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Aerospace Group  
Conveyance Systems Division

Carter® Brand

Ground Fueling Equipment

**SM64055**

November 2012

Applicable additional manuals:  
None

## **Maintenance & Repair Manual**

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### **4 Inch Internal/Bottom Loading Valves**

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**Model 64055**

**Model 64143**

**Model 64174**

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## Maintenance, Overhaul & Test Instructions

### Carter brand Models 64055, 64143 & 64174

#### Internal/Bottom Loading Valves

#### 1.0 INTRODUCTION

This manual furnishes detailed instructions covering the maintenance and overhaul of Carter® brand Models 64055, 64143 and 64174 4" Internal/Bottom Loading Valves. This manual assumes that the valves will be used with a Carter 64079 Level Sensor, however the 64055A or B, 64143A or B, 64174A or B can also be used with optic probe (s) using a solenoid valve (s) to effect the control of the pilot valve (s). If so, service manuals for these components should be requested from the manufacturer of the items used. Carter does not provide such items.

The differences between the three valves are as follows:

64055 – Used for both loading and off-loading with the off-loading accomplished by use of air pressure to the self-contained cylinder to open the valve.

64143 – Used for loading only – no off-loading capability.

64174 – Used for both loading and off-loading with the off-loading accomplished either mechanically by lever action or by air pressure.

#### 2.0 EQUIPMENT DESCRIPTION

Model 64055 4" valves can be used either as straight internal valves or for bottom loading control. The 64055 mounts directly into a 4" TTMA tank sump ring. The 64055A is used with Carter Model 64079 level sensor for bottom loading control with a single control pilot valve. Option "B" adds two-stage level control with two pilot valves. (Note: Early units contained provisions for only single pilot valves with the dual capability available at a later date.) Option "B" requires either the use of 64079B, C or two 64079 level sensors. A Carter inward opening vent, Model 64167, is also available to complete the system requirements. A straight 64055 internal valve can be converted to a bottom loading valve, 64055A, by adding a pilot valve.

Model 64143 4" bottom loading valve is used only for bottom loading. The difference between the 64055 and the 64143 is the absence of an off-loading cylinder on the 64143 and a different orifice system in the piston.

The 64174 4" bottom loading valve has both air operated (standard) and mechanical off-loading (Option C or CE) capability as desired.

The units are spring loaded "overbalanced" piston valves. Fuel inlet pressure is routed to the inside of the piston chamber through a two-staged orifice in the center of the piston. If the piston chamber has no exit, the areas inside the piston chamber (outer diameter of the piston) is larger than the face seal of the piston, hence the

balance of pressure forces, plus the spring force will keep the piston (valve) closed.

If the piston chamber is vented through an open pilot valve, options A or B, the pressure drop across the inlet orifice reduces the piston chamber pressure significantly. The resultant balance of forces will cause the piston to open, hence the valve will open.

When the piston chamber is once again closed [pilot valve (s) closes], the balance of forces again causes the valve to close.

The 64055, 64143 and 64174 Options A or B are normally utilized with the 64079 level sensor. If so desired, a solenoid valve (s) can be used in the system to provide or deprive the pilot valve of pressure (usually routed from the bottom loading adapter) to cause the opening and closing of the valve. In this way the valve can be used with any optic type sensing probe to detect the desired tank level for closure.

On the 64055 and 64174, a separate air operated piston is provided to effect off-loading as desired. The direction of air pressure to this piston will cause it to pull open the main piston to allow for off-loading flow. When the air pressure is depleted, the spring forces will close both the air and main pistons.

The 64174C or CE provides an inlet elbow with a lever system to mechanically open the valve for off-loading.

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### 3.0 AVAILABLE OPTIONS

The 64055 and 64174 basic valve is designed for use as an internal valve and has no other functional controls. The 64055 can be opened for off-loading by application of air pressure to the cylinder provided. The 64143 can only be used as option A (64143A) since it has no off-loading capability.

The "A" option (64055A, 64143A or 64174A) adds a pilot valve to the basic unit, making it a bottom loading control valve. Again the 64055A or 64174A can also be used for off-loading by the application of air pressure to the provided cylinder.

The "B" option (64055B, 64143B or 64174B) adds two pilot valves to the basic unit to close the valve in two-stages. An orifice in the

secondary pilot valve will continue to vent the piston chamber after the primary pilot valve has closed. This orifice restricts the pressure escaping from the piston chamber to maintain the piston in a partially open position hence flow into the tank is reduced significantly. This provides a more accurate final shutoff and also helps control surge pressure on final shutoff.

Viton seals are available as Option C on 64055 and 64143 and as Option D on 64174.

The 64174 has two additional options:

C – Adds an elbow to the inlet with lever system for mechanical opening for off-loading.

E – Adds enhanced opening when used with Option C.

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### 4.0 DISASSEMBLY

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>4.1 All valves except as noted - Refer to Figures 1A, 1B, 2A or 2B for exploded views of the unit.</p> <p>4.2 Remove the six Screws (8) and Washers (9) from the Bonnet (23) or (24) and put a side for reuse.</p> <p>4.3 Rotate the bonnet slightly in either direction and pull it from the Body (28). On the 64055 the Piston (12) and its attaching parts will come out of the Body (28) with the bonnet as Piston Assembly (10). Continue on with the next paragraph if the unit being disassembled is the 64055. Skip to paragraph 4.5 if it is a 64143. Skip to paragraph 4.11.1 if it is 64174 basic, options C or CE.</p> <p>4.4 64055:</p> <p>4.4.1 Find the Pin (17B) in the Shaft Assembly (17). Use the spring pin to hold the shaft in place and remove Rod (11) by unscrewing it, being careful not to drop Piston (12). Remove Piston (12) and Spring (13).</p> <p>4.4.2 Remove Ring (14), Spring Pad (15) and Spring (16). Remove O-ring (22) from Bonnet (23) and discard it.</p> <p>4.4.3 Using the pin used in paragraph 4.4.1 hold the Shaft Assembly (17) while unscrewing Housing (18). Pull Housing (18) off of Bonnet (23).</p> <p>4.4.4 Remove Wipe Ring (20) and Quad-Ring (21) from Bonnet (23). Discard both items. Skip to paragraph 4.6.</p> <p>4.5 64143:</p> <p>4.5.1 Remove Bonnet (24) then remove Spring (13). Remove O-ring (22) from Bonnet (24) and discard it.</p> | <p>4.5.2 Reach into body (28) opening and carefully extract the Piston Assy (25).</p> <p>4.5.3 Unless replacement is needed it is recommended that Set Screw (27) and Nut (26) in the face of the piston not be removed.</p> <p>4.6 64055 &amp; 64143 - Remove and discard O-ring (29) and Seal (30) from Body (28).</p> <p>4.7 Unless the Screen (33) is damaged and needs replacement, do not remove it from the Body (28). If it needs replacing then remove Screws (31) and Nuts (32) to do so.</p> <p>4.8 On the basic unit, remove the Plug (3) only if it has been leaking. If it is removed, then discard Gasket (4).</p> <p>4.9 On Options A or B - Unscrew Pilot Valve Assy (2) from Bonnet (23) or (24) and remove and discard Gasket (4). On "B" option to either unit, remove secondary Pilot Valve Assy (2). Orifice (5) and Gasket (6) will be found under the secondary Pilot Valve Assy (2). Remove them and discard Gasket (6).</p> <p>4.10 Pilot Valve Assy (2) may be replaced as a complete unit or overhauled as follows:</p> <p>4.10.1 Remove six Screws (34) and Washers (35).</p> <p>4.10.2 Using a thin blade screwdriver, pry the Cover (36) from the assembly. Be careful not to scratch the flanged surface of either metal part holding the diaphragms in place.</p> <p>4.10.3 Remove and discard the two Diaphragms (37).</p> <p>4.10.4 Remove Pressure Pad (38) from Poppet (40) shaft.</p> |
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- 4.10.5 Remove Ring (39), which retains Spring (42) and Washer (41) in place. This will free up the remaining parts for removal.
- 4.11 64174, C & 64174CE:
- 4.11.1 64174 – Refer to Figure 4 – Find Pin (17B) in the Shaft Assembly (17). Use the spring pin to hold the shaft in place and remove Rod (11) by unscrewing it, being careful not to drop Piston (12). Remove Piston (12), Spacer (12B) and Spring (13).
- 4.11.2 Remove O-ring (22) from Bonnet (23) and discard it.
- 4.11.3 Using the pin used in paragraph 4.4.1 hold the Shaft Assembly (17) while unscrewing Housing (18). Pull Housing (18) off of Bonnet (23).
- 4.11.4 Remove Wipe Ring (20) and Quad-Ring (21) from Bonnet (23). Discard both items.
- 4.11.5 Remove and discard O-ring (29) and Seal (30) from Body (28).
- 4.11.6 Unless the Screen (33) is damaged and needs replacement, do not remove it from the Body (28). If it needs replacing then remove Screws (31) and Nuts (32) to do so.
- 4.11.7 On the basic unit, remove the Plug (3) only if it has been leaking. If it is removed, then discard Gasket (4).
- 4.11.8 On Options A or B - Unscrew Pilot Valve Assy (2) from Bonnet (23) or (24) and remove and discard Gasket (4). On "B" option to either unit, remove secondary Pilot Valve Assy (2). Orifice (5) and Gasket (6) will be found under the secondary Pilot Valve Assy (2). Remove them and discard Gasket (6). Go back to paragraph 4.10.
- 4.11.9 64174E – Refer to figure 5 – Find Pin (17B) in the Shaft Assembly (17). Use the spring pin to hold the shaft in place and remove Rod (11) by unscrewing it, being careful not to drop Piston (12). Remove Piston (12) and the parts attached to it. There is no need to disassemble these parts further unless there is evidence of damage or wear.
- 4.11.10 Remove O-ring (22) from Bonnet (23) and discard it.
- 4.11.11 Using the pin used in paragraph 4.4.1 hold the Shaft Assembly (17) while unscrewing Housing (18). Pull Housing (18) off of Bonnet (23).
- 4.11.12 Remove Wipe Ring (20) and Quad-Ring (21) from Bonnet (23). Discard both items.
- 4.11.13 Unless the Screen (33) is damaged and needs replacement, do not remove it from the Body (28). If it needs replacing then remove Screws (31) and Nuts (32) to do so.
- 4.11.14 On the basic unit, remove the Plug (3) only if it has been leaking. If it is removed, then discard Gasket (4).
- 4.11.15 On Options A or B - Unscrew Pilot Valve Assy (2) from Bonnet (23) or (24) and remove and discard Gasket (4). On "B" option to either unit, remove secondary Pilot Valve Assy (2). Orifice (5) and Gasket (6) will be found under the secondary Pilot Valve Assy (2). Remove them and discard Gasket (6). Go back to paragraph 4.10.
- 4.11.16 64174C – Refer to Figure 6 – Remove and discard O-ring (6-1). Unscrew Nut (6-2) from Screw (6-3) and remove both from assembly.
- 4.11.17 Pull Lever (6-4) from unit by unscrewing Screw (3-3) from Nut (3-2). Do not disassemble Clip (6-5) from Lever (6-4) unless replacement is deemed necessary.
- 4.11.18 Unscrew Bushing (6-6) from unit and remove from Shaft (6-9A). Remove and discard O-ring (6-7) and Quad-ring (6-10).
- 4.11.19 Rotate Shaft Assy (6-9) counter-clockwise to line up pins on Shaft Assy to allow it to be removed from the Body (3A-11). Do not remove Pin (6-4A) from Body (6-11). Do not remove Pins (6-8) from Shaft Assy (6-9) unless replacement is deemed necessary due to damage. If they are to be removed, observe the installation of the pins and measure the protrusion of them for reinstallation. To remove them use an appropriate size drift pin and with the Shaft Assy (6-9) fully supported drive the Pins (6-8) out of the Shaft Assy (6-9).
- 4.11.20 The Cam (6-12) can be removed by removing Cotter Pins (6-13) from Pins (6-14). Links (6-15) can then be removed.)
- 4.11.21 Remove Bushing (6-16) only if it is worn.

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## 5.0 INSPECTION

- 5.1 It is recommended that all O-rings (19), (22), (29); Gaskets (4), (6); Quad Ring (21); Wipe Ring (20); Diaphragms (37) and Seal (30) be replaced at each overhaul.
- 5.2 The outer diameters of the Shaft (17A), and Piston (12) along with the inner diameter of

Housing (18) should be inspected for scratches that might cause leakage. The piston seat in the Body (28) shall also be free of pits, scratches or gouges that would cause leakage. Inspect all other metal parts for dings, gouges, abrasions, etc. On all parts except the ones listed above, use 320 grit paper to smooth and remove sharp

edges. The outer diameter of the Shaft (17A) and the Piston (12) can be polished to remove minor scratches by using a very fine emery cloth while the parts are rotated. **Do not** polish local areas of these diameters. Unless proper equipment is available to accomplish this task and to polish the inner diameter of the Housing (18), it is recommended that the parts be replaced. If polishing is attempted, **do not** break through the hard anodized surface of the Piston (12). If scratches are too pronounced, the parts

should be replaced. Replace any part with damage exceeding 15% of local wall thickness. Use Alodine 1200, or similar chem. film treatment, to touch up bared aluminum.

The flat surfaces of the Fitting (43) and Cover (36) may be polished to remove minor scratches by using a flat plate and very fine emery cloth. Be careful to keep the parts flat during polishing and to not raise any burrs on the inside diameters that bear on the diaphragms.

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## 6.0 REASSEMBLY

- 6.1. Reassembly is accomplished in essentially the reverse order of disassembly, noting the following:
- 6.2. Light lubrication of all O-rings and seals, using petroleum jelly is recommended to facilitate installation.
- 6.1.3 When reassembling the Pilot Valve Assy (2) use the following procedure to assure proper diaphragm retention:
- 6.1.3.1 Once the Poppet (40), Spring (42), Washer (41) and Ring (39) are in place, be sure that the Pressure Pad (38) is placed onto the Poppet (40) shaft with the smaller end placed onto the shaft first. The larger flat surface should be facing away from the shaft.
- 6.1.3.2 The two Diaphragms (37) are placed such that the loops in the diaphragms are facing the Pressure Pad (38). See Figure 3B for an illustration. [In operation, the loops always face in the direction in which the pressure from the Level Sensor or solenoid valve is applied.] Smooth out the Diaphragms (37), place onto the Fitting (43) and align the six holes in all three parts. Carefully place the Cover (36) onto this assembly, aligning the holes.
- 6.1.3.3 Start the six Screws (34) with the Washers (35) in place by hand until resistance is met. Note that if no resistance is met in attempting to hand tighten the screws, it is recommended that the Screws (34) be replaced. They are self-locking and some resistance should be felt.
- 6.1.3.4 Observing the Cover (36) from the outside end (look at the threaded port in the middle), mentally number the holes in a clockwise direction from one to six. Refer to Figure 3C. Using a properly set torque wrench, tighten the number 1 screw to 1.6 in-lbs. (1.8 Kg-cm), followed by tightening screws number 5, 3, 6 and 4 in that order. Then repeat the tightening sequence to 3.2 in-lbs. (2.1 Kg-cm) and then 5.3 in-lbs. (6.1 Kg-cm) respectively.
- Let the assembly stand for a minimum of 15 hours, retighten the screws as above to the 5.3 in-lbs. (6.1 Kg-cm) setting.
- 6.1.4 When installing the Seal (30) onto O-ring (29) in Body (28) be sure to smooth the surface evenly with a finger. See note on Figures 2A and 2B.
- 6.1.5 On the 64055 - Use Loctite 242 (17C) on the thread of Shaft (17A) before screwing on Housing (18). Note the thread of both parts should be cleaned with the recommended Loctite cleaning solution prior to using 242. Read the instructions on 242 before using.
- 6.1.6 Once the Piston/Bonnet Assy (10) has been inserted into the Body (28) the Rod (11) must be adjusted to provide a gap of  $0.012 \pm 005$  (.305 ± .127 mm) between the under side of the hex head of the rod and the mating flat surface of the Piston (12). A feeler gauge should be used for this purpose. This will assure that the proper surge control during shutoff will be effective. On the 64143, if the Set Screw (27) and Nut (26) were removed it will be necessary to adjust the face of the Set Screw (27) to  $.409 \pm .005$  inches ( $10.388 \pm .127$  mm) from the face of the Nut (26).
- 6.1.7 On 64174 follow the same procedure as with the 64055 except recognize the differences in the two piston assemblies for the basic and option E.
- 6.1.8 On Option C assemble in the reverse order of disassembly. Be sure to bend Cotter Pins (3A-13) to secure them in place.
- 6.1.9 If the Screen (33) was removed and replaced, the replacement will be provided in a flat condition and it will be necessary to carefully shape it to fit the Body (28).

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## 7.0 TEST

- 7.1 The following test procedures will be accomplished after overhaul:
- 7.2 Test conditions
- 7.2.1 Test media shall be odorless kerosene, Jet A or equivalent at  $75^{\circ} \pm 15^{\circ}\text{F}$ .
- 7.3 Functional Test - If testing prior to reinstalling the unit in the refueler is desired, conduct the following tests:
- 7.3.1 Connect the inlet of the unit to a test media pressure source with a minimum of 150-psig available. Tee off the inlet pressure line to the primary pilot valve and to the secondary pilot valve on "B" option units. Install a small ball valve between the inlet pressure source and each pilot valve. Install a bleed valve between the pilot valve (s) and the ball valve. Gauges should be installed in the pressure line to the main valve's inlet and in the line to the pilot valve (s).
- 7.3.2 On the 64055 connect the air port to a 100-psig air pressure source with a gauge in the line.
- 7.3.3 Bleed all air from the valve by applying 10-psig test media pressure to the inlet and opening the bleed valve (s) in the lines to the pilot (s). Once the air is bled, close the valve in the line to the pilot (s) and bleed all liquid trapped in the line (s).
- 7.3.4 Increase the pressure to the valve to approximately 25-psig for one minute and then increase it to 150-psig for one minute. Observe for external leakage during the test period. No leakage except from the main piston shall be allowed. This leakage should be limited to 100 cc/minute.
- 7.3.5 On the 64055, following the above test with the valve still full of liquid apply air pressure to the unit starting at 35-psig and slowly increasing slowly until the valve opens. The valve should open at an air pressure of 50-psig maximum. If testing the 64143 skip this paragraph and go on to 7.3.6. Shutoff the air pressure and bleed it to atmosphere. The valve should return to the closed position.
- 7.3.6 Apply liquid pressure slowly to the valve inlet and simultaneously to the pilot (s). Observe when the main piston opens. The valve shall open with an inlet pressure of 15-psig or less.

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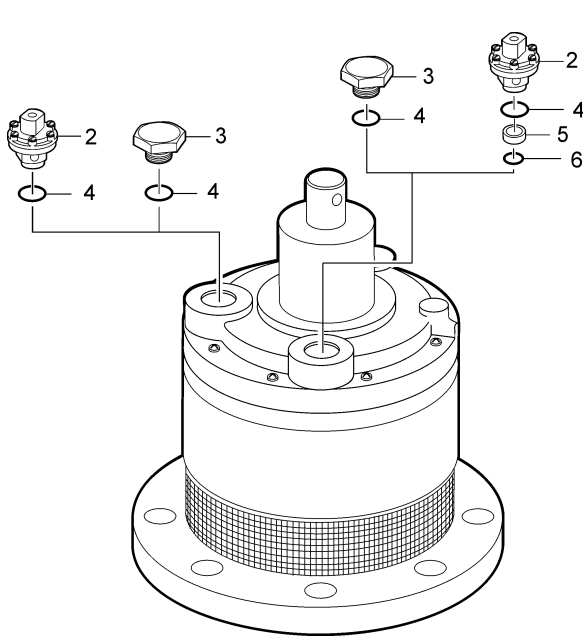
## 8.0 ILLUSTRATED PARTS CATALOG

Table 1.0 tabulates the parts and sub-assemblies comprising the various versions of both the 64055 and 64143 Valves with all

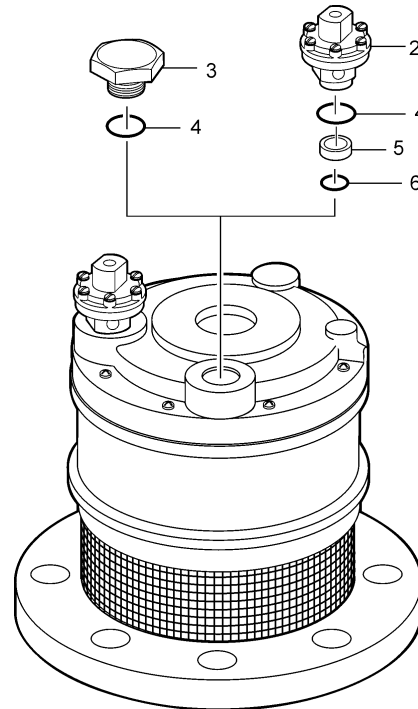
options. The item numbers of the table are keyed to the exploded views of the unit diagrammed in the various figures.

**Table 1.0**  
**64055 & 64143 Bottom Loading Valves & Options**  
 Refer to Figures 1A and 1B

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr.
1A	1	64055	Internal Valve, Bottom Loading and Off-loading	1	-	-
	3	GF814-10D	Plug	2	Basic	-
	4	MS29512-10	Gasket	2	Basic	20
	2	47097	Pilot Valve, Primary	1	A	-
	3	GF814-10D	Plug	1	A	-
	4	MS29512-10	Gasket	2	A	20
	2	47097	Pilot Valve, Secondary	2	B	-
	4	MS29512-10	Gasket	2	B	20
	5	221087	Orifice	1	B	-
	6	MS29512-08	Gasket	1	B	10
1B	1	64143	Internal Valve, Bottom Loading Only)	1	-	-
	2	47097	Pilot Valve, Primary	1	A	-
	3	GF814-10D	Plug	1	A	-
	4	MS29512-10	Gasket	2	A	20
	2	47097	Pilot Valve, Secondary	2	B	-
	4	MS29512-10	Gasket	2	B	20
	5	221087	Orifice	1	B	-
6	MS29512-08	Gasket	1	B	10	



**FIGURE 1A**  
**64055 & Options**

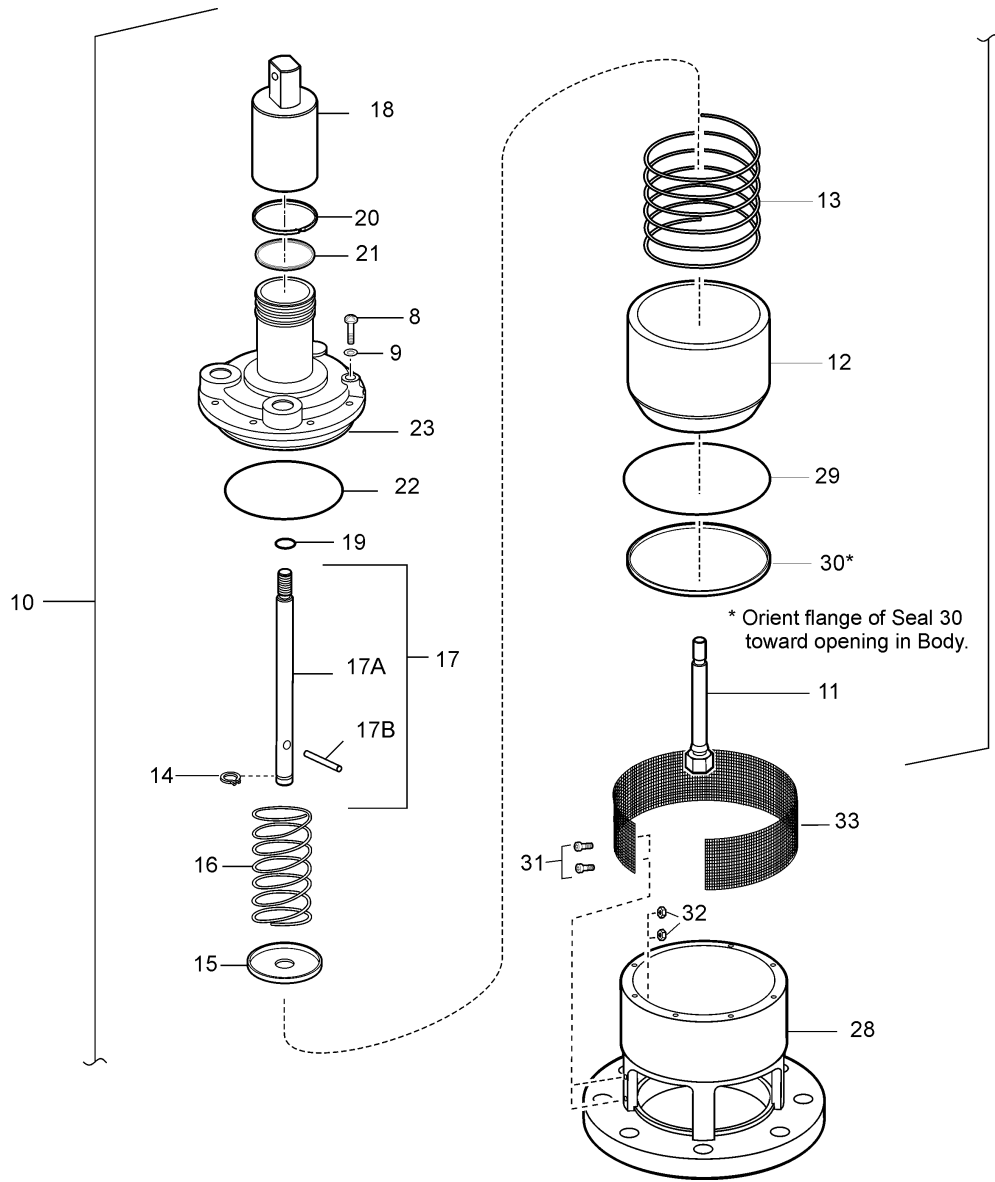


**FIGURE 1B**  
**64143A & Options**

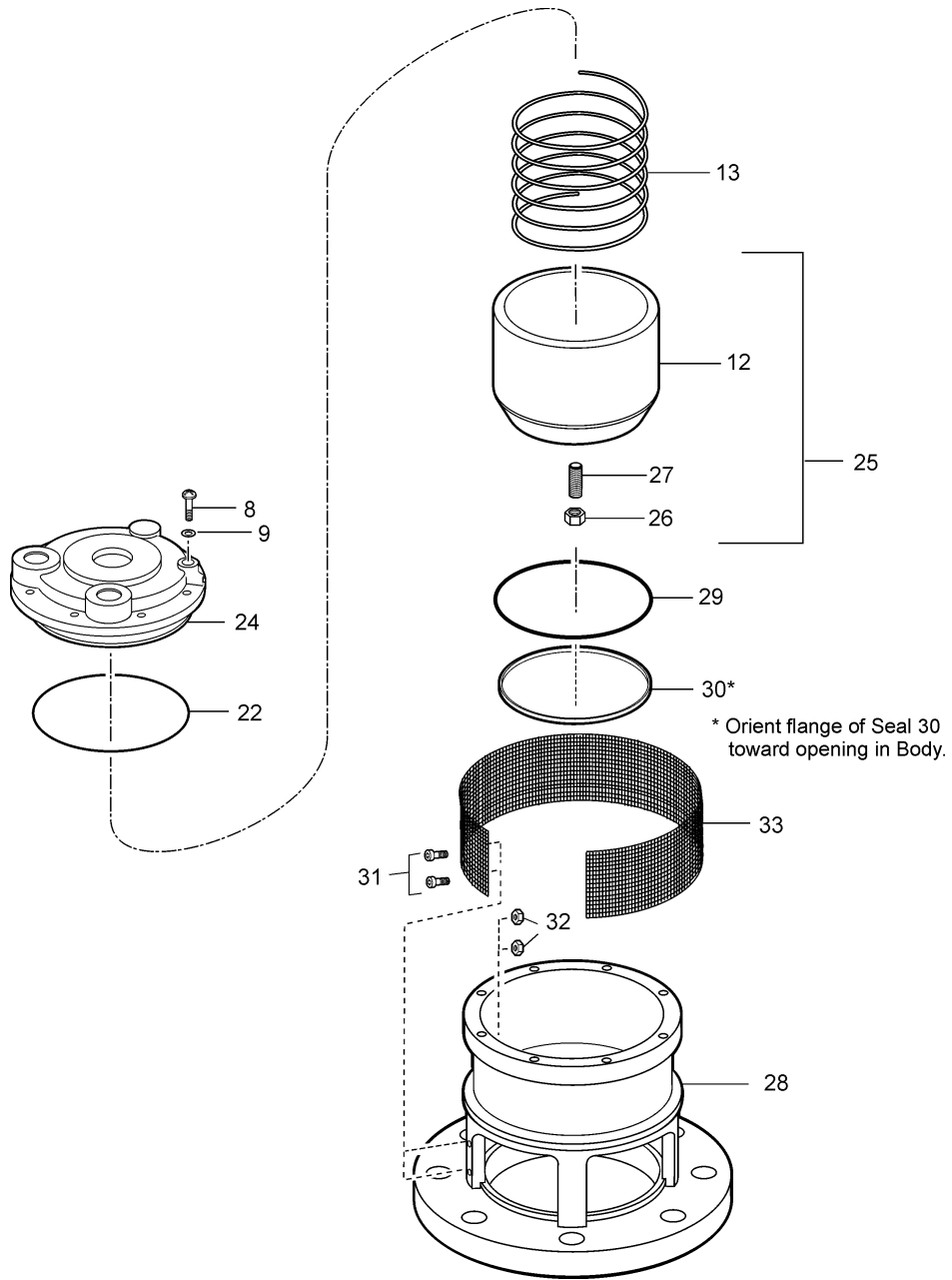
**TABLE 2.0**  
 Parts Breakdown, 64055 & 64143 Basic Valves



Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr.
2A, 2B	8	GF35275-265	Screws	8	All	-
	9	GF35338-138	Washers	8	All	-
2A	10	No number	Piston/Bonnet Assy	1	64055	-
	11	220447	Rod	1	64055	-
2A, 2B	12	47096	Piston	1	64055	1
	13	220436	Spring	1	All	-
2A	14	GF16633-4050	Ring	1	64055	-
	15	220438	Spring Pad	1	64055	-
	16	220437	Spring	1	64055	-
	17	47095	Shaft Assembly	1	64055	-
	17A	220448	Shaft	1	64055	-
	17B	GF16562-238	Pin	1	64055	-
	17C	242	Locktite	1	64055	-
	18	220450	Housing	1	64055	-
	19	MS29513-112	O-ring	1	All 64055 except C	10
		M83248/1-112	O-ring, Viton	1	64055 Option C	10
	20	220453	Wipe Ring	1	64055	10
	21	Q4325-366Y	Quad Ring	1	64055	10
		Q4325-514AD	Quad Ring, Viton	1	64055 Option C	10
	22	MS29513-157	O-ring	1	64055	10
	23	47099	Bonnet	1	64055	-
	22	MS29513-157	O-ring	1	64143	10
2B	24	221108	Bonnet	1	64143	-
	25	47284	Piston Assy	1	64143	1
	12	47096	Piston	1	64143	1
	26	GF51971-3	Nut	1	64143	-
	27	221109	Set Screw, Orifice	1	64143	-
2A, 2B	28	220458	Body	1	All	-
	29	MS29513-248	O-ring	1	All except Option C	10
		M83248/1-248	O-ring, Viton	1	64055 Option C	10
	30	220456	Seal	1	All	10
	31	GF515C4-5	Screw	2	All	-
	32	GF20365D440	Nut	2	All	-
	33	220431	Screen	1	All	-



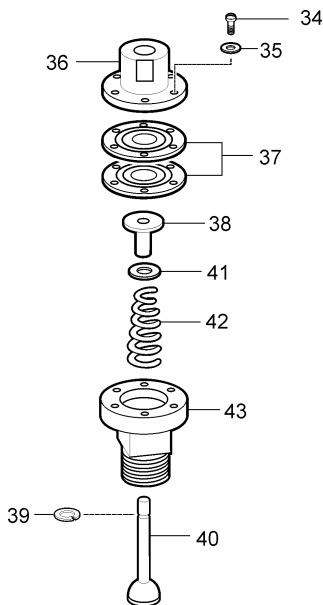
**Figure 2A**  
**64055 Parts Breakdown**



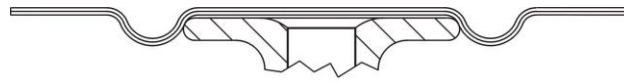
**Figure 2B**  
**64143 Parts Breakdown**

**TABLE 3.0**  
Pilot Valve Parts Breakdown

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr.
1A, 1B	2	47097	Pilot Valve Assy, Primary	1	A & B	-
3A	34	LP35275-230	Screw	6	A & B	-
	35	GF620C6	Washer	6	A & B	-
	36	220441	Cover	1	A & B	-
	37	220445	Diaphragm	2	A & B	20
	38	220443	Pressure Pad	1	A & B	-
	39	GF16633-4018	Ring	1	A & B	-
	40	220434	Poppet	1	A & B	-
	41	220442	Washer	1	A & B	-
	42	220444	Spring	1	A & B	-
	43	220433	Fitting	1	A & B	-
1A, 1B	5	47097	Pilot Valve Assy, Secondary	1	B	-
3A	34	LP35275-230	Screw	6	B	-
	35	GF620C6	Washer	6	B	-
	36	220441	Cover	1	B	-
	37	220445	Diaphragm	2	B	20
	38	220443	Pressure Pad	1	B	-
	39	GF16633-4018	Ring	1	B	-
	40	220434	Poppet	1	B	-
	41	220442	Washer	1	B	-
	42	220444	Spring	1	B	-
	43	220433	Fitting	1	B	-

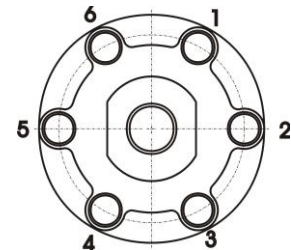


**Figure 3A**  
Pilot Valve Parts  
Breakdown



Note diaphragm loop position prior to installing

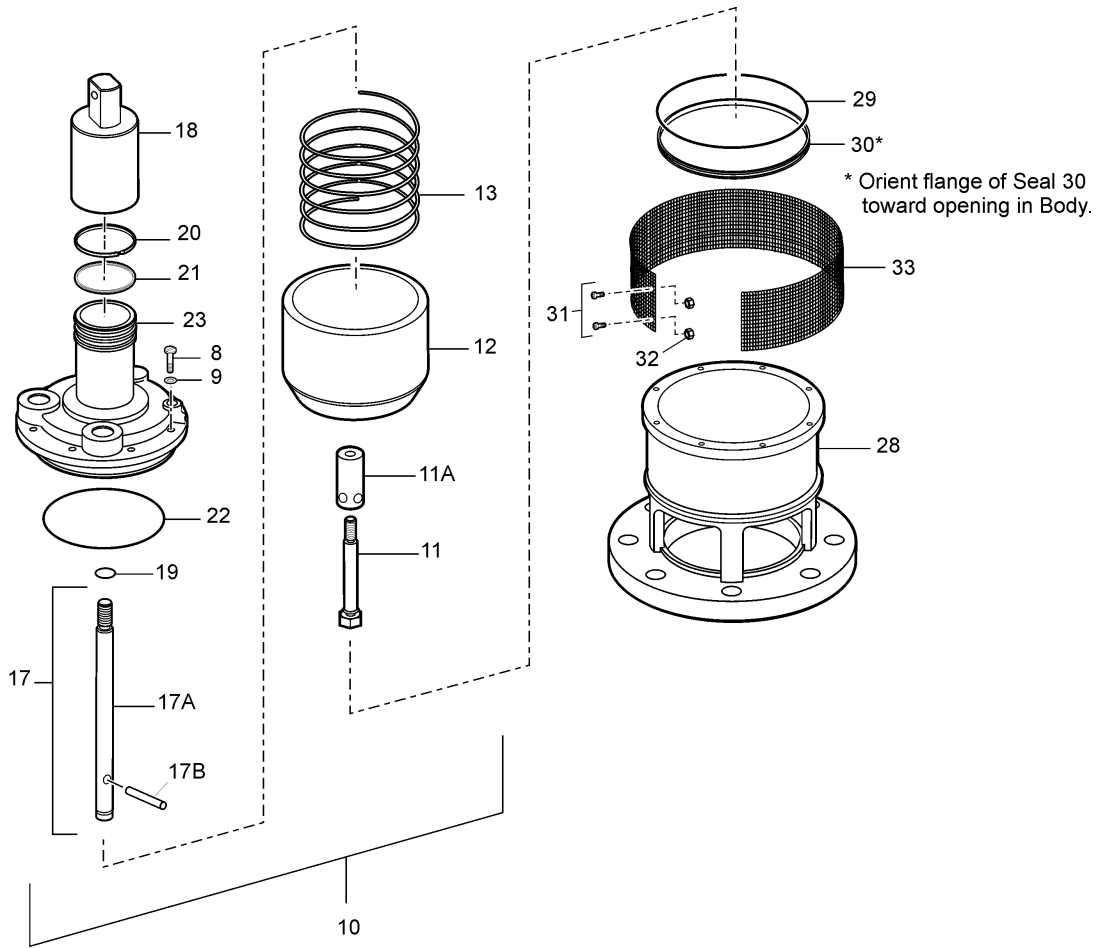
**Figure 3B**  
Diaphragm Installation  
Position



**Figure 3C**  
Diaphragm Torque  
Sequence

## 64174 Parts Breakdown (See Figure 4)

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr.
4	8	GF35275-265	Screws	8	All	-
	9	GF35338-138	Washers	8	All	-
	10	No number	Piston/Bonnet Assy	1	All but E	-
	11	220447	Rod	1	All but E	-
	11A	221507	Spacer	1	All but E	-
	12	47096	Piston	1	All but E	1
	13	220436	Spring	1	All	-
	17	47095	Shaft Assembly	1	All	-
	17A	220448	Shaft	1	All	-
	17B	GF16562-238	Pin	1	All	-
	17C	242	Locktite	1	All	-
	18	220450	Housing	1	All	-
	19	MS29513-112	O-ring	1	All but D	10
		M83248/1-112	O-ring, Viton	1	D	10
	20	220453	Wipe Ring	1	All	10
	21	Q4325-366Y	Quad Ring	1	All but D	10
		Q4325-514AD	Quad Ring	1	D	10
	22	MS29513-157	O-ring	1	All but D	10
	23	47099	Bonnet	1	All	-
	28	220458	Body	1	All	-
	29	MS29513-248	O-ring	1	All	10
		M83248/1-248	O-ring	1	D	10
	30	220456	Seal	1	All	10
	31	GF515C4-5	Screw	2	All	-
	32	GF20365D440	Nut	2	All	-
	33	220431	Screen	1	All	-



**Figure 4**  
**64174 Parts Breakdown**

**Table 5.0**  
64174E Parts Breakdown (Refer to Figure 5)

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr.
5	8	GF35275-265	Screws	8	E	-
	9	GF35338-138	Washers	8	E	-
	10	No number	Piston/Bonnet Assy	1	E	-
	11	221614	Rod	1	E	-
	11A	221615	Variable Orifice	1	E	-
	11B	C036-051-1380S	Spring	1	E	-
	11C	221616	Retainer	1	E	-
	11D	NAS1351-3-12P	Screw	6	E	-
	12	47462	Piston	1	E	1
	13	220436	Spring	1	E	-
	17	47095	Shaft Assembly	1	E	-
	17A	220448	Shaft	1	E	-
	17B	GF16562-238	Pin	1	E	-
	17C	242	Locktite	1	E	-
	18	220450	Housing	1	E	-
	19	MS29513-112	O-ring	1	E	10
		M83248/1-112	O-ring, Viton	1	DE	10
	20	220453	Wipe Ring	1	E	10
	21	Q4325-366Y	Quad Ring	1	E	10
		Q4325-514AD	Quad Ring	1	DE	10
	22	MS29513-157	O-ring	1	E	10
	23	47099	Bonnet	1	E	-
	28	220458	Body	1	E	-
	29	MS29513-248	O-ring	1	E	10
		M83248/1-248	O-ring	1	DE	10
	30	220456	Seal	1	E	10
	31	GF515C4-5	Screw	2	E	-
	32	GF20365D440	Nut	2	E	-
	33	220431	Screen	1	E	-

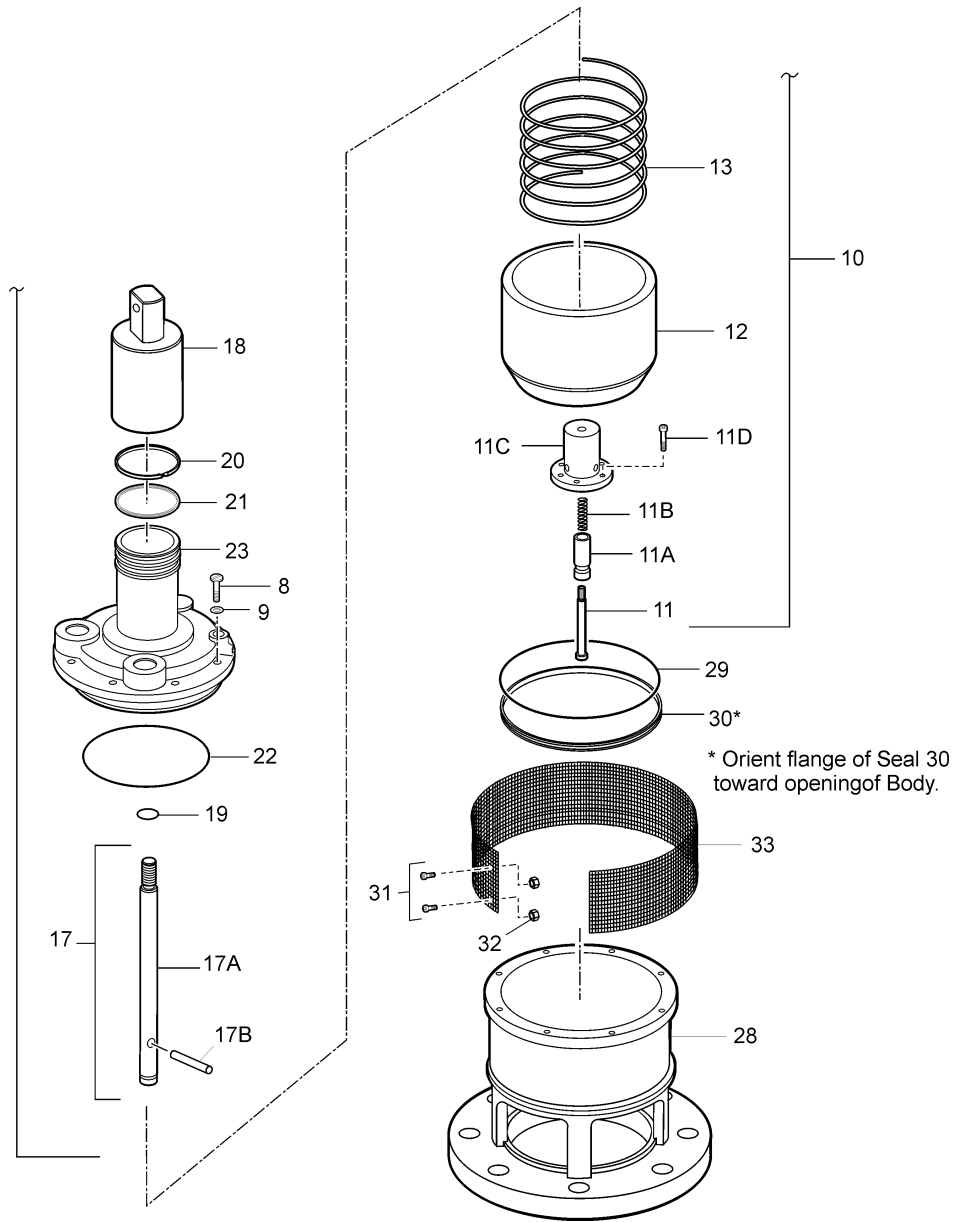


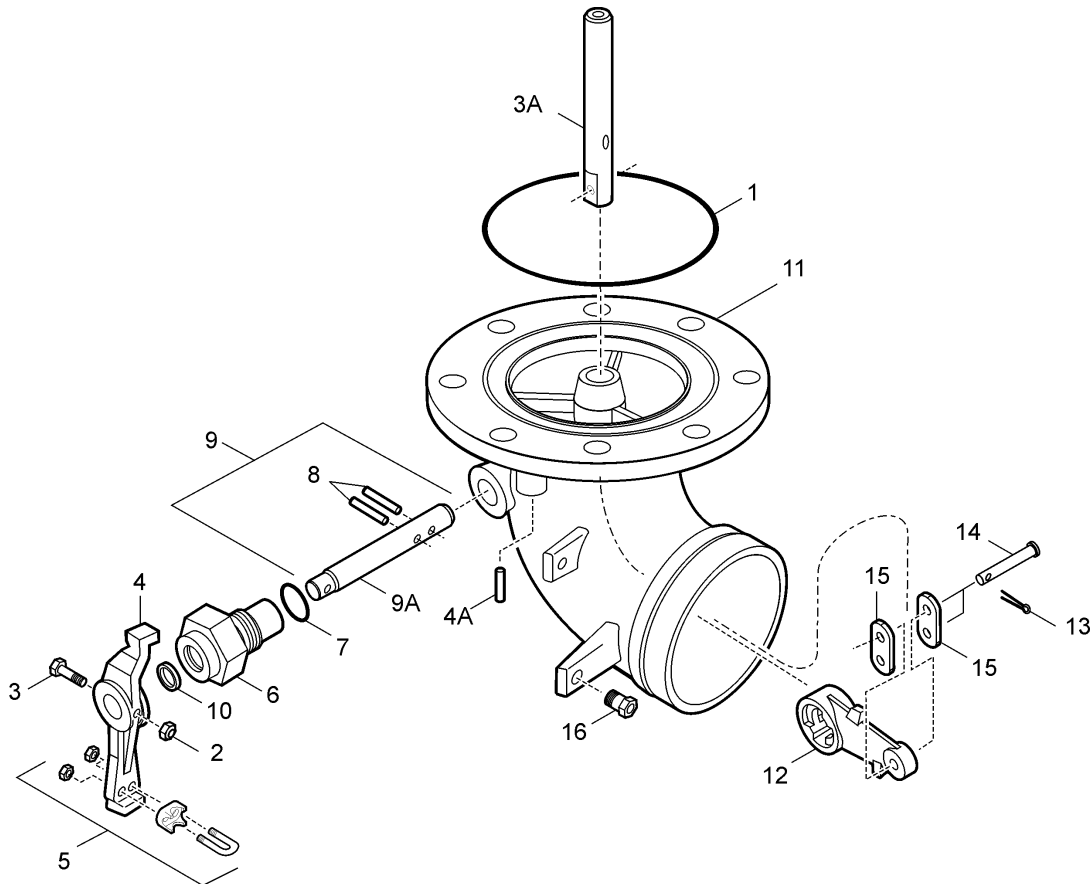
Figure 5

64174DE & 64174E Parts Breakdown



**TABLE 6.0**  
64174C Parts Breakdown

Fig.	Item	Part Number	Description	Units / Assy	Option	Spares/10 Units/Yr.
6	1	MS29513-353	O-ring	1	All	10
	2	GF21042-4	Nut	1	All	-
	3	GF18153-9	Screw	1	All	-
	3A	221301	Shaft	1	All	-
	4	47461	Lever Assy	1	All	-
	4A	90692A347	Spring Pin	1	All	-
	5	30325T27	Clip	1	All	-
	6	220688	Bushing	1	All	-
	7	MS29513-121	O-ring	1	All	10
	9	47487	Shaft Assy	1	All	-
	9A	220686	Shaft	1	All	-
	8	221644	Pin	2	All	-
	10	Q4114-366Y	Quad Ring	1	All but D	10
		Q4114-514AD	Quad Ring	1	D	10
	11	221303	Body	1	All	-
	12	221487	Cam	1	All	-
	13	GF24665-1013	Cotter Pin	2	All	-
	14	98306A159	Clevis Pin	2	All	-
	15	221302	Link	2	All	-
	16	5406-04-02	Bushing	1	All	5



**Figure 6**  
**64174C Parts Breakdown**

**Kits**

There are several kits of parts designed to provide the necessary items to overhaul the units as described below.

<b>Kit Number</b>	<b>Description</b>
KD64055-1	Kit, seal replacement for 64055A valve. Contains items 4, 19, 20, 21, 22, 29, 30 & 37
KD64055-2	Kit, seal replacement for 64055 basic valve. Contains items 4, 19, 20, 21, 22, 29 & 30
KD64055-3	Kit; seals to convert standard valve to Option C (Viton sliding seals). Contains items 19, 21, 29 & 30.
KD64129-3	Kit; Overhaul for 47097 pilot valve assy. Contains items 4 & 37
KD64143-1	Kit; seal replacement for 64143A valve. Contains items 4, 22, 29, 30 & 37
KD64143-2	Kit; seal replacement for 64143B valve. Contains items 4, 6, 22, 29, 30 & 37

- Notes:**
1. All part numbers beginning with "GF" are interchangeable with those beginning with either "AN" or "MS". If three numbers follow the "GF" it is interchangeable with an "AN" part, otherwise it is interchangeable with an "MS" part of the same number.
  2. The recommended spare parts shown above are the number required to support 10 units for one year or each overhaul, whichever is sooner. These quantities do not include replacement spares for intermediate replacement of parts required by abuse or misuse of the equipment. The recommended quantities are based on the ratio of spare parts sold for each unit during a one-year period of time. The actual quantity required will vary from location to location.



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