Bell Helicopter
A Textron Company

TECHNICAL BULLETIN 429-11-19
17 October 2011
Revision A, 4 November 2011

MODEL AFFECTED: **429**

SUBJECT: **FUEL SYSTEM, IMPROVEMENT OF**

HELICOPTERS AFFECTED: **Serial number 57001 through 57034.**

Serial number 57035 and subsequent will have the intent of this bulletin accomplished prior to delivery.

COMPLIANCE: Bell Helicopter recommends accomplishment of this bulletin no later than April 30, 2012

DESCRIPTION:

This bulletin provides instructions to modify fuel system components to address installation and manufacturing issues as well as undesired operational behaviors. Applicability of this bulletin to any spare part shall be determined prior to its installation on an affected aircraft.

The bulletin is divided into 5 individual parts. Each part addresses a particular fuel system component to be modified.

Revision A introduces a Kit number to facilitate ordering the required material and revises the warranty statement. In addition, multiple changes were done to facilitate accomplishment without affecting the intent of the bulletin.

Part 1: Fuel transfer valve set and Interconnect transfer valve set

The electrical wire protection flexible conduit P/N 508417 AMDT A is replaced by P/N 508417 AMDT B with modified termination fitting design to prevent fuel leakage at connection interface with the sump plate.

The molded butterfly seal P/N 508421-1 is replaced by P/N 508421-2 to prevent seal damage and resulting undesired internal fuel transfer.

Part 2: Fuel transfer selector valve set

The fuel balance transfer tube P/N 509975 connected to the fuel transfer selector valve set P/N 429-366-417-111 is replaced with new tube P/N 509975-1 with modified routing to prevent flow disturbance around the transfer pump inlet.

The balance pump support P/N 509973 is modified to P/N 509973-1 configuration to accommodate the clamping of the new balance transfer tube P/N 509975-1.

The fuel transfer selector valve set P/N 429-366-417-111 electrical wire protection flexible conduit P/N 508417 AMDT A is replaced by an improved P/N 508417 AMDT B with modified termination fitting design to prevent fuel leakage at connection interface with the sump plate.

Part 3: Fuel balance transfer line

The fuel balance transfer line P/N 509976 is modified to P/N 509976-1 configuration by drilling a vent hole in the transfer line to prevent unwanted forward fuel migration due to siphoning through balance pump.

Part 4: Internal fuel transfer line

The internal fuel transfer line P/N 508540-3 is modified to P/N 508540-4 configuration by drilling a vent hole in the transfer line to prevent a siphoning effect and resulting undesired fuel transfer when pump is turned off.

Part 5: Fuel pressure switch tee fitting

The T fitting P/N 508353-3 with integral fuel pressure switch P/N 508201-2 is replaced by tee fitting P/N 508353-4 to prevent premature switch activation resulting in false transfer pump failure indication.

APPROVAL:

The engineering design aspects of this bulletin are Transport Canada Civil Aviation (TCCA) approved.

CONTACT INFO:

For any questions regarding this bulletin, please contact:

Bell Helicopter Product Support Engineering - Intermediate Helicopters
Tel: 450-437-2077 / 1-800-463-3036 / pseinter@bellhelicopter.textron.com

MANPOWER:

Approximately 26 man-hours are required to complete this bulletin. This estimate is based on hands-on time, and may vary with personnel and facilities available.

WARRANTY:

Owners / Operators of Bell Helicopters who comply with the instructions in this Bulletin will be eligible to receive a credit for the replacement parts identified in the Required Material section of this Bulletin. Along with this, Bell will approve $2080.00USD for the labor to perform this bulletin.

To receive this credit:

- Comply with the instructions contained in this technical bulletin no later than the applicable date in the “compliance section” of this bulletin.
- Purchase replacement parts as required in the materials section of this bulletin from a Bell approved source.
- Submit an MMIR to the Bell Warranty Department for parts and labor.

Customers who fail to comply with the instructions in this Bulletin within the applicable compliance date of April 30, 2012 are not eligible for the special warranty credit listed above.

MATERIAL:

Required Material:
The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

The following material can be purchased under Kit # CT-429-11-19

Part Number	Nomenclature	Qty
NAS1149C0332R	Washer	2
NAS1802-3-8	Screw	1
MS21043-3	Nut	2
MS21919WCJ8	Clam	1
508421-2	Butterfly Molded	2
509975-1	Pipe	1
508353-4	Tee	1
508417 AMDT B	Electrical Harness Conduit	3
MS29512-08	O-ring	1
M25988/1-114*	O-ring	2
M25988/1-016*	O-ring	1
MS29512-10	O-ring	1
M25988/1-037*	O-ring	3
MS29513-013	O-ring	3

The O-Rings with an asterix (*) may be expressed as M25988/1-xxx or M25988-1-xxx.

Consumable Material:
The following material is required to accomplish this bulletin, but may not require ordering, depending on the operator's consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

Part Number	Nomenclature	Qty	Reference *
TT-N-95, TYII	Aliphatic Naphtha	As required	C-305
Loctite 243	Anaerobic Sealant	50ML	C-263
Alodine	Chemical film material	As required	C-100

* C-XXX numbers refer to the consumables list in BHT-ALL-SPM Standard Practices Manual

SPECIAL TOOLS:

None required

WEIGHT AND BALANCE:

Not affected

ELECTRICAL LOAD DATA:

Not affected

REFERENCES:

BHT-429-IPB Illustrated Parts Breakdown
BHT-429-MM Maintenance Manual

PUBLICATIONS AFFECTED:

BHT-429-IPB Illustrated Parts Breakdown
BHT-429-MM Maintenance Manual

ACCOMPLISHMENT INSTRUCTIONS:

1. Prepare helicopter for maintenance.

-NOTE-

The following procedures assume the complete bulletin is carried out at the same time. The initial steps are for providing the required access to internal fuel system components.

-NOTE-

Kits or customized equipment mounted on the helicopter fuselage may require removal for access to reworked areas.

CAUTION

Protect the fuel cell membrane surface and nearby components when performing maintenance inside the fuel cell.

WARNING

Obey all the safety precautions when you do maintenance on fuel system equipment. Refer to BHT-429-MM chapter 28 for additional information.

2. Defuel helicopter. Refer to BHT-429-MM chapter 12. The transfer valves must be selected to the closed position after defuel.

3. Ensure all power is removed from the helicopter by disconnecting the battery and removing the external power. Refer to BHT-429-MM chapter 96.

-NOTE-

Retain all hardware unless specified otherwise for later re-installation. Note the sequence, location and size of the clamps, spacers and screws.

4. Remove the forward fuel quantity probe/plate assembly (1,figure 7) P/N 508195-3. Refer to BHT-429-MM, Chapter 28.

5. Remove the mid-forward fuel quantity probe assembly P/N 429-066-400-163. Refer to BHT-429-MM, Chapter 28.

6. Remove the mid-aft fuel quantity probe assembly P/N 429-066-400-169. Refer to BHT-429-MM, Chapter 28.

Part 1: Fuel transfer valve set and Interconnect transfer valve set

1. Remove the fuel transfer valve set (6, figure 1) P/N 429-366-428-107. Refer to BHT-429-MM, chapter 28.

2. Remove the interconnect fuel transfer valve set (6, figure 1) P/N 429-366-428-107. Refer to BHT-429-MM, chapter 28.

-NOTE-

The following procedure applies to both valve assemblies P/N 429-366-428-107.

3. Disassemble the transfer valve sets and the interconnect fuel transfer valve set as follows:

   a. Remove the collar (2, Figure 1) P/N NAS1922-175-3 from the half clamp (3) P/N 509380.

   b. Remove the half clamp (3) P/N 509380 from the actuator (1) P/N 429-366-428-109 and the transfer valve assembly (4) P/N 429-366-428-103.

   c. Carefully remove the actuator (1) P/N 429-366-428-109 from the transfer valve assembly (4) P/N 429-366-428-103.

CAUTION

Use caution not to damage the wires when removing/installing the hose electrical conduit.

   d. Remove and retain qty 4 screws (8,figure 1) P/N DIN84A2 attaching the hose electrical conduit (9) P/N 508417 AMDT A to the actuator (1) P/N 429-366-428-109.

   e. Clean the transfer valve assembly (4) using a lint free cloth moist with Aliphatic Naphtha(C-305).

CAUTION

Do not remove the shaft lower bearing during removal of the molded butterfly seal.

f. Remove the shaft (11, figure 2) P/N 508246 from the transfer valve assembly (4) P/N 429-366-428-103. Refer to figure 2.

g. Remove the molded butterfly seal (12) P/N 508421-1 from the transfer valve assembly (4) P/N 429-366-428-103.

4. Assemble the transfer valve sets and the interconnect fuel transfer valve set as follows:

a. Position the new butterfly molded seal (13, figure 2) P/N 508421-2 inside the transfer valve assembly (4) P/N 429-366-428-103.

b. Confirm the shaft lower bearing is still in position and install the shaft (11, figure 2) P/N 508246 in the transfer valve assembly (4) P/N 429-366-428-103.

c. Clean the transfer valve assembly (4) using a lint free cloth moist with Aliphatic Naphtha (C-305).

d. Install O-ring (14, figure 1 and 2) P/N MS29513-013 on the new hose electrical conduit (10) P/N 508417 AMDT B.

e. Position the hose electrical conduit (10, figure 1) P/N 508417 AMDT B on the actuator (1) P/N 429-366-428-103, Apply Loctite 243 (C-263) on the threads of the 4 retaining screws (8) P/N DIN84A2 and install the 4 screws in the transfer valve (1)

f. Torque the 4 screws (8) P/N DIN84A2 to 9-11 IN-LBS (.8-1.2 N-m).

g. Clean the excessive Loctite 243 (C-263) using a lint free cloth moist with Aliphatic Naphtha (C-305).

h. Using a vibration stylus, re-identify the transfer valve set (1, figure 1 and 2) and the interconnect fuel transfer valve set (7, figure 1 and 2) per the following. Actuator 429-366-428-109 (1 figure 1) remains unchanged

- Transfer Valve Set 429-366-428-107 to -111
- Transfer Valve Assembly 429-366-428-103 to -115

h. Apply chemical film material (C-100) to the re-identified area of the transfer valve assembly (5).

i. Carefully position the actuator (1,figure 1) P/N 429-366-428-109 on the transfer valve assembly (5) P/N 429-366-428-115.

j. Position the half clamps (3,figure 1) P/N 509380 on the actuator (1) P/N 429-366-428-109 and the transfer valve assembly (5) P/N 429-366-428-115.

k. Install the collar (2,figure 1) P/N NAS1922-175-3 over the clamps (3) P/N 509380..

l. Torque the collar (2) P/N NAS1922-175-3 to 12-15 IN-LBS (1.4-1.7 N-m).

5. Install the interconnect fuel transfer valve set (7,figure 1) P/N 429-366-428-111. Refer to BHT-429-MM, chapter 28.

Part 2: Fuel transfer selector valve set

1. Remove the fuel transfer selector valve set (13 Figure 3) P/N 429-366-417-111. Refer to BHT-429-MM, Chapter 28.

2. Remove and discard the fuel balance transfer tube (small pipe) (7, figure 4, view C) P/N 509975.

3. Modify the fuel transfer selector valve set (13, figure 3) P/N 429-366-417-111 as follows:

CAUTION

Use caution not to damage the wires when removing/installing the hose electrical conduit.

a. Remove the qty 4 screws (1, figure 3) P/N DIN84A2 retaining the hose electrical conduit (2) P/N 508417 AMDT A to the actuator (13) P/N 429-366-417-111.

b. Install O-ring (14, figure 1 and 2) P/N MS29513-013 on the new hose electrical conduit (10) P/N 508417 AMDT B.

c. Position the hose electrical conduit (3, figure 3 and 4) P/N 508417 AMDT B on the actuator (1) P/N 429-366-417-111, Apply Loctite 243 (C-263) on the threads of the 4 retaining screws (1) P/N DIN84A2 and install the 4 screws in the transfer valve (1)

d. Torque the 4 screws (1) P/N DIN84A2 to 9-11 IN-LBS (.8-1.2 N-m).

e. Clean the excessive Loctite 243 (C-263) using a lint free cloth moist with Aliphatic Naphtha (C-305).

4. Remove the fuel balance pump P/N 429-366-416-101 and balance pump support assembly (4, figure 3) P/N 509973. Refer to BHT-429-MM, Chapter 28.

5. Modify the balance pump support assembly (4) P/N 509973 as follows:

    a. Locate and remove rivet (6, figure 3) from the balance pump support assembly (4) P/N 509973.

    b. Using a drill bit, enlarge the rivet hole to 0.203 to .0.208 inch (5.20 to 5.30 mm).

    c. Using a vibration stylus, re-identify the balance pump support assembly to P/N 509973-1 (5, figure 3, View A)

    d. Apply chemical film material (C-100) to the re-identified area of balance pump support assembly (5).

6. Install the fuel balance pump P/N 429-366-416-101 and modified balance pump support assembly (5, figure 3) P/N 509973-1. Refer to the BHT-429-MM, Chapter 28.

7. Install the new fuel balance transfer tube (small pipe) (8, figure 4) P/N 509975-1 on to the fuel transfer selector valve set (13, figure 3) P/N 429-366-417-111.

8. Install the fuel transfer selector valve set (1) P/N 429-366-417-111. Refer to BHT-429-MM, Chapter 28.

9. Clamp the new fuel balance transfer tube (small pipe) (8, figure 4, View D) P/N 509975-1 to the modified balance pump support assembly (5) P/N 509973-1 using clamp (12) P/N MS21919WCJ8, washer (10) P/N NAS1149C0332R, screw (9) P/N NAS1802-3-8 and nut (11) MS21043-3.

10. Secure and torque all screws and tube connection fittings.

Part 3: Fuel balance transfer line

1. Remove the fuel balance transfer line (14, figure 4) P/N 509976. Refer to BHT-429-MM, chapter 28.

2. Drill a 0.025 to 0.035 inch (0.64 to 0.89 mm) vent hole in the fuel balance transfer line (1, figure 5) P/N 509976. Refer to figure 5, View A for location of the hole.

-NOTE-

Confirm no loose materials from drilling operations are left inside the transfer line.

3. Clean outer surface of the transfer line using a lint free cloth moist with Aliphatic Naphtha (C-305). Rinse the inside surface of the transfer line with Aliphatic Naphtha (C-305).

4. Apply chemical film material (C-100) to reworked area of fuel balance transfer line (1, figure 5) P/N 509976.

5. The fuel balance transfer line (1, figure 5) P/N 509976 is now equivalent to P/N 509976-1.

6. Install the fuel balance transfer line (14, figure 4) P/N 509976-1. Refer to BHT-429-MM, chapter 28.

Part 4: Internal fuel transfer line

1. Remove the internal fuel transfer line (15, figure 4) P/N 508540-3. Refer to BHT-429-MM, chapter 28.

2. Drill a 0.030 to 0.035 inch (0.76 to 0.89 mm) vent hole in the fuel balance transfer line (1, figure 6) P/N 508540-3. Refer to figure 6, View A for location of the hole.

-NOTE-

Confirm no loose materials from drilling operations are left inside the transfer line.

3. Clean outer surface of the transfer line using a lint free cloth moist with Aliphatic Naphtha (C-305). Rinse the inside surface of the transfer line with Aliphatic Naphtha (C-305).

4. Apply chemical film material (C-100) to the reworked area of the fuel balance transfer line (1) P/N 508540-3

5. The fuel balance transfer line (1, figure 6) P/N 508540-3 is now equivalent to P/N 508540-4.

6. Install the internal fuel balance transfer line (15, Figure 4) P/N 508540-4. Refer to BHT-429-MM, chapter 28.

Part 5: Fuel pressure switch tee fitting

1. Locate the T fitting (7, figure 7) P/N 508353-3 on the forward fuel quantity probe assembly (1, figure 7) P/N 508195-3.

2. Remove the restrictor (3, figure 7) P/N 510341-3 from the T fitting (7).

3. Remove the plug (9, figure 7) P/N 509275 from the T fitting (7).

4. Remove the pressure switch (14, figure 7) P/N 508201-2 and the washer (11) P/N NAS1149D1416J. Remove and discard O-rings (12 and 13) from switch (14). Retain washer (11) for future use.

5. Remove Qty 3 screws (5, figure 7) P/N NAS1351C3-10 and washers (6) P/N NAS1149D0363J retaining the T fitting (7) to the forward fuel quantity probe assembly (1).

6. Remove and discard the T fitting (7) P/N 508353-3.Remove and discard O-ring (10) from the probe assembly (1).

7. Position new O-ring (10, figure 7) P/N M25988/1-114 on the probe assembly (1). Install the new T fitting (8) P/N 508353-4 on the forward fuel quantity probe assembly (1).using previously removed screws (5) P/N NAS1351C3-10 and washers (6) P/N NAS1149D0363J.

8. Torque the retaining screws (5) to 30-40 IN-LBS (3.4-4.5 N-m).

9. Install new packing (12) P/N MS25988-1-016 and (13) P/N MS29512-10 on pressure switch (14, figure 7). Position washer (11) P/N NAS1149D1416J on the switch (14). Install switch (14) in the T fitting (8) P/N 508353-4

10. Position new packing (10) P/N M25988/1-114 on the plug (9) P/N 509275.

11. Install the plug (9) P/N 509275 in the T fitting (8) P/N 508353-4 and torque to 177-221 IN-LBS (20-25 N-m).

12. Position packing (4, figure 7) P/N MS29512-08 on restrictor (3) P/N 510341-3

13. Install the restrictor (3) P/N 510341-3 on the T fitting (8) P/N 508353-4. Torque restrictor to 177-221 IN-LBS (20-25 N-m).

14. Using a vibration stylus, re-identify the fuel quantity probe assembly (1, figure 7, View A) from P/N 508195-3 to P/N 508195-4

15. Apply chemical film material (C-100) to the re-identified area of fuel quantity probe assembly (2) P/N508195-4.

16. Clean the fuel quantity probe assembly (2) using a lint free cloth moist with Aliphatic Naphtha(C-305)

7. Re-Install the mid-aft fuel quantity probe assembly P/N 429-066-400-169. Refer to BHT-429-MM, Chapter 28.

8. Re-Install the mid-forward fuel quantity probe assembly P/N 429-066-400-163. Refer to BHT-429-MM, Chapter 28.

9. Re-install the forward fuel quantity probe assembly (1, figure 7) P/N 508195-4. Refer to BHT-429-MM, Chapter 28.

10. Perform a fuel system operational check. Refer to BHT-429-MM, Chapter 28.

11. Make an entry in helicopter historical records indicating compliance with this Technical Bulletin.

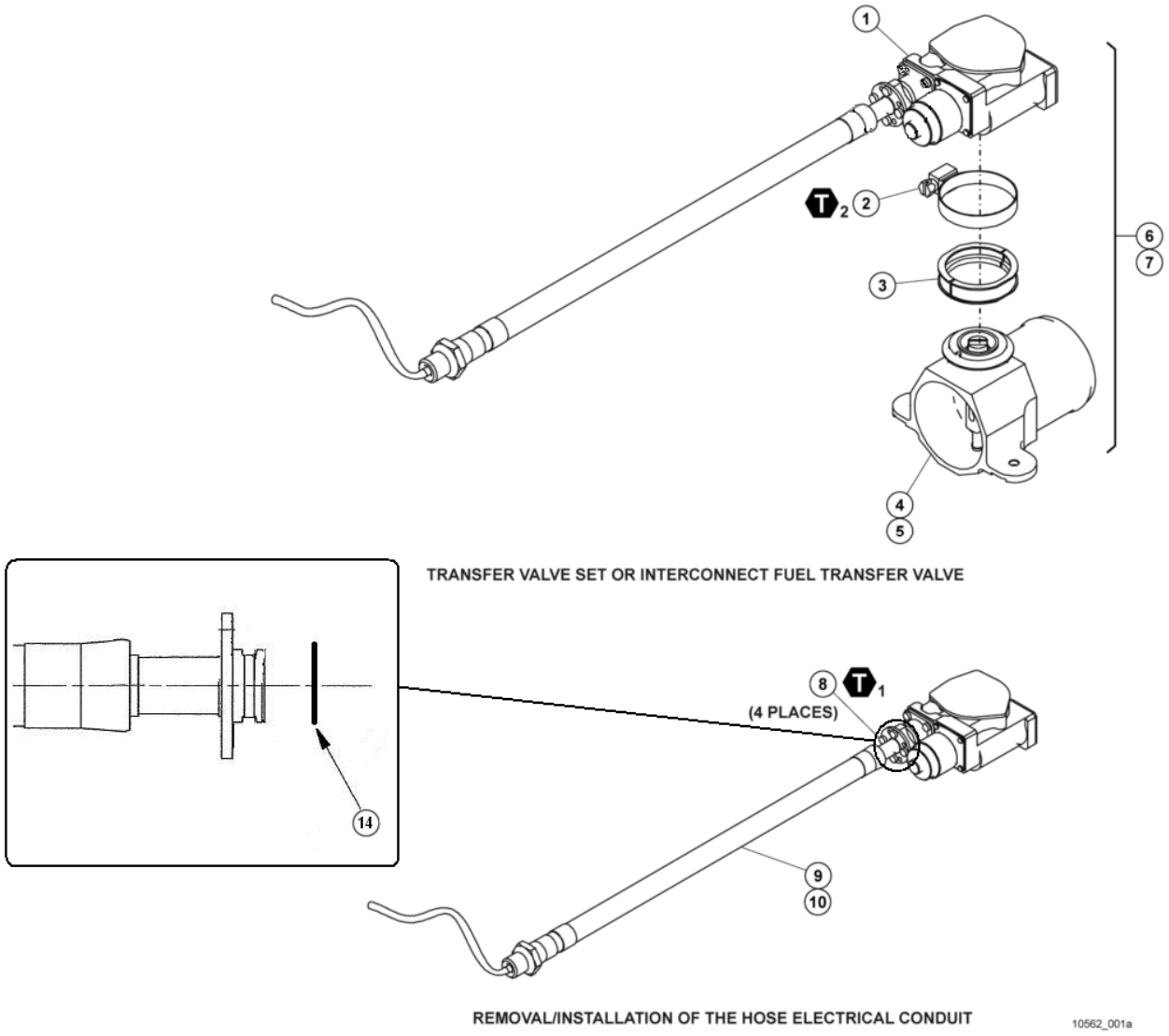

1
T2
2
3
6
7
4
5
TRANSFER VALVE SET OR INTERCONNECT FUEL TRANSFER VALVE
8
T1
(4 PLACES)
14
9
10
REMOVAL/INSTALLATION OF THE HOSE ELECTRICAL CONDUIT
10562_001a

Figure 1

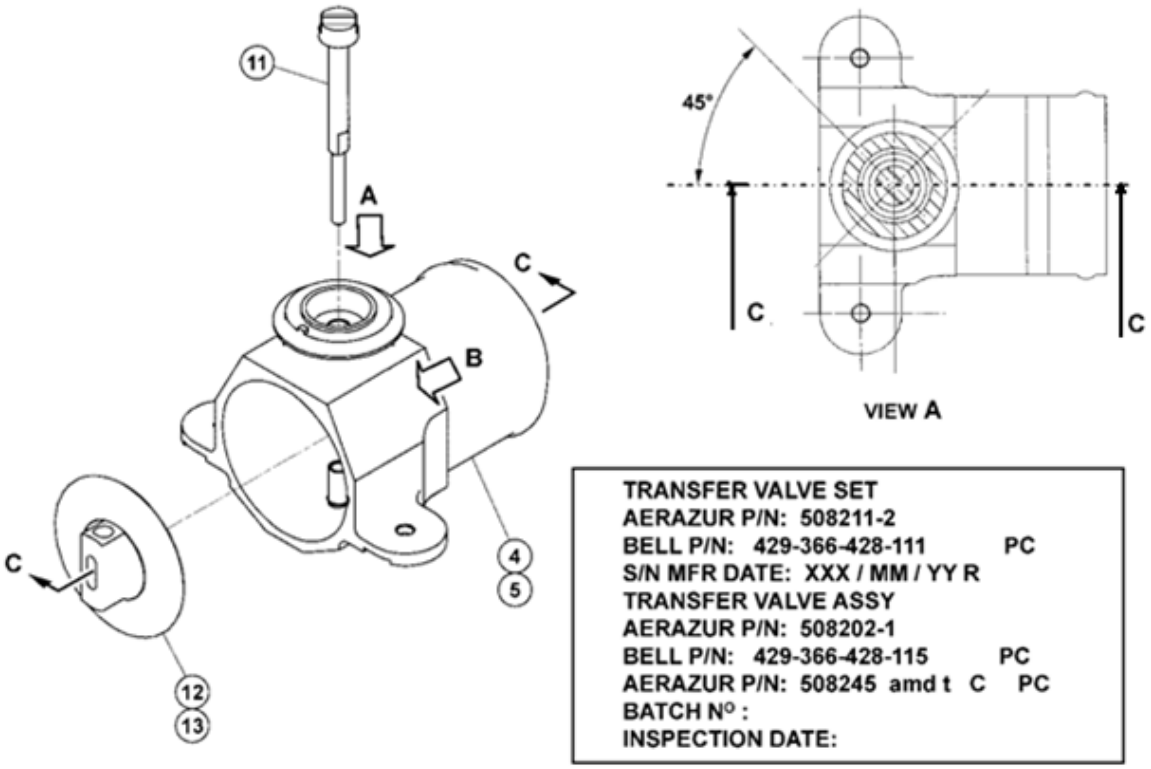
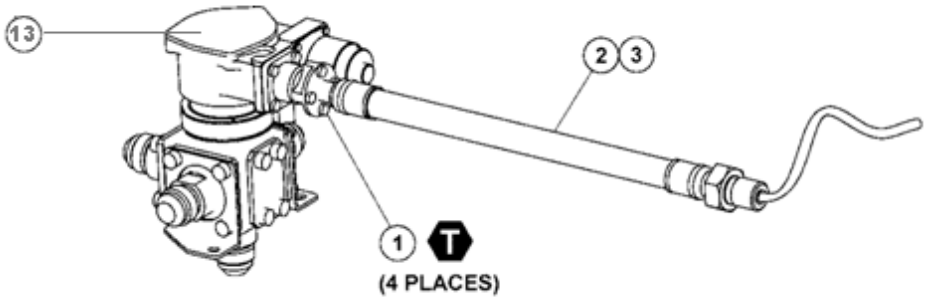
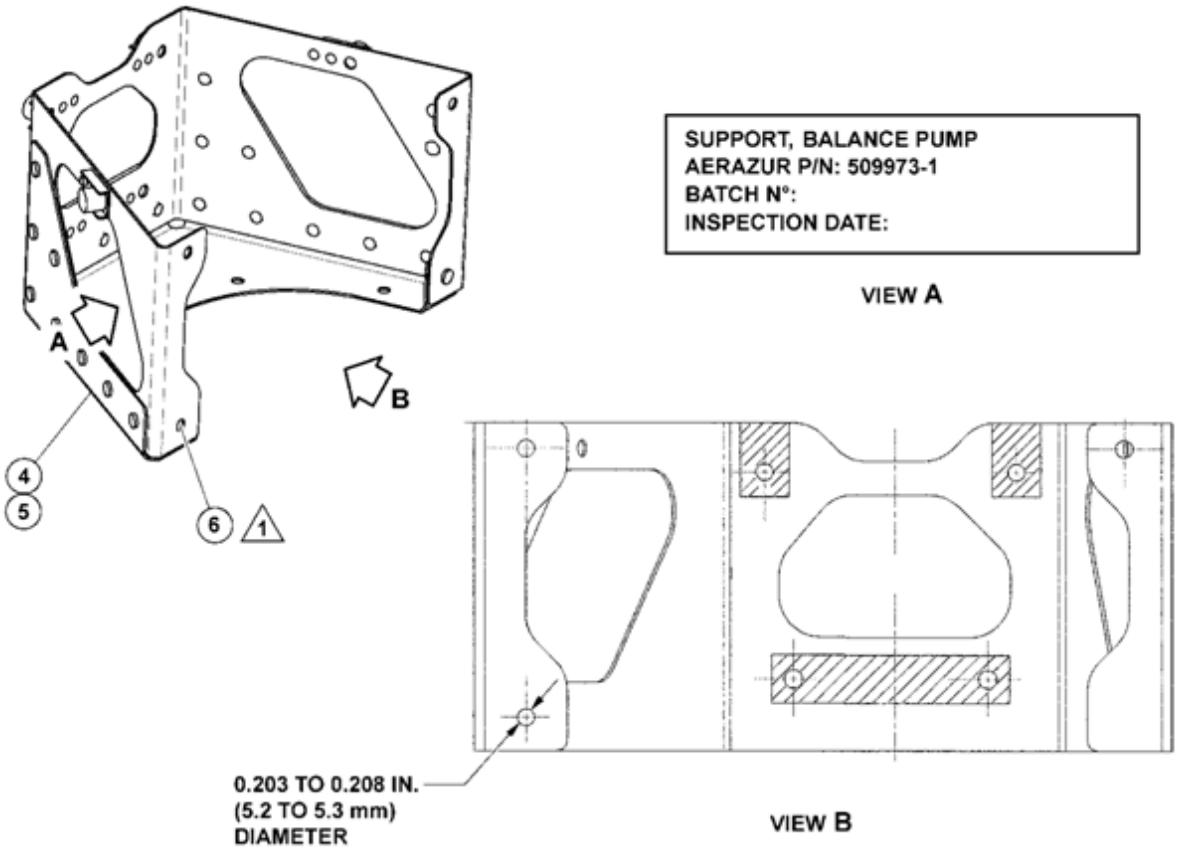

11
A
B
C
C
4
5
12
13
45°
C
C
VIEW A
TRANSFER VALVE SET
AERAZUR P/N: 508211-2
BELL P/N: 429-366-428-111 PC
S/N MFR DATE: XXX / MM / YY R
TRANSFER VALVE ASSY
AERAZUR P/N: 508202-1
BELL P/N: 429-366-428-115 PC
AERAZUR P/N: 508245 amd t C PC
BATCH N° :
INSPECTION DATE:
VIEW B
1. Actuator (429-366-428-109)
2. Collar (NAS1922-175-3)
3. Half clamp (509380)
4. Transfer valve assembly (Pre-TB) (429-366-428-103)
5. Transfer valve assembly (Post-TB) (429-366-428-115)
6. Transfer valve set or Interconnect fuel transfer valve (Pre-TB) (429-366-428-107)
7. Transfer valve set or Interconnect fuel transfer valve (Post-TB) (429-366-428-111)
8. Screw (DIN 84A2)
9. Hose electrical conduit (Pre-TB) (508417 AmdtA)
10. Hose electrical conduit (Post-TB) (508417 AmdtB)
11. Shaft (508246)
12. Butterfly molded seal (Pre-TB) (508421-1)
13. Butterfly molded seal (Post-TB) (508421-2)
14. O ring MS29513-013
T1 9 TO 11 IN-LBS (1.0 TO 1.2 Nm)
T2 12 TO 15 IN-LBS (1.4 TO 1.7 Nm)
SECTION C-C
(SHOWN ASSEMBLED)
REWORK OF THE TRANSFER VALVE ASSEMBLY
10562_001b

Figure 2



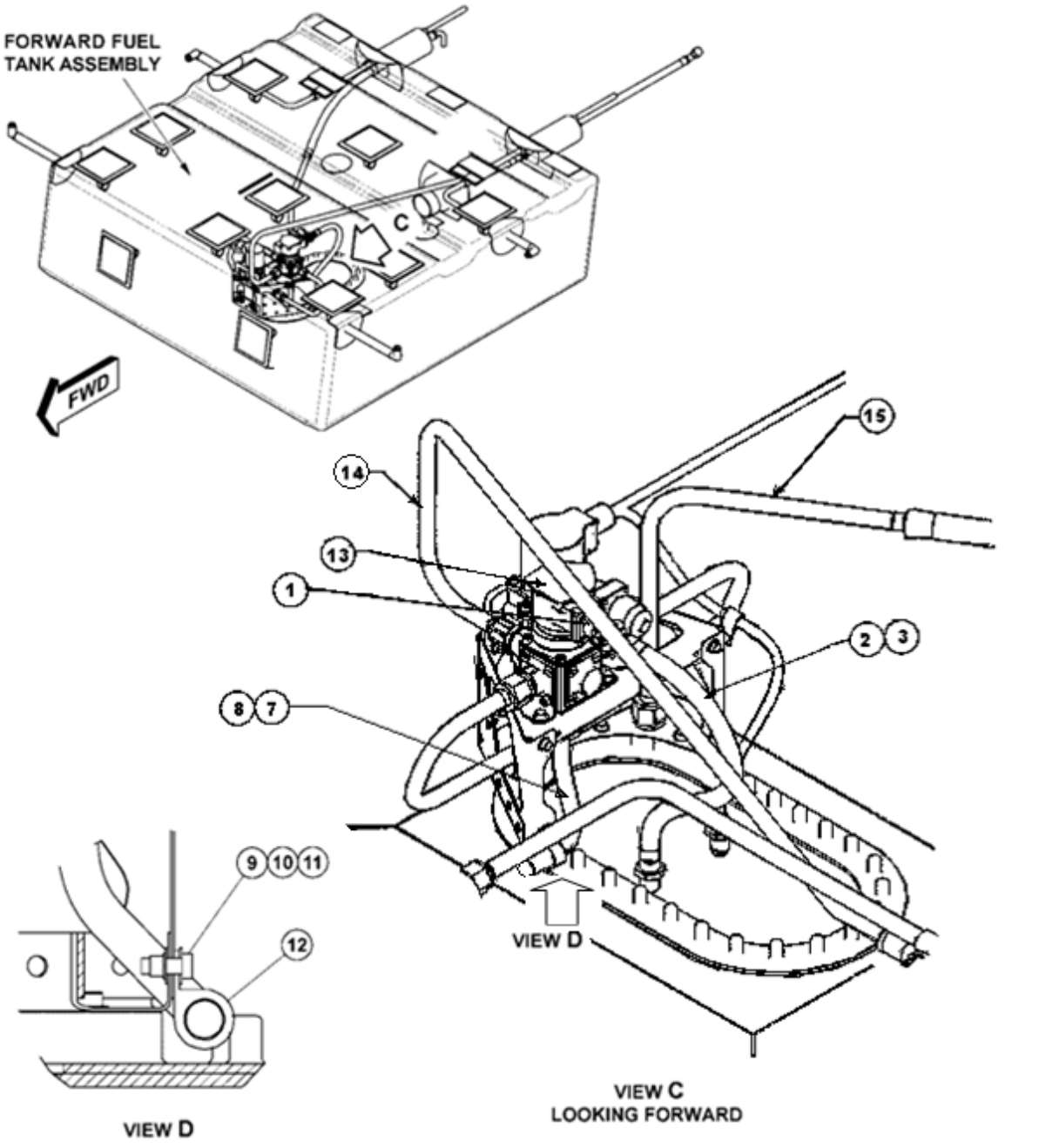
FUEL TRANSFER SELECTOR VALVE
REMOVAL/INSTALLATION OF THE HOSE ELECTRICAL CONDUIT



REWORK OF THE BALANCE PUMP SUPPORT

10562_002a

Figure 3



BALANCE TRANSFER TUBE INSTALLATION

10662_002b

Figure 4

1. Screw (DIN 84A3)
2. Hose electrical conduit (Pre-TB) (508417 AmdtA)
3. Hose elctrical conduit (Post-TB) (508417 AmdtB)
4. Balance pump support (Pre-TB) (509973)
5. Balance pump support (Post-TB) (509973-1)
6. Rivet (MS20470AD4-4)
7. Balance transfer tube (Pre-TB) (509975)
8. Balance transfer tube (Post-TB) (509975-1)
9. Scew (NAS1802-3-8)
10. Washer (MAS1149C0332R)
11. Nut (MS21043 -3)
12. Clamp (MS21919WCJ8)
13. Feul transfer selector valve (429-366-417-111)
14. Fuel balance transfer line (509976/509976-1)
15. Interna fuel transfer line (508540-3/-4)

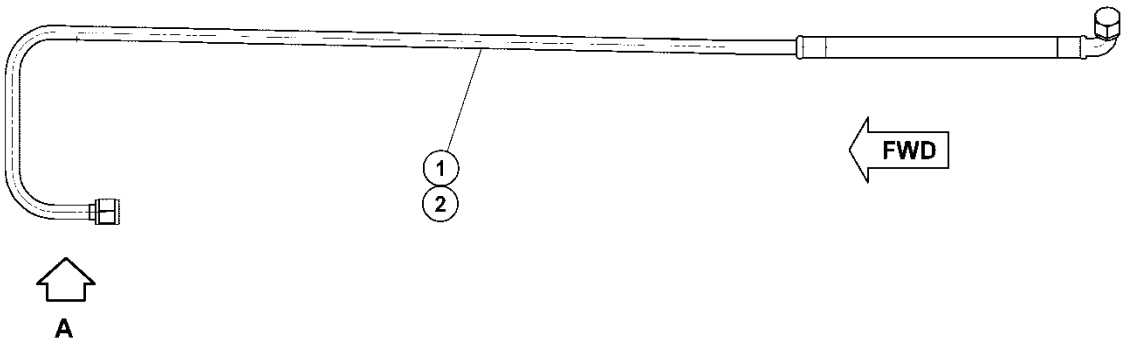
T 9 TO 11 IN-LBS
(1.0 TO 1.2 Nm)

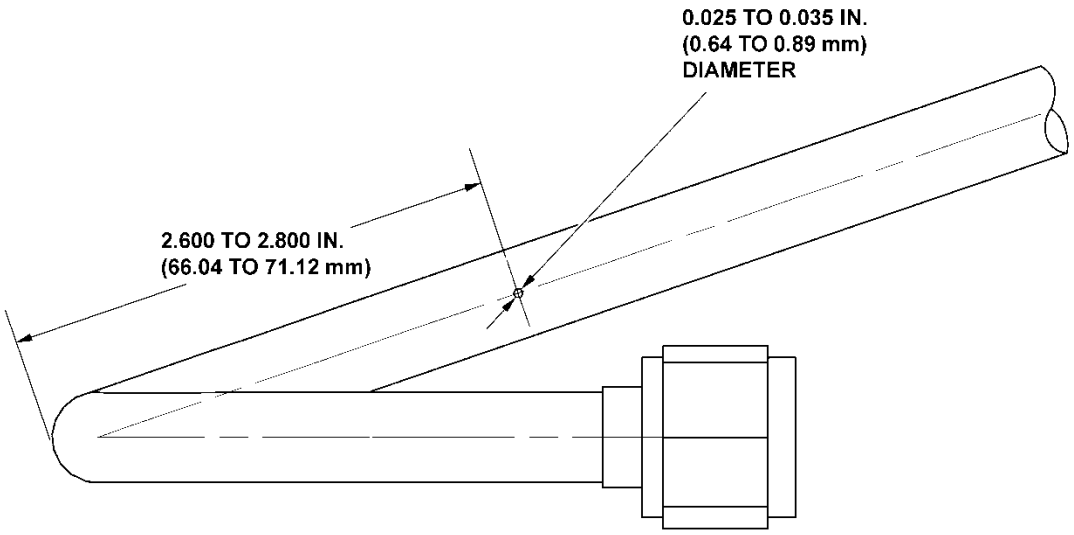
NOTE

1 Rivet to be removed.

10562_002c

Reference Figure 3 & 4





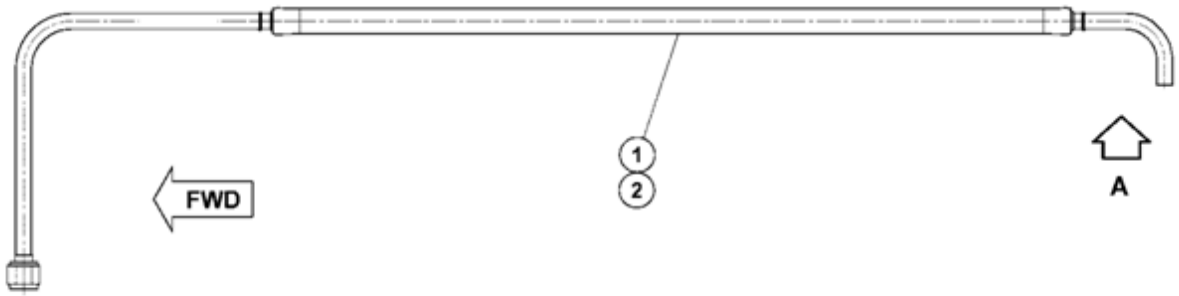
VIEW **A**

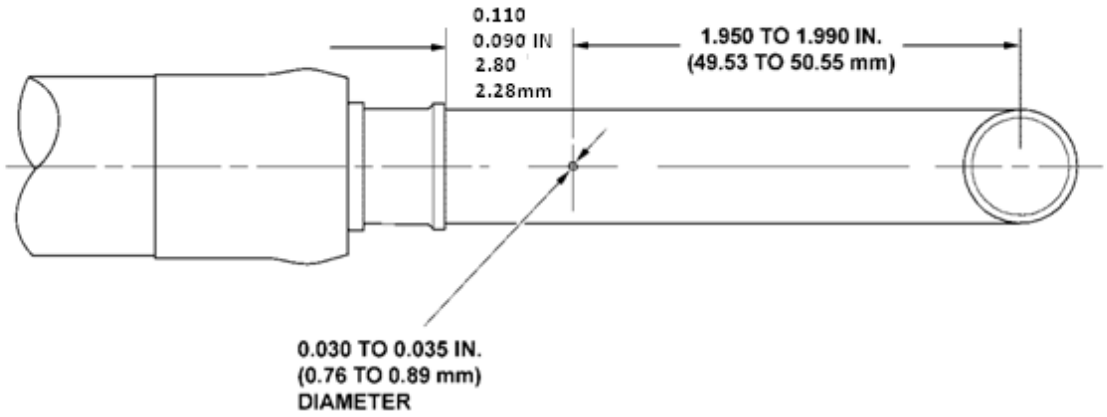
1. Fuel balance transfer line (Pre-TB) (509976)
2. Fuel balance transfer line (Post-TB) (509976-1)

REWORK OF THE BALANCE TRANSFER LINE ASSEMBLY

10562_003

Figure 5





VIEW A

1. Internal fuel transfer line (Pre-TB) (508540-3)
2. Internal fuel transfer line (Post-TB) (508540-4)

REWORK OF THE INTERNAL FUEL TRANSFER LINE ASSEMBLY

10962_004

Figure 6

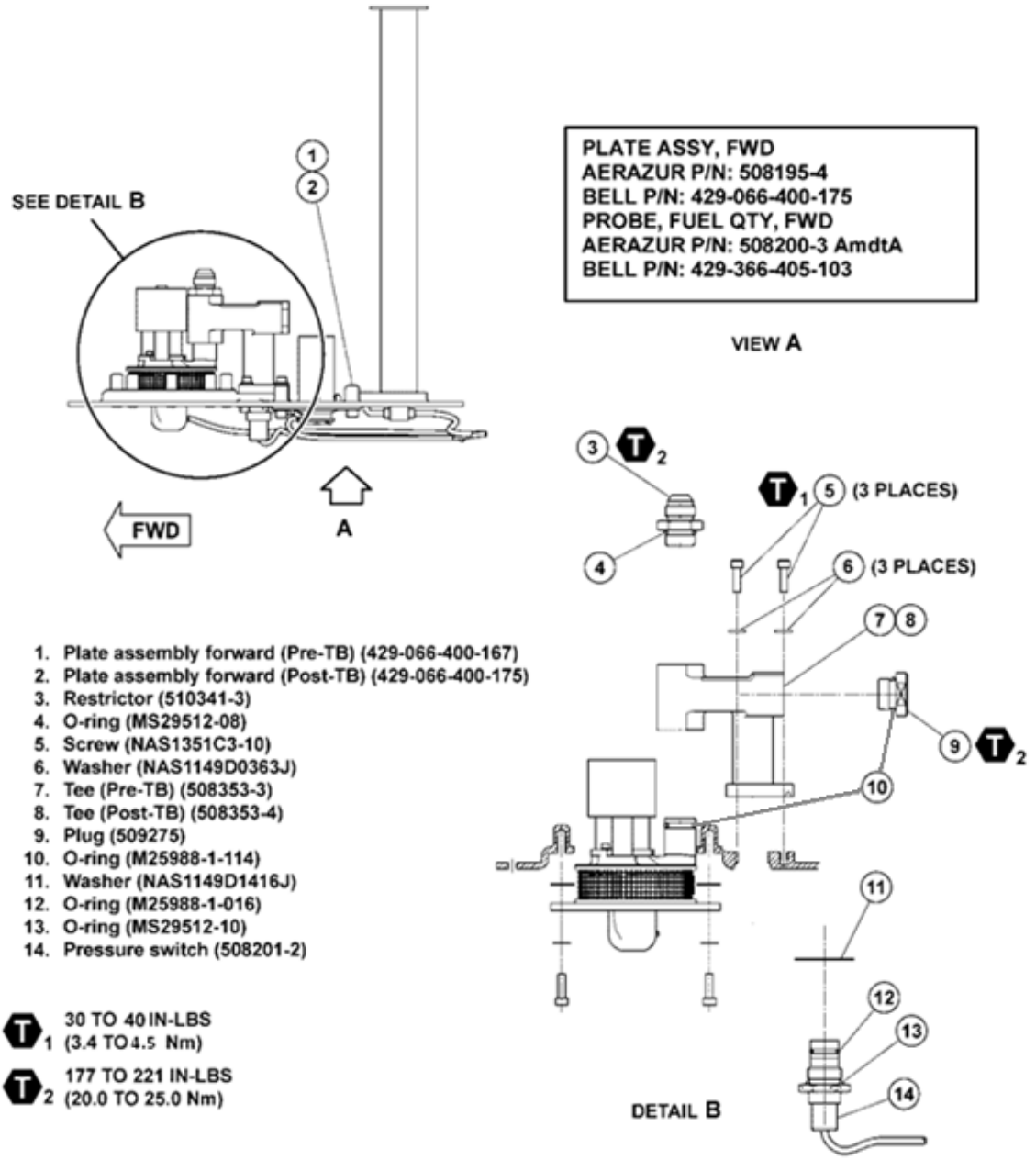

SEE DETAIL B
1
2
FWD
A
PLATE ASSY, FWD
AERAZUR P/N: 508195-4
BELL P/N: 429-066-400-175
PROBE, FUEL QTY, FWD
AERAZUR P/N: 508200-3 AmdtA
BELL P/N: 429-366-405-103
VIEW A
3
T2
4
T1
5 (3 PLACES)
6 (3 PLACES)
7
8
9
T2
10
11
12
13
14
DETAIL B
1. Plate assembly forward (Pre-TB) (429-066-400-167)
2. Plate assembly forward (Post-TB) (429-066-400-175)
3. Restrictor (510341-3)
4. O-ring (MS29512-08)
5. Screw (NAS1351C3-10)
6. Washer (NAS1149D0363J)
7. Tee (Pre-TB) (508353-3)
8. Tee (Post-TB) (508353-4)
9. Plug (509275)
10. O-ring (M25988-1-114)
11. Washer (NAS1149D1416J)
12. O-ring (M25988-1-016)
13. O-ring (MS29512-10)
14. Pressure switch (508201-2)
T1 30 TO 40 IN-LBS (3.4 TO 4.5 Nm)
T2 177 TO 221 IN-LBS (20.0 TO 25.0 Nm)
REMOVAL INSTALLATION OF THE TEE
10562_005

Figure 7