RUDDER I - REMOVAL/INSTALLATION

EFFECTIVITY: ALL

1. General

   A. This section gives the procedures to remove and install rudder I.

   B. 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*
27-20-03-000-801-A	RUDDER I - REMOVAL	ALL
27-20-03-400-801-A	RUDDER I - INSTALLATION	ALL

TASK 27-20-03-000-801-A
EFFECTIVITY: ALL

2. RUDDER I - REMOVAL

A. General

(1) This procedure gives the instructions to remove rudder I.

B. References

REFERENCE	*DESIGNATION*
AMM 52-40-04/101	-
AMM MPP 06-42-00/100	-
AMM TASK 27-20-02-000-801-A/400	RUDDER II - REMOVAL
AMM TASK 27-22-02-000-801-A/400	RUDDER ACTUATOR - REMOVAL
AMM TASK 29-10-00-860-802-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH EMDP
AMM TASK 31-31-06-000-803-A/400	FDR RUDDER RVDT/RVIT - REMOVAL
AMM TASK 53-32-00-000-801-A/400	TAIL CONE - REMOVAL

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
326	326AL	Rudder I
326	326BL	Rudder I
326	326CL	Rudder I
326	326DL	Rudder I
326	326EL	Rudder I
326	326FL	Rudder I
326	326GL	Rudder I
326	326HL	Rudder I

D. Tools and Equipment

Not Applicable

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	Rudder
1	Helps the other technician	Rudder

I. Preparation

SUBTASK 841-002-A

WARNING: MAKE SURE THAT THE RUDDER CANNOT BE OPERATED ACCIDENTALLY. AN ACCIDENTAL OPERATION OF THE RUDDER CAN CAUSE INJURY TO PERSONS.

(1) Make sure that the pressure in hydraulic systems 1 and 2 is fully released (AMM TASK 29-10-00-860-802-A/200).

(2) On the circuit breaker panel, open the RUDDER 1 and RUDDER 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

NOTE: The EICAS display shows Rudder Sys 1-2 INOP caution message.

WARNING: RUDDER I WITH RUDDER II INSTALLED TO IT ARE HEAVY AND THERE IS MOVEMENT BETWEEN THE TWO PARTS. TELL ONE OR MORE PERSONS TO HELP YOU DURING THE REMOVAL. THIS WILL PREVENT INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

(3) If applicable, remove rudder II (AMM TASK 27-20-02-000-801-A/400).

(4) Remove access panels 326AL, 326BL, 326CL, 326DL, 326EL, 326FL, 326GL, and 326HL (AMM MPP 06-42-00/100, AMM 52-40-04/101).

(5) Disconnect the ends of the actuators from rudder I (AMM TASK 27-22-02-000-801-A/400).

(6) Remove tail cone fairing (AMM TASK 53-32-00-000-801-A/400).

J. Removal (Figure 401)

SUBTASK 020-002-A

(1) On aircraft with RVDT/RVIT, disconnect the rod from the rudder I surface (refer to AMM TASK 31-31-06-000-803-A/400).

(2) Push the stop pin (DET. E) and remove the cotter pins (9) and (50), nut (8), washer (7), locking nut (6), bushing (5), washer (3), and eccentric pin (2) to disconnect the end of the feedback rod (1) from the hinge (4) at the rudder I structure.

(3) Remove the nut (22), washers (21), (20) and (18), and bolt (17) to disconnect the end of the bonding strap (14) (2 positions) from the stabilizer.

(4) Remove the cotter pin (13), nut (12), washers (11) and (15), and bolt (16) to disconnect the ends of the rudder II actuating rods (10) (2 positions) from the supports at the stabilizer structure.

(5) Remove the rudder II actuating rods (10) (2 positions).

(6) Remove the nut (49), washers (48), (47), (46), and (45), and bolt (44) to disconnect the end of the bonding strap (28) (2 positions) from rudder I (23).

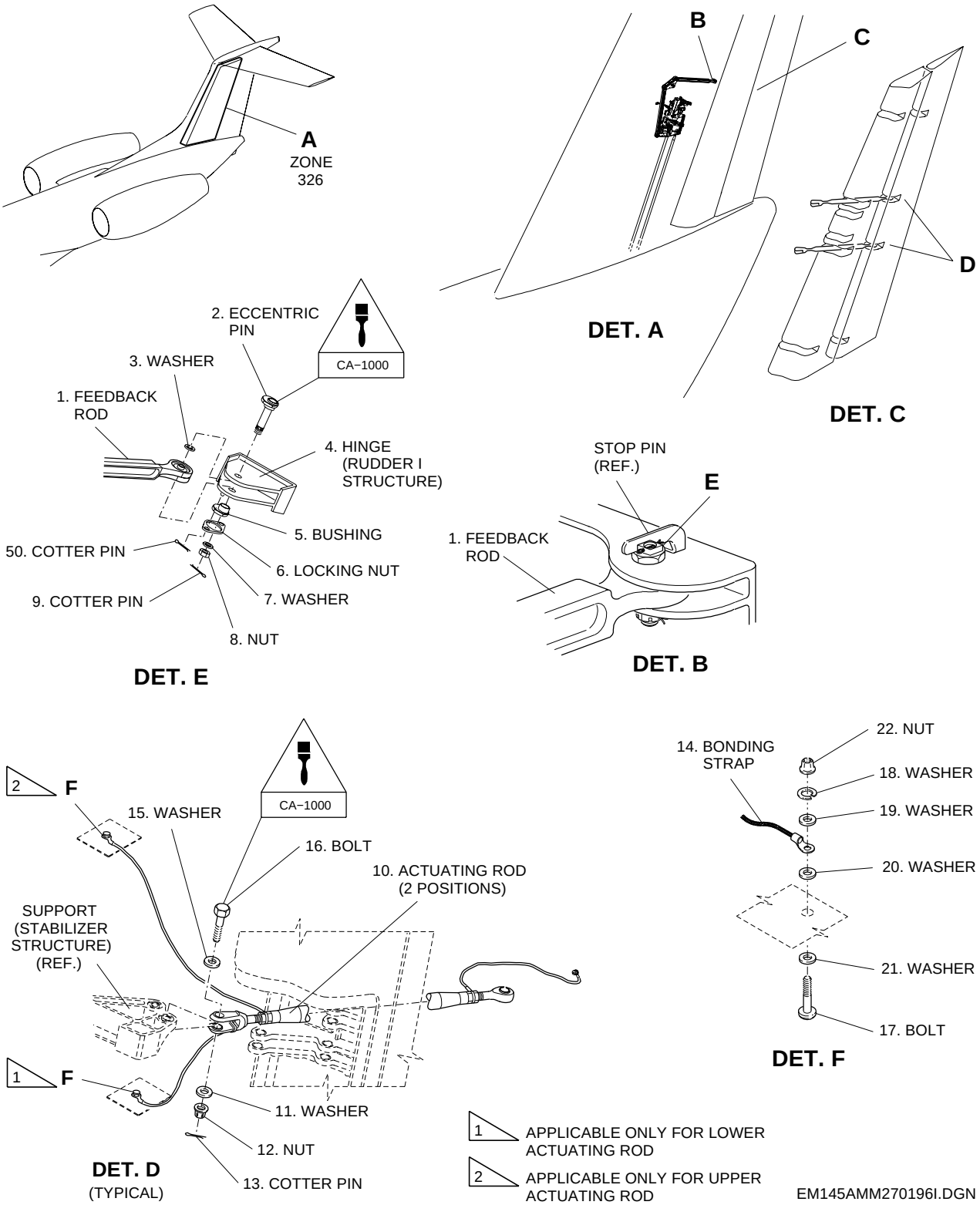
(7) Remove the cotter pins (36) and (43), nuts (35) and (42), washers (34), (32), (41) and (38), bushings (33), (40), and (39), and bolts (31) and (37) to disconnect the rudder I (23) center hinges from the supports at the stabilizer structure (2 positions).

(8) Hold the rudder I (23).

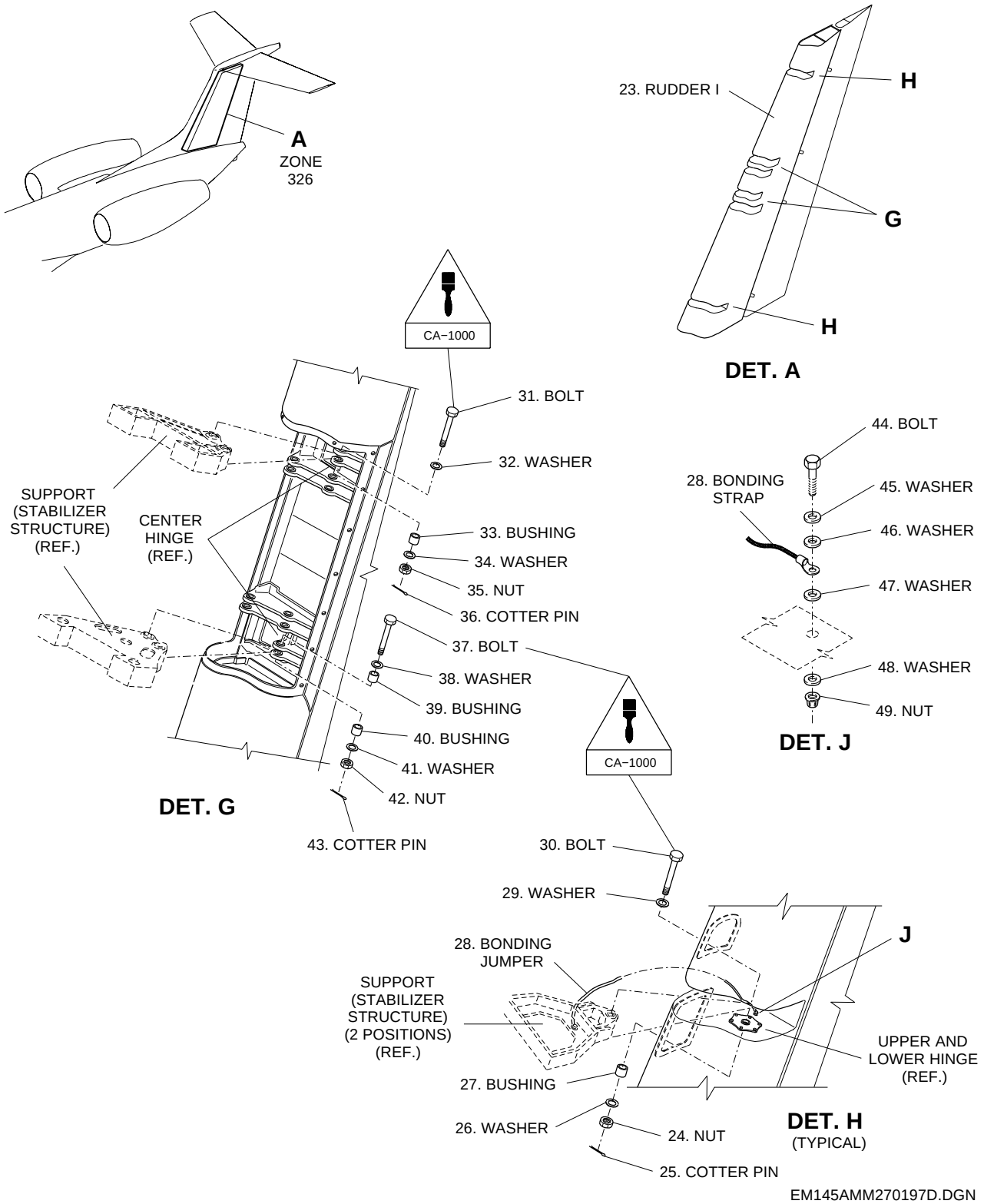
(9) Remove the cotter pins (25), nuts (24), washers (26) and (29), bushings (27), and bolts (30) to disconnect the rudder I (23) upper and lower hinges from the supports at the stabilizer structure.

(10) Remove the rudder I (23).

EFFECTIVITY: ALL
Rudder I - Removal/Installation
Figure 401 - Sheet 1

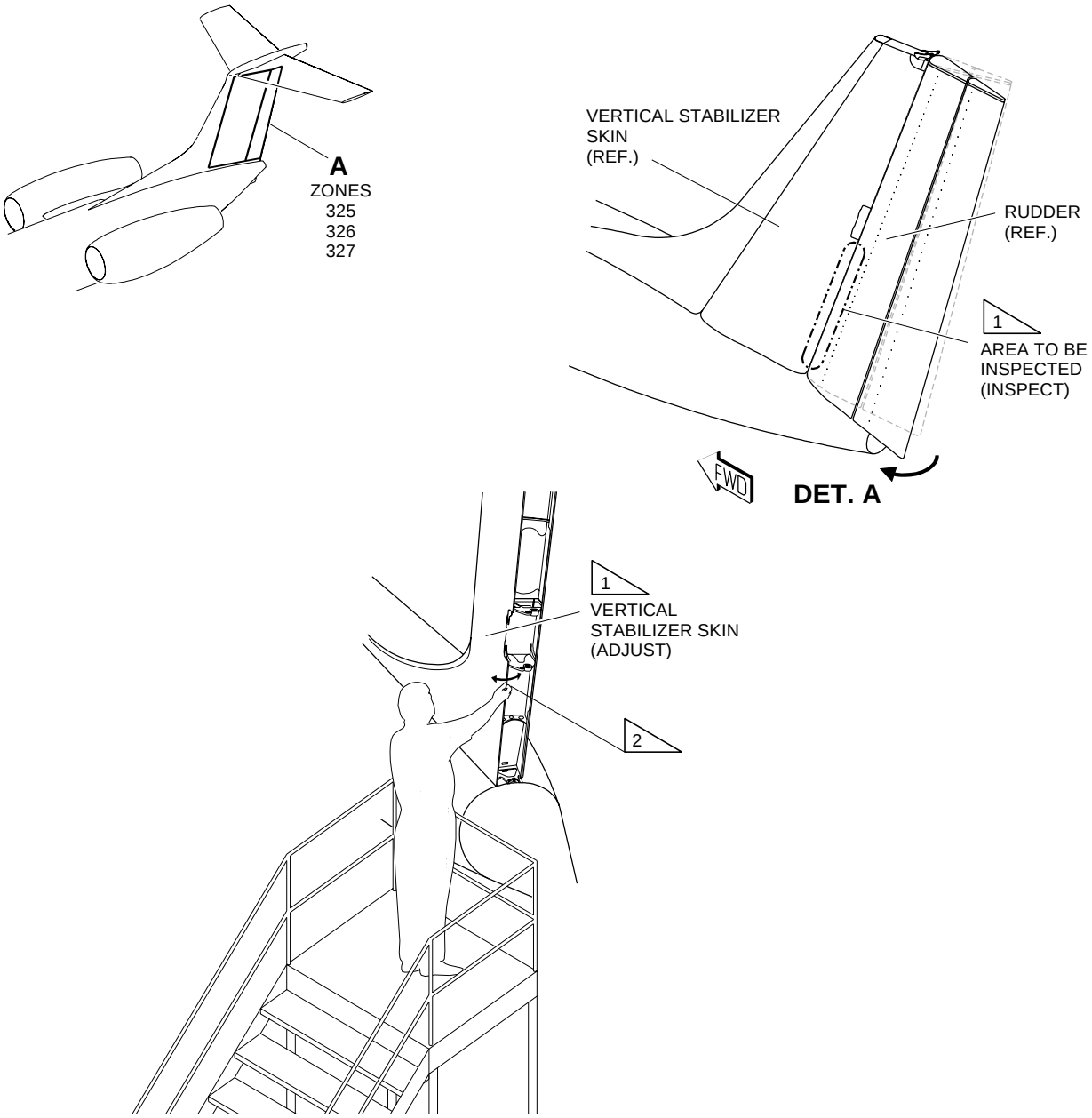


EFFECTIVITY: ALL
Rudder I - Removal/Installation
Figure 401 - Sheet 2



EFFECTIVITY: ALL

Vertical Stabilizer seal - Adjustment/Check
Figure 402



1 THE RUDDER CAN TOUCH THE SEAL BUT MUST NOT CAUSE A DEFORMATION ON THE VERTICAL STABILIZER SKIN.

2 IT IS ALLOWED TO MOVE THE VERTICAL STABILIZER SKIN UNTIL THE ADJUSTMENT IS OBTAINED.

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TASK 27-20-03-400-801-A
EFFECTIVITY: ALL

3. RUDDER I - INSTALLATION

A. General

(1) This procedure gives the instructions to install rudder I.

B. References

REFERENCE	*DESIGNATION*
AMM 52-40-04/101	-
AMM MPP 06-42-00/100	-
AMM MPP 20-10-01/200	- MAINTENANCE PRACTICES
AMM TASK 20-13-21-910-801-A/200	TYPES OF ELECTRICAL BONDING AND SURFACE PREPARATION - STANDARD PROCEDURES
AMM TASK 27-20-00-700-801-A/500	ADJUSTMENT OF THE RUDDER NEUTRAL POSITION AND DEFLECTIONS OF RUDDER I AND RUDDER II
AMM TASK 27-20-02-400-801-A/400	RUDDER II - INSTALLATION
AMM TASK 27-22-00-700-801-A/500	-
AMM TASK 27-22-02-400-801-A/400	RUDDER ACTUATOR - INSTALLATION
AMM TASK 29-10-00-860-802-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH EMDP
AMM TASK 31-31-06-400-803-A/400	FDR RUDDER RVDT/RVIT - INSTALLATION
IPC 27-21-02	RUDDER II
IPC 27-21-03	RUDDER I
IPC 27-24-00	YAW TRIM ACTUATOR
TASK 53-32-00-400-401-A	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
326	326AL	Rudder I
326	326BL	Rudder I
326	326CL	Rudder I
326	326DL	Rudder I
326	326EL	Rudder I
326	326FL	Rudder I
326	326GL	Rudder I
326	326HL	Rudder I

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 058	Kit, rig pin, flight controls	To lock the aileron control system in the neutral position	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Rubber Gloves	Protection for the hands	1 pair
Commercially available	Goggles	Protection for the eyes	1 pair

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
MEP 09-060	Corrosion-Inhibiting Compound	As necessary

G. Expendable Parts

ITEM	*IPC REFERENCE (VENDOR REFERENCE)*	*QTY*
Cotter pin	IPC 27-21-02	2
Cotter pin	IPC 27-21-03	4
Cotter pin	IPC 27-24-00	2

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Rudder
1	Helps the other technician	Rudder

I. Installation (Figure 401)

SUBTASK 420-002-A

WARNING:
- **MAKE SURE THAT THE RUDDER CANNOT BE OPERATED ACCIDENTALLY. AN ACCIDENTAL OPERATION OF THE RUDDER CAN CAUSE INJURY TO PERSONS.**
- **CA-1000 CORROSION-INHIBITING COMPOUND IS TOXIC TO SKIN, EYES AND RESPIRATORY TRACT. USE PVC GLOVES AND EYE PROTECTION. USE ONLY IN WELL VENTILATED AREAS. OBEY THE MANUFACTURERS' HEALTH AND SAFETY INSTRUCTIONS.**

(1) Apply the corrosion-inhibiting compound specification MEP 09-060 to the eccentric pin (2), and bolts (16), (30), (31), and (37). Use gloves, Goggles, and a brush for it.

WARNING: RUDDER I WITH RUDDER II INSTALLED TO IT ARE HEAVY AND THERE IS MOVEMENT BETWEEN THE TWO PARTS. TELL ONE OR MORE PERSONS TO HELP YOU DURING THE INSTALLATION. THIS WILL PREVENT INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

(2) Put rudder I (23) on the stabilizer structure.

NOTE: Start with Upper Center Hinge Fitting.

(3) Install the bolts (30), washers (29) and (26), bushings (27), nuts (24), and cotter pins (25) (2 positions) to connect the rudder I (23) upper and lower hinges to the supports at the stabilizer structure.

(4) Install the bolts (31) and (37), washers (32), (34), (38), and (41), bushings (33), (39), and (40), nuts (35) and (42), and cotter pins (36) and (43) to connect the rudder I (23) center hinges to the supports at the stabilizer structure (2 positions).

(5) Install access panels 326AL, 326BL, 326EL, 326GL, and 326HL (AMM MPP 06-42-00/100).

(6) Push the stop pin (DET. E) and install the eccentric pin (2), washer (3), bushing (5), locking nut (6), washer (7), and nut (8) to connect the end of the feedback rod (1) to the hinge (4) at the rudder I structure.

(7) Apply torque on the nut (8) (AMM MPP 20-10-01/200) and install the cotter pins (9) and (50).

1. Use a torque wrench and turn the nut (8) to measure the drag torque.
2. Make sure that the drag torque value is 0.73 to 6.78 N.m (6.5 to 60 lb.in). If the drag torque value is out of the limits, replace the nut. This value will be used to get the final torque value.
3. The nut (8) must be tightened from 7.9 to 10.2 N.m (70 to 90 lb.in).
4. Add the drag torque value measured in the steps above to the standard torque of 7.9 to 10.2 N.m (70 to 90 lb.in) to get the final torque.

(8) Put the rudder II actuating rods (10) in rudder I (23) and on the supports at the stabilizer structure.

(9) Install the bolt (16), washers (15) and (11), nut (12), and cotter pin (13) to connect the ends of the rudder II actuating rods (10) (2 positions) to the supports at the stabilizer structure.

(10) Connect the bonding straps (14) (2 positions) to the stabilizer with the bolt (17), washers (18), (20), and (21), and nut (22).

NOTE: Refer to AMM TASK 20-13-21-910-801-A/200.

(11) Connect the bonding straps (28) (2 positions) to the rudder I (23) with the bolt (44), washers (45), (46), (47), and (48), and nut (49).

NOTE: Refer to AMM TASK 20-13-21-910-801-A/200.

(12) On aircraft with RVDT/RVIT, connect the rod to the rudder I surface (refer to AMM TASK 31-31-06-400-803-A/400).

J. Follow-on

SUBTASK 842-002-A

(1) If applicable, install rudder II (AMM TASK 27-20-02-400-801-A/400).

(2) Connect the ends of the actuators to rudder I (AMM TASK 27-22-02-400-801-A/400).

(3) Do a check on the vertical stabilizer seal. Refer to Figure 402.

(a) With the rudder in neutral position, check the clearance between the vertical stabilizer LH skin and rudder. The maximum gap between the rudder I and the vertical stabilizer seal is 2.2mm (0.086 in).

(b) To guarantee that there is no excessive friction between the rudder and the horizontal stabilizer seal, command the rudder fully to the left position.

NOTE: The rudder can touch the seal but must not cause a deformation on the vertical stabilizer skin.

(c) If necessary, manually adjust the vertical stabilizer LH skin.

NOTE: It is allowed to move the vertical stabilizer skin until the adjustment is obtained.

(4) On the circuit breaker panel, close the RUDDER 1 and RUDDER 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.

NOTE: The Rudder Sys 1-2 INOP caution message goes out of view.

(5) Pressurize hydraulic systems 1 and 2 (AMM TASK 29-10-00-860-802-A/200).

(6) Do a check of rudder I backlashes (AMM TASK 27-22-00-700-801-A/500).

NOTE: Do this step only if you replaced the rudder I with a new one or if you replaced it with a rudder I used on other aircraft.

(7) Do a check of rudder I deflections (AMM TASK 27-20-00-700-801-A/500) as applicable.

(8) Install tail cone fairing (TASK 53-32-00-400-401-A).

(9) Install the rig pins to the rudder control system to lock it in the neutral position.

(10) Make sure that the clearance between the rudder I and boom fairing is 26.00 to 30.00 mm (1.02 to 1.18 in) on the leading edge and 7.00 to 10 mm (0.27 to 0.39 in) on the trailing edge.

(11) Make sure that the clearance between the rudder I and Tail cone fairing is 6.60 to 12.50 mm (0.25 to 0.49 in).

(12) Remove the rig pins from the rudder control system.

(13) Install access panels 326CL, 326DL and 326FL (AMM MPP 06-42-00/100, AMM 52-40-04/101).