0
3" Valve Assembly
Used on 64500
Reference Figure 3

Fig.	Item	Part Number	Description	Units/ Assy	Spares/10 Units/Yr
3		47510-1	Valve Assembly, 3"	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"	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	-

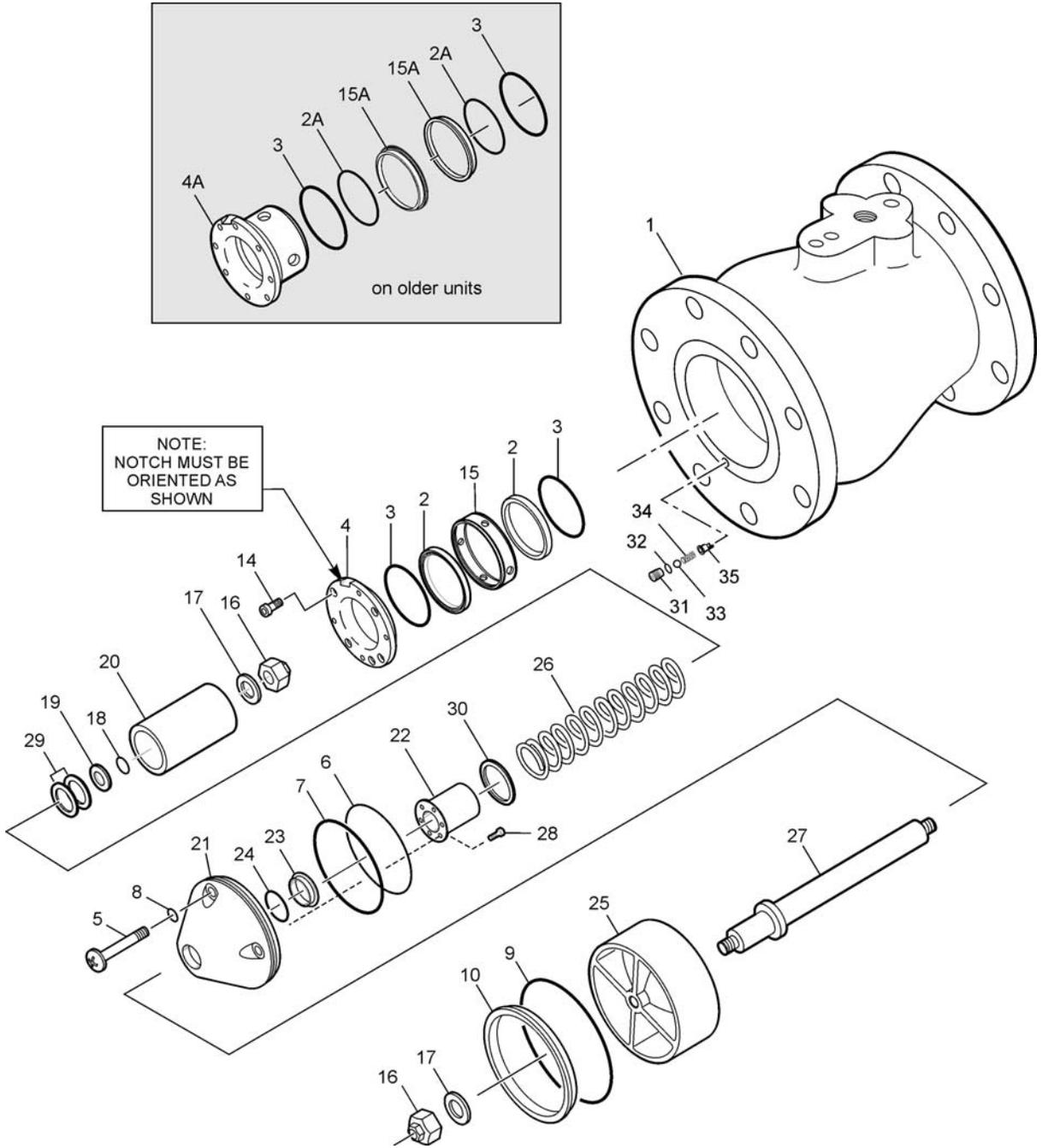


FIGURE 4
47511-1 4" Valve Assembly
Used on 64510

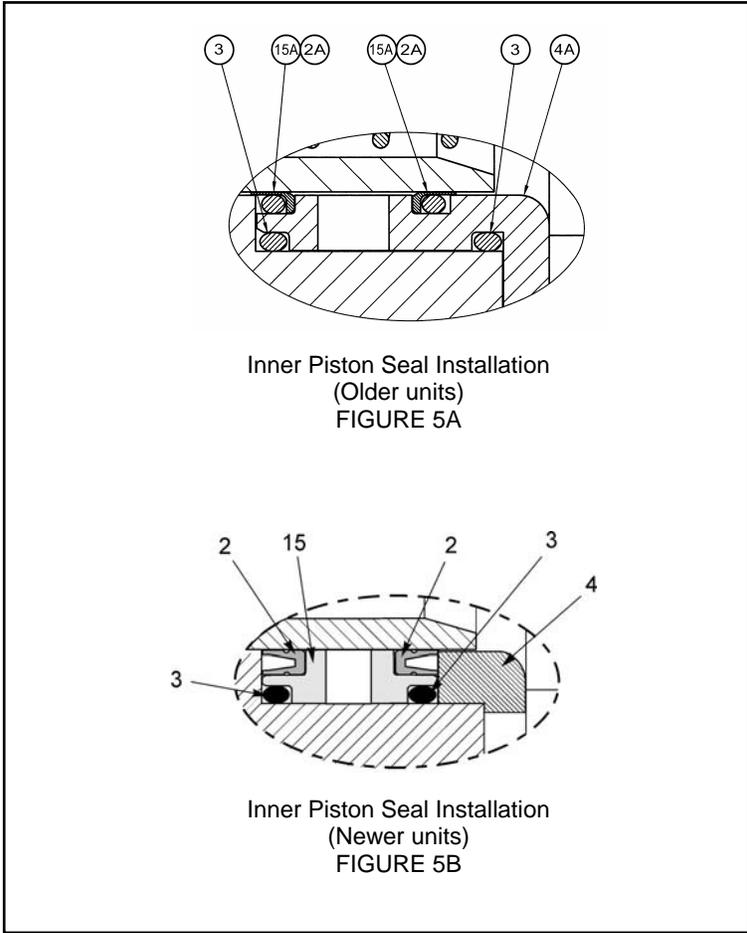
TABLE 4.0
4" Valve Assembly
Used on 64510

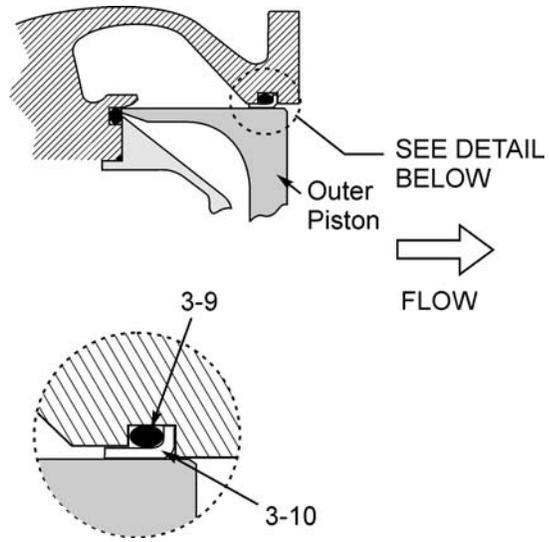
Reference Figure 4

Figure	Item	Part Number	Description	Units / Assy	Spares/10 Units/Yr
4		47511-1	Valve Assembly, 4"	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"	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

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