

## TORQUE TUBE QUADRANTS - REMOVAL/INSTALLATION

*EFFECTIVITY: ALL*

### 1. General

- A. This section gives the procedures to remove and install the torque tube quadrants of the elevator control system.
- B. These procedures are applicable to the LH and RH torque tube quadrants.
- C. The procedures in this section are given in the sequence below. The tasks identified with (♦) are part of the Scheduled Maintenance Requirements Document (SMRD).

TASK NUMBER	DESCRIPTION	EFFECTIVITY
27-31-02-000-801-A	TORQUE TUBE QUADRANT - REMOVAL	ALL
27-31-02-400-801-A	TORQUE TUBE QUADRANT - INSTALLATION	ALL

TASK 27-31-02-000-801-A

EFFECTIVITY: ALL

## 2. TORQUE TUBE QUADRANT - REMOVAL

### A. General

- (1) This procedure gives the instructions to remove the torque tube quadrants of the elevator control system.

### B. References

REFERENCE	DESIGNATION
AMM MPP 06-41-01/100	-
<a href="#">AMM TASK 27-35-00-000-801-A/400</a>	ELEVATOR DISCONNECT DEVICE - REMOVAL
<a href="#">AMM TASK 27-36-04-000-801-A/400</a>	STICK PUSHER - REMOVAL

### C. Zones and Accesses

ZONE	PANEL/DOOR	LOCATION
123	123BL	Below the cockpit floor
124		Below the cockpit floor

### D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
<a href="#">GSE 058</a>	Kit, rig pins, flight controls	To lock the elevator control system in the neutral position	
See IPC 27-31-03	Prop block	To permit the removal and installation of the control cables in the tension regulator	

### E. Auxiliary Items

Not Applicable

### F. Consumable Materials

Not Applicable

### G. Expandable Parts

Not Applicable

### H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Below the cockpit floor
1	Helps the other technician	Below the cockpit floor

### I. Preparation

**SUBTASK 841-002-A**

- (1) Remove cockpit underfloor access hatch123BL (AMM MPP 06-41-01/100).

- (2) Install the rig pins to the elevator control system to lock it in the neutral position.
- (3) Install the prop block in the elevator tension regulator.
- (4) Remove the elevator disconnect device ([AMM TASK 27-35-00-000-801-A/400](#)).

J. Removal ([Figure 401](#))

*SUBTASK 020-002-A*

- (1) Remove the LH torque tube quadrant (2) as follows:
  - (a) Release the tension on the control cables (5) and disconnect them from the sector at the LH torque tube quadrant (8). For this, remove the cotter pins (35) and (36), and pin (34).

NOTE: Identify the positions at which the control cables (5) were installed to install them again in the same positions.
  - (b) Release the tension on the control cables (10) (autopilot system) and disconnect them from the sector at the LH torque tube quadrant (8). For this, remove the cotter pins (35) and (36), and pin (34).

NOTE: Identify the positions at which the control cables (10) were installed to install them again in the same positions.
  - (c) Disconnect the end of the cable (6) (stick pusher actuator) from the sector at the LH torque tube quadrant (8) ([AMM TASK 27-36-04-000-801-A/400](#)).
  - (d) Disconnect the end of the rod (7) from the bellcrank at the LH torque tube quadrant (8). For this, remove the cotter pin (23), nut (24), washers (22), (20), (18), and (17), bushing (21), bonding strap (19), and bolt (16) (DET. E).
  - (e) Disconnect the end of the bonding strap (9) from the fuselage structure. For this, remove the bolt (12) and washers (13), (14), and (15) (DET. D).
  - (f) Remove the bolts (41) and washers (40) (5 positions).
  - (g) Remove the bolts (37) and washers (38) (5 positions), and shim (39).
  - (h) Remove the LH torque tube quadrant (8).
- (2) Remove the RH torque tube quadrant (2) as follows:
  - (a) Release the tension on the control cables (4) and disconnect them from the sector at the RH torque tube quadrant (2). For this, remove the cotter pins (35) and (36), and pin (34).

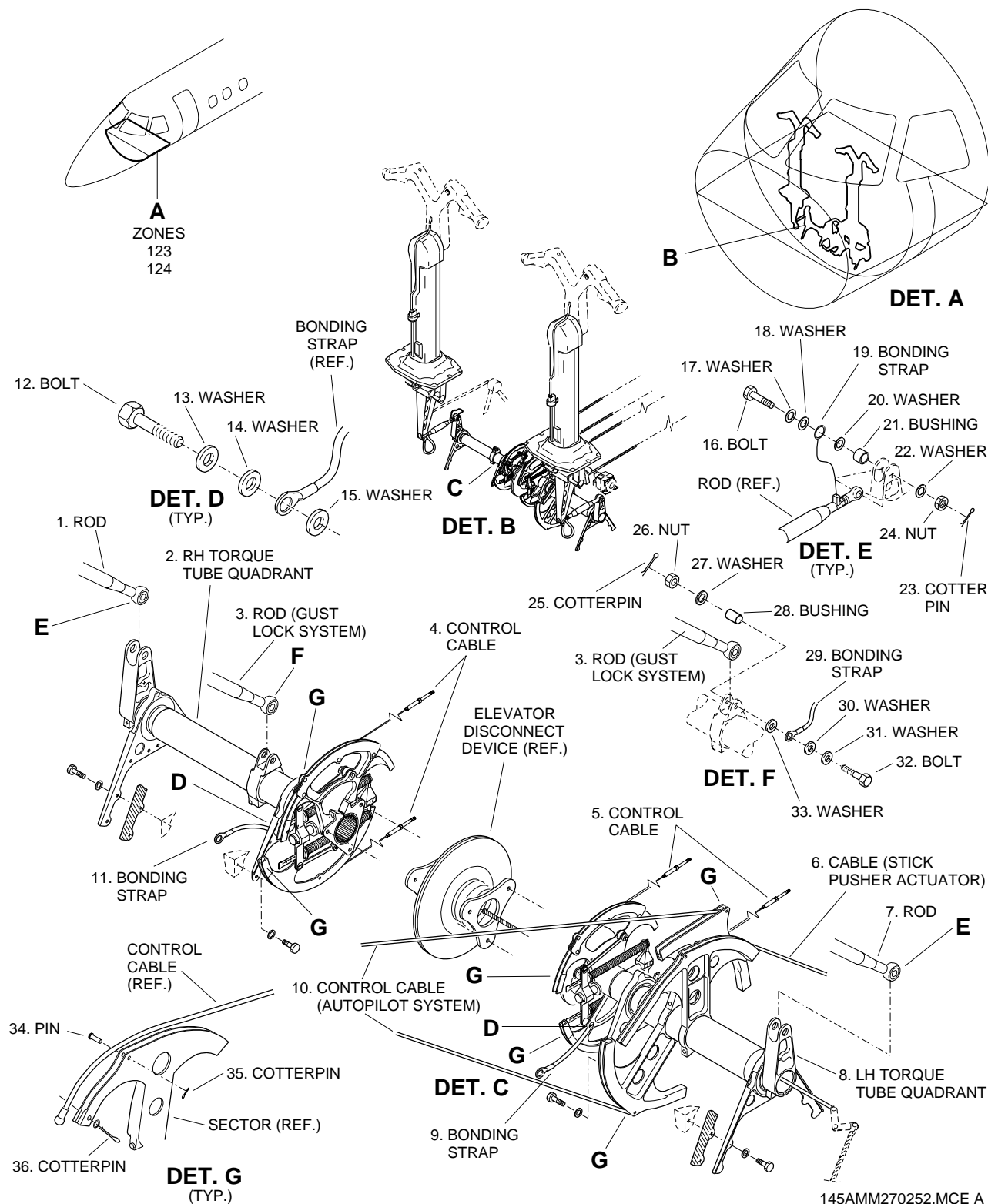
NOTE: Identify the positions at which the control cables (4) were installed to install them again in the same positions.
  - (b) Disconnect the end of the rod (1) from the bellcrank at the RH torque tube quadrant (2). For this, remove the cotter pin (23), nut (24), washers (22), (20), (18), and (17), bushing (21), bonding strap (19), and bolt (16) (DET. E).

- (c) Disconnect the end of the rod (3) (gust lock system) from the bellcrank at the RH torque tube quadrant (2). For this, remove the cotter pin (25), nut (26), washers (27), (33), (30), and (31), bushing (28), bonding strap (29), and bolt (32) (DET. F).
- (d) Disconnect the end of the bonding strap (11) from the fuselage structure. For this, remove the bolt (12) and washers (13), (14), and (15) (DET. D).
- (e) Remove the bolts (42) and washers (43) (5 positions).
- (f) Remove the bolts (46) and washers (45) (5 positions), and shim (44).
- (g) Remove the RH torque tube quadrant (2).

EFFECTIVITY: ALL

Torque Tube Quadrant - Removal/Installation

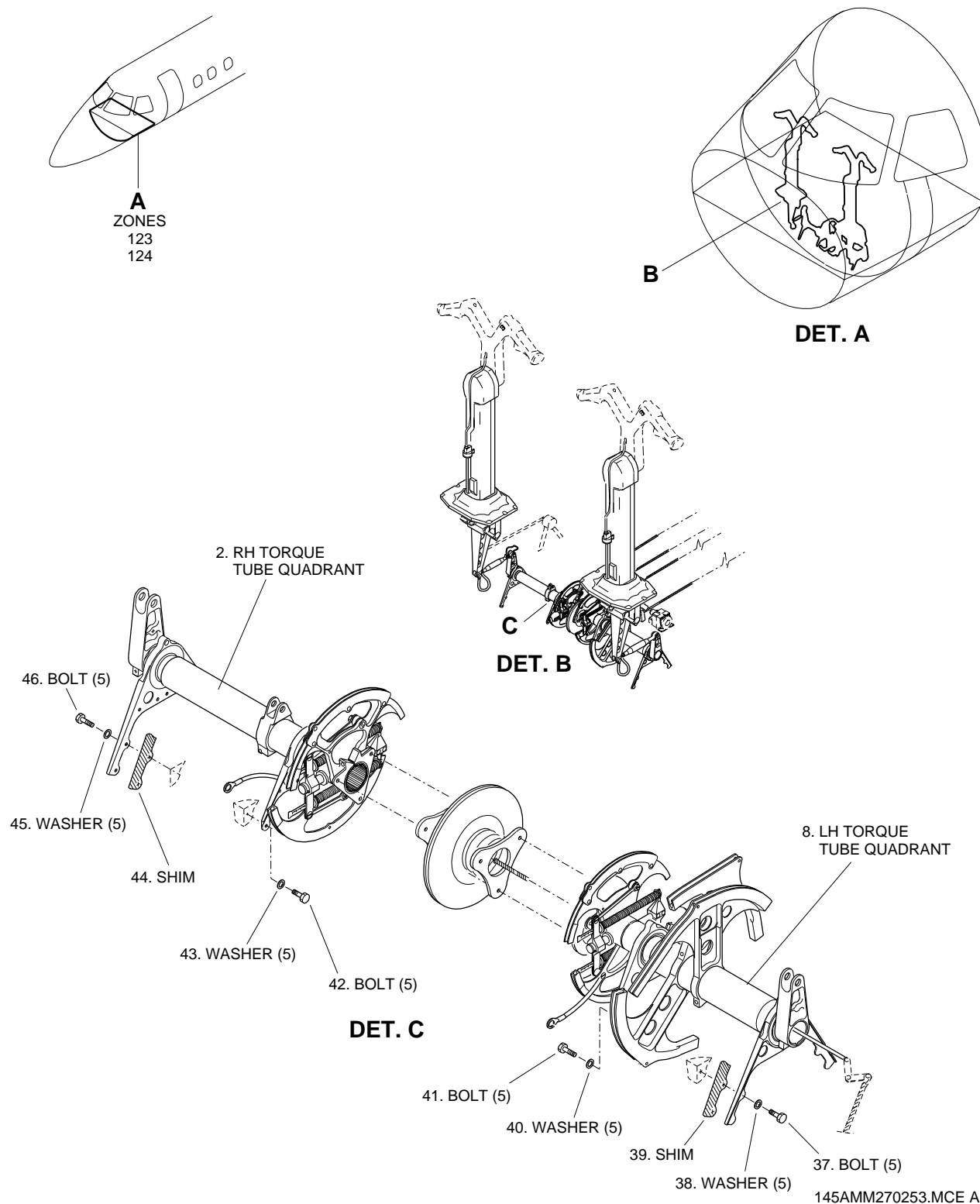
Figure 401 - Sheet 1



EFFECTIVITY: ALL

Torque Tube Quadrant - Removal/Installation

Figure 401 - Sheet 2



TASK 27-31-02-400-801-A  
EFFECTIVITY: ALL

### 3. TORQUE TUBE QUADRANT - INSTALLATION

#### A. General

- (1) This procedure gives the instructions to install the torque tube quadrants of the elevator control system.

#### B. References

REFERENCE	DESIGNATION
AMM MPP 06-41-01/100	-
<a href="#">AMM TASK 20-13-21-910-801-A/200</a>	TYPES OF ELECTRICAL BONDING AND SURFACE PREPARATION - STANDARD PROCEDURES
<a href="#">AMM TASK 27-31-00-700-803-A/500</a>	ELEVATOR - DEFLECTIONS
<a href="#">AMM TASK 27-31-01-700-801-A/500</a>	TENSION OF THE ELEVATOR CONTROL CABLES - FUNCTIONAL CHECK
<a href="#">AMM TASK 27-35-00-400-801-A/400</a>	ELEVATOR DISCONNECT DEVICE - INSTALLATION
<a href="#">AMM TASK 27-36-04-400-801-A/400</a>	STICK PUSHER - INSTALLATION
<a href="#">AMM TASK 27-70-00-700-801-A/500</a>	GUST LOCK SYSTEM - ADJUSTMENT
IPC 27-31-00	ELEVATOR PRIMARY MECHANICAL CONTROL
IPC 27-71-00	GUST LOCK ELECTROMECHANICAL

#### C. Zones and Accesses

ZONE	PANEL/DOOR	LOCATION
123	123BL	Below the cockpit floor
124		Below the cockpit floor

#### D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
<a href="#">GSE 058</a>	Kit, rig pins, flight controls	To lock the elevator control system in the neutral position	
See IPC 27-31-03	Prop block	To permit the removal and installation of the control cables in the tension regulator	

#### E. Auxiliary Items

Not Applicable

#### F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
MS24665-134	Cotter pin	AR
MS24665-170	Cotter pin	AR

G. Expendable Parts

ITEM	IPC REFERENCE (VENDOR REFERENCE)	QTY
Cotter pin	IPC 27-31-00	2
Cotter pin	IPC 27-71-00	1

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Below the cockpit floor
1	Helps the other technician	Below the cockpit floor

I. Installation (Figure 401)

**SUBTASK 420-002-A**

(1) Install the LH torque tube quadrant (8) as follows:

- (a) Put the LH torque tube quadrant (8) on the fuselage structure.
- (b) Install the bolts (41) and washers (40) (5 positions).
- (c) Install the bolts (37) and washers (38) (5 positions), and shim (39).
- (d) Connect the end of the bonding strap (9) to the fuselage structure. For this, install the bolt (22) and washers (23), (21), and (20) (DET. C).

**NOTE:** Refer to [AMM TASK 20-13-21-910-801-A/200](#) for the correct installation of the bonding strap (9).

- (e) Connect the end of the rod (7) to the bellcrank at the RH torque tube quadrant (4), with the bolt (16), washers (17), (18), (20), and (22), bonding strap (19), bushing (21), nut (24), and cotter pin (23) (DET. E).

**NOTE:** Refer to [AMM TASK 20-13-21-910-801-A/200](#) for the correct installation of the bonding strap (19).

- (f) Connect the control cables (5) to the sector at the LH torque tube quadrant (8), and install the pin (34) and cotter pins (35) and (36) to lock them.

**NOTE:** The control cables (5) must be installed in the same positions as those they were removed from. Refer to their position identification.

- (g) Connect the control cables (10) (autopilot system) to the sector at the LH torque tube quadrant (8), and install the pin (34) and cotter pins (35) and (36) to lock them.

**NOTE:** The control cables (10) must be installed in the same positions as those they were removed from. Refer to their position identification.

- (h) Connect the end of the cable (6) (stick pusher actuator) to the sector at the LH torque tube quadrant (8) ( [AMM TASK 27-36-04-400-801-A/400](#)).

(2) Install the RH torque tube quadrant (2) as follows:



- (a) Put the RH torque tube quadrant (2) on the fuselage structure.
- (b) Install the bolts (39) and washers (40) (5 positions).
- (c) Install the bolts (43) and washers (42) (5 positions), and shim (41).
- (d) Connect the end of the bonding strap (11) to the fuselage structure. For this, install the bolt (12) and washers (13), (14), and (15) (DET. D).

NOTE: Refer to [AMM TASK 20-13-21-910-801-A/200](#) for the correct installation of the bonding strap (11).

- (e) Connect the end of the rod (3) (gust lock system) to the bellcrank at the RH torque tube quadrant (2) with the bolt (32), washers (31), (30), (33), and (27), bonding strap (29), bushing (28), nut (26), and cotter pin (25) (DET. F).

NOTE: Refer to [AMM TASK 20-13-21-910-801-A/200](#) for the correct installation of the bonding strap (29).

- (f) Connect the end of the rod (1) to the bellcrank at the RH torque tube quadrant (2), with the bolt (16), washers (17), (18), (20), and (22), bonding strap (19), bushing (21), nut (24), and cotter pin (23) (DET. E).
- (g) Connect the control cables (4) to the sector at the RH torque tube quadrant (2) and lock with the pin (34) and cotter pins (35) and (36).

NOTE: The control cables (4) must be installed in the same positions as those they were removed from. Refer to their position identification.

J. Follow-on

*SUBTASK 842-002-A*

- (1) Install the elevator disconnect device ( [AMM TASK 27-35-00-400-801-A/400](#)).
- (2) Apply tension to the control cables of the elevator control system ( [AMM TASK 27-31-01-700-801-A/500](#)).
- (3) Remove the rig pins from the elevator control system.
- (4) Remove the prop block from the elevator tension regulator.
- (5) Do a check on the elevator control system ( [AMM TASK 27-31-00-700-803-A/500](#)).
- (6) Do the adjustment of the mechanical gust lock system ([AMM TASK 27-70-00-700-801-A/500](#)).
- (7) Install cockpit underfloor access hatch123BL (AMM MPP 06-41-01/100).

