CHAPTER

22

AUTOFLIGHT

CHAPTER 22
AUTOFLIGHT

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

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AUTOFLIGHT

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AUTOFLIGHT - DDG MAINTENANCE PROCEDURES

1. General

A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG). These tasks prepare the airplane for flight with certain systems/components inoperative.

B. This procedure also has the tasks that put the airplane back to its usual condition.

C. These are the tasks for the components in the autoflight system:

(1) MMEL 22-11-1 (DDG) Preparation - Autopilot Flight Director Computers (AFDC) Inoperative

(2) MMEL 22-11-1 (DDG) Restoration - Autopilot Flight Director Computers (AFDC) Inoperative

(3) MMEL 22-11-2 (DDG) Preparation - Autopilot Backdrive Actuator Systems Inoperative

(4) MMEL 22-11-2 (DDG) Restoration - Autopilot Backdrive Actuator Systems Inoperative

(5) MMEL 22-11-6 (DDG) Preparation - Autothrottle Arm Switch Inoperative

(6) MMEL 22-11-6 (DDG) Restoration - Autothrottle Arm Switch Inoperative

(7) MMEL 22-31-2 (DDG) Preparation - Autothrottle Servomotors (ASM) Inoperative

(8) MMEL 22-31-2 (DDG) Restoration - Autothrottle Servomotors (ASM) Inoperative

TASK 22-00-00-040-801

2. MMEL 22-11-1 (DDG) Preparation - Autopilot Flight Director Computers (AFDC) Inoperative

A. General

(1) This task contains the maintenance steps which prepare the airplane for flight with the Autopilot Flight Director Computers (AFDC) inoperative.

(2) All AFDCs may be inoperative provided approach minimums do not require use of the associated autopilot.

(3) One AFDC may be inoperative provided:

(a) Associated AFDC is deactivated.

(b) Associated AFDC backdrive actuator is deactivated.

(4) Center and one other AFDC may be inoperative provided:

(a) Associated AFDCs are deactivated.

(b) For left or right AFDC inoperative, the associated AFDC backdrive actuator is deactivated.

(c) Radio altimeter associated with the operative AFDC operates normally.

(d) Both flap/slat control lanes operate normally.

(e) All warning electronics system channels operate normally.

(5) All AFDC may be inoperative provided:

(a) All AFDCs are deactivated.

(b) Both AFDC backdrive actuators are deactivated.

(c) Number of flight segments and segment duration is acceptable to flight crew.

(d) Enroute operations do not require use of the autopilots.

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B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

C. AFDCs Deactivation

SUBTASK 22-00-00-860-001

(1) If the left AFDC does not operate, then do this step:

(a) Open these circuit breakers and install safety locks:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

NOTE: The AFDCs are interchangeable. The left AFDC may be moved to the center position to maintain left backdrive function operational.

SUBTASK 22-00-00-860-002

(2) If the center AFDC does not operate, then do this step:

(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C

NOTE: The center AFDC does not have an associated backdrive actuator circuit breaker.

SUBTASK 22-00-00-860-003

(3) If the right AFDC does not operate, then do this step:

(a) Open these circuit breakers and install safety locks:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

NOTE: The AFDCs are interchangeable. The right AFDC may be moved to the center position to maintain right backdrive function operational.

SUBTASK 22-00-00-860-009

(4) If all three AFDCs do not operate, then do these steps:

(a) Open these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	4	C22601	MCP-L
F	17	C22600	MCP-R

(b) Close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	4	C22601	MCP-L
F	17	C22600	MCP-R

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END OF TASK

TASK 22-00-00-440-801

3. MMEL 22-11-1 (DDG) Restoration - Autopilot Flight Director Computers (AFDC) Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Autopilot Flight Director Computers (AFDC) inoperative.

B. References

Reference	Title
22-11-00-730-802	Autopilot Flight Director Computers - System Test (P/B 501)
22-11-01-000-801	Autopilot Flight Director Computer Removal (P/B 401)
22-11-01-400-801	Autopilot Flight Director Computer Installation (P/B 401)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. AFDCs Reactivation

SUBTASK 22-00-00-900-001

(1) Replace the AFDCs that do not operate. These are the tasks:

- Autopilot Flight Director Computer Removal, TASK 22-11-01-000-801,
- Autopilot Flight Director Computer Installation, TASK 22-11-01-400-801.

SUBTASK 22-00-00-740-001

(2) If there are more than one AFDCs that do not operate, then do this system test:

(a) Make sure that these circuit breakers are closed:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

(b) Do this ground test on the MAT: 22 Autopilot Flight Director System, System Test, Autopilot Flight Director Computers (TASK 22-11-00-730-802).

1) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

2) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

END OF TASK

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TASK 22-00-00-040-802

4. MMEL 22-11-2 (DDG) Preparation - Autopilot Backdrive Actuator Systems Inoperative

A. General

(1) This task contains the maintenance steps which prepare the airplane for flight with the Autopilot Backdrive Actuator Systems inoperative.

(2) Both may be inoperative provided approach minimums do not require use of the associated autopilot.

(3) One may be inoperative provided:

(a) Associated AFDC backdrive actuator is deactivated.

(b) Opposite AFDC operates normally.

(4) Both may be inoperative provided:

(a) Both AFDC backdrive actuators are deactivated.

(b) Number of flight segments and segment duration is acceptable to flight crew.

(c) Enroute operations do not require use of the autopilots.

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Autopilot Backdrive Actuator Systems Deactivation

SUBTASK 22-00-00-860-004

(1) If the left autopilot backdrive actuator system does not operate, then do this step:

(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-00-00-860-007

(2) If the right autopilot backdrive actuator system does not operate, then do this step:

(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	25	C22608	AFDC BACK DRIVE R

——— END OF TASK ———

TASK 22-00-00-440-802

5. MMEL 22-11-2 (DDG) Restoration - Autopilot Backdrive Actuator Systems Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Autopilot Backdrive Actuator Systems inoperative.

B. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

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(Continued)

Zone	Area
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left
116	Area Outboard and Above Nose Landing Gear Wheel Well, Right
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Autopilot Backdrive Actuator Systems Reactivation

SUBTASK 22-00-00-860-005

(1) Remove the safety locks and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	11	C22607	AFDC BACK DRIVE L
F	25	C22608	AFDC BACK DRIVE R

D. Autopilot Backdrive Actuator Systems Repair

SUBTASK 22-00-00-740-002

(1) Go to the MAT and find the EICAS status message.

(a) Find the fault code and the correlated maintenance message numbers on the MAT.

SUBTASK 22-00-00-810-001

(2) Go to the Fault Code Index in the FIM and find the fault code (the first two digits of the fault code are the FIM chapter).

(a) For each correlated maintenance message, find the maintenance message number to the right side of the fault code.

(b) Find the task number on the same line as the maintenance message number.

SUBTASK 22-00-00-810-002

(3) Go to the task in the FIM and do the steps in the task.

——— END OF TASK ———

TASK 22-00-00-040-804

6. MMEL 22-11-6 (DDG) Preparation - Autothrottle Arm Switches Inoperative

A. General

(1) This task contains the maintenance steps which prepare the airplane for flight with the Autothrottle Arm Switches inoperative.

(2) One may be inoperative provided:

(a) Associated servo motor is deactivated.

(b) EEC normal mode operates normally.

(c) Both thrust levers are manually set for takeoff and go-around thrust.

(d) Flight remains within 180 minutes of landing at a suitable airport.

B. Location Zones

Zone	Area
211	Flight Compartment, Left

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(Continued)

Zone	Area
212	Flight Compartment, Right

C. Autothrottle Arm Switches Deactivation

SUBTASK 22-00-00-860-010

(1) If the left Autothrottle ARM Switch does not operate, then do this step:

(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	5	C22620	A/T SERVO L

SUBTASK 22-00-00-860-011

(2) If the right Autothrottle ARM Switch does not operate, then do this step:

(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	18	C22621	A/T SERVO R

——— END OF TASK ———

TASK 22-00-00-440-804

7. MMEL 22-11-6 (DDG) Restoration - Autothrottle Arm Switches Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Autothrottle Arm Switches inoperative.

B. References

Reference	Title
22-31-00-730-803	Left TMCF - Autothrottle Switches - LRU Replacement Test (P/B 501)
22-31-00-730-804	Right TMCF - Autothrottle Switches - LRU Replacement Test (P/B 501)
22-31-01-000-802	Autothrottle Servo Motor Removal (P/B 401)
22-31-01-400-801	Autothrottle Servo Motor Installation (P/B 401)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Autothrottle Arm Switches Reactivation

SUBTASK 22-00-00-900-003

(1) Replace the Autothrottle Arm Switches that do not operate. These are the tasks:

- Autothrottle Servo Motor Removal, TASK 22-31-01-000-802,
- Autothrottle Servo Motor Installation, TASK 22-31-01-400-801.

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SUBTASK 22-00-00-740-004

(2) If there are more than one Autothrottle Arm Switches that do not operate, then do these system tests:

(a) Make sure that these circuit breakers are closed:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	5	C22620	A/T SERVO L
F	18	C22621	A/T SERVO R

(b) Do this ground test on the MAT: 22 AIMS - Autothrottle, System Test, Left TMCF - Autothrottle Switches (Left TMCF - Autothrottle Switches - LRU Replacement Test, TASK 22-31-00-730-803).

1) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

2) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Do this ground test on the MAT: 22 AIMS - Autothrottle, System Test, Right TMCF - Autothrottle Switches (Right TMCF - Autothrottle Switches - LRU Replacement Test, TASK 22-31-00-730-804).

1) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

2) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

——— END OF TASK ———

TASK 22-00-00-040-803

8. MMEL 22-31-2 (DDG) Preparation - Autothrottle Servomotors (ASM) Inoperative

A. General

(1) This task contains the maintenance steps which prepare the airplane for flight with the Autothrottle Servomotor (ASM) inoperative.

(2) Both may be inoperative provided:

(a) Flight remains within 180 minutes of landing at a suitable airport.

(b) ECC normal mode operates normally.

(3) One may be inoperative provided:

(a) Associated servo motor is deactivated.

(b) Both thrust levers are manually set for takeoff and go-around thrust.

(4) Both may be inoperative provided:

(a) Both servo motors are deactivated.

(b) Approach minimums do not require use of the autothrottles.

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

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C. ASMs Deactivation

SUBTASK 22-00-00-860-006

(1) If the left ASM does not operate, then do this step:

(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	5	C22620	A/T SERVO L

SUBTASK 22-00-00-860-008

(2) If the right ASM does not operate, then do this step:

(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	18	C22621	A/T SERVO R

——— END OF TASK ———

TASK 22-00-00-440-803

9. MMEL 22-31-2 (DDG) Restoration - Autothrottle Servomotors (ASM) Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Autothrottle Servomotors (ASM) inoperative.

B. References

Reference	Title
22-31-00-730-802	Left TMCF - Autothrottle Servo Loop - System Test (P/B 501)
22-31-00-730-806	Right TMCF - Autothrottle Servo Loop - System Test (P/B 501)
76-12-01-000-805-H00	Autothrottle Servomotor (ASM) and Gearbox Removal (P/B 401)
76-12-01-400-804-H00	Autothrottle Servomotor (ASM) and Gearbox Installation (P/B 401)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. ASMs Reactivation

SUBTASK 22-00-00-900-002

(1) Replace the ASMs that do not operate. These are the tasks:

- Autothrottle Servomotor (ASM) and Gearbox Removal, TASK 76-12-01-000-805-H00,
- Autothrottle Servomotor (ASM) and Gearbox Installation, TASK 76-12-01-400-804-H00.

SUBTASK 22-00-00-740-003

(2) If there are more than one ASMs that do not operate, then do these system tests:

(a) Make sure that these circuit breakers are closed:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	5	C22620	A/T SERVO L

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Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	18	C22621	A/T SERVO R

(b) Do this ground test on the MAT: 22 AIMS - Autothrottle, System Test, Left TMCF - Autothrottle Servo Loop (TASK 22-31-00-730-802).

1) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

2) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Do this ground test on the MAT: 22 AIMS - Autothrottle, System Test, Right TMCF - Autothrottle Servo Loop (TASK 22-31-00-730-806).

1) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

2) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

——— END OF TASK ———

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AUTOPILOT FLIGHT DIRECTOR SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Autopilot Flight Director System Deactivation.

(2) Autopilot Flight Director System Activation.

TASK 22-11-00-040-801

2. Autopilot Flight Director System - Deactivation

(Figure 201)

A. General

(1) This procedure removes electrical power from the following components of the Autopilot Flight Director System:

(a) Autopilot Flight Director Computer.

(b) Control Column Backdrive Actuator.

(c) Control Wheel Backdrive Actuator.

(d) Rudder Backdrive Actuator.

B. References

Reference	Title
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
45-10-00-740-819	How to Do a Ground Test (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Procedure

SUBTASK 22-11-00-860-045

WARNING MAKE SURE THAT THE AREA AROUND THE DOOR FOR THE MAIN LANDING GEAR IS CLEAR OF PERSONNEL, AND EQUIPMENT. THE DOORS CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

WARNING KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE AREA AROUND THE THRUST REVERSERS. THE THRUST REVERSERS EXTEND AND RETRACT QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)

WARNING

KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure clearance zones are established at the following areas of flight control surfaces:

(a) Ailerons

(b) Rudders

(c) Elevators

(d) Flaps

(e) Slats

(f) Spoilers

(g) Landing Gear

(h) Thrust Reversers

(i) Drive mechanisms

SUBTASK 22-11-00-020-001

(2) For the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-00-860-048

(3) Set all the FLT CONTROL HYD VALVE POWER TAIL switches, on the aft Overhead Maintenance Panel P61, to the SHUT OFF positions.

SUBTASK 22-11-00-860-035

(4) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	9	C34427	MMR C
A	10	C34630	ILS ANT SWITCH C
A	21	C22606	AFDC WARN
A	24	C22604	AFDC-C
E	9	C34426	MMR L
E	22	C34425	MMR R
F	4	C22601	MCP-L
F	8	C34629	ILS ANT SWITCH L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L
F	17	C22600	MCP-R
F	21	C34628	ILS ANT SWITCH R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-00-860-036

(5) Make sure that a DO NOT OPERATE tag, STD-858 is on the captain's and first officer's control wheels.

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SUBTASK 22-11-00-860-037

(6) Set both F/D switches on the Mode Control Panel to OFF and attach a DO NOT OPERATE tag, STD-858.

F. Autopilot Flight Director System - Tryout

NOTE: This tryout is to make sure the Autopilot Flight Director System is in a zero energy state.

SUBTASK 22-11-00-860-046

WARNING MAKE SURE THAT THE AREA AROUND THE DOOR FOR THE MAIN LANDING GEAR IS CLEAR OF PERSONNEL, AND EQUIPMENT. THE DOORS CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

WARNING KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE AREA AROUND THE THRUST REVERSERS. THE THRUST REVERSERS EXTEND AND RETRACT QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure clearance zones are established at the following areas of flight control surfaces:

(a) Ailerons
(b) Rudders
(c) Elevators
(d) Flaps
(e) Slats
(f) Spoilers
(g) Landing Gear
(h) Thrust Reversers
(i) Drive mechanisms

SUBTASK 22-11-00-860-039

(2) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	9	C34427	MMR C
A	10	C34630	ILS ANT SWITCH C
A	21	C22606	AFDC WARN
A	24	C22604	AFDC-C
E	9	C34426	MMR L
E	22	C34425	MMR R
F	4	C22601	MCP-L
F	8	C34629	ILS ANT SWITCH L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

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Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	17	C22600	MCP-R
F	21	C34628	ILS ANT SWITCH R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-00-860-040

(3) Make sure that the Mode Control Panel “A/P” pushbutton light bars are not lit and that both F/D switches are set to OFF.

SUBTASK 22-11-00-740-022

(4) Use a maintenance access terminal (MAT) to do a test of the Autopilot Flight Director Computers (How to Do a Ground Test, TASK 45-10-00-740-819):

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Autopilot Flight Director Computers
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that FAILED shows adjacent to TEST CONDITION on the MAT.

1) If FAILED shows, Auto Flight Director System is deactivated.

——— END OF TASK ———

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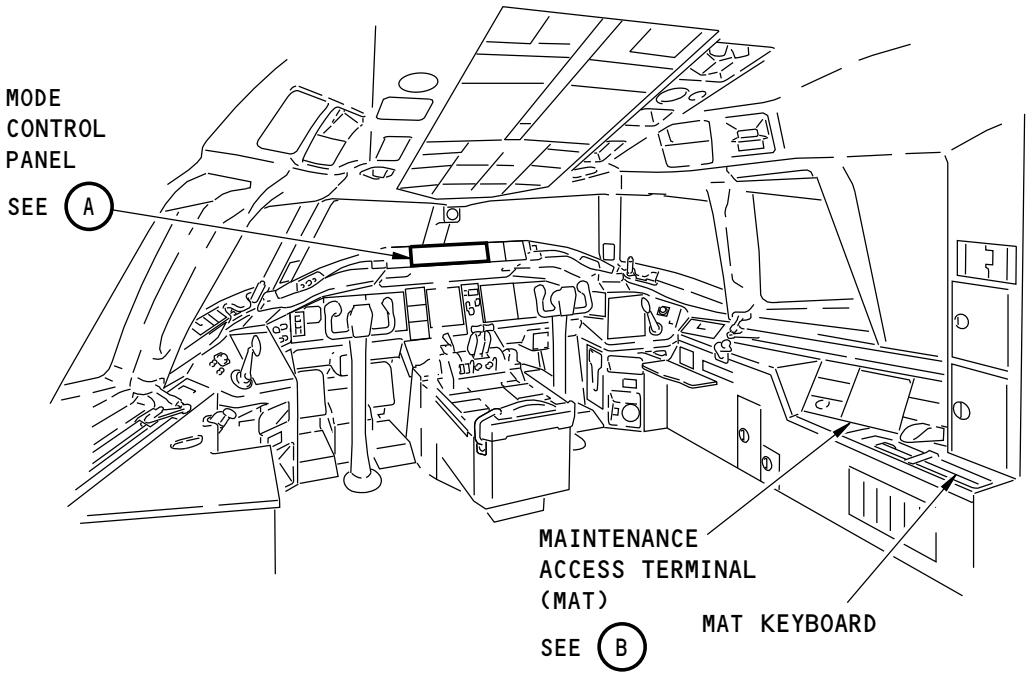
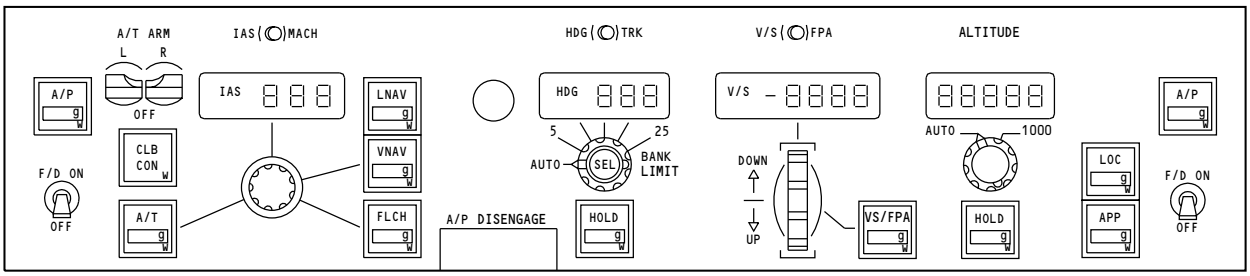


FLIGHT COMPARTMENT



MODE CONTROL PANEL
A

2404701 S0000555801_V1

Autopilot Flight Director System
Figure 201/22-11-00-990-801 (Sheet 1 of 2)

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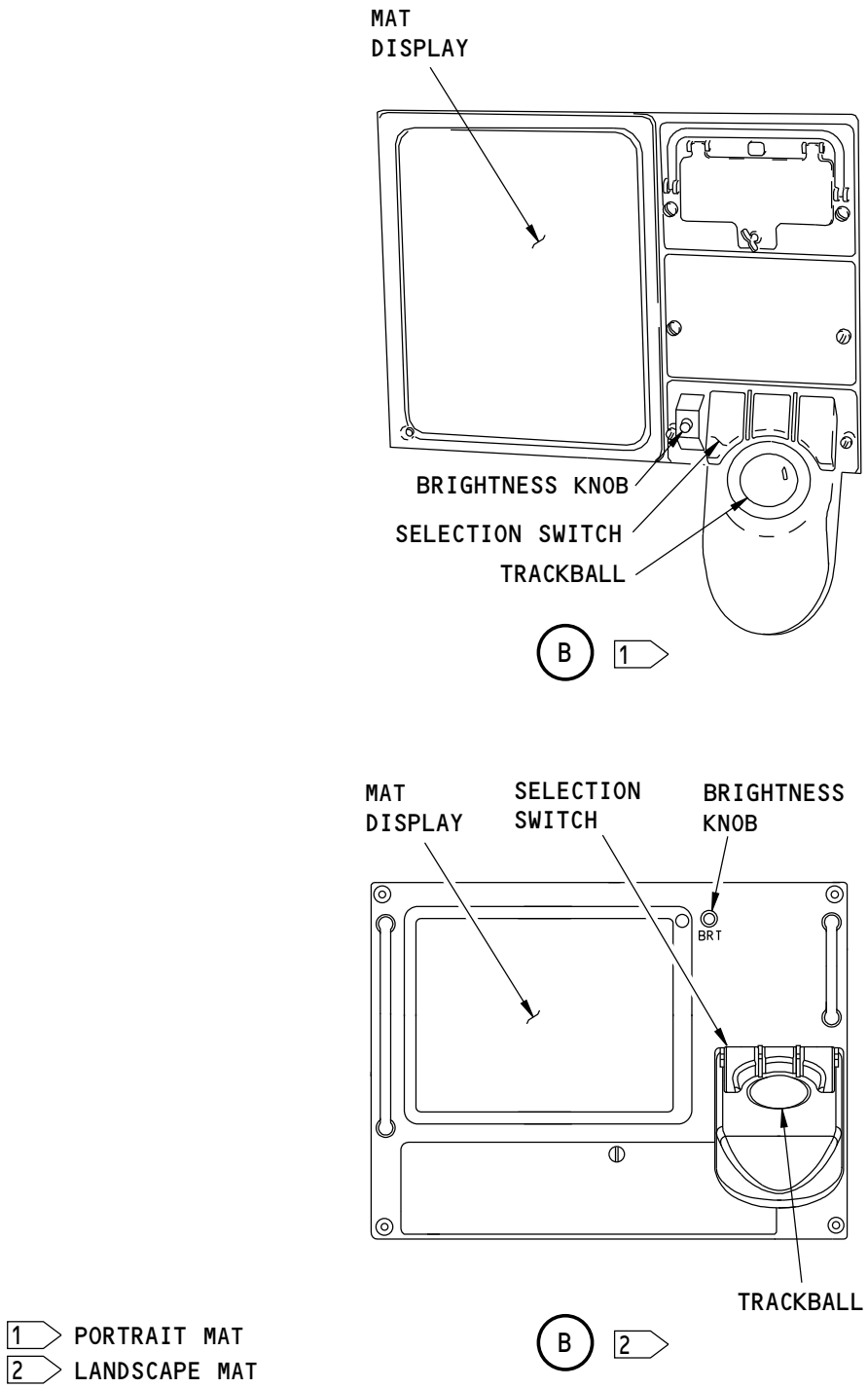

2404717 S0000555816_V1

Autopilot Flight Director System
Figure 201/22-11-00-990-801 (Sheet 2 of 2)

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TASK 22-11-00-440-801

3. Autopilot Flight Director System - Activation

(Figure 201)

A. General

(1) This procedure adds electrical power to the following components of the Autopilot Flight Director System:

(a) Autopilot Flight Director Computer.

(b) Control Column Backdrive Actuator.

(c) Control Wheel Backdrive Actuator.

(d) Rudder Backdrive Actuator.

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-047

WARNING MAKE SURE THAT THE AREA AROUND THE DOOR FOR THE MAIN LANDING GEAR IS CLEAR OF PERSONNEL, AND EQUIPMENT. THE DOORS CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

WARNING KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE AREA AROUND THE THRUST REVERSERS. THE THRUST REVERSERS EXTEND AND RETRACT QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure clearance zones are established at the following areas of flight control surfaces:

(a) Ailerons

(b) Rudders

(c) Elevators

(d) Flaps

(e) Slats

(f) Spoilers

(g) Landing Gear

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(h) Thrust Reversers

(i) Drive mechanisms

SUBTASK 22-11-00-860-042

(2) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	9	C34427	MMR C
A	10	C34630	ILS ANT SWITCH C
A	21	C22606	AFDC WARN
A	24	C22604	AFDC-C
E	9	C34426	MMR L
E	22	C34425	MMR R
F	4	C22601	MCP-L
F	8	C34629	ILS ANT SWITCH L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L
F	17	C22600	MCP-R
F	21	C34628	ILS ANT SWITCH R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-00-860-043

(3) Remove the DO NOT OPERATE tag, STD-858 from the captain's and first officer's control wheels.

SUBTASK 22-11-00-860-044

(4) Remove the DO NOT OPERATE tag, STD-858 from both F/D switches on the Mode Control Panel and set the switches to ON.

——— END OF TASK ———

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AUTOPILOT FLIGHT DIRECTOR SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has 15 tasks and these tasks are in the sequence as follows:

(1) Autopilot Flight Director System (AFDS) - System Test

(a) This test contains all the AFDS system ground tests.

(2) Autopilot Flight Director Computers - System Test

(a) This is an automatic test.

(3) Mode Control Panel - System Test

(a) This is an interactive test.

(4) TO/GA Switch - System Test

(a) This is an interactive test.

(5) Control Column Backdrive - System Test

(a) This is an automatic test. The test will not move the control columns if you do not remove hydraulic power before you do this test.

(6) Control Wheel Backdrive - System Test

(a) This is an automatic test. The test will not move the control wheels if you do not remove hydraulic power before you do this test.

(7) Rudder Pedal Backdrive - System Test

(a) This is an automatic test. The test will not move the rudder pedals if you do not remove hydraulic power before you do this test.

(8) ILS Interface - System Test

(a) This is an automatic test.

(9) Autopilot Disconnect Warning - System Test

(a) This is an interactive test.

(10) Autopilot Flight Director System (AFDS) - System Configuration

(a) This function lets you do a configuration check of the Autopilot Flight Director Computers and the Mode Control Panel.

(11) ILS Localizer Antenna Switching

(a) This is a special function of the Autopilot Flight Director System. This function allows you to choose the selected antenna for the ILS localizer signal.

(12) ILS Glideslope Antenna Switching

(a) This is a special function of the Autopilot Flight Director System. This function allows you to choose the selected antenna for the glideslope signal.

(13) Autopilot Disengage Bar - Operational Test

NOTE: This is a scheduled maintenance task.

(a) This is a manual test. .

(14) Autopilot Disconnect Switches - Operational Test

NOTE: This is a scheduled maintenance task.

(a) This is an interactive test.

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(15) TO/GA Switches - Operational Test

NOTE: This is a scheduled maintenance task.

(a) This is an interactive test.

TASK 22-11-00-730-801

2. Autopilot Flight Director System (AFDS) - System Test

A. General

(1) This is a system test of the Autopilot Flight Director System (AFDS). The AFDS system test contains all the system ground tests of the AFDS. This AFDS system test makes sure that the AFDS is satisfactory.

(2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-740-001

(1) Do this task: Autopilot Flight Director Computers - System Test, TASK 22-11-00-730-802.

SUBTASK 22-11-00-740-002

(2) Do this task: Mode Control Panel - System Test, TASK 22-11-00-730-803.

SUBTASK 22-11-00-740-003

(3) Do this task: TO/GA Switch - System Test, TASK 22-11-00-730-804.

SUBTASK 22-11-00-740-004

(4) Do this task: Control Column Backdrive - System Test, TASK 22-11-00-730-805.

SUBTASK 22-11-00-740-005

(5) Do this task: Control Wheel Backdrive - System Test, TASK 22-11-00-730-806.

SUBTASK 22-11-00-740-006

(6) Do this task: Rudder Pedal Backdrive - System Test, TASK 22-11-00-730-807.

SUBTASK 22-11-00-740-007

(7) Do this task: ILS Interface - System Test, TASK 22-11-00-730-808.

SUBTASK 22-11-00-740-008

(8) Do this task: Autopilot Disconnect Warning - System Test, TASK 22-11-00-740-801.

END OF TASK

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TASK 22-11-00-730-802

3. Autopilot Flight Director Computers - System Test

A. General

(1) This is an internal function test of the left AFDC, center AFDC, and right AFDC. The test also makes sure that the left, center, and right AFDC interfaces are satisfactory.

(2) This is an automatic test. During this test, there is no movement of the flight controls or primary surfaces.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-001

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-009

(2) Use a maintenance access terminal (MAT) to do the system test of the Autopilot Flight Director Computers:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Autopilot Flight Director Computers
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

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TASK 22-11-00-730-803

4. Mode Control Panel - System Test

A. General

(1) This is a test of the Mode Control Panel (MCP). This test makes sure that the switch-lights, the displays, the switches and the selectors on the MCP operate correctly. The test also makes sure that the interfaces between the MCP and these systems are satisfactory:

(a) The Autopilot Flight Director Computers

(b) The Airplane Information Management Systems (AIMS).

(2) This is an interactive test. During this test, the instructions on the MAT will tell you to operate all the switches and the selectors on the MCP. Visually monitor the displays on the MCP for the correct results when you do this test.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-003

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-010

(2) Use a maintenance access terminal (MAT) to do the system test of the Mode Control Panel:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Mode Control Panel
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) Do the instructions that show on the MAT to complete the test.

1) Visually monitor the displays on the MCP for the correct results.

a) If the following message shows after you push the 'VS/FPA' button on the MCP, push the 'IAS/MACH' button to continue the test.

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"Description: This test makes sure the Maintenance Access Terminal is installed correctly."

NOTE: If you push 'CONTINUE' on the MAT it will cause the test to fail.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-11-00-730-804

5. TO/GA Switch - System Test

A. General

(1) This is a test of the Takeoff/Go-Around (TO/GA) switches and their interfaces with the Autopilot Flight Director Computers.

(2) This is an interactive test. During this test, the instructions on the MAT will tell you to operate the left and right TO/GA switches.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-005

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-860-032

(2) Make sure that the A/T ARM switches are in the OFF position.

SUBTASK 22-11-00-860-033

(3) Make sure that the engines are not in operation.

SUBTASK 22-11-00-740-011

(4) Use a maintenance access terminal (MAT) to do the system test of the TO/GA Switch:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST

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WARNING

MAKE SURE THAT THE A/T ARM SWITCHES ARE IN THE OFF POSITION AND THE ENGINES ARE NOT IN OPERATION BEFORE YOU PUSH THE LEFT OR RIGHT TO/GA SWITCH. IF THE A/T ARM SWITCHES ARE NOT IN THE OFF POSITION AND THE ENGINES ARE IN OPERATION AND THE FLAPS ARE NOT IN THE UP POSITION, THE AUTOTHROTTLE SERVO MOTORS WILL MOVE AND THE ENGINES WILL OPERATE AT THE TAKE-OFF THRUST LEVEL WHEN YOU PUSH THE TO/GA SWITCH. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

6) TO/GA Switch

7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE

2) START TEST

(c) Do the instructions that show on the MAT to complete the test.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

END OF TASK

TASK 22-11-00-730-805

6. Control Column Backdrive - System Test

A. General

(1) This is a test of the left and right control column backdrive actuators. The test makes sure that the control columns can move through the full range of travel with sufficient rate and torque.

(2) This is an automatic test. The test will not move the control columns if you do not remove hydraulic power before you do this test. During this test, the control columns will move.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-007

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

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SUBTASK 22-11-00-860-008

(2) For the left, center and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-00-740-012

WARNING KEEP ALL PERSONS AND EQUIPMENT CLEAR OF THE CAPTAIN'S AND FIRST OFFICER'S CONTROL COLUMNS. THIS TEST WILL MOVE THE CONTROL COLUMNS THROUGH THEIR FULL RANGE OF TRAVEL. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Use a maintenance access terminal (MAT) to do the system test of the Control Column Backdrive:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Control Column Backdrive
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

END OF TASK

TASK 22-11-00-730-806

7. Control Wheel Backdrive - System Test

A. General

(1) This is a test of the left and right control wheel backdrive actuators. The test makes sure that the control wheels can move through the full range of travel with sufficient rate and torque.

(2) This is an automatic test. The test will not move the control wheels if you do not remove hydraulic power before you do this test. During this test, the control wheels will move.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

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(Continued)

Reference	Title
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-010

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-860-011

(2) For the left, center and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-00-740-013

WARNING KEEP ALL PERSONS AND EQUIPMENT CLEAR OF THE CAPTAIN'S AND FIRST OFFICER'S CONTROL WHEELS. THIS TEST WILL MOVE THE CONTROL WHEELS THROUGH THEIR FULL RANGE OF TRAVEL. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Use a maintenance access terminal (MAT) to do the system test of the Control Wheel Backdrive:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Control Wheel Backdrive
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

END OF TASK

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TASK 22-11-00-730-807

8. Rudder Pedal Backdrive - System Test

A. General

(1) This is a test of the left and right rudder pedal backdrive actuators. The test makes sure that the rudder pedals can move through the full range of travel with sufficient rate and torque.

(2) This is an automatic test. The test will not move the rudder pedals if you do not remove hydraulic power before you do this test. During this test, the rudder pedals will move.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-013

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-860-014

(2) For the left, center and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808

SUBTASK 22-11-00-740-014

WARNING KEEP ALL PERSONS AND EQUIPMENT CLEAR OF THE CAPTAIN'S AND FIRST OFFICER'S RUDDER PEDALS. THIS TEST WILL MOVE THE RUDDER PEDALS THROUGH THEIR FULL RANGE OF TRAVEL. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Use a maintenance access terminal (MAT) to do the system test of the Rudder Pedal Backdrive:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Rudder Pedal Backdrive
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE

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2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-11-00-730-808

9. ILS Interface - System Test

A. General

(1) This is a test of the ILS interface. This test makes sure that the interfaces to the ILS receivers and the antenna switches are satisfactory. The test also makes sure that these functions of all the Autopilot Flight Director Computers (AFDCs) are satisfactory:

(a) The Localizer antenna switching function

(b) The Glideslope antenna switching function

(c) ILS tune inhibit function.

(2) This is an automatic test. During this test, each AFDC will operate its ILS tune inhibit function, localizer and glideslope switching functions to make sure that all the ILS interfaces are satisfactory.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-016

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-015

(2) Use a maintenance access terminal (MAT) to do the system test of the ILS Interface:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE

2) LINE MAINTENANCE

3) GROUND TESTS

4) 22 Autopilot Flight Director System

5) SYSTEM TEST

6) ILS Interface

7) CONTINUE

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(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE

2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-11-00-740-801

10. Autopilot Disconnect Warning - System Test

A. General

(1) This is a test of the autopilot disconnect switches and their interfaces to the Autopilot Flight Director Computers (AFDCs). The test also makes sure that the disconnect warning function interfaces between the AFDCs and these systems are correct:

(a) The Airplane Information Management Systems (AIMS)

(b) The Warning Electronic System (WES).

(2) This is an interactive test. During this test, the instructions on the MAT will tell you to operate the captain's and first officer's autopilot disconnect switches. When you do this test, these indications occur:

(a) The sound of the aural warning

(b) The two master warning lights come on

(c) The "AUTOPILOT DISC" EICAS message shows on the EICAS display.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-018

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-016

(2) Use a maintenance access terminal (MAT) to do the system test of the Autopilot Disconnect Warning:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE

2) LINE MAINTENANCE

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3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Autopilot Disconnect Warning
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:
1) CONTINUE
2) START TEST

(c) Do the instructions that show on the MAT to complete the test.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-11-00-730-809

11. Autopilot Flight Director System (AFDS) - System Configuration

A. General

(1) The configuration check makes sure that the AFDC has correct software. It will show a failure if the operational program software (OPS) is not installed.

(2) The configuration check will show the hardware part number, serial number, program pins and software part numbers for each of the Autopilot Flight Director Computer (AFDC) installed. It also shows the configuration data for the mode control panel.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
22-11-01-400-803	Autopilot Flight Director Computer Software Installation (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-020

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

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SUBTASK 22-11-00-750-001

(2) Use a maintenance access terminal (MAT) to do a system configuration check of the Autopilot Flight Director System (AFDS):

NOTE: The configuration check will show a failure if the operational program software (OPS) is not installed. The AFDC must also contain the operational program configuration (OPC).

(a) Make these selections on the MAT:
1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) SYSTEM CONFIGURATION
4) 22 Autopilot Flight Director System
5) CONTINUE

(b) Make sure that these data show for the Left AFDC, Center AFDC and Right AFDC:
1) Hardware Part Number (Supplier P/N).
2) Serial Number (AFDC serial number).
3) Program Pins:
a) Ch ID L (For left AFDC only)
b) Ch ID C (For center AFDC only)
c) Ch ID R (For right AFDC only)
4) Software Part Numbers (Supplier P/N):
a) Operational Program Software (OPS) Part Number.
b) Operational Program Configuration (OPC) Part Number.
NOTE: If there is no OPC installed, then 0000-000-000-00 will show.
c) Flight Test Data (FTD) Part Number.
NOTE: The Flight Test Data is a file that can be installed to cause specific internal AFDC parameters to be transmitted on a dedicated 429 output bus from the AFDC. It will not normally be used for in service flights. If there is no FTD file installed, then this entry will not show on the MAT.
d) If the part numbers are incorrect, do this task: Autopilot Flight Director Computer Software Installation, TASK 22-11-01-400-803.

(c) Make sure that these data show for the Mode Control Panel:
1) LRU Part Number (Supplier P/N).
2) Serial Number (Supplier P/N).
3) Program pin:
a) A-3 Dig Mach
b) B-3 Dig Mach

(d) Select GO BACK to remove the configuration display.

END OF TASK

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TASK 22-11-00-740-802

12. ILS Localizer Antenna Switching

A. General

(1) The ILS Localizer Antenna Switching is not a test. It is an AFDS special function. This function lets you select the localizer antenna or the VOR antenna for troubleshooting of the Instrument Landing System. It has no PASSED/FAILED indication. There are no EICAS messages.

(2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-022

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-017

(2) Use a maintenance access terminal (MAT) to do the ILS Localizer Antenna Switching:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) OTHER FUNCTIONS
3) SPECIAL FUNCTIONS
4) 22 Autopilot Flight Director System
5) ILS Localizer Antenna Switching
6) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START FUNCTION

(c) Do the instructions that show on the MAT to select the localizer Antenna or the VOR antenna.

(d) Make this selection on the MAT to put the ILS localizer antenna back to its usual condition (localizer antenna):

1) STOP FUNCTION

——— END OF TASK ———

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TASK 22-11-00-740-803

13. ILS Glideslope Antenna Switching

A. General

(1) The ILS Glideslope Antenna Switching is not a test. It is an AFDS special function. This function lets you select the track antenna or the capture antenna for troubleshooting of the Instrument Landing System. It has no PASSED/FAILED indication. There are no EICAS messages.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-024

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-018

(2) Use a maintenance access terminal (MAT) to do the ILS Glideslope Antenna Switching:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) OTHER FUNCTIONS
3) SPECIAL FUNCTIONS
4) 22 Autopilot Flight Director System
5) ILS Glideslope Antenna Switching
6) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START FUNCTION

(c) Do the instructions that show on the MAT to select the track antenna or the capture antenna.

(d) Make this selection on the MAT to put the ILS glideslope antenna back to its usual condition (track antenna):

1) STOP FUNCTION

——— END OF TASK ———

TASK 22-11-00-710-801

14. Autopilot Disengage Bar - Operational Test

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
34-21-00-820-801	Air Data Inertial Reference Unit - Alignment (P/B 201)

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B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Procedure

SUBTASK 22-11-00-860-026

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-980-001

(2) Do these steps to engage the autopilot:

(a) Make sure that the airplane is on the ground.

(b) Make sure that the flaps are retracted.

(c) Do this task: Air Data Inertial Reference Unit - Alignment, TASK 34-21-00-820-801.

(d) Push the autopilot (A/P) engage switch on the mode control panel (MCP) to engage the autopilot.

SUBTASK 22-11-00-980-002

(3) Do these steps to disengage the autopilot:

(a) Put the autopilot disengage bar (on the MCP) in the down position to disengage the autopilot.

(b) Make sure that these indications occur:

1) The sound of the autopilot disconnect aural warning

2) The two master warning lights come on

3) The "AUTOPILOT DISC" EICAS message shows on the EICAS display.

(c) Push the captain's or first officer's autopilot disconnect switch (on the control wheel) to stop the autopilot disconnect aural warning.

(d) Make sure that the two master warning lights go off.

(e) Make sure that the "AUTOPILOT DISC" EICAS message does not show on the EICAS display.

SUBTASK 22-11-00-740-019

(4) Look at the Line Maintenance, Existing Flight Deck Effects display on the MAT for the 22-13404 maintenance message.

(a) Make sure that the maintenance message shows ACTIVE on the MAT.

(b) Select the maintenance message and select MAINTENANCE MESSAGE DATA to make sure that all AFDCs show the fault.

(c) Put the autopilot disengage bar in the up position.

1) Make sure that the MAT shows NOT ACTIVE for the maintenance message.

(d) Set the ADIRU switch on the overhead panel (P5) to OFF.

——— END OF TASK ———

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TASK 22-11-00-710-802

15. Autopilot Disconnect Switches - Operational Test

A. General

(1) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-028

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-020

(2) Use a maintenance access terminal (MAT) to do the LRU replacement test of the Autopilot Disconnect Switch:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) LRU REPLACEMENT TEST
6) Autopilot Disconnect Switch
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) Do the instructions that show on the MAT to complete the test.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-11-00-710-803

16. TO/GA Switches - Operational Test

NOTE: This procedure is a scheduled maintenance task.

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A. General

(1) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-11-00-860-030

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-00-740-021

(2) Use a maintenance access terminal (MAT) to do the LRU replacement test of the TO/GA Switch:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) LRU REPLACEMENT TEST
6) TO/GA Switch
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) Do the instructions that show on the MAT to complete the test.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

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TASK 22-11-01-400-803

1. Autopilot Flight Director Computer Software Installation

A. General

(1) This procedure tells you how to install software in the Autopilot Flight Director Computer (AFDC). The AFDC must contain these pieces of software:

(a) The names of the two software parts loaded into each AFDC follow:

AFDC Operational Program Software (OPS)

REF: AIPC 46-00-00-22D.

AFDC Operational Program Configuration (OPC)

REF: AIPC 46-00-00-22C.

Using the names, the two specific software part numbers for an aircraft can be identified in the Illustrated Parts Catalog (IPC).

(2) You can install the software in any sequence, but it is best to install the OPS before you install the OPC.

(3) To read about the conditions and times necessary for software installation, do this task: On-Airplane Software Installation, TASK 20-15-11-400-801.

(4) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

(5) If you do not know if the AFDC needs new software, you can first do the software configuration check. It will save time if you only install software when the software is missing or the part number is incorrect. You can find the software configuration check in this task: Autopilot Flight Director Computer Installation, TASK 22-11-01-400-801.

(6) You can use the Ground Support Equipment (GSE)-Laptop, maintenance device, SPL-5704, as an alternative to the Portable Maintenance Access Terminal (PMAT) in this task.

NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.

(7) You can install the software from disks, the Maintenance Access Terminal (MAT) hard drive or the PMAT hard drive (if available). It is recommended that you install software from the MAT or PMAT hard drive. To install new software on the MAT or PMAT hard drive, do this task: How to Add Software to the Hard Drive, TASK 45-10-00-860-812.

NOTE: When new software is installed in the AFDC, the load process first erases the old software and then installs the new software. If you install software directly to the AFDC from a faulty disk, the load process may erase the old software and then fail, so that no software is installed. If you install a faulty disk to the MAT or PMAT hard drive, the load may fail, but you will not erase the software from the AFDC.

(a) It is recommended that you remove old software part numbers from the MAT or PMAT hard drive after new software is installed. To remove software from the hard drive, do this task: How to Remove Software from the Hard Drive, TASK 45-10-00-860-813.

ARO 014-999

(8) You can also install the software from the Onboard Network System (ONS) Mass Storage Device (MSD). To install new software on the ONS MSD, do this task: Mass Storage Device Software Part Installation, TASK 46-13-00-470-802.

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ARO 014-999 (Continued)

(a) It is recommended that you remove old software part numbers from the ONS MSD after new software is installed. To remove software from the ONS MSD, do this task: Mass Storage Device Software Removal, TASK 46-13-00-070-801.

ARO ALL

(9) Before you can install software, the airplane must be on the ground with the engines off, and the autopilot must not be engaged.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
22-11-01-400-801	Autopilot Flight Director Computer Installation (P/B 401)
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-860-812	How to Add Software to the Hard Drive (P/B 201)
45-10-00-860-813	How to Remove Software from the Hard Drive (P/B 201)
46-13-00-070-801	Mass Storage Device Software Removal (P/B 201)
46-13-00-470-802	Mass Storage Device Software Part Installation (P/B 201)
AIPC 46-00-00-22C	Aircraft Illustrated Parts Catalog
AIPC 46-00-00-22D	Aircraft Illustrated Parts Catalog

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

Zone	Area
212	Flight Compartment, Right

E. Procedure

SUBTASK 22-11-01-860-012

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-01-420-003

(2) Use a maintenance access terminal (MAT or PMAT) to install software in the AFDC:

NOTE: Make sure you know the correct software part number for the AFDC before you select the software part number on the display. For the AFDC to be an approved installation, the correct software must be installed.

(a) If the software is on a disk, put the correct disk in the disk drive.

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(b) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) EXTENDED MAINTENANCE
3) DATA LOAD

(c) Make these selections to select the component that will receive the software:

1) SELECT DESTINATION
2) 22 Autopilot Flight Director System
3) Autopilot Flight Director Computer (Left, Center, or Right)
4) CONTINUE

(d) Make these selections to select the source of the software:

1) SELECT SOURCE
2) Select the source of the software (if Disk Drive is the only selection, it is automatically selected).
3) Select the correct software part number from the display.
4) CONTINUE

(e) Select START to start the software installation.

NOTE: During the installation of new software for the left, center and right AFDCs, an AFDC status message will show on the Engine Indication and Crew Alerting System (EICAS) display. The AFDC has a built-in monitor which causes an AFDC status message to show when an AFDC has a different software part number from the other two. However, after the software installation for the last AFDC, no AFDC status message will show.

(f) When the software installation is completed, make sure the correct software part number shows on the display.

(g) If the software part number shows on the display, select CONTINUE to remove the configuration display. Do not do the steps that follow.

(h) If the software part number does not show on the display, make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) SYSTEM CONFIGURATION
4) 22 Autopilot Flight Director System
5) CONTINUE

(i) Find Autopilot Flight Director Computer (Left, Center, or Right) on the display and make sure that the software part numbers are correct.

(j) Select GO BACK to remove the configuration display.

NOTE: If the other computers (left, right, center) need to have software loaded, do this task again.

——— END OF TASK ———

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AUTOPILOT FLIGHT DIRECTOR COMPUTER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of an autopilot flight director computer (AFDC).

(2) The installation of an autopilot flight director computer.

(a) The installation test has the configuration check which makes sure that the AFDC has correct software.

(b) The configuration check will show a failure if the operational program software (OPS) is not installed.

B. You can find the three AFDCs in the main equipment center. The left AFDC (M22101) is on the No. 3 shelf of the E1 electronics equipment rack (E1-3). The center AFDC (M22301) is on the No. 1 shelf of the E4 electronics equipment rack (E4-1). The right AFDC (M22201) is on the No. 5 shelf of the E2 electronics equipment rack (E2-5).

C. The removal and installation tasks are the same for the left AFDC, center AFDC and right AFDC.

TASK 22-11-01-000-801

2. Autopilot Flight Director Computer Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
20-10-01-000-801	E/E Box Removal (P/B 401)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Removal Procedure

SUBTASK 22-11-01-860-001

(1) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	21	C22606	AFDC WARN

SUBTASK 22-11-01-860-002

(2) For the left AFDC;

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(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
E	9	C34426	MMR L
F	8	C34629	ILS ANT SWITCH L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-01-860-003

(3) For the right AFDC;

(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
E	22	C34425	MMR R
F	21	C34628	ILS ANT SWITCH R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-01-860-004

(4) For the center AFDC;

(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	9	C34427	MMR C
A	10	C34630	ILS ANT SWITCH C
A	24	C22604	AFDC-C

SUBTASK 22-11-01-010-001

(5) To get to the main equipment center, open this access panel:

(TASK 06-41-00-800-801)

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 22-11-01-020-001

CAUTION

DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE AFDC. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE AFDC.

(6) To remove the AFDC [1], do this task: E/E Box Removal, TASK 20-10-01-000-801.

END OF TASK

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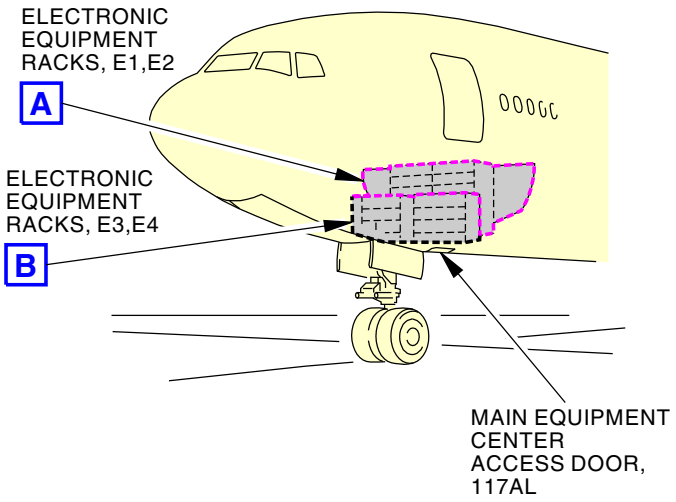

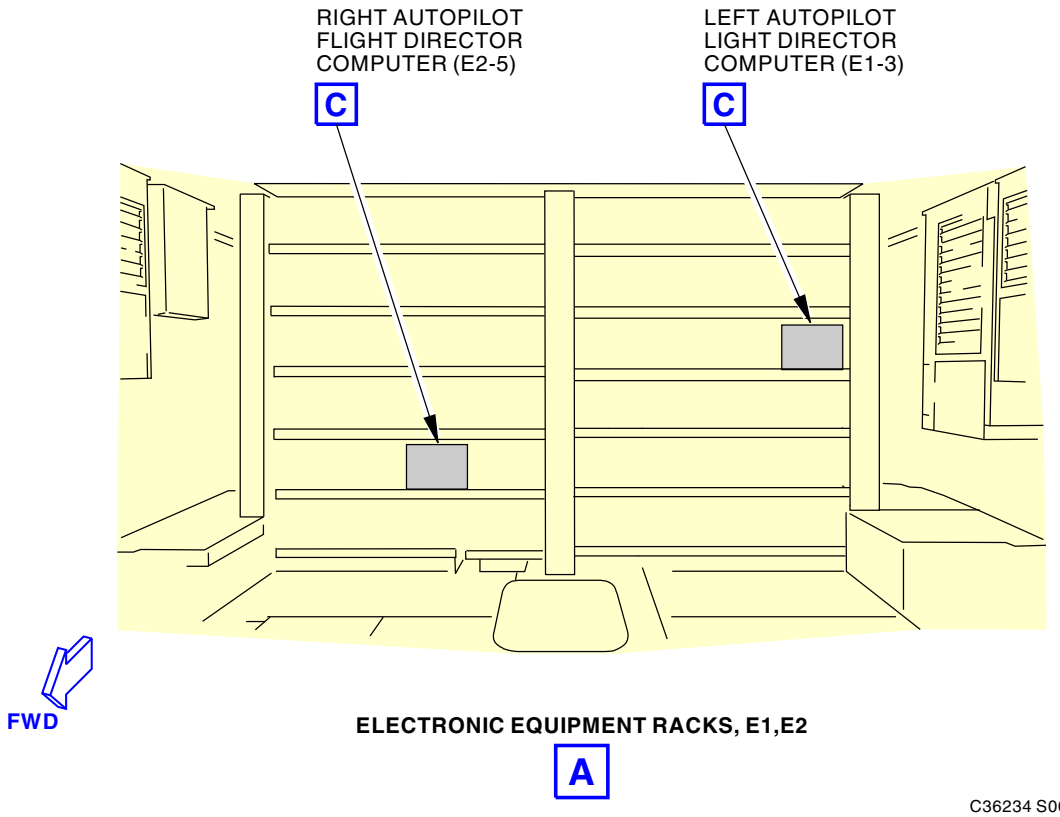

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Autopilot Flight Director Computer Installation
Figure 401/22-11-01-990-802 (Sheet 1 of 2)

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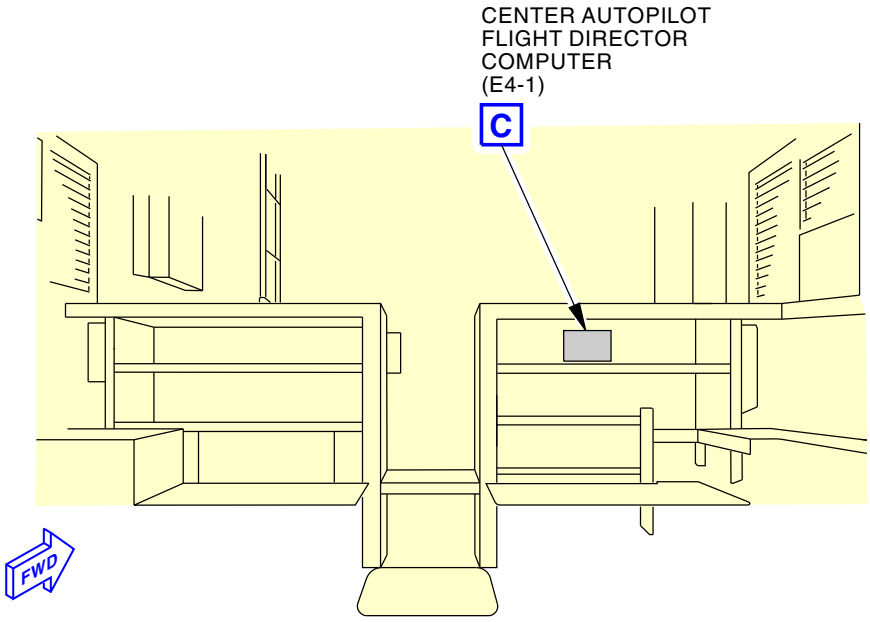
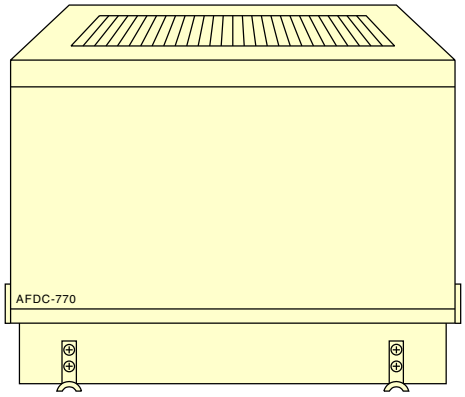


ELECTRONIC EQUIPMENT RACKS, E3, E4

B



[1] AUTOPILOT FLIGHT DIRECTOR COMPUTER

C

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Autopilot Flight Director Computer Installation
Figure 401/22-11-01-990-802 (Sheet 2 of 2)

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TASK 22-11-01-400-801

3. Autopilot Flight Director Computer Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
20-10-01-400-801	E/E Box Installation (P/B 401)
22-11-01-400-803	Autopilot Flight Director Computer Software Installation (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	AFDC	22-11-01-01-008	ARO ALL
		22-11-01-02-008	ARO 001-011
		22-11-01-02-410	ARO 012-999

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Installation Procedure

SUBTASK 22-11-01-860-005

(1) Make sure that this circuit breaker is open and has safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	21	C22606	AFDC WARN

SUBTASK 22-11-01-860-006

(2) For the left AFDC;

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(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
E	9	C34426	MMR L
F	8	C34629	ILS ANT SWITCH L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-01-860-007

(3) For the right AFDC;

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
E	22	C34425	MMR R
F	21	C34628	ILS ANT SWITCH R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-01-860-008

(4) For the center AFDC;

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	9	C34427	MMR C
A	10	C34630	ILS ANT SWITCH C
A	24	C22604	AFDC-C

SUBTASK 22-11-01-420-001

CAUTION

DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE AFDC. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE AFDC.

(5) To install the AFDC [1], do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 22-11-01-410-001

(6) Close this access panel:

(TASK 06-41-00-800-801)

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 22-11-01-860-009

(7) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	9	C34427	MMR C
A	10	C34630	ILS ANT SWITCH C
A	21	C22606	AFDC WARN
A	24	C22604	AFDC-C

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(Continued)

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
E	9	C34426	MMR L
E	22	C34425	MMR R
F	8	C34629	ILS ANT SWITCH L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L
F	21	C34628	ILS ANT SWITCH R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

G. Installation Test

SUBTASK 22-11-01-860-010

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-01-750-001

(2) Use a maintenance access terminal (MAT) to do a software configuration check of the Autopilot Flight Director Computer (AFDC):

NOTE: The configuration check will show a failure if the operational program software (OPS) is not installed. The AFDC must also contain the operational program configuration (OPC).

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) SYSTEM CONFIGURATION
4) 22 Autopilot Flight Director System
5) CONTINUE

(b) Find Autopilot Flight Director Computer (Left, Center, or Right) on the display and make sure that the software part numbers are correct.

(c) Select GO BACK to remove the configuration display.

SUBTASK 22-11-01-420-002

(3) If the part numbers are incorrect, install software in the Autopilot Flight Director Computer (Left, Center, or Right), do this task: Autopilot Flight Director Computer Software Installation, TASK 22-11-01-400-803.

SUBTASK 22-11-01-740-001

(4) Use a maintenance access terminal (MAT) to do the LRU replacement test of the Autopilot Flight Director Computer:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) LRU REPLACEMENT TEST
6) Autopilot Flight Director Computer (left, center, right)

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7) CONTINUE

(b) Do the instructions that show on the MAT and make these selections:

1) CONTINUE

2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

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MODE CONTROL PANEL - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the Mode Control Panel (MCP).

(2) An installation of the MCP.

(3) A removal of a mode select switch and/or a lamp for the mode select switch.

(4) An installation of a mode select switch and/or a lamp for the mode select switch.

B. The MCP is in the center of the glareshield, P55, in the flight compartment.

C. The MCP is installed on supports in the glareshield structure. Captive screws attach the MCP to the glareshield supports. There are three electrical connectors at the rear of the MCP. An opening at the rear of the MCP automatically connects with the equipment cooling system when the panel is installed.

TASK 22-11-02-000-801

2. Mode Control Panel Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-41-01-000-802	Conductive Dust Cap and Connector Cover Installation (P/B 201)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Mode Control Panel Removal

SUBTASK 22-11-02-860-001

(1) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

SUBTASK 22-11-02-860-007

(2) On the Overhead Panel, P5, set the MASTER BRIGHT switch to off.

SUBTASK 22-11-02-860-002

(3) On the Overhead Panel, P5, turn the outer knob of the GLARESHIELD PNL/FLOOD control fully counterclockwise.

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SUBTASK 22-11-02-910-001

CAUTION

DO NOT TOUCH THE MCP BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE MCP.

(4) Before you touch the MCP [1], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 22-11-02-020-001

(5) Remove the MCP [1]:

(a) Loosen the four captive screws [2] on the bottom of the MCP supports in the glareshield that attach to the MCP [1].

CAUTION

CAREFULLY MOVE THE MCP OUT FROM ITS SUPPORTS IN THE GLARESHIELD TO PREVENT FORCE ON THE ELECTRICAL CABLES. DAMAGE TO THE ELECTRICAL CABLES COULD OCCUR IF YOU PUT TOO MUCH FORCE ON THEM.

(b) Move the MCP [1] out from its supports in the glareshield until you can get access to the electrical connectors at the rear of the MCP unit.

WARNING

BE CAREFUL WHEN YOU PUT YOUR HAND BEHIND THE MODE CONTROL PANEL. THE SCREW HEADS ADJACENT TO THE CONNECTOR CAN CUT YOUR HAND.

(c) Disconnect the electrical connectors.

(d) Remove the MCP [1] from its supports in the glareshield.

(e) Do this task: Conductive Dust Cap and Connector Cover Installation, TASK 20-41-01-000-802.

——— END OF TASK ———

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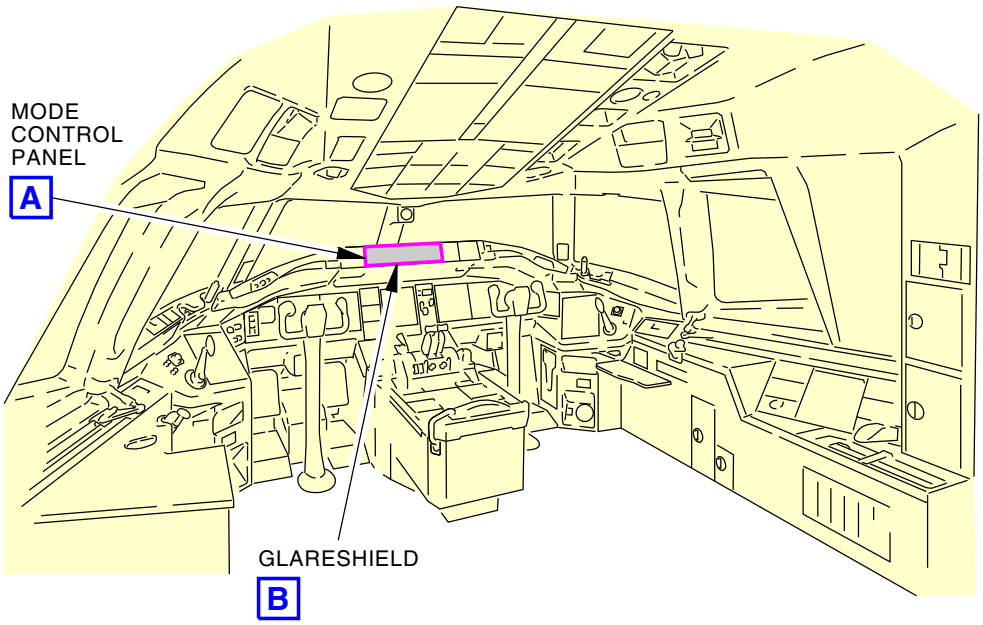
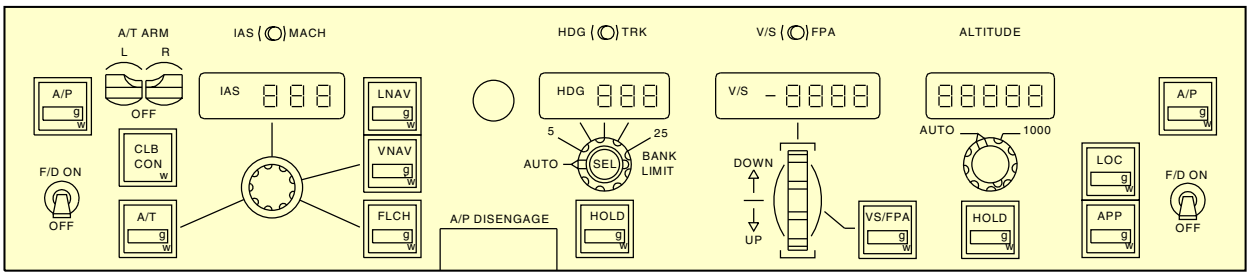


FLIGHT COMPARTMENT



MODE CONTROL PANEL

A

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Mode Control Panel Installation
Figure 401/22-11-02-990-801 (Sheet 1 of 2)

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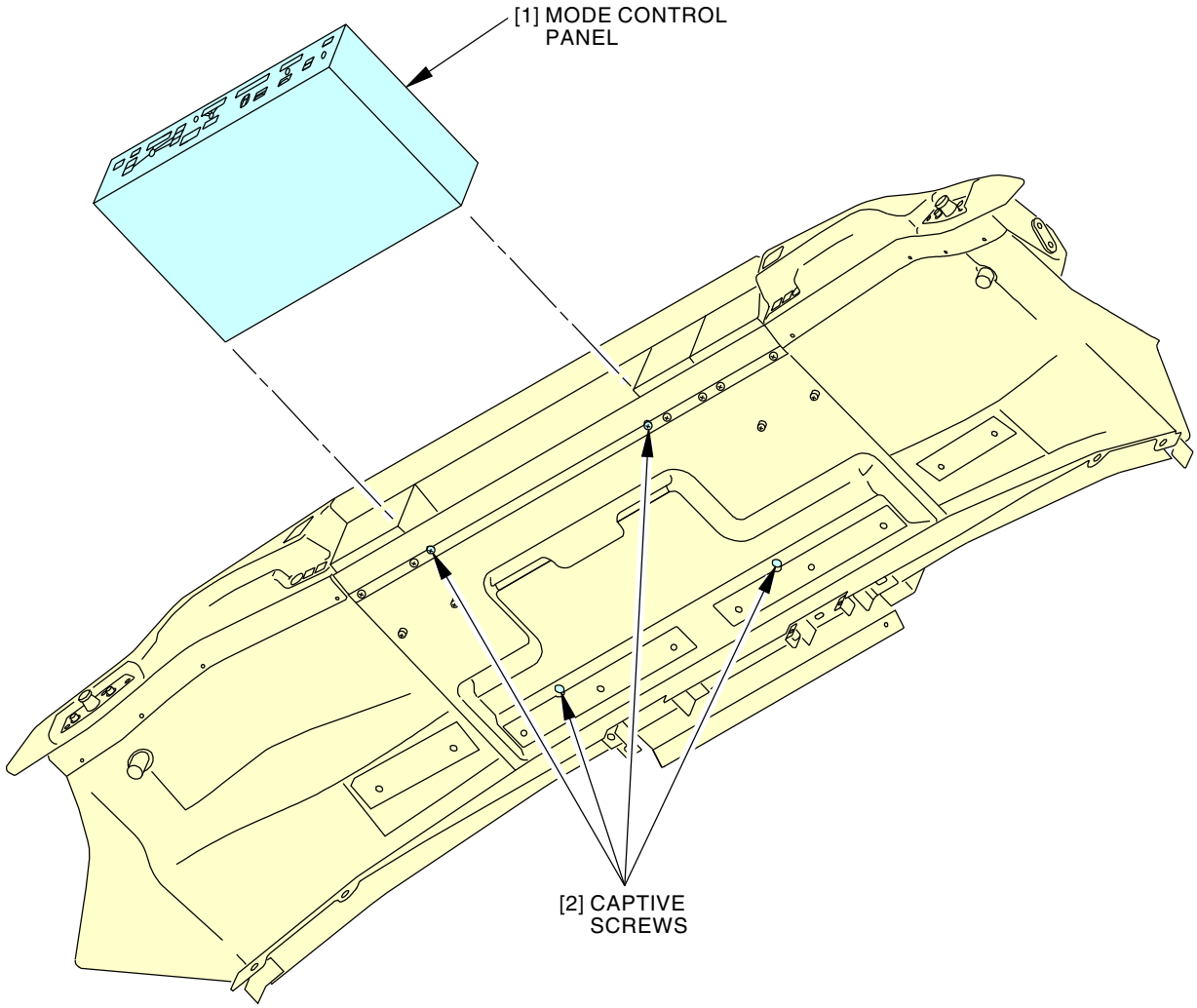

GLARESHIELD (BOTTOM VIEW)

B

C39320 S0006404563_V2

Mode Control Panel Installation
Figure 401/22-11-02-990-801 (Sheet 2 of 2)

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TASK 22-11-02-400-801

3. Mode Control Panel Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) The installation test makes sure that the mode control panel is installed correctly.

(2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
20-41-01-400-803	ESDS Handling for Metal Encased Unit Installation (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	MCP	22-11-02-10-005	ARO 001-013
		22-11-02-10-450	ARO ALL

D. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Mode Control Panel Installation

SUBTASK 22-11-02-860-003

(1) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

SUBTASK 22-11-02-910-002

CAUTION

DO NOT TOUCH THE MCP BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE MCP.

(2) Before you touch the MCP [1], do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-41-01-400-803.

SUBTASK 22-11-02-420-001

(3) Install the MCP [1]:

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CAUTION MAKE SURE THE COVER FOR THE AIR INLET ON THE REAR OF THE MCP IS REMOVED. DAMAGE TO EQUIPMENT COULD OCCUR IF THIS OPENING IS BLOCKED.

(a) Make sure the cover for the air inlet on the rear of the MCP [1] is removed.

CAUTION MAKE SURE THAT THE AIR OUTLET AT THE REAR OF THE MCP SUPPORTS IN THE GLARESHIELD IS CLEAR OF BLOCKAGE. EQUIPMENT DAMAGE COULD OCCUR IF THIS OPENING IS BLOCKED.

(b) Make sure the air outlet at the rear of the supports in the glareshield is clear of blockage.

(c) Remove the protective covers from the electrical connectors.

(d) Examine the electrical connectors for bent or broken pins, dirt, and damage.

CAUTION CAREFULLY PUT THE MCP INTO ITS SUPPORTS IN THE GLARESHIELD TO PREVENT FORCE ON THE ELECTRICAL CABLES. DAMAGE TO ELECTRICAL CABLES COULD OCCUR IF YOU PUT TOO MUCH FORCE PUT ON THEM.

(e) Move the MCP [1] on to its supports in the glareshield until the electrical connectors can connect to the rear of the MCP.

WARNING BE CAREFUL WHEN YOU PUT YOUR HAND BEHIND THE MODE CONTROL PANEL. THE SCREW HEADS ADJACENT TO THE CONNECTOR CAN CUT YOUR HAND.

(f) Connect the electrical connectors.

(g) Move the MCP [1] into its installed position.

(h) Tighten the four captive screws [2] on the bottom of the MCP supports in the glareshield.

SUBTASK 22-11-02-860-004

(4) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

F. Mode Control Panel Installation Test

SUBTASK 22-11-02-860-008

(1) On the Overhead Panel, P5, set the MASTER BRIGHT switch to on.

SUBTASK 22-11-02-860-009

(2) Turn the outer knob of the MASTER BRIGHT control switch approximately to the middle position.

SUBTASK 22-11-02-860-010

(3) On the Overhead Panel, P5, turn the outer knob of the GLARESHIELD PNL/FLOOD control approximately to the middle position.

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SUBTASK 22-11-02-710-001

(4) Use a maintenance access terminal (MAT) to do the LRU replacement test of the MCP:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) LRU REPLACEMENT TEST
6) Mode Control Panel
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-11-02-000-802

4. Mode Select Switch and Lamp Removal

(Figure 402)

A. General

(1) This task has steps to remove a mode select switch and to remove a lamp for the mode select switch.

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1611	Extractor - Lens Module, Mode Select Switch Part #: 50445 Supplier: 08719

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Removal Procedure

SUBTASK 22-11-02-860-011

(1) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C

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(Continued)

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

SUBTASK 22-11-02-860-012

(2) On the Overhead Panel, P5, set the MASTER BRIGHT switch to off.

SUBTASK 22-11-02-860-013

(3) On the Overhead Panel, P5, turn the outer knob of the GLARESHIELD PNL/FLOOD control fully counterclockwise.

SUBTASK 22-11-02-020-002

(4) To remove a lamp, do these step:

(a) Use the lamp mode control switch lens module extractor, COM-1611 (or your fingernails) in the grooves at the sides of the lens module to pull the lens module out.

NOTE: The lens module is now held by two pins at the end of the bail plates (one on each side).

(b) Use the lamp mode control switch lens module extractor, COM-1611 (or your fingernails) to remove the lens module from the bail plate if it is necessary.

(c) To remove a lamp, pull the lamp out of the rear of the lens module.

NOTE: The top two incandescent lamps are replaceable. The bottom two LEDs are not replaceable except for the CLB-CON lens module. For the CLB-CON lens module, the bottom two incandescent lamps are also replaceable.

SUBTASK 22-11-02-020-003

(5) To remove the switch, do these steps:

(a) Turn the jackscrew counterclockwise until it stops.

NOTE: There are two jackscrews in the switch module. One is at the top and the other is at the bottom behind the mating plate for the lens module.

(b) Pull the switch module out from the case.

——— END OF TASK ———

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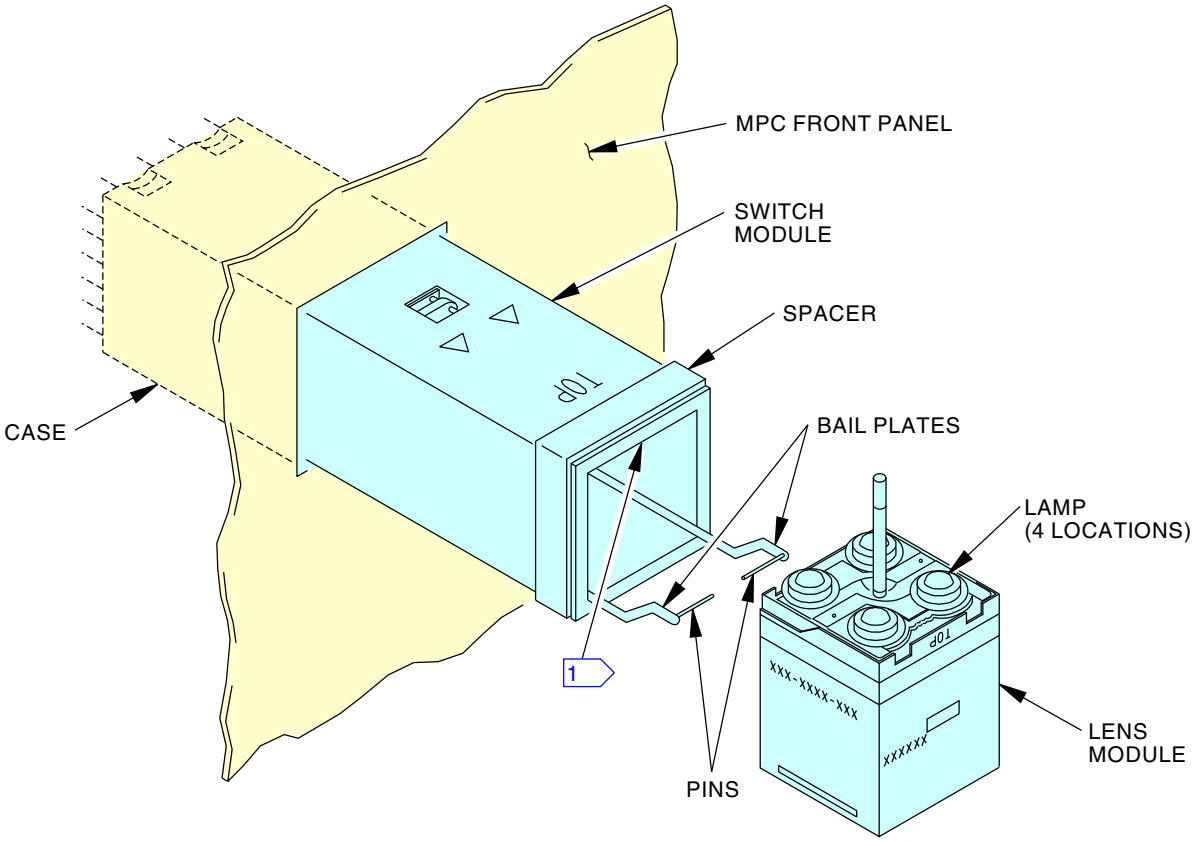

MODE SELECT SWITCH

1 THE JACKSCREWS ARE IN THE SWITCH MODULE. ONE IS AT THE TOP AND THE OTHER IS AT THE BOTTOM BEHIND THE MATING PLATE FOR THE LENS MODULE.

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Mode Select Switch Removal/Installation
Figure 402/22-11-02-990-802

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TASK 22-11-02-400-802

5. Mode Select Switch and Lamp Installation

(Figure 402)

A. General

(1) This task has steps to install a mode select switch and to install a lamp for the mode select switch.

(2) The installation test makes sure that the switch-lights and the switches on the MCP operate correctly.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1611	Extractor - Lens Module, Mode Select Switch Part #: 50445 Supplier: 08719

D. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Installation Procedure

SUBTASK 22-11-02-860-014

(1) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

SUBTASK 22-11-02-420-002

(2) To install the switch, do these steps:

(a) Turn the jackscrews counterclockwise until the jackscrew stops before you install the switch module.

(b) Move the spacer to the front flange of the switch module.

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(c) Push the switch module into the case.

NOTE: Put the side that has the word "TOP" in the up position.

CAUTION

DO NOT USE THE JACKSCREWS TO PULL THE SWITCH MODULE INTO ITS POSITION. THIS CAN CAUSE DAMAGE TO THE SWITCH MODULE AND CASE.

(d) Push the switch module with your finger while you lightly turn the jackscrews clockwise.

1) Continue to push the switch module and turn the jackscrews clockwise until the jackscrews are tight.

SUBTASK 22-11-02-420-003

(3) To install the lamp, do these steps:

(a) Put the lamp into the rear of the lens module.

(b) Make sure the part number of the lamp is 685 or equivalent.

SUBTASK 22-11-02-420-004

(4) To install the lens module, do these steps:

(a) Use the lamp mode control switch lens module extractor, COM-1611 (or your fingernails) to install the lens module to the bail plates.

(b) Push the lens module into the switch module.

NOTE: Make sure that the side that has the word "TOP" is in the up position.

SUBTASK 22-11-02-860-015

(5) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

F. Installation Test

SUBTASK 22-11-02-860-016

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-02-860-017

(2) On the Overhead Panel, P5, set the MASTER BRIGHT switch to on.

SUBTASK 22-11-02-860-018

(3) Turn the outer knob of the MASTER BRIGHT control switch approximately to the middle position.

SUBTASK 22-11-02-860-019

(4) On the Overhead Panel, P5, turn the outer knob of the GLARESHIELD PNL/FLOOD control approximately to the middle position.

SUBTASK 22-11-02-710-002

(5) Use a maintenance access terminal (MAT) to do the LRU replacement test of the MCP:

(a) Make these selections on the MAT:

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1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) SYSTEM TEST
6) Mode Control Panel
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:
1) CONTINUE
2) START TEST

(c) Do the instructions that show on the MAT to complete the test.
1) Visually monitor the displays on the MCP for the correct results.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-11-02-000-803

6. Mode Control Panel Speed Knob, Heading Knob, Altitude Knob Removal

(Figure 403)

A. General

(1) This task has steps to remove a Heading, Speed, or an Altitude knob.

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Removal Procedure

SUBTASK 22-11-02-860-020

(1) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

SUBTASK 22-11-02-020-004

(2) To remove the Speed Indicator Control Knob [7], do these steps:

(a) Loosen the two Speed Control Screws [3] on the Speed Indicator Control Knob [7].

(b) Remove the Speed Indicator Control Knob [7] by pulling on it.

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SUBTASK 22-11-02-020-005

(3) To remove the Altitude Indicator Control Knob [6], do these steps:

(a) Loosen the two Altitude Control Screws [2] on the Altitude Indicator Control Knob [6].

(b) Remove the Altitude Indicator Control Knob [6] by pulling on it.

SUBTASK 22-11-02-020-006

(4) To remove the Heading Indicator Control Knob [9], do these steps:

(a) Loosen the two Push Button Screws [4] on the Push Button [8].

(b) Remove the Push Button [8] by pulling on it.

(c) Loosen the two Heading Control Screws [5] on the Heading Indicator Control Knob [9].

(d) Remove the Heading Indicator Control Knob [9] by pulling on it.

——— END OF TASK ———

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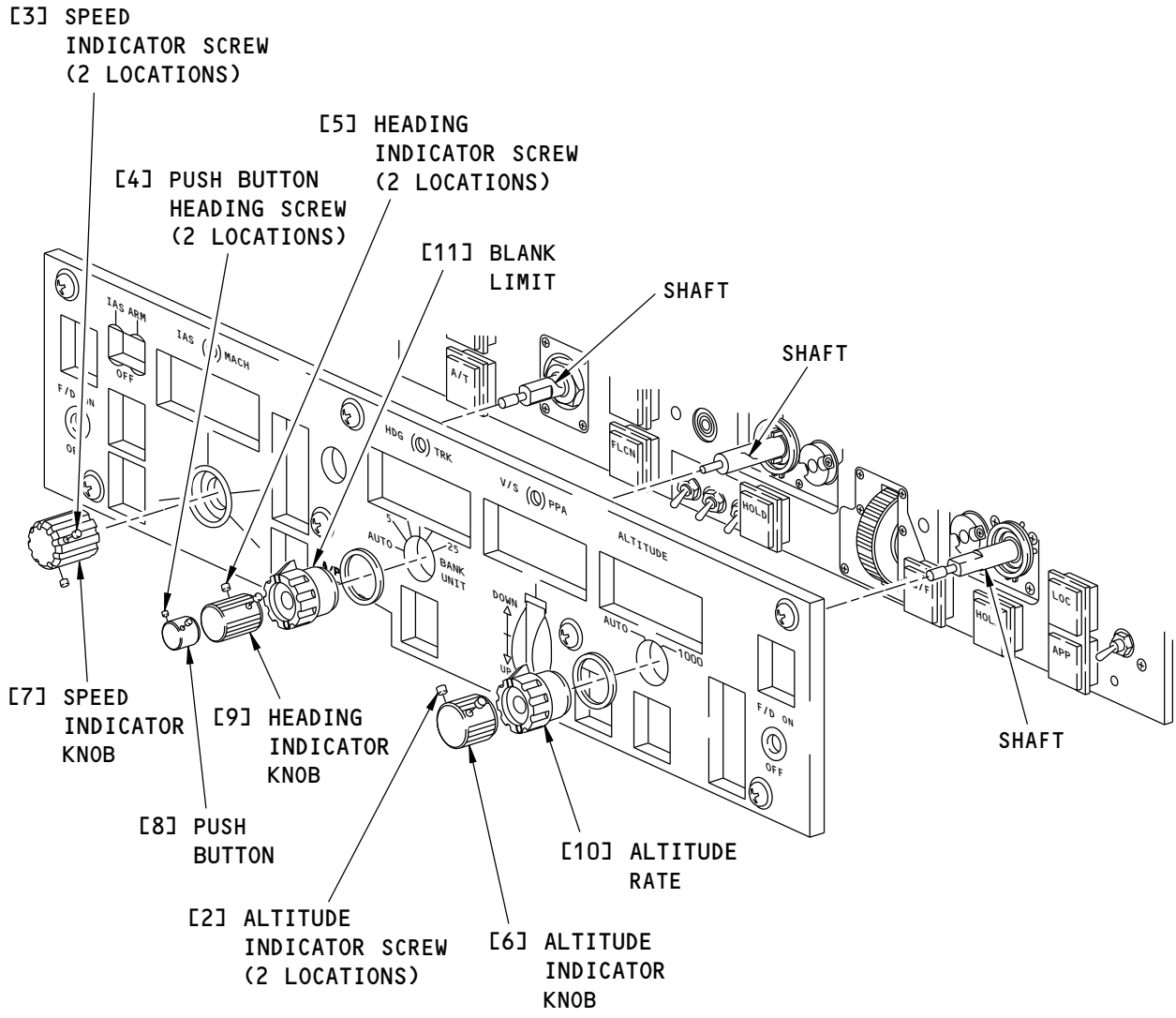

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Speed Knob, Heading Knob, Altitude Knob Removal/Installation
Figure 403/22-11-02-990-803

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TASK 22-11-02-400-803

7. Mode Control Panel Speed Knob, Heading Knob, Altitude Knob Installation

(Figure 403)

A. General

(1) This task has steps to install a Heading, Speed or an Altitude knob.

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Installation Procedure

SUBTASK 22-11-02-860-021

(1) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

SUBTASK 22-11-02-420-005

(2) To install the Altitude Indicator Control Knob [6], do these steps:

(a) Install the Altitude Indicator Control Knob [6] on the shaft of the Altitude Rate Switch [10].

(b) Make sure there is a clearance of .030 +/- .010 inch between the two knobs.

(c) Tighten the Altitude Indicator Control Knob [6] with two Altitude Control Screws [2].

(d) Make sure to tighten the screws to 3.5 in-lbs min.

SUBTASK 22-11-02-420-006

(3) To install the Speed Indicator Control Knob [7] do these steps:

(a) Install the Speed Indicator Control Knob [7] onto the indicator shaft.

(b) Make sure there is a clearance of .030 +/- .010 inch between the bottom face of the knob and the top face of the light panel.

(c) Tighten the Speed Indicator Control Knob [7] with two Speed Control Screws [3].

(d) Make sure to tighten the screws to 3.5 in-lbs min.

SUBTASK 22-11-02-420-007

(4) To install the Heading Indicator Control Knob [9], do these steps:

(a) Align Heading Indicator Control Knob [9] with switch flats of Bank Limit Switch [11].

(b) Push on the Heading Indicator Control Knob [9].

(c) Tighten the Heading Indicator Control Knob [9] with two Heading Control Screws [5].

(d) Make sure to tighten the screws to 3.5 in-lbs min.

(e) Install Push Button [8] on shaft of Bank Limit Switch [11] so it has full travel.

(f) Tighten with two Push Button Screws [4].

(g) Make sure to tighten the screws to 3.5 in-lbs min.

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SUBTASK 22-11-02-420-008

(5) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	24	C22604	AFDC-C
F	10	C22603	AFDC-L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R

SUBTASK 22-11-02-420-009

(6) Do this task to test the knobs:

(a) Rotate the knobs back and fourth.

(b) Make sure the window change as knobs rotated.

SUBTASK 22-11-02-420-010

(7) Put the airplane back to it usual condition.

END OF TASK

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AUTOPILOT DISCONNECT SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of an autopilot disconnect switch.

(2) The installation of an autopilot disconnect switch.

B. You can find the two autopilot disconnect switches (S22001 and S22002) on each outboard horn of the pilots' control wheels. The switch is a single action, multipole, button type. A switch plate holds the switch in its position.

C. The removal and installation tasks are the same for the two autopilot disconnect switches.

TASK 22-11-03-000-801

2. Autopilot Disconnect Switch Removal

(Figure 401)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1113	Tool - Wire Insertion and Extraction Part #: M15570-20 Supplier: 00779

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Removal Procedure

SUBTASK 22-11-03-860-001

(1) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	21	C22606	AFDC WARN
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-03-020-001

(2) Remove the autopilot disconnect switch [5]:

(a) Move the approach plate [10] until you can get access to the screw [8] and screw [9] on the medallion [7].

(b) Remove the screw [8] and screw [9] on the medallion [7].

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1) Remove the medallion [7] and the approach plate [10].

NOTE: The medallion is part of the approach plate.

(c) Remove the wire guard assembly [6].

(d) For stabilizer trim autopilot wire connector with quick disconnect type.

1) Disconnect the wires on the autopilot disengage switch side of the wire connectors in the center of the control wheel.

(e) Use (Table 401) for switch part number 721101A1-2 or (Table 402) for switch part number SW43896-2.

NOTE: There are two equivalent switches you can use for the autopilot disconnect function. The switches have different part numbers and some different wire colors.

NOTE: The wires on the 721101A1-2 switch are white. The switch wire labels are stamped onto the wires. The wires on the SW43896-2 switch each have a different color.

NOTE: In the AIRPLANE WIRE COLOR column of the table, the second color is for the stripe on the wire.

Table 401/22-11-03-993-802 Wire Labels and Colors for Switch 721101A1-2

SWITCH WIRE LABEL	AIRPLANE WIRE COLOR
BRN	White/Black
YEL	White/Violet
GRN	White/Orange
BKB	White/Brown
BKY	White/Green
BKA	Black/Yellow
BLU	Black/Green
BKG	Black/White

Table 402/22-11-03-993-803 Wire Labels and Colors for Switch SW43896-2

SWITCH WIRE COLOR	AIRPLANE WIRE COLOR
BROWN	White/Black
YELLOW	White/Violet
GREEN	White/Orange
BLACK	White/Brown
ORANGE	White/Green
WHITE	Black/Yellow
BLUE	Black/Green
GRAY	Black/White

1) Use the extraction wire insertion and extraction tool, COM-1113 to disconnect the eight wires on the autopilot disengage switch side of the wire connectors in the center of the control wheel.

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(f) Attach one end of the threading wire around the eight wires that connect to the autopilot disconnect switch [5].

NOTE: For the threading wire, you can use a 30-inch length of standard wire (No. 18 to 20 gage, without insulation).

(g) Remove the nut [1] on the outboard horn of the control wheel.

(h) Remove the screw [2] and screws [3] on the plate [4].

1) Remove the plate [4].

(i) Remove the autopilot disconnect switch [5] through the plate hole.

(j) Pull the eight wires through the control wheel horn slowly until the threading wire shows.

NOTE: Pull until approximately 3 inches of the threading wire comes out of the control wheel horn. Do not remove the threading wire. It is necessary to use this threading wire for the installation.

(k) Remove the eight wires from the threading wire.

——— END OF TASK ———

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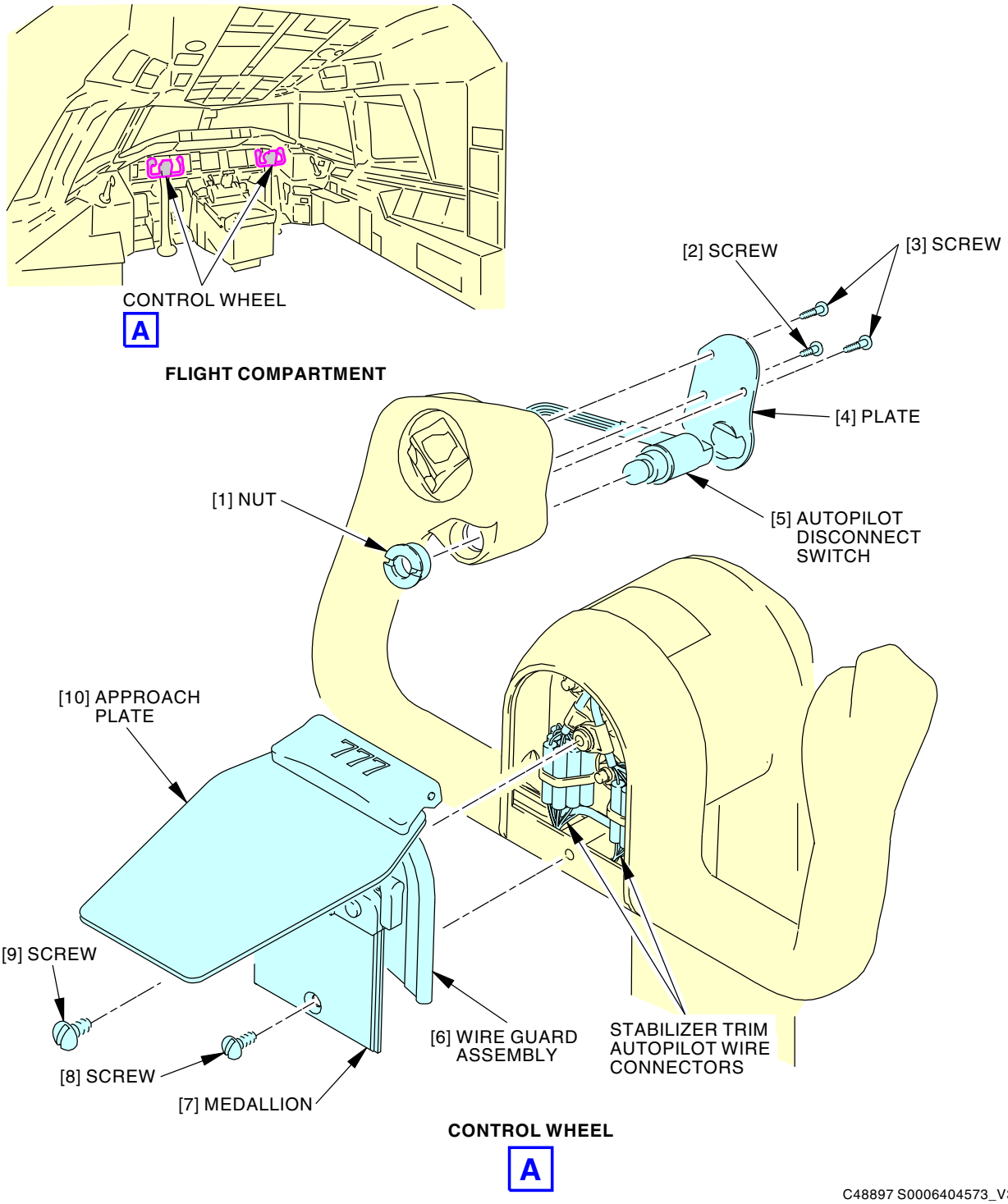

Autopilot Disconnect Switch Installation
Figure 401/22-11-03-990-801

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TASK 22-11-03-400-801

3. Autopilot Disconnect Switch Installation

(Figure 401)

A. General

(1) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1113	Tool - Wire Insertion and Extraction Part #: M15570-20 Supplier: 00779

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Autopilot disconnect switch	22-11-03-01-020	ARO ALL

E. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

F. Installation Procedure

SUBTASK 22-11-03-860-002

(1) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	21	C22606	AFDC WARN
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-03-420-001

(2) Install the autopilot disconnect switch [5]:

(a) Make sure that the threading wire is in the control wheel horn and the two ends of the threading wire show.

(b) Pull the eight wires through the plate [4] hole.

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(c) Attach the end of the threading wire that comes out of the control wheel horn around the eight wires.

(d) Pull the eight wires down through the control wheel horn with the opposite end of the threading wire.

(e) Put the autopilot disconnect switch [5] in its position.

1) Install the nut [1].

(f) Hold the plate [4] in its position.

1) Install the screw [2] and screws [3].

(g) Remove the threading wire from the eight wires.

(h) For stabilizer trim autopilot wire connectors with quick disconnect.

1) Connect the quick disconnect on the autopilot disengage switch side to the connectors in the center of the control wheel.

(i) For switch part number 721101A1–2 or SW43896–2.

1) Use the insertion wire insertion and extraction tool, COM-1113 to connect the eight wires to the wire connectors in the center of the control wheel (Table 401),(Table 402).

NOTE: There are two equivalent switches you can use for the autopilot disconnect function. The switches have different part numbers and some different wire colors.

NOTE: The wires on the 721101A1-2 switch are white. The switch wire labels are stamped onto the wires. The wires on the SW43896-2 switch each have a different color.

NOTE: In the AIRPLANE WIRE COLOR column of the table, the second color is for the stripe on the wire.

Table 403/22-11-03-993-804 Wire Labels and Colors for Switch 721101A1-2

SWITCH WIRE LABEL	AIRPLANE WIRE COLOR
BRN	White/Black
YEL	White/Violet
GRN	White/Orange
BKB	White/Brown
BKY	White/Green
BKA	Black/Yellow
BLU	Black/Green
BKG	Black/White

Table 404/22-11-03-993-805 Wire Labels and Colors for Switch SW43896-2

SWITCH WIRE COLOR	AIRPLANE WIRE COLOR
BROWN	White/Black
YELLOW	White/Violet
GREEN	White/Orange
BLACK	White/Brown

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Table 404/22-11-03-993-805 Wire Labels and Colors for Switch SW43896-2 (Continued)

SWITCH WIRE COLOR	AIRPLANE WIRE COLOR
ORANGE	White/Green
WHITE	Black/Yellow
BLUE	Black/Green
GRAY	Black/White

(j) Install the wire guard assembly [6].

(k) Put the approach plate [10] in its position.

NOTE: The medallion [7] is part of the approach plate.

1) Install the screw [8] and screw [9].

SUBTASK 22-11-03-860-003

(3) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	21	C22606	AFDC WARN
A	24	C22604	AFDC-C
F	4	C22601	MCP-L
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L
F	17	C22600	MCP-R
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

G. Installation Test

SUBTASK 22-11-03-860-004

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-03-740-001

(2) Use a maintenance access terminal (MAT) to do the LRU replacement test of the autopilot disconnect switch:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) LRU REPLACEMENT TEST
6) Autopilot Disconnect Switch
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) Do the instructions that show on the MAT to complete the test.

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(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

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TAKEOFF/GO-AROUND SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a Takeoff/Go-Around Switch.

(2) The installation of a Takeoff/Go-Around Switch.

TASK 22-11-04-000-801

2. Takeoff/Go-Around Switch Removal

A. References

Reference	Title
76-12-03-000-804-H00	Takeoff and Go-Around Switch Removal (P/B 401)

B. Removal Procedure

SUBTASK 22-11-04-020-001

(1) To remove the Takeoff/Go-Around Switch, do this task: Takeoff and Go-Around Switch Removal, TASK 76-12-03-000-804-H00.

——— END OF TASK ———

TASK 22-11-04-400-801

3. Takeoff/Go-Around Switch Installation

A. References

Reference	Title
76-12-03-400-804-H00	Takeoff and Go-Around Switch Installation (P/B 401)

B. Installation Procedure

SUBTASK 22-11-04-420-001

(1) To install the Takeoff/Go-Around Switch, do this task: Takeoff and Go-Around Switch Installation, TASK 76-12-03-400-804-H00.

——— END OF TASK ———

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CONTROL COLUMN BACKDRIVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a control column backdrive actuator.

(2) The installation of a control column backdrive actuator.

B. You can get access to the control column backdrive actuators through the forward access door, 112AL. There are two control column backdrive actuators directly above the forward access door. You can find the left control column backdrive actuator (M22102) on the left side of the area above the forward access door. You can find the right control column backdrive actuator (M22202) on the right side of the area above the access door.

C. Mounting bolts attach the control column backdrive actuator to the airplane structure. The output crank of the control column backdrive actuator attaches to a control rod. An electrical cable is also attached to the control column backdrive actuator.

TASK 22-11-05-000-801

2. Control Column Backdrive Actuator Removal

(Figure 401)

A. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

C. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

D. Access Panels

Number	Name/Location
112AL	Forward Access Door

E. Removal Procedure

SUBTASK 22-11-05-020-001

(1) For the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-05-860-011

(2) Set all the FLT CONTROL HYD VALVE POWER TAIL switches, on the aft Overhead Maintenance Panel P61, to the SHUT OFF positions.

SUBTASK 22-11-05-860-001

(3) For the left control column backdrive actuator:

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(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-05-860-002

(4) For the right control column backdrive actuator:

(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-05-860-003

(5) Attach DO-NOT-OPERATE tags to the two control columns.

SUBTASK 22-11-05-010-001

(6) Open this access panel, do this task:

(TASK 06-41-00-800-801)

Number	Name/Location
112AL	Forward Access Door

SUBTASK 22-11-05-020-002

(7) Remove the control column backdrive actuator [13]:

(a) Disconnect the electrical connector [1] from the electrical panel.

NOTE: The electrical connector on the actuator side is not a removable connector and it should stay connected to the actuator.

(b) Put protective covers on the electrical connector [1].

(c) For the left control column backdrive actuator [13], do these steps to remove the electrical cable [14]:

1) Make a note of the sequence of the clamps in the left inboard clamp assembly [9].

2) Remove the screw [4] and washer [3] that attach the inboard clamp [2] to the structure.

3) Remove the clamp [2] from the electrical cable [14].

4) Make a note of the sequence of the clamps in the left outboard clamp assembly [10].

5) Identify the electrical cable [14] and clamp [2] at the left outboard clamp assembly [10].

6) Use a piece of twine, G00472 to temporarily attach the other cables in the left outboard clamp assembly [10] to an adjacent structure to keep them together.

7) Remove the screw [4] and washer [3] that attach the left outboard clamp assembly [10] to the structure.

8) Remove the clamp [2] from the electrical cable [14].

(d) For the right control column backdrive actuator [13], do these steps to remove the electrical cable [14]:

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1) Make a note of the sequence of the clamps in the right inboard clamp assembly [11].
2) Remove the screw [4] and washer [3] that attach the right inboard clamp assembly [11] to the structure.
3) Remove the clamp [2] from the electrical cable [14].
4) Make a note of the sequence of the clamps and spacers in the right outboard clamp assembly [12].
5) Identify the electrical cable [14] and clamp [2] at the right outboard clamp assembly [12].
6) Use a piece of twine, G00472 to temporarily attach the other cables in the right outboard clamp assembly [12] to an adjacent structure to keep them together.
7) Remove the screw [8], washer [3], spacer [5], spacer [6] and spacer [7] that attach the right outboard clamp assembly [12] to the structure.

   NOTE: The spacer [5], spacer [6] and spacer [7] are loose and can fall out.
8) Remove the clamp [2] from the electrical cable [14].

(e) Remove the bolt [15], washer [18], and nut [19] that attach the control rod [17] to the output crank [16] of the control column backdrive actuator [13].

(f) Remove the loose end of the control rod [17].

(g) Hold the control column backdrive actuator [13] in its position.

(h) Remove the mounting bolts [15], washers [20], and nuts [19] that attach the control column backdrive actuator [13] to the mounting structure.

(i) Remove the control column backdrive actuator [13].

——— END OF TASK ———

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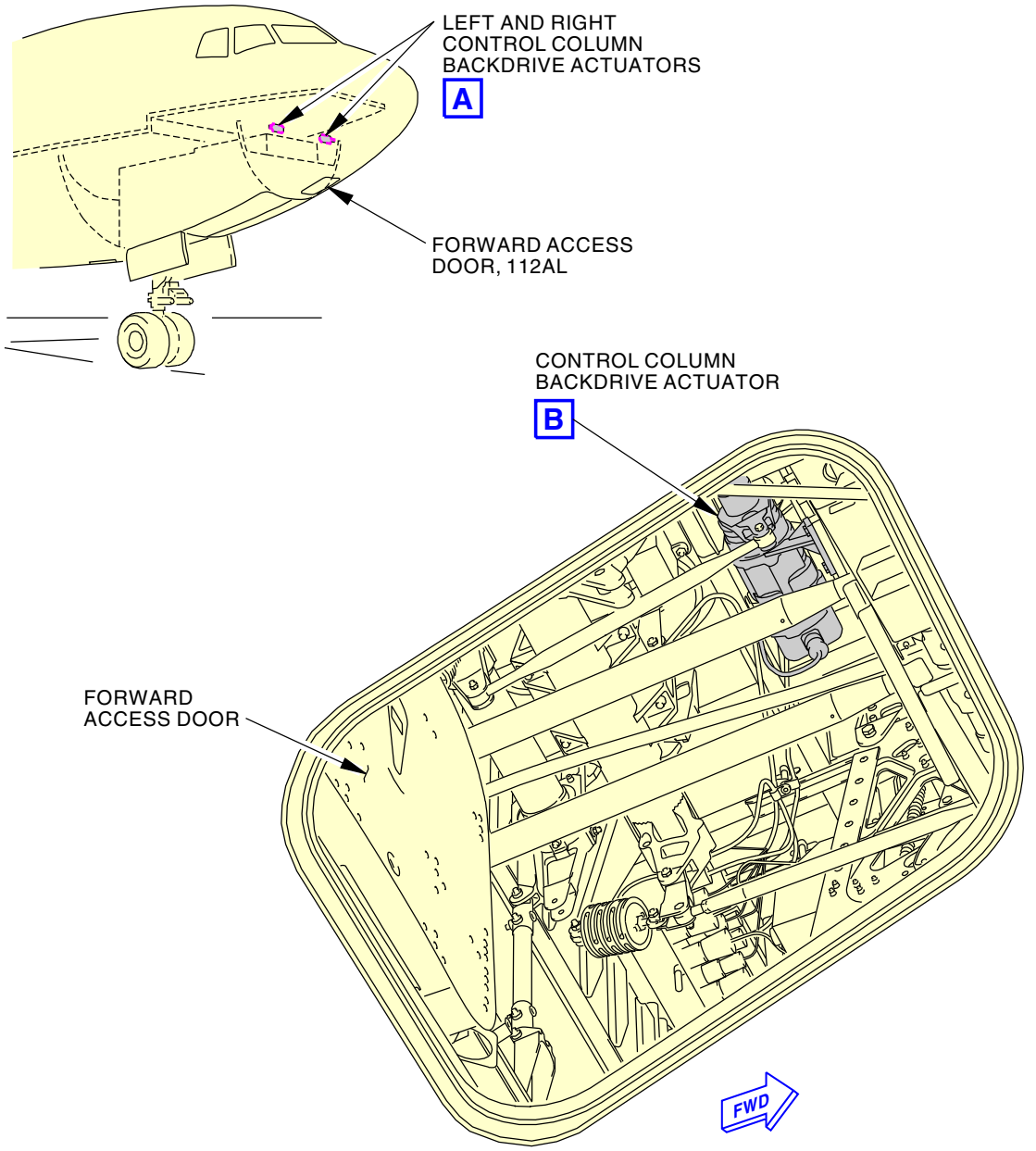

E10145 S0006404582_V2

Control Column Backdrive Actuator Installation
Figure 401/22-11-05-990-801 (Sheet 1 of 4)

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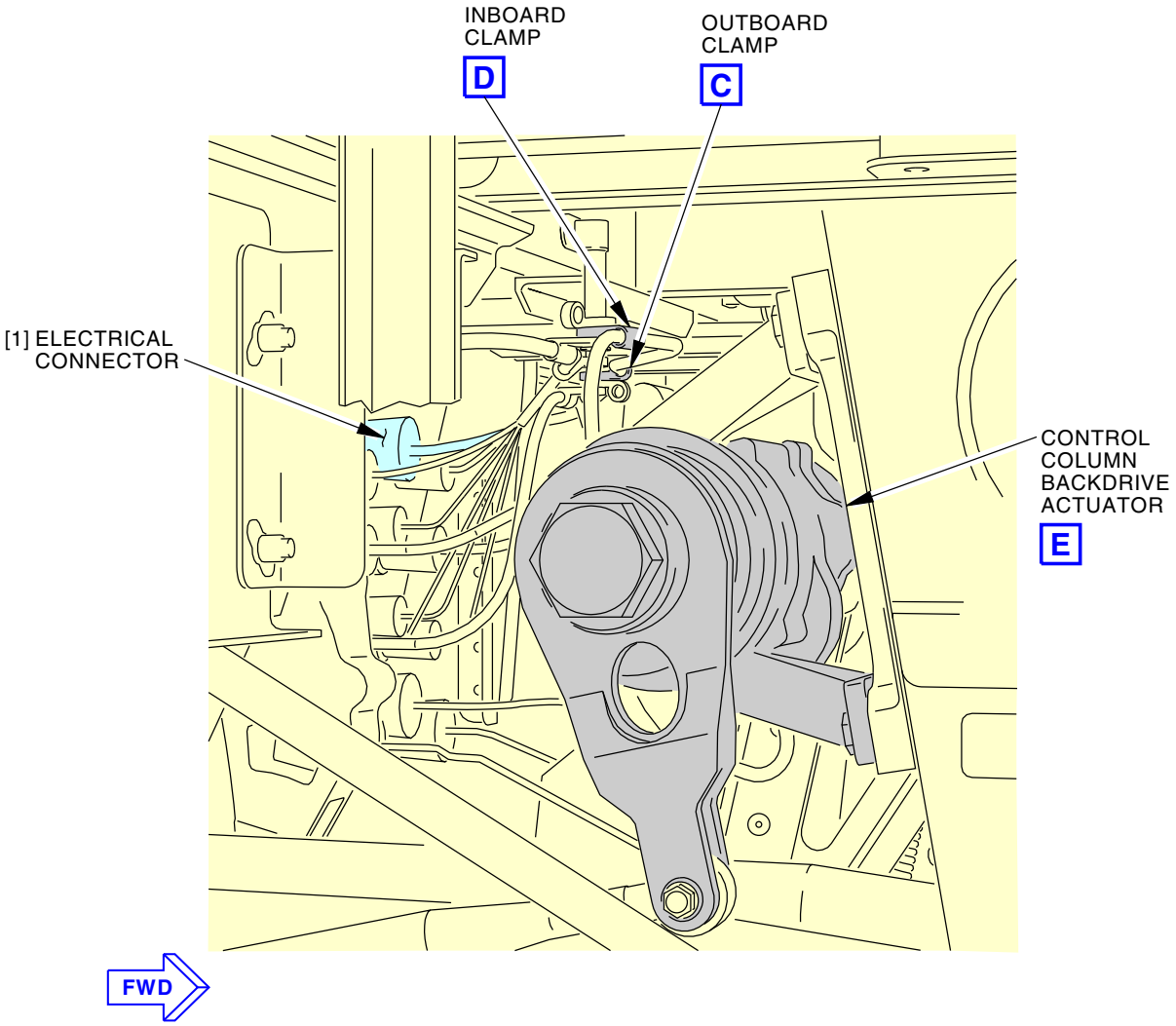

LEFT CONTROL COLUMN BACKDRIVE ACTUATOR
(RIGHT CONTROL COLUMN BACKDRIVE ACTUATOR IS OPPOSITE)

B

E10148 S0006404583_V2

Control Column Backdrive Actuator Installation
Figure 401/22-11-05-990-801 (Sheet 2 of 4)

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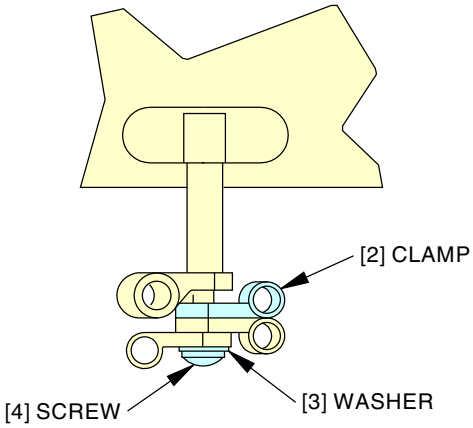
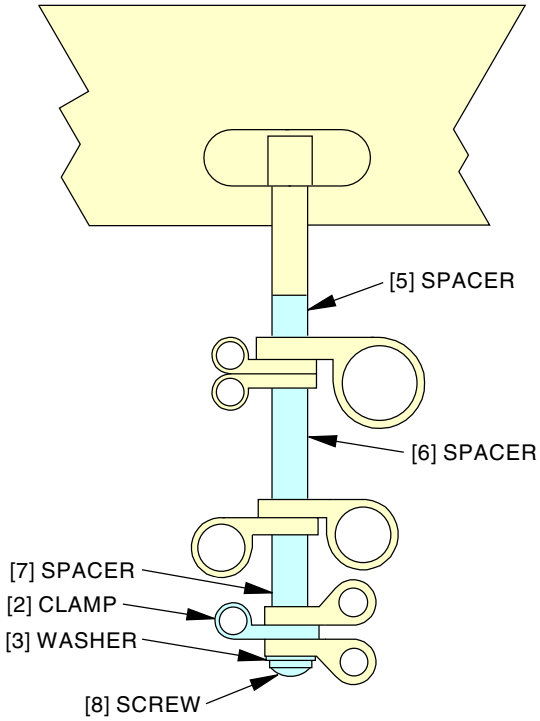


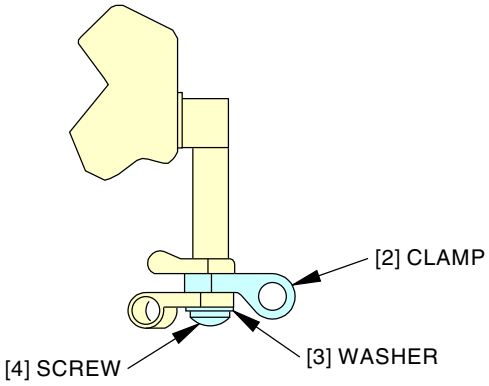
[10] LEFT OUTBOARD CLAMP ASSEMBLY

C



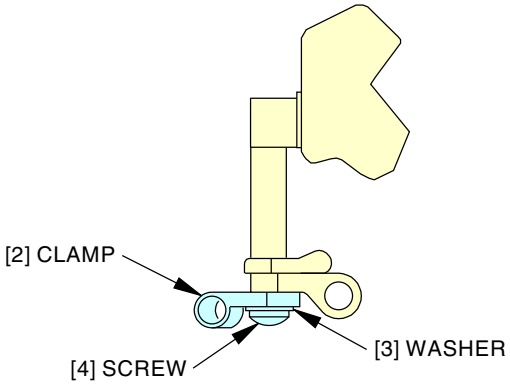
[12] RIGHT OUTBOARD CLAMP ASSEMBLY

C



[9] LEFT INBOARD CLAMP ASSEMBLY

D



[11] RIGHT INBOARD CLAMP ASSEMBLY

D

E10150 S0006404584_V2

Control Column Backdrive Actuator Installation
Figure 401/22-11-05-990-801 (Sheet 3 of 4)

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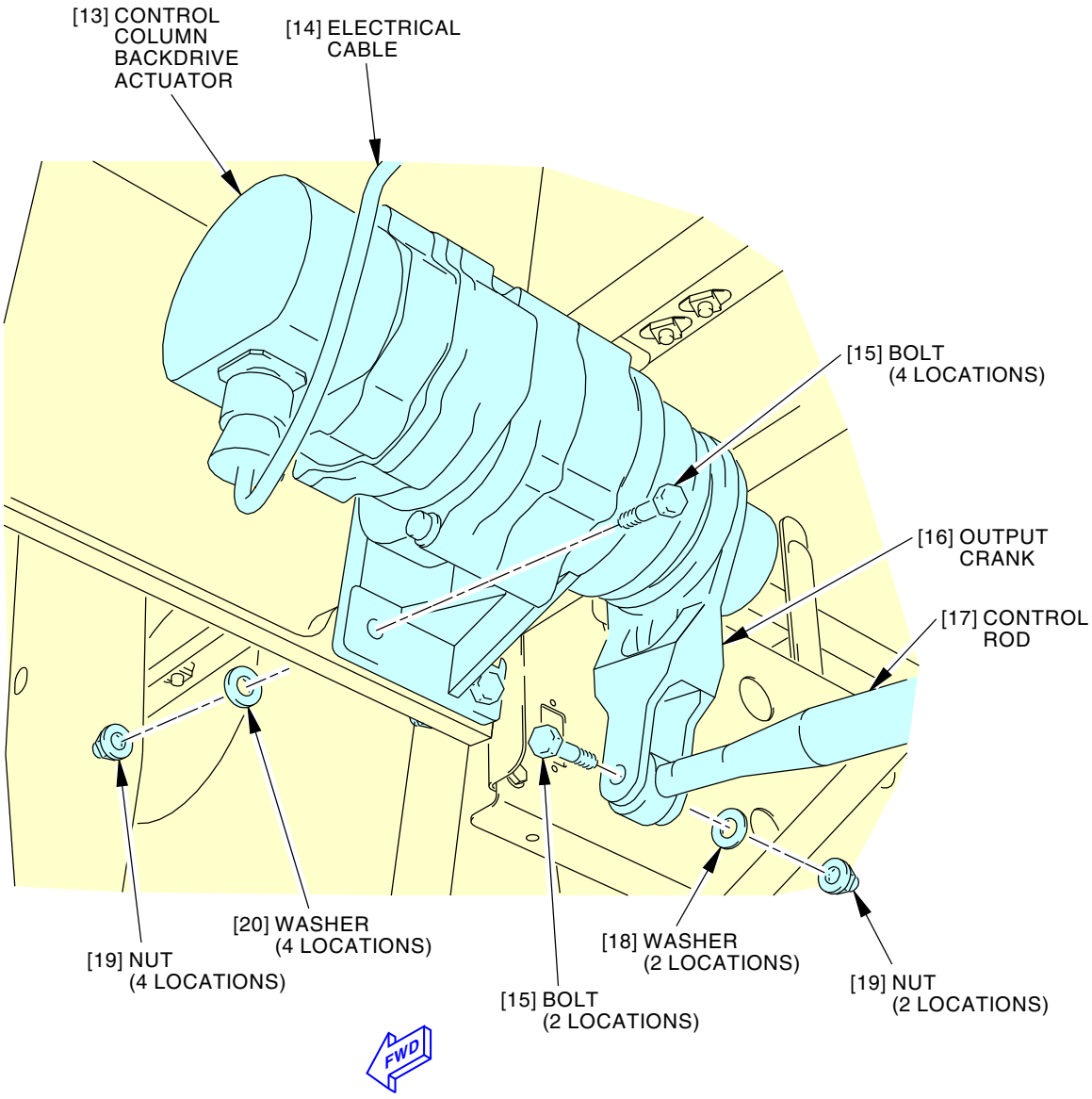

CONTROL COLUMN BACKDRIVE ACTUATOR

E

E10149 S0006404585_V2

Control Column Backdrive Actuator Installation
Figure 401/22-11-05-990-801 (Sheet 4 of 4)

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TASK 22-11-05-400-801

3. Control Column Backdrive Actuator Installation

(Figure 401)

A. General

(1) The control column backdrive actuator test makes sure that the control column backdrive actuator (left or right) is installed correctly. The test also makes sure that the control columns can move through their full range of travel with sufficient rate and torque.

(2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

D. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Access Panels

Number	Name/Location
112AL	Forward Access Door

F. Installation Procedure

SUBTASK 22-11-05-000-001

(1) If the power is not removed from the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-05-860-012

(2) Make sure that all the FLT CONTROL HYD VALVE POWER TAIL switches, on the aft Overhead Maintenance Panel P61, are in the SHUT OFF positions.

SUBTASK 22-11-05-860-004

(3) For the left control column backdrive actuator:

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

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SUBTASK 22-11-05-860-005

(4) For the right control column backdrive actuator:

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-05-860-006

(5) Make sure that DO-NOT-OPERATE tags are on the two control columns.

SUBTASK 22-11-05-400-001

(6) Install the control column backdrive actuator [13]:

(a) Hold the control column backdrive actuator [13] in the correct position for the installation.

(b) Install the mounting bolts [15], washers [20], and nuts [19] to the mounting structure of the control column backdrive actuator [13].

(c) Do an inspection check of the mechanical linkage of the control column backdrive actuator [13]:

1) Examine the control rod [17] for worn areas, bends, cracks, or corrosion.

2) Examine the control rod [17] bearings for worn areas.

3) If the condition of the control rod [17] is not satisfactory, replace the control rod [17]:

a) Remove the bolt [15], washer [18] and nut [19] that attach the other end of the control rod [17].

b) Hold the replacement control rod [17] in its position.

c) Install the bolt [15], washer [18] and nut [19].

(d) Connect the control rod [17] to the output crank [16].

NOTE: Make sure that the output crank is in the down position when you connect the control rod [17].

1) Install the bolt [15], washer [18] and nut [19].

(e) Remove the protective covers from the electrical connector [1].

(f) Examine the electrical connector [1] for bent or broken pins, dirt and damage.

(g) For the left control column backdrive actuator [13], install the electrical cable [14]:

1) Connect the electrical connector [1].

2) Install the inboard clamp [2] on the electrical cable [14].

3) Put the inboard clamps and washer [3] on the screw [4] in the correct sequence.

4) Attach the left inboard clamp assembly [9] to the structure with the screw [4].

5) Install the outboard clamp [2] on the electrical cable [14].

6) Put the outboard clamps and washer [3] on the screw [4] in the correct sequence.

7) Attach the left outboard clamp assembly [10] to the structure with the screw [4].

8) Remove the twine, G00472.

(h) For the right control column backdrive actuator [13], install the electrical cable [14]:

1) Connect the electrical connector [1].

2) Install the inboard clamp [2] on the electrical cable [14].

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3) Put the inboard clamps and washer [3] on the screw [4] in the correct sequence.
4) Attach the right inboard clamp assembly [11] to the structure with the screw [4].
5) Install the outboard clamp [2] on the electrical cable [14].
6) Put the outboard clamps, spacer [5], spacer [6], spacer [7] and washer [3] on the screw [4] in the correct sequence.
7) Attach the right outboard clamp assembly [12] to the structure with the screw [8].
8) Remove the twine, G00472.

SUBTASK 22-11-05-410-001

(7) Close this access panel, do this task:

(TASK 06-41-00-800-801)

Number	Name/Location
112AL	Forward Access Door

SUBTASK 22-11-05-860-007

(8) Remove the D0-NOT-OPERATE tags from the two control columns.

SUBTASK 22-11-05-860-008

(9) For the left control column backdrive actuator:

(a) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-05-860-009

(10) For the right control column backdrive actuator:

(a) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

G. Installation Test

SUBTASK 22-11-05-860-013

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-05-860-016

(2) Set all the FLT CONTROL HYD VALVE POWER TAIL switches, on the aft Overhead Maintenance Panel P61, to the NORM positions.

SUBTASK 22-11-05-860-017

(3) Make sure that the right and center stab trim cut-out switches on the control stand are in the NORMAL position.

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SUBTASK 22-11-05-710-001

WARNING KEEP ALL PERSONS AND EQUIPMENT CLEAR OF THE CAPTAIN'S AND FIRST OFFICER'S CONTROL COLUMNS. THIS TEST WILL MOVE THE CONTROL COLUMNS THROUGH THEIR FULL RANGE OF TRAVEL. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Use a maintenance access terminal (MAT) to do the LRU replacement test of the left (right) Control Column Backdrive Actuator:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TEST
4) 22 Autopilot Flight Director System
5) LRU REPLACEMENT TEST
6) Control Column Backdrive Actuator (left, right)
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

SUBTASK 22-11-05-420-001

(5) Put the airplane back to its usual condition.

END OF TASK

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CONTROL WHEEL BACKDRIVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a control wheel backdrive actuator.

(2) The installation of a control wheel backdrive actuator.

B. You can get access to the control wheel backdrive actuators through the electrical/electronics access door, 117AL. Go forward to the area above the nose landing gear wheel well. There are two control wheel backdrive actuators. You can find the left control wheel backdrive actuator (M22103) on the left side of the area above the nose landing gear wheel well. You can find the right control wheel backdrive actuator (M22203) on the right side of the area above the nose wheel landing gear wheel well.

C. Mounting bolts attach the control wheel backdrive actuator to the airplane structure. The output crank of the control wheel backdrive actuator attaches to the control rod. An electrical cable is also attached to the control wheel backdrive actuator.

TASK 22-11-06-000-801

2. Control Wheel Backdrive Actuator - Removal

(Figure 401)

A. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

B. Location Zones

Zone	Area
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left
116	Area Outboard and Above Nose Landing Gear Wheel Well, Right
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Removal Procedure

SUBTASK 22-11-06-020-001

(1) For the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-06-860-011

(2) Set all the FLT CONTROL HYD VALVE POWER WING switches, on the aft Overhead Maintenance Panel P61, to the SHUT OFF positions.

SUBTASK 22-11-06-860-001

(3) For the left control wheel backdrive actuator;

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(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-06-860-002

(4) For the right control wheel backdrive actuator;

(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-06-860-003

(5) Attach DO-NOT-OPERATE tags to the two control wheels.

SUBTASK 22-11-06-010-001

(6) Open this access panel:

(TASK 06-41-00-800-801)

Number	Name/Location
117AL	Main Equipment Center Access Door

(a) Go forward to the area above the nose wheel landing gear wheel well.

SUBTASK 22-11-06-020-002

(7) Remove the control wheel backdrive actuator [1]:

(a) Disconnect the electrical connector [6].

NOTE: The electrical connector on the actuator side is not a removable connector and it should stay connected to the actuator.

(b) Put protective covers on the electrical connector [6].

(c) Remove the electrical cable [3]:

1) Remove the screw [12] or screw [14], and washer [11] that attach the clamp [10] or clamp [15] to the structure.

2) If necessary, remove the strap [16] from the electrical cable [3] on the right backdrive actuator [1].

3) Remove the clamp [10] or clamp [15] from the electrical cable [3].

(d) Remove the bolt [2] or bolt [13], washer [4], and nut [5] that attach the control rod [7] to the output crank [8] of the control wheel backdrive actuator [1].

(e) Remove the loose end of the control rod [7].

(f) Hold the control wheel backdrive actuator [1] in its position.

(g) Remove the mounting bolts [9], washers [4], and nuts [5] that attach the control wheel backdrive actuator [1] to the mounting structure.

(h) Remove the control wheel backdrive actuator [1].

END OF TASK

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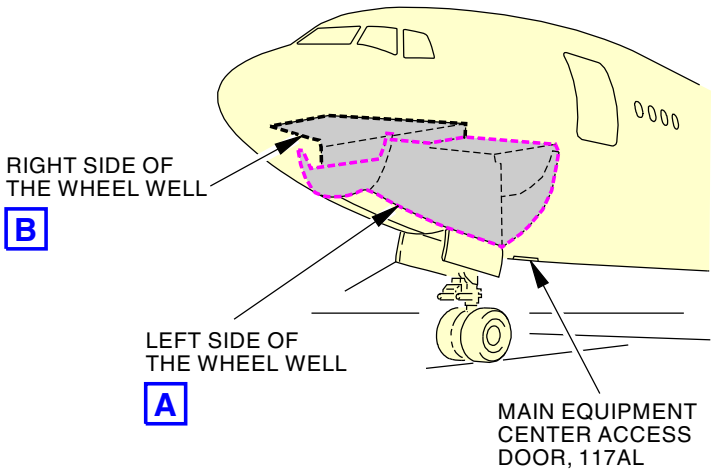

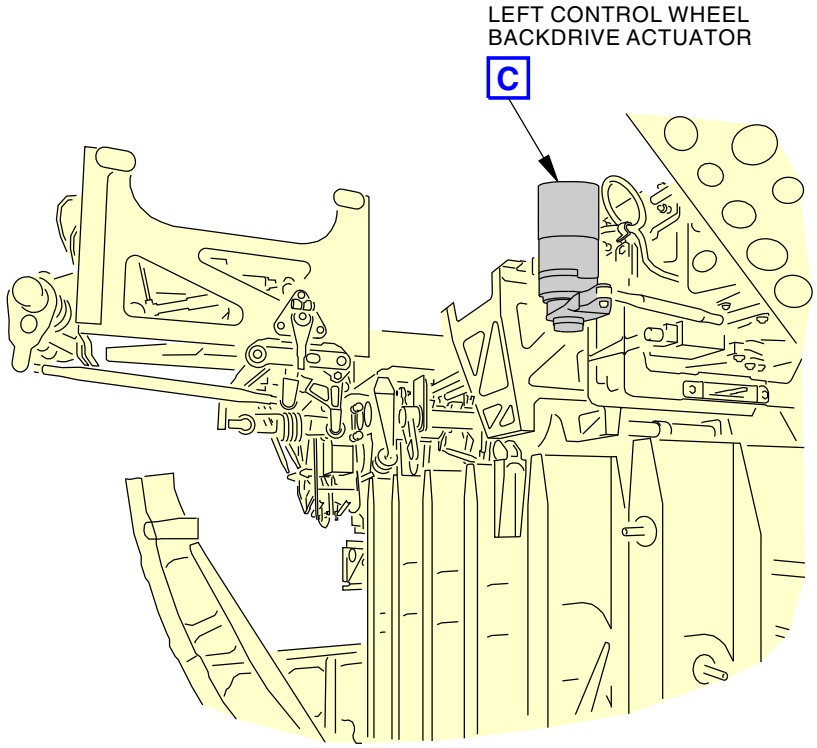

LEFT SIDE OF THE WHEEL WELL

A

C34514 S0006404590_V2

Control Wheel Backdrive Actuator Installation
Figure 401/22-11-06-990-801 (Sheet 1 of 4)

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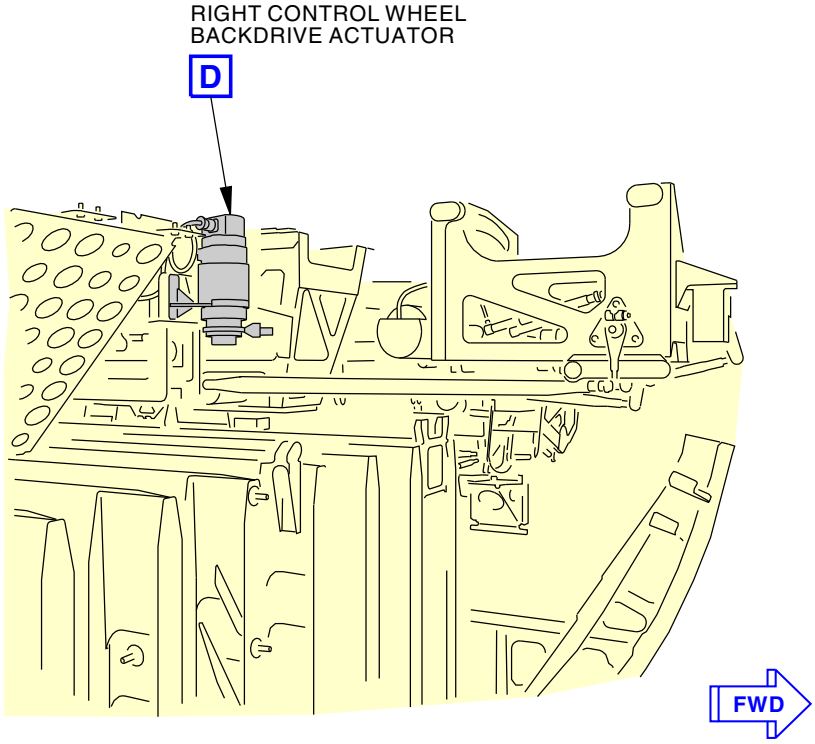

RIGHT SIDE OF THE WHEEL WELL

B

C34551 S0006404591_V3

Control Wheel Backdrive Actuator Installation
Figure 401/22-11-06-990-801 (Sheet 2 of 4)

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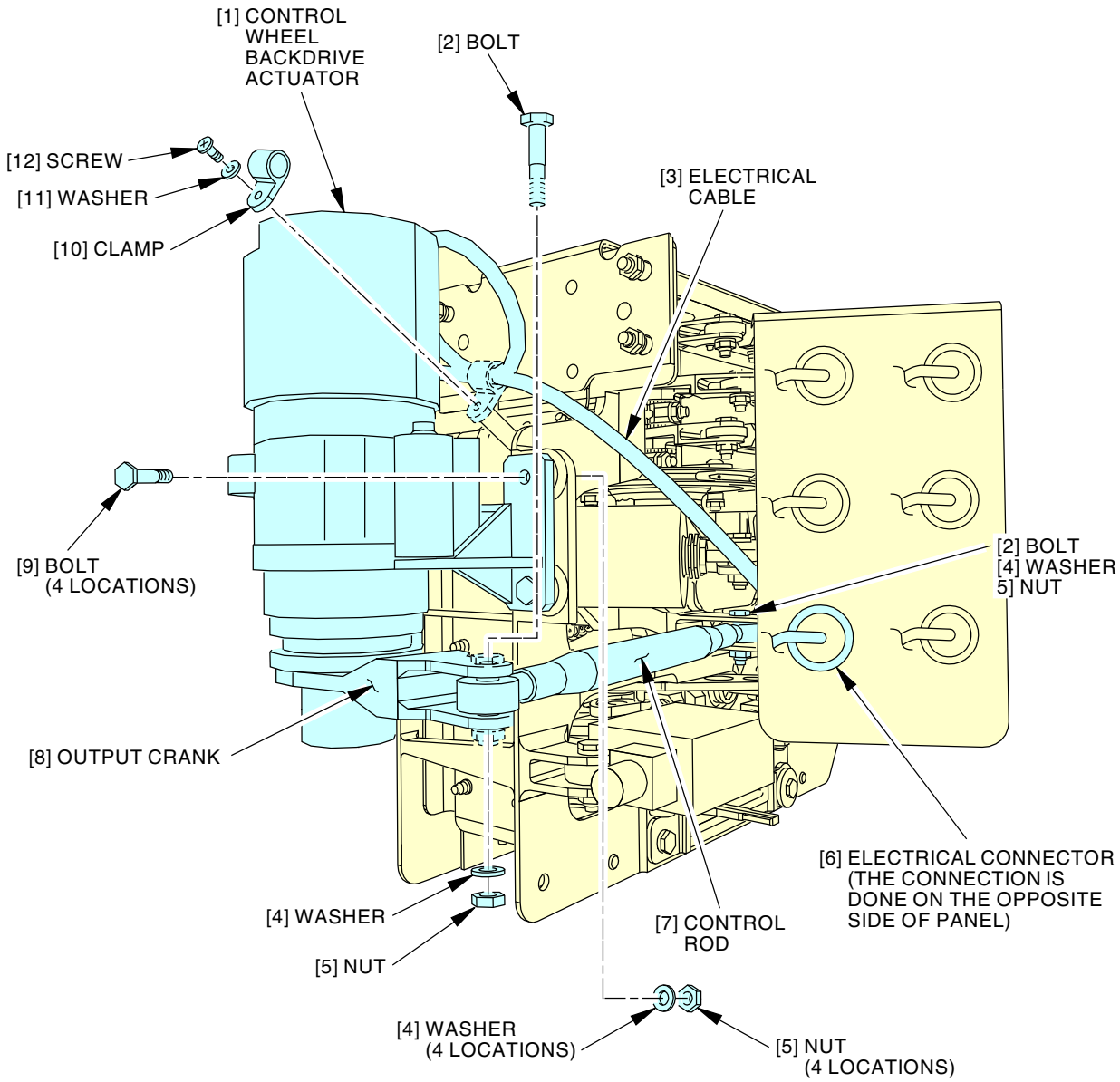

LEFT CONTROL WHEEL BACKDRIVE ACTUATOR

C

C76901 S0006404592_V2

Control Wheel Backdrive Actuator Installation
Figure 401/22-11-06-990-801 (Sheet 3 of 4)

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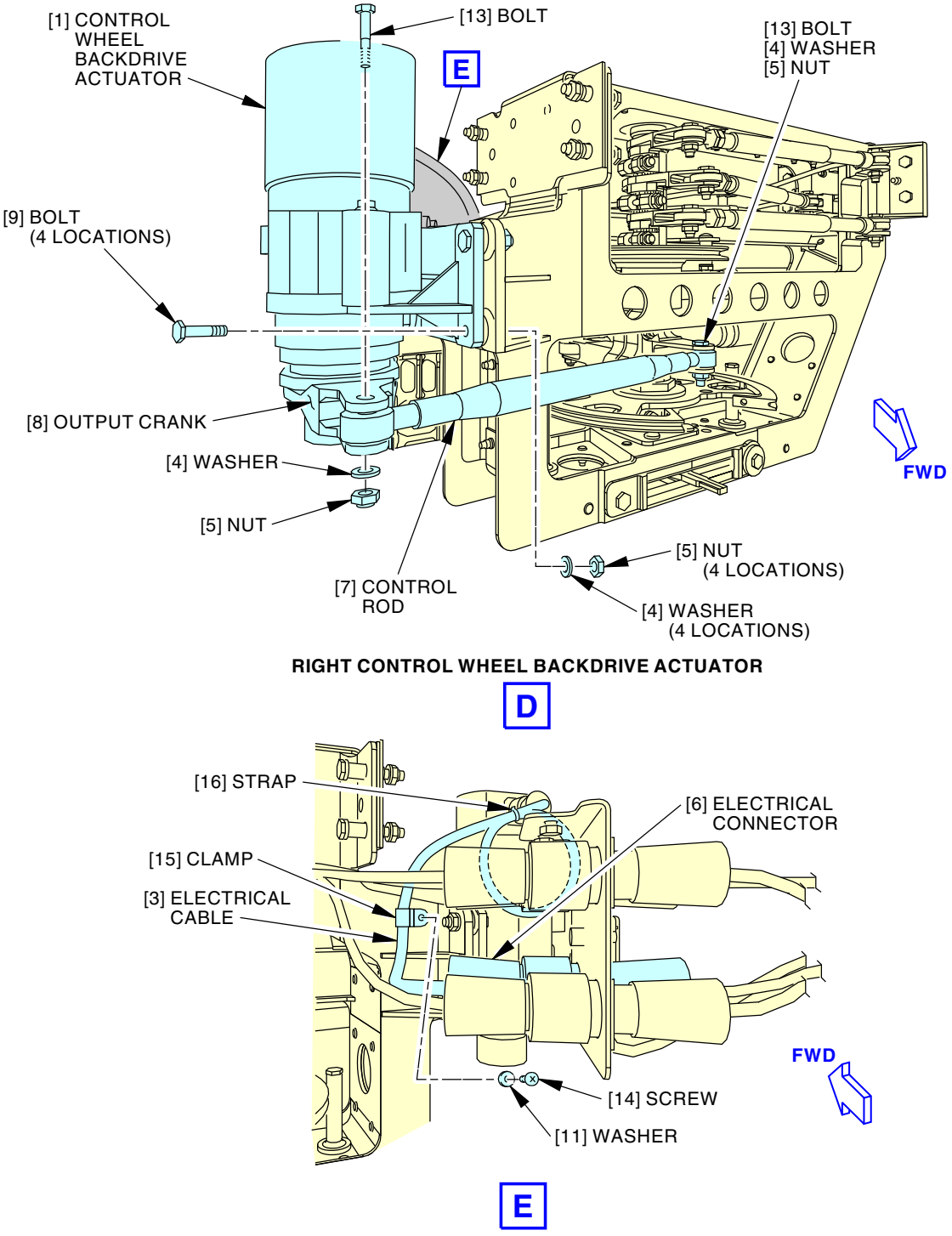

Control Wheel Backdrive Actuator Installation
Figure 401/22-11-06-990-801 (Sheet 4 of 4)

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TASK 22-11-06-400-801

3. Control Wheel Backdrive Actuator - Installation

(Figure 401)

A. General

(1) The control wheel backdrive actuator test makes sure that the Control Wheel Backdrive Actuator (left or right) is installed correctly. The test also makes sure that the control wheels can move through their full range of travel with sufficient rate and torque.

(2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G50809	Strap - Plastic, Adjustable, Self-locking, 5.50 Inches (139.70 mm) Long	BACS38K5

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Backdrive actuator	22-11-06-01-040	ARO ALL
		22-11-06-05-045	ARO ALL

E. Location Zones

Zone	Area
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left
116	Area Outboard and Above Nose Landing Gear Wheel Well, Right
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

F. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

G. Installation Procedure

SUBTASK 22-11-06-000-001

(1) If the power is not removed from the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-06-860-012

(2) Make sure that all the FLT CONTROL HYD VALVE POWER WING switches, on the aft Overhead Panel P61, are in the SHUT OFF positions.

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SUBTASK 22-11-06-860-004

(3) For the left control wheel backdrive actuator;

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-06-860-005

(4) For the right control wheel backdrive actuator;

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-06-860-006

(5) Make sure that DO-NOT-OPERATE tags are on the two control wheels.

SUBTASK 22-11-06-400-001

(6) Install the control wheel backdrive actuator [1]:

(a) Hold the control wheel backdrive actuator [1] in the correct position for the installation.

(b) Install the mounting bolts [9], washers [4], and nuts [5] to the mounting structure of the control wheel backdrive actuator [1].

(c) Do an inspection check of the mechanical linkage of the control wheel backdrive actuator [1]:

1) Examine the output crank [8] of the control wheel backdrive actuator [1] for worn areas.

2) Examine the control rod [7] for worn areas, bends, cracks, or corrosion.

3) Examine the control rod [7] bearings for worn areas.

4) If the condition of the control rod [7] is not satisfactory, replace the control rod:

a) Remove the bolt [2] or bolt [13], washer [4] and nut [5] that attach the other end of the control rod [7].

b) Hold the replacement control rod [7] in its position.

c) Install the bolt [2] or bolt [13], washer [4], and nut [5].

(d) Connect the control rod [7] to the output crank [8].

NOTE: Make sure that the output crank is in the down position when you connect the control rod.

1) Install the bolt [2] or bolt [13], washer [4] and nut [5].

(e) Remove the protective covers from the electrical connector [6].

(f) Examine the electrical connector [6] for bent or broken pins, dirt, and damage.

(g) For the left control wheel backdrive actuator [1], install the electrical cable [3]:

1) Make a loop to adjust the length of the electrical cable [3].

2) Install the clamp [10] on the part of the electrical cable [3] loop with two sections of the cable.

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3) Connect the electrical connector [6].

4) Hold the clamp [10] in its position.

a) Install the screw [12] and washer [11].

(h) For the right control wheel backdrive actuator [1], install the electrical cable [3]:

1) If the strap [16] was removed from the electrical cable [3] during the control wheel backdrive actuator [1] removal:

a) Make a loop to adjust the length of the electrical cable [3].

b) Install the adjustable plastic strap, G50809 on the part of the electrical cable [3] loop with two sections. Cut unwanted strap length after installation.

2) Connect the electrical connector [6].

3) Install the clamp [15] on the electrical cable [3].

4) Hold the clamp [15] in its position.

a) Install the screw [14] and washer [11].

SUBTASK 22-11-06-410-001

(7) Close this access panel:

(TASK 06-41-00-800-801)

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 22-11-06-860-007

(8) Remove the DO-NOT-OPERATE tags from the two control wheels.

SUBTASK 22-11-06-860-008

(9) For the left control wheel backdrive actuator;

(a) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-06-860-009

(10) For the right control wheel backdrive actuator;

(a) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

H. Installation Test

SUBTASK 22-11-06-860-013

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-11-06-000-002

(2) If the power is not removed from the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

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SUBTASK 22-11-06-860-015

(3) Set all the FLT CONTROL HYD VALVE POWER WING switches, on the aft Overhead Maintenance Panel P61, to the NORM positions.

SUBTASK 22-11-06-710-001

WARNING KEEP ALL PERSONS AND EQUIPMENT CLEAR OF THE CAPTAIN'S AND FIRST OFFICER'S CONTROL WHEELS. THIS TEST WILL MOVE THE CONTROL WHEELS THROUGH THEIR FULL RANGE OF TRAVEL. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Use a maintenance access terminal (MAT) to do the LRU replacement test of the left (right) Control Wheel Backdrive Actuator:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TEST
4) 22 Autopilot Flight Director system
5) LRU REPLACEMENT TEST
6) Control Wheel Backdrive Actuator (left, right)
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

SUBTASK 22-11-06-420-001

(5) Put the airplane back to its usual condition.

END OF TASK

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RUDDER PEDAL BACKDRIVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a rudder pedal backdrive actuator.

(2) The installation of a rudder pedal backdrive actuator.

B. You can get access to the rudder pedal backdrive actuators through the Main Equipment Center Access Door, 117AL. Go forward to the area of the nose landing gear wheel well. There are two rudder pedal backdrive actuators. You can find the left rudder pedal backdrive actuator (M22104) in the left forward area of the nose landing gear wheel well. You can find the right rudder pedal backdrive actuator (M22204) in the right forward area of the nose landing gear wheel well.

C. The mounting bolts attach the rudder pedal backdrive actuator to the structure. The output crank of the rudder pedal backdrive actuator attaches to the control rod. An electrical cable is also attached to the rudder pedal backdrive actuator.

TASK 22-11-07-000-801

2. Rudder Pedal Backdrive Actuator Removal

(Figure 401)

A. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

B. Location Zones

Zone	Area
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left
116	Area Outboard and Above Nose Landing Gear Wheel Well, Right
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Removal Procedure

SUBTASK 22-11-07-860-001

(1) For the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808

SUBTASK 22-11-07-860-015

(2) Set all the FLT CONTROL HYD VALVE POWER TAIL switches, on the aft Overhead Maintenance Panel P61, to the SHUT OFF positions.

SUBTASK 22-11-07-860-002

(3) For the left rudder pedal backdrive actuator:

(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L

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(Continued)

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-07-860-003

(4) For the right rudder pedal backdrive actuator:

(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-07-860-004

(5) Attach the DO-NOT-OPERATE tags to the two rudder pedals.

SUBTASK 22-11-07-010-001

(6) Open this access panel, do this task:

(TASK 06-41-00-800-801)

Number	Name/Location
117AL	Main Equipment Center Access Door

(a) Go forward to the area above the nose landing gear wheel well.

SUBTASK 22-11-07-020-001

(7) Remove the rudder pedal backdrive actuator [1]:

(a) Disconnect the electrical connector [12] from the control panel directly in front of the mechanism assembly.

NOTE: The electrical connector on the actuator side is not a removable connector and it should stay connected to the actuator.

(b) Put protective covers on the electrical connector [12].

(c) Remove the electrical cable [13]:

1) For the left rudder pedal backdrive actuator [1], do these steps:

a) Remove the screw [11], washers [9] and nut [8] that attach the clamp [10] to the structure.

b) Remove the clamp [10] from the electrical cable [13].

2) For the right rudder pedal backdrive actuator [1], do these steps:

a) Remove the screw [11] and washer [9] that attach the small clamp [14] to the structure.

b) Remove the small clamp [14] from the electrical cable [13].

c) Remove the screw [15], washer [9], spacer [16], and nut [8] that attach the large clamp [10] to the bracket.

d) Remove the large clamp [10] from the electrical cable [13].

(d) Remove the bolt [6], washer [5], and nut [4] that attach the control rod [7] to the output crank [3].

(e) Remove the loose end of the control rod [7].

(f) Hold the rudder pedal backdrive actuator [1] in its position for the removal.

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(g) Remove the mounting bolts [2], washers [5], and nuts [4] that attach the rudder pedal backdrive actuator [1] to the mounting structure.

(h) Remove the rudder pedal backdrive actuator [1].

——— END OF TASK ———

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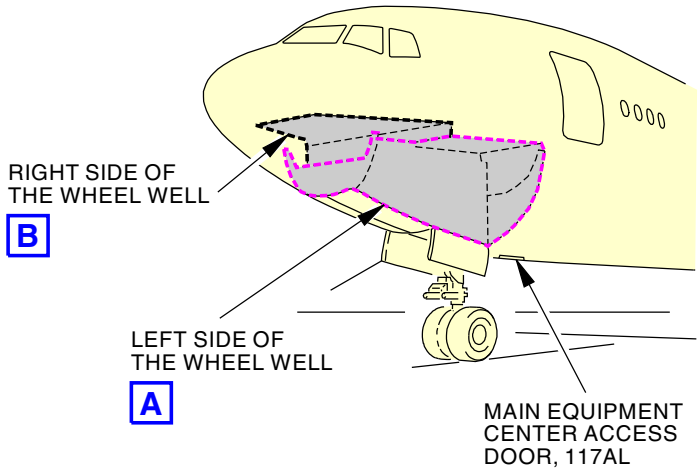

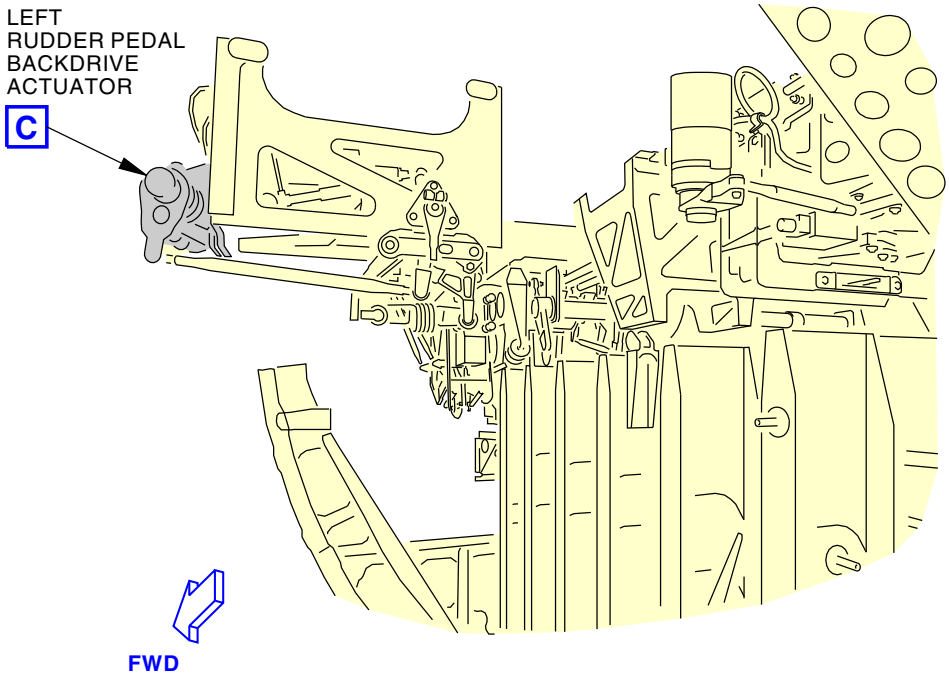

C35378 S0006404598_V2

Rudder Pedal Backdrive Actuator Installation
Figure 401/22-11-07-990-801 (Sheet 1 of 3)

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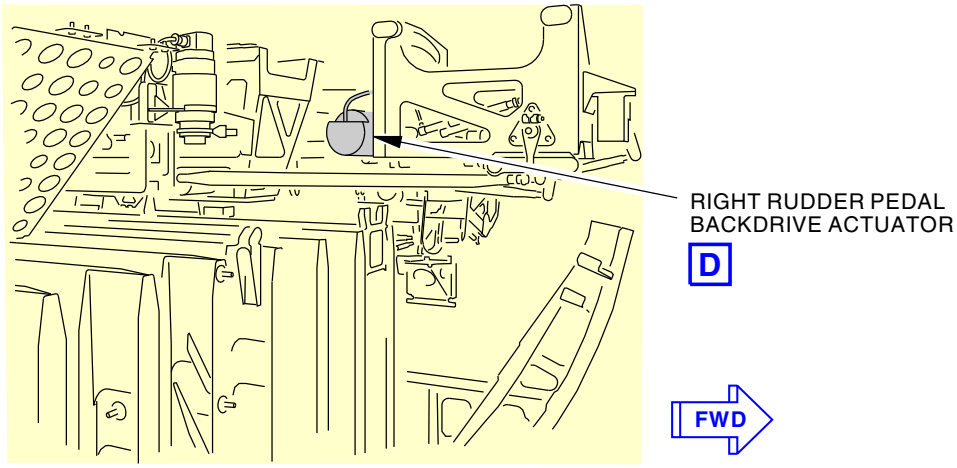
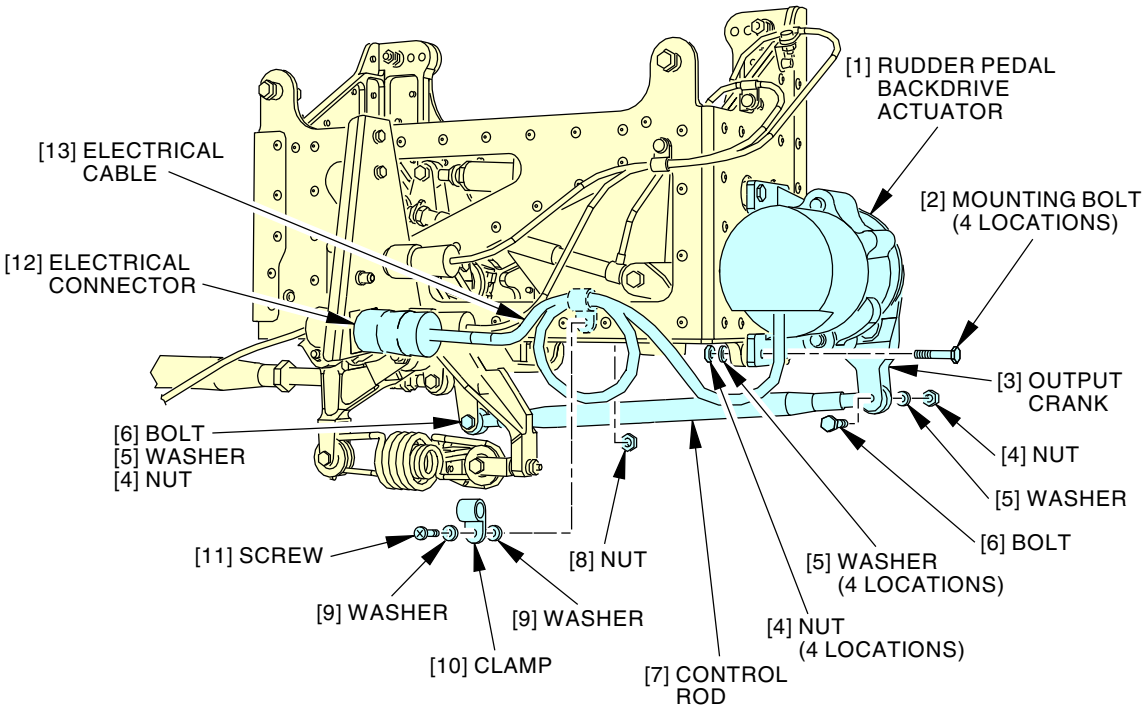


RIGHT SIDE OF THE WHEEL WELL

B



LEFT RUDDER PEDAL BACKDRIVE ACTUATOR

C

C35443 S0006404599_V3

Rudder Pedal Backdrive Actuator Installation
Figure 401/22-11-07-990-801 (Sheet 2 of 3)

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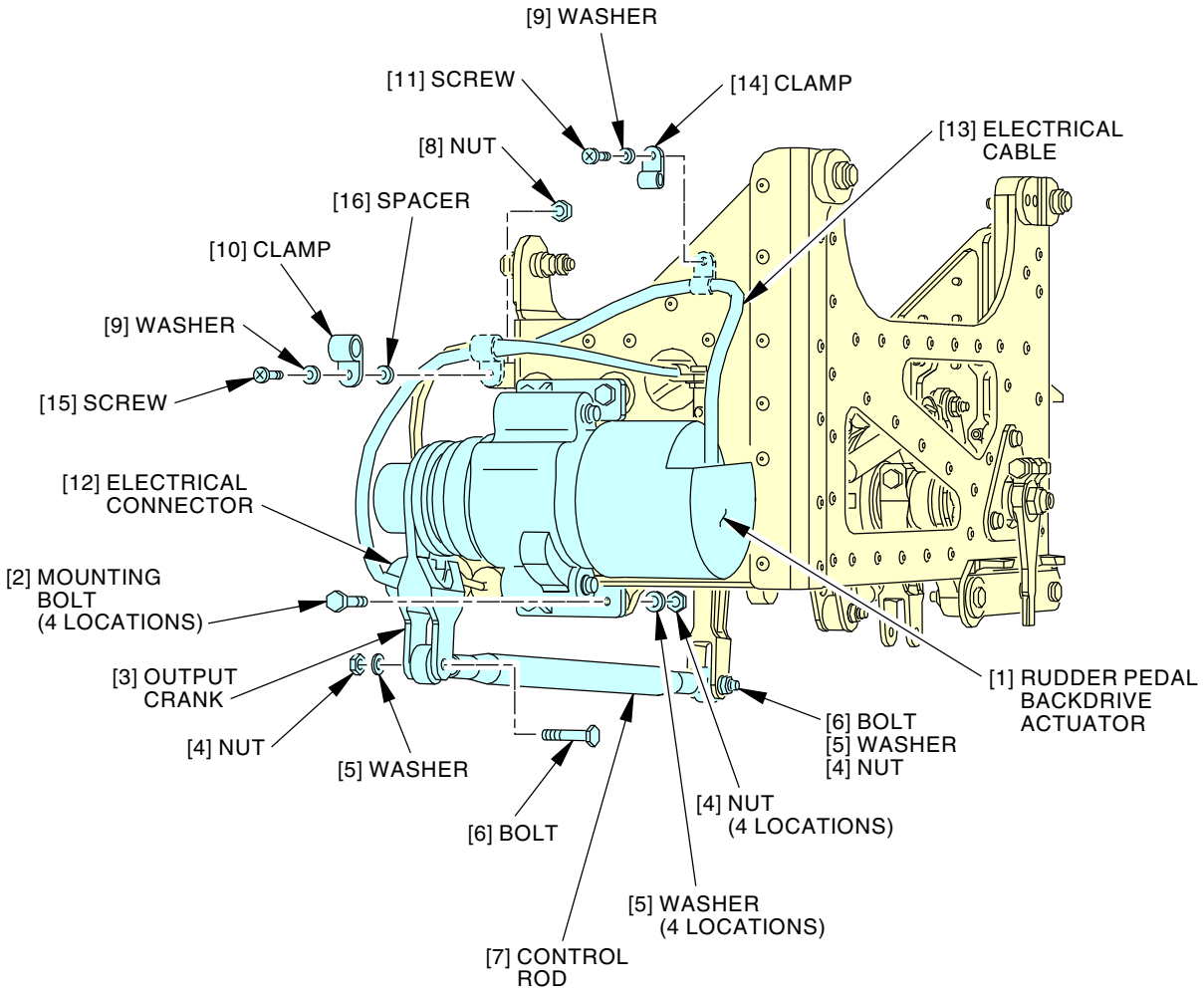

RIGHT RUDDER PEDAL BACKDRIVE ACTUATOR

D

C77326 S0006404600_V2

Rudder Pedal Backdrive Actuator Installation
Figure 401/22-11-07-990-801 (Sheet 3 of 3)

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TASK 22-11-07-400-801

3. Rudder Pedal Backdrive Actuator Installation

(Figure 401)

A. General

(1) The rudder pedal backdrive actuator test makes sure that the Rudder Pedal Backdrive Actuator (left or right) is installed correctly. The test also makes sure that the rudder pedals can move through their full range of travel with sufficient rate and torque.

(2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Backdrive actuator	22-11-07-10-070	ARO ALL
7	Control rod	27-21-06-10-080	ARO ALL
		27-21-06-10-120	ARO ALL

E. Location Zones

Zone	Area
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left
116	Area Outboard and Above Nose Landing Gear Wheel Well, Right
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

F. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

G. Installation Procedure

SUBTASK 22-11-07-860-005

(1) If the power is not removed from the left, center and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 22-11-07-860-016

(2) Make sure that all the FLT CONTROL HYD VALVE POWER TAIL switches, on the aft Overhead Maintenance Panel P61, are in the SHUT OFF positions.

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SUBTASK 22-11-07-860-006

(3) For the left rudder pedal backdrive actuator:

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-07-860-007

(4) For the right rudder pedal backdrive actuator:

(a) Make sure that these circuit breakers are open and have safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

SUBTASK 22-11-07-860-008

(5) Make sure that the DO-NOT-OPERATE tags are on the two rudder pedals.

SUBTASK 22-11-07-420-001

(6) Install the rudder pedal backdrive actuator [1]:

(a) Clean the mounting surface of the rudder pedal backdrive actuator [1] mounting structure with a cotton wiper, G00034.

(b) Clean the mounting surface of the rudder pedal backdrive actuator [1] with a cotton wiper, G00034.

(c) Hold the rudder pedal backdrive actuator [1] in the correct position for the installation.

(d) Install the mounting bolts [2], washers [5] and nuts [4] to attach the rudder pedal backdrive actuator [1] to the mounting structure.

(e) Do an inspection check of the mechanical linkage of the rudder pedal backdrive actuator [1]:

1) Examine the output crank [3] for worn areas.

2) Examine the control rod [7] for worn areas, bends, cracks or corrosion.

3) Examine the bearings of the control rod [7] for worn areas.

4) If the condition of the control rod [7] is not satisfactory, replace the control rod [7]:

a) Remove the bolt [6], washer [5], and nut [4] that attach the other end of the control rod [7].

b) Hold the replacement control rod [7] in its position.

c) Install the bolt [6], washer [5] and nut [4].

(f) Connect the control rod [7] to the output crank [3].

NOTE: Make sure that the output crank is in the down position when you connect the control rod.

1) Install the bolt [6], washer [5] and nut [4].

(g) Remove the protective covers from the electrical connector [12].

(h) Examine the electrical connector [12] for bent or broken pins, dirt, and damage.

(i) Connect the electrical connector [12].

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(j) Install the electrical cable [13]:

1) For the left rudder pedal backdrive actuator [1], do these steps:

a) Make a loop to adjust the length of the electrical cable [13].

b) Install the clamp [10] on the part of the loop with two sections of the electrical cable [13].

c) Hold the clamp [10] in its position.

d) Install the screw [11], washers [9] and nut [8].

2) For the right rudder pedal backdrive actuator [1], do these steps:

a) Install the small clamp [14] on the electrical cable [13].

b) Hold the small clamp [14] in its position.

c) Install the screw [11] and washer [9].

d) Install the large clamp [10] on the three electrical cables.

e) Hold the large clamp [10] in its position.

f) Install the screw [15], spacer [16], washer [9] and nut [8].

SUBTASK 22-11-07-410-001

(7) Close this access panel:

(TASK 06-41-00-800-801)

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 22-11-07-860-009

(8) Remove the DO-NOT-OPERATE tags from the two rudder pedals.

SUBTASK 22-11-07-860-010

(9) For the left rudder pedal backdrive actuator:

(a) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	10	C22603	AFDC-L
F	11	C22607	AFDC BACK DRIVE L

SUBTASK 22-11-07-860-011

(10) For the right rudder pedal backdrive actuator:

(a) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
F	24	C22602	AFDC-R
F	25	C22608	AFDC BACK DRIVE R

H. Installation Test

SUBTASK 22-11-07-860-013

(1) If the power is not removed from the left, center, and right hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808

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SUBTASK 22-11-07-860-018

(2) Set all the FLT CONTROL HYD VALVE POWER TAIL switches, on the aft Overhead Maintenance Panel P61, to the NORM positions.

SUBTASK 22-11-07-740-001

WARNING KEEP ALL PERSONS AND EQUIPMENT CLEAR OF THE CAPTAIN'S AND FIRST OFFICER'S RUDDER PEDALS. THIS TEST WILL MOVE THE RUDDER PEDALS THROUGH THEIR FULL RANGE OF TRAVEL. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Use a maintenance access terminal (MAT) to do the LRU replacement test of the left (right) Rudder Pedal Backdrive Actuator:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 Autopilot Flight Director System
5) LRU REPLACEMENT TEST
6) Rudder Pedal Backdrive Actuator (left, right)
7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

1) CONTINUE
2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

SUBTASK 22-11-07-420-002

(4) Put the airplane back to its usual position.

END OF TASK

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THRUST MANAGEMENT COMPUTING SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Thrust Management Computing System - System Test

(a) This task does all the system ground tests of the thrust management computing system.

(2) Left TMCF - Autothrottle Servo Loop - System Test

(a) This is an automatic test.

(3) Right TMCF - Autothrottle Servo Loop - System Test

(a) This is an automatic test.

(4) Left TMCF - Autothrottle Switches - LRU Replacement Test

(a) This is an interactive test.

(5) Right TMCF - Autothrottle Switches - LRU Replacement Test

(a) This is an interactive test.

TASK 22-31-00-730-801

2. Thrust Management Computing System - System Test

A. General

(1) This is a system test of the Thrust Management Computing System (TMCS). This task does all of the system ground tests of the TMCS. Do this task to make sure that the TMCS is satisfactory.

(2) The system tests are usually done together with the left TMCF Servo Loop test and then the right Servo Loop test. The Switches tests are also done together.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-31-00-730-001

(1) Do this task: Left TMCF - Autothrottle Servo Loop - System Test, TASK 22-31-00-730-802.

SUBTASK 22-31-00-730-010

(2) Do this task: Right TMCF - Autothrottle Servo Loop - System Test, TASK 22-31-00-730-806.

SUBTASK 22-31-00-730-002

(3) Do this task: Left TMCF - Autothrottle Switches - LRU Replacement Test, TASK 22-31-00-730-803.

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SUBTASK 22-31-00-730-003

(4) Do this task: Right TMCF - Autothrottle Switches - LRU Replacement Test, TASK 22-31-00-730-804.

——— END OF TASK ———

TASK 22-31-00-730-802

3. Left TMCF - Autothrottle Servo Loop - System Test

A. General

(1) This test makes sure that the TMCF in the Left AIMS and the autothrottle servo motors operate correctly.

(2) This is an automatic test.

(3) This system test is usually done together with the right TMCF Servo Loop test

(4) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-31-00-860-001

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-31-00-860-002

(2) Set the FMC selector, found on the first officer's display switching panel, to the L position.

SUBTASK 22-31-00-730-005

(3) Use a maintenance access terminal (MAT) to do the system test of the left TMCF servo loop:
NOTE: During this test both throttles will be driven aft for 7 seconds, then forward for 5 seconds and then aft again for 5 seconds.

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 AIMS - AUTOTHROTTLE
5) SYSTEM TEST
6) LEFT TMCF - AUTOTHROTTLE SERVO LOOP
7) CONTINUE

(b) Do the instructions that show on the MAT.

(c) If TEST CONDITION: INHIBITED appears, select TO TEST, perform the listed actions and then select CONTINUE.

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(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-31-00-730-806

4. Right TMCF - Autothrottle Servo Loop - System Test

A. General

(1) This test makes sure that the TMCF in Right AIMS and the autothrottle servo motors operate correctly.

(2) This is an automatic test.

(3) This system test is usually done together with the left Servo Loop test.

(4) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-31-00-860-010

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-31-00-860-011

(2) Set the FMC selector, found on the first officer's display switching panel, to the R position.

SUBTASK 22-31-00-730-011

(3) Use a maintenance access terminal (MAT) to do the system test of the right cabinet servo loop:
NOTE: During this test both throttles will be driven aft for 7 seconds, then forward for 5 seconds and then aft again for 5 seconds.

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 AIMS - AUTOTHROTTLE
5) SYSTEM TEST
6) RIGHT TMCF - AUTOTHROTTLE SERVO LOOP
7) CONTINUE

(b) Do the instructions that show on the MAT.

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(c) If TEST CONDITION: INHIBIT appears, select TO TEST, perform the listed actions and then select CONTINUE.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-31-00-730-803

5. Left TMCF - Autothrottle Switches - LRU Replacement Test

A. General

(1) This test makes sure that the TMCF in left AIMS and the Takeoff/Go-Around switches, the Autothrottle Disconnect switches, and the Autothrottle Arm Switches operate correctly.

(2) This is an interactive test. During this test, the instructions on the MAT will tell you to operate the left and right TO/GA switches.

(3) This system test is usually done together with the right switches test.

(4) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-31-00-860-003

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-31-00-860-004

(2) Set the FMC selector, found on the first officer's display switching panel, to the L position.

SUBTASK 22-31-00-730-006

(3) Use a maintenance access terminal (MAT) to do the system test of the Left cabinet analog input discretes:

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) GROUND TESTS
4) 22 AIMS - AUTOTHROTTLE
5) LRU REPLACEMENT TEST
6) LEFT TMCF - AUTOTHROTTLE SWITCHES

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7) CONTINUE

(b) Do the instructions that show on the MAT.

(c) If TEST CONDITION: INHIBITED appears, select TO TEST, perform the listed actions, and then select CONTINUE.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

TASK 22-31-00-730-804

6. Right TMCF - Autothrottle Switches - LRU Replacement Test

A. General

(1) This test makes sure that the TMCF in Right AIMS and the Takeoff/Go-Around switches, the Autothrottle Disconnect switches and the Autothrottle Arm Switches operate correctly.

(2) This is an interactive test. During this test, the instructions on the MAT will tell you to operate the left and right autothrottle disconnect switches.

(3) This system test is usually done together with the left switches test.

(4) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 22-31-00-860-005

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 22-31-00-860-006

(2) Set the FMC selector, found on the first officer's display switching panel, to the R position.

SUBTASK 22-31-00-730-007

(3) Use a maintenance access terminal (MAT) to do the system test of the right cabinet analog input discretes :

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE

2) LINE MAINTENANCE

3) GROUND TESTS

4) 22 AIMS - AUTOTHROTTLE

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5) LRU REPLACEMENT TEST

6) RIGHT TMCF - AUTOTHROTTLE SWITCHES

7) CONTINUE

(b) Do the instructions that show on the MAT.

(c) If TEST CONDITION: INHIBITED appears, select TO TEST, perform the listed actions, and then select CONTINUE.

(d) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(e) If FAILED shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

——— END OF TASK ———

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AUTOTHROTTLE SERVO MOTOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a Autothrottle Servo Motor.

(2) The installation of a Autothrottle Servo Motor.

TASK 22-31-01-000-802

2. Autothrottle Servo Motor Removal

A. References

Reference	Title
76-12-01-000-805-H00	Autothrottle Servomotor (ASM) and Gearbox Removal (P/B 401)

B. Removal Procedure

SUBTASK 22-31-01-020-001

(1) To remove the autothrottle servo motor, do this task: Autothrottle Servomotor (ASM) and Gearbox Removal, TASK 76-12-01-000-805-H00.

——— END OF TASK ———

TASK 22-31-01-400-801

3. Autothrottle Servo Motor Installation

A. References

Reference	Title
76-12-01-400-804-H00	Autothrottle Servomotor (ASM) and Gearbox Installation (P/B 401)

B. Installation Procedure

SUBTASK 22-31-01-420-001

(1) To install the autothrottle servo motor, do this task: Autothrottle Servomotor (ASM) and Gearbox Installation, TASK 76-12-01-400-804-H00.

SUBTASK 22-31-01-420-002

(2) Put the airplane back to its usual condition.

——— END OF TASK ———

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AUTOTHROTTLE DISCONNECT SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a Autothrottle Disconnect Switch.

(2) The installation of a Autothrottle Disconnect Switch.

TASK 22-31-02-000-802

2. Autothrottle Disconnect Switch Removal

A. References

Reference	Title
76-12-02-000-807-H00	Autothrottle Disconnect Switch Removal (P/B 401)

B. Removal Procedure

SUBTASK 22-31-02-020-001

(1) To remove the autothrottle disconnect switch, do this task: Autothrottle Disconnect Switch Removal, TASK 76-12-02-000-807-H00.

——— END OF TASK ———

TASK 22-31-02-400-801

3. Autothrottle Disconnect Switch Installation

A. References

Reference	Title
76-12-02-400-804-H00	Autothrottle Disconnect Switch Installation (P/B 401)

B. Installation Procedure

SUBTASK 22-31-02-420-001

(1) To install the autothrottle disconnect switch, do this task: Autothrottle Disconnect Switch Installation, TASK 76-12-02-400-804-H00.

——— END OF TASK ———

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