TO 1300i-2-27JG-10-1

TECHNICAL MANUAL

JOB GUIDE
ORGANIZATIONAL MAINTENANCE

FLIGHT CONTROLS AILERON
(27-10-00 THROUGH 27-11-02)

USAF SERIES
300i
AIRCRAFT

MCDONNELL DOUGLAS CORPORATION
MILITARY TRANSPORT AIRCRAFT
F33657-81-C-2108
FA8526-21-D-0001

THIS MANUAL SUPERSEDES TO 1300i-2-27JG-10-1 DATED 1 SEPTEMBER 2021.

Basic and all changes have been merged to make this a complete publication.
Published under authority of the Secretary of the Air Force

1 JANUARY 2023

TO 1300i-2-27JG-10-1

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T-2 **1 JANUARY 2023**

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

LIST OF EFFECTIVE PAGES

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands.

Dates of issue for original and changed pages are:

Original . . . . . 0 . . . . . 1 Jan 23

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 72 CONSISTING OF THE FOLLOWING:

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TABLE OF CONTENTS

INTRODUCTION

SCOPE.

This manual contains maintenance procedures for the operational checkout, and repair of aileron system components.

MODEL(S) COVERED.

All

ABBREVIATIONS.

The following is a list of non-standard abbreviations used throughout this manual:

LS	Line Select
MFD	Multifunction Display
PLCS	Places

CHANGE REQUEST.

Recommended changes to this manual shall be submitted in accordance with TO 00-5-1.300i

TO INFORMATION.

General 300i TO/eTO, TO Manager, Supplement and finalized Recommended Change (RC) information can be found in the Enhanced Technical Information Management System (ETIMS), System of Record.

LIST OF TIME COMPLIANCE TECHNICAL ORDERS (TCTO).

This list of TCTO's contains all current TCTO's that affect the technical content of text or illustrations found in this manual.

TCTO NUMBER	TITLE	TCTO DATE	APPLICABILITY

SECTION 1

GENERAL INFORMATION (27-10-00)

1-1. GENERAL INFORMATION.

1-2. This section provides general information that is essential for ensuring complete and safe maintenance procedures contained throughout this job guide manual.

1-3. When operating an auxiliary motor pump below 15 degrees Fahrenheit a 30 seconds on/30 seconds off duty cycle for a maximum 10 cycles may be required to reach full hydraulic pressure of 3800 to 4200 psi. Allow ten minutes for cooling and repeat cycles.

1-4. Hydraulic system No. 2 may require 45 seconds before reaching full hydraulic pressure of 3800 to 4200 psi.

1-5. Flight control surfaces are to be cleared prior to turning off hydraulic auxiliary pumps from the loadmaster control panels. Flight control surface movement may occur.

1-6. All adhesive sealants, sealants, and compounds used in this manual are listed with a primary part number and/or primary specification number. Any suitable substitutes and/or interchangeable adhesive sealants, sealants, and compounds may be used unless otherwise specified. Suitable substitutes and/or interchangeable adhesive sealants, sealants, and compounds are listed in the system peculiar corrosion control manual (Refer to TO 1300i-23, Chapter 1, Section III).

1-7. GENERAL WARNINGS, CAUTIONS, AND NOTES.

WARNING

All flight control surfaces and thrust reversers shall be clear of personnel and equipment prior to applying or removing hydraulic power. Failure to comply may cause injury to personnel or damage to aircraft.

CAUTION

Air in a hydraulic system can cause numerous malfunctions, from a total system failure to a minor indication problem. If you suspect air has been inducted into a system by removing a hydraulic component or a line, refer to the hydraulic system bleed procedure (12-29-08). Failure to comply may cause damage to aircraft.

NOTE

When installing or removing rig pins during the rigging of cables, the pins shall move freely in rig pin holes.

SECTION 2

MECHANICAL TEST-ROLL MAINTENANCE BUILT-IN TEST (27-10-01)

GENERAL MAINTENANCE INPUT CONDITIONS:

Applicability:

	Task
All	All

Additional information:

This procedure consists of the following task:

01-1. Mechanical test-roll maintenance built-in test.

Additional data:

	Task
TO 1300i-2-27FI-00-1	All
TO 1300i-2-29JG-20-1	All
TO 1300i-2-31JG-60-1	All

Personnel recommended:

	Task
Two	All

Person (A) performs task.

Person (B) ground observer.

Safety conditions:

	Task
WARNING	
All flight control surfaces and thrust reversers shall be clear of personnel and equipment prior to applying or removing hydraulic power. Failure to comply may cause injury to personnel or damage to aircraft.	All

Support equipment:

Nomenclature	PN	Specification	Qty	Task
NA	--	--	--	--

Supplies:

Nomenclature	PN	Specification	Qty	Task
NA	--	--	--	--

01-1. MECHANICAL TEST-ROLL MAINTENANCE BUILT-IN TEST.

1. Review ″Section 1 (General Information)″ of this TO for system general warnings, cautions, and notes.

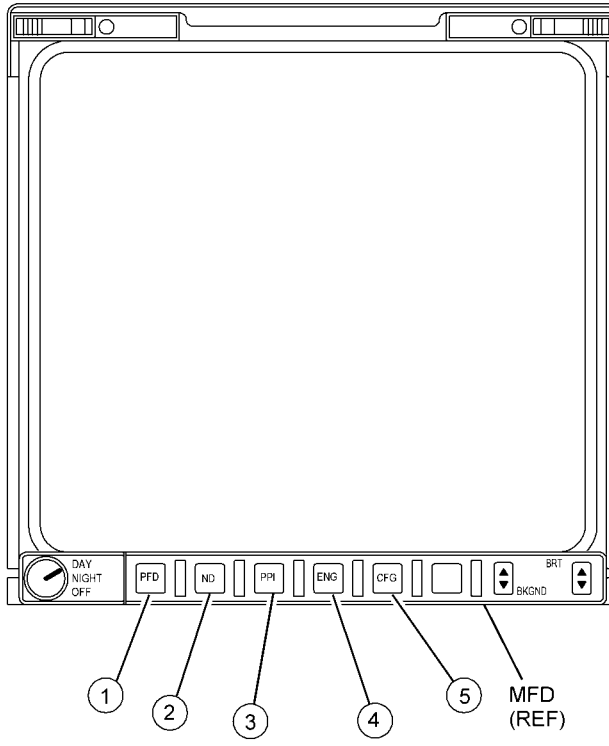
2. Review task ″General Maintenance Input Conditions″ page for task specific safety conditions.

3. Perform maintenance interphone operation (23-41-02, task 02-3).

4. Operate Multifunction Displays (MFD) system (31-61-02, task 02-1 or 02-2).

5. Select **CFG** format on MFD system.

6. Operate auxiliary hydraulic system (29-20-01, task 01-1).



5.

INDEX NO.	PUSHBUTTON	DISPLAY
1	PFD	PRIMARY FLIGHT DISPLAY
2	ND	MAP DISPLAY COMPASS DISPLAY CHART DISPLAY
3	PPI	TCAS DISPLAY SKE DISPLAY RADAR DISPLAY
4	ENG	NORMAL ENGINE DISPLAY EXPANDED ENGINE DISPLAY SECONDARY ENGINE DISPLAY
5	CFG	SURFACE DISPLAY

(TYPICAL)

ICN-88277-G2710011-001-01

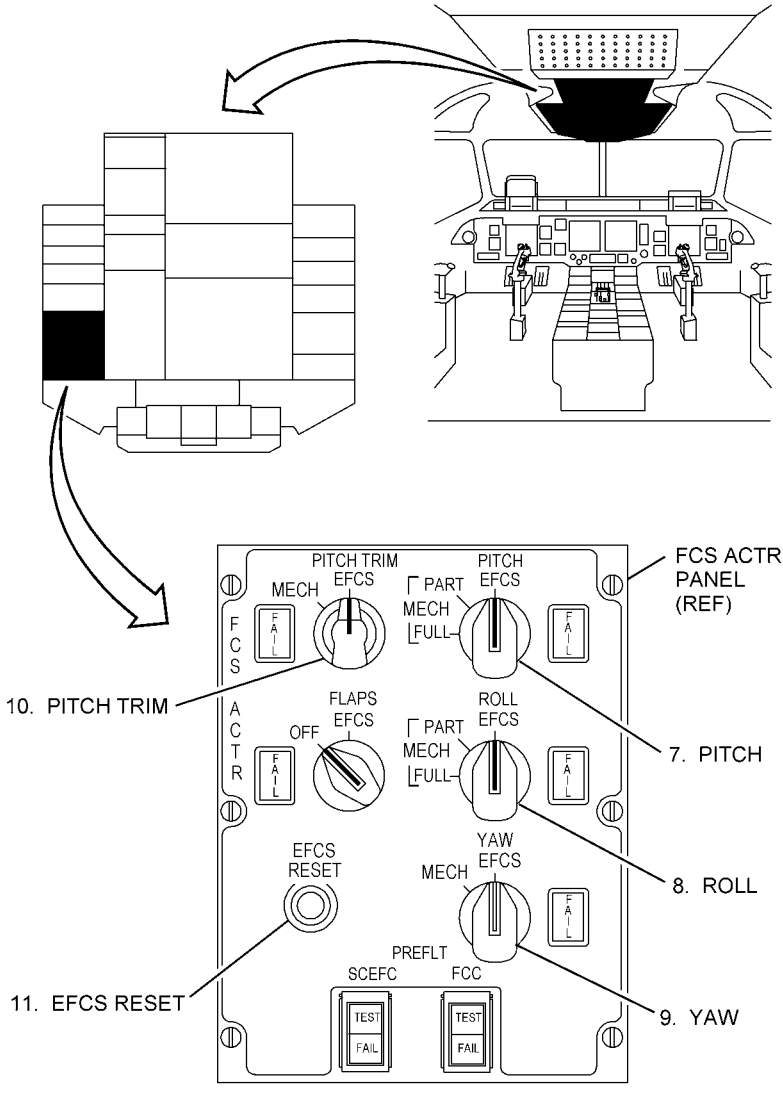
7. (A) Set **PITCH** switch on **FCS ACTR** panel to **EFCS**.

8. (A) Set **Roll** switch to **EFCS**.

9. (A) Set **YAW** switch to **EFCS**.

10. (A) Set **PITCH TRIM** switch to **EFCS**.

11. (A) Press **EFCS RESET** button.



ICN-88277-G2710003-003-01

12. (A) Press **MSN** key on **MCD (DU)**.

    - **MSN INDEX 1** is displayed.

13. (A) Press up arrow key.

    - **MSN INDEX 2** is displayed.

14. (A) Press 6L Line Select (LS) key.

    - **MAINTENANCE MENU** is displayed.

15. (A) Press 2L LS key.

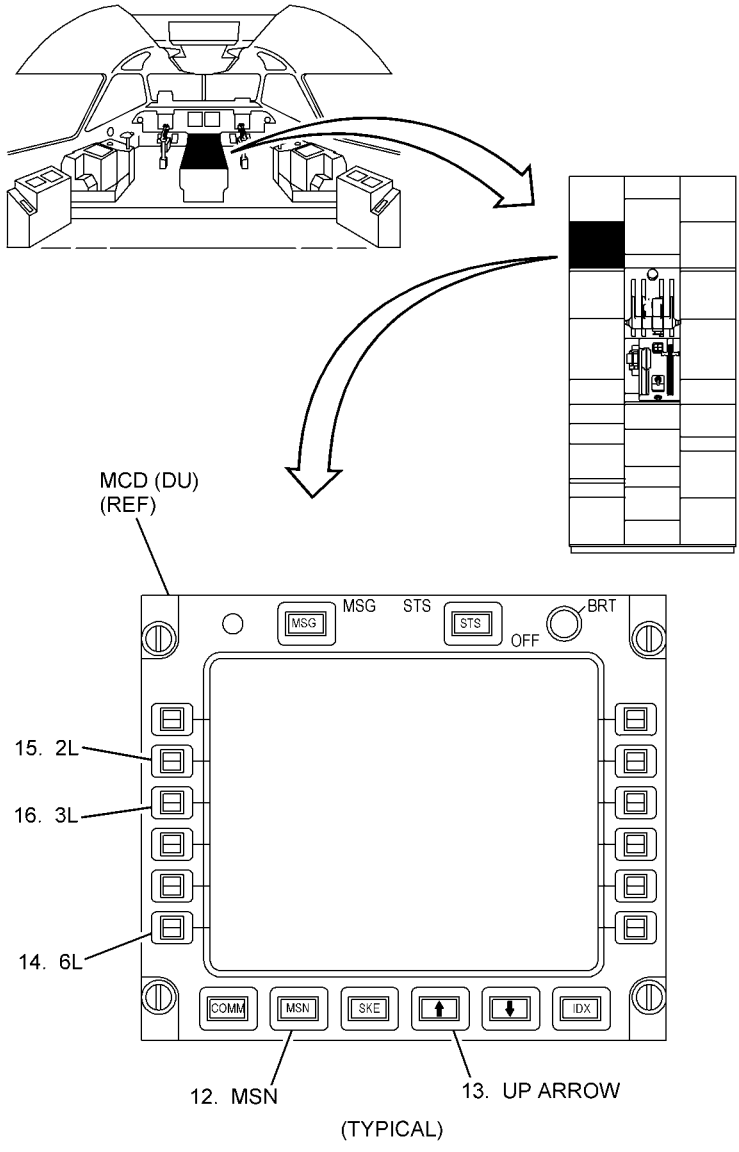
    - **EFCS MAINT MENU** is displayed.

NOTE

A fault list and history of each line replaceable unit can be accessed from **EFCS MAINT MENU** page by pressing 1L or 2L LS key.

16. (A) Press 3L LS key.

    - **EFCS MAINTENANCE BIT** is displayed.



ICN-88277-G2710007-003-01

NOTE

ATS and **AP** switches on automatic pilot control indicator must be set simultaneously to access **EFCS MAINTENANCE BIT** menu.

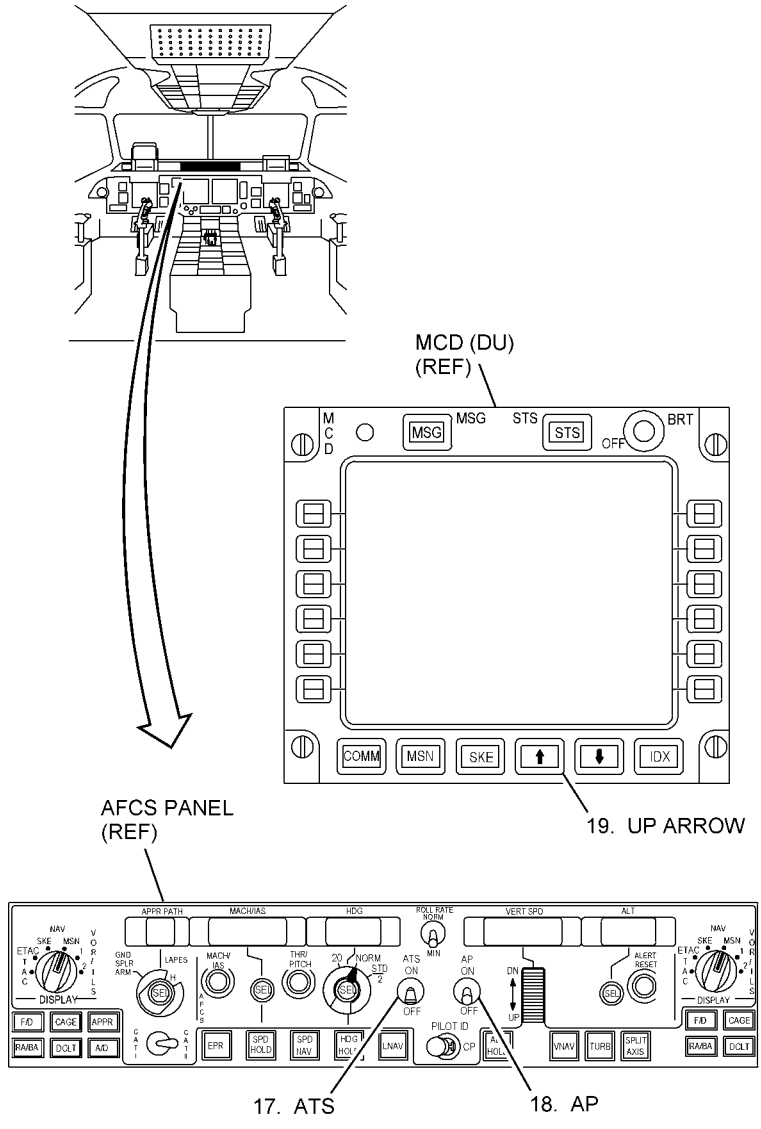
17. (A) Set **ATS** switch on **AFCS** panel to **ON**.

18. (A) Set **AP** switch to **ON**.

- **EFCS MAINTENANCE BIT ENTRY IN PROGRESS** is displayed on **MCD (DU)**.
- **EFCS MAINTENANCE BIT** page is **1/5** is displayed.

19. (A) Press up arrow key on **MCD (DU)** three times.

- **EFCS MAINTENANCE BIT** page **4/5** is displayed.



ICN-88277-G2710008-004-01

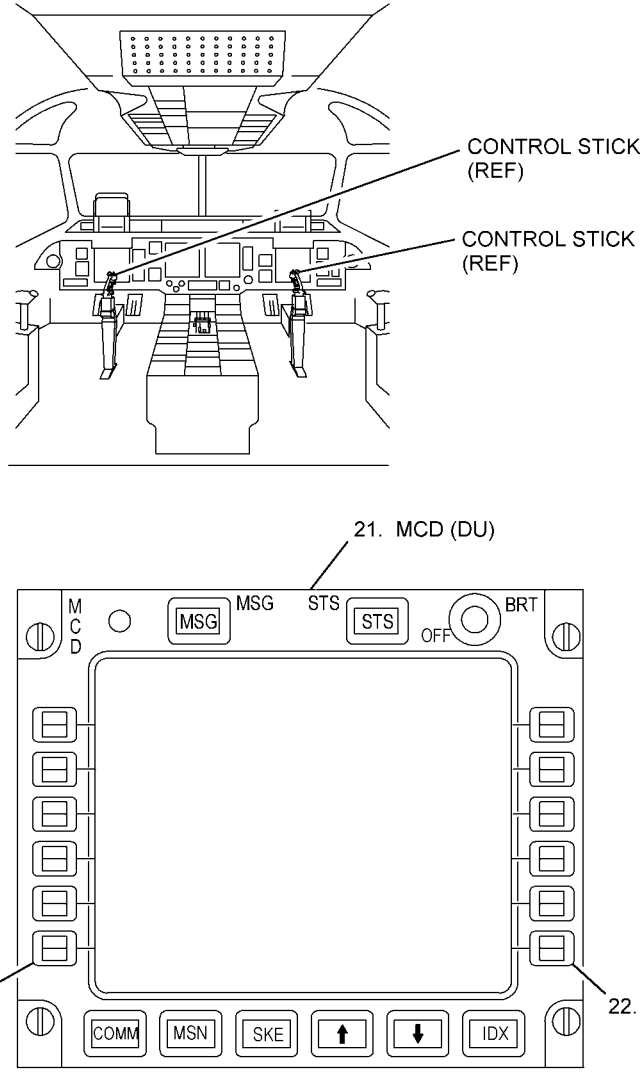
WARNING

All flight control surfaces shall be clear of personnel and equipment prior to movement. Failure to comply may cause injury to personnel or damage to aircraft.

NOTE

- Test may be aborted at any time by pressing 6L LS key.
- Refer to TO 1300i-2-27FI-00-1, fault chart 27-00 to correct any failure condition.
- Do not move control stick while **IN PROGRESS** is displayed.

20. (A) Press 6L LS key.
    - **EFCS MAINTENANCE BIT R_MECH IN PROGRESS** is displayed.
21. (A) Follow instructions on **MCD (DU)**.
    - **TEST PASSED** is displayed.
22. (A) Press 6R LS key.
    - **EFCS MAINTENANCE BIT PAGE 4/5** is displayed.



ICN-88277-G2710009-004-01

23. (A) Press 6R LS key.

    - **EFCS MAINT MENU** is displayed.

24. (A) Press 6R LS key.

    - **MAINTENANCE MENU** is displayed.

25. (A) Press 6R LS key.

    - **MSN INDEX 2** is displayed.

26. (A) Set **1 IRU** switch on **IRU** panel to **OFF**.

27. (A) Set **2 IRU** switch to **OFF**.

28. (A) Set **3 IRU** switch on **IRU** panel to **OFF**.

29. (A) Set **4 IRU** switch to **OFF**.

30. Set **PITCH** switch on **FCS ACTR** panel to **FULL MECH**.

31. (A) Set **ROLL** switch to **FULL MECH**.

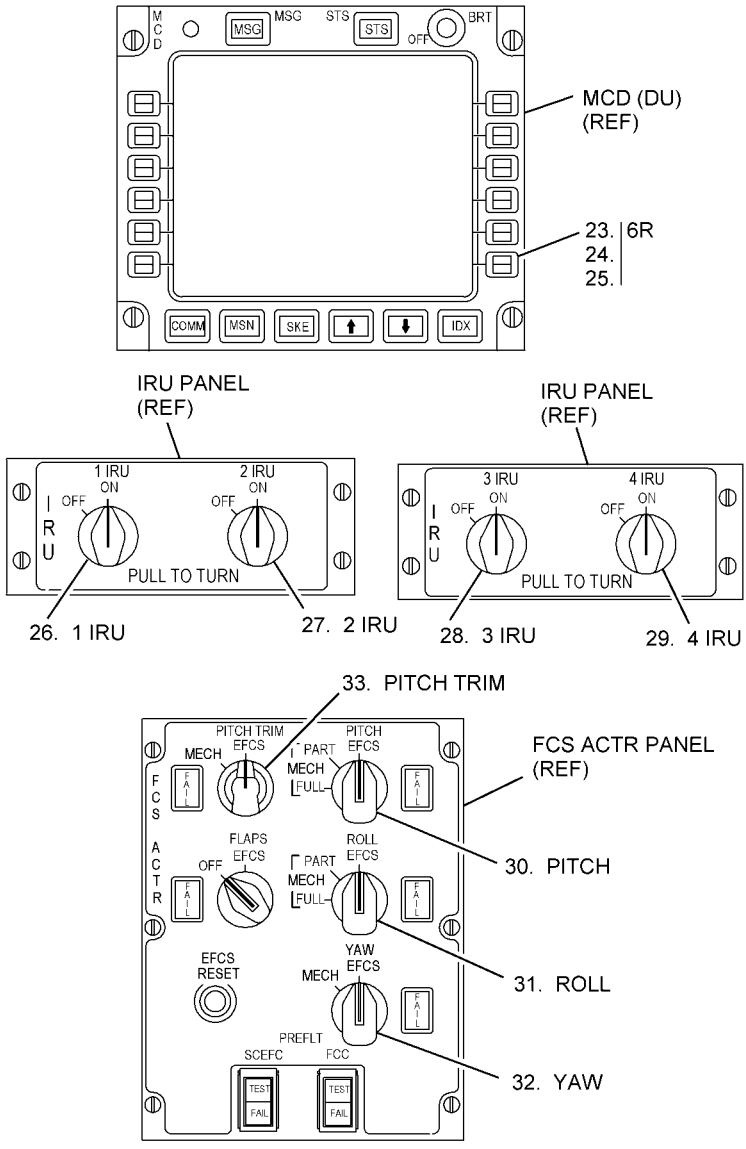
32. (A) Set **YAW** switch to **MECH**.

33. (A) Set **PITCH TRIM** switch to **MECH**.

34. Shutdown auxiliary hydraulic system (29-20-01, task 01-2).

35. Shutdown multifunction displays system (31-61-02, task 02-3 or 02-4).

36. Perform maintenance interphone shutdown (23-41-02, task 02-4).



ICN-88277-G2710010-005-01

AILERON MECHANICAL CONTROLS AND SURFACES SYSTEM OPERATIONAL CHECKOUT (27-11-01)

GENERAL MAINTENANCE INPUT CONDITIONS:

Applicability:

	Task
All	All

Additional information:

This procedure consists of the following tasks:

01-1. Aileron mechanical controls and surfaces system operational checkout.
01-2. Aileron mechanical controls breakout force system operational checkout.

Additional data:

	Task
TO 1300i-2-23JG-40-1	All
TO 1300i-2-27FI-00-1	All
TO 1300i-2-27JG-10-2	01-1
TO 1300i-2-29JG-20-1	All
TO 1300i-2-31JG-60-1	01-1
TO 1300i-2-31FI-00-1	01-1

Personnel recommended:

	Task
Two	All

Person (A) performs task.

Person (B) assists person (A).

Safety conditions:

	Task
NA	--

Support equipment:

Nomenclature	PN	Specification	Qty	Task
Tensiometer, Dial	L20	(0-20 lb)	1	01-2

Supplies:

Nomenclature	PN	Specification	Qty	Task
NA	--	--	--	--

01-1. AILERON MECHANICAL CONTROLS AND SURFACES SYSTEM OPERATIONAL CHECKOUT.

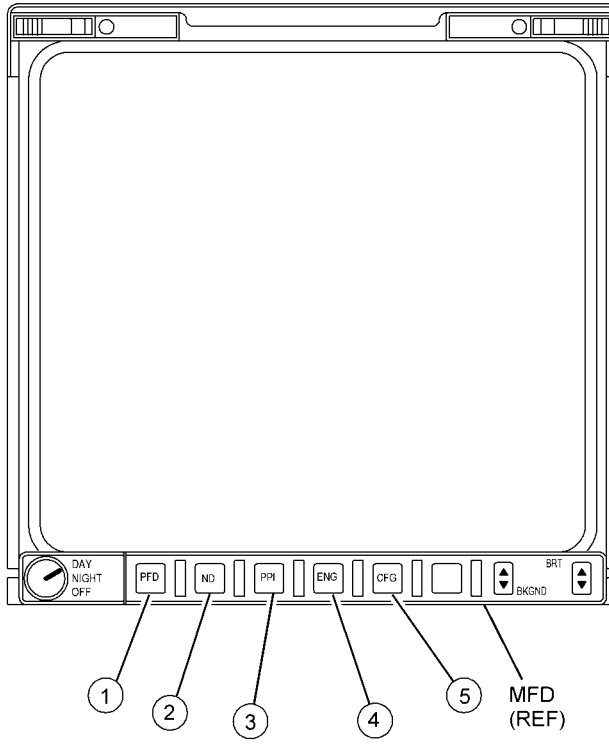
1. Review ″Section 1 (General Information)″ of this TO for system general warnings, cautions, and notes.

2. Review task ″General Maintenance Input Conditions″ page for task specific safety conditions.

3. Operate Multifunction Displays (MFD) system (31-61-02, task 02-1 or 02-2).

4. Select **CFG** format on MFD system.

5. Perform maintenance interphone operation (23-41-02, task 02-3).



4.

INDEX NO.	PUSHBUTTON	DISPLAY
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3	PPI	TCAS DISPLAY SKE DISPLAY RADAR DISPLAY
4	ENG	NORMAL ENGINE DISPLAY EXPANDED ENGINE DISPLAY SECONDARY ENGINE DISPLAY
5	CFG	SURFACE DISPLAY

(TYPICAL)

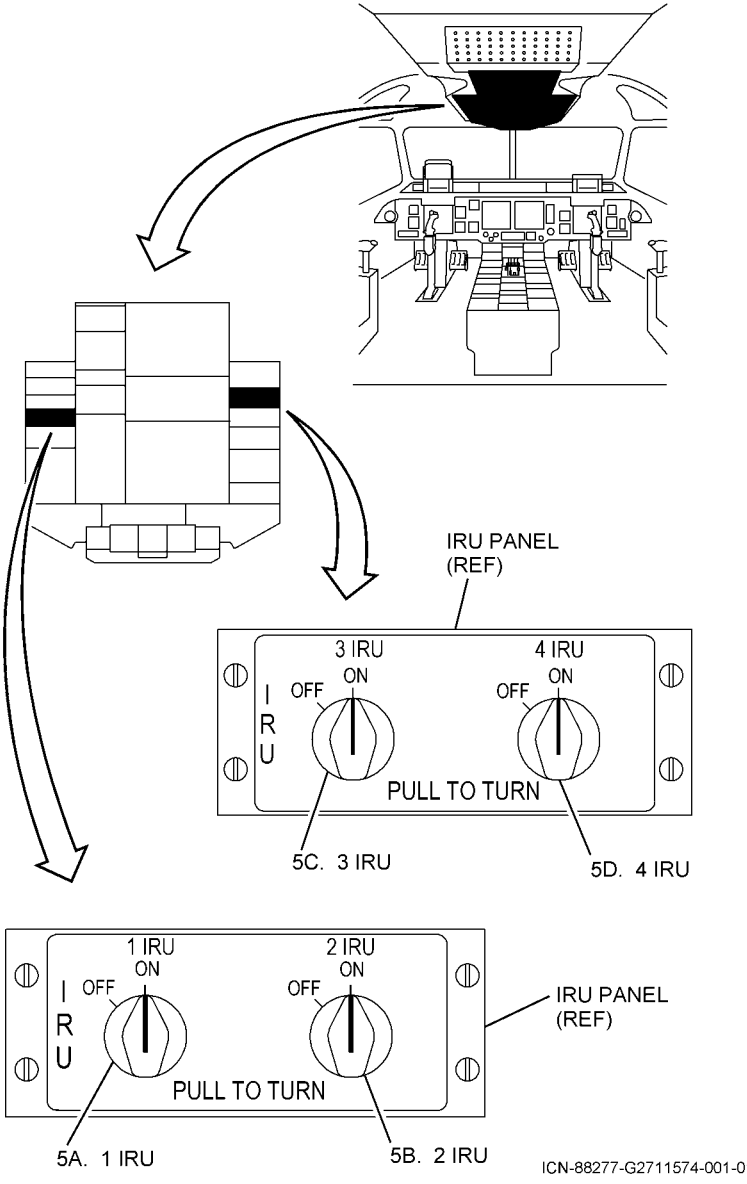
ICN-88277-G2710012-001-01

5A. (A) Set **1 IRU** switch on **IRU** panel to **ON**.

5B. (A) Set **2 IRU** switch to **ON**.

5C. (A) Set **3 IRU** switch on **IRU** panel to **ON**.

5D. (A) Set **4 IRU** switch to **ON**.



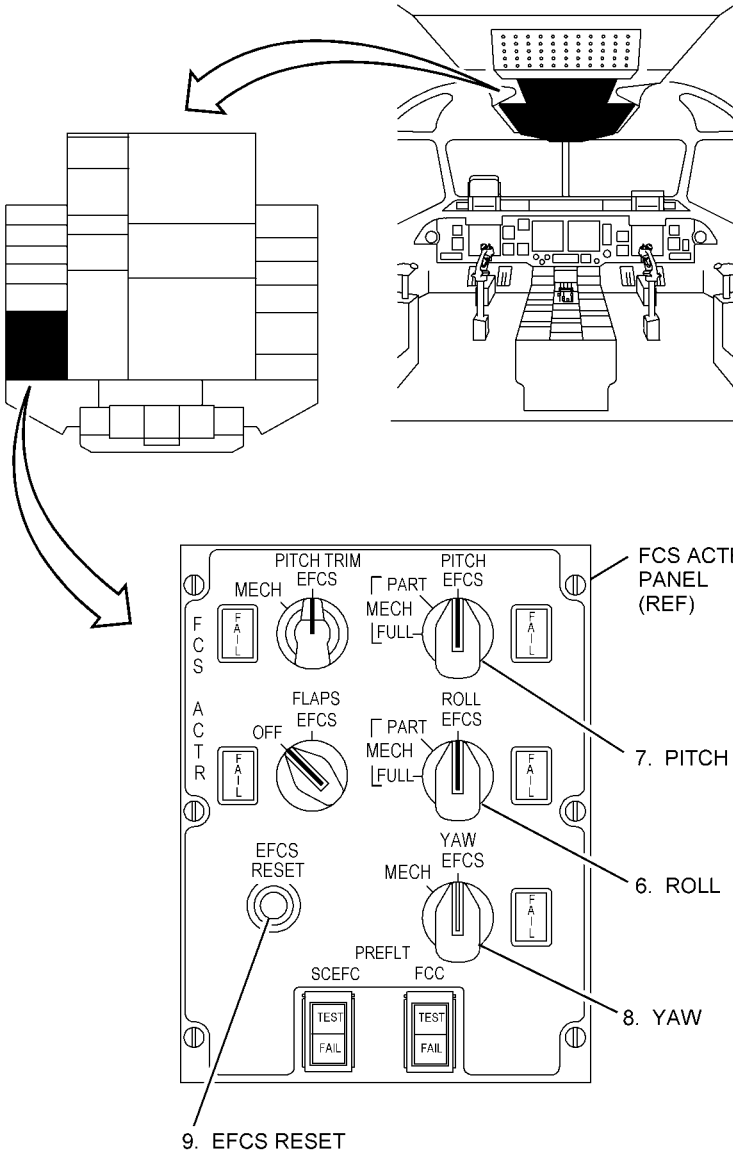
ICN-88277-G2711574-001-01

6. (A) Set **ROLL** switch on **FCS ACTR** panel to **EFCS**.

7. (A) Set **PITCH** switch to **EFCS**.

8. (A) Set **YAW** switch to **EFCS**.

9. (A) Press **EFCS RESET** button on **FCS ACTR** panel.



ICN-88277-G2711420-007-01

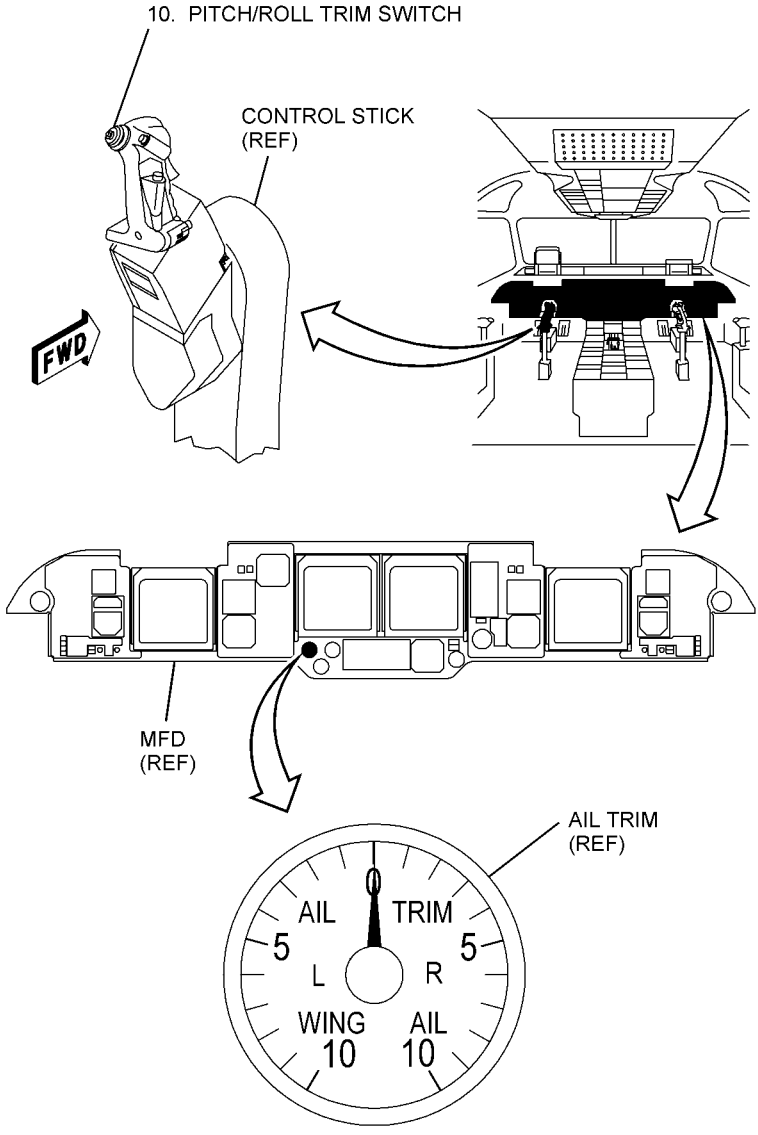
WARNING

All flight control surfaces shall be clear of personnel and equipment prior to movement. Failure to comply may cause injury to personnel or damage to aircraft.

10. (A) Press pitch/roll trim switch left or right on control stick until indicator reads 0.

    - **AIL TRIM** indicator reads 0 (27-12-AJ-00).
    - MFD displays 0 (31-61-AA-01, 31-61-AA-02).

11. Operate auxiliary hydraulic system (29-20-01, task 01-1).



ICN-88277-G2711001-005-01

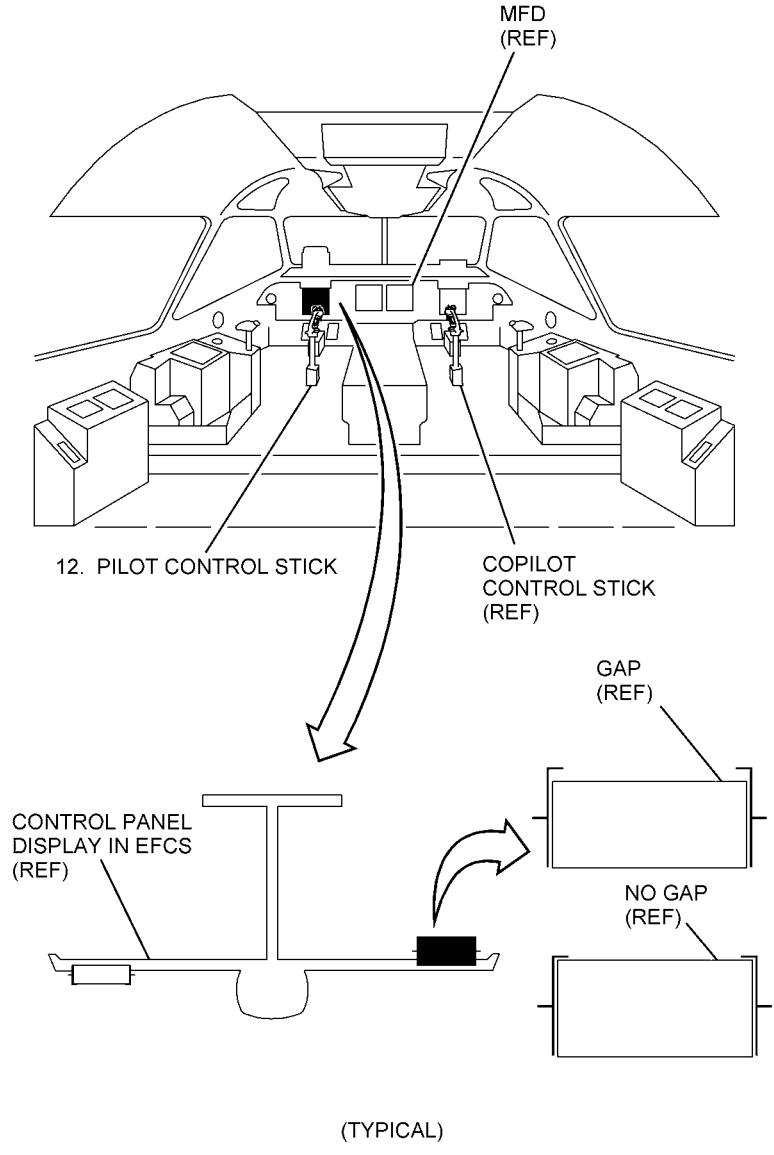
WARNING

All flight control surfaces shall be clear of personnel and equipment prior to movement. Failure to comply may cause injury to personnel or damage to aircraft.

NOTE

- One full aileron cycle is defined as left wing down, right wing down, and neutral.
- The minimum acceptable full surface deflection for the ailerons in **EFCS** is displayed as full scale on the MFD CFG page. Full is defined as no gap between surface deflection and the full scale brackets.

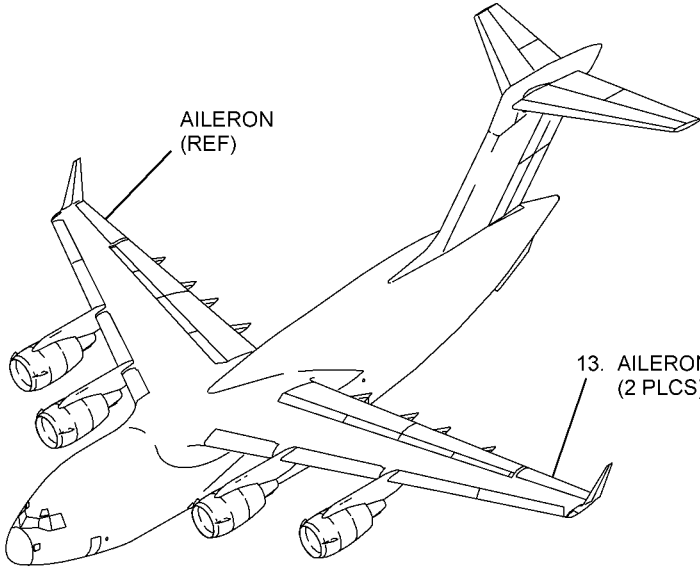
12. (A) Operate ailerons from pilot control stick through one full cycle in **EFCS**.
    - MFD displays proper aileron position (31-61-AA-01, 31-61-AA-02).
    - Aileron position displays no gap on MFD with aileron at full deflection (27-13-AC-_).
    - Copilot control stick follows pilot control stick movement (27-11-AD-00).



ICN-88277-G2711005-008-01

13. (B) Observe ailerons.

    - Ailerons are in correct position (27-11-AD-00).



ICN-88277-G2711030-005-01

14. (A) Set **1 IRU** switch on **IRU** panel to **OFF**.

15. (A) Set **2 IRU** switch to **OFF**.

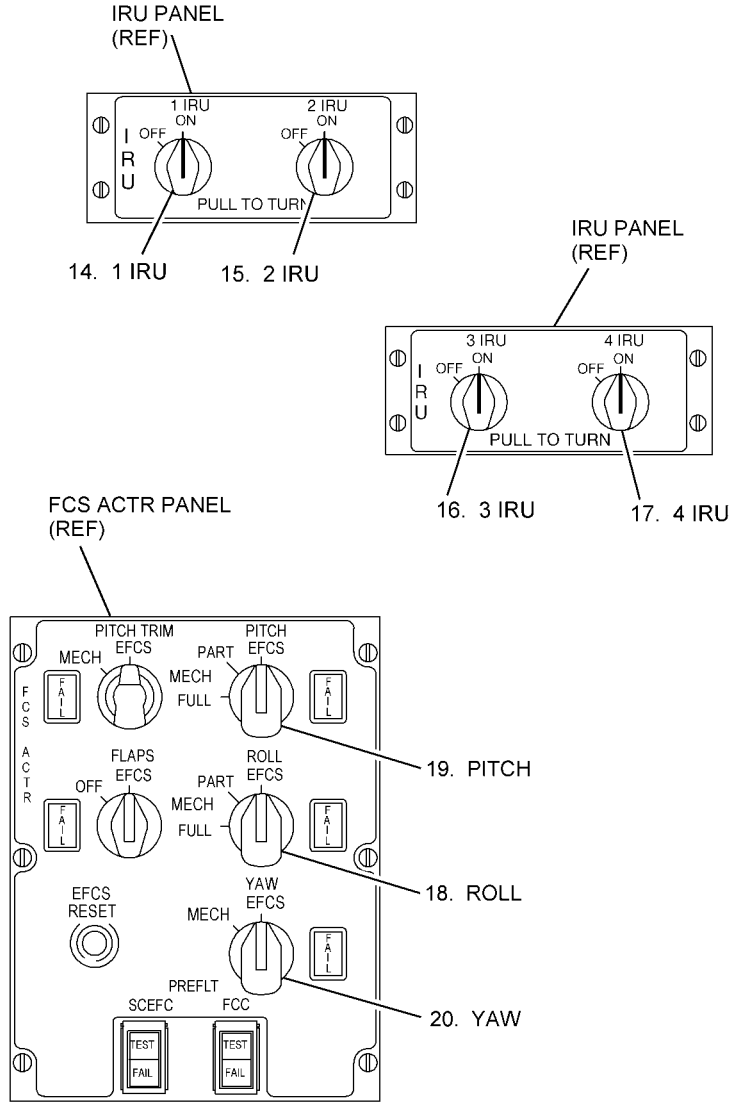
16. (A) Set **3 IRU** switch on **IRU** panel to **OFF**.

17. (A) Set **4 IRU** switch to **OFF**.

18. (A) Set **ROLL** switch on **FCS ACTR** panel to **FULL MECH**.

19. (A) Set **PITCH** switch to **FULL MECH**.

20. (A) Set **YAW** switch to **MECH**.



ICN-88277-G2711452-005-01

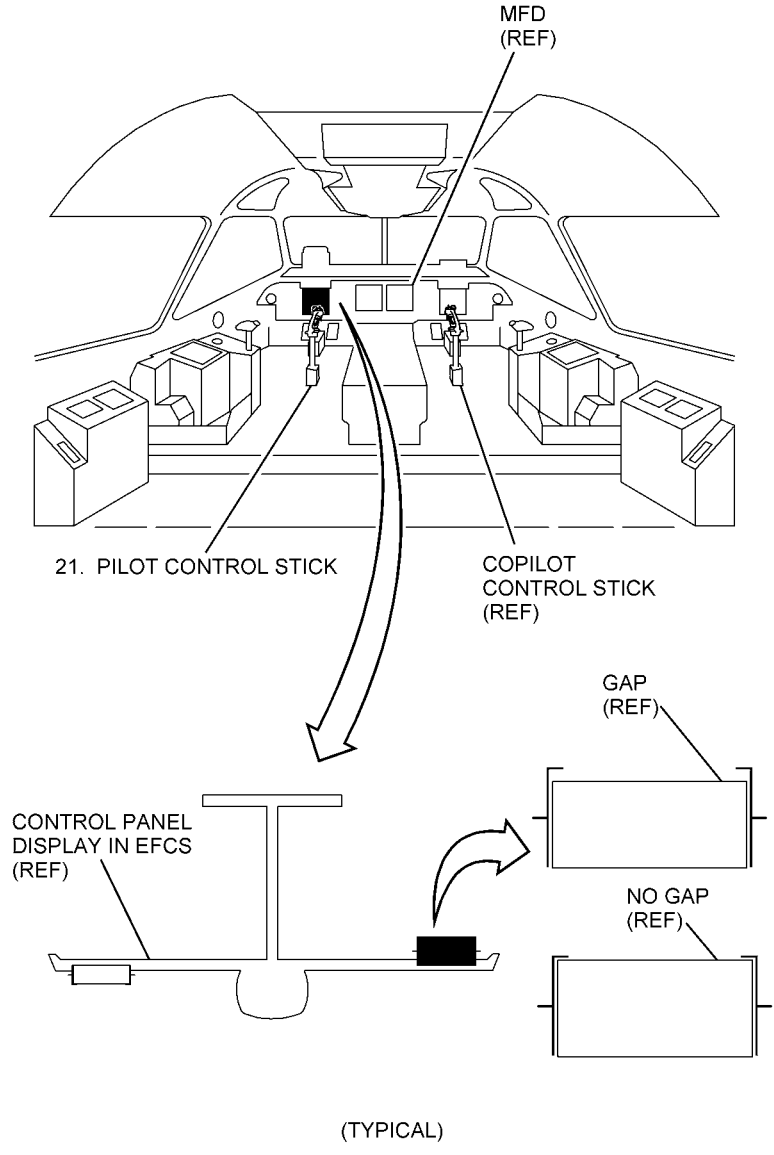
WARNING

All flight control surfaces shall be clear of personnel and equipment prior to movement. Failure to comply may cause injury to personnel or damage to aircraft.

NOTE

- One full aileron cycle is defined as left wing down, right wing down, and neutral.
- The minimum acceptable full surface deflection for the ailerons in **FULL MECH** is displayed as close to full scale on the MFD CFG page. Close to full is defined as when the gap displayed between the surface deflection and the full scale bracket is no wider than the width of the full scale bracket display line.

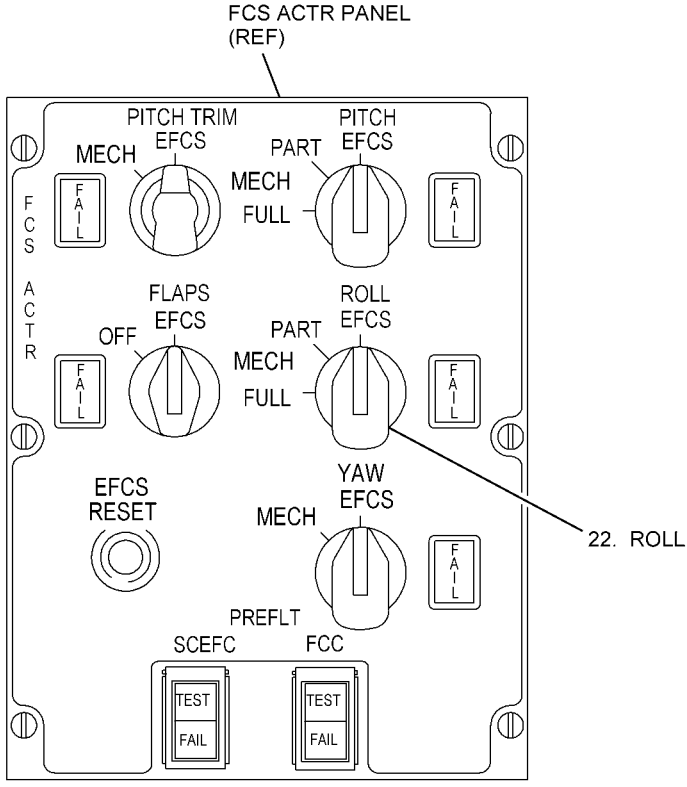
21. (A,B) Operate ailerons from pilots control stick through one full cycle in **FULL MECH**.
    - MFD displays proper aileron position (31-61-AA-01, 31-61-AA-02).
    - Aileron position displays minimum full surface deflection on MFD when aileron is at full deflection (31-61-AA-01, 31-61-AA-02).
    - Ailerons are in correct position (27-11-AD-00).
    - Copilot control stick follows pilot control stick movement (27-11-AD-00).



(TYPICAL)

ICN-88277-G2711453-006-01

22. (A) Set **ROLL** switch on **FCS ACTR** panel to **PART MECH**.



ICN-88277-G2711007-005-01

WARNING

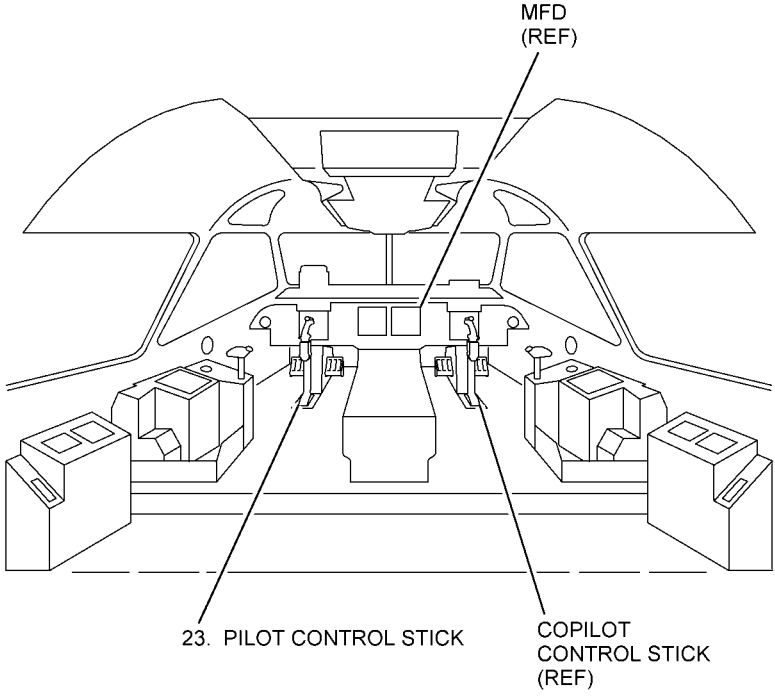
All flight control surfaces shall be clear of personnel and equipment prior to movement. Failure to comply may cause injury to personnel or damage to aircraft.

NOTE

One full aileron cycle is defined as left wing down, right wing down, and neutral.

23. (A,B) Operate ailerons from pilot control stick through one full cycle.

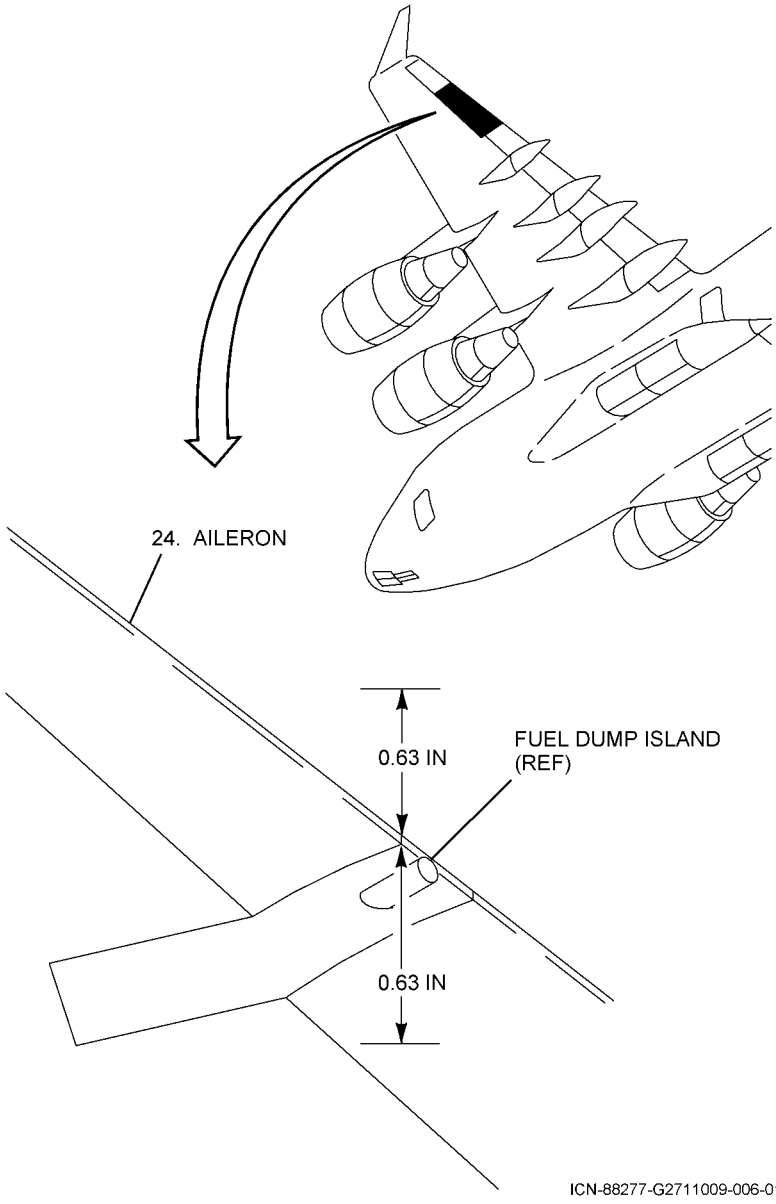
- MFD displays proper aileron position (31-61-AA-01, 31-61-AA-02).
- MFD displays half deflection (31-61-AA-01, 31-61-AA-02).
- Ailerons are in correct position (27-11-AD-00).
- Copilot control stick follows pilot control stick movement (27-11-AD-00).



ICN-88277-G2711008-006-01

24. (B) Measure ailerons inboard trailing edge to trailing edge of fuel dump islands.

    - Ailerons are within 0.63 inches (27-11-03, tasks 03-1, 03-5, and 03-6).

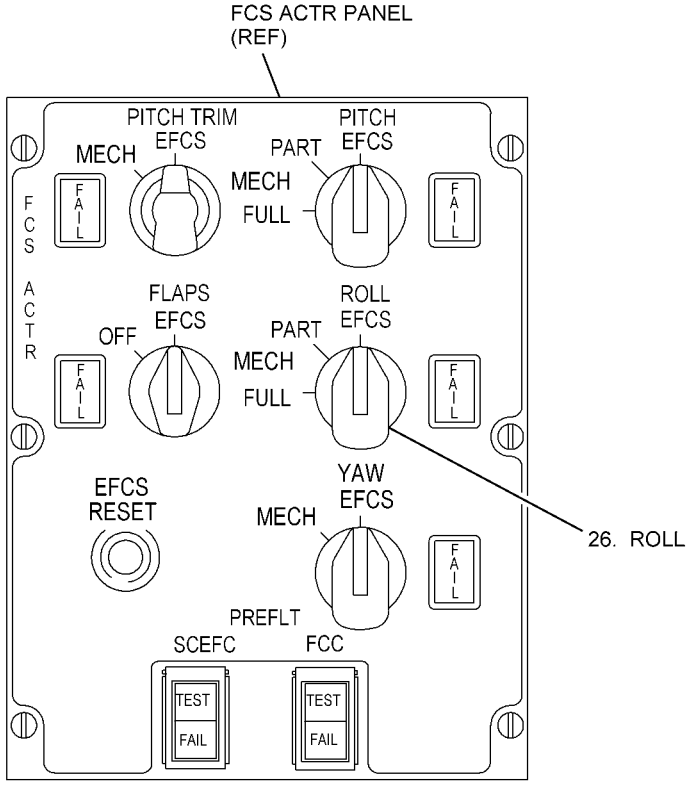

24. AILERON
0.63 IN
FUEL DUMP ISLAND
(REF)
0.63 IN
ICN-88277-G2711009-006-01

25. Shutdown auxiliary hydraulic system (29-20-01, task 01-2).

26. (A) Set **ROLL** switch on **FCS ACTR** panel to **FULL MECH**.

27. Perform maintenance interphone shutdown (23-41-02, task 02-4).

28. Shutdown multifunction displays system (31-61-02, task 02-3 or 02-4).



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01-2. AILERON MECHANICAL CONTROLS BREAKOUT FORCE SYSTEM OPERATIONAL CHECKOUT.

NOTE

This is a typical aileron mechanical controls breakout force system operational checkout for all control stick assemblies.

1. Review ″Section 1 (General Information)″ of this TO for system general warnings, cautions, and notes.

2. Review task ″General Maintenance Input Conditions″ page for task specific safety conditions.

3. Perform maintenance interphone operation (23-41-02, task 02-3).

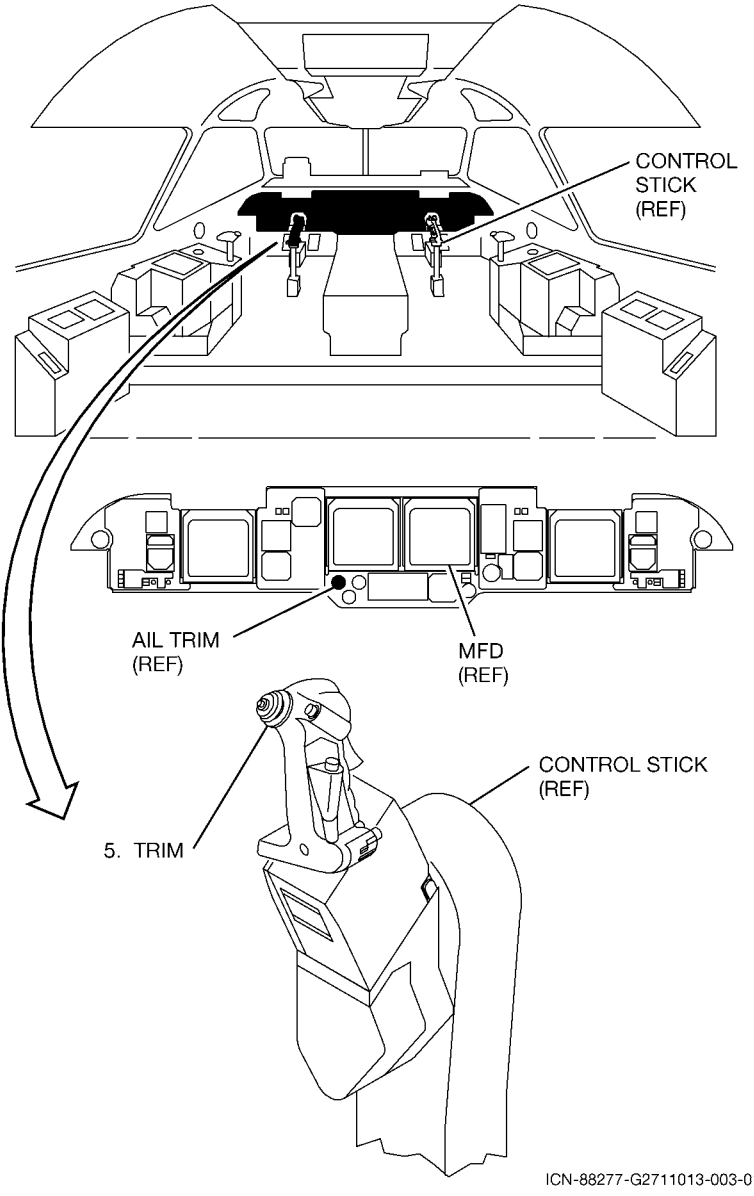
4. Operate auxiliary hydraulic system (29-20-01, task 01-1).

WARNING

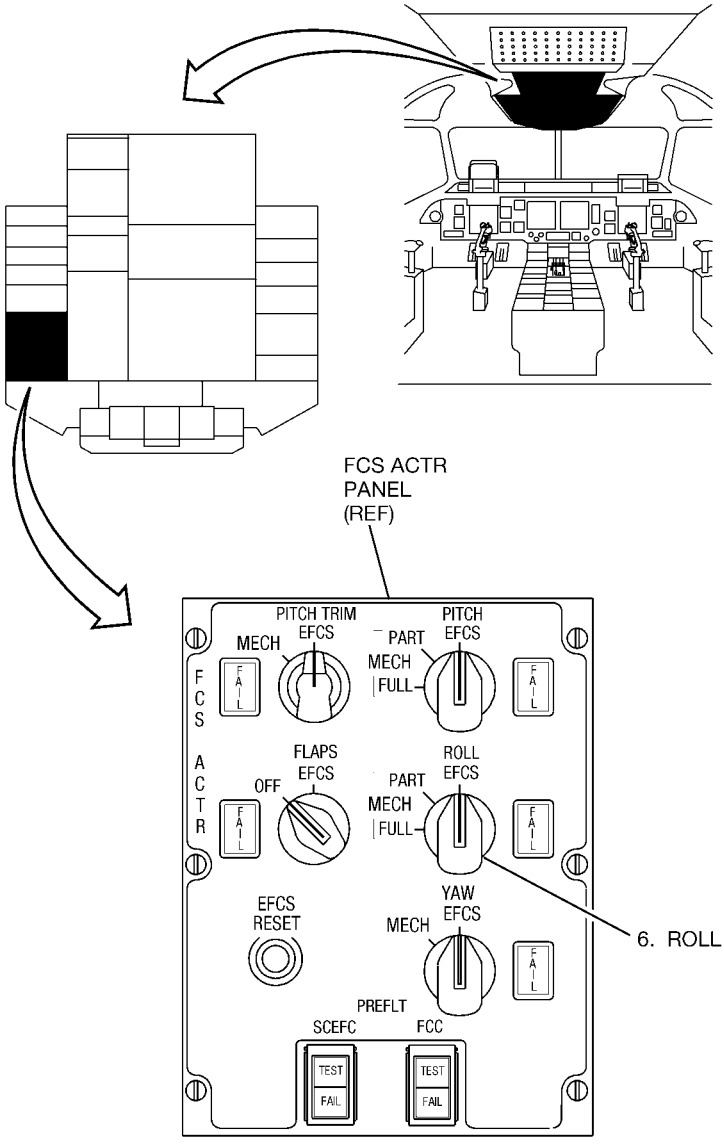
All flight control surfaces shall be clear of personnel and equipment prior to movement. Failure to comply may cause injury to personnel or damage to aircraft.

5. (A) Press pitch/roll trim switch left or right on control stick until indicator reads 0.

   - **AIL TRIM** indicator reads 0 (27-12-AJ-00).


CONTROL
STICK
(REF)
AIL TRIM
(REF)
MFD
(REF)
CONTROL STICK
(REF)
5. TRIM
ICN-88277-G2711013-003-01

6. (A) Rotate **ROLL** switch on **FCS ACTR** panel to **PART MECH**.



ICN-88277-G2711020-002-01

7. (A) Set dial tensiometer to read 0 lbs and position probe 2.13 to 2.63 inches above base of control stick sensor assembly on inboard side of control stick grip.

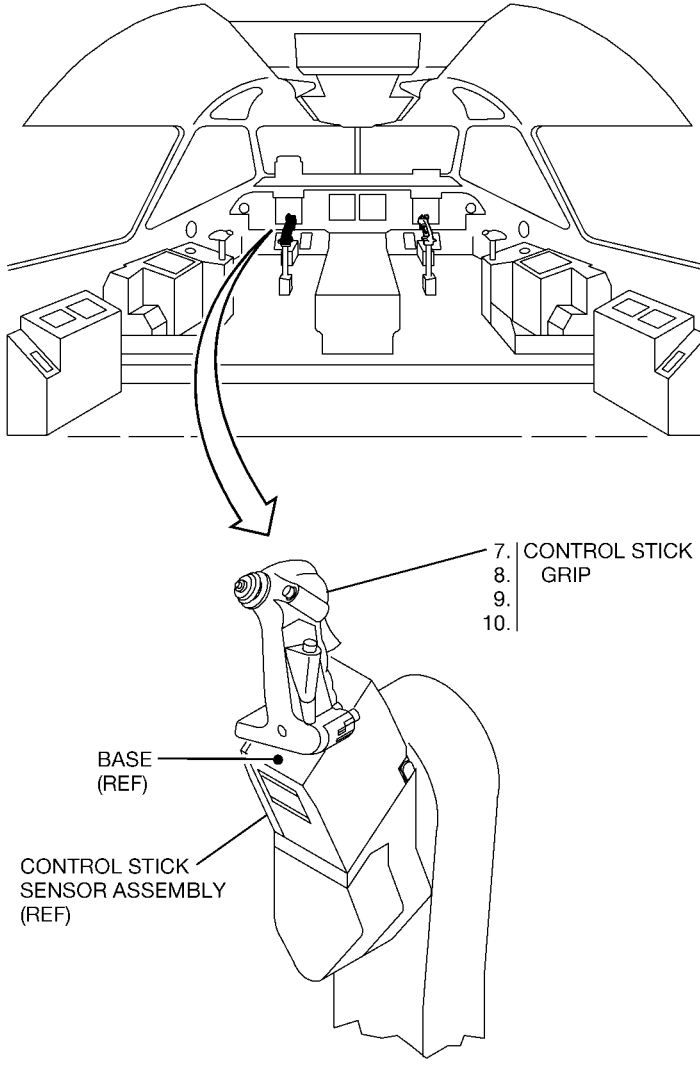
8. (A,B) Maintain a slow and steady push on tensiometer until aileron initially moves.

    - Breakout force is 0.05 - 4 lbs (27-11-AS-00).

9. (A) Set dial tensiometer to read 0 lbs and position probe 2.13 to 2.63 inches above base of control stick sensor assembly on outboard side of control stick grip.

10. (A,B) Maintain a slow and steady push on tensiometer until aileron initially moves.

    - Breakout force is 0.05 - 4 lbs (27-11-AS-00).

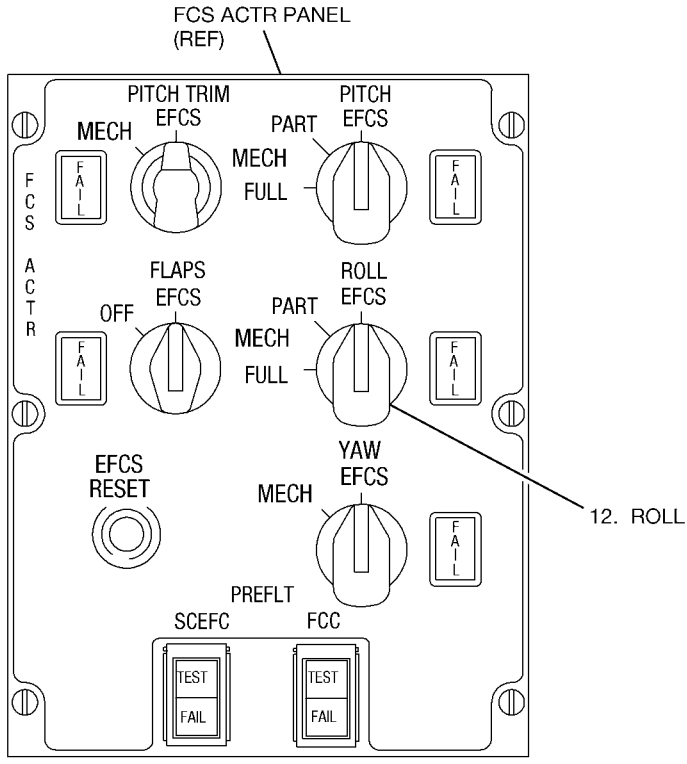


ICN-88277-G2711017-004-01

11. Shutdown auxiliary hydraulic system (29-20-01, task 01-2).

12. (A) Rotate **ROLL** switch on **FCS ACTR** panel to **FULL MECH**.

13. Perform maintenance interphone shutdown (23-41-02, task 02-4).



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AILERON MECHANICAL CONTROLS AND SURFACES SYSTEM REPAIR (27-11-02)

GENERAL MAINTENANCE INPUT CONDITIONS:

Applicability:

	Task
All	All

Additional information:

This procedure consists of the following task:

02-1. Repair aileron mechanical controls and surfaces system by replacing roll damper link.

Additional data:

	Task
TO 1300i-2-05JG-10-1	All
TO 1300i-2-25JG-10-1	All
TO 1300i-2-27FI-00-1	All
TO 1300i-2-53JG-10-1	All
TO 1300i-23	All

Personnel recommended:

	Task
Two	All

Person (A) performs task.

Person (B) assists person (A).

Safety conditions:

	Task
WARNING	
The horizontal pressure panel access cover(s) are removed in these tasks to gain access to the cavity above. When rudder, aileron, and elevator aircraft ground safety locks are not installed, care shall be taken working around rudder, aileron, and elevator cables, pulleys, and linkage due to possible moving parts. Failure to comply could result in injury to personnel.	All

Support equipment:

Nomenclature	PN	Specification	Qty	Task
NA	--	--	--	--

Supplies:

Nomenclature	PN	Specification	Qty	Task
Pin, Cotter	MS24665-151	--	2	All
Sealant	PR-1775 B-2	AMS 3265	AR	All

02-1. REPAIR AILERON MECHANICAL CONTROLS AND SURFACES SYSTEM BY REPLACING ROLL DAMPER LINK.

1. Review ″Section 1 (General Information)″ of this TO for system general warnings, cautions, and notes.

2. Review task ″General Maintenance Input Conditions″ page for task specific safety conditions.

3. Install aileron aircraft ground safety lock (05-10-01, task 01-3).

4. Install elevator aircraft ground safety lock (05-10-01, task 01-5).

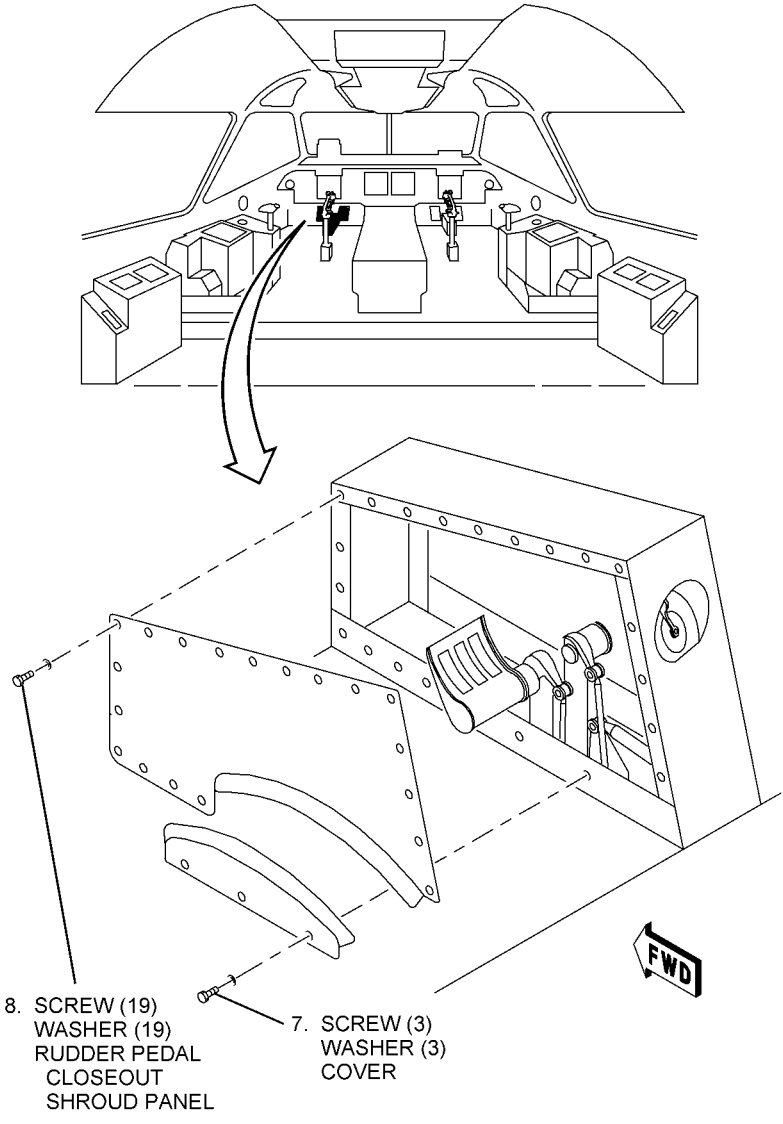
5. Perform horizontal pressure panel access cover assembly removal (53-12-10).

PANEL NO.	PANEL REF DES
112AZP	5312CA001

6. Perform pilot seat assembly removal (25-11-10, task 2-1 and 2-2).

7. (A) Remove screws, washers, and cover (211GZM).

8. (A) Remove screws, washers, and rudder pedal closeout shroud panel (211FZM).



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WARNING

The rudder and elevator aircraft ground safety locks shall be installed when working within the cavity above the horizontal pressure panel access cover. Failure to comply may cause injury to personnel.

9. (A,B) Remove cotter pin, nut, washer, and bolt.

10. (A,B) Remove bolts and washers.

11. (A,B) Remove roll damper and link.

12. (A,B) Loosen jamnut and remove clevis.

CAUTION

To prevent clevis and bearing rod ends from binding, ensure that the clevis and bearing rod ends are centered vertically and in plane with the bell and dampener crank assembly clevis ends. Failure to comply may cause damage to aircraft, and may also result in mechanical contact and/or bearing binding near full stick deflection which may result in abnormal stick feel characteristic and possible reversion to **ROLL FORCE MODE**.

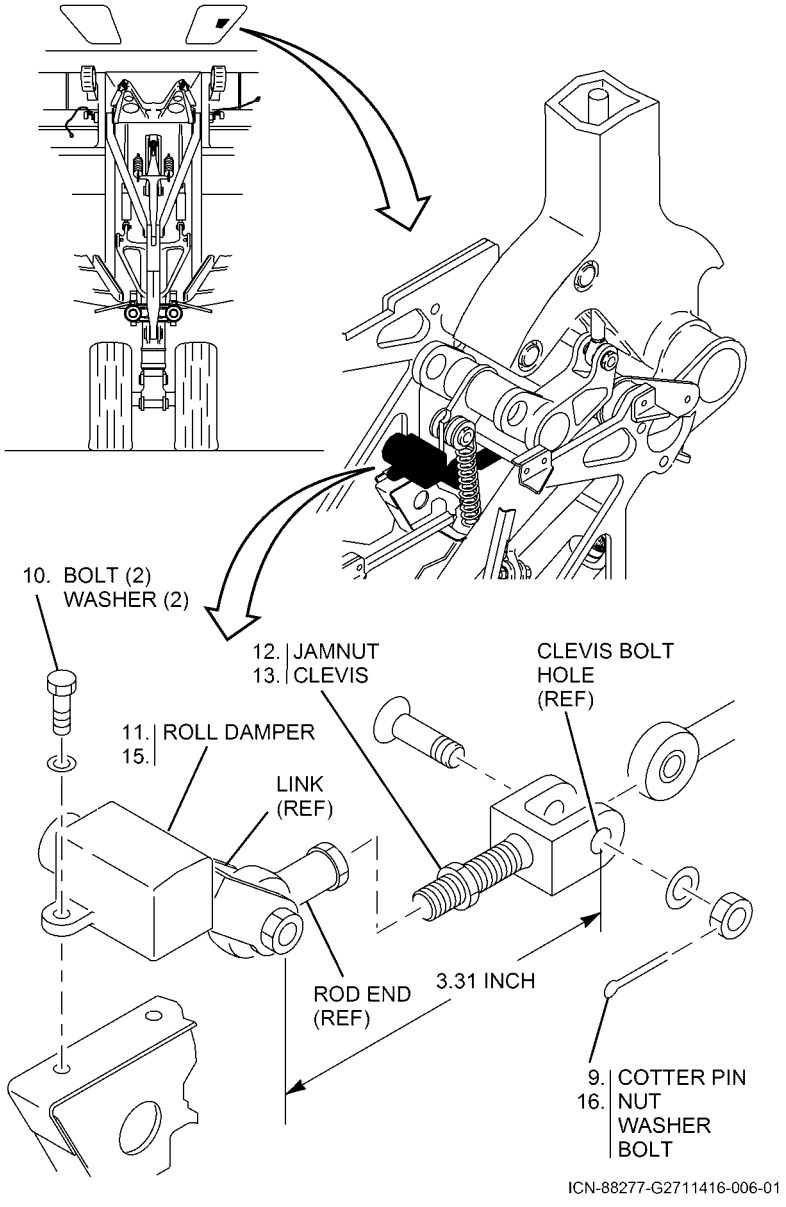
13. (A) Install clevis and adjust to 3.31 inches between clevis bolt hole and rod end bolt; tighten nut.

14. Perform wet fastener installation (TO 1300i-23, Chapter 1, Section III).

15. (A,B) Position roll damper and link; install bolts and washers.

16. (A,B) Install bolt, washer, nut, and cotter pin.

17. Remove aileron aircraft ground safety lock (05-10-01, task 01-4).


10. BOLT (2)
WASHER (2)
12. JAMNUT
13. CLEVIS
CLEVIS BOLT
HOLE
(REF)
11. ROLL DAMPER
15.
LINK
(REF)
ROD END
(REF)
3.31 INCH
9. COTTER PIN
16. NUT
WASHER
BOLT
ICN-88277-G2711416-006-01

18. Remove elevator aircraft ground safety lock (05-10-01, task 01-6).

19. (A,B) Cycle control stick through left wing down, right wing down, and neutral position.

    - Verify damper and linkage for freedom of movement and smooth operation (27-11-AD-00).

20. Remove rudder aircraft ground safety lock (05-10-01, task 01-2).

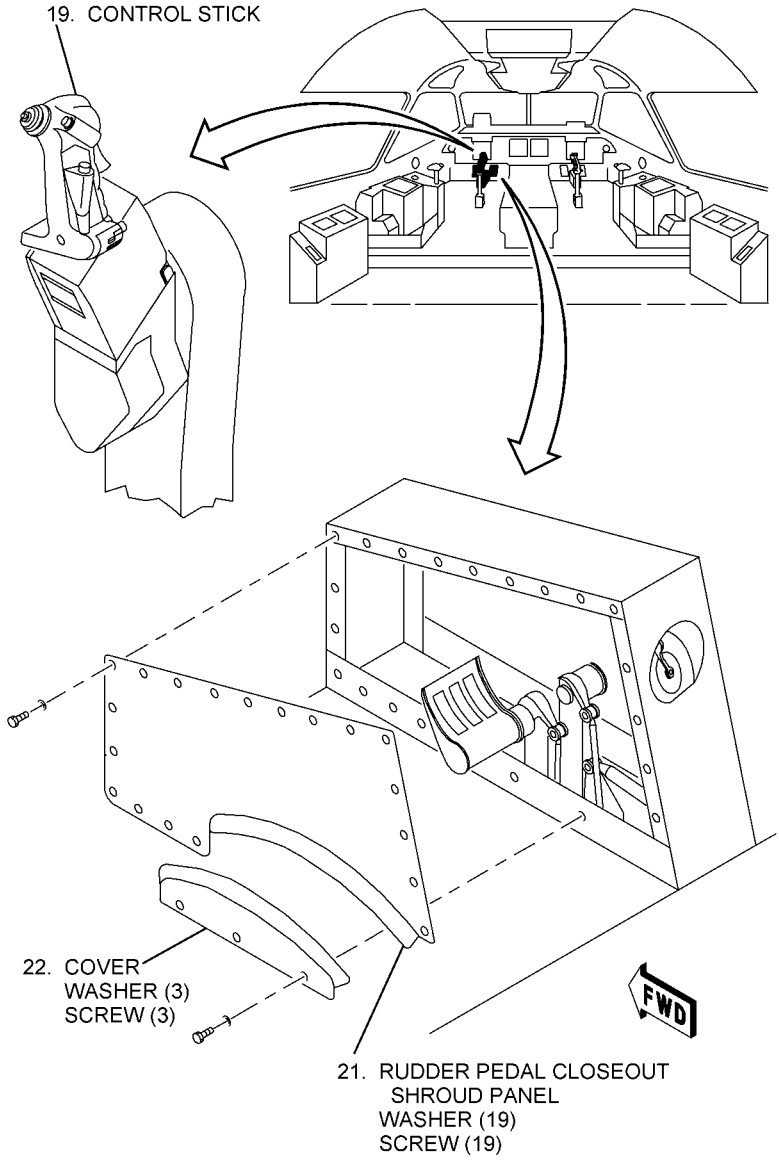
21. Install rudder pedal closeout shroud panel (211FZM), washers, and screws.

22. Install cover, washers, and screws (211GZM).

23. Perform pilot seat assembly installation (25-11-10, task 3-1 and 3-2).

24. Install horizontal pressure panel access cover assembly (53-12-10).

PANEL NO.	PANEL REF DES
112AZP	5312CA001



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