A Textron Company

TECHNICAL BULLETIN 407-20-134

7 June 2023

MODEL AFFECTED: **407**

SUBJECT: **ENGINE TORQUE INDICATION SYSTEM, MODIFICATION OF**

HELICOPTERS AFFECTED: **Serial numbers 54304, 54567, 54805 through 54903, 54905 through 54906, 54908 through 54910 and 54912.**

[Serial numbers 54904, 54907, 54911, 54913 and subsequent will have the intent of this bulletin accomplished prior to delivery.]

COMPLIANCE: At customer's option.

DESCRIPTION:

Bell has discovered that the 407 GXi helicopter engine torque indication system is over indicating by 1.6% on the whole span of the engine torque measurement.

This technical bulletin provides the instructions to modify the engine torque indication system with the installation of balancing resistors to the engine torque transducer circuitry. The function of the balancing resistors is to stabilize the engine torque signal output.

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 Transport Canada Civil Aviation (TCCA) approved.

Approved for public release.

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 24 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:

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

MATERIAL:

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

Part Number	Nomenclature	Qty (Note)
1250-00308-00	Wire	7 feet (2.13m)(1)
1250-00309-00	Wire	28 feet (8.53m)(1)
110-182H1004TAM	Resistor	2
130-057-04B2	Insulation Sleeving	1
130-061-02W2	Insulation Tubing	2
20-108-1	Band	1
31-065-8TB4	Decal	1
DCR-1A-05	Rail	1
2530-00368-00	Insulation Tubing	2 feet (0.61m)(1)
M39029/22-191	Contact	1
M39029/56-348	Contact	2
M81824/1-1	Splice	1
M81714/60-22-05	Terminal block	1
M85049/93-10	Shield support ring	1(2)
S200-2-W1-22-9	Shield Terminator	2
S200-3-00	Shield Terminator	1
S200-3-01-100HN	Shield Terminator	1
S200-3-W1-22-9	Shield Terminator	1

NOTES:

1. Part number is for quantities sold by the foot. Actual quantity required must be specified in the order.

2. Only required if the replacement is needed.

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 Supply Center.

Part Number	Nomenclature	Qty (Note)	Reference *
2000-00731-00	Insulation tape.	1Roll (1)	C-548
2000-09120-00	Adhesive Tape	1Roll (1)	C-460
PLT2S-C702Y	Cable Tie	AR	C-292

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

NOTE 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.

SPECIAL TOOLS:

M81969/14-01 Insertion/Extraction tool
M81969/16-04 Insertion/Extraction tool
M22520/7-01 Crimp tool (or equivalent)
M22520/7-05 Turret/Positioner
M22520/7-11 Turret/Positioner
M81714/69-02 Module extractor
A40199 Band crimper (or equivalent)
AD-1377 Raychem crimper
HT-900 Raychem heat gun (or equivalent)
45-1987 Wire stripper (or equivalent)

WEIGHT AND BALANCE:

Negligible.

ELECTRICAL LOAD DATA:

Not affected.

REFERENCES:

407-IPB, Illustrated Parts Breakdown, chapter 95
407-MM, Maintenance Manual, chapter 95
407-MM, Maintenance Manual, chapter 98
BHT-ELEC-SPM, Electrical Standard Practices Manual
BHT-ALL-SPM, Standard Practices Manual

PUBLICATIONS AFFECTED:

407-IPB, Illustrated Parts Breakdown, chapter 95
407-MM, Maintenance Manual, chapter 98

ACCOMPLISHMENT INSTRUCTIONS:

1. Prepare the helicopter for maintenance.

2. Make sure all electrical power is removed from helicopter.

WARNING

OBEY ALL THE SAFETY PRECAUTIONS WHEN YOU DO MAINTENANCE ON OR NEAR ELECTRICAL/ELECTRONIC EQUIPMENT (407-MM, chapter 96).

-NOTE-

Refer to the 407-MM, DMC-407-A-96-00-00-00A-028A-A to identify the exact location of applicable electrical and electronic components.

3. Gain access to the terminal blocks 8TB1 and 8TB4 by removing the left upper and lower console panel, and left upper door.(407-MM, chapter 95 and BHT-ALL-SPM).

4. Gain access to the connector 6J1 and the wire harness between the terminal block 8TB4 and the connector 6J1 by removing the hat bin, the cockpit and cabin headliners, and the instrument panel shroud assemblies (407-MM, chapter 25, and chapter 95).

5. Remove the terminal blocks 8TB4K, 8TB4L, 8TB4M and 8TB4N from the terminal block rail 8TB4 (BHT-ELEC-SPM).

6. Remove and discard the rail. Retain the hardware for the installation of the new rail.

7. Install the new rail (1, Figure 1) with the hardware that was retained in step 6, and bond the decal (2), as shown in figure 1.

8. Install the new terminal block 8TB4P (3) on the rail (1) and reinstall the terminal blocks 8TB4K, 8TB4L, 8TB4M and 8TB4N that were removed in step 5 (BHT-ELEC-SPM).

-NOTE-

Refer to BHT-ELEC-SPM to complete the following step. Refer to Figure 1 for wire routing and Figure 2 for the wiring diagram.

-NOTE-

Actions specified in the “ACTION” column of the Wiring Modifications Instruction Table (Table 1) are as follows:

Reterminate – Reposition one end of the specified wire FROM its previous location TO a new location.
Add – A new wire or resistor is required between the two locations listed in TO and FROM

9. Wire harness modifications instructions (BHT-ELEC-SPM).

   a. Disconnect connector 6P1 from connector 6J1 (AFT Section).

   b. Disconnect wire E572C22 from connector 6J1 (AFT Section). Re-route the existing wire E572C22 from connector 6J1 to terminal block 8TB4P. Trim the wire E572C22 to proper length for termination.

   c. Cut one piece of wire 1250-00309-00 to the length specified in table 1. Mark the wire number E572D22 every 6 to 12 inches (152.4 to 304.8 mm) using M23053/5-105-9 heat shrink and a permanent ink marker.

   d. Route wire E572D22 from 8TB4P to connector 6J1 (AFT section).

   e. Terminate wire E572D22 to connector 6J1 using contact M39029/56-348, insulation tube 130-057-04B2 and shield terminator S200-3-01-100HN. Insert the white and blue wire to connector 6J1 position 67 and 68 respectively. Join the shield wire with connector 6J1 shield.

   f. Rebuild connector 6J1 and reconnect connector 6P1.

   g. Cut one piece of wire 1250-00308-00 to the length specified in table 1. Mark the wire number E571F22 every 6 to 12 inches (152.4 to 304.8 mm) using M23053/5-105-9 heat shrink and a permanent ink marker.

h. Terminate wire E571F22 to terminal block 8TB1K using contact M39029/22-191. Shield wire E571F22, E571C22, E571D22 and E571E22 shall be terminated together at the terminal block 8TB1K. Splice M81824/1-1 and shield terminator S200-2-W1-22-9 can be used to modify the shield wires. Insert the wire to terminal block 8TB1K position Z.

i. Terminate wire E572C22, E571F22 and E572D22 to terminal block 8TB4P using contact M39029/22-191. Shield wires E572C22, E571F22 and E572D22 shall be terminated together at the terminal block 8TB4P using shield terminator S200-3-00, S200-2-W1-22-9 and S200-3-W1-22-9 respectively.

j. Insert wire E572C22 white and blue to terminal block 8TB4P position G and J respectively.

k. Insert wire E571F22 to terminal block 8TB4P position B.

l. Insert wire E572D22 white and blue to terminal block 8TB4P position H and K respectively.

m. Identify 6341R1 and 6341R2 to the resistors 110-182H1004TAM by using the insulation tube 130-061-02W2 and a permanent ink marker.

n. Insert resistor 6341R1 to terminal block 8TB4P position D and E

o. Insert resistor 6341R2 to terminal block 8TB4P position C and L.

10. Reinstall the left upper and lower console panel, and left upper door. (407-MM, chapter 95 and BHT-ALL-SPM)

11. Reinstall the hat bin, the cockpit and cabin headliner interior and the shroud assembly (407-MM, chapter 25 and chapter 95).

12. Do a torque indication operational check (DMC-407-A-95-65-00-00A-320C-A).

13. Make an entry in the helicopter logbook and historical service records indicating compliance with this Technical Bulletin.

Table 1 – Wiring Modifications Instruction Table

Action	Wire#	Length (feet)	From (Pin location)	Hardware	To (Pin location)	Hardware	Notes
Reterminate	E572C22 WHT		6J1 (67)	M39029/56-348	8TB4P (G)	M39029/22-191	1,4,5,9
	E572C22 BLU		6J1 (68)	M39029/56-348	8TB4P (J)	M39029/22-191	1,4,5,9
	E572C22 SHLD		6J1 SHLD		8TB4P	S200-3-00	5,6
Add	E572D22 WHT	28	8TB4P (H)	M39029/22-191	6J1 (67)	M39029/56-348	1,3,5, 9,10
	E572D22 BLU		8TB4P (K)	M39029/22-191	6J1 (68)	M39029/56-348	1,3,5, 9,10
	E572D22 SHLD		8TB4P	S200-3-W1-22-9	6J1 SHLD	S200-3-01-100HN	5,6,7, 11
Add	E571F22	7	8TB4P (B)	M39029/22-191	8TB1K (Z)	M39029/22-191	1,3,9
	E571F22 SHLD		8TB4P	S200-2-W1-22-9	8TB1K	S200-2-W1-22-9	6,8,12
Add	6341R1		8TB4P (D)	M39029/22-191	8TB4P (E)	M39029/22-191	2
Add	6341R2		8TB4P (C)	M39029/22-191	8TB4P (L)	M39029/22-191	2

NOTES:

1. Cut to length.
2. Identify the resistors by using the insulation tube 130-061-02W2 and a permanent ink marker.
3. Mark the wire number every 6 to 12 inches (152.4 to 304.8 mm) using M23053/5-105-9 heat shrink and a permanent ink marker.
4. Reposition one end of the specified wire from its previous location to a new location.
5. Remove and reinstall the back shell of connector 6J1 to add or delete the wire.
6. Shield of wires E572C22, E571F22 and E572D22 shall be terminated together at the terminal block 8TB4P.
7. Shield of wire E572D22 shall be terminated with connector 6J1 shield.
8. Shield of wires E571F22, E571C22, E571D22 and E571E22 shall be terminated together at the terminal block 8TB1K. Splice M81824/1-1 can be used to modify the shield of the wires.
9. For the contact PN: M39029/22-191 use crimping tool M22520/7-01 and positioner M22520/7-11. The insert/extract tool is M81969/16-04.
10. For the contact PN: M39029/56-348 use crimping tool M22520/7-01 and positioner M22520/7-05. The insert/extract tool is M81969/14-01
11. For the shield termination band 20-108-1 use crimping tool A40199.
12. For the splice M81824/1-1 use crimping tool AD-1377.

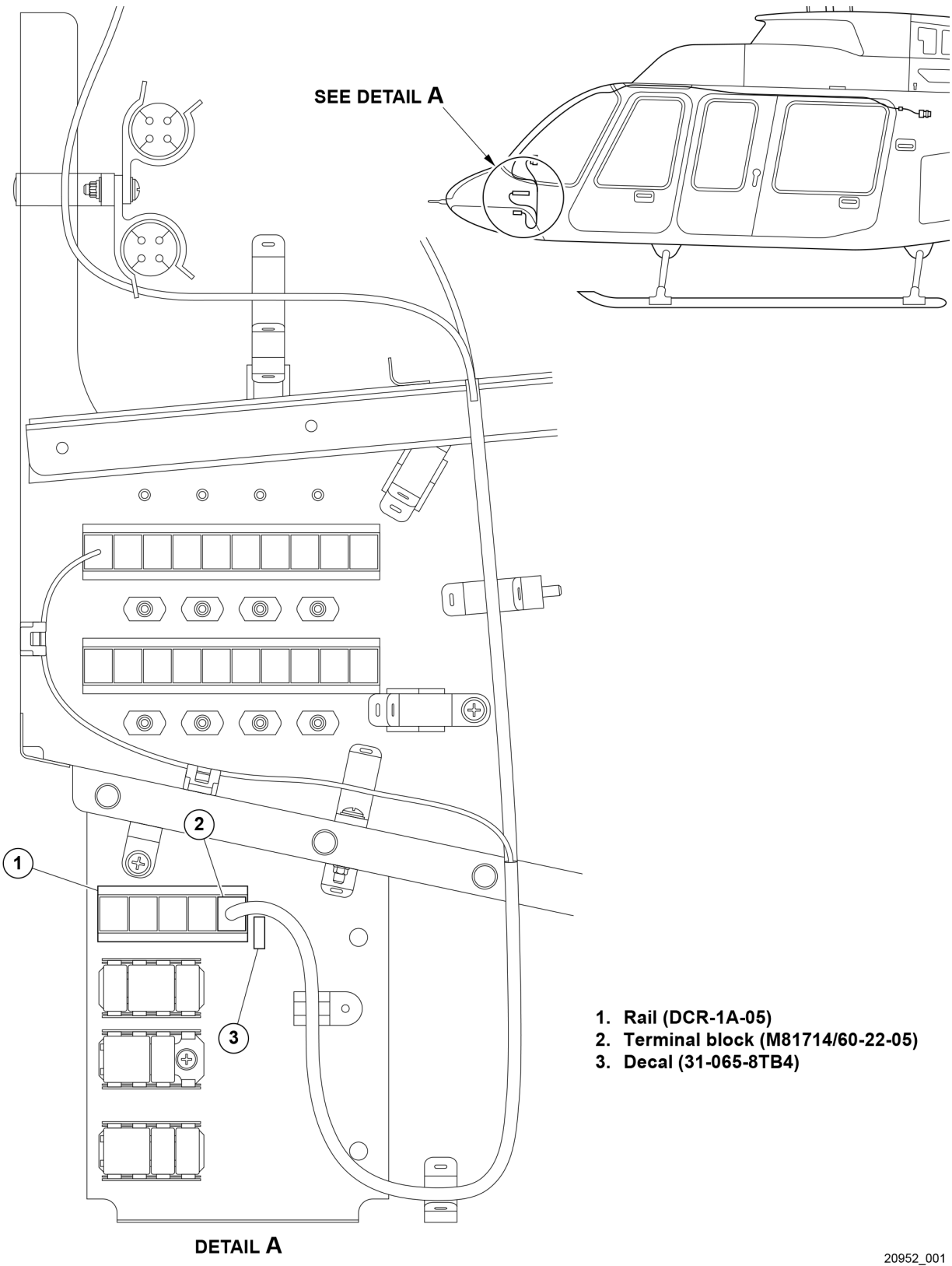
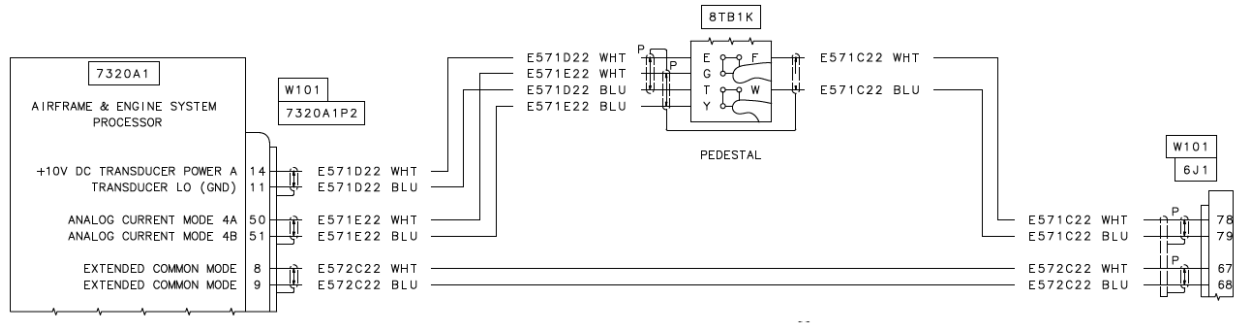


FIGURE 1 – Terminal block, rail, and wire harness installation



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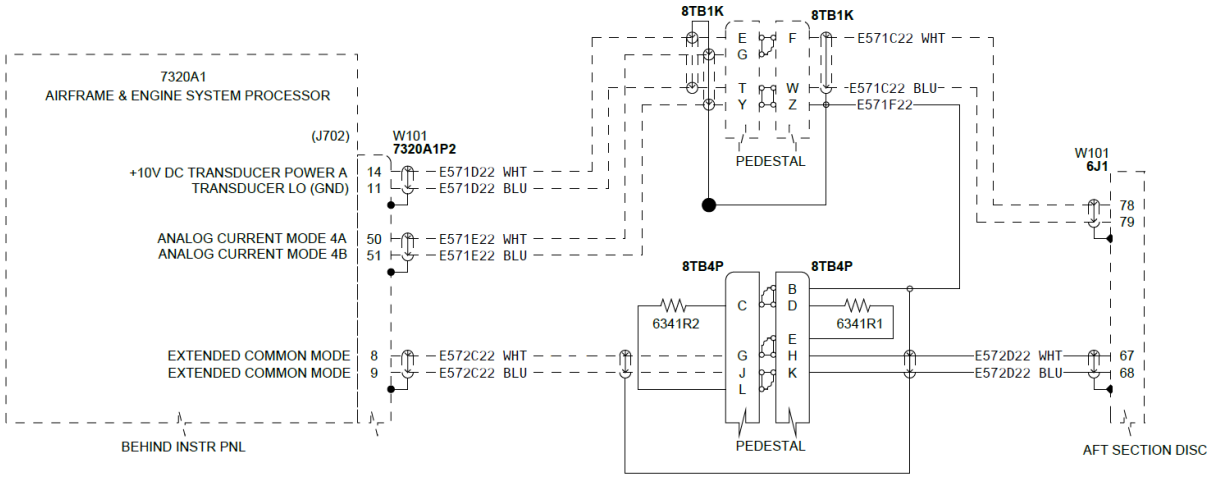

Post TB 407-20-134

FIGURE 2 – Torque transducer modification wiring diagram

Approved for public release.