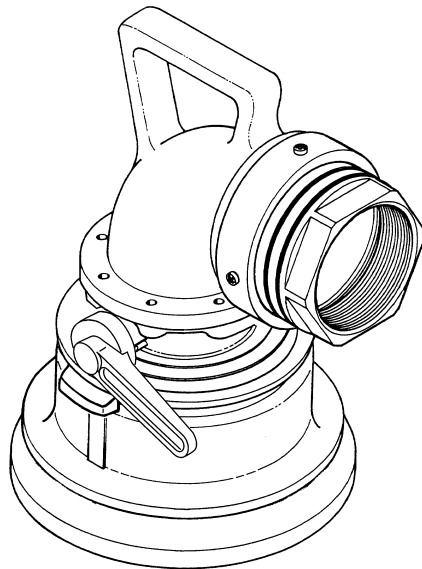


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Maintenance Manual

Hydrant Coupler F250 Series



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LIST OF EFFECTIVE PAGES

On a revised page, the portion of text or illustrations affected by the change is indicated by a vertical line in the outer margin of the page. When a revision is issued, the entire document is reissued with the current revision number and date shown on all pages. For major revisions, the basic number is incremented. For minor revisions, the number following the decimal is incremented. Dates of issue for original and subsequent revisions are as follows:

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INTRODUCTION

1. General

This manual provides component maintenance shop instructions for the Hydrant Coupler (coupler).

2. Revision Service

This manual will be revised as necessary to show the current information.

3. Weights and Measurements

Weights and measurements in this manual are expressed in both English (U.S. customary) and Metric (SI) units.

DESCRIPTION AND OPERATION

NOTE: The F250 Hydrant Coupler is a direct upgrade replacement for the F240 Coupler. The F250 coupler complies with the API Standard 1584 non-ejection requirement. The shaft and seals are designed to improve safety, reliability and maintainability.

1. Description

The Hydrant Coupler (coupler) (see Figure 1) provides the means of connecting 4-inch hydrants and adapters conforming to API Standard 1584. The various optional configurations permit the use of several thread and hose sizes. The major functional components of the hydrant coupler are the swiveling outlet adapter, the elbow, and the coupler body section.

2. Installation/Operation

A. Installing the Coupler on the Hydrant

The coupler may be connected to the hydrant adapter by pressing it downward onto the adapter. This actuates the three locking lugs, and releases the shroud. The shroud slides downward and holds the locking lugs in their locked position. If product selection is installed, the shroud will need to be rotated to align the product selection screws with the slots in the shroud.

B. Operating the Coupler

CAUTION: THE SLEEVE SEAL WILL BE DAMAGED IF THE COUPLER IS OPENED WITHOUT BEING CONNECTED TO AN ADAPTER.

When the coupler is installed, it may be opened by rotating its operating handle to the OPEN position. To close the coupler, rotate its operating handle to the closed position.

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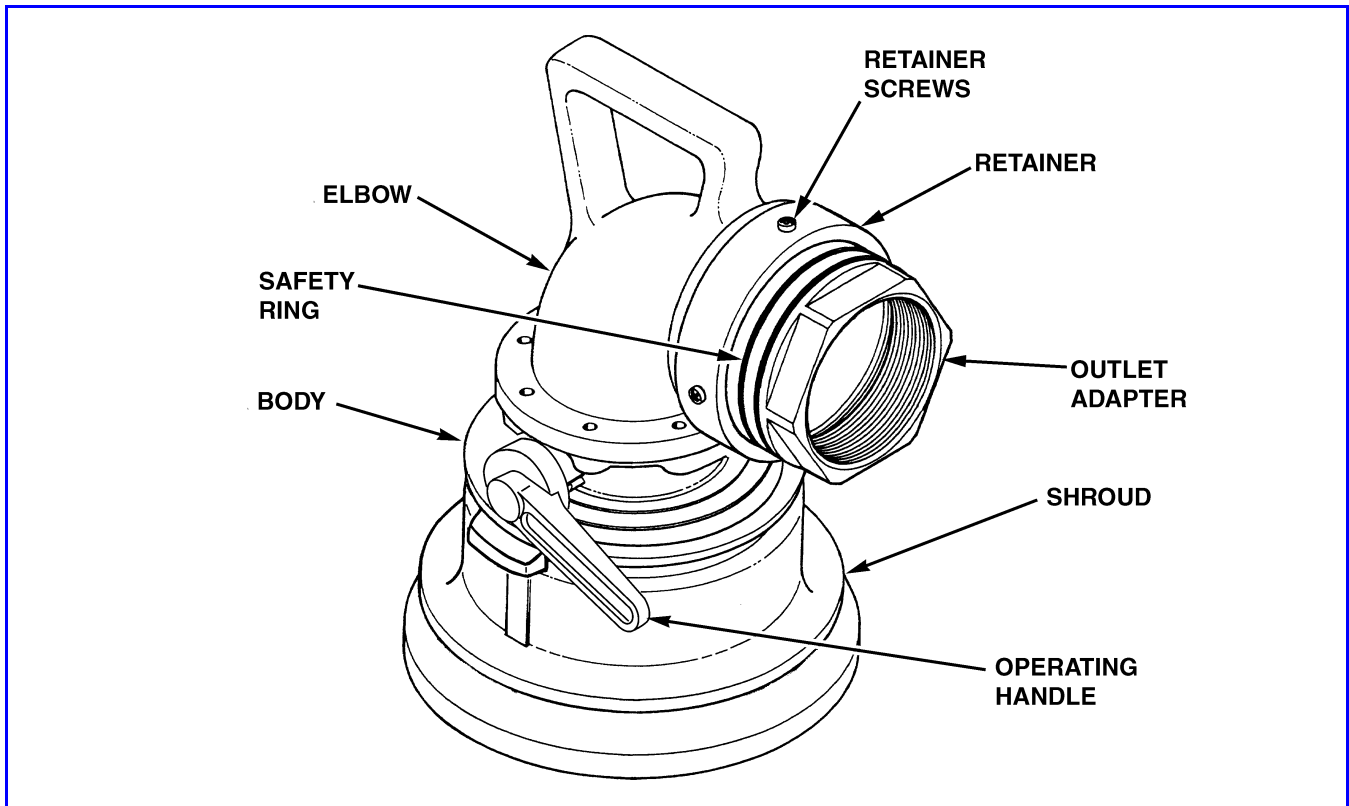


Figure 1. Hydrant Coupler

C. Removing the Coupler from the Hydrant

With the hydrant closed, the coupling may be disengaged from the hydrant adapter by rotating its operating handle to the CLOSED position and pulling back the shroud to disengage the locking lugs.

D. Removing the Coupler and Elbow from the Hose

Pull the safety ring from its groove and slide it back to the retaining ring. Do not remove the safety ring. Unscrew the four retaining screws approximately 3 full turns. Slide the retainer back to the safety ring. The elbow can now be separated from the hose.

3. Leading Particulars (Refer to Table 1)

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Table 1. Leading Particulars

Service	Automotive and Aviation Fuels
Operating Pressure	
Maximum Working	200 psi (1 380 kPa)
Peak Surge	305 psi (2 100 kPa)
Pressure Drop (connected to F368 Hydrant) (approximate)	
	13 psi at 1200 USgpm (90 kPa at 4 500 l/m)
Fluid Temperature	-40 to 160°F (-54 to 71°C)
Ambient Temperature	-40 to 160°F (-54 to 71°C)
Weights (approximate)	
Basic	13.7 pounds (6,2 kg)
Mod A – with 90° Elbow + 4" NPT Swivel	21.5 pounds (9,7 kg)
Mod B – with 90° Elbow + 4" BSPPI Swivel	21.5 pounds (9,7 kg)
Mod C – with 90° Elbow + 3" NPT Swivel	22.3 pounds (10,1 kg)
Mod D – with 90° Elbow + 3" BSPPI Swivel	22.3 pounds (10,1 kg)
Mod E – with 90° Elbow + 2½" NPT Swivel	22.3 pounds (10,1 kg)
Mod F – with 90° Elbow + 2½" BSPPI Swivel	22.3 pounds (10,1 kg)
Mod G – with 90° Elbow + 4" NPSM Swivel	21.5 pounds (9,7 kg)
Mod H – with 90° Elbow for F597 Swivel	19.0 pounds (8,6 kg)
Mod J – Add Product Selection	+0.1 pound (+0,05 kg)
Mod K – with 90° Elbow for F597 Swivel + ¼" NPT Pressure Tap	19.0 pounds (8,6 kg)
Mod R – Change to Viton Seals	No weight change
Mod S – Add 3" NPT Adapter	+2.5 pounds (+1,1 kg)
Mod T – Add 4" NPT Adapter	+2.5 pounds (+1,1 kg)

FAULT ISOLATION

1. General

Refer to Table 2 for fault isolation information. Locate suspected faulty component and take appropriate remedial action.

Table 2. Fault Isolation

FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
Leakage from outlet adapter	Damaged or worn packing (6, IPL Figure 1), seal (8, IPL Figure 2) or packing (9, IPL Figure 2)	Replace the packings and/or seal.
Leakage from elbow flange	Damaged or worn packing (10, IPL Figure 1)	Replace the packing.
Leakage past handle shaft	Damaged or worn packing (17, IPL Figure 2)	Replace the packing.
Leakage past poppet when closed	Damaged or worn packing (9, IPL Figure 2)	Replace the packing.
	Damaged or worn seat (6, IPL Figure 2)	Replace the seat.
	Damaged or wear on seat face of poppet (5, IPL Figure 2)	Replace the poppet.
Leakage at hydrant adapter when open	Damaged or worn packing (9, IPL Figure 2)	Replace the packing.
	Damaged or worn nose seal (8, IPL Figure 2)	Replace the nose seal.

DISASSEMBLY

1. Overhaul Parts Kits

Refer to the **ILLUSTRATED PARTS LIST** section for the Overhaul Parts Kit information.

2. Disassembling the Hydrant Coupler

A. Removing the Swivel Assembly from the Coupler Elbow (Refer to IPL Figure 1)

- 1) Pull the safety ring (1A) out of its groove and slide it back to the retaining ring (1).
- 2) Unscrew the four screws (2) until the retainer will slide back to the safety ring (1A).
- 3) The swivel assembly can now be pulled off of the elbow (11)

NOTE: The seat (6) can be replaced without further disassembly.

B. Disassembly of the Swivel Assembly

- 1) Pull the retaining ring (1) out of its groove. Slide the retaining ring (1), the safety ring (1A) and the retainer (4) off of the body (8).
- 2) Remove the twenty-four balls (7) and the seal (6).

C. Removing the Elbow from the Coupler Assembly

Remove the eight screws (9), and separate the elbow (11) and the packing (10) from the coupler assembly.

D. Disassembling the Coupler Assembly

- 1) Using an API-style adapter without a poppet, release the locking lugs (29). (A 6.0 inch (152 mm) outside diameter x 4.25 inch (108 mm) inside diameter x 3.0 inch (76 mm) long tube may be used as an alternate for the adapter.)
- 2) Put the coupler assembly on the adapter. Press the coupler assembly down until the locking lugs release the shroud. Slide the shroud down as far as it will go.
- 3) Rotate the operating handle (14) approximately 45-degrees toward its open position.
- 4) Remove the pin (20), the washer (21) and the clevis pin (22). Remove the poppet assembly (5) with the links (24 from the body (30).
- 5) If the sleeve (6) did not come out of the body (30) during step 3 above, turn it so that the shroud (25) is down, and gently tap the sleeve and the springs (10) out of the body.

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- 6) Pry the seal retainer (7) from the sleeve (6). Remove the seal (8) and the packing (9) from the sleeve.
- 7) Rotate the operating handle (14) to its closed position.
- 8) Using a piece of 0.06 inch (1,5 mm) diameter wire, push the pin (11) out of the crank (23).
- 9) Drive the pin (12) out of the body (30). Remove the operating handle assembly from the body. Note the relative positions of the operating handle (14) and the crank (23) for reassembly reference.
- 10) Drive the pin (13) out of the operating handle (14). Remove the operating handle, the felt wiper (15), the bushing (16) and the packing (17) from the handle shaft (18).
- 11) Remove the shroud (25) from the body (30). Remove the felt wiper (27) from the shroud.
- 12) Remove the pin (2), the washer (3), the clevis pin (4) and the links (24) from the poppet (2).
- 13) Remove the cotter pin (20), the washer (21) and the clevis pin (22) from the crank (23) and the poppet links (24).
- 14) If the bushing (19) is excessively worn, remove it from the body (30). Use a 3/8-16UNC, 6 1/2-inch long bolt threaded into the bushing as a draw-bolt.
- 15) If the guard (26) is excessively worn, use a sharp bladed tool to cut it from the shroud (25).

CLEANING

1. Cleaning Materials

Refer to Table 4 for recommended cleaning materials. Suitable equivalent cleaning materials may be substituted for the items listed.

Table 4. Recommended Cleaning Materials

DESCRIPTION	SPECIFICATION	SOURCE
Brush, Bristle, stiff, nonmetallic	--	Commercially available
Dry Cleaning Solvent	P-D-680, Type 2	Commercially available
Pick, Teflon	--	Commercially available
Plastic Bags	--	Commercially available
Tissues, lint-free	--	Commercially available

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2. Cleaning Procedures

WARNING: DRY CLEANING SOLVENT IS FLAMMABLE AND TOXIC TO EYES, SKIN, AND RESPIRATORY TRACT. SKIN/EYE PROTECTION REQUIRED. AVOID REPEATED/PROLONGED CONTACT. USE ONLY IN WELL VENTILATED AREAS. GOOD GENERAL VENTILATION IS NORMALLY ADEQUATE. KEEP AWAY FROM OPEN FLAMES OR OTHER IGNITION SOURCES.

A. Clean all metal parts by washing thoroughly in dry cleaning solvent. Remove stubborn deposits by scrubbing with a nonmetallic stiff bristle brush. Use a Teflon pick to remove obstructions from ports, grooves and passages.

NOTE: All of the parts must be free of corrosion, dirt, grease, oil, or any other foreign matter.

WARNING: WEAR EYE PROTECTION WHEN DRYING PARTS WITH COMPRESSED AIR. DO NOT DIRECT AIRSTREAM AT PERSONNEL OR LIGHT METAL PARTS.

B. Dry parts with clean lint-free tissues or clean, dry compressed air.

C. Package clean parts in plastic bags.

INSPECTION

1. General

A. Under strong light and magnification, visually check all parts in accordance with the general criteria specified in paragraph 2 below.

B. Repair minor damage in accordance with local directives. If damage is major or beyond simple repair, replace the part rather than attempt extensive repairs.

2. Component Checks (Refer to Table 5)

Table 5. Component Checks

DESCRIPTION	CHECK CRITERIA
General	Visually check all parts as applicable for nicks, cracks, cuts, burrs, corrosion, breaks, scoring, chafing, scarring, deformation, dents, thread damage, or any other obvious defects. Make sure that the ports, passages, recesses and sealing grooves are clean and unobstructed. Check all sealing and seating surfaces for damage or corrosion that would affect sealing.

ASSEMBLY

1. Overhaul Replacement Parts

Refer to the **ILLUSTRATED PARTS LIST** section for recommended replacements parts information.

2. Assembly Materials

Refer to Table 7 for recommended assembly materials. Suitable equivalent materials may be substituted for the items listed.

Table 7. Recommended Assembly Materials

DESCRIPTION	SPECIFICATION	SOURCE
Petrolatum	–	Commercially available

3. Assembling the Hydrant Coupler

A. Lubrication

Prior to assembly, lightly lubricate all of the packings, seals and screw threads with petrolatum.

B. Assembling the Coupler Section (Refer to IPL Figure 2)

- 1) If the bushing (19) was removed, thread a new bushing onto the $\frac{3}{8}$ -16UNC, 6½-inch long bolt you used to remove the old bushing. Thread the bushing onto the bolt until it is flush with the end of the bolt. Press the bushing into the bushing bore of the body (30), until it bottoms out.
- 2) If the guard (26) was removed from the shroud (25), use tire levers to install a new guard on the shroud.
- 3) Refer to Figure 2 and install the springs (28) and the locking lugs (29) in the body (30) as follows:

NOTE: Long nose pliers can be used to close the spring loop during installation of a spring in the body, but be careful to avoid damaging the spring. The wire should not be marked or scratched.

- a) Push the loop of the spring (28) into the hole in the body (30), with the two tangs resting on the top surface. Push the spring in as far as possible, so that the two tangs contact the body surface. The loop of the spring should be a tight press fit in the hole.

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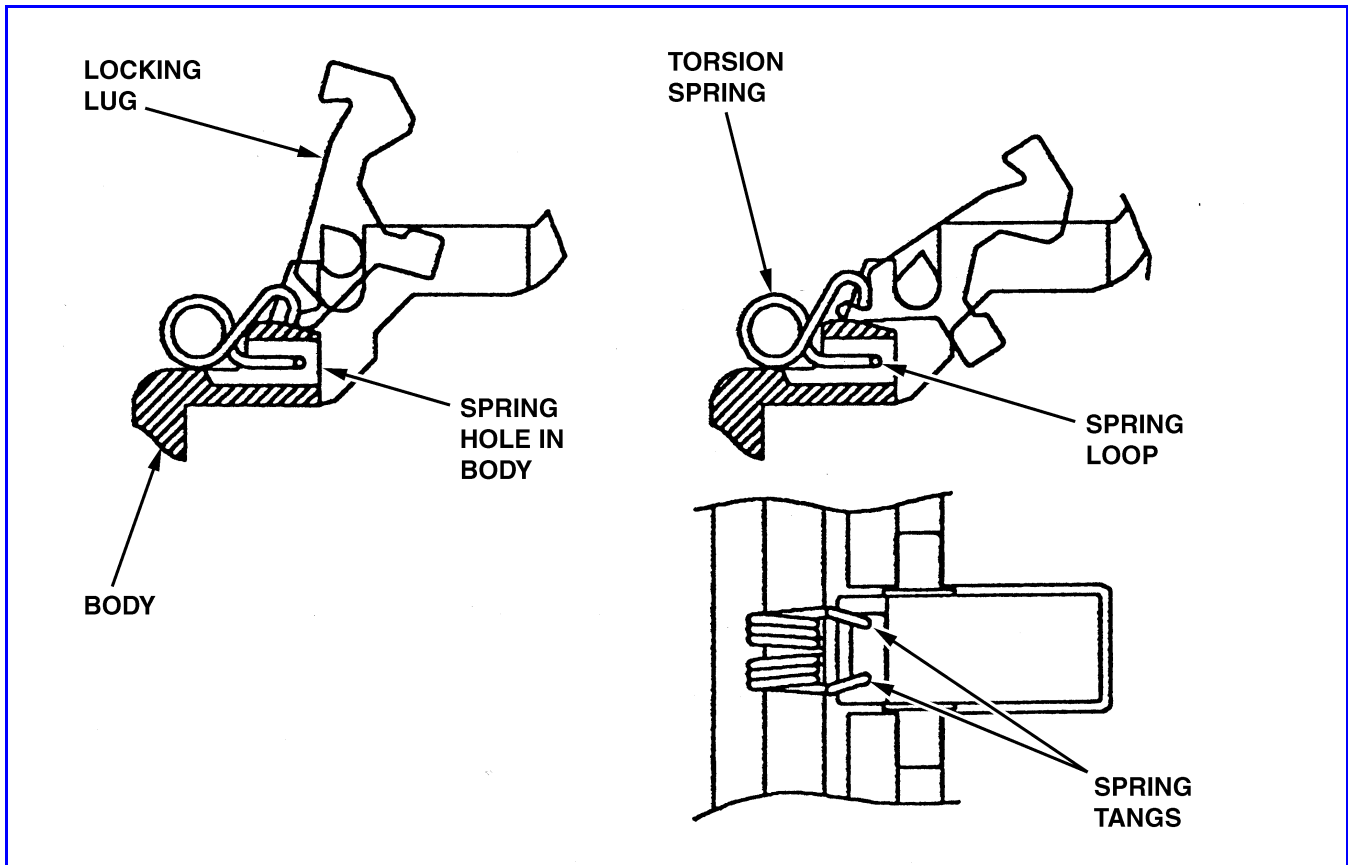


Figure 2. Installing the Springs and the Locking Lugs

- b) Position the locking lug (29) in its groove of the body (30), spring anchor end inward to contact the ends of the two tangs of the spring (28). Lift and place the ends of the spring tangs into the groove of the locking lug. Press the locking lug inward and rotate it into position. Make sure that both of the spring tangs are still in their correct positions and that the locking lug rotates freely.
- c) Repeat steps 1 and 2 above each of the remaining springs (20) and locking lugs (29).
- 4) Install the felt wiper (27) in the wiper groove of the shroud (25).
- 5) Put the body (30) on the API-style adapter (or equivalent tube) you used during disassembly of the coupler. Install the shroud (25) on the body.
- 6) Install the nose seal (8) in the nose seal of the seat (6) and secure it with the retainer (7). Install the packing (9) in the packing groove of the seat.
- 7) Assemble the links (24), the clevis pin (4), the washer (3) and the pin (2) on the poppet (5). Make sure that the bow of the links is away from the central leg of the poppet.

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- 8) Assemble the packing (17), the bushing (16), the felt washer (15) and the operating handle (14) on the shaft (18). Secure the handle to the shaft with the pin (13). The pin must be flush or below surface of the handle.
- 9) Install shaft assembly (items 13 through 18) in the body (30) and through the crank (23). The crank must be oriented opposite the flat on the operating handle (14).
- 10) Drive the pin (12) into the pin bore of the body (30) to secure the shaft assembly (items 13 through 18).
- 11) Install the two washers (10), the seat assembly (items 6 through 9) and the poppet (5) in the body (30).
- 12) Rotate handle assy to the closed position. Orient the bow of the links on the poppet assy opposite to the handle.
- 13) Install the pin (11) in the crank (23). If the holes in the crank are aligned the pin will enter easily.
- 14) Rotate the handle 45° approx towards open. Install clevis pin (22), washer (21) and cotter (20).
- 15) Rotate handle to the closed position, slide the shroud up to the handle until the locks engage.

C. Assembling and Installing the Elbow/Outlet Adapter

- 1) Install the packing (10) in the packing groove of the elbow (11). Engage the elbow with the coupler section and secure it with the screws (9). Tighten the screws securely.
- 2) Install the locking ring (4), retaining rings (1 and 5), the quad ring (6), the balls (7) and the outlet adapter (8) on the elbow (11).
- 3) Secure the locking ring (4) with the screws (2) and the washers (3). Tighten the screws securely.
- 4) Insert the retaining rings (1) into their grooves in the elbow (11).

ILLUSTRATED PARTS LIST

1. General

This section lists, describes, and illustrates all detail parts required for maintenance support of the Hydrant Coupler.

2. Scope of Information

A. The parts list is arranged in the general order of disassembly. The listing is indented to show the relationship between each part and its next higher assembly. Item numbers used in the parts list are keyed to the corresponding numbers of the accompanying illustration.

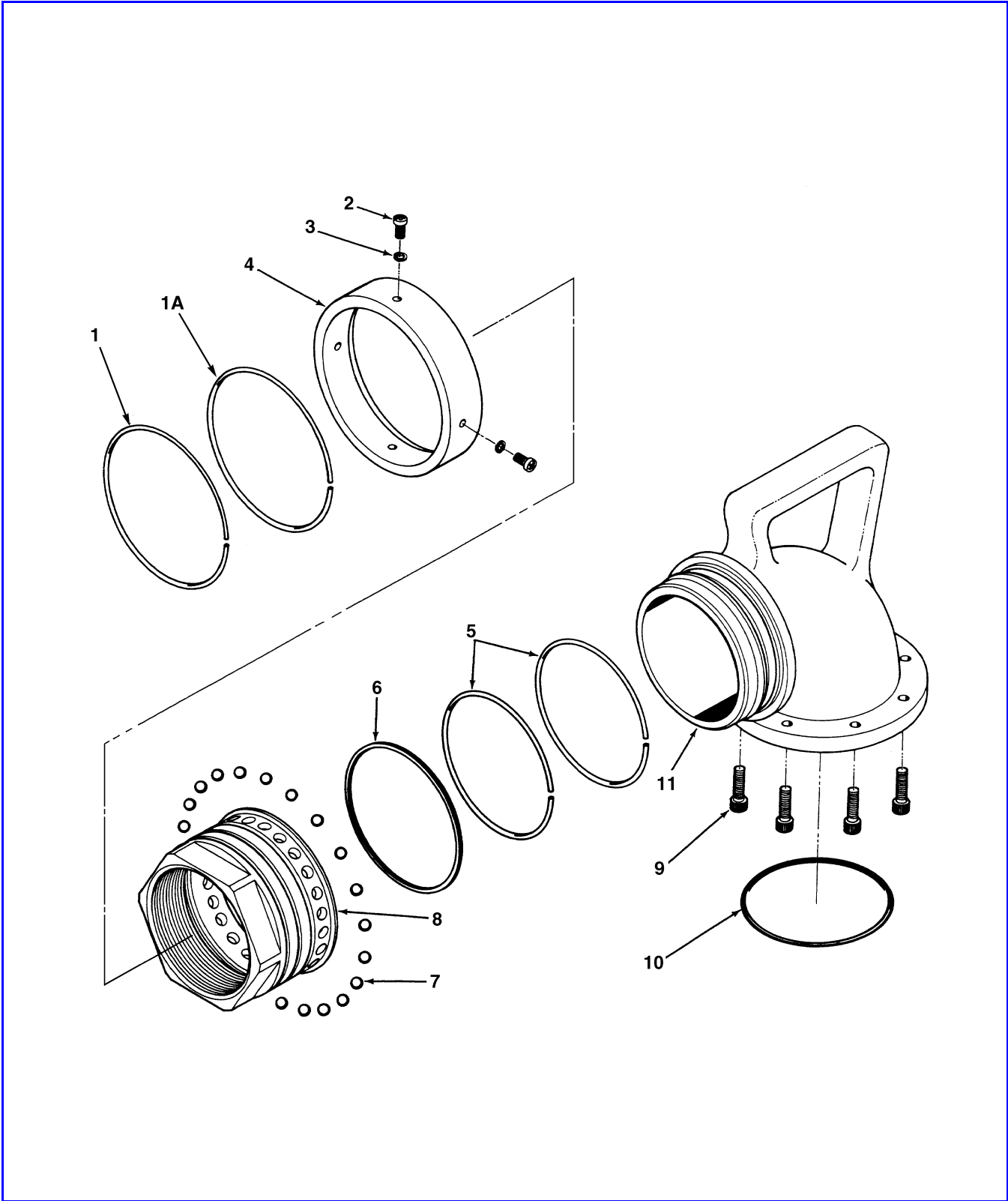
B. MODIFICATION CODE

The modification code (see Table 1) indicates the parts usage with respect to the end item. When the MODIFICATION CODE column is blank, the part usage is applicable to all versions unless otherwise specified in the DESCRIPTION column.

C. Abbreviations

ASSY	Assembly.
FIG.	Figure.
IPL	Illustrated Parts List.
MOD	Modification.

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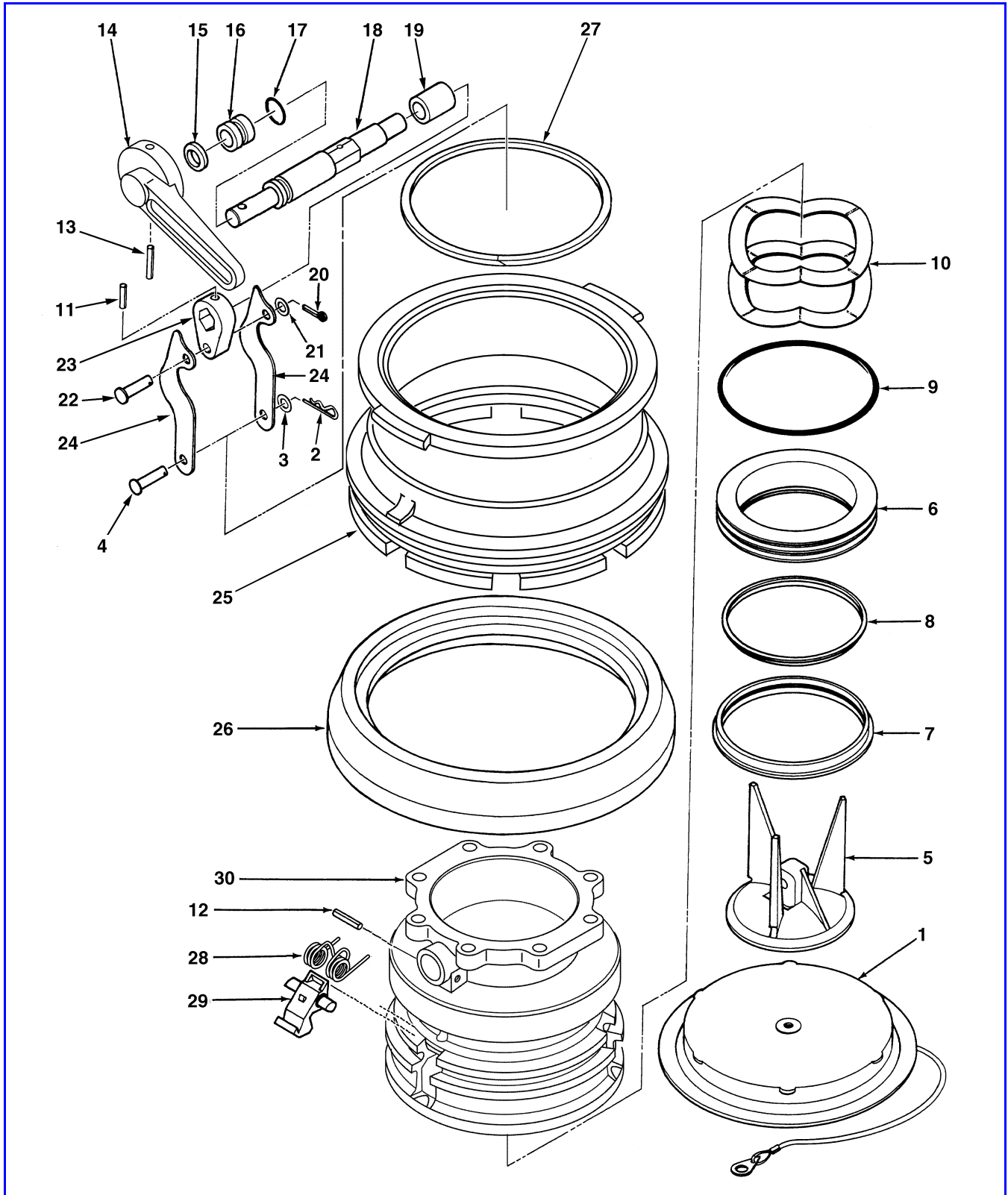


IPL Figure 1. Elbow / Outlet Adapter

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FIG. ITEM	PART NUMBER	DESCRIPTION	MOD CODES	UNITS PER ASSY
1 1	2763539-101	• RING, RETAINING	A-G	1
1 A	2763539-101	• RING, SAFETY	A-G	1
2	2706511CC05012	• SCREW, MACHINE	A-G	4
3	AN935-10L	• WASHER, LOCK	A-G	4
4	2803018-101	• RING, LOCKING	A-G	1
5	2763537-101	• RING, RETAINING	A-H	2
6	Q4248-366Y	• RING, QUAD	A-G	1
7	MS19060-26	• BALL, BEARING	A-G	24
8	2861015-101	• BODY, SWIVEL, NPT (4-inch)	A	1
	2861015-102	• BODY, SWIVEL, BSPPL (4-inch)	B	1
	2861015-103	• BODY, SWIVEL, NPT (3-inch)	C	1
	2861015-104	• BODY, SWIVEL, BSPPL (3-inch)	D	1
	2861015-105	• BODY, SWIVEL, NPT (2½-inch)	E	1
	2861015-106	• BODY, SWIVEL, BSPPL (2½-inch)	F	1
	2861015-107	• BODY, SWIVEL, NPSM (4-inch)	G	1
9	2706525C08030	• SCREW, SOCKET HEAD CAP	A-H	8
10	2661058A157	• PACKING, PREFORMED	A-H	1
11	2861016-101	• ELBOW	A-H	1
	2861016-103	• ELBOW	K	1

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IPL Figure 2. Hydrant Coupler

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FIG. ITEM	PART NUMBER	DESCRIPTION	MOD CODES	UNITS PER ASSY
2 1	900001-101	• COVER ASSEMBLY, DUST		1
2	98335A054	• PIN		1
3	CAN960-516L	• WASHER, FLAT		1
4	CMS28382-4C33	• PIN, CLEVIS		1
5	2763483-102	• POPPET		1
6	2763489-101	• SLEEVE ASSEMBLY, SEALING (Buna)		1
6 A	2763489-102	• SLEEVE ASSEMBLY, SEALING (Viton)	R	1
7	2672293	• RETAINER		1
8	2672292-1	• SEAL (Buna-N)		1
8 A	2672292-2	• SEAL (Viton)	R	1
9	2661058BD350	• PACKING, PREFORMED (Low swell Buna-N)		1
9 A	2661058AF350	• PACKING, PREFORMED (Viton)	R	1
10	W4997-050	• WASHER, WAVE		2
11	901014-101	• PIN, STRAIGHT		1
12	CMS171594	• PIN, SPRING		1
13	CMS171658	• PIN, SPRING		1
14	901006-101	• HANDLE, OPERATING		1
15	2763494-101	• WIPER, FELT		1
16	901010-101	• BUSHING		1
17	2661058A207	• PACKING, PREFORMED (Buna)		1
17 A	2661058AF207	• PACKING, PREFORMED (Viton)	R	1
18	901009-101	• SHAFT, HANDLE		1
19	901012-101	• BUSHING		1
20	CMS24665-300	• PIN, COTTER		1
21	CAN960-516L	• WASHER, FLAT		1
22	CMS28382-4C33	• PIN, CLEVIS		1
23	901011-102	• CRANK		1
24	2763497-103	• LINK, POPPET		2
25	901004-102	• SHROUD (Used on S/N 100 through 150)		1
25 A	901004-103	• SHROUD (Used on S/N 151 and subsequent) (Marked "N")		1
26	2763486-101	• GUARD		1
27	001002-101	• WIPER, FELT (Used with Item 25)		1
27 A	CMS28932C23-3	• WIPER, FELT (Used with Item 25A)		1
28	941016-101	• SPRING, TORSION		3
29	2763487-101	• LUG, LOCKING		3
30	951003-101	• BODY		1

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OVERHAUL PARTS KITS AVAILABLE		
KIT PART NUMBER	DESCRIPTION	ITEMS IN KIT (IPL Figure 2)
KITF250-101	Standard Seals	6, 8, 9, 17
KITF250-102	Viton Seals	6A, 8A, 9A, 17A
KITF250-103	Standard Seal Overhaul	1, 2, 6, 7, 8, 9, 12, 15, 17, 26, 27A
KITF250-104	Viton Seal Overhaul	1, 2, 6A, 7, 8A, 9A, 12, 15, 17A, 26, 27A

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OVERHAUL PARTS KITS AVAILABLE		
KIT PART NUMBER	DESCRIPTION	ITEMS IN KIT (IPL Figure 2)
KITF250-101	Standard Seals	6, 8, 9, 17
KITF250-102	Viton Seals	6A, 8A, 9A, 17A
KITF250-103	Standard Seal Overhaul	1, 2, 6, 7, 8, 9, 12, 15, 17, 26, 27A
KITF250-104	Viton Seal Overhaul	1, 2, 6A, 7, 8A, 9A, 12, 15, 17A, 26, 27A