A Textron Company

ALERT SERVICE BULLETIN **412-23-193**

5 May 2023
Revision A, 18 July 2023
Revision B, 22 August 2023

MODEL AFFECTED: **412EP**

SUBJECT: **MAIN TRANSMISSION OIL TUBE ASSEMBLY 204-040-722-001/204-040-723-001 AND ELBOW FITTING AS1040W0404 REPLACEMENT, OF**

HELICOPTERS AFFECTED: **Serial numbers 39101 through 39112, 39114 39115, 39117 and 39119.**

[Serial number 39113, 39116, 39118, 39120 through 39999 will have the intent of this bulletin accomplished prior to delivery.]

COMPLIANCE: **Revision B**

PART I: Within the next 5 flight hours or 10 days whichever comes first after the release date of this bulletin revision B.

PART II: Within the next 10 flight hours or 30 days whichever comes first after accomplishment of **PART I** or as instructed in the Accomplishment Instructions.

DESCRIPTION:

Original release

Bell has received reports of 412EPX helicopters experiencing a loss of main transmission oil pressure due to the fracture of an elbow fitting on the main transmission ring gear case. Bell has found some instances of non-conforming 204-040-722-001 and/or 204-040-723-001 oil tube assemblies. Thus, to mitigate the risk of an elbow fitting fracture, the original release of this ASB mandated the replacement of four elbow fittings

AS1040W0404, tube assembly 204-040-722-001, and tube assembly 204-040-723-001.

Revision A

Following an elbow fitting failure during a production flight on a Bell 412EPX, which had the intent of ASB 412-23-193 incorporated, Bell released OSN 412-23-44. Since that time Bell has been evaluating potential solutions to the elbow fitting failures and has determined that the path forward will be replacement of the 204-040-722-001 and 204-040-723-001 rigid transmission oil tube assemblies with 70-030F000D142 hose assemblies. Tests performed on the current 412EPX configuration revealed higher strains on the elbow fittings than seen on the Legacy 412 transmission. The replacement of the rigid tube assemblies with hose assemblies reduced the measured strains at the elbow fittings to values that are comparable to what is seen on the Legacy 412 transmission for which no reports of elbow fitting failures have been received.

Revision A of this bulletin mandates the installation of four new elbow fittings, AS1040W0404, and replacement of the rigid tube assemblies 204-040-722-001 and 204-040-723-001 with two hose assemblies P/N 70-030F000D142. The Helicopters Affected listing is also revised to include additional helicopter serial numbers. Helicopters that have the intent of this bulletin accomplished prior to delivery will have a 412-040-008-105 transmission assembly installed.

Revision B

Following the release of the revision A of this bulletin, Bell has been made aware that some operators have not installed the hose assemblies as instructed in the Accomplishment Instructions. In one instance only one bracket was used to secure a hose assembly instead of two and in another, the clamps were installed backward. **PART I** of Revision B of this bulletin mandates a one-time inspection to ensure the hose assemblies and clamps have been installed as instructed in revision A of this bulletin as depicted in Figures 2 through 5. If the **PART I** inspection finds the installation has been completed per revision A of this bulletin, no further action is required. If the **PART I** inspection finds the installation has not been completed per revision A of this bulletin, the installation will have to be corrected to meet the intent of **PART II.**

PART II requires the hose assemblies and clamps to be installed as depicted in Figures 2 through 5. If the helicopter has flown with an incorrect installation, rectify the installation prior to the next flight and replace the affected elbow fittings within the compliance time allowed. To emphasize the criticality of installing the hose assemblies, brackets and clamps as instructed and as depicted in Figures 2 through 5, two Warnings have been added in the Accomplishment Instructions.

Applicability of this bulletin to any spare part shall be determined prior to its installation on an affected helicopter.

APPROVAL:

The engineering design aspects of this bulletin are FAA approved.

CONTACT INFO:

For any questions regarding this bulletin, please contact:

Bell Product Support Engineering
Tel: 1-450-437-2862 / 1-800-363-8023 / productsupport@bellflight.com

MANPOWER:

Approximately 4.0 man-hours are required to complete this bulletin revision A. This estimate is based on hands-on time and may vary with personnel and facilities available.

WARRANTY:

There is no warranty credit applicable for parts or labor associated with revision B of this bulletin.

MATERIAL:

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

Part Number	Nomenclature	Qty (Notes)
70-030F000D142	Hose assembly	2
MS21919WDG5	Clamp	4
AS1040W0404	Elbow fitting	4 (1)
205-040-131-001	Bracket	4
AS3208-04	Packing	4
MS27039-1-08	Screw	4 (2)
NAS9926-3L	Nut	4
NAS1149D0332K	Washer	4

NOTES:

1. AN837-4D elbow fitting can be used as an alternate.
2. NAS1801-3-8 or NAS1802-3-8 screw can be used as an alternate.

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

Part Number	Nomenclature	Qty (Note)	Reference *
2230-10536-00	Torque Seal Lacquer	1 OZ (1)	C-049
1650-03297-00	Safety Wire 0.032 inch	1 LB (1,2)	C-405

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

NOTES:

1. Quantity indicated is the format that the product is delivered in. Actual quantity required to accomplish the instructions in this bulletin may be less than what has been delivered.
2. Sold as a 1 pound roll; replaces the 5 pound roll part number 1650-03296-00.

SPECIAL TOOLS:

None required.

WEIGHT AND BALANCE:

Not affected.

ELECTRICAL LOAD DATA:

Not affected.

REFERENCES:

BHT-412-IPBS-EPX, Illustrated Parts Breakdown Supplement, Chapter 63

PUBLICATIONS AFFECTED:

BHT-412-IPBS-EPX, Illustrated Parts Breakdown Supplement, Chapter 63
BHT-412-MMS-EPX, Maintenance Manual Supplement, Chapter 63

ACCOMPLISHMENT INSTRUCTIONS:

PART I: One-time visual inspection for proper installation of hose assemblies 70-030F000D142.

1. Prepare the helicopter for maintenance and remove the transmission cowlings to gain access to the transmission hose assemblies 70-030F000D142 (1, Figures 2 and 4).

2. Inspect the installation of the hose assemblies 70-030F000D142 and supporting clamps to determine if it matches the accomplishment instructions of Revision A of this bulletin (Part II and Figures 2 through 5 of this revision are unchanged from Revision A).

3. If the installation has been done correctly in accordance with **PART II**, no further action is required. Make an entry in the helicopter logbook and historical service records indicating findings and compliance with this Alert Service Bulletin.

4. If the installation has not been done in accordance with **PART II** and the helicopter has not flown since the accomplishment of Revision A of this bulletin, correct the installation as described in **PART II** before next flight.

5. If the installation has not been done in accordance with **PART II** and the helicopter has flown after accomplishment of Revision A of this bulletin, correct the installation as described in **PART II** before next flight and replace the elbow fittings associated with the hose assembly that was not installed correctly within the next 10 flight hours of 30 days whichever comes first.

PART II: Replacement elbow fittings and tube assemblies 204-040-722-001 and 204-040-723-001.

1. Prepare the helicopter for maintenance and remove the transmission cowlings to gain access to the transmission tube assemblies, 204-040-722-001 and 204-040-723-001 (1 and 2, Figure 1).

2. Referring to Figure 1:

   a. Remove and discard the 204-040-722-001 and 204-040-723-001 tube assemblies (1 and 2).

   b. Remove safety wire where applicable and remove and discard all four elbow fittings (3) and packings AS3208-04. Retain jam nuts (6).

   c. At the housing (4) and oil jets (5) install new elbow fittings (3) with the previously removed jam nuts (6) and new packings. Position the elbow fittings (3) as shown. Do not tighten the jam nuts (6).

3. Referring to Figure 2, install the hose assembly (1), with clamps (3), brackets (2) and attaching hardware as follows:

   a. There are 16 bolts connecting the transmission topcase to the ring gear as indicated by the blue circles in Figure 3. Numbering the bolts in the clockwise direction looking down and beginning next to the housing (7 in Figure 2), at bolt locations 3 and 4 remove the nuts, the steel washers and the aluminum washers. Discard aluminum washers.

   b. Install brackets (2), steel washers and nuts on bolt locations 3 and 4. Tighten nuts 230 to 250 in-lbs (26 to 28 Nm).

   c. Install the hose assembly (1) and thread the hose B-nuts on the elbow fittings (4) by hand only. Elbow fittings (4) should rotate freely.

   d. Adjust the angle of the elbow fittings (4) for optimal fit with the hose assembly (1). There should be no binding.

WARNING

Installation of the clamps at the proper locations and orientation as shown in Figures 2 and 3 is critical. Improper clamp installation could cause excessive stress and strain that can lead to fracture of an elbow fitting.

   e. Install clamps (3) on brackets (2) with MS27039-1-08 screws, NAS1149D0332K washers and NAS9926-3L nuts. Washer is installed under the nut and screw orientation is optional. Ensure the clamps are installed in the position shown. Do not tighten the hardware attaching the clamps (3).

   f. Hold the elbow fittings (4) and tighten the jam nuts (5) 60 to 96 in-lbs (6.8 to 10.8 Nm).

   g. Hold the elbow fittings (4) and tighten the mating hose assembly (1) B-nut 60 to 96 in-lbs (6.8 to 10.8 Nm). Tighten the clamps (3) attaching hardware.

   h. At the oil jet, secure the oil jet attaching screw (6) to the elbow fitting (4) with safety wire (C-405).

   i. Make sure the hose assembly does not contact the ring gear case or any other surrounding part.

4. Referring to Figure 4, install the hose assembly (1) with clamps (3), brackets (2) and attaching hardware as follows:

   a. There are 20 bolts connecting the transmission main case to the ring gear as indicated by the blue circles in Figure 5. Numbering the bolts in the

counterclockwise direction looking down and beginning next to the housing (4 in Figure 1), at bolt locations 3 and 5 remove the nuts, bolts, and washers.

b. On the upper side, install brackets (2), steel washers and bolts at bolt locations 3 and 5. On the underside, install aluminum washers, steel washers and nuts. Tighten nuts 25 to 28 ft-lbs (34 to 38 Nm).

c. Install the hose assembly (1) and thread the hose B-nuts on the elbow fittings (4) by hand only. Elbow fittings (4) should rotate freely.

d. Adjust the angle of the elbow fittings (4) for optimal fit with the hose assembly (1). There should be no binding.

WARNING

Installation of the clamps at the proper locations and orientation as shown in Figures 4 and 5 is critical. Improper clamp installation could cause excessive stress and strain that can lead to fracture of an elbow fitting.

e. Install clamps (3) on brackets (2) with MS27039-1-08 screws, NAS1149D0332K washers and NAS9926-3L nuts. Washer is installed under the nut and screw orientation is optional. Ensure the clamps are installed in the position shown. Do not tighten the hardware attaching the clamps (3).

f. Hold the elbow fittings (4) and tighten the jam nuts (5) 60 to 96 in-lbs (6.8 to 10.8 Nm).

g. Hold the elbow fittings (4) and tighten the mating hose assembly (1) B-nut 60 to 96 in-lbs (6.8 to 10.8 Nm). Tighten the clamps (3) attaching hardware.

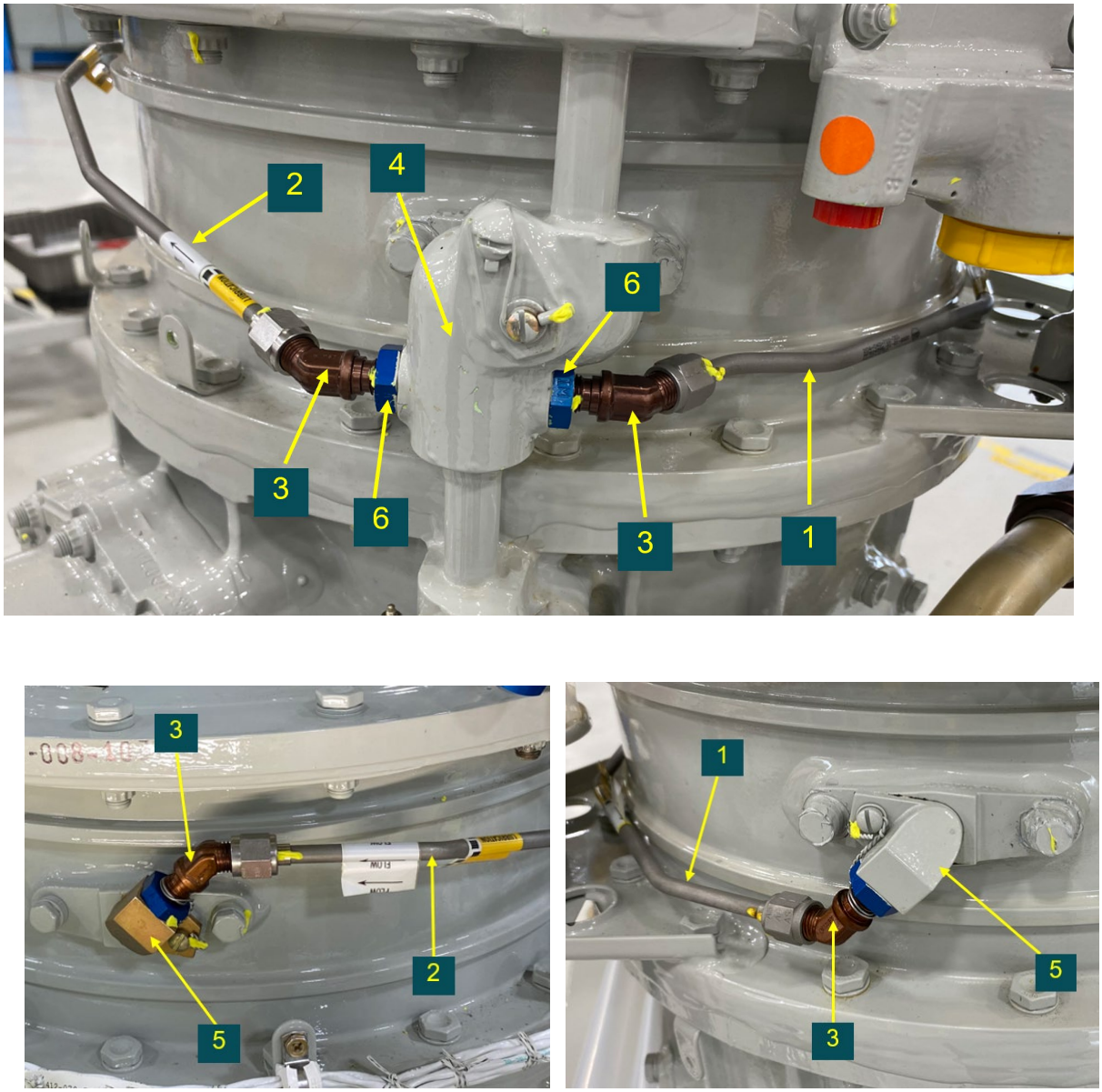
h. At the oil jet, secure the oil jet attaching screw (6) to the elbow fitting (4) with safety wire (C-405).

i. Make sure the hose assembly does not contact the ring gear case or any other surrounding part.

5. Apply Torque Seal lacquer (C-049) at the four elbow fitting jam nuts (5) and the hose assembly (1) B-nuts.

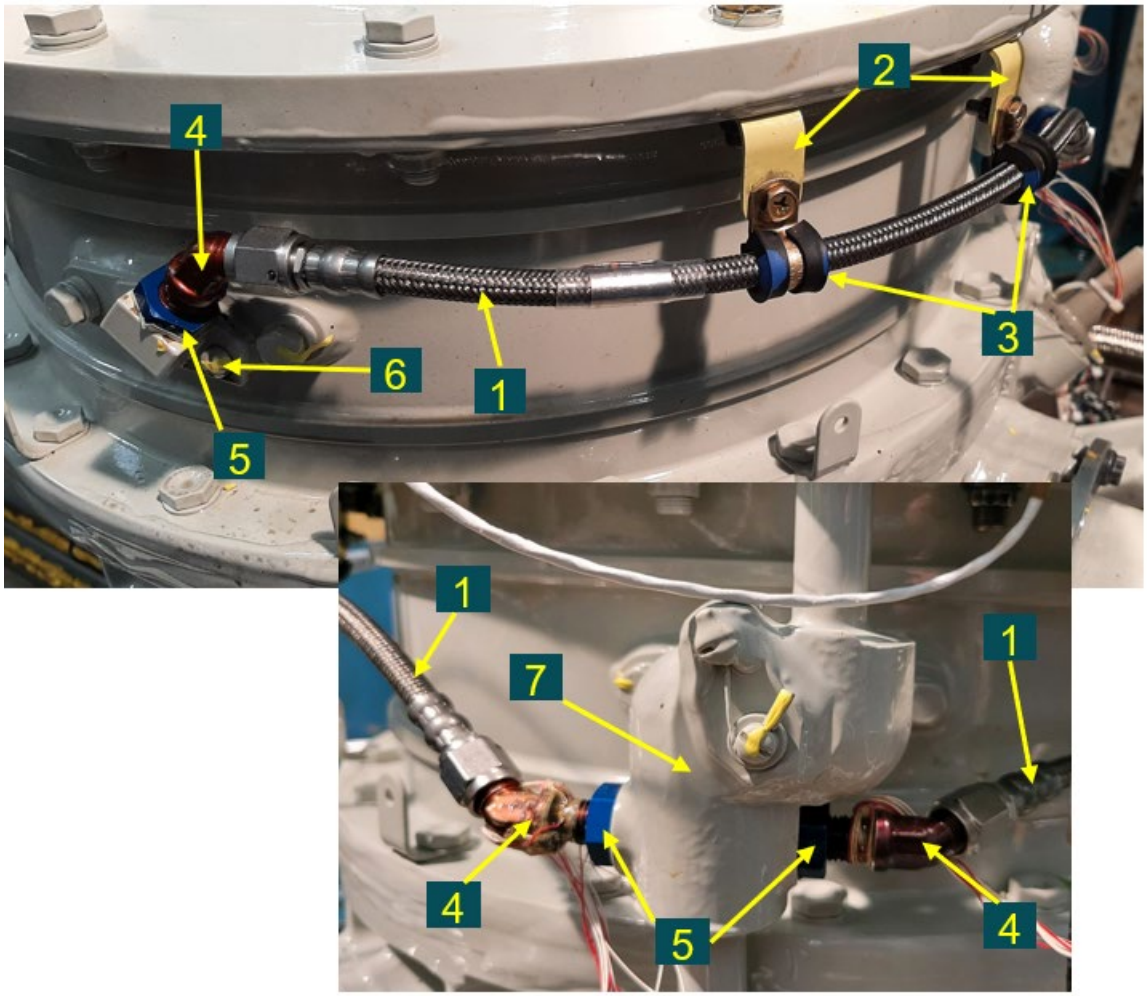
6. Using a vibrating stylus, re-identify the transmission assembly as 412-040-008~~-103~~ - 105.

7. Make an entry in the helicopter logbook and historical service records indicating compliance with this Alert Service Bulletin.



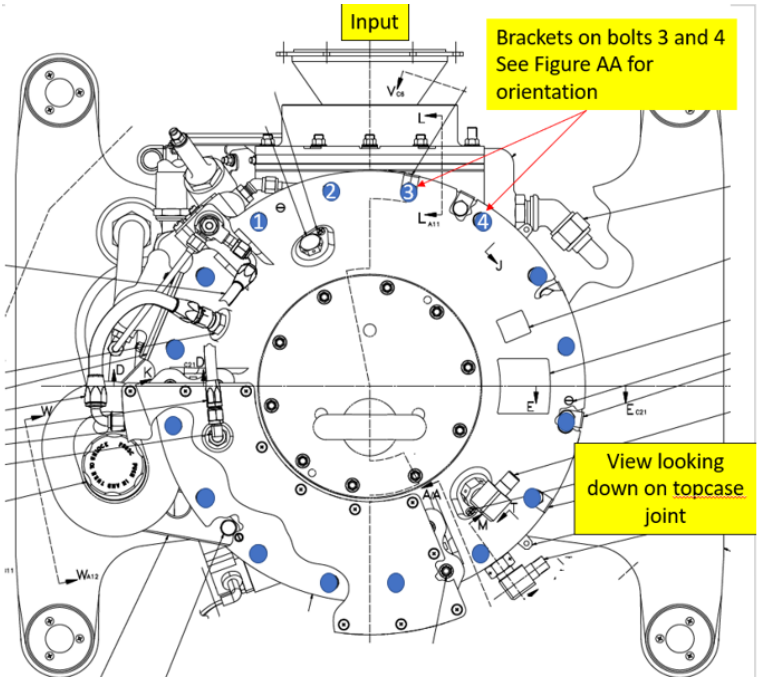
1. Tube assembly 204-040-722-001
2. Tube assembly 204-040-723-001
3. Elbow fitting AS1040W0404
4. Housing
5. Oil jet
6. Jam nut AS5178D04

Figure 1. Tube Assemblies 204-040-722-001 and 204-040-723-001 removal.



1. Hose assembly 70-030F000D142
2. Bracket 205-040-131-001
3. Clamp MS21919WDG5
4. Elbow fitting AS1040W0404
5. Jam nut AS5178D04
6. Screw MS35266-62
7. Housing

Figure 2. Hose assembly 70-030F000D142 installation as a replacement of tube assembly 204-040-723-001.



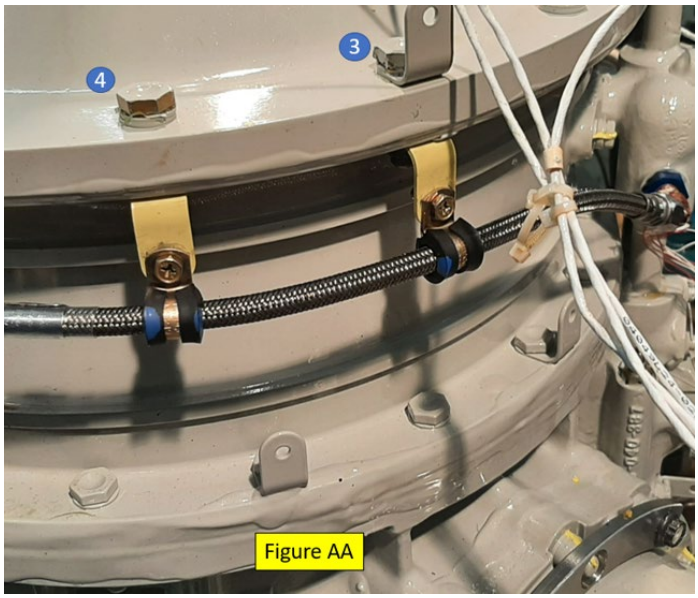
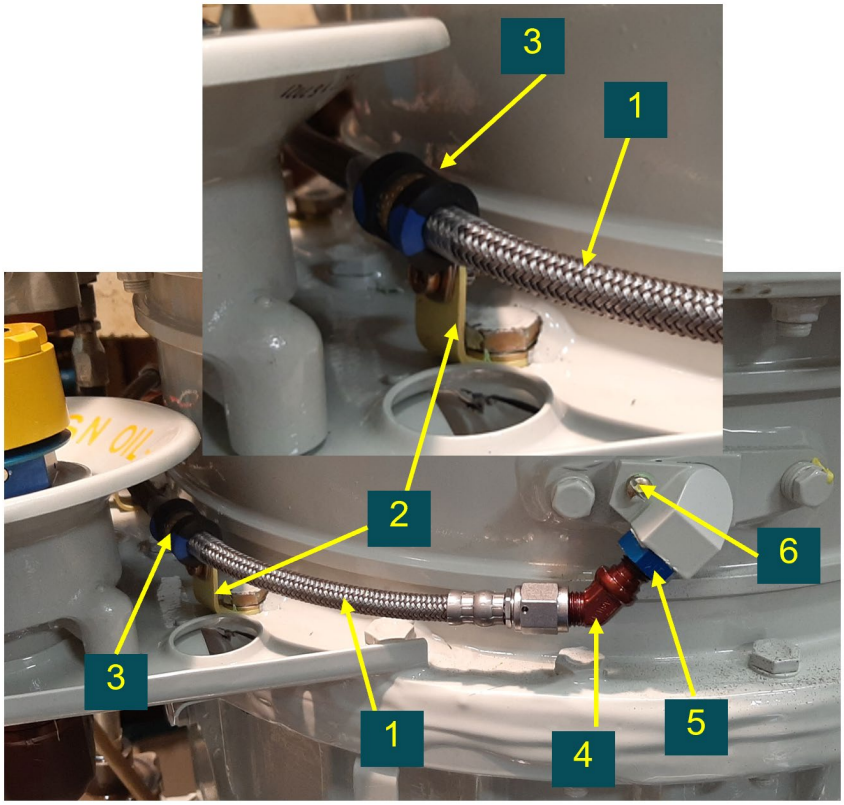
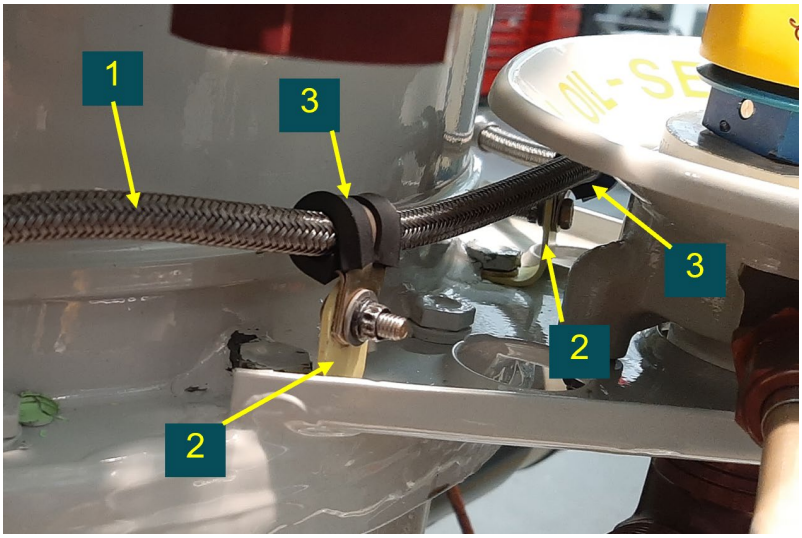


Figure 3. Clamp Locations (top ring gear flange).





1. Hose assembly 70-030F000D142
2. Bracket 205-040-131-001
3. Clamp MS21919WDG5
4. Elbow fitting AS1040W0404
5. Jam nut AS5178D04
6. Screw MS35266-62

Figure 4. Hose assembly 70-030F000D142 installation as a replacement of tube assembly 204-040-722-001.

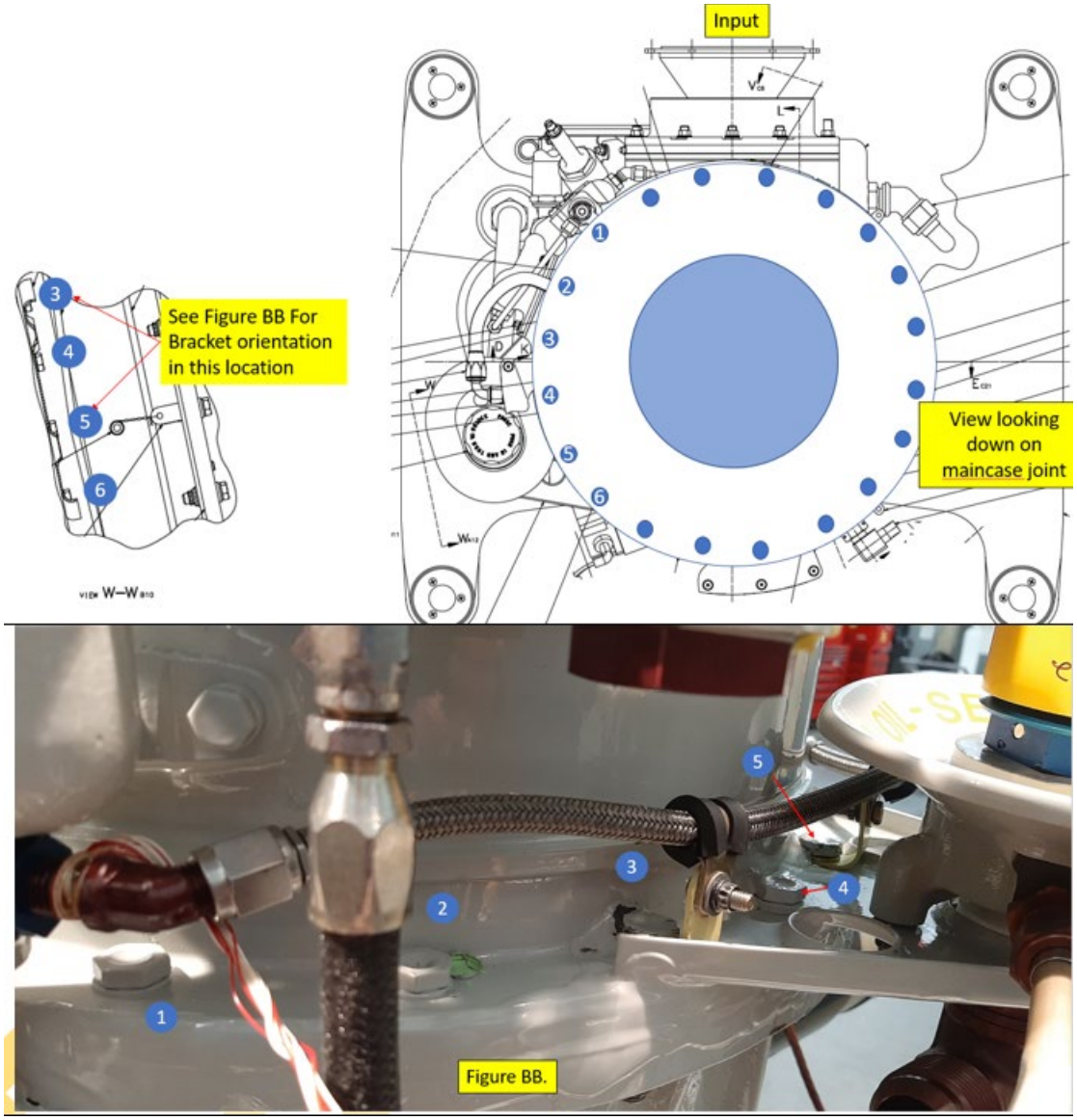


Figure 5. Clamp Locations (bottom ring gear flange).