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Maintenance Manual

WATER SUMP CONTROL VALVE

F532B

MMF532B

Revision 2.0
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Meggitt Fuelling Products
Maintenance Manual (MMF532B)
Water Sump Control Valve – F532B

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	05/02/2000	
1.1	ALL	Revision	11/01/2004	
2.0	ALL	See DCN	02/05/2014	

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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 Water Sump Control Valve. 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 Valve is a mechanical device and can be dangerous if incorrectly 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	- indicates an imminently hazardous situation which, if not avoided, will result in injury or serious injury.
⚠ WARNING	- indicates a potentially hazardous situation which, if not avoided, could result in injury or serious injury.
⚠ CAUTION	- indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
CAUTION	- 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.
- Follow Lock-Out/Tag-Out procedures when working on the valve.

OPERATION AND MAINTENANCE OF FUEL SYSTEMS

- Protect all fuel lines from damage or puncture. Do not operate the valve 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 valve 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 Water Sump Control Valve. The instructions provide information necessary to perform maintenance functions. The valve 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 Water Sump Control Valve (valve) provides the means of detecting free water accumulation in filter/separators, storage tanks and other refueling system components. The major functional components of the valve are the float assembly, valve, sump and plunger assembly.

2. Operation

A. Negligible Free Water Accumulation

When the accumulated free water in the sump is negligible, the specific gravity of the float is sufficient to keep it from floating, and the refueling system operates normally.

B. Excessive Free Water Accumulation

As free water accumulates, its higher specific gravity causes the float to move upward. When the free water accumulation is sufficient, float movement actuates its normally open valve closes and opens a path for the system reference pressure to vent. When this occurs, the refueling system shuts down due to the lack of reference pressure to its control valves.

C. Refueling System Start

When the refueling system has been shut down due to excessive free water accumulation in the valve sump, operator action is required to drain the water. When the water has drained, the float will sink, the vent valve will close, and normal operation will resume.

D. Pre-Check Plunger

The pre-check plunger provides the means to make sure correct operation of the valve. When the plunger is pushed, it manually lifts the float and operates the valve, causing system reference pressure to vent. An audible sound is produced when the system reference pressure vents. The pre-check plunger should be used periodically, in accordance with the operator's established operating procedures.

E. Reference Pressure Source

The valve can operate with reference air or fuel pressure. Reference air can be vented to the atmosphere. Reference fuel pressure must be vented to a low pressure purge tank.

3. Leading Particulars

For the leading particulars refer to Table 1.

Table 1. Leading Particulars

Service	Automotive and Aviation Fuels and Water (Specific gravity: 0.83 maximum)
Operating Pressure (maximum)	0 to 200 psi (1379 kPa)
Pressures:	
Sump (maximum)	200 psig (1379 kPaG)
Valve (maximum)	85 psig (586 kPaG)
Temperature:	
Ambient	-65 to 160°F (-54 to 71°C)
Fluid	-35 to 135°F (-37 to 57°C)
Weight (approximate)	15 pounds (6.8 kg)

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FAULT ISOLATION

1. General

This section contains fault isolation procedures for the valve. Operate the valve in accordance with the DESCRIPTION AND OPERATION section, if the valve fails to operate correctly refer to Table 2 and select the appropriate action. Table 2 identifies the Fault, Probable Cause and Corrective Action.

Table 2. Fault Isolation

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
Valve will not close	Pivot (IPL Figure 1, 15) incorrectly adjusted	Adjust the pivot (refer to ASSEMBLY section, paragraph 3F).
	Seat in valve body (12) excessively worn or damaged due to contamination	Replace the valve body.
	Weight of float assembly (items 16 thru 22) is incorrect	Check and correct the float assembly weight (refer to ASSEMBLY paragraph 3B).
	Reference pressure inlet and outlines switched	Reverse the lines.
Leakage from the vent port	Seat of poppet (6) excessively worn or damaged due to contamination	Replace the poppet.
	Seat in valve body (12) excessively worn or damaged due to contamination	Replace the valve body.
	Pivot (15) incorrectly adjusted	Adjust the pivot (refer to ASSEMBLY section, paragraph 3F).
	Weight of float assembly (items 16 thru 22) is incorrect	Check and correct the float assembly weight (refer to ASSEMBLY paragraph 3B).
Fuel to air leakage	Damaged quad rings (9) due to contamination	Replace the quad rings.

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DISASSEMBLY

NOTE: Before disassembly, the vessel in which the water sump control valve is installed must be drained in accordance with the applicable instructions; and the water sump control valve must be disconnected and removed from the vessel.

1. Seal Replacement Parts Kits

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

2. Disassemble the Plunger Assembly (See IPL Figure 1)

Note: Do not disassemble the plunger assembly (25), unless there is leakage. If there is leakage, do as follows:

A. Remove split ring (30) from plunger (27). Disconnect plug (26) from sump (24).

B. Remove plunger (27), backup retainer (28) and packings (29) from plug (26). Discard backup retainer (28) and packings (29).

3. Disassemble the Water Sump Control Valve (See IPL Figure 1)

A. Remove and discard packing (23) from sump (24).

B. Remove screws (7), washers (8), cap (1), spring (5) and poppet (6) from valve body (12). Remove packings (2 and 4) and packing cap strip (3) from valve body (12). Discard packings (2 and 4).

C. Remove screws (10), washers (11) and gently pull the valve body (12) away from sump (24). Using a suitable small diameter tool (a straightened large paper clip works well), push out the pin (16), and remove the valve body (12) and associated parts.

Note: The pin (22) on float (21) is installed in the groove of the rod (14). Make sure the pin (22) on float (21) is disconnected from the groove of the rod (14) before removing the valve body (12).

D. Remove packing (13) and pivot (15) from valve body (12). Discard packing (13).

CAUTION DO NOT CHANGE THE SETTING OF THE PIVOT (15) AS IT IS SET AT THE FACTORY TO THE DIMENSION SHOWN IN FIGURE 1.

E. Remove rod (14) along with quad rings (9) from valve body (12); discard quad rings (9).

F. Remove float (21) from sump (24). Remove plug (19) and packing (20) from float (21). Discard packing (20). Remove pin (22) from float (21).

CLEANING

1. Cleaning Materials

Refer to Table 3 for recommended cleaning materials. Suitable equivalent cleaning materials may be substituted for the items listed

Table 3. 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 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 metal parts by washing thoroughly in dry cleaning solvent. Remove stubborn deposits by scrubbing with a nonmetallic stiff bristle brush. Brush all threaded areas. Use a Teflon® pick to remove any blockage from the ports, the seal or packing 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.

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

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.

CHECK/INSPECTION

1. General

Under strong light and magnification, look at all parts in accordance with the general criteria specified in Table 4.

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 4)

Table 4. Component Checks

DESCRIPTION (IPL Figure 1 Item Number)	INSPECTION CRITERIA
General	Look at 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 the ports, passages, recesses and sealing grooves are clean and not blocked. Make sure all sealing and seating surfaces are free from damage or corrosion. Look to make sure the ports, passages, recesses and sealing grooves are clean and not blocked.
Poppet (6)	The inside and outside diameters must be free of scratches.
Rod (14)	The air passages must not be blocked (free air flow is critically important). The seating faces must be free of scratches.

ASSEMBLY

1. Overhaul and Seal Replacement Parts Kits

Refer to the ILLUSTRATED PARTS LIST section for recommended seal and overhaul replacements parts kit information.

2. Assembly Materials

Refer to Table 5 for recommended assembly materials. Suitable equivalent materials may be substituted for the items listed.

Table 5. Recommended Assembly Materials

DESCRIPTION	SPECIFICATION	SOURCE
Clean Tap water	--	--
Petroleum jelly	--	Commercially available
Thread Sealing Compound	Loctite Grade HV	Loctite (Commercially available)

3. Assemble the Water Sump Control Valve (See IPL Figure 1)

A. Lubrication

Before assembly, lightly lubricate all of the packings, seals and screw threads with Petroleum jelly.

B. Assemble the Float Assembly

1. Fill the float assembly (18) with clean tap water, put new packing (20) on float (21); apply thread sealant (Loctite Grade HV) to the threads of the plug and bleeder (19) and install on float (21).

   Note: Make sure total weight of float assembly (18) including the plug and bleeder (19) and packing (20) is 4.15 (±0.05) pounds (1.86 to 1.90 kg).

CAUTION USE CARE, DO NOT STRETCH OR CREASE THE PACKING CAP STRIP (3).

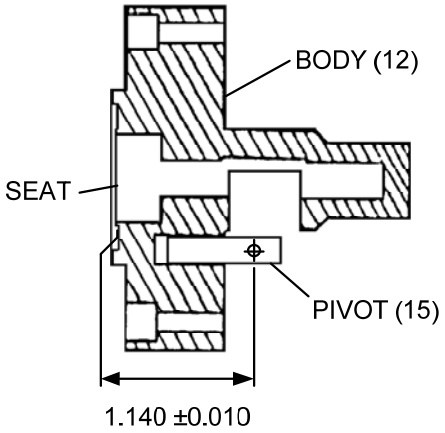
C. Put new packing (2) in cap (1). Gently roll the packing cap strip (3) so that it will form around the packing (2). Put packing cap strip (3) on packing (2). Install new packing (4) into the packing groove of cap (1).

D. Lightly lubricate the inside diameter of the poppet (6) with petroleum jelly and put poppet (6) and spring (5) in the cap (1).

E. Put quad rings (9) on the grooves of rod (14), and then apply petroleum jelly on quad rings (9).

CAUTION MAKE SURE PIVOT (15) IS INSTALLED IN ACCORDANCE WITH THE DIMENSIONAL REQUIREMENT AS SHOWN IN FIGURE 1.

F. Put assembled rod (9) and pivot (15) in the valve body (12). Put new packing (13) in the groove of valve body (12).



Note: This dimension measures the distance between ℄ of hole on pivot to the seat on body (12)

Figure 1. Pivot Detail

G. Put float assembly (18) in the sump (24).

CAUTION

MAKE SURE PIN (16) IS ALIGNED WITH BOTH HOLES IN PIVOT (15) AND LEVER OF FLOAT (21).

MAKE SURE PIN (22) IS ALIGNED WITH HOLES IN LEVER OF THE FLOAT (21) AS SHOWN IN FIGURE 2.

H. Connect the pin (22) on float (21) into the groove of the rod (14). Line up the hole of pivot (15) with the holes in the lever of float (21) and install pin (16).

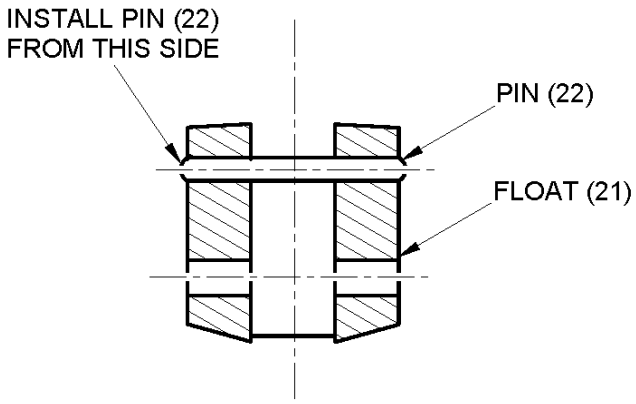


Figure 2. Pin Detail

CAUTION

MAKE SURE PACKING (13) IS CORRECTLY SEATED IN ITS GROOVE ON VALVE BODY (12).

I. Install screws (10) and washers (11) to sump (24)

J. Put assembled cap (1) on valve body (12) and install screws (7) and lock washers (8).

K. Put new packing (23) into the groove of sump (24).

4. Assemble the Plunger Assembly (See IPL Figure 1)

A. Put new packings (29) on plunger (27); and put assemble plunger (27) in plug (26) and install new backup retainer (28).

B. Install assembled plunger (27) in sump (24) and secure with plug (26); put split ring (30) on plunger (27).

TESTING

NOTE: Before testing, the water sump control valve must be drained, disconnected and removed from its installed vessel in accordance with the following.

1. Leakage and Functional Test

A. Connect a regulated air pressure source (85 psig maximum) to the PRESSURE INLET port.

B. Connect a pressure gage to the PRESSURE OUTLET port.

C. Connect an open line to the VENT port.

⚠WARNING **AVIATION FUEL IS A HARZARDOUS MATERIAL. 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.**

D. Immerse the valve with its mounting flange horizontal and facing upward in a container of clean aviation fuel. Pressurize the inlet port to 60 psig.

E. The float must remain in its fully down position. No air bubbles (indicating external leakage) should be visible.

F. Vent the test pressure to 0 psig. Remove the water sump control valve from the container and blow it dry with shop air.

G. Immerse the valve with its mounting flange horizontal and facing upward in a container of clean water. Do not pressurize the inlet port.

H. The float should rise to its fully up position.

I. Manually push the float to its fully down position and hold it down. Pressurize the inlet port to 60 psig. The pressure gage shall read 60 psig.

J. Release the float. Air should vent from the open line. The pressure gage shall show 0 psig.

K. Manually push the float to its fully down position and hold it down. The pressure gage shall read 60 psig.

L. Vent the test pressure to 0 psig. Remove the valve from the container and thoroughly dry it with shop air. Disconnect the valve from the test setup.

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ILLUSTRATED PARTS LIST

1. General

This section lists, describes, and illustrates all detail parts required for maintenance support of the Water Sump Control Valve.

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

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

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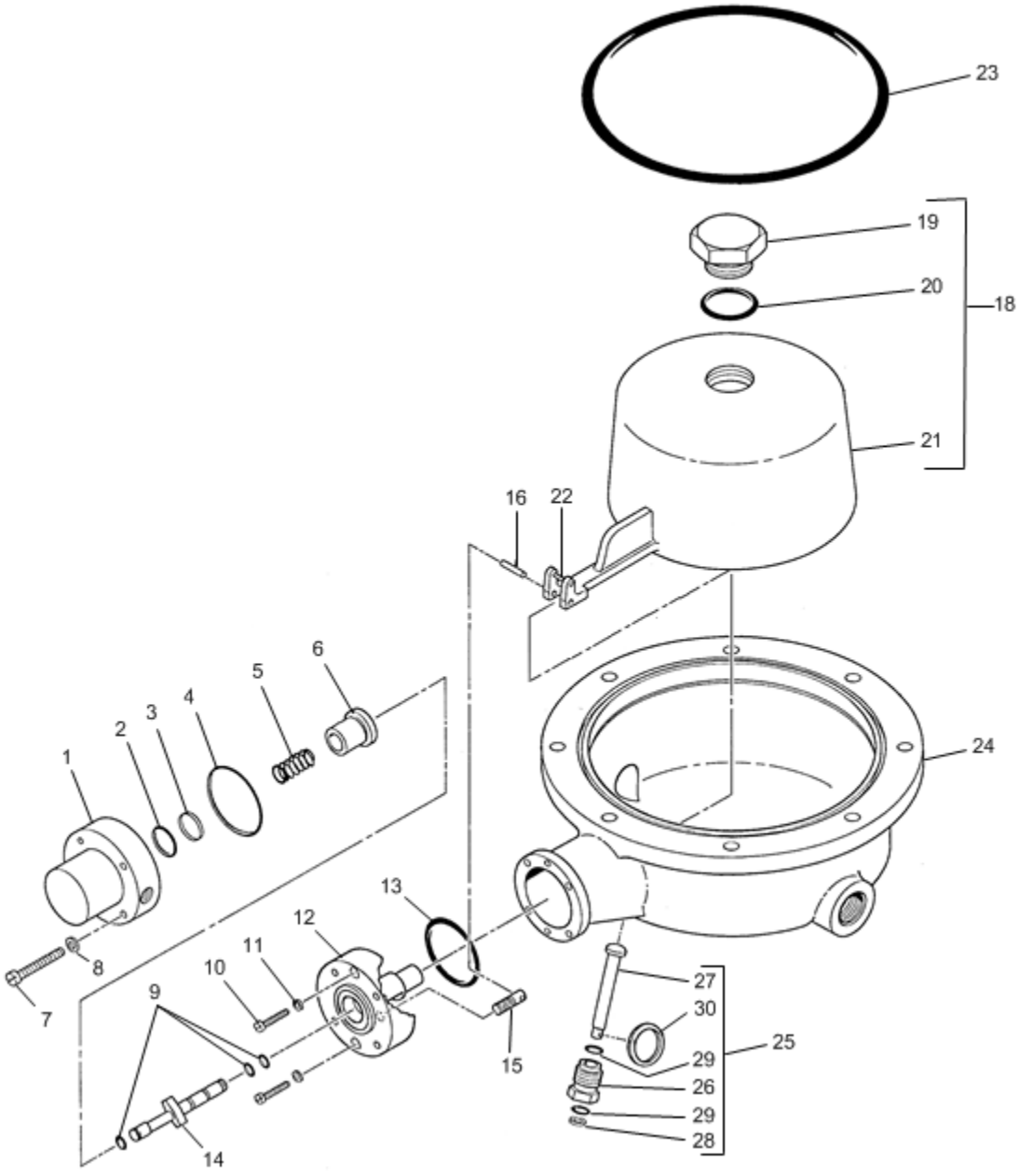

IPL Figure 1. Water Sump Control Valve

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FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS PER ASSY
VALVE, WATER SUMP F532B				
1	F532B	VALVE, WATER SUMP CONTROL		REF
1	F60W1812-1	. CAP		1
2	2661058BD019	. PACKING, O-RING		1
3	DW1304-018-11-009	. DELETED (SUPERSEDED BY 430501)		1
3	430501	. CAP, STRIP (SUPERSEDES DW1304-018-11-009)		1
4	2661058A031	. PACKING, O-RING		1
5	F60W1811	. SPRING, HELICOIL COMPRESSION		1
6	F60W1810	. POPPET		1
7	CAN500C10-28	. SCREW, MACHINE		4
8	CMS35333-39	. WASHER, LOCK		4
9	Q4008-366Y	. RING, QUAD		3
10	CAN500-8-14	. SCREW, MACHINE		2
11	8743-516181	. WASHER, FLAT		2
12	931200-101	. BODY, VALVE (ALUMINUM ALLOY)		1
13	2661058A133	. PACKING, PREFORMED		1
14	F60W1809	. ROD		1
15	F60W1628	. PIVOT		1
16	F60W1627	. PIN, HINGE		1
- 17	F60W1649	. FLOAT ASSEMBLY		1
18	F60W1757	. . FLOAT ASSEMBLY		1
19	CAN814-16D	. . . PLUG AND BLEEDER, SCREW THREAD		1
20	CMS29512-16	. . . PACKING, PREFORMED		1
21	F60W1620	. . . FLOAT		1
22	79-012-062-0687	. . PIN, SPRING		1
23	2661058A266	. PACKING, O-RING		1
24	F60W1622-2	. SUMP (AA) (ALT 931021-102)		1
	931021-102	. SUMP (AA) (ALT TO F60W1622-2)		RF

- Not Illustrated

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FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS PER ASSY
VALVE, WATER SUMP F532B				
25	2691216	. PLUNGER ASSEMBLY		1
26	2691215	. . PLUG		1
27	2691214	. . PLUNGER		1
28	CMS28774-011	. . RETAINER, PACKING BACKUP		1
29	2661058BD011	. . PACKING, O-RING		2
30	1X3/32	. . RING, SPLIT (ALT RR138)		1
	RR138	. . RING, SPLIT (ALT TO 1X3/32)		RF

- Not Illustrated

REPLACEMENT PARTS KITS AVAILABLE		
KIT PART NUMBER	**DESCRIPTION**	**ITEMS IN KIT (IPL Figure 1)**
KITF532-1	Minor Seal Overhaul	2, 3, 4, 9, 13 and 23
KITF532-2	Major Seal Overhaul	2, 3, 4, 6, 7, 8, 9, 10, 11, 13 and 23
KITF532-5	Hardware/Seal Kit	1, 2, 3, 5 and 6