
Maintenance Manual

SERVICING NOZZLE

F1116 Series

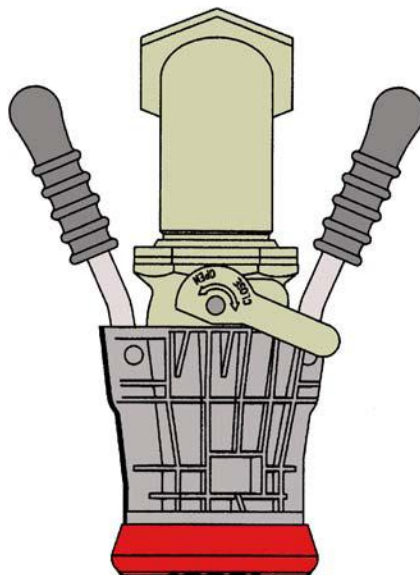
MMF1116

F1116ER [D2] [MS29520-2] [NSN 4930-00-318-1479]

F1116ES [D1] [MS29520-1] [NSN 4930-00-458-5914]

Revision 2.0

06 September 2013



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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	01/01/2002	
1.1	ALL	-	03/15/2002	
1.2	ALL	-	02/01/2006	
2.0	ALL	See DCN	09/06/2013	

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS!

This manual contains important instructions that shall be followed during installation and maintenance of the Fuel and Oil Servicing Nozzle (nozzle). 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 nozzle 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:



- indicates an imminently hazardous situation which, if not avoided, will result in injury or serious injury.



- indicates a potentially hazardous situation which, if not avoided, could result in injury or serious injury.



- indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



- used without the safety alert symbol indicates 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.

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GIVE CLEANERS SPECIAL CARE

- When cleaners are being used read and follow 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.

GENERAL OPERATING LOCATION PRECAUTIONS

- Use only authorized replacement parts or hardware.
- Obey Lock-Out/Tag-Out procedures when working on the nozzle.

OPERATION AND MAINTENANCE OF FUEL SYSTEMS

- Protect all fuel lines from damage or puncture. Do not operate the nozzle if a fuel leak is detected.
- Do not use flammable solvents for cleaning parts.
- Check for tools, rags, or loose parts left in the area before resuming operation.
- Do not attempt to remove the nozzle from the system without first isolating it from the line pressure and venting all of the trapped internal pressure.

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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 Fuel and Oil Servicing Nozzle (nozzle). The instructions provide information necessary to perform maintenance functions. The nozzle 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.

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DESCRIPTION AND OPERATION

1. Description

The Fuel and Oil Servicing Nozzle (nozzle) (See [Figure 1](#)) provides the means of controlling the flow of fuel in pressure fuelling operations. The nozzle inlet port couples to a fuelling hose. The outlet port attaches to the inlet adapter of the system being fueled. The nozzle provides a leak proof connection between the system being fueled and the fuel supply.

2. Operation

A. Uncoupled

When the nozzle is not coupled to a mating fuel system inlet adapter, its poppet valve is closed, so that there is no flow or leakage of fuel from the outlet port. The flow control handle that operates the poppet valve remains locked in the CLOSED position until the nozzle is coupled to the mating fuel system inlet adapter.

B. Coupling and Opening

When the nozzle is coupled to the mating fuel system inlet adapter, the nose seal of the nozzle is compressed against the sealing surface of the inlet adapter to form a fluid-tight connection. When the nozzle is fully engaged and locked to the bayonet flange of the inlet adapter, the flow control handle is unlocked. Rotation of the flow control handle to the OPEN position opens the poppet valve, providing a flow passage into the system being fueled. As the system is being fueled, fuel pressure acts on the floating nose seal of the nozzle to increase the sealing force.

C. Closing and Uncoupling

Rotation of the flow control handle to the CLOSED position closes the poppet valve and the flow passage into the system being fueled. When the nozzle is unlocked and disengaged from the bayonet flange of the inlet adapter, the flow control handle is locked in the CLOSED position.

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P/N F1116ES SHOWN

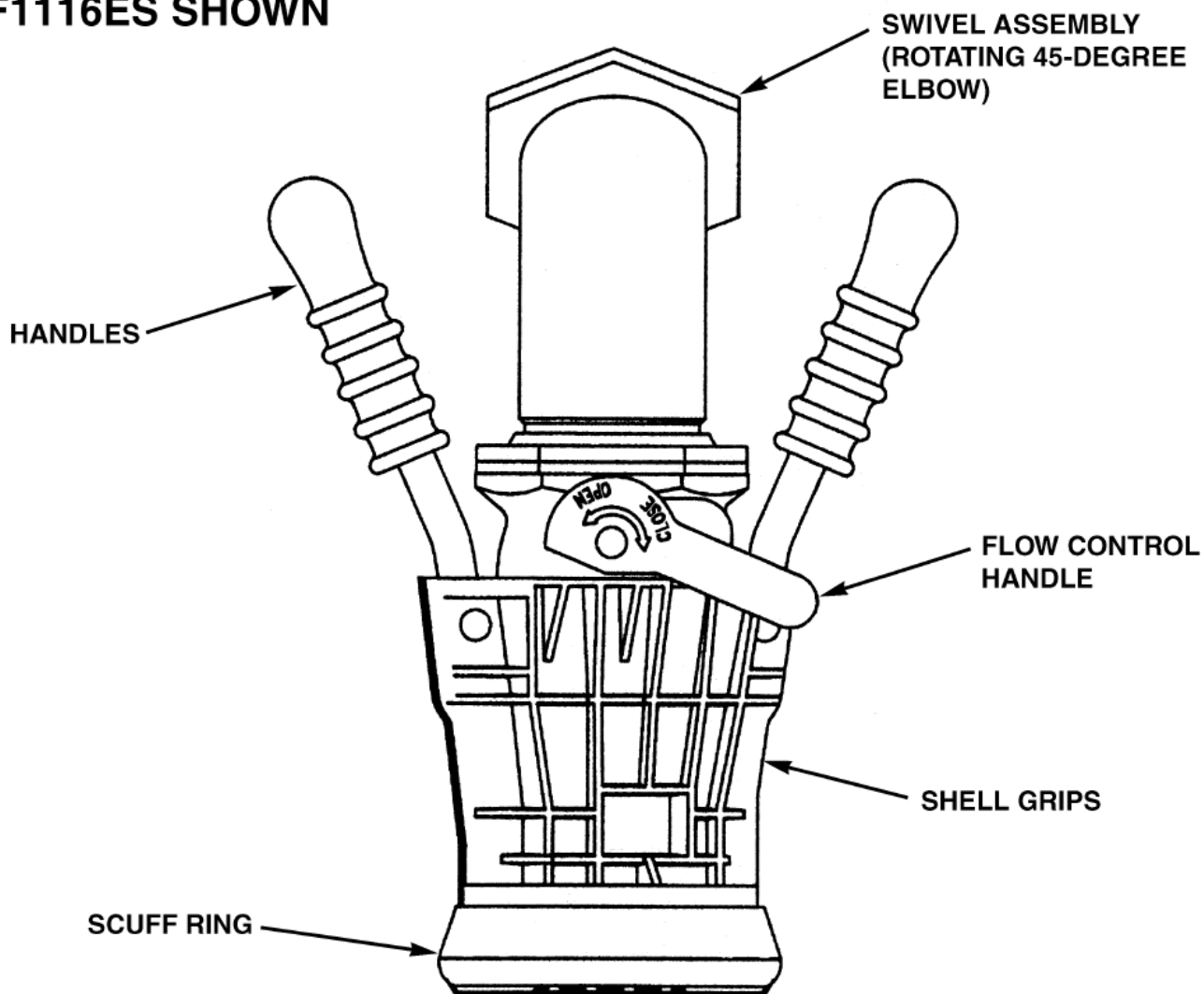


Figure 1. Fuel and Oil Servicing Nozzle

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3. Leading Particulars

For the leading particulars refer to [Table 1](#).

Table 1. Leading Particulars

Service	Automotive and Aviation Fuels
Tube Size	2.5 inch (63.5 mm)
Rotating Inlet Swivel Assembly	
Part Number F1116ER	Straight-In
Part Number F1116ES	Elbow, 45-degree
Operating Pressure	(maximum) 60 psi (4.1 bar)
Nozzle Rotation for Full Engagement	37.5 degrees
Flow Control Handle Rotation	220 degrees (Fully Closed to Fully Open)
Mating Pressure Fuel Servicing Adapter	per MS24484
Inlet Flange	per MS33786-40
Fuel Sampling Ports	2 each, 0.375-18 NPT (For use with Gammon GTP-235-F115 Coupler)
Fluid Temperature	-40 to 165°F (-40 to 74°C)
Ambient Temperature	-40 to 165°F (-40 to 74°C)
Specification/Standard Conformance	MIL-N-5877E
Part Number F1116ER	MS29520-2, Type D2
Part Number F1116ES	MS29520-1, Type D1
Protective Closure	Dust cover with lanyard
Dimensions	See Figure 2
Weight (approximate)	11.2 pounds (5.1 kg)

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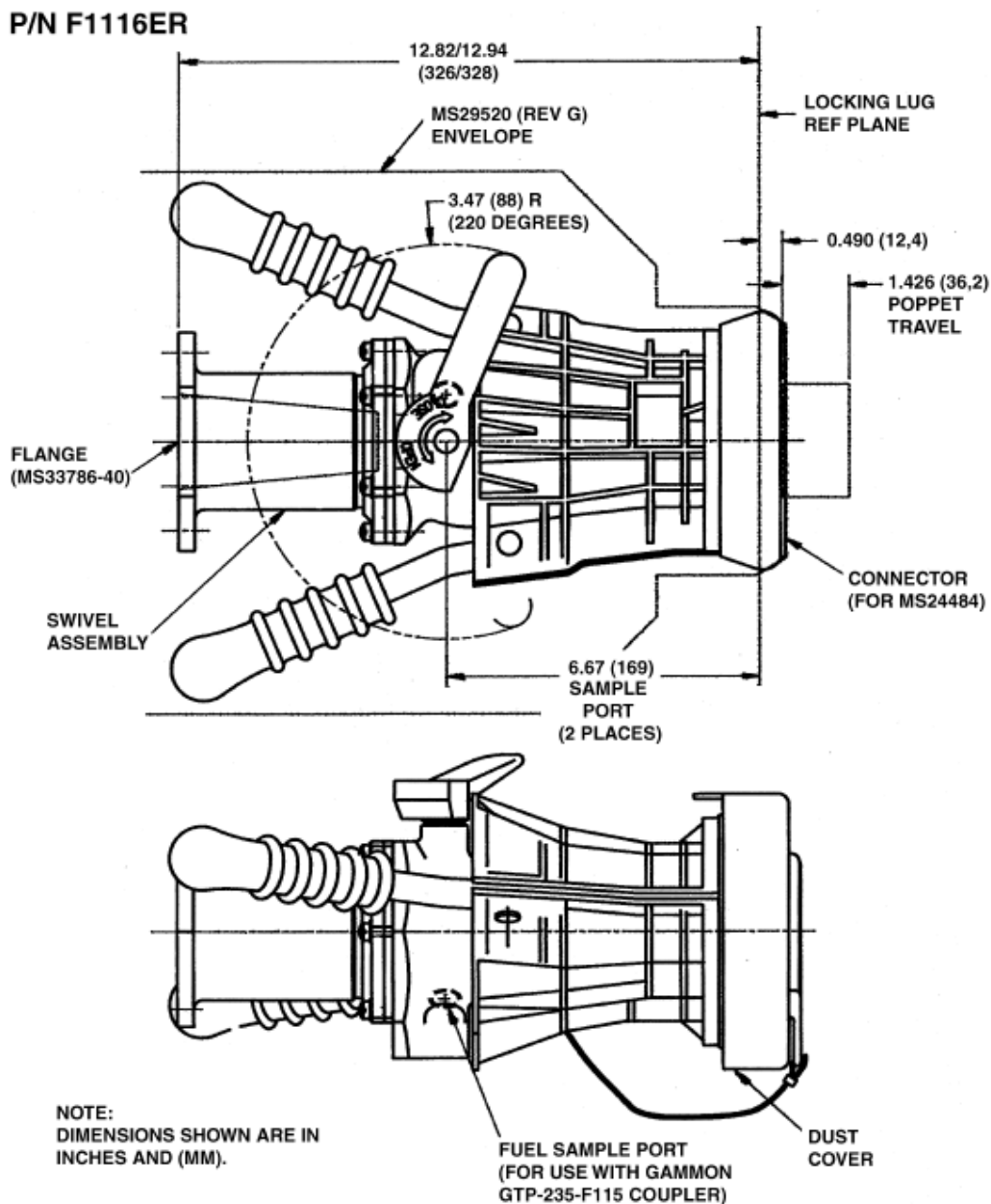


Figure 2. Nozzle Dimensions (Sheet 1 of 2)

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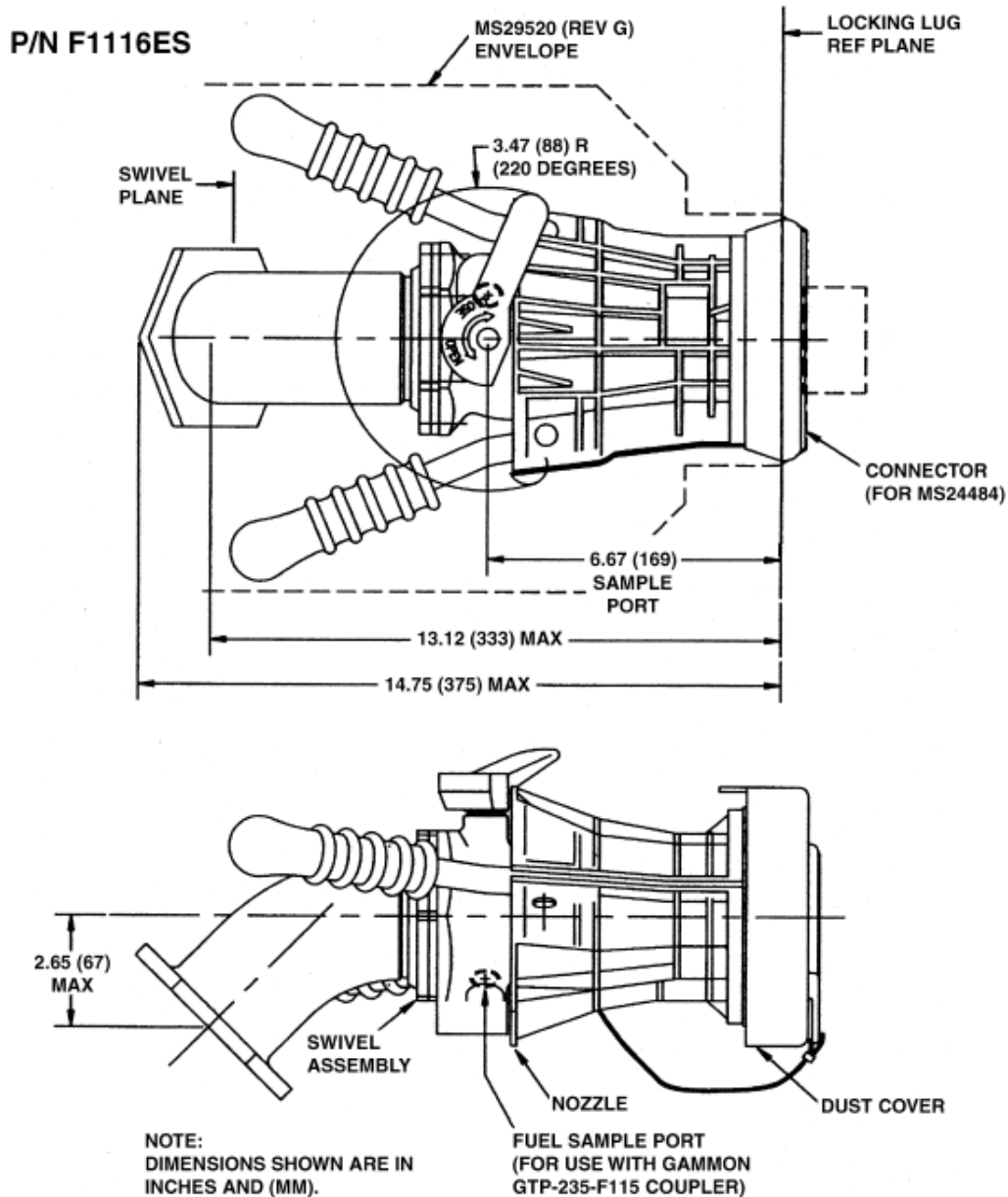


Figure 2. Nozzle Dimensions (Sheet 2)

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SPECIAL TOOLS AND TEST EQUIPMENT

1. General

For special tools and test equipment recommended for maintenance of the nozzle refer to [Table 2](#).

Table 2. Special Tools and Test Equipment

PART NUMBER	DESCRIPTION	APPLICATION
C1-0-486	Hand Reamer	Alignment of the handle shaft bearings
F65-0-1130	Nose Seal Test Fixture	Leakage testing of the nose seal
2706112-102	Gage Assembly	Adjustment of the nose seal
2706128-101	Gage, Adapter Wear	Checking adapter wear
2707013	Special Screwdriver	Replacing the nose seal seat

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TESTING

1. General

Perform all tests using Stoddard solvent (or equivalent) as the test fluid, supplied by a 0 to 120 psig (0 to 827.37 kPaG) test stand.

2. Functional Test

- A. Engage and lock the nozzle to the PORT C side of the test fixture (P/N F65-0-1130).
- B. Actuate the flow control handle five times. The valve must operate freely with no mechanical interference or binding. The flow control handle must rotate freely only when the nozzle is fully engaged and locked to the test fixture.

3. Leakage Test

- A. Engage and lock the nozzle or the coupler to the PORT A side of test fixture (P/N F65-0-1130).
- B. Install a matching test cap on the swivel inlet flange of the nozzle under test.
- C. Actuate the flow control handle and fill the adapter and the nozzle with test fluid, bleeding out the air through the test cap on the swivel flange.
- D. Open and close the nozzle three times at pressures of 10 psig (0.69 bar) and 60 psig (4.14 bar). Hold each test pressure for one minute minimum.
- E. There must not be any external leakage through the swivel assembly, the nozzle body, or past the shaft seals, or the nose seal, or evidence of any damage to the nozzle.
- F. Rotate the flow control handle to its CLOSED position. Unlock and disengage the nozzle from the test fixture.
- G. Pressurize the nozzle to 10 psig (0.689 bar) and 60 psig (4.136 bar). Hold each test pressure for one minute minimum. There must not be any leakage from the exterior of the swivel, the nozzle body, or from the nose plug.

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FAULT ISOLATION

1. General

This section contains fault isolation procedures for the nozzle. Operate the nozzle in accordance with the Operation section, if the nozzle fails to operate correctly refer to [Table 3](#) and select the appropriate action. [Table 3](#) identifies the Fault, Probable Cause and Corrective Action.

Table 3. Fault Isolation

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
Leakage past poppet seat when closed	Damaged or worn nose seal (IPL Figure 1, 29)	Replace the nose seal.
	Damage or worn poppet (18)	Replace the poppet.
	Damaged or worn packing (19)	Replace the packing.
	Damaged or cracked nose on body (37)	Replace the body.
	Poppet (18) incorrectly adjusted	Adjust the poppet.
Leakage past nose seal when coupled	Mating flange and locking lugs on fuel system inlet adapter damaged or worn	Use the adapter wear gage (P/N 2706128-101) to check the three locking lugs of the bayonet flange for wear, straightness, and alignment. If they are damaged, the inlet adapter must be replaced.
Leakage past nose seal when coupled	Damaged or worn nose seal (29)	Replace the nose seal.
	Packing (19) twisted, cut, or incorrectly installed	Replace the packing.
Nozzle engages too tightly	Poppet (18) incorrectly adjusted	Adjust the poppet.

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Table 3. Fault Isolation (cont.)

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
Leakage past flow control handle shaft	Packing (25 or 26) damaged, twisted, or incorrectly installed	Replace the packings.
	Bearing (39A or 39B) damaged or worn	Replace the bearings.
Leakage at swivel flange	Damaged or worn packing (52)	Replace the packing.
Leakage at swivel	Contaminated seal (46)	Clean and overhaul the swivel.
	Damaged or worn seal (46)	Replace the seal.

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REPAIR TASKS

1. Lubrication

Lightly lubricate all of the packings with petroleum jelly before installation.

2. Removing the Poppet (IPL Figure 1, 18)

- A. Remove dust cap (5) from nozzle.
- B. Compress key ring (15) and rotate shell grips (12).
- C. Rotate flow control handle (22) to its OPEN position.
- D. Remove cotter pin (17) from rod (33) and remove poppet (18).

3. Adjusting the Poppet (IPL Figure 1, 18)

- A. Remove poppet (18) in accordance with paragraph 2.

B. Initial Adjustment

With the flow control handle (22) at its fully OPEN position, thread the poppet (18) onto the rod (33) until the flow control handle cannot be rotated to its CLOSED position. Back the poppet outward until the flow control handle can just be rotated to its CLOSED position. Back the poppet out further, up to 1/2-turn, to align the holes for the cotter pin (17).

C. Checking the Poppet Adjustment

1. Insert the flange of the nose seal adjustment gage (P/N 2706112-102) in the nozzle and rotate the handles (9) to the connected position. The flow control handle (22) must remain in the CLOSED position.
2. Insert plug of the nose seal adjustment gage (P/N 2706112-102) in the nozzle.
3. If the poppet adjustment is correct, the flange level will be between the gage surface marked "BELOW FLANGE" and the gage surface marked "ABOVE FLANGE." If the poppet adjustment is not correct, thread it inward or outward until it is correct, and then back it out just sufficiently to install the cotter pin (17).

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D. Install new cotter pin (17) to retain poppet (18).

4. Replacing the Nose Seal (IPL Figure 1, 29)

A. Remove poppet (18) in accordance with paragraph 2.

B. Using a small flat-tip screwdriver, gently pry one end of the retainer (53) out of its groove and remove it from the nozzle body (37).

C. Using two flat-tip screwdrivers from opposite sides, and using connector (13) as their resting point, gently pry nose seal (29) and packing (19) from nozzle body (37). Remove belleville washer (20) from nozzle body (37).

D. Check nozzle body (37) and belleville washer (20) for damage or excessive wear. Check belleville washer (20) for roundness or deformation. The belleville washer can be reformed to its round shape by hand.

Note: The convex side of the belleville washer (20) must be toward the nose of the nozzle as shown in [IPL Figure 1](#).

E. Install belleville washer (20) on new nose seal (29). Apply petroleum jelly to new packing (19) and install on packing groove of the nose seal (29).

F. Install belleville washer (20) and new nose seal (29) with in nozzle body (37). Install retainer (53).

G. Install and adjust poppet (18) in accordance with paragraph 3.

5. Replacing the Stop Screws (IPL Figure 1, 10)

A. Remove bolt (7), washer (6), nuts (8), and handles (9) from shell grips (12).

B. Remove screws (10), washers (11) and shell grips (12) from connector (13).

C. Remove screws (38) and split ring (39) from nozzle body (37).

D. Inspect the key ring (15) and shell grips (12). The wear surfaces must be smooth and free of gouges or pits. Replace the parts if they are damaged. The key ring (15) and shell grips (12) may be sprayed with dry-film lubricant. Do not use grease on these parts.

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- E. Install split ring (39) and screws (38) on nozzle body (37). Use a single strand of lockwire (MS20995C20) to secure the screws (38). Carefully tuck in the ends of the lockwire to prevent interference with the shell grips (12).
 - F. Make sure the springs (16) and key ring (15) are correctly positioned. Apply thread sealant to the threads of the screws (10). Install shell grips (12) and secure them to the connector (13) with screws (10) and washers (11). Safety wire the screws with lockwire (MS20995C20).
 - G. Put handles (9) in shell grips (12) and install bolt (7), washers (6) and nuts (8).
- 6. Replacing the Handle Shaft Packings (IPL Figure 1, 25 and 26)**
- A. Compress key ring (15) and rotate shell grips (12).
 - B. Rotate flow control handle (22) to its OPEN position.
 - C. Remove cotter pin (17) from handle shaft (27). Remove the washer (24) from the small end of the handle shaft (27).
 - D. Slowly pull the handle shaft (27) (with flow control handle attached to it) out of the nozzle body (37), and push a small rod or screwdriver in from the opposite end to retain the linkage. If linkage becomes uninstalled, refer to paragraph 6G, steps 1 through 6.
 - E. Using a suitable pointed tool, remove the small packing (25) from the handle shaft (27) and the large packing (26) from the nozzle body (37). Remove washer (23) and inspect handle shaft (27) (refer to [Table 5](#)).

CAUTION

MAKE SURE THE PACKINGS ARE NOT TWISTED WHEN THEY ARE INSTALLED IN THE PACKING GROOVES.

- F. Apply petroleum jelly to new packings (25 and 26). Using a pair of tweezers or similar suitable tool put packing (25) on the handle shaft (27). Install washer (23) on the handle shaft. Put new packing (26) in the nozzle body (37), behind the bearing (39A).
- G. Insert the handle shaft (27) with an easy twisting motion, slowly withdrawing the small rod or screwdriver.

Note: If crank (31) and links (32) are uninstalled, do as follows:

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1. Line up the links (32) so that their curved sides match the bulge in the side of the nozzle body (37).
 2. Insert the handle shaft (27) with a twisting motion until it enters the crank (31) up to its hexagonal section.
 3. Rotate the flow control handle (22) so that it points 90 degrees from the center of the nozzle body (37) in the OPEN position.
 4. Pull the crank (31) upward from inside of the nozzle body (37) allowing the crank to hang vertically.
 5. Slide the handle shaft (27) inward so that its hexagonal section enters the crank (31).
 6. Push the handle shaft (27) into its fully installed position.
- H. Install washer (24) on the end of handle shaft (27). Install a new cotter pin (17) to retain the handle shaft (27).
- I. Rotate flow control handle (22) to its OPEN position. Make sure the linkage operates freely and correctly.
- J. Install and adjust the poppet (18) in accordance with paragraph 3.
- 7. Replacing the Clevis Pins (IPL Figure 1, 30) and the Links (32)**
- A. Remove poppet (18) in accordance with paragraph 2 above.
 - B. Remove handle shaft (27) from nozzle body (37) (refer to paragraph 6). Remove linkage components from nozzle body (37).
 - C. Remove cotter pins (17) and clevis pins (30).
 - D. Install new links (32) and secure them with new clevis pins (30) and new cotter pins (17). Install the linkage components in the nozzle body (37).
 - E. Install handle shaft (27) in the nozzle body (37) (refer to paragraph 6 above).
 - F. Install and adjust the poppet (18) in accordance with paragraph 3.

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8. Replacing the Bearings (IPL Figure 1, 39A and 39B)

- A. Remove poppet (18) in accordance with paragraph 2.
- B. Remove handle shaft (27) from nozzle body (37) (refer to paragraph 6). Remove the linkage components from the nozzle body.

CAUTION

DO NOT CLAMP THE NOZZLE BODY TOO TIGHTLY OR IT MAY BECOME DEFORMED OR CRACKED.

- C. Carefully clamp the nozzle body (37) in a vise, so that the handle shaft boss faces upward.
 - D. Using a 9/16-12NC tap, form three to four threads in the bearing (39A) (just sufficient to grip the bearing).
 - E. Thread a bolt into the bearing (39A) and insert a rod into the hole in its other end. Gently tap the rod until bearing is removed.
 - F. Remove the bearing (39B), using a 7/16-14NC tap in a similar manner.
 - G. Blow out all machining chips from the interior of the bearings (39A and 39B) into the nozzle body (37), tapping them lightly with a plastic or rubber (not steel) mallet until they are fully shouldered.
 - H. Check the alignment of the bearings (39A and 39B) using the handle shaft (27) with no packings installed. Rotate the handle shaft several times to check for binding. If required, use the hand reamer (P/N C1-0-486) to align the bearings.
 - I. Install handle shaft (27) in nozzle body (37) (refer to paragraph 6).
 - J. Install and adjust poppet (18) in accordance with paragraph 3.
- #### 9. Overhauling the Swivel Assembly (IPL Figure 1, 40 or 41)

A. Disassembly

- 1. Remove screws (35) and washers (36). Remove swivel assembly (40 or 41) from the nozzle body (37).
- 2. Remove and discard packing (52). Remove two screws (51).

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3. Separate inner flange (49) from outer flange (50). Slide outer flange (50) towards inner flange (49) of the sleeve (42 or 43).
4. Remove packing (46) that holds the two bearing rings (44). This packing is not used as a seal in the swivel assembly and may be used if it is not damaged.
5. Remove bearing rings (44) from sleeve (42 or 43).
6. Remove and discard two quad ring seals (47) and backup seal (48).
7. Slide the outer flange (50) off of the sleeve.
8. Inspect bearing rings (44) and flanges (49 and 50) for damage to their bearing and sealing faces. Replace these parts if they are damaged.

B. Assembly

1. Slide the outer flange (50) onto the sleeve (42 or 43).
2. Install quad ring seal (47) and backup seal (48) together in the groove near the sleeve outlet. Install quad ring (47) (dust seal).
3. Check for installation of the keys (45) in the bearing rings (44). Install the two bearing rings with their keys on the sleeve (42 or 43).
4. Put the packing (46) over the two bearing rings (44).
5. Slide inner flange (49) and outer flange (50) together around the bearing rings (44).
6. Install the two screws (51). Apply petroleum jelly to new packing (52) and put on flange (49).
7. Apply thread sealing compound (Loctite, Grade A) to the threads of the screws (35). Put swivel assembly (40 or 41) on the nozzle body (37) and install screws (35) and washers (36).

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CLEANING

1. Cleaning Materials

Refer to [Table 4](#) for recommended cleaning materials. Equivalent items may be used.

Table 4. 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



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

- 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 obstructions from the ports, the grooves, and the flow passages.
- B. Clean all of the non-metallic parts by wiping them with clean lint-free tissues slightly moistened with isopropyl alcohol.
- C. Make sure the flow passage of the nozzle body (IPL Figure 1, 37) is clean, especially where the plug (34) is installed.

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

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

- D. Dry the parts with clean lint-free tissues or clean, dry, compressed air.
- E. Package all of the clean parts in plastic bags.

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CHECK/INSPECTION

1. General

- A. Under strong light and magnification, Look at all parts in accordance with the general criteria specified in Table 5.
- B. Repair minor damage in accordance with instructions presented in the REPAIR section. If damage is major or beyond simple repair, replace the part.

2. Component Checks (Table 5)

Table 5. Component Checks

DESCRIPTION (See IPL Figure 1)	INSPECTION CRITERIA
General	Look at the parts for; nicks, cracks, cuts, burrs, corrosion, breaks, scoring, dents, thread damage, serration damage, or other damage.
	Make sure the ports, passages, recesses, and sealing grooves are clean and are not obstructed.
	Make sure all sealing and seating surfaces are free from damage or corrosion.
Bolts (7) and Machine Screws (10, 35 and 51)	Check for burrs, excessive wear, and straightness.
	Replace the screws if damaged. Do not attempt to repair them.
Connector (13)	Using a dial indicator, check for wear on the lug engagement face in three places as shown in Figure 2, Sheet 1. If the wear is greater than 0.031 inch (0.78 mm), replace the connector (IPL Figure 1, 13).
	Check the corner wear radius on the three corners as shown in Figure 2, Sheet 1. If any corner radius is worn to more than 0.078 inch (1.98 mm), replace the connector (IPL Figure 1, 13).
Springs (16)	If the free length of a spring is less than 0.850 inch (21.6 mm), replace the spring.
	If a spring is not straight or is deformed, replace the spring.
Flow Control Handle (22)	Check for sharp edges and abrasive wear.

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Table 5. Component Checks (cont.)

DESCRIPTION (See IPL Figure 1)	INSPECTION CRITERIA
Handle Shaft (27)	The surface finish in the bearing areas must be smooth
	Roll the shaft on a flat surface to check straightness. The shaft must be straight
	Check for abrasive wear on the ends of the shaft.
	Check for cracks at the cross holes.
Rod (33)	Check the pin hole in the threaded end of the rod for cracks.
	Replace the rod if cracks are found.
Nozzle Body (37)	Check the shaft holes in the body for burrs where the packings enter. Remove any burrs.
	Check for excessive wear of the sacrificial bosses at the handle shaft
	Check for cracks at all of the holes in the body. Replace the body if any cracks are found
	Check for cracks where the seat for the nose seal (29) joins the main body. Replace the body if any cracks are found.
Bearings (39A and 39B)	If the handle shaft (27) can be moved up and down more than 0.001 inch (0.025 mm) total, replace both of the bearings.
Sleeves (42 and 43)	Check the bearing ring seat area. Replace the sleeve if it is damaged or worn.
	Check the flange face. Replace the sleeve if it is damaged or worn.
Bearing Rings (44)	Check the bearing faces. Replace the rings if they are worn or scored.
Flanges (49 and 50)	Check the bearing faces. Replace the flanges if they are worn or scored.

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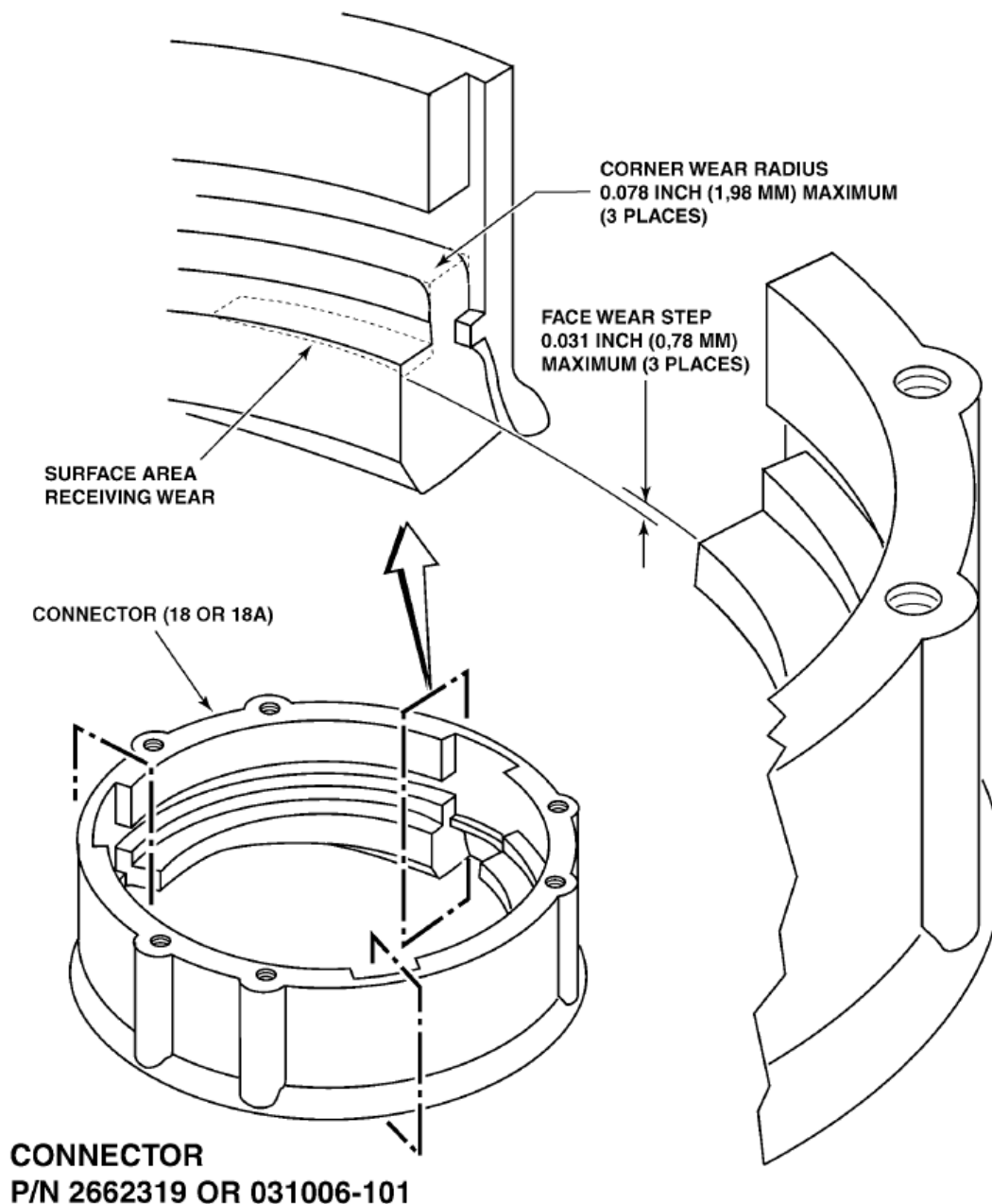


Figure 3. Connector Wear Limits

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ILLUSTRATED PARTS LIST

1. General

This section lists, describes, and illustrates all detail parts required for maintenance support of the Fuel and Oil Servicing Nozzle (nozzle).

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.

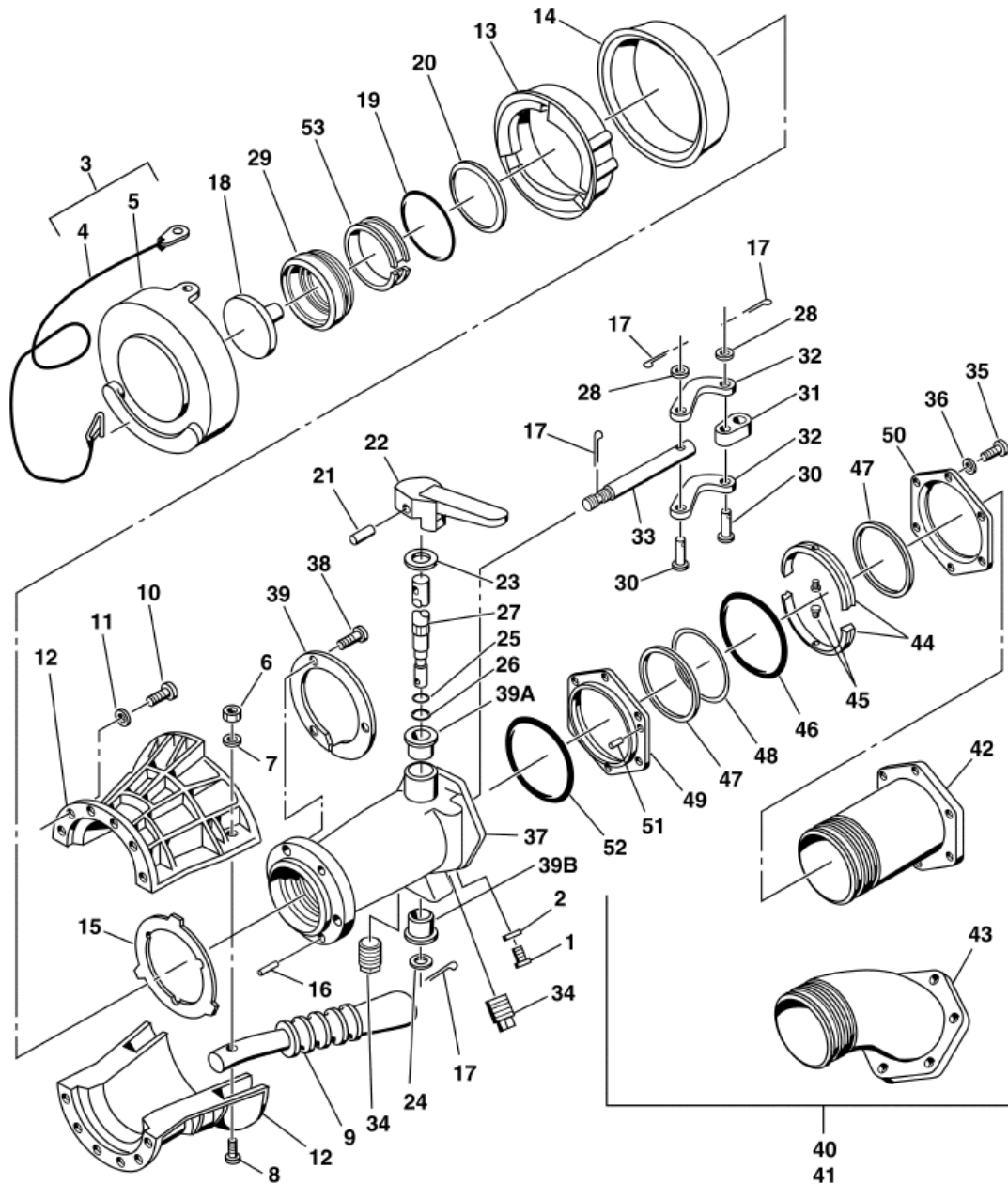
C. Abbreviations

ASSY	Assembly
FIG.	Figure
IPL	Illustrated Parts List
MOD	Modification
REF	Reference Item

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IPL Figure 1. Fuel and Oil Servicing Nozzle

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FIG. ITEM	PART NUMBER	DESCRIPTION	MOD CODES	UNITS PER ASSY
FUEL AND OIL SERVICING NOZZLE, PART NUMBER MMF1116				
1	F1116ER	NOZZLE, FUEL AND OIL SERVICING (D2)		REF
	F1116ES	NOZZLE, FUEL AND OIL SERVICING (D1)		REF
1	CAN501D616-8	. SCREW, MACHINE		1
2	CMS35338-141	. WASHER, LOCK.....		1
3	F62W7504	. COVER ASSEMBLY, DUST		1
4	1426-595145	. . CABLE		1
5	F62W7503	. . COVER, DUST.....		1
6	CMS35338-139	. WASHER, LOCK.....		2
7	CAN4C13A	. BOLT, MACHINE		2
8	CMS20364-428C	. NUT, SELF-LOCKING		2
9	1426-586133	. HANDLE.....		2
10	CMS35275-265	. SCREW, MACHINE		6
11	MS35338-138	. WASHER, LOCK.....		6
12	2671769	. GRIP, SHELL		2
13	2662319	. CONNECTOR		1
14	7-449-16	. RING, SCUFF		1
15	F61F1363	. RING, KEY		1
16	7410-585771	. SPRING, COMPRESSION		3
17	CAN381-3-10	. PIN, COTTER		4
18	2713550-2	. POPPET.....		1
19	2661058A145	. PACKING, PREFORMED		1
20	2642886	. WASHER, BELLEVILLE		1
21	CMS39086-451	. PIN, SPRING		1
22	911002-101	. HANDLE, FLOW CONTROL		1
23	CAN960PD816L	. WASHER, FLAT.....		1

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FIG. ITEM	PART NUMBER	DESCRIPTION							MOD CODES	UNITS PER ASSY
		1	2	3	4	5	6	7		
24	CAN960C616L	.	W	A	S	H	E	R		1
25	2661058A010	.	P	A	C	K	I	N		1
26	2661058A014	.	P	A	C	K	I	N		1
27	901072-101	.	S	H	A	F	T			1
28	CAN960C516L	.	W	A	S	H	E	R		2
29	2713509	.	S	E	A	L				1
30	1426-522446	.	P	I	N					2
31	2701173	.	C	R	A	N	K			1
32	F61F1307	.	L	I	N	K				2
33	2713659	.	R	O	D					1
34	CMS20913-3CR	.	P	L	U	G				2
35	CMS35276-282	.	S	C	R	E	W			6
36	CMS35338-139	.	W	A	S	H	E	R		6
37	2681430-4	.	B	O	D					1
38	2662382	..	S	C	R	E	W			3
39	F61F1364	..	R	I	N	G				1
39A	SLF517-10	..	B	E	A	R	I	N		1
	FF620-7	..	B	E	A	R	I	N		1
39B	SLF384-11	..	B	E	A	R	I	N		1
	FF503-4	..	B	E	A	R	I	N		1
40	2860007-101	S	W	I	V	E	L			REF
41	2860007-102	S	W	I	V	E	L			REF
42	901067-101	.	S	L	E	E	V	E		1
43	901069-101	.	S	L	E	E	V	E		1
44	901052-101	.	R	I	N	G				2
45	901053-101	.	K	E	Y					2
46	2661058A036	.	P	A	C	K	I	N		1
47	Q4231-366Y	.	S	E	A	L				2

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FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS
				PER ASSY
48	CMS27595-231	. SEAL, BACKUP		1
49	901066-101	. FLANGE, INNER.....		1
50	901065-101	. FLANGE, OUTER		1
51	CMS24693C26	. SCREW, MACHINE		2
52	2661058A042	. PACKING, PREFORMED		1
53	2671843	. RETAINER		1

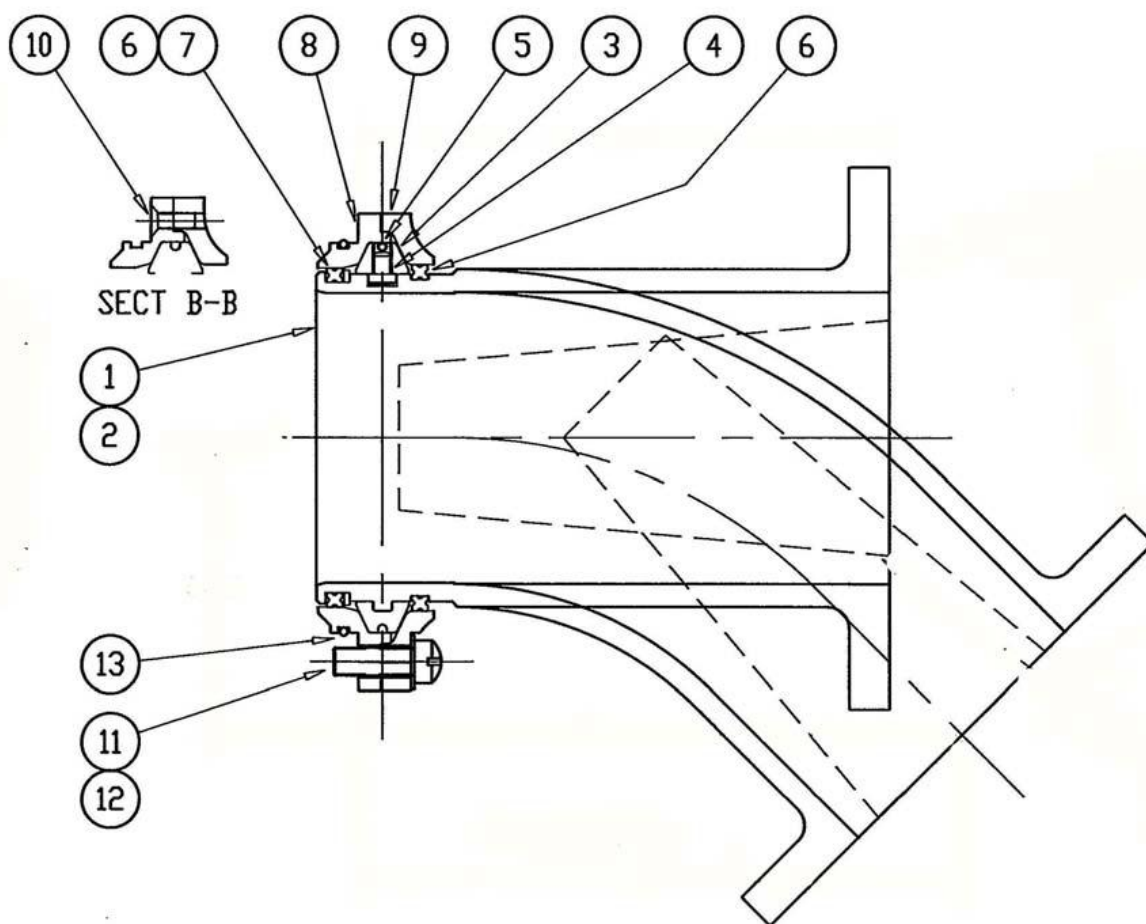
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NOZZLE REPLACEMENT PARTS KITS AVAILABLE		
KIT PART NUMBER	DESCRIPTION	ITEMS IN KIT (IPL Figure 1)
KITF1116-1	Overhaul	17, 19, 23, 25, 26, 46, 47, 48, 52
KITF1116-2	Nose Seal	17, 19, 29, 53

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IPL Figure 2. Sleeve Assembly

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FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNIT PER ASSY	
				-101	-102
SLEEVE ASSEMBLY					
2 1	901067-101	. SLEEVE, STRAIGHT		1	-
2	901069-101	. SLEEVE, 45°		-	1
3	901052-101	. BEARING RING		2	2
4	901053-101	. KEY		2	2
5	2661058A036	. RETAINER		1	1
6	Q4231-366Y	. SEAL, QUAD RING		2	2
7	CMS27595-231	. SEAL, BACKUP		1	1
8	901066-101	. FLANGE, INNER		1	1
9	901065-101	. FLANGE, OUTER		1	1
10	CMS24693-C26	. SCREW FLAT HD		2	2
11	CMS35276-282	. SCREW FILLISTER HD		6	6
12	CMS35338-139	. LOCK WASHER		6	6
13	2661058A042	. PACKING		1	1

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