Aerospace
Defense
Energy

Energy products

Maintenance Manual

COUPLER ASSEMBLY, BOTTOM LOADING, 4 INCH

F228 Series

MMF228

Revision 2.1
January 20, 2017

Meggitt (North Hollywood), Inc. Proprietary Information

The information contained in this document is disclosed in confidence. It is the property of Meggitt (North Hollywood), Inc. and shall not be used, disclosed to others, or reproduced in whole or in part without the express written consent of Meggitt (North Hollywood), Inc. If consent is given, this notice shall appear in any such reproduction. These commodities, technology, or software were exported from the United States in accordance with the export administration regulations. Diversion contrary to U.S. law is prohibited.

SENSITIVE BUT UNCLASSIFIED-EXPORT CONTROLLED-EAR RESTRICTED.
These commodities, technology or software are exported from the United States of America in accordance with the Export Administration Regulations. ECCN EAR99. Diversion contrary to U.S. law is prohibited.

Copyright © 2017 Meggitt (North Hollywood), Inc.

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

REVISION RECORD

Keep this record in the front of the manual. When you get the revisions, put the revised pages in the manual. Write the revision number, date issued and your initials on this page.

Rev No.	PAGES AFFECTED	DESCRIPTION OF CHANGE	DATE	APPROVED BY
1.0	ALL	Initial Release	12/15/2002	
1.1	ALL	-	02/01/2006	
2.0	ALL	See DCN	08/23/2013	A.B
2.1	ALL	See DCN	03/01/2017	B. W

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Control Systems

Our product competencies & services:
Aerospace valves | Thermal management solutions | Environmental control systems | Electro-mechanical products
Ground fuelling products | Energy products | Aftermarket services

MEGGiTT
smart engineering for
extreme environments

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4" Bottom Loading Coupler Assembly–F228 Series

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Control Systems

Our product competencies & services:
Aerospace valves | Thermal management solutions | Environmental control systems | Electro-mechanical products
Ground fuelling products | Energy products | Aftermarket services

MEGGiTT
smart engineering for
extreme environments

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4" Bottom Loading Coupler Assembly–F228 Series

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS!

This manual contains important instructions that shall be followed during installation and maintenance of the Bottom Loading Coupler. The following are general safety precautions that are not related to specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during maintenance.

The Coupler is a mechanical device and can be dangerous if not correctly operated or maintained.

Safety Alert Symbols

Safety alert symbols are used in this manual to identify potential or immediate personal injury hazards. The safety alert symbol words are explained below:

⚠DANGER	- identifies an imminently hazardous situation which, if not avoided, will result in injury or serious injury.
⚠WARNING	- identifies a potentially hazardous situation which, if not avoided, could result in injury or serious injury.
⚠CAUTION	- identifies a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
CAUTION	- used without the safety alert symbol identifies a potentially hazardous situation which, if not avoided, may result in property damage.

WEAR PROTECTIVE CLOTHING

- Wear protective clothing (gloves, apron, etc.) approved for the materials and tools being used.

USE APPROVED SAFETY EQUIPMENT

- Use only approved equipment and make sure firefighting equipment is readily available.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

GIVE CLEANERS SPECIAL CARE

- When cleaners are being used read and obey the material safety data sheet (MSDS) instructions for correct handling.

Equipment Safety Information

The following safety information briefly discusses hazards peculiar to the equipment, which are likely to be encountered during maintenance activity.

COUPLER INSTALLATION AND OPERATION PRECAUTIONS

- The design of the piping system must provide sufficient pressure to prevent going more than the limits of the coupler.
- Make sure the coupler orientation is correct and install the coupler in-line with the flanges. Make sure the piping flanges are correctly positioned and spaced. Do not force the piping in order to fit the coupler.
- After installation, make sure the coupler operates correctly.
- Do not go more than the pressure limits of the coupler.

COUPLER MAINTENANCE PRECAUTIONS

- Do not loosen any fasteners or remove the coupler from the line until all pressure is isolated and released from the system.
- Use only authorized replacement parts or hardware.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

INTRODUCTION

1. General

The information and procedures contained in this manual have been prepared to assist qualified repair personnel in off-aircraft maintenance of the Bottom Loading Coupler. The instructions provide information necessary to accomplish maintenance functions. The coupler is manufactured by Meggitt (North Hollywood), Inc., 12838 Saticoy Street, North Hollywood, California 91605.

2. Scope

The instructions contained in this manual do not claim to cover all details or variations in equipment. They do not provide for every problem that could occur during installation, operation, or maintenance. If further information is required, contact Meggitt (North Hollywood), Inc., Product Support Department.

3. Standard Shop Practices

Use approved procedures and safety precautions to prevent damage to the equipment and injury to personnel.

4. Weights and Measurements

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

5. Revision Service

This manual will be revised, as necessary, to reflect current information.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Control Systems

Our product competencies & services:
Aerospace valves | Thermal management solutions | Environmental control systems | Electro-mechanical products
Ground fuelling products | Energy products | Aftermarket services

MEGGiTT
smart engineering for
extreme environments

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

DESCRIPTION AND OPERATION

1. Description

The Bottom Loading Coupler (coupler) (see Figure 1) is a push-on pull-off one-hand operation coupler designed to mate with adapters conforming to API Standard RP1004. The major functional components of the coupler are the coupler body, the poppet, the operating handle, the bail, and the crank mechanism. A floating nose seal provides positive sealing under all normal operating conditions.

2. Operation

A. Connecting the Coupler to the Adapter

The coupler may be connected to the adapter by pressing it forward onto the adapter. This actuates the three locks, and releases the spring-loaded shroud. The shroud slides forward and holds the locks in their locked position.

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 connected to the adapter, 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.

C. Disconnecting the Coupler from the Adapter

The coupler may be disengaged from the adapter by rotating its operating handle to the CLOSED position and pulling back on the bail arm to disengage the locks.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

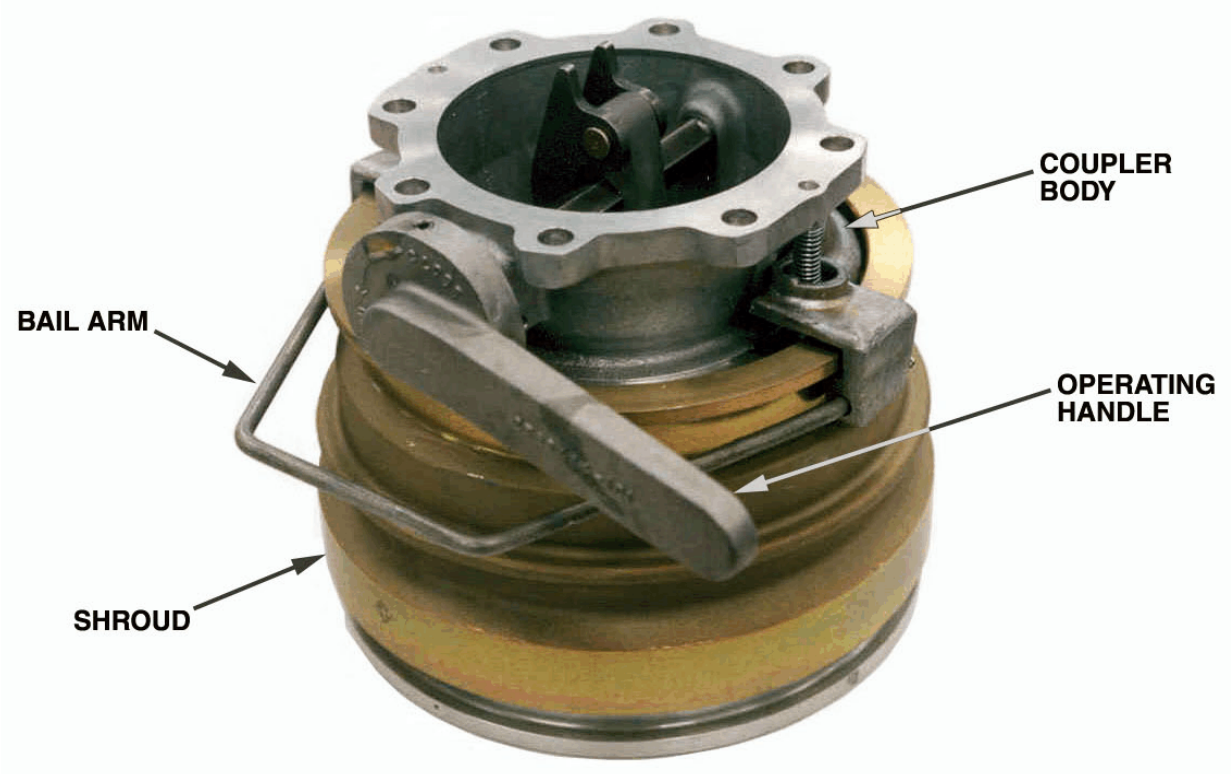


Figure 1. 4 Inch Bottom Loading Coupler Assembly

3. Leading Particulars

For the leading particulars refer to Table 1.

Table 1. Leading Particulars

Service Fluid	Automotive and Aviation Fuels
Line Size	4-inch (101.6 mm)
Operating Pressure	
Working	0 to120 psi (0 to 827 kPa)
Peak Surge	350 psi (2413 kPa)

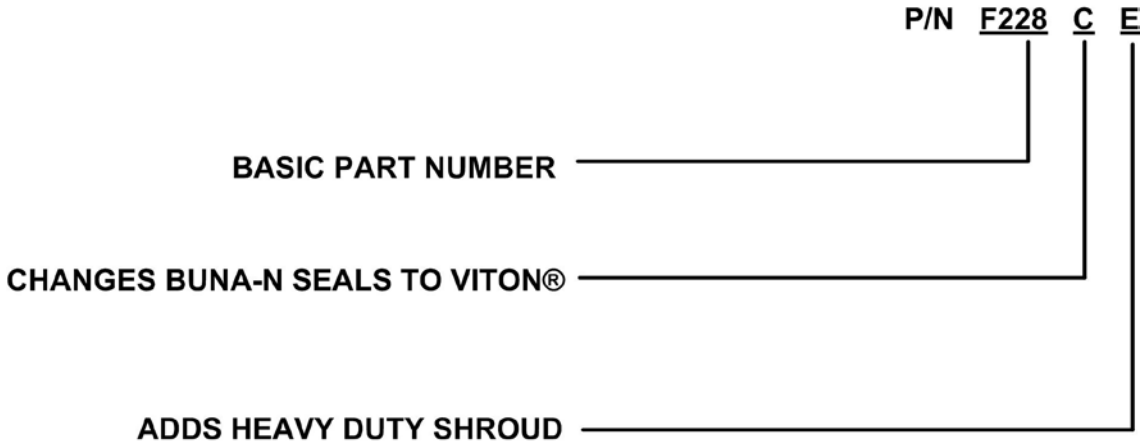
USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Table 1. Leading Particulars – cont.

Pressure Drop	4.7 psi (32.40 kPa) through F228/F433 at 1000 gpm (3785 lpm)
Fluid Temperature	-20 to 160°F (-29 to 71°C)
Ambient Temperature	-20 to 160°F (-29 to 71°C)
Key Dimensions	See Figure 3
Weight (approximate)	13.6 pounds (6.2 kg)

4. Model Variations

For model (Mod) variation refer to Table 2. The 'basic' F228 series coupler is equipped with standard seals. The Mod C variation uses fluorocarbon (Viton®) seals. The Mod E variation adds a stainless steel insert for heavy duty service (see Figure 2). Refer to the ILLUSTRATED PARTS LIST section for additional details.



P/N Example: F228CE – Basic F228 coupler is equipped with optional Viton® seals and heavy duty coupler.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Table 2. Model Variations

MOD LETTERS	DESCRIPTION
BASIC	4 Inch Bottom Loading Coupler
A	Adds 4 Inch NPT Internal Pipe Thread
B	Adds straight swivel (4 Inch NTT Flange)
C	Viton® Seals (-15 to 160°F [-26 to 71°C])
D	Adds F628B (180° Double Swivel, 4 Inch NTT Flanges)
E	Add Heavy Duty Shroud
F	Adds F628C (90° Single Swivel Assembly with 4 Inch Female NPT Flange)
G	Adds 90 Degree Single Swivel, 4 Inch NTT Flange F628 (Basic)
H	Adds 12.75 Inch Extension
J	Viton® GF Seals for Ethanol Fuel Blend (-15 to 160°F [-26 to 71°C]) (Special Order Only)
K	Adds 3 Inch NTT Flange
L	Adds 6 Inch Extension
N	Adds 3 Inch NPT Internal Pipe Threads
P	Adds 3 Inch BSP PL Internal Pipe Threads
Q	Adds 4 Inch BSP PL Internal Pipe Threads
R	Adds Wear Ring
T	Ethylene-Propylene (EPR) Seals for Acetone and Alcohol (-20 to 160°F [-29 to 71°C]) (Special Order Only)
W	Low Temperature Fluorocarbon/Fluoroelastomer (FKM) Seals (-40 to 160°F [-40 to 71°C]) (Special Order Only)
Y	As Basic without Wear Ring Retainer (Use Existing Parts Only)
Z	Obsolete Spares Coupling

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

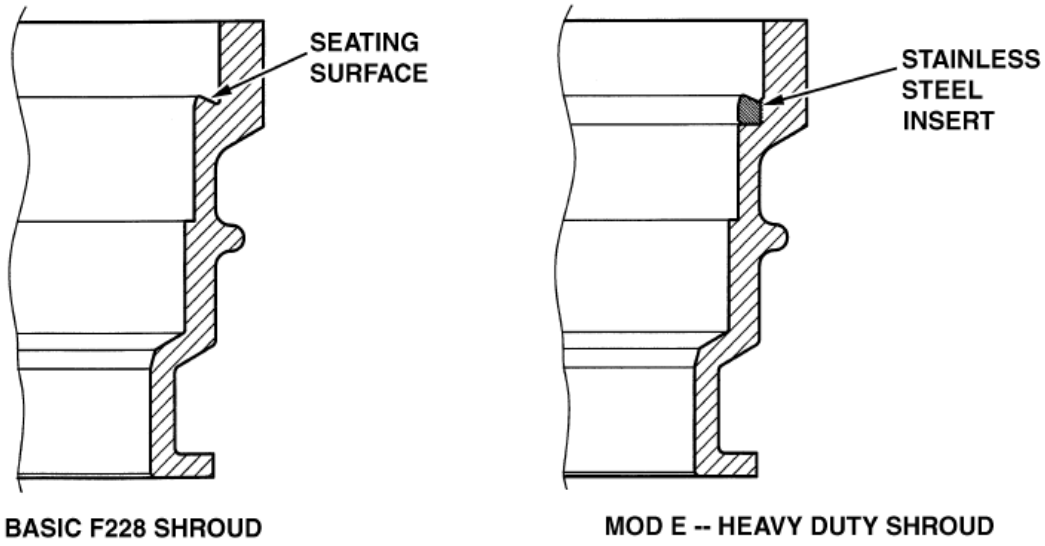


Figure 2. Shroud Variations

B. (Mod C) Fluorocarbon (FKM) (Viton®) Seal Notes

CAUTION **DO NOT MIX OR USE ACETONE WITH FLUOROCARBON SEALS AS SEALS WILL SWELL SIGNIFICANTLY.**

Fluorocarbon seals are not recommended for use in areas where the ambient temperature falls below 0°F (–18°C).

C. (Mod J) Fluorocarbon (FKM) (Viton® GF) Seal Notes

1) The Viton® GF seals are specially formulated to handle gasoline blends with 10% ethanol.

2) Temperature range for the coupler equipped with these seals range from -15 to 160°F (-26 to 71°C).

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

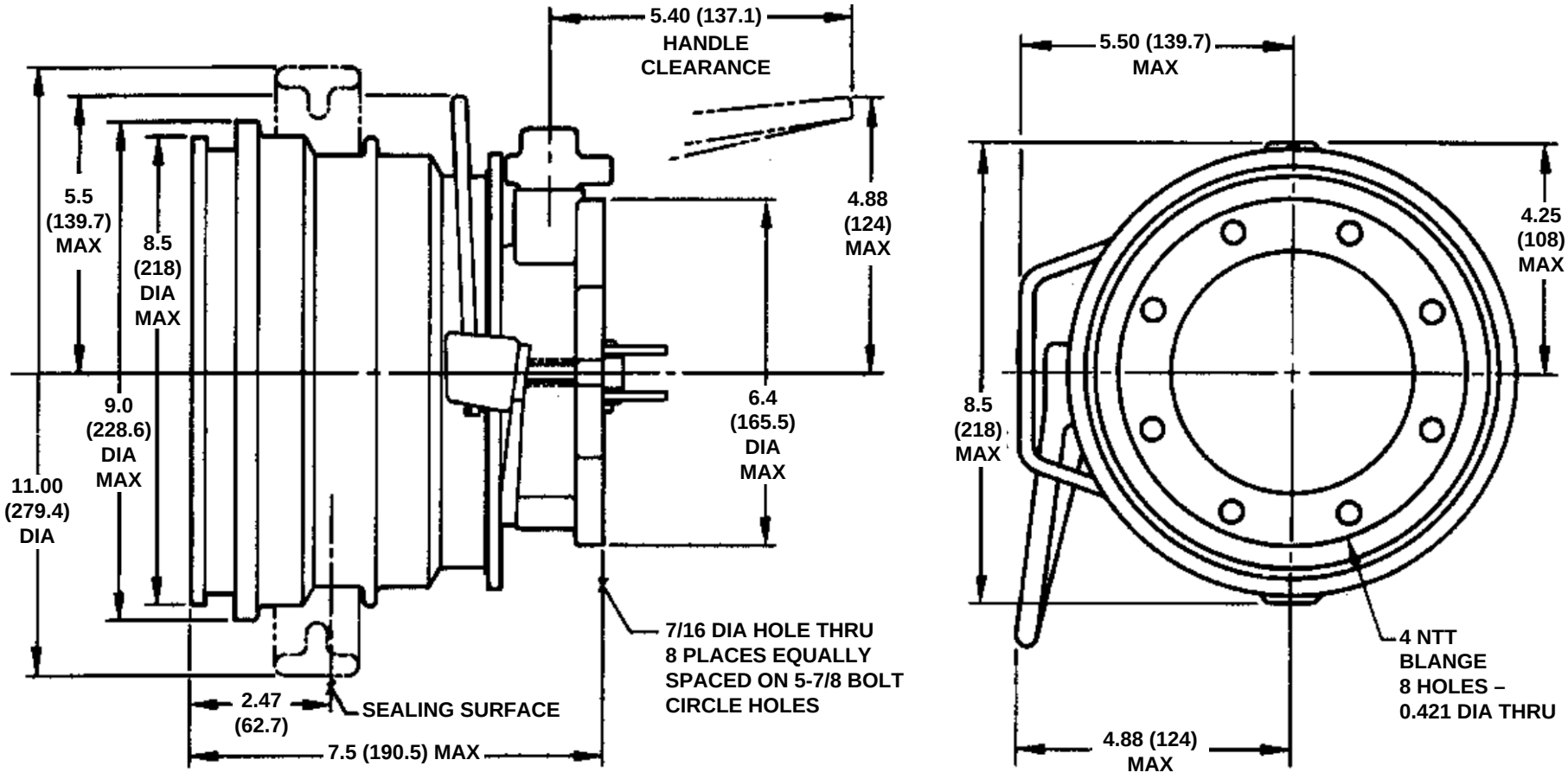


Figure 3. Envelope Dimensions

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

TESTING AND FAULT ISOLATION

1. General

This section establishes the procedures and requirements for testing. The F228 is a 4 inch bottom loading coupler with manual operated lever to open and close the coupler. The coupler consists of 3 latching mechanism to properly latch onto a 4 inch mating adapter.

2. Test Conditions

Except when otherwise specified, the temperatures and pressures shall be the prevailing atmospheric conditions. Fluid used in the follow test shall be air or PD680 Stoddard solvent.

3. Test Equipment

Before use the accuracy of all instruments shall be verified and shall be within their required calibration period. Tests equipment is listed in Table 3.

Table 3. Test Equipment

PARAMETER	UNIT/MEASUREMENT	INSTRUMENT TYPE	ACCURACY
Pressure Gauge	Pounds Per Square Inch Gauge (psig)	0 – 10 PSIG 0 – 100 PSIG 0 – 200 PSIG 0 – 500 PSIG	±1% of Full Scale ±1% of Full Scale ±1% of Full Scale ±1% of Full Scale
Time	Hour-min-second	Electronic Timer Stop Watch	±1% of reading ±5% of reading

Note 1: Calibration intervals are established and adjusted based on stability, degree of usage, etc., as defined in ANSI/NCSL Z540-1.

Note 2: Equivalent instruments may be used provided they are documented and approved.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

4. Test Procedures

A. Functional Test (See Figure 4)

1) Connect the unit to the applicable mating 4-inch API style adapter.

2) Turn the operating handle from OPEN to CLOSE 5 times.

3) Make sure the handle turns from OPEN to CLOSE freely.

4) Disconnect the unit from the mating adapter.

5) Requirement:

The handle shall rotate open and close freely without binding.

B. Proof Pressure Test (See Figure 5)

1) Seal the inlet of the unit with applicable flange on inlet of coupler.

2) Coupler shall be tested in CLOSE position.

3) Attach pressure source A to the inlet of unit.

4) Apply 10 ±5 psig (69 ±34.5 kPaG) of air pressure at pressure source A.

CAUTION COUPLER F228T MUST BE SUBMERGED IN WATER ONLY.

5) Put the unit in PD-680 solvent or water and wait for trapped air bubbles to dissipate.

6) Increase pressure to 305 ±5 psig (2103 ±34.5 kPaG) and test for 1 minute minimum.

7) Requirement:

Make sure there are zero air bubbles released from the unit.

8) Reduce pressure at end of the test.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

9) If leakage is found at the sealing locations, refer to DISASSEMBLY procedure to inspect seal assembly/repair unit and test unit again.

C. Leakage Test (See Figure 4)

1) Make sure the unit is connected to a mating 4-inch API style adapter that is capped and sealed.

2) Make sure the adapter sealing surface is in good condition for correct sealing.

3) Make sure the inlet flange on the unit is installed.

4) Attach pressure source A to the unit.

5) Turn the operating handle to the OPEN position.

6) Apply 10 ±5 psig (69 ±34.5 kPaG) pressure to the unit.

CAUTION COUPLER F228T MUST BE SUBMERGED IN WATER ONLY.

7) Put the unit in PD-680 solvent or water and wait for trapped air bubbles to dissipate.

8) Increase pressure to 205 ±5 psig (1413 ±34.5 kPaG) and test for 1 minute minimum.

9) Requirement:

Make sure there are zero air bubbles released from the unit.

10) Slowly decrease the pressure at end of test and remove test equipment.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

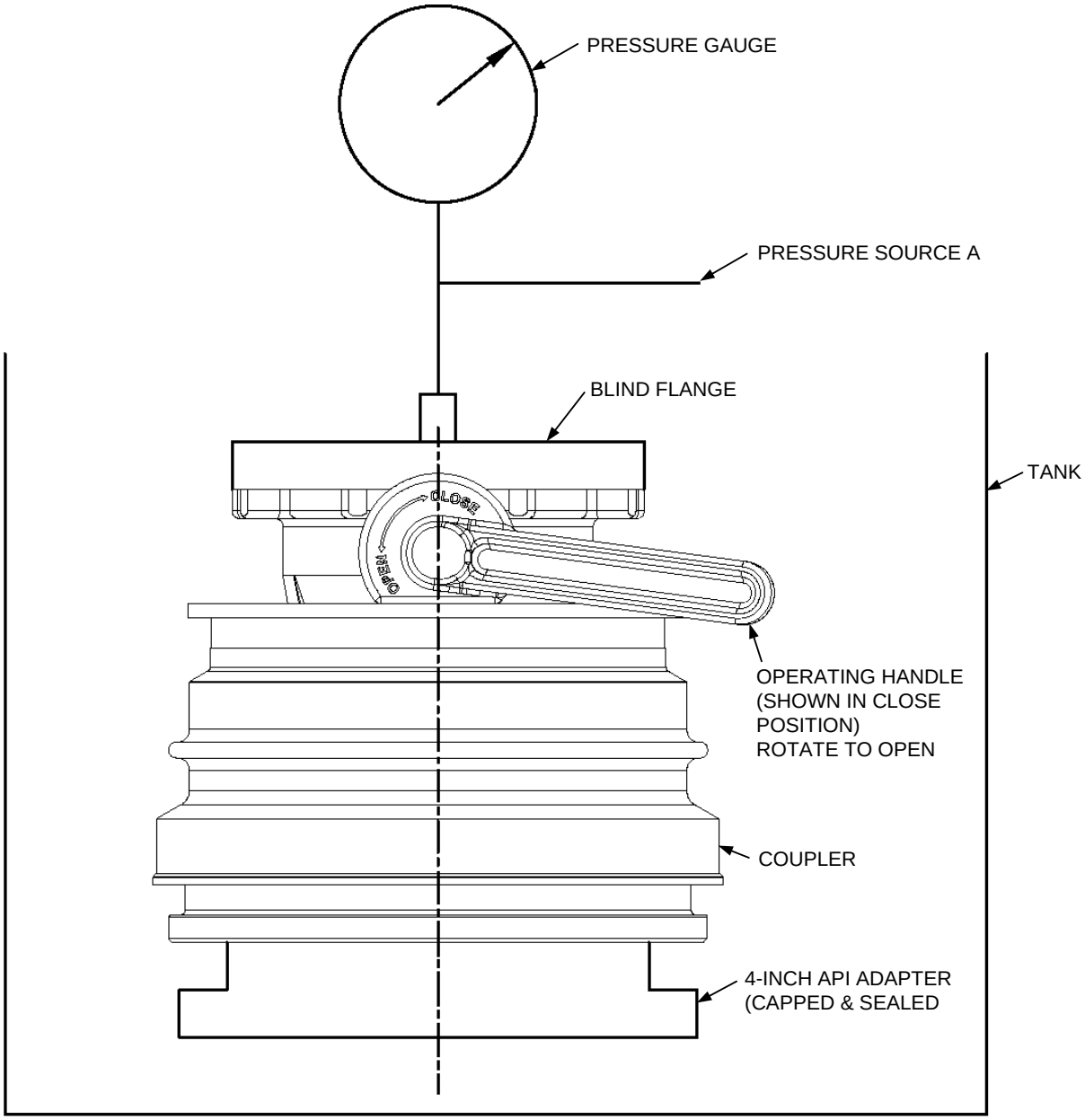


Figure 4. Functional and Leakage Test

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

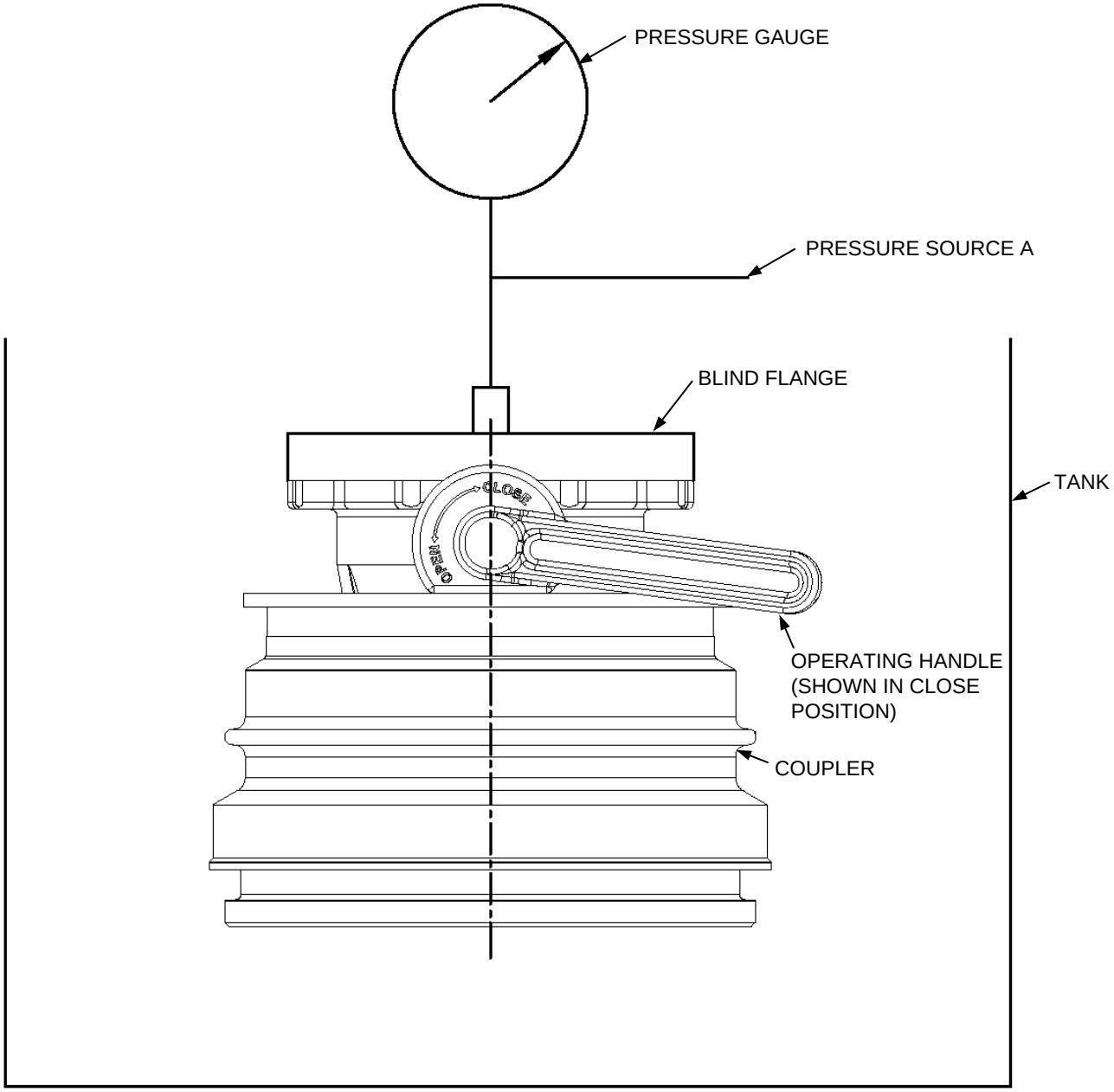


Figure 5. Proof Pressure Test

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

5. Fault Isolation

Operate the coupler in accordance with the Operation section, if the coupler fails to operate correctly refer to Table 4 and select the corrective action. Table 4 identifies the Fault, Probable Cause and Corrective Action.

Table 4. Fault Isolation

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
Leakage past poppet when closed	Damaged or worn seat (bonded) on sleeve (IPL Figure 1, 24)	Check condition and replace sleeve as necessary
Nose seal leakage	Damaged or worn nose seal (31)	Check condition and replace nose seal as necessary.
Leakage past sleeve	Damaged or worn packing (28)	Check condition and replace packing as necessary.
Leakage around operating handle shaft	Damaged or worn packing (20)	Check condition and replace packing as necessary.
	Damaged or worn slipper seal (20A)	Check condition and replace seal as necessary.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

DISASSEMBLY

1. Replacement Parts Kits

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

2. Disassembly Tools

Refer to Table 5 for recommended disassembly tools. Equivalent tools may be substituted for the items listed.

Table 5. Recommended Disassembly Tools

PART NUMBER	DESCRIPTION	APPLICATION
2702058	Adapter (API RP1004)	To drain the coupler/hose before removal.

3. Disassemble the Coupler (See IPL Figure 1)

A. Use an API-style adapter (2702058 or equivalent) without a poppet to release locks (16) and drain the coupler.

B. Unbolt the coupler from the adapter or hose connection. Remove the API-style adapter from the coupler.

C. Remove cotter pin (2) and bail arm (8) from bail (3). Discard cotter pin (2).

D. Remove retaining rings (4), pins (5), springs (6) and washers (7) from coupler body (26).

E. Remove bail (8) from coupler body (26).

F. Manually release locks (16) and slide shroud assembly (13) downward.

⚠WARNING **THE SLEEVE ASSEMBLY IS SPRING-LOADED. USE CARE WHEN RELEASING THE SPRING FORCE.**

G. Rotate operating handle (10) to OPEN and release spring force on sleeve assembly (24).

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

H. Remove straight pin (21), washer (33), and clevis pin (34) to release poppet (23), and remove poppet (23) from coupler body (26).

I. Remove sleeve assembly (24) from coupler body (26).

Note: If the sleeve assembly is difficult to remove; put coupler body (26) face down and gently tap out sleeve assembly (24) from the inlet side.

J. Remove wave washers (25) from coupler body (26).

K. Pry retainer (30) from sleeve assembly (24). Remove nose seal (31) from the sleeve assembly (24). Remove wiper (29) and packing (28) from the sleeve assembly (24). Discard packing (28) and nose seal (31).

L. With operating handle (10) in OPEN position, remove setscrew (21).

M. Drive pin (17) out of coupler body (26).

N. Put seal guide tool (AT-6476-1) into dowel pin hole (see Figure 8), and seal guide tool (AT-6476-2) into flange bolt hole of coupler body (IPL Figure 1, 26). Align grove of seal guide tool (AT-6476-1) with the inside diameter of coupler body's (26) handle bore; then remove assembled operating handle (10 [along with items 9, 11, 12, 18, 19, 20, 20A and 27]) from coupler body (26).

Note: For assembly reference; write down the relative positions of crank (35) and links (36).

O. Remove pin (9) out of operating handle (10). Remove operating handle (10), washer (11), wiper (12), bushing (18), washers (19), packing (20) and seal (20A) from shaft (27). Discard wiper (12), packing (20) and seal (20A).

P. Remove cotter pin (32), washer (33) and clevis pin (34) from crank (35) and links (36). Discard cotter pin (32).

Q. Put API-style adapter (2702058 or equivalent) onto coupler body (26) to unlatch locks (16). Slide shroud assembly (13) up and away from coupler body (26).

R. Remove locks (16) and spring (15) from coupler body (26).

S. Remove and discard wiper (14) from shroud (13).

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

CLEANING

1. Cleaning Materials

Refer to Table 6 for recommended cleaning materials. Suitable equivalent cleaning materials may be substituted for the items listed.

Table 6. Recommended Cleaning Materials

DESCRIPTION	SPECIFICATION	SOURCE
Alcohol, Isopropyl	ASTM D770	Commercially available
Bags, Plastic	-	Commercially available
Brush, Bristle, Stiff, Non-metallic	-	Commercially available
Pick, Teflon®	-	Commercially available
Solvent, Dry Cleaning	P-D-680, Type 2	Commercially available
Tissues, Lint-free	-	Commercially available

2. Cleaning Procedures

⚠WARNING

DRY CLEANING SOLVENT AND ISOPROPYL ALCOHOL ARE HAZARDOUS MATERIALS. BEFORE USE, READ AND OBEY THE MATERIAL SAFETY DATA SHEET (MSDS) INSTRUCTIONS FOR CORRECT HANDLING. FAILURE TO OBEY THIS WARNING MAY RESULT IN PERSONAL INJURY, LONG TERM HEALTH HAZARDS OR DEATH.

DO NOT USE ACETONE TO CLEAN ANY SEALS AS IT CAN DAMAGE THE SEALS.

A. Clean all of the metal parts by washing them thoroughly in dry cleaning solvent. Remove any stubborn deposits by scrubbing them with a non-metallic stiff bristle brush. Use a Teflon® pick to remove any blockage from the ports, grooves and flow passages.

B. Clean all of the non-metallic parts by wiping them with clean lint-free tissues slightly moistened with isopropyl alcohol.

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

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

WARNING

WEAR EYE PROTECTION WHEN USING COMPRESSED AIR. DO NOT DIRECT AIRSTREAM AT PERSONNEL OR LIGHT METAL PARTS.

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

D. Package all of the clean parts in plastic bags.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

CHECK/INSPECTION

1. General

Under strong light and magnification, look at all parts in accordance with the general criteria specified in paragraph 2.

Repair minor damage in accordance with local directives. If damage is major or beyond simple repair, replace the part.

2. Component Checks (Refer to Table 7)

Table 7. Component Checks

DESCRIPTION	INSPECTION CRITERIA
General	Look at the parts for; nicks, cracks, cuts, burrs, corrosion, breaks, scoring, chafing, scarring, deformation, dents, thread damage, serration damage, or other damage. Make sure the ports, passages, recesses, and grooves are clean and are not blocked. Make sure all sealing and seating surfaces are free from damage or corrosion.
Slipper Seal (20A)	Make sure slipper seal is free from any damage or excessive wear.
Nose Seal (31)	Make sure nose seal is free from any damage or excessive wear.
Sleeve Assembly (24)	Make sure the bonded seal on the sleeve assembly is free from any damage or excessive wear.
Clevis Pins (34)	Make sure there are no wear grooving from contact with the links (36).
Coupler Body (26)	Make sure sealing interface on body is free of nicks/scratches.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

ASSEMBLY

1. Replacement Parts Kits

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

2. Assembly Tools

Refer to Table 8 for recommended assembly tools. Equivalent tools may be substituted for the items listed.

Table 8. Recommended Assembly Tools

PART NUMBER	DESCRIPTION	APPLICATION
AT-6476	Seal Guide Tool	To install assembled handle with slipper seal
2702058	Adapter (API RP1004)	To aid in assembly of coupler/hose.

3. Repair Materials

Refer to Table 9 for recommended assembly materials. Suitable equivalent materials may be substituted for the items listed.

Table 9. Recommended Assembly Materials

DESCRIPTION	SPECIFICATION	SOURCE
Petroleum Jelly	--	Commercially available
Thread Locking Compound	Loctite, Grade 242	Commercially available

4. Assemble the Coupler

A. Assembly Procedure (See IPL Figure 1)

Note: Check condition of wiper (14) and replace as necessary.

1) Put wiper (14) onto coupler body (26).

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

CAUTION USE CARE WHEN USING LONG NOSE PLIERS, TO AVOID DAMAGING THE SPRING (15). THE WIRE SHALL NOT BE MARKED OR SCRATCHED.

2) See Figure 6 and install springs (IPL Figure 1, 15) and locks (16) in coupler body (26) as follows:

Note: Long nose pliers may be used to close the spring loop during installation of a spring in the body.

a) Push the loop of spring (15) into the hole in coupler body (26), with the two tangs resting on the top surface. Push spring (15) in as far as possible, so the two tangs contact the coupler body (26) surface. The loop of the spring (15) shall be a tight press fit in the hole.

b) Position lock (16) in its groove on coupler body (26); spring anchor end inward to contact the ends of the two tangs of spring (15). Lift and place the ends of the spring tangs into the groove of the lock (16). Push lock (16) inward and rotate it into position. Make sure the two spring tangs are in their correct positions and lock (16) rotates freely.

Note: Do steps, a and b to the remaining springs (15) and locks (16).

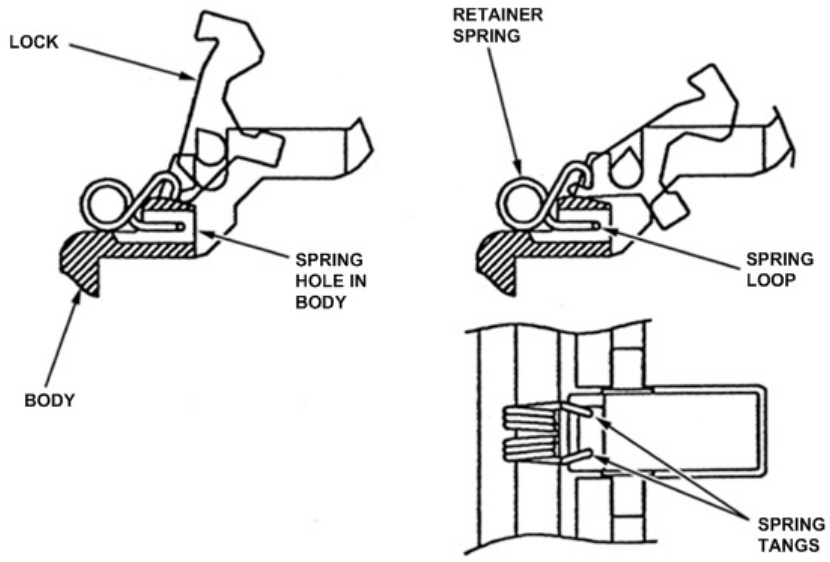


Figure 6. Springs and Locks Installation

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

3) Slide shroud (IPL Figure 1, 13) over coupler body (26) and engage locks (16).

4) Assemble operating handle (10) containing items (9, 11, 12, 18, 19, 20, 20A and 27) as follows:

   a) Put one washer (19) onto handle shaft (27).

   b) Put new seal (20A) onto handle shaft (27).

CAUTION BEFORE INSTALLING PACKING (20). MAKE SURE ALL BURRS ARE REMOVED ON HOLE LOCATED ON HANDLE SHAFT (27), AS IT MAY DAMAGE THE PACKING (20) AND CAUSE LEAKAGE.

   c) Lubricate new packing (20) with petroleum jelly and put onto handle shaft (27).

   d) Put second washer (19) onto handle shaft (27).

      Note: Check condition of bushing (18), and replace as necessary.

   e) Put bushing (18) onto handle shaft (27).

   f) Put new wiper (12) onto handle shaft (27).

   g) Put flat washer (11) onto handle shaft (27).

   h) Put operating handle (10) onto handle shaft (27) and align holes on operating handle (10) with hole on handle shaft (27).

   i) Press spring pin (9) through hole of operating handle (10) and handle shaft (27).

      Note: The pin (9), see Figure 7, must be flush or the flat side on operating handle (IPL Figure 1, 10).

5) Put links (36) onto crank (35) and install one clevis pin (34), one washer (33) and secure with new cotter pin (32).

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

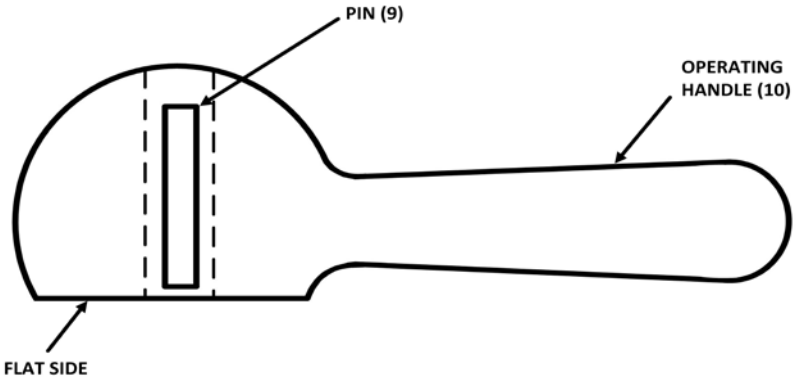


Figure 7. Spring Pin Installation

CAUTION

BEFORE INSTALLING THE ASSEMBLED OPERATING HANDLE (10) THROUGH COUPLER BODY (IPL FIGURE 1, 26); MAKE SURE ALL BURRS ARE REMOVED AT THE HOLE LOCATION ON COUPLER BODY (26) WHERE SPRING PIN (17) IS INSTALLED. BURRS ON THE COUPLER BODY (26) CAN DAMAGE PACKING (20) DURING INSTALLATION AND CAUSE LEAKAGE.

6) Put seal guide tool (AT-6476-1) into dowel pin hole (see Figure 8), and seal guide tool (AT-6476-2) into flange bolt hole of coupler body (IPL Figure 1, 26). Align grove of seal guide tool (AT-6476-1) with the inside diameter of the coupler body's (26) handle bore; then slide assembled operating handle (10 [containing items 9, 11, 12, 18, 19, 20, 20A and 27]) through coupler body (26) and then through hex of crank (35).

   Note: Record the position of the crank (35) relative to the handle shaft (27) when it was disassembled.

7) Secure assembled operating handle (10) to coupler body (26) with spring pin (17).

8) Make sure the operating handle (10) and links (26) are in the correct position when closing and opening the operating handle (10).

9) Rotate operating handle (10) to the OPEN position to lower the links (36).

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

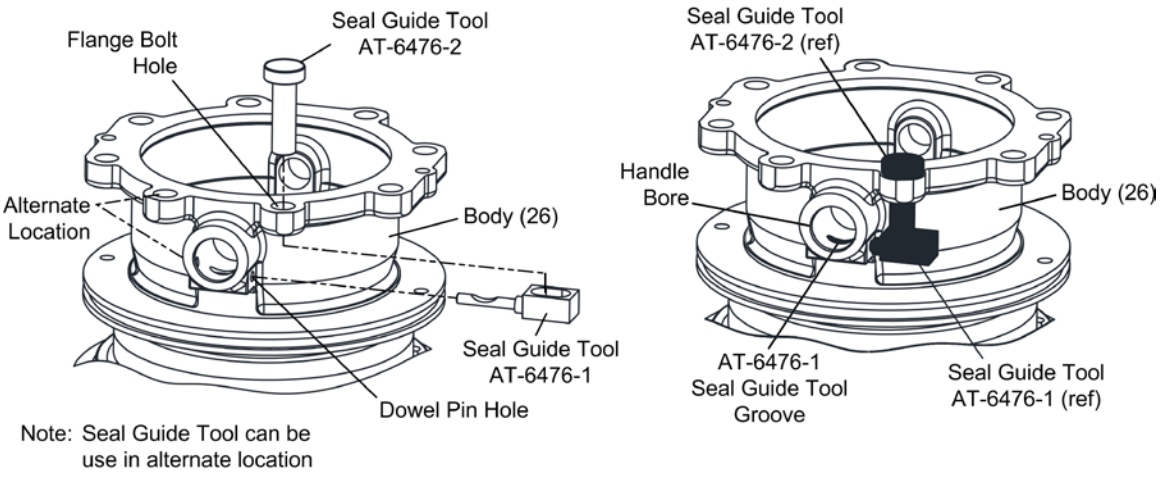


Figure 8. Assembled Handle/Seal Guide Detail

10) Press on the three locks (IPL Figure 1, 16) together; to disengage locks (16) from shroud (13). Slide shroud (13) downward.

11) Assemble new nose seal (31) containing items (24, 28, 29, and 30) as follows:

    a) Put new nose seal (31) in the applicable groove on sleeve assembly (24) and secure with retainer (30).

       Note: Check condition of wiper (29), and replace as necessary.

    b) Put wiper (29) onto sleeve assembly (24).

    c) Apply petroleum jelly to back of new packing (28) and put on sleeve assembly (24).

12) Put wave washers (25) on assembled nose seal (31) in coupler body (26).

13) Align poppet (23) with coupler body (26) and links (36).

14) Secure poppet (23) to links (36) with pin (34), washer (33), and straight pin (22).

15) Apply thread locking compound (Grade 242) to the threads of setscrew (21) and install in crank (35). Tighten setscrew (21) to secure its position on shaft (27). Torque setscrew (21) 88 ±2 in-lbs (9.9 ±0.2 Nm) plus running torque.

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

16) Rotate operating handle (IPL Figure 1, 10) to the CLOSED position to secure the assembled nose seal and the poppet.

17) Slide bail (3) over the outside diameter of the shroud (13); put washers (7), springs (6), and pins (5) through coupler body (26) and install retaining rings (4) to secure pins (5).

18) Install bail arm (8) onto bail (3) and secure with new cotter pins (2).

19) Lift bail arm (8) upwards to slide shroud (13) up to engage the locks (16).

20) Attached the coupler body (26) to an API-style adapter (2702058, or equivalent) without poppet. Lower shroud (13).

21) Turn operating handle (10) from OPEN to CLOSED several times to make sure it operates correctly.

22) Turn operating handle (10) to CLOSED. Lift bail arm (8) upwards to slide the shroud (13) up to engage locks (16). Remove the API-style adapter and test (refer to TESTING section).

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

ILLUSTRATED PARTS LIST

1. General

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

2. Scope of Information

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.

A. Modification Code

The modification code indicates the parts usage with respect to the end item. When the MOD column is blank, the part usage is applicable to all versions unless otherwise specified in the DESCRIPTION column.

B. How to Identify a Part

When the part number is known: Refer to the parts list for the item number, description, modification codes, and quantity. Refer to the illustration to make sure of the physical appearance and location of the part.

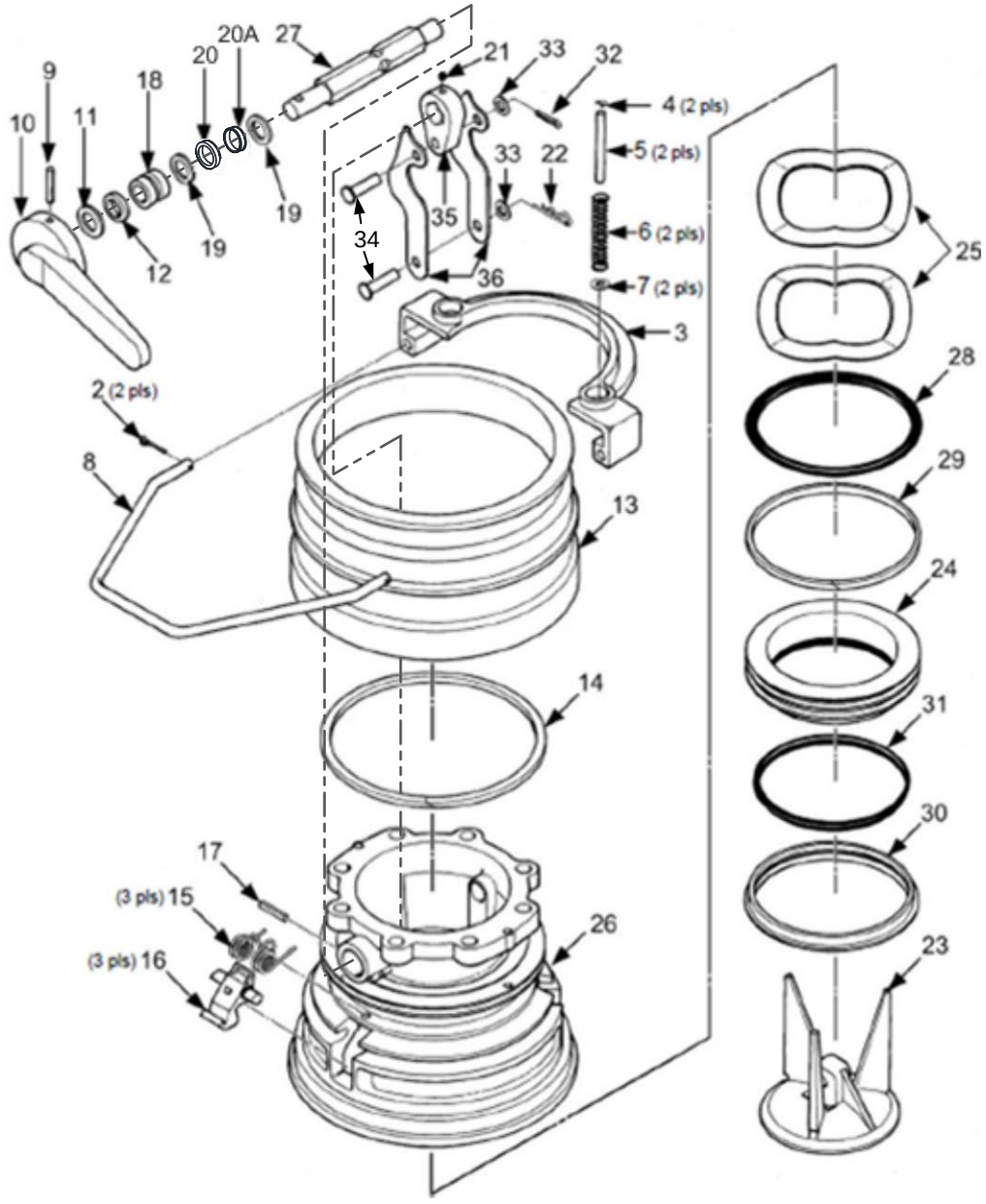
When the part number is not known: Examine the illustrations to identify the part by physical appearance and location. Refer to the accompanying parts list to get the part number, nomenclature, modification codes, quantity, etc.

C. Abbreviations

ASSY	Assembly	IPL	Illustrated Parts List
BSP	British Standard Pipe	MOD	Modification
EPR	Ethylene-Propylene	NPT	National Pipe Thread
FIG.	Figure	PL	Parallel
FKM	Fluoroelastomer	RF	Reference

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series



IPL Figure 1. Coupler Assembly, Bottom Loading, 4 Inch

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS PER ASSY
1 - 1	F228	COUPLER ASSY, BOTTOM LOADING, 4 IN.		RF
2	MS24665-210	. PIN		2
3	2773212-101	. BAIL		1
4	MS16625-1025	. RETAINER (ALT MS16625-4025)		2
4	MS16625-4025	. RETAINER (ALT TO MS16625-1025)		RF
5	2773214-101	. PIN		2
6	LC042E17	. SPRING, COMPRESSION ..... (ALT C0360-042-2250)		2
6	C0360-042-2250	. SPRING, COMPRESSION ..... (ALT TO LC042E17)		RF
7	AN960-416L	. WASHER, FLAT		2
8	2773211-101	. ARM, BAIL		1
9	MS171660	. PIN, SPRING		1
10	2763484-101	. HANDLE, OPERATING		1
11	AN960-916L	. WASHER, FLAT		1
12	2763494-101	. WIPER		1
13	2773207-101	. SHROUD (NOT USED ON MODS E, Y, Z)		1
13	971027-101	. SHROUD ASSY	E	1
13	2773207-103	. SHROUD.....	Y	1
13	2773207-102	. SHROUD (OBSOLETED)	Z	1
14	MS28932C20-8	. WIPER		1
15	2763491-101	. SPRING (REPLACED BY 941016-101)		RF
15	941016-101	. SPRING (SEE SERVICE BULLETIN 76)		3
16	2763487-101	. LOCK		3
17	MS171594	. PIN, SPRING		1
18	2763492-101	. BUSHING.....		1
19	2763493-101	. WASHER		2
20	2661058A207	. PACKING, PREFORMED..... (NOT USED ON MODS C, T, J, W)		1
20	2661058AF207	. PACKING, PREFORMED.....	C	1
20	2661058H207	. PACKING, PREFORMED.....	T	1

- Not Illustrated

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS PER ASSY
1 20	2661058CB207	. PACKING, PREFORMED	J	1
20	2661058CD207	. PACKING, PREFORMED	W	1
20A	F430731	. SEAL, SLIPPER		1
21	LP565A428H4	. SETSCREW		1
22	98335A054	. PIN, STRAIGHT		1
23	2763483-101	. POPPET		1
24	2763489-101	. SLEEVE ASSEMBLY (NITRILE)..... (NOT USED ON MODS C, T, J, W)		1
24	2763489-102	. SLEEVE ASSEMBLY (FLUOROCARBON)	C	1
24	2763489-103	. SLEEVE ASSEMBLY (ETHYLENE-..... PROPYLENE)	T	1
24	2763489-105	. SLEEVE ASSEMBLY ..... (VITON® GF FLUOROCARBON)	J	1
24	2763489-111	. SLEEVE ASSEMBLY (FLUOROCARBON)	W	1
25	W4997-050	. WASHER, WAVE		2
26	2773209-101	. BODY, COUPLER (NOT USED ON MOD Z).....		1
26	2773209-102	. BODY, COUPLER (OBSOLETED)	Z	1
27	2763496-101	. SHAFT, HANDLE		1
28	2661058BD350	. PACKING, PREFORMED (NITRILE)..... (NOT USED ON MODS C, T, J, W)		1
28	2661058AF350	. PACKING, PREFORMED (FLUOROCARBON)	C	1
28	2661058H350	. PACKING, PREFORMED ..... (ETHYLENE-PROPYLENE)	T	1
28	2661058CB350	. PACKING, PREFORMED (HI FLUOR).....	J	1
28	2661058CD350	. PACKING, PREFORMED (FLUOROCARBON)	W	1
29	MS28932C15-5	. WIPER.....		1
30	2672293	. RETAINER		1
31	2672292-1	. SEAL, NOSE (NITRILE)..... (NOT USED ON MODS C, T, J, W)		1
31	2672292-2	. SEAL, NOSE (FLUOROCARBON)	C	1
31	2672292-4	. SEAL, NOSE (ETHYLENE PROPYLENE)	T	1
31	2672292-6	. SEAL, NOSE (VITON® GF FLUOROCARBON) ...	J	1

- Not Illustrated

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS PER ASSY
1 31	2672292-7	. SEAL, NOSE (FLUOROCARBON)	W	1
32	MS24665-300	. PIN, COTTER		1
33	AN960-516L	. WASHER, FLAT		2
34	MS20392-4C33	. PIN, CLEVIS		2
35	2733269-1	. CRANK		1
36	2763497-102	. LINK		2
- 37	2711586-1	. FLANGE	A	1
- 38	2711546	. GASKET	A, B, D, F-H, K, L, N, P, Q	1
- 39	MS90725-64	. BOLT, HEX HEAD	A, B, H, K, L, P	8
- 39	MS90725-62	. BOLT, HEX HEAD	F, N, Q	8
- 40	AN960-616	. WASHER, LOCK	A, D, F, G, H, L, N, P, Q	8
- 40	AN935-616L	. WASHER, LOCK	B, K	8
- 41	MS35691-17	. NUT	A, B, F, H, L, N, P, Q	8
- 41	MS35649-2382	. NUT	K	8
- 42	2706000-518-12	. SCREW, CAP HEX HEAD	B	8
- 43	2711671	. BEARING	B	1
- 44	2711672-1	. BEARING RING SET	B	1
- 45	2711674	. FLANGE	B	1
- 46	2711675-1	. SEAL, DUST	B	1
- 47	2732291-1	. SEAL	B	1
- 49	2734501	. FLANGE	B	1
- 50	F628	. SWIVEL ASSY	G	1
- 50	F628B	. SWIVEL ASSY, DOUBLE	D	1
- 50	F628C	. SWIVEL ASSY, SINGLE	F	1
- 51	MS90725-60	. BOLT, HEX HEAD	D	7
- 52	MS35691-17	. NUT	D, G	1
- 53	AN565-616H24	. SETSCREW	D, G	1
- 54	MS90725-64	. BOLT, HEX HEAD	G	7

- Not Illustrated

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS PER ASSY
1 - 55	2711622-1	. EXTENSION (ALT 2891011-101)	H	1
- 55	2891011-101	. EXTENSION (ALT TO 2711622-1)	H	RF
- 55	2734972	. EXTENSION (ALT 2891011-111)	L	1
- 55	2891011-111	. EXTENSION (ALT TO 2734972).....	L	RF
- 56	2734138	. RING, ADAPTER.....	K	1
- 57	2775191-101	. FLANGE	N	1
- 57	2775191-103	. FLANGE	P	1
- 57	2711586-2	. FLANGE	Q	1
- 58	2783400-101	. RING, WEAR.....	R	2
- 59	MS35649-2252	. NUT, HEX HEAD.....	R	4
- 60	MS51957-86	. SCREW	R	4

- Not Illustrated

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT

Meggitt Fuelling Products
Maintenance Manual (MMF228)
4” Bottom Loading Coupler Assembly–F228 Series

REPLACEMENT PARTS KITS AVAILABLE			
KIT PART NUMBER	**DESCRIPTION**	**APPLICABLE TO**	**ITEMS IN KIT (IPL Figure 1)**
KITF228-101	Wear Ring Kit	F228R	58, 59, and 60
KITF228-102	Seal Kit (Buna® N)	Basic	20, 20A, 28, and 31
KITF228-103	Overhaul Kit (Buna® N)	Basic	2, 4, 5, 9, 12, 14, 17, 18, 20, 20A, 21, 22, 24, 28, 31, and 34
KITF228-104	Viton® Conversion Kit	F228C	20, 20A, 24, 28, and 31
KITF228-105	E.P.R Conversion Kit	F228T	20, 20A, 24, 28, and 31
KITF228-106	Viton® Overhaul Kit	F228C	2, 4, 5, 9, 12, 14, 17, 18, 20, 20A, 21, 22, 24, 28, 31, and 34
KITF228-107	Viton® Seal Kit	F228C	20, 20A, 28, and 31
KITF228-108	Conversion Kit for MTBE	F228J	20, 20A, 24, 28, and 31
KITF228-109	Viton® GF Seal Kit	F228J	20, 20A, 28, and 31
KITF228-110	Viton® GF Seal Overhaul Kit	F228J	2, 4, 5, 9, 12, 14, 17, 18, 20, 20A, 21, 22, 24, 28, 31, and 34
KITF228-111	Fluorocarbon FKM (Low Temp) Seal Kit	F228W	20, 20A, 24, 28, and 31
KITF228-112	Fluorocarbon FKM (Low Temp) Overhaul Kit	F228W	2, 4, 5, 9, 12, 14, 17, 18, 20, 20A, 21, 22, 24, 28, 31, and 34

USE OR DISCLOSURE OF DATA ON THIS PAGE IS SUBJECT TO THE RESTRICTIONS ON THE TITLE PAGE OF THIS DOCUMENT