



AIRCRAFT  
MAINTENANCE MANUAL

**WING TO STUB (ROD ENDS) - REMOVAL/INSTALLATION**

EFFECTIVITY: ALL

1. General

- A. This section gives the procedures to remove/install the wing-to-stub rod ends.
- 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
57-10-02-000-801-A	WING-TO-STUB ROD ENDS - REMOVAL	ALL
57-10-02-400-801-A	WING-TO-STUB ROD ENDS - INSTALLA- TION	ALL



EMB145 – EMB135

AIRCRAFT  
MAINTENANCE MANUAL

TASK 57-10-02-000-801-A

EFFECTIVITY: ALL

2. WING-TO-STUB ROD ENDS - REMOVAL

A. General

- (1) This task gives the procedures to remove the wing-to-stub rod ends.

B. References

REFERENCE	DESIGNATION
AMM MPP 06-41-01/100	-
AMM TASK 07-10-00-500-801-A/200	-
<a href="#">AMM TASK 20-40-02-910-801-A/200</a>	STATIC GROUNDING - STANDARD PRACTICES
<a href="#">AMM TASK 32-00-01-910-801-A/200</a>	LG SAFETY PIN - INSTALLATION AND REMOVAL
<a href="#">AMM TASK 32-44-02-910-801-A/200</a>	HYDRAULIC ACCUMULATOR EMERGENCY/PARKING BRAKE - RELEASE
<a href="#">AMM TASK 53-04-10-000-801-A/400</a>	CENTER WING-TO-FUSELAGE FAIRING - REMOVAL
<a href="#">AMM TASK 53-04-20-000-801-A/400</a>	LATERAL WING-TO-FUSELAGE FAIRING - REMOVAL

C. Zones and Accesses

Not Applicable

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	Wing-to-stub attachment area

I. Preparation

*SUBTASK 841-002-A*

- (1) Make sure that the aircraft is safe for maintenance.
- (2) Statically ground the aircraft ([AMM TASK 20-40-02-910-801-A/200](#)).
- (3) On the circuit breaker panel, open the ELEC PUMP 1, CMD, IND 1 and IND 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

- (4) Control the rudder left and right until the pressure of the hydraulic system is zero PSI on the EICAS.
- (5) Fully release the pressure from the fluid chamber of the emergency/parking-brake system hydraulic accumulator ([AMM TASK 32-44-02-910-801-A/200](#)).
- (6) Open access door 114CR of the nose hydraulic compartment (AMM MPP 06-41-01/100) and release the pressure from the passenger door/LDG accumulator, installed in the nose hydraulic compartment. For this, open the discharge valve and monitor the pressure gage until it shows the nitrogen precharge.
- (7) Slowly open the charging valve of the nitrogen chamber of the hydraulic accumulator to let all its pressure go out.
- (8) Make sure that the safety pins of the landing gears are installed ([AMM TASK 32-00-01-910-801-A/200](#)).
- (9) Lift the aircraft on jacks (AMM TASK 07-10-00-500-801-A/200).

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

• **MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP TRAVEL AREA.**

- (10) On the circuit breaker panel, open the FLAP 1 and FLAP 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.
- (11) On the circuit breaker panel, open the SPEED BRAKE, GND SPLR OUTBD, and GND SPLR INBD circuit breakers and attach a DO-NOT-CLOSE tag to them.
- (12) Remove the lateral wing-to-fuselage fairing ([AMM TASK 53-04-20-000-801-A/400](#)).
- (13) Remove the center wing-to-fuselage fairing ([AMM TASK 53-04-10-000-801-A/400](#)).

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

##### SUBTASK 020-002-A

- (1) Remove the bolts (28), washers (29), and spar-III cover (27) installed in the wing stub assembly, inside the landing gear bay. Refer to VIEW D, sheet 2.
- (2) Remove the cotter pin (17), nut (1), and washer (4) from the upper rod end of the wing/fuselage attach spar-III rod assembly (15). Refer to DET. B, sheet 1.
- (3) Remove the cotter pin (10), nut (9), and washer (11) from the lower rod end of the wing/fuselage attach spar-III rod assembly (15). Refer to DET. B, sheet 1.
- (4) Discard the cotter pins (10) and (17).
- (5) Cut the lockwire (5) from the jam nuts (7) and (16). Refer to DET. B, sheet 1.
- (6) Loosen and adjust the jam nuts (7) and (16) until the bolts (3) and (13) and bushings (2), (12), and (14) are free for disassembly. Refer to DET. B, sheet 1.



EMB145 - EMB135

AIRCRAFT  
MAINTENANCE MANUAL

- (7) Remove the bolt (3), washer (4), and bushing (2) to detach the upper rod end of the wing/fuselage attach spar-III rod assembly (15) from the aircraft structure. Refer to DET. B, sheet 1.
- (8) Remove the bolt (13), washer (11), flanges (8), and bushings (12) and (14) to detach the lower rod end of the wing/fuselage attach spar-III rod assembly (15) from the aircraft structure. Refer to DET. B, sheet 1.
- (9) Remove the wing/fuselage attach spar-III rod assembly (15). Refer to DET. B, sheet 1.

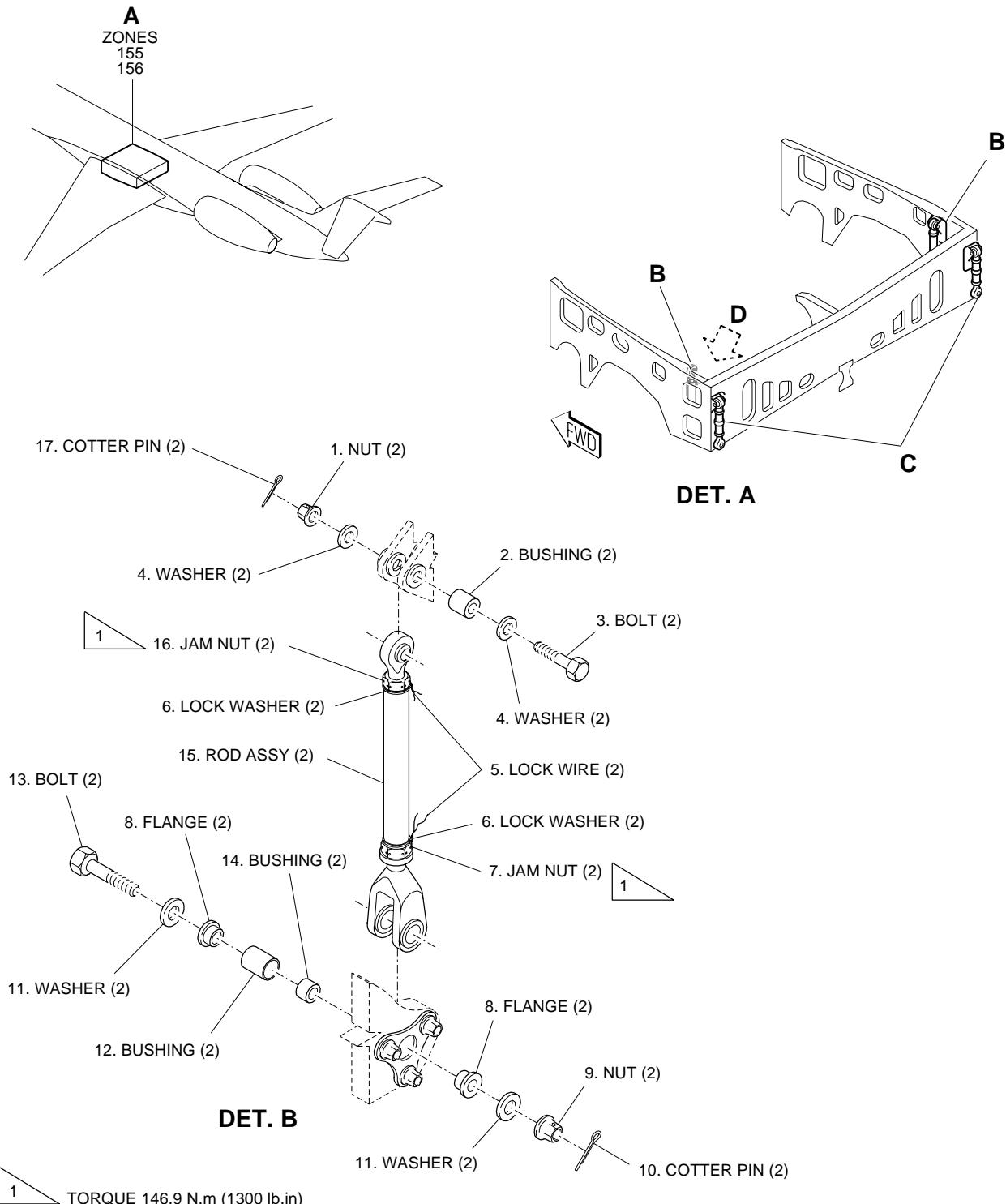
K. Removal (Figure 401)

SUBTASK 020-003-A

- (1) Remove the cotter pins (22), nuts (21), and washers (19) from the upper and lower rod end of the wing-to-fuselage rod assembly (26). Refer to DET. C, sheet 2.
- (2) Discard the cotter pins (22).
- (3) Cut the lockwire (25) from the jam nuts (23). Refer to DET. C, sheet 2.
- (4) Loosen and adjust the jam nuts (23) until the bolts (18) and bushings (20) are free for disassembly. Refer to DET. C, sheet 2.
- (5) Remove the bolts (18), washers (19), and bushings (20) to detach the upper and lower rod end of the wing-to-fuselage rod assembly (26) from the aircraft structure. Refer to DET. C, sheet 2.
- (6) Remove the wing-to-fuselage rod assembly (26). Refer to DET. C, sheet 2.

**EFFECTIVITY: ALL**

Wing-to-Stub Rod Ends - Removal/Installation  
Figure 401 - Sheet 1

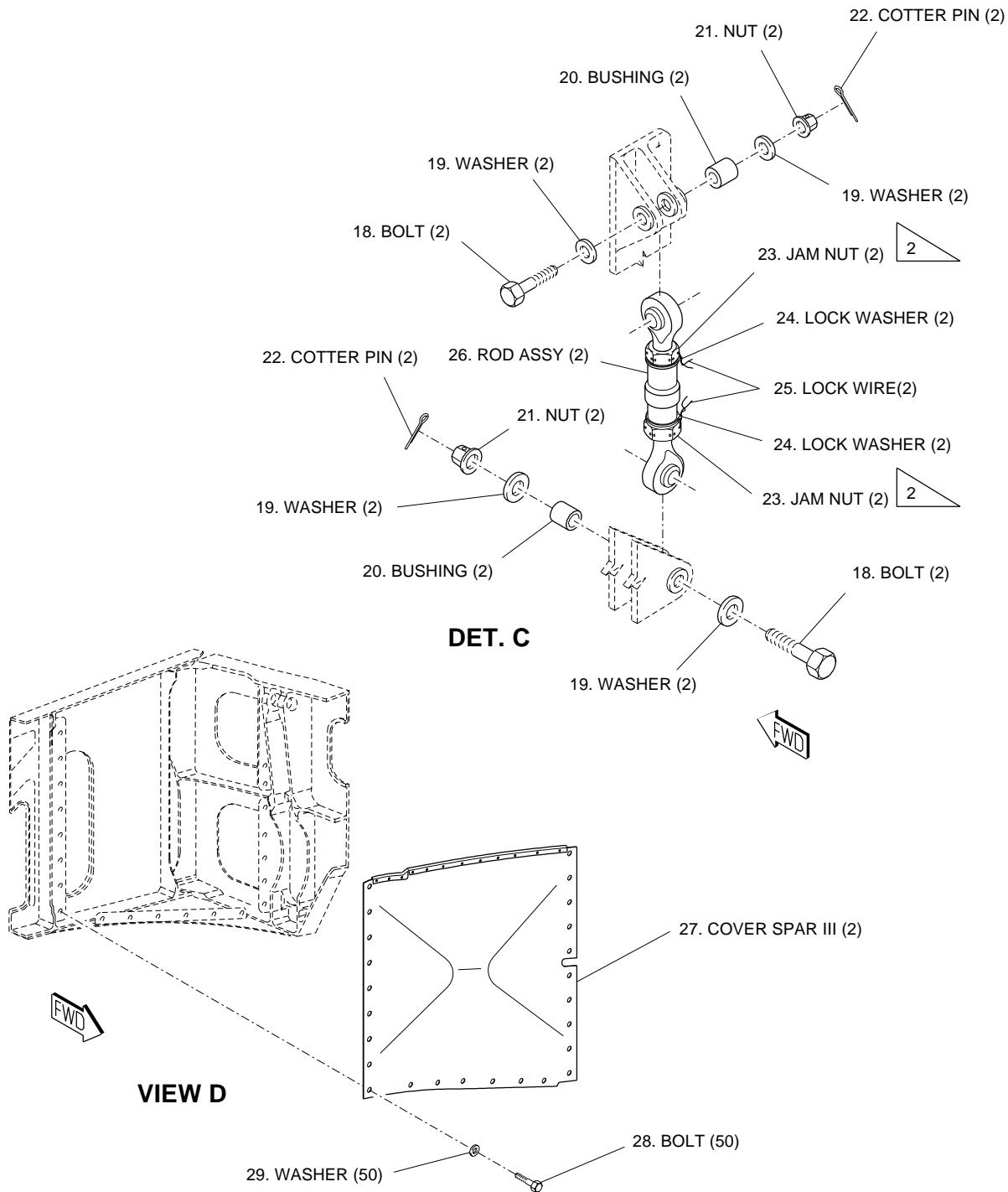


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**EFFECTIVITY: ALL**

Wing-to-Stub Rod Ends - Removal/Installation

Figure 401 - Sheet 2



**TASK 57-10-02-400-801-A**
*EFFECTIVITY: ALL*
**3. WING-TO-STUB ROD ENDS - INSTALLATION**
**A. General**

(1) This task gives the procedures to install the wing-to-stub rod ends.

**B. References**

<i>REFERENCE</i>	<i>DESIGNATION</i>
AMM TASK 07-10-00-500-802-A/200	-
AMM TASK 20-40-02-910-801-A/200	STATIC GROUNDING - STANDARD PRACTICES
AMM TASK 29-10-00-860-803-A/200	HYDRAULIC SYSTEM - BLEED OF AIR
AMM TASK 32-00-01-910-801-A/200	LG SAFETY PIN - INSTALLATION AND REMOVAL
AMM TASK 32-30-00-700-801-A/500	EXTENSION AND RETRACTION SYSTEM - OPERATIONAL CHECK
AMM TASK 32-44-02-600-801-A/300	EMERGENCY/PARKING BRAKE ACCUMULATOR - CHARGE
AMM TASK 53-04-10-400-801-A/400	CENTER WING-TO-FUSELAGE FAIRING - INSTALLATION
AMM TASK 53-04-20-400-801-A/400	LATERAL WING-TO-FUSELAGE FAIRING - INSTALLATION
AMM TASK 57-10-02-000-801-A/400	WING-TO-STUB ROD ENDS - REMOVAL
TASK 20-10-02-200-801-A	-

**C. Zones and Accesses**

Not Applicable

**D. Tools and Equipment**

<i>ITEM</i>	<i>DESCRIPTION</i>	<i>PURPOSE</i>	<i>QTY</i>
Commercially available	Torque wrench (range 0 to 1000 lb.in)	To torque the jam nuts of the rod assembly	
Commercially available	Torque wrench (range 500 to 2500 lb.in)	To torque the jam nuts of the rod assembly	
Commercially available	Bench vise	To fix the rod assembly and torque the jam nuts	

**E. Auxiliary Items**

Not Applicable

**F. Consumable Materials**

<i>SPECIFICATION (BRAND)</i>	<i>DESCRIPTION</i>	<i>QTY</i>
MS24665	Cotter Pin - MS24665-372	2
MS24665	Cotter Pin - MS24665-151	2



EMB145 - EMB135

AIRCRAFT  
MAINTENANCE MANUAL

(Continued)

SPECIFICATION (BRAND)	DESCRIPTION	QTY
MS24665	Cotter Pin - MS24665-370	4
MS20995	Lockwire - MS20995C32	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Wing-to-stub attachment area

I. Preparation

*SUBTASK 841-003-A*

- (1) Make sure that the aircraft is in the same configuration as it was at the end of the removal ([AMM TASK 57-10-02-000-801-A/400](#)).

J. Installation (Figure 401)

*SUBTASK 420-002-A*

- (1) Put the wing/fuselage attach spar-III rod assembly (15) in position at the aircraft structure. Refer to DET. B, sheet 1.
- (2) Provisionally install, to the upper rod end of the wing/fuselage attach spar-III rod assembly (15), the bushing (2), washer (4), bolt (3), washer (4), and nut (1). Refer to DET. B, sheet 1.
- (3) Provisionally install, to the lower rod end of the wing/fuselage attach spar-III rod assembly (15), the bushings (14) and (12), flange (8), washer (11), bolt (13), flange (8), washer (11), and nut (9). Refer to DET. B, sheet 1.
- (4) Adjust the rod length, through the jam nuts (7) and (16), threaded rod end, and bearing rod end, until it is possible to install the bolts (3) and (13) and bushings (2), (12), and (14) with no interference. Refer to DET. B, sheet 1.
- (5) Pre-torque the jam nuts (7) and (16). Refer to DET. B, sheet 1.
- (6) Remove the nut (9), washer (11), flange (8), bolt (13), washer (11), flange (8), and bushings (12) and (14) from the lower rod end of the wing/fuselage attach spar-III rod assembly (15). Refer to DET. B, sheet 1.
- (7) Remove the nut (1), washer (4), bolt (3), washer (4), and bushing (2) from the upper rod end of the wing/fuselage attach spar-III rod assembly (15). Refer to DET. B, sheet 1.
- (8) Remove the wing/fuselage attach spar-III rod assembly (15) from the aircraft structure. Refer to DET. B, sheet 1.
- (9) Put the wing/fuselage attach spar-III rod assembly (15) in position in the bench vise.

- (10) Apply a torque of 146.9 N.m (1300 lb.in) to the jam nuts (7) and (16). Refer to DET. B, sheet 1.
- (11) Make sure that position of the lock washers (6) is correct and safety-wire the jam nuts (7) and (16). Refer to DET. B, sheet 1.
- (12) Safety with lockwire (5) (TASK 20-10-02-200-801-A). Refer to DET. B, sheet 1.
- (13) Put the wing/fuselage attach spar-III rod assembly (15) back to the aircraft structure. Refer to DET. B, sheet 1.
- (14) Install the upper rod end of the wing/fuselage attach spar-III rod assembly (15) at the aircraft structure with the bushing (2), washer (4), bolt (3), washer (4), nut (1), and a new cotter pin (17). Refer to DET. B, sheet 1.
- (15) Install the lower rod end of the wing/fuselage attach spar-III rod assembly (15) at the aircraft structure with the bushings (14) and (12), flange (8), washer (11), bolt (13), flange (8), washer (11), nut (9), and a new cotter pin (10). Refer to DET. B, sheet 1.
- (16) Install the spar-III cover (27) at the wing stub assembly inside the landing gear bay with the washers (29) and bolts (28). Refer to VIEW D, sheet 2.

**K. Installation (Figure 401)**

**SUBTASK 420-003-A**

- (1) Put the wing-to-fuselage rod assembly (26) in position on the aircraft structure. Refer to DET. C, sheet 2.
- (2) Provisionally install, to the upper and lower rod ends of the wing-to-fuselage rod assembly (26), the bushings (20), washers (19), bolts (18), washers (19), and nuts (21). Refer to DET. C, sheet 2.
- (3) Adjust the rod length, through its jam nuts (23), threaded rod end, and bearing rod end, until it is possible to install the bolts (18) and bushings (20) with no interference. Refer to DET. C, sheet 2.
- (4) Apply a torque of 74.6 N.m (660 lb.in) to the jam nuts (23). Refer to DET. C, sheet 2.
- (5) Make sure that the position of the lock washers (24) is correct and safety-wire the jam nuts (23). Refer to DET. C, sheet 2.
- (6) Safety with lockwire (25) (TASK 20-10-02-200-801-A). Refer to DET. C, sheet 2.
- (7) Install the upper and lower rod ends of the wing-to-fuselage rod assembly (26) at the aircraft structure with the bushings (20), washers (19), bolts (18), washers (19), nuts (21), and new cotter pins (22). Refer to DET. C, sheet 2.

**L. Follow-on**

**SUBTASK 842-002-A**

- (1) Install the center wing-to-fuselage fairing ( [AMM TASK 53-04-10-400-801-A/400](#)).
- (2) Install the lateral wing-to-fuselage fairing ( [AMM TASK 53-04-20-400-801-A/400](#)).



EMB145 – EMB135

AIRCRAFT  
MAINTENANCE MANUAL

- (3) On the circuit breaker panel, close the SPEED BRAKE, GND SPLR OUTBD, and GND SPLR INBD circuit breakers and remove the DO-NOT-CLOSE tag from them.
- (4) On the circuit breaker panel, close the FLAP 1 and FLAP 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.
- (5) Pressurize the emergency/parking brake accumulator ( [AMM TASK 32-44-02-600-801-A/300](#)).
- (6) On the circuit breaker panel, close the ELEC PUMP, CMD, IND 1, and IND 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.
- (7) Bleed the air from the hydraulic system lines ( [AMM TASK 29-10-00-860-803-A/200](#)).
- (8) Do an operational check of the landing gear ( [AMM TASK 32-30-00-700-801-A/500](#)).
- (9) Install the landing-gear safety pins ( [AMM TASK 32-00-01-910-801-A/200](#)).
- (10) Lower the aircraft and remove the jacks (AMM TASK 07-10-00-500-802-A/200).
- (11) Remove the grounding cable from the aircraft ( [AMM TASK 20-40-02-910-801-A/200](#)).
- (12) Restore the aircraft to normal condition.