

TECHNICAL MANUAL JOB GUIDE

FLIGHT CONTROL SYSTEM

C-27J AIRCRAFT

ARMÉE DE L'AIR TCHADIENNE



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INTRODUCTION

PURPOSE

This Job Guide Manual provides illustrated, step by step, Maintenance procedures for Functional test, Adjustment, Removal and Installation, etc., of C-27J aircraft system/subsystem components.

USE

Instructions in this manual are arranged in a task format with procedural steps, supported by illustrations which give components location and instructions about the maintenance procedure. Index numbers are provided in the illustrations to identify the components requiring action. These index numbers follow the component names in the procedural steps.

A "Table of Contents" provides a sequentially-ordered list of procedures identified with related paragraph and page number enabling the user to quickly find the procedure.

Each task of maintenance is identified by a progressive sub-paragraph number. A 6-digit code uniquely identifies the maintenance procedure by system, subsystem, sub-subsystem and unit. This code is located in the lower outer corner of each page and provides a quick reference for locating the desired maintenance procedure.

MAINTENANCE

Maintenance task consists of three basic sections (refer to figure 1, sheet 1/3) and (refer to figure 1, sheet 2/3):



- -Input Condition: provides a quick identication of the Aircraft Applycability, the Required Conditions, the Recommended Personnel, the Aerospace Ground Equipments (AGE), the Consumable Material Required, the specific Safety Conditions and any other maintenance actions that must be performed to place the equipment or aircraft in the required condition before starting the maintenance task. The input condition section that doesn't contain informations, will contain the written "None".
- -Procedure: provides how to execute the job; each maintenance task is supported by illustrations.
- -Follow on Maintenance: provides details of how to return the aircraft to an operational condition following the completion of the maintenance tasks.

AIRCRAFT APPLICABILITY

Aircraft Applicability codes identify a specific aircraft or a group of aircrafts to which maintenance task is applicable. Aircraft Applicability Codes are identified by Manufacturer Serial Number (MSN) in the form (4162, 4180, etc.).

REQUIRED CONDITIONS

This paragraph provide the preventive procedures that must be carried out in order to prepare the aircraft for the maintenance procedure. The listed preventive procedures make reference to procedures described in others Job Guide (JG).

RECOMMENDED PERSONNEL

This paragraph provide information about recommended minimum personnel required to perform the maintenance task. Personnel identified by (*) shall be in control of the entire task.

AEROSPACE GROUND EQUIPMENTS (AGE)



A list of special tools and test equipment is included at the beginning of each task. Tools and test equipments listed are those recommended to ensure a maintenance activity is properly performed.

Special tools and test equipments are identified by Part Number, and Nomenclature. They are also associated to an AGE numbers (AGE NO.) for a quick identification in a list of the AGE. Special tools and test equipment AGE Part Numbers followed by an asterisk are loose equipment and they are stowed onboard the aircraft while those followed by two asterisks are Commercial Off The Shelf (COTS). Equivalent equipment is acceptable (unless otherwise specified), however, the procedures are written assuming the listed equipment is used. Equipment and tools that are not listed they are considered common and can be found in a commercial tool kit.

CONSUMABLE MATERIAL REQUIRED (LCM)

This paragraph provides Consumable Materials required to accomplish the Maintenance tasks, identified by LCM NO., Nomenclature, part number and quantity. Consumable materials are associated to a LCM numbers (LCM NO.) for a quick identification in the List of Consumable Materials (LCM).

SAFETY CONDITIONS

Maintenance procedures are written in a sequence to emphasize safety.General warnings applied to the maintenance procedure are listed in this paragraph. These warnings are not repeated elsewhere in the maintenance procedure unless it needs to be emphasized in a particular situation. Warnings that are unique to a particular situation are shown in the text prior to the actual operation.



ILLUSTRATIONS

Illustrations in the maintenance procedures (refer to figure 1, sheet 3/3) locate equipments on which the maintenance is being performed. To facilitate the "reading" of the illustration, the location of the equipment is represented by a blacken zone of the Assembly on the aircraft or the Subassembly/Component position on the main assembly.

Callout numbers are used to identify each item on the illustration and are identical to the item numbers that identify the components in the maintenance task. Every item is identified by a number and numbering of items follows a clockwise rotation. Illustration number and title is located to the bottom of the illustration. If the figure includes more sheets, the sheets number is shown in the title.

WARNINGS, CAUTIONS AND NOTES

WARNINGS, CAUTIONS and NOTES used in this Job Guide are defined as follows:

WARNING

AN OPERATING OR MAINTENANCE PROCEDURE, PRACTICE, CONDITION OR STATEMENT WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN INJURY TO OR DEATH OF PERSONNEL.



CAUTION

An operating or maintenance procedure, practice, condition or statement which if not strictly observed, could result in damage to, or destruction of equipment or loss of mission effectiveness or long term health hazards to personnel.

NOTE

An essential operating or maintenance procedure, practice, condition or statement which requires to be highlighted.

STANDARD MAINTENANCE PRACTICES

Instructions in this manual represent planned action for conditions normally encountered during maintenance.

It is almost impossible to account for maintenance difficulties that may be only occasionally encountered. Therefore, the use of local decisions suitably authorized for general repair practices, not involving safety of flight, is acceptable to avoid unnecessary delay when there is no coverage in the manual. Standard practices are executed when performing maintenance such as: replace used o-rings, cotter pins, and self-locking nuts; cap and plug disconnected hoses, tubes, fittings, and ports; protect disconnected electrical plugs, receptacles, and bleed air ducts; and clean up spilled fluids.

ACCESS PANELS

All the access panels that must be removed/installed and all the doors that must be opened/closed in this job guide are illustrated in the "General Maintenance" section.

> 27-00-00 2-21



AIRCRAFT ZONING

The Aircraft Zoning used in this JG Manual has been established, quickly in order to locate and identify, from the recommended personnel, the areas and access panels in the aircraft. The Aircraft Zoning is based on three figure groups: major zone, minor zone, access doors and panels.



1—		2-31 LOAD FEEL SPRING - REMOVAL AND INSTALLATION		
		INPUT CONDITION:		
		Aircraft Applicability:		
		XXXX.XXXX		
		Required Conditions:		
		 Disconnect electrical power (refer to manual XXX.1C-27J-2-00-GV). 		
		 Isolate hydraulic power (refer to manual XXX.1C-27J-2-00-GV). 		
		3. Position Maintenance Platform (AGE NO. 00074).		
	4. Open access panel 322E.			
		Recomended Personnel:		
		None		
•		AGE Required:		
2—	İ	AGE NOMENCLATURE P/N		
		00054 Kit, torque wrenches G0001200001-001**		
		000/4 Kit, aircraft assy platform G0005100001 00181 Kit, flight controls rigging 11G001-C052200-801 pins		
		Consumable Material Required:		
		LCM NOMENCLATURE P/N QTY		
		00052 PIN, COTTER MS24665-153 1,00		
		<u>Safety Conditions:</u> Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing		
	maintenance.			
		27-20-30 2-290		

1. MAINTENANCE PARAGRAPH AND TITLE.

2. INPUT CONDITION AREA.

Figure 1 (sheet 1/3) C27J-JG-INTRO-001





PROCEDURE AREA.
 FOLLOW MAINTENANCE AREA.

C27J-JG-INTRO-002

Figure 1 (sheet 2/3)





1. LOCATION ZONE / SUB ZONES 2. LOCATION ASSEMBLY / SUB ASSEMBLY 6. FIGURE TITLE 3. ITEM NUMBER 4. FIGURE NUMBER

- 5. SHEET NUMBER
- 7. DETAIL IDENTIFICATION
- 8. DETAIL REFERENCE

C27J-JG-INTRO-003

Figure 1 (sheet 3/3)



LIST OF ABBREVIATION

ABBREVIATION	DESCRIPTION
AC	Alternating Current
ACMP	Alternate Current Motor Pump
ACOC	Air Cooled Oil Cooler
ADU	Annunciator Dimmer Unit
AGE	Aircraft Ground Equipment
AMP	Ampere
APU	Auxiliary Power Unit
AR	As Required
ASM	Air Separator Module
Assy	Assembly
ATU	Antenna Tuning Unit
BAU	Bus Adapter Unit
BIU	Bus Interface Unit
Bkdn	Breackdown
BOM	Bills of Material
BPCU	Bus Power Control Unit
C.I.R.	Cleaning, Inspection and Repair Manual
CCDL	Cross Channel Data Link
CDP	Compressor Discharge Pressure
CDT	Compressor Discharge Temperature
CDU	Cargo Dimmer Unit
CGV	Compressor Variable Geometry
СН	Chapter
CIP	Compressor Inlet Pressure
CIT	Compressor Inlet Temperature
CMDU	Color Multifunction Display Unit
CMM	Component Maintenance Manual
CNI-MU	Communication/Navigation/Information Management Unit
CNRP	Communication/Navigation Radio Panel
CPC	Cabin Pressure Controller
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ABBREVIATION	DESCRIPTION
CS	Center Section
CSN	Catalogue Sequence Number
CSN	Catalogue Sequence Number
CSU	Central Switching Unit
CVG	Compressor Variable Geometry
CVR	Cockpit Voice Recorder
DA	Digital Autopilot
DADS	Distributed Air Data System
DASS	Defensive Aids Sub-System
DC	Direct Current
DFDR	Digital Flight Data Recorder
DITU	De-ice Timer Unit
DMM	Data Memory Module
DSDTU	Dual Slotted Data Transfer Unit
DSMCP	Defensive System Master Control Panel
ECDS	Enhanced Countermeasure Dispensing System
EDP	Engine Driven Pump
EMMU	External Mass Memory Unit
EPGS	Electrical Power Generation System
EWMU	Electronic Warfare Management Unit
Exh	Exhaust
Ext	External
F	Fahrenheit
FADEC	Fuel Authority Digital Electronic Control
FCOC	Fuel Cooled Oil Cooler
FCS	Flight Control System
FD	Flight Director
FFM	Fuel Flow Meter
FI	Fault Isolation
Fig.	Figure
Figs.	Figures
Flex	Flexible



ABBREVIATION	DESCRIPTION
FPMU	Fuel Pump Metering Unit
FQCU	Fuel Quantity Control Unit
Fr	Frame
FR	Fault Reporting
FSDU	Flight Station Dimmer Unit
FSN	Fleet Serial Numbers
FTEPS	Fuel Tanks Explosion Protection System
FWD	Forward
GCU	Generator Control Unit
GDMU	Global Digital Map Unit
GMAD	Gearbox Mounted Accessory Drive
GPS	Global Positioning System
GS	General System
GV	General Vehicle
HEU	Hud Electronic Unit
HIU	Headset Interface Unit
HLS	High Level Sensor
HP	High Pressure
HPA	High Power Amplifier
HUD	Head Up Display
Hz	Hertz
ICN	Illustration Control Number
ICS	Intercommunication System
IFRCU	In Flight Refuelling Control Unit
IGV	Inlet Guide Vane
Illus	Illustration
in	Inch
Instl	Installation
Intl	Internal
IPC	Illustrated Parts Catalogue
IPL	Illustrated Parts List
JG	Job Guide
JOM	Jam Override Mechanism

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ABBREVIATION	DESCRIPTION
Kg	Kilogram
Kohm	Kilo Ohm
KVA	Kilo Volt Ampere
Latl	Lateral
Lb	Pound
Lbs	Pounds
LCM	List Consumable Material
LCU	Logic Control Unit
LE	Leading Edge
LH	Left Hand
LNA	Low Noise Amplifier
LOP	Low Oil Pressure
LSWD	Low Speed Warning Device
Lwr	Lower
LWS	Laser Warning System
m	Meter
MAX	Maximum
MDT	Mission Data Table
MFRC	Manufacturer Code
MGT	Measured Gas Temperature
MHIU	Modified Headset Interface Unit
MIN	Minute(s)
MLG	Main Landing Gear
mm	Millimeter
MM	Maintenance Manual
MMR	Multi Mode Receiver
MPU	Magnetic Pulse Unit
MWS	Missile Warning System
Ν	Newton
NHA	Next Higher Assembly
NI	Not Illustrated
NIU	Nacelle Interface Unit
NLG	Nose Landing Gear



ABBREVIATION	DESCRIPTION
NO No.	Number
Nos.	Numbers
NP	Non Procurable
OAT	Outside Air Temperature
OHU	Overhead Unit
OM	Operations Manual
OSG	Overspeed Governor
PBIT	Power-On Built In Test
PCU	Pitch Control Unit
PDU	Power Distribution Unit
PFD	Primary Flight Display
PGB	Propeller Gearbox
POrM	Plus or Minus
PSN	Product Sequence Numbers
PUAD	Power Unit Accessory Drive
PubN	Publication Number
PWR	Power
RCU	Remote Control Unit
Ref	Reference
RF	Radio Frequency
RH	Right Hand
RMI	Radio Magnetic Indicator
RRSC	Remote Radio Set Control
RT	Receiver Transmitter
RTLU	Rudder Travel Limitator Unit
RWR	Radar Warning Receiver
SAMU	Single Avionics Management Unit
SATCOM	Satellite Communications
SDU	Sequencer & Dispencer Unit
Sep.	Separate
Sht	Sheet
Shts	Sheets
SKC	Search Key Code

ххх



ABBREVIATION	DESCRIPTION
Spec	Specification
SUBCH	Sub-Chapter
SWS	Stall Warning System
Т.О.	Technical Order
ТВА	To Be Added
TBD	To Be Define
TE	Trailing Edge
Thkns	Thickness
TPCS	Temperature Compensated Pressure Switch
TRU	Transformer Rectifier Unit
UHF	Ultra High Frequency
ULB	Underwater Locator Beacon
V	Volt
VA	Volt Ampere
W	Watt
WHCU	Windshield Heating Control Unit
WOW	Weight on Wheels



LIST OF INCORPORATED MODIFICATION

This list contains only Prescrizione Tecnica Ditta (PTD) affecting the contents of this manual. Following embodiment of a modification in all affected aircraft, the corresponding number will not be deleted from this list, but the information regarding the pre-modification configuration will be deleted from the manual.

NOT APPLICABLE


SECTION I

GENERAL MAINTENANCE PROCEDURES

1-1 PRIMARY FLIGHT CONTROLS - GENERAL MAINTENANCE

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Recomended Personnel:

Not Provided

AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00088	PRESERVATIVE OIL	MIL-PRF-6083F	AR

Safety Conditions:

WARNING

DISCHARGE SYSTEM PRESSURE BEFORE REMOVING ANY HYDRAULIC COMPONENT.



CAUTION

Cap the disconnected hydraulic tubes immediately after removing the component. After having fitted the hydraulic component, fill and bleed the system, pressurize it and check for leaks.

PRIMARY FLIGHT CONTROLS

- 1.Refer to paragraph GROUND HANDLING SAFETY PRECAUTIONS (refer to manual TCH.1C-27J-2-09JG) and paragraph GROUND SAFETY RULES (refer to manual TCH.1C-27J-2-00GV) for general safety instructions to be considered in performing maintenance on aircraft.
- 2. Make certain that the control surfaces and the surrounding area are clear of tools that could interfere with control surfaces movement.
- 3. To prevent any damage to components of directional trim control system, do not operate the system unless the aircraft hydraulic system is pressurised.
- 4. After replacement of any component in the hydraulic system, restore the fluid level in the reservoirs and carry out a complete cycle of manoeuvres of the relevant system before the next flight.
- 5. If particular hydraulic contamination event occurs, check and clean internal filters.
- 6. Hydraulic fluid is acid. Prevent contact with skin. Screw tops must be fixed on pipes after removal.
- 7. In many cases, corrosion results from fingerprints caused by careless handling. Avoid handling the units when not necessary and keep all disassembled parts submerged in preservative oil (LCM NO. 00088).



PROCEDURE:

1-1.1 LUBRICATION

For lubrication procedures and types of lubricants to be used, (refer to manual TCH.1C-27J-2-00GV).

1-1.2 PREPARATION

- 1. Connect hydraulic supply to the aircraft.
- Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- Connect headset to the external socket of the interphone system and switch on the system (refer to manual TCH.1C-27J-2-23JG).

NOTE

When the templates installation are required, apply a light force on the template itself in order to reduce or annull the possible offset due to skin surface waveness.





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1-2 SECONDARY FLIGHT CONTROLS - GENERAL MAINTENANCE

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00088	PRESERVATIVE OIL	MIL-PRF-6083F	AR

Safety Conditions:

WARNING

DISCHARGE SYSTEM PRESSURE BEFORE REMOVING ANY HYDRAULIC COMPONENT.



CAUTION

Cap the disconnected hydraulic tubes immediately after removing the component. After having fitted the hydraulic component, fill and bleed the system, pressurize it and check for leaks.

SECONDARY FLIGHT CONTROLS

- 1.Refer to paragraph GROUND HANDLING SAFETY PRECAUTIONS (refer to manual TCH.1C-27J-2-09JG) and paragraph GROUND SAFETY RULES (refer to manual TCH.1C-27J-2-00GV) for general safety instructions to be considered in performing maintenance on aircraft.
- 2. Make certain that the control surfaces and the surrounding area are clear of tools that could interfere with control surfaces movement.
- 3. To prevent any damage to components of directional trim control system, do not operate the system unless the aircraft hydraulic system is pressurised.
- 4. After the installation any component in the hydraulic system, restore the fluid level in the reservoirs and carry out a complete cycle of manoeuvres of the relevant system before the next flight.
- 5. If particular hydraulic contamination event occurs, check and clean internal filters.
- 6. Hydraulic fluid is acid. Prevent contact with skin. Screw tops must be fixed on pipes after removal.
- 7. In many cases, corrosion results from fingerprints caused by careless handling. Avoid handling the units when not necessary and keep all disassembled parts submerged in preservative oil (LCM NO. 00088).



PROCEDURE:

1-2.1 LUBRICATION

1.For lubrication procedures and types of lubricants to be used (refer to manual TCH.1C-27J-2-00GV).

1-2.2 PREPARATION

- 1. Connect the hydraulic supply to the aircraft.
- 2. Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Connect headset to the external socket of the interphone system and switch on the system (refer to manual TCH.1C-27J-2-23JG).





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1-3 JOM RE-ENGAGEMENT PROCEDURE

INPUT CONDITION:

Aircraft Applicability:

4162, 04180,

Required Conditions:

None

Recomended Personnel:

Not Provided

AGE Required:

AGE No.	NOMENCLATURE	P/N
00227	Jam override resetting tool	26H-G2262735004-001

Consumable Material Required:

None

Safety Conditions:

None

PROCEDURE:

1-3.1 JOM RE-ENGAGEMENT PROCEDURE.

- 1. Block the right lever with the relevant rigging pin.
- 2. Place the JOM override resetting tool on the disconnection mechanism.



1-3.1 JOM RE-ENGAGEMENT PROCEDURE. (Cont'd)

- 3. Screw the tool pin unit the point doesn't touch the roller.Pay attention that the tool pin axis coincides with the roller axis.
- 4. Allow the cam concavity to coincident with roller, then, screw the pin slowly until the mechanism is engaged. After this operation, check that the two axes are stiff each other.
- 5. Disconnect the resetting tool.

FOLLOW ON MAINTENANCE:

None







1-4 <u>AEROSPACE GROUND EQUIPMENT (AGE)</u> LIST

_	AGE No.	NOMENCLATURE	P/N
	00002	Kit, air data accessories	ADAC27J-945
	00006	Jam override adapter	ATCN6050
	00007	Fixture, control stick force/travel measurement	ATCN6149
	00008	Fixture, pedal force measurement	A34151-000
	00009	Kit, spoiler slack measurement	A34195-000
	00013	Kit, spoiler check templates	A34321-000
	00016	Sling assy, horizontal stabilizer	A34781-000
	00023	Kit elevator balance tab slack measurement	A35603-000
	00024	Kit, flaps and aileron locking	A35653-000
	00025	Fixture, control wheel maneuver force measurement	A35681-000
	00034	Kit, dynamometers	A37781-000
	00036	Kit, aileron control lever locking	A37837-000
	00038	Kit, elevator balance tab check templates	A37901-000
	00039	Kit, aileron trim check templates	A38021-000
	00048	Test set, digital pitot static	DPS-500
	00053	Power unit (diesel motor)	GPU 50 MDI1ALN**
	00054	Kit, torque wrenches	G0001200001-001**
	00061	Kit, digital inclinometers	G0002700001



AGE No.	NOMENCLATURE	P/N
00062	Kit, comparators	G0002700002
00063	Kit, aileron balance tabs check templates	G0002710001
00064	Kit, ailerons check templates	G0002710002
00065	Kit, elevator - trims check templates	G0002730001
00066	Fixture control wheel travel measurement	G0002731001
00067	Kit, flaps check templates	G0002750001
00074	Kit, aircraft assy platform	G0005100001
00079	Locking tool for copilot control stick	G0312730001
00106	Templates, rudder check	G0342730001
00113	Tensiometer	T60-1001C8-1A**
00114	Clinometer	MCL90
00117	External Electrical Feeder 115/200 Va.c 400 Hz	26-6D
00181	Kit, flight controls rigging pins	11G001-C052200-801
00183	Kit, aileron balance tab control locking	11G2-1145760000-001
00227	Jam override resetting tool	26H-G2262735004-001
00262	Test stand, hydraulic system (diesel engine)	846805-D**
00263	Test stand, hydraulic system (electric engine)	846805-E**



1-5 LIST OF CONSUMABLE MATERIAL

LCM No.	NOMENCLATURE	P/N
00009	NUT, SELF-LOCKING	H14-08
00010	PIN, COTTER	MS24665-155
00011	NUT, SELF-LOCKING	H14-3
00012	PIN, COTTER	MS24665-374
00013	NUT, SELF-LOCKING	H14-4
00014	NUT, SELF-LOCKING	MS21042L08
00015	NUT, SELF-LOCKING	MS21042-L3
00016	LOCK WIRE	MS20995C32
00017	PIN, COTTER	MS24665-134
00020	KEY WASHER	68867-101
00022	PIN, COTTER	MS24665-86
00023	NUT, SELF-LOCKING	H14-06
00025	NUT, SELF-LOCKING	MS21043-4
00027	PACKING, PREFORMED	M83461/2-908
00031	PACKING, PREFORMED	M83461/2-904
00032	O-RING, PREFORMED	M83461/2-906
00033	PIN, COTTER	MS24665-162
00034	PIN, COTTER	MS24665-300
00035	NUT, SELF-LOCKING	MS21042L4
00036	PIN, COTTER	MS24665-154
00037	PACKING, PREFORMED	MS28778-6
00038	PACKING, PREFORMED	MS28778-5
00039	PACKING, PREFORMED	MS28778-4
00040	NUT, SELF-LOCKING	H14-5
00041	PIN, COTTER	MS24665-302
00043	HYDRAULIC FLUID	MIL-PRF-83282D
00052	PIN, COTTER	MS24665-153
00069	NUT, SELF-LOCKING	MS21043-3



 LCM No.	NOMENCLATURE	P/N
00073	PACKING, RETAINER	MS28773-04
88000	PRESERVATIVE OIL	MIL-PRF-6083F
00110	PACKING,	MS29513-122
	PREFORMED	
00179	RING, LOCKING	68538-101
00204	NUT, SELF-LOCK	NAS1726-3E
00370	NUT, SELF-LOCKING	MS14144L3
00407	RETAINER, PACKING	MS9058-06
00408	NUT, LOCKING	68537-101
00433	AEROSHELL 17	MIL-G-21164D
00434	AEROSHELL	MIL-G-21164D
	33MS077009	





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SECTION II

FLIGHT CONTROL SYSTEM

2-1 FLIGHT CONTROLS - SAFETY PRECAUTIONS

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00088	PRESERVATIVE OIL	MIL-PRF-6083F	AR

Safety Conditions:

- 1.Refer to paragraph GROUND HANDLING SAFETY PRECAUTIONS (refer to manual TCH.1C-27J-2-09JG) and paragraph GROUND SAFETY RULES (refer to manual TCH.1C-27J-2-00GV) for general safety instructions to be considered in performing maintenance on aircraft.
- 2. Make certain that the control surfaces and the surrounding area are clear of tools that could interfere with control surfaces movement.
- 3. To prevent any damage to components of directional trim control system, do not operate the system unless the aircraft hydraulic system is pressurised.
- 4. Discharge system pressure before removing any hydraulic component.



- 5. After the installation of any component in the hydraulic system, restore the fluid level in the reservoirs and carry out a complete cycle of manoeuvres of the relevant system before the next flight.
- 6.Cap the disconnected hydraulic tubes immediately after removing the component. After having fitted the hydraulic component, fill and bleed the system, pressurise it and check for leaks.
- 7. If particular hydraulic contamination event occurs, check and clean internal filters.
- 8. Hydraulic fluid is acid. Prevent contact with skin. Screw tops must be fixed on pipes after removal.
- 9. In many cases, corrosion results from fingerprints caused by careless handling. Avoid handling the units when not necessary and keep all disassembled parts submerged in preservative oil (LCM NO. 00088).



2-2 PRIMARY FLIGHT CONTROLS - GENERAL FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	5,00	
	ELT	1	5,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 10 (Min.) Total Time Detention System: 5 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

None

PROCEDURE:

27-00-25 2-3



WARNING

MAKE CERTAIN THAT THE CONTROL SURFACES AND THE SURROUNDING AREA ARE CLEAR OF TOOLS THAT COULD INTERFERE WITH CONTROL SURFACES MOVEMENT.

CAUTION

To prevent any damages to components of directional trim control system, do not operate the system unless the aircraft hydraulic system is pressurized.

2-2.1 GENERAL

Before carrying out the functional test bleed completely spoiler and rudder control hydraulic systems. Noise, buffeting and vibration of these surfaces are symptoms of presence of air in the hydraulic system.

2-2.2 PREPARATION

- 1. Connect hydraulic supply to aircraft.
- Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- Connect headset to the external socket of the interphone system and switch on the system (refer to manual TCH.1C-27J-2-23JG).

NOTE

When the templates installation are required, apply a light force on the template itself in order to reduce or annull the possible offset due to skin surface waveness.



FOLLOW ON MAINTENANCE:

None

27-00-25 2-5





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2-3 CHECK AND ACCEPTABLE LIMITS OF CONTROL CABLES - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

Not Provided

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

None

PROCEDURE:

1.For control cables check and acceptable limits (refer to manual TCH.1C-27J-2-00GV).

FOLLOW ON MAINTENANCE:

None





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TCH.1C-27J-2-27JG

2-4 CHECK OF CLEARANCES BETWEEN PULLEYS AND GUARD PINS - OTHER CHECK

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

1.To check clearances between the flight controls pulleys and related guard pins, refer to Table 2-1.



Table 2-1. Clearance between flight controls pulleys and guard pins

CONTROL LINE	CABLE DIAMETER	CLEARANCE
Ailerons	Cable 5/32" (4 mmm)	0.039 thru 0.078 in (1 thru 2 mm)
	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)
Rudder	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)
Elevator	Cable 5/32" (4 mm)	0.039 thru 0.078 in (1 thru 2 mm)
	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)
Pitch trim	Cable 1/8" (3.2 mm)	0.031 thru 0.059 in (0.8 thru 1.5 mm)
Flaps	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)

FOLLOW ON MAINTENANCE:

None

27-00-25 2-10



2-5 SECONDARY FLIGHT CONTROLS -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00061	Kit, digital inclinometers	G0002700001
00067	Kit, flaps check templates	G0002750001
00117	External Electrical Feeder 115/200 Va.c 400 Hz	26-6D
	or alternate:	
00262	Test stand, hydraulic system (diesel engine)	846805-D**



Consumable Material Required:

None

Safety Conditions:

PROCEDURE:

2-5.1 GENERAL

Before performing the functional tests bleed completely flaps and lift dumpers control hydraulic systems. Noise, buffeting and vibration of these surfaces are symptoms of presence of air in the hydraulic system.

1. In case of the FLAP CONTROL SYSTEM troubleshooting requires to perform the flap rigging, it is necessary to perform the below desribed functional test / adjustement by respecting the following order : A. Preparation as described in following Paragraph. B. Adjustement of flap control lever. C. Visual check (refer to para 2-68) FOLLOW ON MAINTENANCE, step from 9 to 11.E. D. Bungee installation (refer to para 2-76) . E. Flaps adjustement (refer to manual TCH.1C-27J-2-57JG) . F. Flap functional check from hyd sys No. 1.

2-5.2 PREPARATION

- 1.Supply (AGE NO. 00262) the hydraulic pressure to 3000 psi, (210 kg/cm²). Set the flow rate at least 6.6 gpm (25lt/min).
- 2. Install the template (AGE NO. 00067) for flaps surfaces travel check. Do not install the two brackets on the template.



2-5.2 PREPARATION (Cont'd)

NOTE

When the templates installation are required, apply a light force on the template itself in order to reduce or annull the possible offset due to skin surface waveness.

- 3. On flap control panel, ensure that the flap control lever is to UP position and the flap surfaces are retracted (0 position).
- 4. Fit on the inner and outer flaps surfaces the four inclinometer (AGE NO. 00061) (use biadhesive tape), non in contact with their rivets. Switch on the inclinometer and perform the proper calibration so that the inclinometer assume their zero reference with the flaps up position (related angle shall be set). Remove the template.
- 5. Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 6.Close the following circuit breaker to feed the flap system:
 - A.FLAP ASYM (1CA) (6) located on Rear Mid Circuit Breaker Panel (451VE) (5) in position L 3 (refer to figure 2-1, sheet 2/2).
 - B.FLAP ASYM (12CA) (4) located on Rear Upper Circuit Breaker Panel (452VE) (3) in position H 4 (refer to figure 2-1, sheet 2/2).
 - C.FLAP IND (3CA) (2) located on Overhead Circuit Breaker Panel (271VE) (1) in position F 14 (refer to figure 2-1, sheet 1/2).
- 7. Power-up the avionic system in order to have the availability the cockpit displays (ACAWS and FD Maintenance Page).
- 8.Connect headset to the external socket of the interphone system and switch on the system (refer to manual TCH.1C-27J-2-34JG).



2-5.2 PREPARATION (Cont'd)

9. It is assumed that left and right flap transducer have been already checked (as resistance requirement) before installation. The main characteristics are, reported in the Table 2-2.

Flap lever position	Outer Flap Surface Travel	Nominal Resistence-ohms	Position % of applied nominal voltage to the transducer
Up	0°-1mm/+7mm	33.8	6.76 %
1	11.25°	135.2	27.04 %
2	22.5°	231	46.02 %
3	33.75°	331	66.02 %
Full	45°	422	84.40 %

Table 2-2. Flap adjustment and specification

FOLLOW ON MAINTENANCE:

None





(sheet 1/2)

27-00-30 2-15





27-00-30 2-16



2-6 AILERON CONTROL SYSTEM - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1.Before proceed through the Functional Test (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	2	185,00	
Follow Maintenance	AFM	1	5,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 375 (Min.) Total Time Detention System: 190 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00025	Fixture, control wheel maneuver force measurement	A35681-000
00061	Kit, digital inclinometers	G0002700001
00064	Kit, ailerons check templates	G0002710002
00066	Fixture control wheel travel measurement	G0002731001
00181	Kit, flight controls rigging pins	11G001-C052200-801



AGE No.	NOMENCLATURE	P/N
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	1,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.

PROCEDURE:

NOTE

This procedure is valid for LH control wheel. For RH control wheel is similar.

- 2-6.1 TRAVEL CHECK OF THE CONTROL WHEEL (refer to figure 2-2, sheet 1/8)
 - 1. Fit the fixture control wheel travel measurement (AGE NO. 00066) on pilot control wheel, fit on it the inclinometer (AGE NO. 00061) in order to check the control wheel travel.
 - 2. Perform some manoeuvre on pilot control wheel all-to-left and all-to-right position and check that angular travel is $80.75^{\circ} -0^{\circ} / + 2^{\circ}$ (read on inclinometer) in both position. Furthermore also check that the whole control is free without interferences.
 - 3. Remove the fixture control wheel travel measurement (AGE NO. 00066) from the control wheel.

TCH.1C-27J-2-27JG



2-6.2 AILERON AND GEAR TRIM TAB TRAVEL

(refer to figure 2-2, sheet 3/8) and (refer to figure 2-2, sheet 2/8)

NOTE

This procedure is valid for LH aileron. For RH aileron is similar.

- 1. Disconnect external AC power supply from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic supply (refer to manual TCH.1C-27J-2-00GV).
- 3. Fit Aileron check template (AGE NO. 00064) on top surface of right and left outer wing.
- 4. Put the double side adhesive tape on the top surface of the aileron and the trim tab/geared tab, non in contact with their rivets, and position on it the digital inclinometers (AGE NO. 00061), parallel to the template.
- 5. Acting on control wheel set the aileron surfaces in neutral position. Aileron displacement should be $0^{\circ} \pm 0.25^{\circ}$ as read on the templates.
- 6.Reset the inclinometer (AGE NO. 00061), then remove the templates.
- 7. With aileron surfaces in neutral position check that the clearance between wing trailing edge and aileron surface is 0.394 in +0.059/-0.157 in (10 mm + 1.5/-4 mm).
- 8. Turn LH (RH) control wheel fully right and keep it in this position:

-the right aileron must travel $26^{\circ} \pm 1^{\circ}$ upwards and the left aileron must travel $19^{\circ} \pm 1^{\circ}$ downwards position;

-the right gear tab must travel downwards $19.75^{\circ} \pm 1^{\circ}$ and left gear trim tab must travel upwards $15.75^{\circ} \pm 1^{\circ}$ (Make the difference between the readings of the inclinometers (AGE NO. 00061)).

(Cont'd)



- 2-6.2 AILERON AND GEAR TRIM TAB TRAVEL (Cont'd)
 - 9. Turn control wheel fully left and keep it in this position:
 - -the left aileron must travel $26^{\circ} \pm 1^{\circ}$ upwards and the right aileron must travel $19^{\circ} \pm 1^{\circ}$ downwards position;
 - -the left gear trim tab must travel downwards $19.75^{\circ} \pm 1^{\circ}$ and right gear tab must travel upwards $15.75^{\circ} \pm 1^{\circ}$ (Make the difference between the readings of the inclinometers (AGE NO. 00061)).
 - 10. Remove all tools previously installed.
- 2-6.3 MEASUREMENT OF AILERON MANOUVRE EFFORT (refer to figure 2-2, sheet 4/8)

CAUTION

Be sure that the No. 1 and No. 2 Hydraulic systems are not powered.

NOTE

This procedure is valid for LH control wheel. For RH control wheel is similar.

- 1. Ensure that there aren't installed templates on Aileron surface.
- 2.On the control wheel install the force measurement fixture (AGE NO. 00025).
- 3. Rotate the control wheel fully rightwards and check that the manoeuvre force required does not exceed 70 N (7.14 kg) (15.74 lb).
- 4. Rotate the control wheel fully leftwards and check that the manoeuvre force required does not exceed 70 N (7.14 kg) (15.74 lb).
- 5.By means of hydraulic test stand (AGE NO. 00262) apply the hydraulic supply 3000 psi (210 Kg/cm²) and verify that the results step 3 and 4 are the same.

27-10-00

(Cont'd)
TCH.1C-27J-2-27JG



- 2-6.3 MEASUREMENT OF AILERON MANOUVRE EFFORT (refer to figure 2-2, sheet 4/8) (Cont'd)
 - 6. Remove from the control wheel the force measurement fixture (AGE NO. 00025).
- 2-6.4 AILERON BALANCE CHECK (refer to figure 2-2, sheet 5/8)

NOTE

This procedure is valid for LH aileron. For RH aileron is similar.

- 1.Fit aileron template (AGE NO. 00064) on the top surface of left and right outer wings.
- 2. Disconnect the rod connecting aileron trim position transmitter to the trim actuator from LH trim tab bellcrank (refer to para 2-16).
- 3. Disconnect rod (1) from bellcrank (6) by removing bolt (7), flat washers (4 and 5), castellated nut (3) and cotter pin (2). Discard removed cotter pin.
- 4. Disconnect mechanism connecting RH aileron geared tab (refer to manual TCH.1C-27J-2-57JG).
- 5. Check aileron balance according to the procedure described in Section I of AER(EP).1C-27J-3 manual.
- 6.Reconnect mechanism connecting RH aileron geared tab (refer to manual TCH.1C-27J-2-57JG).
- 7. Reconnect rod (1) at the bellcrank (6) by using bolt (7), washers flat (4 and 5), castellated nut (3) and new cotter pin (2) (LCM NO. 00052).
- 8. Reconnect the rod connecting aileron trim position transmitter to the trim actuator at the LH trim tab bellcrank (refer to para 2-16).
- 9. Remove template (AGE NO. 00064) from the top surface of left and right outer wings.



- 2-6.5 SPRING TAB FREE TRAVEL CHECK (refer to figure 2-2, sheet 6/8) and (refer to figure 2-2, sheet 7/8)
 - 1. Ensure thath the LH and the RH spring tab is installed without the LH and RH fail safe rod is linked (LH and RH spring tab freely to move around the its hinge).
 - 2. Insert the rig pin 0.193 in (4,915 mm) (AGE NO. 00181) in the differential levers at rib 24 (LH and RH side) in order to set the LH and RH aileron in neutral position.
 - 3. On the LH and RH aileron, fit the aileron check template (AGE NO. 00064) in order to ensure that LH and RH aileron is really set to 0° position (this is verified using the situable control template tool that aligns the central part of the surfaces against the zero reference mark indicated on the aileron check template). Do not move the LH / RH aileron from this zero position. Fit the inclinometer (AGE NO. 00061) (parallel to the template using biadhesive tape) on the LH /RH aileron surface. Switch on the inclinometers (AGE NO. 00061), select the related angle and perform the calibration so that the inclinometer shown its 0° position. Remove the aileron check template (AGE NO. 00064) and the situable control template tool.
 - 4. Fit on the LH and RH the aileron spring tab check template (AGE NO. 00064) and on it the control rod tool.
 - 5. With the LH and RH aileron set to 0° position, move by hand the LH and RH spring tab so that the central part of the surface is aligned with zero reference mark indicated on the aileron spring tab check template (AGE NO. 00064). Hold by hand this position until next step 6. is completed.

(Cont'd)



2-6.5 SPRING TAB FREE TRAVEL CHECK (refer to figure 2-2, sheet 6/8) and (refer to figure 2-2, sheet 7/8) (Cont'd)

- 6.On LH and RH spring tab fit the digital inclinometer (AGE NO. 00061), parallel to the aileron balance tab check template (AGE NO. 00064), using adhesive tape. Switch on the inclinometer (AGE NO. 00061), select the related angle and perform the calibration so that the inclinometer shown its 0° position.
- 2-6.6 SPRING TAB FREE TRAVEL CHECK (refer to figure 2-2, sheet 6/8) and (refer to figure 2-2, sheet 8/8).
 - 1.On left aileron install balance tab templates and aileron travel template put the double side adhesivetape on the top surface of the ailerons and of the tabs, non in contact with their rivets, andposition on it the digital inclinometers, parallel to the templates.
 - 2. Ensure that L aileron trim tab and the L balance tab are to neutral position.
 - 3. Reset the inclinometers, then remove the templates.
 - 4. Check that the clearance between L balance tab and aileron and between L aileron trim tab andaileron is 0.08 in + 0.04 / 0 in (2 mm + 1 / 0 mm); check that the clearance between L balancetab and flap is 0.393 in \pm 0.078 in (10 mm \pm 2 mm), between L aileron balance tab and L ailerontrim tab is 0.20 in \pm 0.08 in (5 mm \pm 2 mm) and between L trim tab and aileron tip is 0.24 in \pm 0.08in (6 mm \pm 2 mm).
 - 5. Ensure that R outer balance tab and the R inner balance tab are to neutral position.



- 2-6.6 SPRING TAB FREE TRAVEL CHECK (refer to figure 2-2, sheet 6/8) and (refer to figure 2-2, sheet 8/8). (Cont'd)
 - 6. Check that the clearance between R inner balance tab and aileron and between R outer balancetab and aileron is 0.08 in + 0.04 / - 0 in (2 mm + 1 / - 0 mm); check that the clearance between Rinner balance tab and flap is 0.393 in \pm 0.078 in (10 mm \pm 2 mm), between R aileron inner balancetab and outer balance tab is 0.20 in \pm 0.08 in (5 mm \pm 2 mm) and between R outer balance taband aileron tip is 0.24 in \pm 0.08 in (6 mm \pm 2 mm).
 - 7. Remove the inclinometers and adhesive tape.

FOLLOW ON MAINTENANCE:

None





(sheet 1/8)







NOTE : THE ARRANGEMENT OF THE TEMPLATES ON THE RH OUTER WING IS SYMMETRICAL







NOTE : ALL DIMENSION ARE IN INCHES (IN MILLIMETERS) ICN-02-A-271

ICN-02-A-271000-A-A0170-00201-A-01-1

Figure 2-2 Aileron Control System - Functional Test (sheet 3/8)







DETAIL

ROD



Figure 2-2 Aileron Control System - Functional Test (sheet 5/8)







Figure 2-2 Aileron Control System - Functional Test (sheet 6/8)





Figure 2-2 Aileron Control System - Functional Test (sheet 7/8)







2-7 AILERON CONTROL CABLE TENSION -ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	150,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 150 (Min.) Total Time Detention System: 150 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00113	Tensiometer	T60-1001C8-1A**
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in Paragraph (refer to para) SAFETY PRECAUTIONS before performing maintenance.



PROCEDURE:

- 2-7.1 ADJUSTMENT CABIN CONTROL CABLES TENSION (refer to figure 2-3, sheet 1/7) and (refer to figure 2-3, sheet 2/7)
 - 1.Insert a 0.193 in (4.915 mm) diameter rigging pin (1) (AGE NO. 00181) in the pilot and copilot control wheel (2) in order to set to neutral position.
 - 2. Open the access panels 130B and 130C (LH and RH side) and place the first quadrant (LH and RH side) (3 and 6) in neutral position inserting a rigging pin 0.193 in (4.915 mm) (4 and 5) (AGE NO. 00181) in the pulley.
 - 3. Install the cables from the Pilot and Copilot control wheel (2) to the related first quadrant (3 and 6), then stretch them, by means of the turnbuckles (7) located at frame 3b (refer to figure 2-3, sheet 3/7).

NOTE

When the cables stretching is complete, check that the terminal lugs are tightened on the turnbuckle coupling with the same number of turns. Furthermore check that not more than 3 threads are visible on each terminal lug.

NOTE

The cables, as reported in figure, have two different sections around the turnbuckles (1.8" and 5/32") (3.2 and 4 mm). The tension value considers the smallest section.

4. Remove the rigging pins (1 and 4) (AGE NO. 00181) from both control wheels (2) and from LH first quadrant (3). Reinsert the rigging pin (4) (AGE NO. 00181) in the LH first quadrant (3) and check that the rigging pins (4) can be inserted freely on the both control wheels (2) without causing any movement of the control.

(Cont'd)



2-7.1 ADJUSTMENT CABIN CONTROL CABLES TENSION (refer to figure 2-3, sheet 1/7) and (refer to figure 2-3, sheet 2/7) (Cont'd)

NOTE

If the above requirement is not obtained, re-adjust the cable tension properly.

- 5. Check that the control wheels (2) rotations are free without interferences.
- 6. Check that the clearance between all quadrants ends and the cable guard bolts for the whole aileron control is in the range 0.039 to 0.06 in (1 to 1.6 mm) (cable 3.2 mm), range 0.039 to 0.078 in (1 to 2.00 mm) (cable 4 mm) (Table 2-3).

Table 2-3. Clearance between flight controls pulleysand guard pins

CONTROL LINE	CABLE DIAMETER	CLEARANCE
Ailerons	Cable 5/32" (4 mmm)	0.039 thru 0.078 in (1 thru 2 mm)
	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)
Rudder	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)
Elevator	Cable 5/32" (4 mm)	0.039 thru 0.078 in (1 thru 2 mm)
	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)
Pitch trim	Cable 1/8" (3.2 mm)	0.031 thru 0.059 in (0.8 thru 1.5 mm)
Flaps	Cable 1/8" (3.2 mm)	0.039 thru 0.062 in (1 thru 1.6 mm)

7. Close the access panel 130B and 130C.



- 2-7.2 ADJUSTMENT AUTOPILOT CONTROL CABLES TENSION (refer to figure 2-3, sheet 4/7) and (refer to figure 2-3, sheet 5/7)
 - 1. Place the right aft quadrant (8) (central wing section) in neutral position inserting rigging pins (9) (AGE NO. 00181).
 - 2. Insert the rigging pin (AGE NO. 00181) (13) in the drum autopilot actuator (14).
 - 3. Install the autopilot cable (12) between the right aft quadrant (8) and the autopilot actuator quadrant (14), then stretch it by means of the turnbuckles (15). (refer to figure 2-3, sheet 3/7)

NOTE

When the cables stretching is complete, check that the terminal lugs are tightened on the turnbuckle coupling with the same number of turns. Furthermore check that not more than 3 threads are visible on each terminal lug.

4. Remove the two rigging pins (9 and 13) from the right aft quadrant (8) (central wing section) and drum autopilot actuator (14). Reinsert the rigging pin (9 and 13) in the right aft quadrant (central wing section) and the drum autopilot actuator (14) and check that the rigging pins (9 and 13) can be inserted freely without causing any movement of the control.

NOTE

If the above requirement is not obtained, re-adjust the cable tension properly.

5. Verify that the clearance between all quadrants and the cable guard bolt for the whole aileron control is in the range 0.039 to 0.062 in (1 to 1.6 mm) cable Dia 0.125 in (3.2 mm).



- 2-7.3 ADJUSTMENT FUSELAGE CONTROL CABLES TENSION (refer to figure 2-3, sheet 1/7) and (refer to figure 2-3, sheet 4/7)
 - 1. Ensure that the rigging pin (4) (AGE NO. 00181) is inserted in the axle (3).
 - 2. Insert two rigging pins (9 and 10) (AGE NO. 00181) on the LH and RH quadrant (8 and 11) located in centre wing section.
 - 3. Install the cables on the Pilot and Copilot line (LH and RH side) and stretch them, acting on the appropriate turnbuckles (7), so that the tension regulator position is in accordance with the diagram (refer to figure 2-3, sheet 3/7).
 - 4. Remove the three rigging pins (4, 9 and 10) (AGE NO. 00181) then re-insert the rigging pin in the quadrant. Check that the two rigging pins (9 and 10) in the LH and RH quadrant (8 and 11) in the centre wing section can be inserted freely without causing any movement of the control.
 - 5. Ensure that the rigging pins (9 and 10) (AGE NO. 00181) are inserted in LH and RH quadrant (8 and 11) in the center wing section.
 - 6. Install the interconnecting cables between LH and RH quadrant (8 and 11) and stretch them, acting on the appropriate turnbuckles (15).
 - 7. Remove and re-insert the rigging pins (9 and 10) (AGE NO. 00181) in the LH and RH quadrant (8 and 11) several times checking that they enter freely without causing any movement of the control.
- 2-7.4 ADJUSTMENT OUTER WING INSTALLATION AND CONTROL CABLES TENSION (refer to figure 2-3, sheet 4/7) and (refer to figure 2-3, sheet 6/7)
 - 1.Ensure that the rigging pins (9 and 10) (AGE NO. 00181) are inserted in left and right quadrant (8 and 11) in the center wing section.

(Cont'd)



- 2-7.4 ADJUSTMENT OUTER WING INSTALLATION AND CONTROL CABLES TENSION (refer to figure 2-3, sheet 4/7) and (refer to figure 2-3, sheet 6/7) (Cont'd)
 - 2. Insert two additional rigging pins (17) (AGE NO. 00181) in left and right quadrant (16) located between ribs 23 and 24.
 - 3. Install the control cables on the left (right) quadrant in the center wing and on the quadrant of the left (right) outer wing along side the left (right) wing and stretch them, acting on the appropriate turnbuckles (15), (refer to figure 2-3, sheet 7/7).
 - 4. Remove and re-insert the rigging pins (9, 10 and 17) (AGE NO. 00181) in centre section and outer wing quadrant (8, 11 and 16) several times, checking that they enter freely without causing any movement of the control.
 - 5. Measure the clearance between all quadrants end and the cable guard bolt for the whole aileron control and check that is in the following range:
 - -0.039 thru 0.078 in (1 thru 2 mm) (cable diameter 5/32 " (4mm));
 - -0.039 thru 0.062 in (1 thru 1.6 mm) (cable diameter 1/8" (3.2 mm)).

FOLLOW ON MAINTENANCE:

None





Figure 2-3 Aileron Control Cable Tension - Adjustment (sheet 1/7)







Figure 2-3 Aileron Control Cable Tension - Adjustment (sheet 2/7)





CABLE TENSION FROM CONTROL WHEEL TO FIRST QUADRANT











Figure 2-3 Aileron Control Cable Tension - Adjustment (sheet 5/7)







Figure 2-3 Aileron Control Cable Tension - Adjustment (sheet 6/7)





CABLE TENSION BETWEEN FIRST QUADRANT AND



2-8 AILERON TENSION REGULATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4.Open the access panels 130AD, 130AE, 130AH and 130AG.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 95 (Min.) Total Time Detention System: 95 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001



AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	1,00
00033	PIN, COTTER	MS24665-162	1,00
00052	PIN, COTTER	MS24665-153	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-8.1 REMOVAL (refer to figure 2-4, sheet 1/4), (refer to figure 2-4, sheet 2/4), (refer to figure 2-4, sheet 3/4) and (refer to figure 2-4, sheet 4/4)

NOTE

Here after is outlined the removal and installation of a aileron tension regulator, which is applicable to any one of the flight controls adjusters.

- 1. Insert a rigging pin (1) (AGE NO. 00181) in the control wheel (2) to set to neutral position.
- 2.Insert a rigging pin (5) (AGE NO. 00181) in LH quadrant (3).
- 3. Insert a rigging pins (40) in the LH sector group (41) in center wing.
- 4. Remove the clips (8, 10, 11 and 13) then acting on the turnbuckles (9 and 12).(if is necessary remove the LH AILERON FUSELAGE CABLE (refer to para 2-9)).



- 2-8.1 REMOVAL (refer to figure 2-4, sheet 1/4) , (refer to figure 2-4, sheet 2/4) , (refer to figure 2-4, sheet 3/4) and (refer to figure 2-4, sheet 4/4) (Cont'd)
 - 5. Disconnect from the LH quadrant (3) the cotter pins (6 and 7). Discard removed cotter pins.
 - 6.Draw out the aileron cables (4) from the LH quadrant (3).
 - 7. Draw out the aileron cables (37 and 39) from the left pulleys (36 and 38) upstream the tension adjuster.
 - 8. Disconnect from pulleys of the tension adjuster (34) the bolts (28 and 29), washers (20, 27, 30 and 31), nuts (18 and 32) and cotter pins (19 and 33). Discard removed cotter pins.
 - 9. Disconnect from the lower support (22) the Aileron Tension Regulator (34) by removing the bolt (21), washers (23 and 24), nut (25) and cotter pin (26). Discard removed cotter pin.
 - Disconnect from the upper support (17) the Aileron Tension Regulator (34) by removing the bolt (16), washer (15), nut (14) and cotter pin (35). Discard removed cotter pin.
 - 11. Remove the Aileron Tension Regulator (34).
- 2-8.2 INSTALLATION (refer to figure 2-4, sheet 1/4) , (refer to figure 2-4, sheet 2/4) , (refer to figure 2-4, sheet 3/4) and (refer to figure 2-4, sheet 4/4)
 - 1. Connect at the upper support (17) the Aileron Tension Regulator (34) by using the bolt (16), washer (15), nut (14) and new cotter pin (35) (LCM NO. 00052). Tighten bolt (AGE NO. 00054) to 10 thru 29 in lb.
 - 2. Connect at the lower support (22) the Aileron Tension Regulator (34) by using the bolt (21), washers (23 and 24), nut (25) and new cotter pin (26) (LCM NO. 00052). Tighten bolt (AGE NO. 00054) to 10 thru 29 in lb.

(Cont'd)



- 2-8.2 INSTALLATION (refer to figure 2-4, sheet 1/4), (refer to figure 2-4, sheet 2/4), (refer to figure 2-4, sheet 3/4) and (refer to figure 2-4, sheet 4/4) (Cont'd)
 - 3. Position the cables in the pulley of the tension adjuster (34) and connect the bolts (28 and 29), washers (20, 27, 30 and 31), nuts (18 and 32) and new cotter pins (19 and 33). Tighten bolts (AGE NO. 00054) to 10 thru 29 in lb.
 - 4. Install the aileron cables (37 and 39) on the left pulleys (36 and 38) upstream the tension adjuster.
 - 5. Position the aileron cables (4) on the LH quadrant (3). Lock the cables with a new cotter pins (6) (LCM NO. 00010) and (7) (LCM NO.00033).
 - 6. Restore the cables by means of turnbuckles (9 and 12) (if the cable has been removed install the LH AILERON FUSELAGE CABLE (refer to para 2-9)).

CAUTION

Do not perform the complete tension of the cable.

- 7. Install the clips (8, 10, 11 and 13) then acting on the turnbuckles (9 and 12).
- 8. Perform aileron fuselage cables tension (if the cable has been removed install the LH AILERON FUSELAGE CABLE) (refer to para 2-9).
- 9. Remove a rigging pins (40) from the LH sector group (41) in center wing.
- 10. Remove a rigging pin (5) (AGE NO. 00181) from LH quadrant (3).
- 11.Remove a rigging pin (1) (AGE NO. 00181) from the control wheel (2).



FOLLOW ON MAINTENANCE:

- 1.Close the access panels 130AD, 130AE, 130AH and 130AG.
- 2. Remove maintenance platform (AGE NO. 00074).
- 3.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 4. Restore Hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform the required test and adjustment:
 - A.When installation is completed adjust fuselage control cables tension (refer to para 2-7).





Figure 2-4 Aileron Tension Regulator - Removal and Installation (sheet 1/4)











Figure 2-4 Aileron Tension Regulator - Removal and Installation (sheet 3/4)







Installation (sheet 4/4)



2-9 LH (RH) AILERON FUSELAGE CABLE -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Remove Pilot (Copilot) seat (refer to manual TCH.1C-27J-2-25JG).
- 3. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV)
- 4. Position maintenance platform (AGE NO. 00074).
- 5. Open the access panels 553A, 553B and 553C.
- 6.To gain access to LH (RH) Aileron open following access panels 212AZ, 212BZ, 214BZ, 130AD, 130AH and 213AZ (212EZ, 212DZ, 213BZ, 130AE and 130AG).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	40,00	
Installation	AFM	1	45,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 115 (Min.) Total Time Detention System: 115 (Min.)





AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	1,00
00011	NUT, SELF-LOCKING	H14-3	8,00
00033	PIN, COTTER	MS24665-162	1,00
00052	PIN, COTTER	MS24665-153	1,00
00110	PACKING, PREFORMED	MS29513-122	AR

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

NOTE

This procedure is applicable of each fuselage cable.

- 2-9.1 REMOVAL (refer to figure 2-5, sheet 1/6), (refer to figure 2-5, sheet 2/6), (refer to figure 2-5, sheet 3/6), (refer to figure 2-5, sheet 4/6), (refer to figure 2-5, sheet 5/6) and (refer to figure 2-5, sheet 6/6)
 - 1. Insert a rigging pins (5) (AGE NO. 00181) in the Pilot (Copilot) control wheels (6).
 - 2. Insert a rigging pin (8) (AGE NO. 00181) in the LH Quadrant (7) for neutral position.

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(Cont'd)


- 2-9.1 REMOVAL (refer to figure 2-5, sheet 1/6), (refer to figure 2-5, sheet 2/6), (refer to figure 2-5, sheet 3/6), (refer to figure 2-5, sheet 4/6), (refer to figure 2-5, sheet 5/6) and (refer to figure 2-5, sheet 6/6) (Cont'd)
 - 3. Insert a rigging pin (23) (AGE NO. 00181) in the LH pulley (27) in center wing section.
 - 4. Insert a rigging pin (49) (AGE NO. 00181) in the aft pulley (42) in center wing section.
 - 5. Remove the retaining clips (15, 17, 18 and 20) then acting on the turnbuckles (16 and 19) between frames 10 and 12. After loosen completely turnbuckles (16 and 19).
 - 6. Remove from LH sector assy (7) the cotter pin (9). Discard removed cotter pin.
 - 7.Remove from RH sector assy (21) the cotter pin (22). Discard removed cotter pin.
 - 8. Release through pulleys (10, 11, 12, 13 and 14) LH (RH) Aileron Fuselage Cable (3 and 4).
 - 9. Complete release through pulleys (1 and 2) of the LH (RH) Aileron Fuselage Cable (3 and 4).
 - 10. Remove from support (28) of the LH pulley (27) the fairlead (26) by removing nut locking (24) and ring locking (25).
 - 11.Remove from support (43) of the aft pulley (42) the fairlead (41) by removing rings retaining (35 and 40), nuts locking (34 and 39), fairlead (36), sector (37) and spacer (38).
 - Remove from LH pulley (27) the cable-lock clevis (32) by removing bolts (33), washers (31), castellated nuts (29) and cotter pins (30). Discard removed cotter pins.
 - Remove from aft pulley (42) the cable-lock clevis (47) by removing bolts (48), washers (46), castellated nuts (44) and cotter pins (45). Discard removed cotter pins.

(Cont'd)



- 2-9.1 REMOVAL (refer to figure 2-5, sheet 1/6), (refer to figure 2-5, sheet 2/6), (refer to figure 2-5, sheet 3/6), (refer to figure 2-5, sheet 4/6), (refer to figure 2-5, sheet 5/6) and (refer to figure 2-5, sheet 6/6) (Cont'd)
 - 14. Remove fairleads (52 and 59) by removing bolts (50 and 57), washers (51, 53, 55, 58, 60 and 62) and self locking nuts (54, 56, 61 and 63). Discard removed self locking nuts.
 - 15. Remove the cables (3 and 4).
- 2-9.2 INSTALLATION (refer to figure 2-5, sheet 1/6), (refer to figure 2-5, sheet 2/6), (refer to figure 2-5, sheet 3/6), (refer to figure 2-5, sheet 4/6), (refer to figure 2-5, sheet 5/6) and (refer to figure 2-5, sheet 6/6)
 - 1.Install the cables (3 and 4) on the groove of the LH pulley (27) and aft pulley (42).
 - 2.Connect fairleads (52 and 591) by using bolts (50 and 57), washers (51, 53, 55, 58, 60 and 62) and new self locking nuts (54, 56, 61 and 63) (LMC NO. 00011).
 - 3. Install cables (3 and 4) on pulley (1 and 2).
 - 4. Connect the cables (3 and 4) with turnbuckles (16 and 19).

CAUTION

Do not perform the complete tension of the cable.

- 5. Install the cables (3 and 4) on the tension regulator pulley (10) and pulleys (11, 12, 13 and 14).
- 6.Insert in the RH sector assy (21) the new cotter pin (22) (LCM NO 00033).
- 7. Insert in the LH sector assy (7) the new cotter pin (9) (LCM NO 00010).

(Cont'd)



- 2-9.2 INSTALLATION (refer to figure 2-5, sheet 1/6), (refer to figure 2-5, sheet 2/6), (refer to figure 2-5, sheet 3/6), (refer to figure 2-5, sheet 4/6), (refer to figure 2-5, sheet 5/6) and (refer to figure 2-5, sheet 6/6) (Cont'd)
 - 8. Insert the retaining clips (15, 17, 18 and 20) then acting on the turnbuckles (16 and 19) and perform tension of cables (3 and 4) (refer to para 2-7).
 - 9. Connect at the LH pulley (27) the cable-lock clevis (32) by using bolts (33), washers (31), castellated nuts (29) and new cotter pins (30) (LMC NO. 00052)
 - 10. Connect at the aft pulley (42) the cable-lock clevis (47) by using bolts (48), washers (46), castellated nuts (44) and new cotter pins (45) (LMC NO. 00052).
 - 11.Connect at the support (43) of the aft pulley (42) the fairlead (41) by using rings retaining (35 and 40), nuts locking (34 and 39), fairlead (36), sector (37) and spacer (38).
 - 12. Connect at the support (28) of the LH pulley (27) the fairlead (26) by using nut locking (24) and ring locking (25).
 - 13. Remove a rigging pin (49) (AGE NO. 00181) from aft pulley (42) in center wing section.
 - 14. Remove a rigging pin (23) (AGE NO. 00181) from LH pulley (27) in center wing section.
 - 15. Remove a rigging pin (8) (AGE NO. 00181) from LH Quadrant (7).
 - 16.Remove a rigging pins (5) (AGE NO. 00181) from Pilot (Copilot) (6) control wheels.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).



- 3. Close the access panels to LH (RH) Aileron 212AZ, 212BZ, 214BZ, 130AD, 130AH and 213AZ (212EZ, 212DZ, 213BZ, 130AE and 130AG).
- 4. Close the access panels 553A, 553B and 553C.
- 5. Install Pilot (Copilot) seat (refer to manual TCH.1C-27J-2-25JG).
- 6. Perform the functional test and adjustment:
 - A.AILERON TENSION REGULATOR (refer to para 2-8).
 - B.TRAVEL CHECK OF THE CONTROL WHEEL (refer to para 2-6).
 - C.AILERON CONTROL SYSTEM (refer to para 2-7), (refer to para 2-14) and (refer to para 2-18).
 - D.MEASUREMENT OF AILERON MANOEUVRE EFFORT (without hydraulic) (refer to para 2-6).
 - E.FRICTION MANOEUVRE EFFORT AND BREAK-OUT CHECK (refer to para 2-22).
- 7. Remove maintenance platform (AGE NO. 00074).





Figure 2-5 LH (RH) Aileron Fuselage Cable - Removal and Installation (sheet 1/6)







Installation (sheet 2/6)







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Figure 2-5 LH (RH) Aileron Fuselage Cable - Removal and Installation (sheet 3/6)







Figure 2-5 LH (RH) Aileron Fuselage Cable - Removal and Installation (sheet 4/6)





Figure 2-5 LH (RH) Aileron Fuselage Cable - Removal and Installation (sheet 5/6)





Figure 2-5 LH (RH) Aileron Fuselage Cable - Removal and Installation (sheet 6/6)



2-10 AILERON OUTER WING CABLE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panels 553A, 553B and 553C.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	25,00	
Installation	AFM	1	30,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801





Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00011	NUT, SELF-LOCKING	H14-3	8,00
00052	PIN, COTTER	MS24665-153	6,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

NOTE

This procedure is applicable to the LH and RH aileron outer wing cables, LH and Aft pulleys in center wing section.

- 2-10.1 REMOVAL (refer to figure 2-6, sheet 1/4), (refer to figure 2-6, sheet 2/4), (refer to figure 2-6, sheet 3/4) and (refer to figure 2-6, sheet 4/4)
 - 1.Insert a rigging pin (1) (AGE NO. 00181) in the LH pulley (2) in center wing section.
 - 2. Insert a rigging pin (14) (AGE NO. 00181) in the pulley (15) in center wing section.
 - 3. Insert a rigging pin (33) (AGE NO. 00181) in LH and RH pulleys (34) in outer wing section between ribs 23 and 24.
 - 4. Remove from LH pulley in the center wing section (2) cable-lock clevis (7) by removing bolts (8), washers (6), castellated nuts (5) and cotter pins (4). Discard removed cotter pins.
 - Remove from aft pulley (15) cable-lock clevis (17) by removing bolts (16), washers (18), castellated nuts (19) and cotter pins (20). Discard removed cotter pins.

(Cont'd)



- 2-10.1 REMOVAL (refer to figure 2-6, sheet 1/4) , (refer to figure 2-6, sheet 2/4) , (refer to figure 2-6, sheet 3/4) and (refer to figure 2-6, sheet 4/4) (Cont'd)
 - 6. Remove plates (11) from fairleads (10) by removing bolts (9), washers (13) and self locking nuts (12). Discard removed self locking nuts.
 - 7. Remove from LH (RH) pulleys between ribs 23 and 24 (34) cable-lock clevis (38) by removing pins (35), washers flat (37) and cotter pins (36). Discard removed cotter pins.
 - 8. Remove LH (RH) upper fairleads (29) by removing bolts (30), washers (28) and self locking nuts (27). Discard removed self locking nuts.
 - 9. Remove the retaining clips (21, 23, 24 and 31) then, acting on the turnbuckles (22, 25 and 32), release the cable tension of all cable stretches (3).
 - 10.Loosen completely the turnbuckles (22, 25 and 32) then remove all cable stretches (3) from LH pulley in center wing section (2), aft pulley (15) and LH (RH) pulleys between ribs 23 and 24 (34).
- 2-10.2 INSTALLATION (refer to figure 2-6, sheet 1/4) , (refer to figure 2-6, sheet 2/4) , (refer to figure 2-6, sheet 3/4) and (refer to figure 2-6, sheet 4/4)
 - 1.Install cable stretch (3) on LH (RH) pulleys between ribs 23 and 24 (34).
 - 2. Position the cable stretch (3) in the grooves of the other pulleys (26).
 - 3. Install cable stretch (3) on LH pulleys (2) in the center wing section and in Aft pulley (15).
 - 4. Insert cable stretch (3) in the fairleads (10) and connect plates (11) by using bolts (9), washers (13) and new self locking nuts (12) (LCM NO. 00011).
 - 5. Insert cable stretch (3) in LH (RH) upper fairleads (29) and tighten bolts (30), washers (28) and new self locking nuts (27)(LCM NO. 00011).



- 2-10.2 INSTALLATION (refer to figure 2-6, sheet 1/4), (refer to figure 2-6, sheet 2/4), (refer to figure 2-6, sheet 3/4) and (refer to figure 2-6, sheet 4/4) (Cont'd)
 - 6. Insert the retaining clips (21, 23, 24 and 31) then, acting on the turnbuckles (22, 25 and 32).

CAUTION

Do not perform the complete tension of the cable.

- 7.Lock the turnbuckles (22, 25 and 32) and perform cable tension.
- 8. Connect at the LH (RH) pulleys between ribs 23 and 24 (34) cable-lock clevis (38) by using pins (35), washers flat (37) and new cotter pins (36) (LCM NO. 00052).
- 9. Connect at the aft pulley (15) cable-lock clevis (17) by using bolts (16), washers (18), castellated nuts (19) and new cotter pins (20) (LCM NO. 00052).
- 10. Connect at the LH pulley in the center wing section (2) cable-lock clevis (7) by using bolts (8), washers (6), castellated nuts (5) and new cotter pins (4) (LCM NO. 00052).
- 11. Remove a rigging pin (33) (AGE NO. 00181) from LH and RH pulleys (34) in outer wing section between ribs 23 and 24.
- 12. Remove a rigging pin (14) (AGE NO. 00181) from aft pulley (15) in center wing section.
- 13. Remove a rigging pin (1) (AGE NO. 00181) from the LH pulley (2) in center wing section.



FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3.Install Pilot (Copilot) seat (refer to manual TCH.1C-27J-2-25JG).
- 4. Close the access panels 553A, 553B and 553C.
- 5. Remove maintenance platform (AGE NO. 00074).
- 6. Perform the functional test and adjustment:
 - A.AILERON TENSION REGULATOR (refer to para 2-8).
 - B.TRAVEL CHECK OF THE CONTROL WHEEL (refer to para 2-6).
 - C.AILERON CONTROL SYSTEM (refer to para 2-7), (refer to para 2-14) and (refer to para 2-18).
 - D.MEASUREMENT OF AILERON MANOEUVRE EFFORT (without hydraulic) (refer to para 2-6).
 - E.FRICTION MANOEUVRE EFFORT AND BREAK-OUT CHECK (refer to para 2-22).







Figure 2-6 Aileron Outer Wing Cable - Removal and Installation (sheet 1/4)





Installation (sheet 2/4)







Installation (sheet 3/4)







Figure 2-6 Aileron Outer Wing Cable - Removal and Installation (sheet 4/4)



2-11 AILERON CENTER WING CABLE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panels 553A, 553B and 553C.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	25,00	
Installation	AFM	1	30,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	4,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-11.1 REMOVAL (refer to figure 2-7, sheet 1/2) and (refer to figure 2-7, sheet 2/2)
 - 1.Insert a rigging pin (1) (AGE NO. 00181) in the LH sector group (3) in center wing section.
 - 2. Insert a rigging pin (9) (AGE NO. 00181) in the RH sector group (10) in center wing section.
 - Remove from LH sector group in center wing section
 (3) the cable-lock clevis (7) by removing bolts (8), washers (6), castellated nuts (5) and cotter pins (4). Discard removed cotter pins.
 - 4. Remove from RH sector group in center wing section (10) the cable-lock clevis (12) by removing bolts (11), washers (13), castellated nuts (14) and cotter pins (15). Discard removed cotter pins.
 - 5. Remove the retaining clips (17, 18, 20 and 21) then, acting on the turnbuckles (16 and 19), release the cable tension. After loosen completely turnbuckles (16 and 19).
 - 6. Remove the cable stretches (2) from LH sector group (3) groove in center wing section and from RH sector group (10) groove in center wing section.



- 2-11.2 INSTALLATION (refer to figure 2-7, sheet 1/2) and (refer to figure 2-7, sheet 2/2)
 - 1. Install cable stretches (2) in the LH sector group (3) in center wing section and in the RH sector group (10) in center wing section.
 - 2. Install the retaining clips (17, 18, 20 and 21) then, acting on the turnbuckles (16 and 19).

CAUTION

Do not perform the complete tension of the cable.

- 3. Loosen turnbuckles (16 and 19) and perform the cable tension (2).
- 4. Connect at the RH sector group in center wing section (10) the cable-lock clevis (12) by using bolts (11), washers (13), castellated nuts (14) and new cotter pins (15) (LCM NO. 00052).
- 5. Connect at the LH sector group in center wing section (3) the cable-lock clevis (7) by using bolts (8), washers (6), castellated nuts (5) and new cotter pins (4) (LCM NO. 00052).
- 6. Remove a rigging pin (9) (AGE NO. 00181) from RH sector group (10) in center wing section.
- 7. Remove a rigging pin (1) (AGE NO. 00181) from LH sector group (3) in center wing section.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Close the access panels 553A, 553B and 553C.
- 4. Remove maintenance platform (AGE NO. 00074).
- 5. Perform the functional test and adjustment:

27-10-05

2-78



- A.AILERON TENSION REGULATOR (refer to para 2-8).
- B.TRAVEL CHECK OF THE CONTROL WHEEL (refer to para 2-6).
- C.AILERON CONTROL SYSTEM (refer to para 2-7), (refer to para 2-14) and (refer to para 2-18).
- D.MEASUREMENT OF AILERON MANOEUVRE EFFORT (without hydraulic) (refer to para 2-6).
- E.FRICTION MANOEUVRE EFFORT AND BREAK-OUT CHECK (refer to para 2-22).





Figure 2-7 Aileron Center Wing Cable - Removal and Installation (sheet 1/2)







Figure 2-7 Aileron Center Wing Cable - Removal and Installation (sheet 2/2)



2-12 AILERON AUTOPILOT CABLE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panels 553A, 553B and 553C.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	20,00	
Removal	AFM	1	40,00	
Installation	AFM	1	45,00	
Follow Maintenance	AFM	1	20,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 125 (Min.) Total Time Detention System: 125 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	AR

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-12.1 REMOVAL. Remove elevator drum and bracket, proceed as follows:
 - A.Remove aileron drum and bracket assembly as follows:
 - -Disconnect cable control tension nuts from quadrant.
 - -Remove nuts, flat washers, and bolts.
 - -Position ground strap out of the way, then lift drum and bracket assembly from airplane frame.

2-12.2 INSTALLATION. Proceed as follows:

- A.Attach drum and bracket assembly with ground strap to air frame with bolts, flat washers, and nuts.
- B. Attach servo motor cables to quadrant.



FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Close the access panels 553A, 553B and 553C.
- 4. Remove maintenance platform (AGE NO. 00074).
- 5. Perform the adjustment:
 - A.AUTOPILOT CONTROL CABLES TENSION (refer to para 2-41).





Figure 2-8 Aileron Autopilot Cable - Removal and Installation (sheet 1/3)









Installation (sheet 3/3)



2-13 LH (RH) AILERON CABIN CABLE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Open the access panels to gain access to LH (RH) Aileron Cabin Cable 212AZ, 212BZ, 214BZ, 130AH, 130AD and 213AZ (212EZ, 212DZ, 213BZ, 130AE and 130AG).
- 4. Remove Pilot (Copilot) seat in order to get access to LH (RH) Aileron Cabin Cable (refer to manual TCH.1C-27J-2-25JG)

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	30,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	2	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 185 (Min.) Total Time Detention System: 125 (Min.)



AGE Required:

AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00033	PIN, COTTER	MS24665-162	1,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-13.1 REMOVAL. Proceed as follows:

- A.Insert a rigging pin on the centre of rotation of the pilot and copilot control wheel in order to set to neutral position.
- B.Place the first quadrant (R side) in neutral position inserting a rigging pin.
- C.Release slowly the tension of the L/R AILERON CABIN CABLE.
- D.Screw completely the turnbuckles (count the number of rotations and report it on a note).
- E.Hold and remove the cable.



2-13.2 INSTALLATION. Proceed as follows:

- A. Install the cable then stretch them, by means of the turnbuckles (perform the same number of rotation reported in the note).
- B.Perform cable tension.

C.Remove all the rigging pins previously inserted.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Close the access panels 212AZ, 212BZ, 214BZ, 130AH, 130AD and 213AZ (212EZ, 212DZ, 213BZ, 130AE and 130AG).
- 4. Install Pilot (Copilot) seat in order to get access to LH (RH) Aileron Cabin Cable (refer to manual TCH.1C-27J-2-25JG)
- 5. Perform the functional tests adjustment:
 - A.AILERON TENSION REGULATOR (refer to para 2-8).
 - B.TRAVEL CHECK OF THE CONTROLWHEEL (refer to para 2-6).
 - C.AILERON CONTROL SYSTEM (refer to para 2-7), (refer to para 2-14) and (refer to para 2-18).
 - D.MEASUREMENT OF AILERON MANOEUVRE EFFORT (without hydraulic) (refer to para 2-6).
 - E.FRICTION MANOEUVRE EFFORT AND BREAK-OUT CHECK (refer to para 2-22).





Figure 2-9 LH (RH) Aileron Cabin Cable - Removal and Installation (sheet 1/2)







Figure 2-9 LH (RH) Aileron Cabin Cable - Removal and Installation (sheet 2/2)


2-14 AILERON SURFACES, MEASUREMENT AND PLAY - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	2	300,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 600 (Min.) Total Time Detention System: 300 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N	
00024	Kit, flaps and aileron locking	A35653-000	
00034	Kit, dynamometers	A37781-000	
00036	Kit, aileron control lever locking	A37837-000	
00039	Kit, aileron trim check templates	A38021-000	
00061	Kit, digital inclinometers	G0002700001	
00062	Kit, comparators	G0002700002	
00063	Kit, aileron balance tabs check templates	G0002710001	
00064	Kit, ailerons check templates	G0002710002	
00181	Kit, flight controls rigging pins	11G001-C052200-801	



AGE No.	NOMENCLATURE	P/N
00183	Kit, aileron balance tab control locking	11G2-1145760000-001

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-14.1 ADJUSTMENT OF AILERON TO NEUTRAL POSITION (refer to figure 2-10, sheet 1/11) and (refer to figure 2-10, sheet 2/11)
 - 1.Install the template (AGE NO. 00064) for aileron deflection check on the trailing edge of the left and of the right wing.
 - 2. Move by hand the LH aileron upwards, up to mechanical stop, and check that the surface travel is 27° at least (read on template).
 - 3. Move by hand the LH aileron downwards, up to mechanical stop, and check that the surface travel is 20° at least (read on template).
 - 4. Move by hand the RH aileron upwards, up to mechanical stop, and check that the surface travel is 27° at least (read on template).
 - 5. Move by hand the RH aileron downwards, up to mechanical stop, and check that the surface travel is 20° at least (read on template).
 - 6. Insert one rigging pin (2) (AGE NO. 00181) in the quadrant (1) between ribs 23 and 24 of left wing and another one (4) in the left differential lever (3) at rib 24.



2-14.1 ADJUSTMENT OF AILERON TO NEUTRAL POSITION (refer to figure 2-10, sheet 1/11) and (refer to figure 2-10, sheet 2/11) (Cont'd)

- 7. Adjust properly (and connect, if not connected) the rod between quadrant (1) and differential lever (3) so that the rigging pins (2 and 4) (AGE NO. 00181) can be inserted and removed freely.
- 8. Adjust properly (and connect, if not connected) the two remaining rods between the differential lever (3) and the left aileron so that the left aileron T. E. is positioned to $0^{\circ} \pm 0.25^{\circ}$ read on the template (AGE NO. 00064) indication.
- 9. Insert one rigging pin (2) (AGE NO. 00181) in the quadrant (1) between ribs 23 and 24 of left wing and another one (4) in the right differential lever (3) at rib 24.
- 10. Adjust properly (and connect, if not connected) the rod between quadrant (1) and differential lever (3) so that the rigging pins (2 and 4) (AGE NO. 00181) can be inserted and removed freely.
- 11. Adjust properly (and connect, if not connected) the two remaining rods between the differential lever (3) and the right aileron so that the right aileron T. E. is positioned to $0^{\circ} \pm 0.25^{\circ}$ read on the template (AGE NO. 00064) indication.
- 2-14.2 MEASUREMENT OF AILERON CONTROL CONVENTIONAL PLAY (refer to figure 2-10, sheet 3/11), (refer to figure 2-10, sheet 4/11) and (refer to figure 2-10, sheet 5/11)
 - 1. Ensure that left aileron is to neutral position.
 - 2. Install the template (AGE NO. 00064) for aileron travel check.
 - 3. Mount the comparator support on the proper holes of the template (AGE NO. 00064) head, and fit the comparator (AGE NO. 00062) on it.



- 2-14.2 MEASUREMENT OF AILERON CONTROL CONVENTIONAL PLAY (refer to figure 2-10, sheet 3/11), (refer to figure 2-10, sheet 4/11) and (refer to figure 2-10, sheet 5/11) (Cont'd)
 - 4. Fit the tool (AGE NO. 00183) to underside of the left aileron for locking of the intermediate control lever of the balance tab, so that the left aileron and balance tab are locked each other.
 - 5.Lock the left Differential Lever by means of the proper locking tool (AGE NO. 00036).
 - 6. Apply, by the dynamometer (AGE NO. 00034), on the left aileron trailing edge, a vertical load and measure the left aileron displacement as follows:

NOTE

Care should be taken to apply the load to the aileron T. E. and not to the tab T. E.

- A.Gradually apply a load upwards up to 22.48 lb (10.20 kg) maximum, leaving out the reading on the comparator (AGE NO. 00062).
- B. Stepwise unload, every 4.50 lb (2.04 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left aileron.
- C.Stepwise load downwards, every 4.50 lb (2.04 kg), up to 22.48 lb (10.20 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left aileron.
- D.Stepwise unload, every 4.50 lb (2.04 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left aileron.



- 2-14.2 MEASUREMENT OF AILERON CONTROL CONVENTIONAL PLAY (refer to figure 2-10, sheet 3/11), (refer to figure 2-10, sheet 4/11) and (refer to figure 2-10, sheet 5/11) (Cont'd)
 - E. Stepwise load upwards, every 4.50 lb (2.04 kg), up to 4.50 lb (2.04 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left aileron.
 - 7.Put the values obtained in a diagram and draw a graph, load applied vs aileron displacement. Check, from the graph, that the play C is max 0.3° (1.2 mm).
 - 8. Remove the play test equipments from the left aileron and re-install them to the right aileron.
 - 9. Repeat the play procedure described in steps 4 to 8 applying the load on the right aileron. Check that the play C is max 0.3° (1.2 mm).
- 2-14.3 MEASUREMENT OF THE GEARED TRIM TAB/ RIGHT GEAR TAB SURFACES CONVENTIONAL PLAY (refer to figure 2-10, sheet 6/11), (refer to figure 2-10, sheet 5/11) and (refer to figure 2-10, sheet 7/11)
 - 1. Ensure that the geared trim tab / right gear tab is in neutral position.
 - 2.Lock together the LH (RH) aileron with the outboard flap, by means of the flap and aileron locking tool (AGE NO. 00024).
 - 3. Fit the aileron trim check templates (AGE NO. 00039) with comparator (AGE NO. 00062) between LH aileron and LH trim tab and between RH aileron and RH gear tab, close to fail safe rod. Set the comparator to zero.



NOTE

The comparator (AGE NO. 00062) must be no more resetted until the test is terminated.

- 4. By the dynamometer (AGE NO. 00034) apply a vertical load on the geared trim tab / right gear tab trailing edge, close to fail safe rod and measure the LH trim tab, RH gear tab displacement as follows:
 - A.Gradually apply a load upwards up to 11.24 lb (5.10 kg) maximum, leaving out the reading on the comparator (AGE NO. 00062).
 - B. Stepwise unload, every 2.25 lb (1.02 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left trim tab /right gear tab.
 - C. Stepwise load downwards, every 2.25 lb (1.02 kg), up to 11.24 lb (5.10 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left trim tab/right gear tab.
 - D.Stepwise unload, every 2.25 lb (1.02 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left trim tab /right gear tab.
 - E.Stepwise load upwards, every 2.25 lb (1.02 kg), up to 11.24 lb (5.10 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left trim tab /right gear tab.
- 5. Put the value obtained in a diagram and draw a graph, load applied Vs LH (RH) trim tab displacement.
- 6. To calculate correctly the backlash (refer to figure 2-10, sheet 5/11) proceed as follows after that the diagram load applied vs surface displacement has been drawn:



- 2-14.3 MEASUREMENT OF THE GEARED TRIM TAB/ RIGHT GEAR TAB SURFACES CONVENTIONAL PLAY (refer to figure 2-10, sheet 6/11), (refer to figure 2-10, sheet 5/11) and (refer to figure 2-10, sheet 7/11) (Cont'd)
 - A.draw the tangent to the highest point of the unloading curves (U1 and U2) and of the loading curves (L1 and L2) up to the intersection with the surface displacement axis;
 - B.the backlash value C1 is the distance between the intersection of the lines U1 and L2 read on the surface displacement axis;
 - C. the backlash value C2 is the distance between the intersection of the lines U2 and L1 read on the surface displacement axis;
 - D.the total resulting backlash C is defined as the mean value between C1 and C2.
 - 7.Check, from the graph, that the backlash C is not greater than 0.09 in (2.2 mm).
 - 8. Remove the the aileron trim check templates (AGE NO. 00039) and the comparators (AGE NO. 00062), from left trim tab /right gear tab surfaces.
- 2-14.4 ADJUSTMENT OF SPRING TAB (BALANCE TAB) NEUTRAL POSITION (refer to figure 2-10, sheet 1/11), (refer to figure 2-10, sheet 2/11) and (refer to figure 2-10, sheet 8/11)
 - 1. Put the double side adhesive tape on the top surface of the ailerons and of the tabs, non in contact with their rivets, and position on it the digital inclinometers (AGE NO. 00061), parallel to the templates (AGE NO. 00063).
 - 2. Reset the inclinometers (AGE NO. 00061), then remove the templates (AGE NO. 00063).



- 2-14.4 ADJUSTMENT OF SPRING TAB (BALANCE TAB) NEUTRAL POSITION (refer to figure 2-10, sheet 1/11), (refer to figure 2-10, sheet 2/11) and (refer to figure 2-10, sheet 8/11) (Cont'd)
 - 3. Insert one rigging pin (4) (AGE NO. 00181) in the left differential lever (3) at rib 24 in order to set the left aileron in neutral position.
 - 4. Adjust the internal rod of the spring tab control, so that its axis is perpendicular with the axis of the intermediate lever.
 - 5. Properly adjust and connect the external rod to the spring tab surface attachment so that the spring tab is positioned to $0^{\circ} \pm 0.25^{\circ}$ read on inclinometer (AGE NO. 00061).
 - 6. Insert one rigging pin (4) (AGE NO. 00181) in the right differential lever (3) at rib 24 in order to set the right aileron in neutral position.
 - 7. Adjust the internal rod of the spring tab control, so that its axis is perpendicular with the axis of the intermediate lever (refer to figure 2-10, sheet 8/11).
 - 8. Properly adjust and connect the external rod to the spring tab surface attachment so that the spring tab is positioned to $0^{\circ} \pm 0.25^{\circ}$ read on inclinometer (AGE NO. 00061).
 - 9. Remove the rigging pins (4) (AGE NO. 00181) previously inserted.
 - 10. Remove the inclinometers (AGE NO. 00061).
- 2-14.5 MEASUREMENT OF SPRING TAB (BALANCE TAB) SURFACES CONVENTIONAL PLAY (refer to figure 2-10, sheet 2/11), (refer to figure 2-10, sheet 5/11) and (refer to figure 2-10, sheet 3/11)
 - 1.Insert a rigging pin (4) (AGE NO. 00181) in the left differential lever (3) at rib 24 and lock it by means of the locking tool (AGE NO. 00036).

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- 2-14.5 MEASUREMENT OF SPRING TAB (BALANCE TAB) SURFACES CONVENTIONAL PLAY (refer to figure 2-10, sheet 2/11), (refer to figure 2-10, sheet 5/11) and (refer to figure 2-10, sheet 3/11) (Cont'd)
 - 2.Lock the LH (RH) spring tab intermediate lever by means of aileron control lever locking tool (AGE NO. 00036).
 - 3. Ensure that the LH (RH) spring tab is in neutral position.
 - 4. Fit on the LH (RH) spring tab trailing edge, the test equipments for spring tab salck and set the comparator to zero.

NOTE

The comparator (AGE NO. 00062) must be no more resetted until the test is terminated.

- 5. By the dynamometer (AGE NO. 00034)apply a vertical load on the LH (RH) spring tab trailing edge, close to linkage rod, and measure the LH (RH) balance tab displacement as follows:
 - A.Gradually apply a load upwards up to 11.24 lb (5.10 kg) maximum, leaving out the reading on the comparator (AGE NO. 00062).
 - B. Stepwise unload, every 2.25 lb (1.02 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the LH (RH) spring tab.
 - C. Stepwise load downwards, every 2.25 lb (1.02 kg), up to 11.24 lb (5.10 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the LH (RH) spring tab.



- 2-14.5 MEASUREMENT OF SPRING TAB (BALANCE TAB) SURFACES CONVENTIONAL PLAY (refer to figure 2-10, sheet 2/11), (refer to figure 2-10, sheet 5/11) and (refer to figure 2-10, sheet 3/11) (Cont'd)
 - D.Stepwise unload, every 2.25 lb (1.02 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the LH (RH) spring tab.
 - E.Stepwise load upwards, every 2.25 lb (1.02 kg), up to 11.24 lb (5.10 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the LH (RH) spring tab.
 - 6. Put the value obtained in a diagram and draw a graph, load applied Vs LH (RH) balance tab displacement.
 - 7. To calculate correctly the backlash proceed as follows after that the diagram load applied vs surface displacement has been drawn:
 - A.Draw the tangent to the highest point of the unloading curves (U1 and U2) and of the loading curves (L1 and L2) up to the intersection with the surface displacement axis.
 - B. The backlash value C1 is the distance between the intersection of the lines U1 and L2 read on the surface displacement axis.
 - C.The backlash value C2 is the distance between the intersection of the lines U2 and L1 read on the surface displacement axis.
 - D.The total resulting backlash C is defined as the mean value between C1 and C2.
 - 8.Check, from the graph, that the play C is not greater than 0.09 in (2.2 mm) , 0.5 $^\circ$.
 - 9. Remove the test equipment and the comparator (AGE NO. 00062) from LH (RH) spring tab.



- 2-14.6 SPRING TAB / AILERON TRANSMISSION RATIO CHECK (refer to figure 2-10, sheet 2/11) and (refer to figure 2-10, sheet 9/11)
 - 1.Fit a 0.193 in (4.915 mm) diameter rigging pin (4) (AGE NO. 00181) to the LH (RH) differential lever (3) of both outer wings and lock the differential levers (3) to rib 24 and install differential control levers locking tools (AGE NO. 00036). Remove the rigging pin (4) (AGE NO. 00181).
 - 2. On the LH (RH) aileron, fit the aileron check template (AGE NO. 00064) in order to ensure that LH (RH) aileron is set to 0° position (this is verified using the situable control template tool that aligns the central part of the surfaces against the zero reference mark indicated on the aileron check template). Do not move the LH (RH) aileron from this zero position. Fit the inclinometer (AGE NO. 00061) on LH (RH) aileron surface parallel to the template (use biadhesive tape). Reset the inclinometer so that assume its 0° position.
 - 3. Remove the aileron check template (AGE NO. 00064) and the situable control template tool.
 - 4. Fit the LH (RH) spring tab check template and on it the control rood tool, in order to check that the LH (RH) spring tab is aligned with the 0° reference mark indicated on the template.
 - 5. Fit on the LH (RH) spring tab surface a biadhesive tape in a zone free from rivets, position on it the digital inclinometers (AGE NO. 00061)parallel to the template. Reset the digital inclinometer so that assume its 0° position.
 - 6.Remove spring tab check template and the control rood tool from the LH (RH) spring tab.



- 2-14.6 SPRING TAB / AILERON TRANSMISSION RATIO CHECK (refer to figure 2-10, sheet 2/11) and (refer to figure 2-10, sheet 9/11) (Cont'd)
 - 7. Apply by hand an increasing load first upwards and then downwards on the trailing edge of each aileron, until the ailerons reach their travel limits. The LH (RH) spring tab must travel $12^{\circ} + 1.7^{\circ}$ /-0.5° upwards or downwards with respect to the aileron. The LH (RH) aileron must travel $8.5^{\circ} + 3.4^{\circ}$ /-0.3° upwards or downwards. This check shall be performed using inclinometer readings and the following formula: ° Spring Tab = 1° Spring Tab — 1° Aileron.
 - 8. Check tab control mechanism for freedom of movement and absence of interference.
 - 9. Apply by hand a load upwards and then downwards on the trailing edge of LH (RH) aileron, making the aileron travel in 1° increment. Read the corresponding angle of LH (RH) spring tabs on the related inclinometer. The average ratio between LH (RH) spring tab angle and LH (RH) aileron must be 1.15 ÷ 1.4.
 - 10. Remove the differential control levers locking tool (AGE NO. 00036).
- 2-14.7 TRIM TAB FREE TRAVEL CHECK (refer to figure 2-10, sheet 7/11)
 - 1. Ensure that the geared Trim Tab (LH) and geared tab (RH) are installed but not connected to the control line.
 - 2. Install the LH (RH) aileron trim check templates (AGE NO. 00039) on the LH (RH) aileron.



2-14.7 TRIM TAB FREE TRAVEL CHECK (refer to figure 2-10, sheet 7/11) (Cont'd)

- 3. Move by hand the geared trim tab and geared tab fully upwards and fully downwards. Check that the LH (RH) Tabs surface move freely without interference and that the LH (RH) Tabs perform a stroke of 37° downwards at least, and 33° upwards at least (reading on the related template).
- 4. Remove the templates (AGE NO. 00039) previously installed.
- 2-14.8 GEARED TRIM TAB / GEARED TAB / SPRING TAB / GAP CHECK (refer to figure 2-10, sheet 10/11)
 - 1. Ensure that geared trim tab, geared tab and the left/right spring tabs are to neutral position.
 - 2. Verify that the gap between geared trim tab and the LH aileron is 0.236 in \pm 0.079 in (6 mm \pm 2 mm).
 - 3. Verify that the gap between the geared trim tab and the left spring tab is 0.197 in + 0.157 in - 0.079 in (5 mm + 4 mm - 2 mm).
 - 4. Move the geared trim tab from all upwards to all downwards (or viceversa) and check that during all travel the gap between the tab and (LH) aileron is 0.079 in + 0.039 in 0 in (2 mm + 1 mm 0 mm).
 - 5. Move the LH spring tab from all upwards to all downwards (or viceversa) and check that during all travel, the gap between the tab and the LH aileron is 0.079 in + 0.039 in 0 in (2 mm + 1 mm 0 mm).
 - 6. Verify the gap between geared tab and RH aileron is 0.236 in \pm 0.079 in (6 mm \pm 2 mm).
 - 7. Verify that the gap between the geared tab and the RH spring tab is 0.197 in + 0.157 in 0.079 in (5 mm + 4 mm 2 mm).



- 2-14.8 GEARED TRIM TAB / GEARED TAB / SPRING TAB / GAP CHECK (refer to figure 2-10, sheet 10/11) (Cont'd)
 - 8. Move the geared tab from to all upwards to all downwards (or viceversa) and check that during all travel the gap between the tab and the RH aileron is 0.079 in + 0.039 in 0 in (2 mm + 1 mm 0 mm).
 - 9. Move the RH spring tab from all upwards to all downwards (or viceversa) and check that during all travel, the gap between the tab and the RH aileron is 0.079 in + 0.039 in 0 in (2 mm + 1 mm 0 mm).
- 2-14.9 ADJUSTMENT OF GEARED TRIM TAB/GEARED TAB TO NEUTRAL POSITION (refer to figure 2-10, sheet 2/11) and (refer to figure 2-10, sheet 11/11)
 - 1.Be sure that the electrical actuator of the geared trim tab is installed to the aircraft and that it is adjusted to neutral position (8.79 in / 223.3 mm between the connection axes).
 - 2. Install the template (AGE NO. 00039) on the LH (RH) aileron in order to check the trim geared tab/geared tab deflection.
 - 3. Insert one rigging pin (4) (AGE NO. 00181) in the LH (RH) quadrant (3) between ribs 23 and 24.
 - 4.Connect the fail safe rod between the attachment point on the aileron and the geared trim tab attachment point so that the geared trim tab is positioned to $0^{\circ} \pm 0.25^{\circ}$.

NOTE

If the trim tab doesn't satisfy the $0^{\circ} \pm 0.25^{\circ}$ position, properly operate on the knurl plate.

5. Install the fail safe rod between the wing structure support and the geared tab attachment point so that the geared tab is positioned to $0^{\circ} \pm 0.25^{\circ}$.

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- 2-14.9 ADJUSTMENT OF GEARED TRIM TAB/GEARED TAB TO NEUTRAL POSITION (refer to figure 2-10, sheet 2/11) and (refer to figure 2-10, sheet 11/11) (Cont'd)
 - 6. Remove and re-insert the rigging pins (4) (AGE NO. 00181) in the LH and RH quadrant (3) several times verifying that they enter freely without causing any movement of the control.
 - 7.Remove the template (AGE NO. 00039) from the LH (RH) aileron.
- 2-14.10 ADJUSTMENT OF LH AILERON TRIM POSITION TRANSMITTER
 - 1. For adjustment of LH aileron trim position transmitter (refer to para 2-17).

FOLLOW ON MAINTENANCE:

None





Adjustment (sheet 1/11)





Adjustment (sheet 2/11)







TOOL FOR AILERON BALANCE TAB CONTROL LOCKING

> NOTE : THE POSITIONING OF THE TOOL ON THE RH AILERON IS SYMMETRICAL.

Figure 2-10 Aileron Surfaces Measurement and Play -Adjustment (sheet 3/11)





Figure 2-10 Aileron Surfaces Measurement and Play -Adjustment (sheet 4/11)







Figure 2-10 Aileron Surfaces Measurement and Play -Adjustment (sheet 5/11)

















Figure 2-10 Aileron Surfaces Measurement and Play -Adjustment (sheet 8/11)





Figure 2-10 Aileron Surfaces Measurement and Play -Adjustment (sheet 9/11)





Figure 2-10 Aileron Surfaces Measurement and Play -Adjustment (sheet 10/11)











2-15 AILERON GEARED TRIM TAB TRAVEL -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect Hydraulic Test Stand (AGE NO. 00262) supply to 3000 psi.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	2	120,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 240 (Min.) Total Time Detention System: 120 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00039	Kit, aileron trim check templates	A38021-000
00061	Kit, digital inclinometers	G0002700001
00064	Kit, ailerons check templates	G0002710002
00262	Test stand, hydraulic system (diesel engine)	846805-D**



Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-15.1 LEFT AILERON GEARED TRIM TAB TRAVEL (refer to figure 2-11, sheet 3/4), (refer to figure 2-11, sheet 2/4), (refer to figure 2-11, sheet 1/4) and (refer to figure 2-11, sheet 4/4)
 - 1.On left aileron fit the Aileron trim check template (AGE NO. 00039) and aileron check templates (AGE NO. 00064).
 - 2. Put the double side adhesive tape on the top surface of the aileron and the geared trim tab, non in contact with their rivets, and position on it the digital inclinometers (AGE NO. 00061), parallel to the templates. Put the aileron and the geared trim tab in neutral position and reset the inclinometers, then remove the templates.
 - 3. Ensure the cover of the AILERON EMER switch (1), on FCS 2 Control Panel (104 VE) (2), is lowered.
 - 4. Set the trim button (8), on the Pilot control wheel (7) from neutral position, to LH and maintain. Check that the geared trim tab moves to $15.25^{\circ} \pm 1^{\circ}$ downwards and the LH nipple of the aileron trim indicator (3) on the Combined Trim Indicator (4) shows 15° down (Tolerance -1 mm respectly to red strep).



- 2-15.1 LEFT AILERON GEARED TRIM TAB TRAVEL (refer to figure 2-11, sheet 3/4), (refer to figure 2-11, sheet 2/4), (refer to figure 2-11, sheet 1/4) and (refer to figure 2-11, sheet 4/4) (Cont'd)
 - 5. Set the trim button (8), on the Pilot control wheel (7) from neutral position, to RH and maintain. Check that the geared trim tab moves to $15.25^{\circ} \pm 1^{\circ}$ upwards and the LH nipple of the aileron trim indicator (3) on the Combined Trim Indicator (4) shows 15° up (Tolerance -1 mm respectly to red strep).
 - 6. Release the trim button (8) on the Pilot control wheel (7).
 - 7. Set the trim button (5), on the Copilot control wheel (6), to LH and maintain. Check that the geared trim tab moves to $15.25^{\circ} \pm 1^{\circ}$ downwards and the LH nipple of the aileron trim indicator (3) on the Combined Trim Indicator (4) shows 15° down.
 - 8. Set the trim button (5), on the Copilot control wheel (6), to RH and maintain. Check that the geared trim tab moves to $15.25^{\circ} \pm 1^{\circ}$ upwards and the LH nipple of the aileron trim indicator (3) on the Combined Trim Indicator (4) shows 15° up.
 - 9. Release the trim button (5) on the Copilot control wheel (6).
 - 10. Set the trim button (8), on the Pilot control wheel (7) to LH/RH and, as soon as the trim tab does not continue to move, set the Copilot trim button (5), on the Copilot control wheel (6) to RH/LH and verify that the geared trim tab does not continue to move downwards (upwards).
 - 11. Perform the trim complete travel, from all downwards to all upwards (or vice versa) and verify that the time required is within the range 6 thru 10 seconds.



- 2-15.1 LEFT AILERON GEARED TRIM TAB TRAVEL (refer to figure 2-11, sheet 3/4), (refer to figure 2-11, sheet 2/4), (refer to figure 2-11, sheet 1/4) and (refer to figure 2-11, sheet 4/4) (Cont'd)
 - 12. Select the geared trim tab to fully upwards (trim button (5 and 8) to RH). Rotate the Pilot (7) and Copilot (6) control wheel fully rightwards and check that the geared trim tab moves to $31^{\circ} \pm 2^{\circ}$ upwards with respect to the aileron (Make the difference between the readings of the inclinometers (AGE NO. 00061)).
 - 13. Select the geared trim tab (9) to fully downwards (trim button (5 and 8) to LH) leaving the Pilot (7) and Copilot (6) control wheel fully rightwards. Check that the geared trim tab is to $0.5^{\circ} \pm 2^{\circ}$ downwards with respect to the aileron (Make the difference between the readings of the inclinometers (AGE NO. 00061)).
 - 14. Return the control wheel (7) to neutral with the gearead trim tab select fully downwards rotate the control wheel (7) fully leftwards. Check that gearead trim tab is to $33^{\circ} \pm 2^{\circ}$ downwards with respect to the aileron. (Make the difference between readings of the inclinometers (AGE NO. 00061)).
 - 15. Select the geared trim tab to fully upwards (trim button (8) to RH) leaving the control wheel (7) fully leftwards. Check that the geared trim tab is to $4.5^{\circ} \pm 2^{\circ}$ downwards with respect to the aileron. (Make the difference between the readings of the inclinometers (AGE NO. 00061)).
 - 16. Return the control wheel (7) to neutral.
 - 17. Lift the cover of the AILERON EMER (1) switch on the FCS 2 Control Panel (104 VE) (2).



- 2-15.1 LEFT AILERON GEARED TRIM TAB TRAVEL (refer to figure 2-11, sheet 3/4), (refer to figure 2-11, sheet 2/4), (refer to figure 2-11, sheet 1/4) and (refer to figure 2-11, sheet 4/4) (Cont'd)
 - 18. Select the emergency trim button (1) to LH and maintain. Check that the geared trim tab moves to $15.25^{\circ} \pm 1^{\circ}$ downwards and that the LH nipple of the aileron trim indicator (3) on the Combined Trim Indicator (4) shows 15° down (Tolerance -1 mm respectly to red strep).
 - 19. Select the normal trim button (5 and 8) on control wheel (6 and 7) to LH and RH and verify that the geared trim tab does not move.
 - 20. Select the emergency trim button (1) to RH and maintain. Check that the geared trim tab moves to $15.25^{\circ} \pm 1^{\circ}$ upwards and that the LH nipple of the aileron trim indicator (3) on the Combined Trim Indicator (4) shows 15° up (Tolerance -1 mm respectly to red strep).
 - 21. Select the normal trim button (5 and 8) on control wheel (6 and 7) to LH and RH and verify that the geared trim tab does not move.
 - 22.Lower the cover of the AILERON EMER switch (1) on the FCS 2 Control Panel (104 VE) (2) .
 - 23.Remove digital inclinometers (AGE NO. 00061) from the top surface of the aileron and the geared trim tab.

FOLLOW ON MAINTENANCE:

- 1. Disconnect Hydraulic Test Stand (AGE NO. 00262) .
- 2. Restoret hydraulic supply.
- Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).











NOTE :

THE ARRANGEMENT OF THE TEMPLATES ON THE RH OUTER WING IS SYMMETRICAL

Figure 2-11 Aileron Geared Trim Tab Travel - Functional Test (sheet 2/4)







Figure 2-11 Aileron Geared Trim Tab Travel - Functional Test (sheet 3/4)







2-16 AILERON TRIM TAB ACTUATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Remove the Sequencer Unit (refer to manual TCH.1C-27J-2-99JG).
- 5. Remove the cover tip.
- 6. Remove the access 544E panel.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	10,00	
Removal	ELT	1	20,00	
Installation	ELT	1	25,00	
Follow Maintenance	ELT	1	10,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 65 (Min.) Total Time Detention System: 65 (Min.)


AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	3,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-16.1 REMOVAL (refer to figure 2-12, sheet 2/3) , (refer to figure 2-12, sheet 3/3) and (refer to figure 2-12, sheet 1/3)

WARNING

DURING MAINTENANCE OPERATION, HOLD THE COVER TIP TO AVOID THAT ITS WEIGHT PULLS DOWN THE WING TIP LIGHT WIRE.

WARNING

DURING MAINTENANCE OPERATION NOT MOVE THE AILERONS COMMAND.



2-16.1 REMOVAL (refer to figure 2-12, sheet 2/3) , (refer to figure 2-12, sheet 3/3) and (refer to figure 2-12, sheet 1/3) (Cont'd)

CAUTION

Install protection caps on the disconnected electrical connectors.

- 1. Disconnect the electrical connectors 8CBA (1) and 8CBB (2).
- 2. Disconnect the position transmitter control rod (13) from intermediate lever (9) by removing special bolt (14), washers (8, 12 and 15), castellated nuts (7 and 11) and cotter pins (6 and 10). Discard removed cotter pins.
- 3. Disconnect the trim tab actuator (19) from intermediate lever (9) by removing bolt (21), washers (3 and 20), castellated nut (5) and cotter pin (4). Discard removed cotter pin.
- 4. Disconnect the trim tab actuator (19) from structure by removing bolt (18), washer (17) and nut (16).
- 2-16.2 INSTALLATION (refer to figure 2-12, sheet 2/3) , (refer to figure 2-12, sheet 3/3) and (refer to figure 2-12, sheet 1/3)

CAUTION

Install aileron trim tab actuator (19) in neutral position 8.79 in (223.3 mm) between the connection axis

1. Connect the trim tab actuator (19) at the structure by using bolt (18), washer (17) and nut (16). Torque tighten (AGE NO. 00054) bolt to 30 thru 35 in lb (0.346 thru 0.403 m Kg).

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- 2-16.2 INSTALLATION (refer to figure 2-12, sheet 2/3) , (refer to figure 2-12, sheet 3/3) and (refer to figure 2-12, sheet 1/3) (Cont'd)
 - 2. Connect the trim tab actuator (19) at the intermediate lever (9) by using bolt (21), washers (3 and 20), castellated nut (5) and new cotter pin (4)(LCM NO. 00010). Torque tighten (AGE NO. 00054) bolt to 30 thru 35 in lb (0.346 thru 0.403 m Kg).
 - 3. Connect the position transmitter control rod (13) at the intermediate lever (9) by using special bolt (14), washers (8, 12 and 15), castellated nuts (7 and 11) and new cotter pins (6 and 10) (LCM NO. 00010). Torque tighten (AGE NO. 00054) bolt to 30 thru 35 in lb (0.346 thru 0.403 m Kg).

NOTE

Remove protection caps from the electrical connectors to be installed.

4. Connect the electrical connectors 8CBA (1) and 8CBB (2)

FOLLOW ON MAINTENANCE:

- 1. Install the access panel 544E.
- 2. Install the cover tip.
- 3.Install the Sequencer Unit (refer to manual TCH.1C-27J-2-99JG).
- 4. Remove maintenance platform (AGE NO. 00074).
- 5. Restore hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 6.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 7. Perform the required test:
 - A.AILERON AND GEAR TRIM TAB TRAVEL (STEP 1, 4 AND 6) (refer to para 2-6).

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B.LEFT AILERON TRIM TAB TRAVEL AND CLEARANCE CHECK (refer to para 2-15).





CONTROL ROD



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Figure 2-12 Aileron Trim Tab Actuator - Removal and Installation (sheet 2/3)

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Figure 2-12 Aileron Trim Tab Actuator - Removal and Installation (sheet 3/3)

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2-17 LH AILERON TRIM POSITION TRANSMITTER -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

Not Provided

AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00015	NUT, SELF-LOCKING	MS21042-L3	5,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

CAUTION

During maintenance operation not move the ailerons comand and do not touch the aileron surfaces.



- 2-17.1 REMOVAL (refer to figure 2-13, sheet 1/2) and (refer to figure 2-13, sheet 2/2)
 - 1. Open the access panel 523A.
 - 2.Remove LH aileron trim tab actuator (refer to para 2-16).
 - 3. Disconnect electrical connector (13CBA) (1) from the related adapter (3) on the support (2) on rib 33.
 - 4. Disconnect from the position transducer lever (11) the rod end (7) by removing bolt (8), washer (5) and nut, self-locking (4). Discard removed nut, self-locking.
 - 5. Disconnect and remove the LH position transmitter (13CB) (6) from the aircraft structure (9) by removing bolts (10), washers (12) and nuts, self-locking (13). Discard removed nuts, self-locking.

2-17.2 INSTALLATION (refer to figure 2-13, sheet 1/2) and (refer to figure 2-13, sheet 2/2)

- 1. Position and install the LH position transmitter (13CB) (6) to the aircraft structure (9) by using bolts (10), washers (12) and new nuts, self-locking (LCM NO. 00015) (13).
- 2. Connect to the position transducer lever (11) the rod end (7) by using bolt (8), washer (5) and new nut, self-locking (LCM NO. 00015) (4).
- 3. Connect electrical connector (13CBA) (1) to the related adapter (3) on the support (2) on rib 33.
- 4. Install LH aileron trim tab actuator (refer to para 2-16) and set in neutral position.
- 5. Ensure that LH aileron is to zero position.
- 6. Adjust and connect the linkage rod between the LH aileron position transducer lever and LH aileron attachment point.
- 7. Check that, on the Combined Trim Indicator (15CB) (15), the AILERON indication (14) shows about 0°.
- 8. It is necessary to re-adjust the linkage rod and / or the transducer lever to get 0°.



- 2-17.2 INSTALLATION (refer to figure 2-13, sheet 1/2) and (refer to figure 2-13, sheet 2/2) (Cont'd)
 - 9. Perform the fully trim travel leftward / rightward and check that, on the Combined Trim Indicator (15CB) (15), the AILERON indication (14) shows about 15.25°.
 - 10. Close the access panel 523A.

FOLLOW ON MAINTENANCE:

None





Figure 2-13 LH Aileron Trim Position Transmitter -Removal and Installation (sheet 1/2)

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COMBINED TRIM INDICATOR (15CB)

Figure 2-13 LH Aileron Trim Position Transmitter -Removal and Installation (sheet 2/2)

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TCH.1C-27J-2-27JG

2-18 AILERON COMPONENT CONVENTIONAL PLAY - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	2	100,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 200 (Min.) Total Time Detention System: 100 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00024	Kit, flaps and aileron locking	A35653-000
00025	Fixture, control wheel maneuver force measurement	A35681-000
00034	Kit, dynamometers	A37781-000
00061	Kit, digital inclinometers	G0002700001
00062	Kit, comparators	G0002700002
00181	Kit, flight controls rigging pins	11G001-C052200-801





Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance

PROCEDURE:

2-18.1 ADJUSTMENT AILERON REAR QUADRANT (refer to figure 2-14, sheet 1/4)

CAUTION

During the play check, no working stress must be applied to the aircraft in order to avoid wrong indication of the comparator (AGE NO. 00062).

NOTE

In this document the load to be applied is expressed in force value and not in torque moment. It is intended that, during the test, the load must be applied in the best point where the comparator (AGE NO. 00062) is able to read.

- 1.To calculate correctly the play (refer to figure 2-14, sheet 1/4) proceed as follows after that the diagram load applied vs surface displacement has been drawn:
 - -draw the tangent to the highest point of the unloading curves (U1 and U2) and of the loading curves (L1 and L2) up to the intersection with the surface displacement axis;
 - -the play value C2 is the distance between the intersection of the lines U2 and L1 read on the surface displacement axis;

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2-18.1 ADJUSTMENT AILERON REAR QUADRANT (refer to figure 2-14, sheet 1/4) (Cont'd)

-the total resulting play C is defined as the mean value between C1 and C2.

NOTE

The test sequence as reported by this document (roll axis, pitch axis, yaw axis) is not strictly mandatory; it can also be exchanged if considered more convenient.

- 2-18.2 CONTROL WHEEL CABLE STIFFNESS CHECK (refer to figure 2-14, sheet 3/4), (refer to figure 2-14, sheet 4/4) and (refer to figure 2-14, sheet 2/4)
 - 1.Lock the left differential lever using the differential control levers locking tool (AGE NO. 00024).
 - 2. Fit on Pilot control wheel the fixture control wheel travel measurement tool (AGE NO. 00025) plus inclinometer (AGE NO. 00061).

NOTE

Before to apply on the control wheel the tool fixture control wheel maneuver force measurementl, remove the chart holder light (refer to manual TCH.1C-27J-2-33JG).

- 3. Using rigging pin (AGE NO. 00181), set the Pilot control wheel to neutral position. Perform the the zero calibration of the inclinometer(AGE NO. 00061).
- 4. Apply on the Pilot control wheel, by the dynamometer (AGE NO. 00034), a lateral load and measure the control wheel rotation as follows (Pilot control wheel vs left differential lever locked):
 - A.Gradually apply a load leftwards up to 67.44 lb (30.59 kg) maximum, reading the related control rotation by means of inclinometer.



- 2-18.2 CONTROL WHEEL CABLE STIFFNESS CHECK (refer to figure 2-14, sheet 3/4), (refer to figure 2-14, sheet 4/4) and (refer to figure 2-14, sheet 2/4)) (Cont'd)
 - B. Stepwise unload, every 11.24 lb (5.10 kg), up to zero load and simultaneously read, on the inclinometer, the related displacement value of the Pilot control wheel.
 - C.Stepwise load rightwards, every 11.24 lb (5.10 kg), up to 67.44 lb (30.59 kg) maximum and simultaneously read, on the inclinometer, the related rotationt value of the Pilot control wheel.
 - D. Stepwise unload, every 11.24 lb (5.10 kg), up to zero load and simultaneously read, on the inclinometer, the related rotation of the Pilot control wheel.
 - E.Stepwise load leftwards, every 11.24 lb (5.10 kg), up to 67.44 lb (30.59 kg) maximum and simultaneously read, on the inclinometer, the related rotation value of the Pilot control wheel.
 - 5. Put the values obtained in a diagram and draw a graph, load applied Vs Pilot control wheel rotations. Check, from the graph, that the slack C is not greater than 1.5°.
 - 6. Move the tool previously installed from the Pilot to the Copilot control wheel.
 - 7. Repeat the procedure from steps 4. to 5. by loading the Copilot control wheel (Copilot control wheel Vs right differential lever locked) and verify the results are the same.
 - 8. With the right differential lever locked, move the tool previously installed from the Copilot to the Pilot control wheel.



- 2-18.2 CONTROL WHEEL CABLE STIFFNESS CHECK (refer to figure 2-14, sheet 3/4), (refer to figure 2-14, sheet 4/4) and (refer to figure 2-14, sheet 2/4) (Cont'd)
 - 9. Repeat the procedure from steps 4. to 5. by loading the Pilot control wheel (to check the interconnection line) and verify the results are the same.
 - 10. Remove the tools previously installed from the Pilot control wheel the rigging pin and the differential control levers locking tool.

FOLLOW ON MAINTENANCE:

None







Figure 2-14 Aileron Component Conventional Play -Adjustment (sheet 1/4)











TOOL FOR AILERON BALANCE TAB CONTROL LOCKING

> NOTE : THE POSITIONING OF THE TOOL ON THE RH AILERON IS SYMMETRICAL.

Figure 2-14 Aileron Component Conventional Play -Adjustment (sheet 3/4)





Figure 2-14 Aileron Component Conventional Play -Adjustment (sheet 4/4)



2-19 LH AILERON QUADRANT (AILERON PULLEY) -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4.Lock in neutral Position the control wheel (2), the quadrants (3), and outer wing pulley (5) by insertion of rigging pins (AGE NO. 00181) (1, 4 and 6) (refer to figure 2-15, sheet 1/4) and (refer to figure 2-15, sheet 2/4).
- 5. Open the access panels 553A, 553B and 553C.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	150,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 300 (Min.) Total Time Detention System: 150 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	6,00
00179	RING, LOCKING	68538-101	1,00
00408	NUT, LOCKING	68537-101	1,00

Safety Conditions:

Be aware of information contained in Paragraph SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-19.1 REMOVAL (refer to figure 2-15, sheet 1/4) , (refer to figure 2-15, sheet 3/4) , (refer to figure 2-15, sheet 2/4) and (refer to figure 2-15, sheet 4/4)
 - 1.Loosen the locking nut (9) and remove the locking ring (10). Discard removed the locking nut and locking ring.
 - 2. Extract the flanged failrlead (11).
 - 3. Remove the cables lock (16, 31 and 37) by removing the cotter pins (13, 28 and 35), loosening the nuts (14, 29 and 34) and by removing the bolts (18, 33 and 38) and washers (15, 30 and 36). Discard removed the cotter pins.
 - 4. Release cables tension for the following cables:
 - A.LH (RH) aileron outer wing cable (if is necessary remove the LH (RH) aileron outer wing cable in accordance with maintenance task remove/replace LH (RH) aileron outer wing cable (refer to para 2-10)).
 - B. Aileron center wing cable (if is necessary remove the aileron center wing cable in accordance with maintenance task remove/replace aileron center wing cable (refer to para 2-11)).

(Cont'd)



- 2-19.1 REMOVAL (refer to figure 2-15, sheet 1/4), (refer to figure 2-15, sheet 3/4), (refer to figure 2-15, sheet 2/4) and (refer to figure 2-15, sheet 4/4) (Cont'd)
 - C.LH (RH) aileron fuselage cable (if is necessary remove the LH (RH) aileron fuselage cable in accordance with maintenance task remove/replace LH (RH) aileron fuselage cable (refer to para 2-9)).
 - 5. Remove the cables (17, 20, 25 and 32) from the LH (RH) Aileron Pulley (19).
 - 6. Remove the spacer (12).
 - 7. Extract the pulley (19) and remove the washer (24).
 - 8. Loosen the bolts (21 and 27) that connect the sector support (23) and remove the washers (22 and 26), if is necessary the removal of the sector support (23).
- 2-19.2 INSTALLATION (refer to figure 2-15, sheet 1/4), (refer to figure 2-15, sheet 3/4), (refer to figure 2-15, sheet 2/4) and (refer to figure 2-15, sheet 4/4))
 - 1. Replace the LH (RH) Aileorn Pulley (19).
 - 2. Tighten the bolts (21 and 27) that connect the sector support (23) and install the washers (22 and 26), if previously removed of the sector support (23).
 - 3. If pulley (19) is not assembled with support (23) install the pulley (19) in the following way:

A. Position the washer (24) and insert the pulley (19).

B.Insert the spacer (12).

- 4. Insert the following cables (17, 20, 25 and 32) in the LH Aileron Pulley (19).
 - A.LH (RH) aileron outer wing cable (if the cable has been removed, replace the aileron outer wing cable in accordance with maintenance task remove/replace LH Aileron Outer Wing cable (refer to para 2-10)).



2-19.2 INSTALLATION (refer to figure 2-15, sheet 1/4), (refer to figure 2-15, sheet 3/4), (refer to figure 2-15, sheet 2/4) and (refer to figure 2-15, sheet 4/4)) (Cont'd)

CAUTION

Do not perform the complete tension of the cable.

B.Aileron center wing cable (if the cable has been removed, replace aileron center wing cable in accordance with maintenance task remove/replace aileron center wing cable (refer to para 2-11)).

CAUTION

Do not perform the complete tension of the cable.

C.LH aileron fuselage cable (if the cable has been removed, replace LH aileron fuselage cable in accordance with maintenance task remove/replace LH aileron fuselage cable (refer to para 2-9)).

CAUTION

Do not perform the complete tension of the cable.

- 5. Install the cables lock (16, 31 and 37) by using the new cotter pins (LCM NO. 00052) (13, 28 and 35), tightening the nuts (14, 29 and 34) and by using the bolts (18, 33 and 38) and washers (15, 30 and 36).
- 6. Insert the flanged failrlead (11).
- 7. Insert the new locking ring (LCM NO. 00179) (10) and tighten the new locking nut (LCM NO. 00408) (9).



- 2-19.2 INSTALLATION (refer to figure 2-15, sheet 1/4), (refer to figure 2-15, sheet 3/4), (refer to figure 2-15, sheet 2/4) and (refer to figure 2-15, sheet 4/4)) (Cont'd)
 - 8. Tighten the turnbuckles (7, 8, 39 and 40) up to previously note position.

FOLLOW ON MAINTENANCE:

- 1. Perform fuselage cables tension.
- 2. Perform center wing cable tension.
- 3. Perform outer wing cables tension.
- Perform the functional test and adjustment as described in AILERON TENSION REGULATOR (refer to para 2-7).
- 5.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 6.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 7. Remove all the rigging pins (1, 4 and 6) previously inserted (refer to figure 2-15, sheet 1/4) and (refer to figure 2-15, sheet 2/4).
- 8. Perform the functional test MEASUREMENT OF AILERON MANOEUVRE EFFORT (without hydraulic) (refer to para 2-6).
- 9. Close the access panels 553A, 553B and 553C.
- 10. Remove maintenance platform (AGE NO. 00074).





Removal and Installation (sheet 1/4)









Removal and Installation (sheet 3/4)







Figure 2-15 LH Aileron Quadrant (Aileron Pulley) -Removal and Installation (sheet 4/4)



2-20 RH AILERON QUADRANT (AILERON PULLEY) -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panels 553A, 553B and 553C .

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	150,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 300 (Min.) Total Time Detention System: 150 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801





Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	3,00
00179	RING, LOCKING	68538-101	1,00

Safety Conditions:

Be aware of informati on contained in SAFETY PRECAUTIONS (refer to para 2-1) before performingmaintenance.

PROCEDURE:

- 2-20.1 REMOVAL (refer to figure 2-16, sheet 1/4), (refer to figure 2-16, sheet 2/4), (refer to figure 2-16, sheet 3/4), (refer to figure 2-16, sheet 4/4)
 - 1. Insert a rigging pin (2) (AGE NO. 00181) in the pilot and copilot control column (1) in order to set them inneutral position.
 - 2. Insert a rigging pin (3) (AGE NO. 00181) in the left quadrant (4).
 - 3. Insert a rigging pin (6) (AGE NO. 00181) in the right pulley (5) in outer wing between ribs 23 and 24.
 - 4. Insert a rigging pin (67) (AGE NO. 00181) in the left pulley (68) in center wing section.
 - 5. On right outer wing trailing edge remove the locking clips (8, 9,10 and 13), turnbuckles (11 and 14) and slowly release the tension of cables (12) connecting the aft quadrant (42) to the right pulley between ribs 23 and 24. Disconnect the cables (7 and 12) to aft quadrant (42) from the turnbuckles (11 and 14).
 - 6.On the right side of the cargo compartment ceiling, frame 11, remove the locking clips (15 and 17), turnbuckles (18), and slowly release the tension of the flap control cables (16) to the aft quadrant (42).Do not disconnect the cables (16).

- 2-20.1 REMOVAL (refer to figure 2-16, sheet 1/4), (refer to figure 2-16, sheet 2/4), (refer to figure 2-16, sheet 3/4), (refer to figure 2-16, sheet 4/4) (Cont'd)
 - 7.Disconnect the bungee (20) from sector assembly (19).
 - 8.On the center wing section remove the locking clips(60 and 62), turnbuckles (61 and 63) and slowlyrelease the tension of cables (34) connecting the aftquadrant to left pulley (68). Disconnect the cables(34) from turnbuckles (61 and 63).
 - 9. On center wing section, remove thelocking clips (58 and 64), turnbuckles (59 and 65), and slowly release the tension of cables (35) connecting the aileronautopilot actuator (66) to aft quadrant (42). Disconnect the cables (35) from turnbuckles (59 and 65).
 - 10. Disconnect the retaining rings (21 and 23), the locking nuts (22 and 24), and remove the fair lead sector (25) from the support (44).
 - 11. Disconnect cable (26) from the sector assembly (56).
 - 12. Remove the sector assembly (56) with two bearings (28 and 57) and spacer (27) from support (44).
 - 13. Disconnect locking ring (30), locking nut (29) and fairlead flange (31) from the support (44). Discard removed the locking ring.
 - 14. Disconnect from the aft quadrant (42) the bolts (40, 46 and 55), flat washers (38, 48 and 53), the castellated nuts (36, 49 and 51), the cotter pins (37, 50 and 52) and cable lock clevises (39, 47 and 54). Discard removed cotter pins.
 - 15. From the grooves of the aft quadrant (44) remove the cables (34, 35 and 41), to the copilot control wheel, to LH pulley, to right aileron and to autopilot actuator.



- 2-20.1 REMOVAL (refer to figure 2-16, sheet 1/4), (refer to figure 2-16, sheet 2/4), (refer to figure 2-16, sheet 3/4), (refer to figure 2-16, sheet 4/4) (Cont'd)
 - 16. Remove the aft quadrant (42) with the two bearings (32 and 45), the spacer (33) and washer (43) from the support (44).
- 2-20.2 INSTALLATION (refer to figure 2-16, sheet 1/4), (refer to figure 2-16, sheet 2/4), (refer to figure 2-16, sheet 3/4), (refer to figure 2-16, sheet 4/4)
 - 1.Install the aft quadrant (42) with the two bearings (32 and 45), the spacer (33) and washer (43) to the support (44).

CAUTION

When the following cables are positioned in the related grooves of the aft quadrant, connect them to the turnbuckles but do not perform the complete tension of cables at this step.

NOTE

Performing next step does not pull the cable excessively to avoid their repositioning on pulleys in fuselage and in right outer wing.

- 2. In the grooves of the aft quadrant (42) install cables(34 and 35).
- 3. Install on the aft quadrant (42), the bolts (40, 46 and 55), flat washers (38, 48 and 53), the castellated nuts (36, 49 and 51), the new cotter pins (37, 50 and52) (LCM NO. 00052) and cable lock clevises (39, 47and 54).
- 4. Install new locking ring (30) (LCM NO. 00179), locking nut (29) and fair lead flange (31) on thesupport (44).

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- 2-20.2 INSTALLATION (refer to figure 2-16, sheet 1/4), (refer to figure 2-16, sheet 2/4), (refer to figure 2-16, sheet 3/4), (refer to figure 2-16, sheet 4/4) (Cont'd)
 - 5. Install the sector assembly (56) with two bearings (30 and 57) and spacer (27) to support (44).
 - 6. Install cable (26) on the sector assembly (56).
 - 7. Install fair lead sector (25), locking nuts (22 and 24) and retaining rings (21 and 23) on the support (44).
 - 8.On center wing section, connect cables (35) toturnbuckles (59 and 65) and install locking clips (58and 64).
 - 9.On the center wing section connect cables (34) toturnbuckles (61 and 63) and install locking clips (60and 62).
 - 10. Connect the bungee (20) to sector assembly (19).
 - 11.On the right side of the cargo compartment ceiling, frame 11, connect locking clips (15 and 17) andturnbuckles (18).
 - 12. On right outer wing trailing edge connect the cables (7 and 12) to turnbuckles (11 and 14) and Installlocking clips (8, 9, 10 and 13).
 - 13. Remove rigging pin (67) (AGE NO. 00181) from left pulley (68) in center wing section.
 - 14. Remove rigging pin (6) (AGE NO. 00181) from right pulley (5) in outer wing between ribs 23 and 24.
 - 15. Remove rigging pin (3) (AGE NO. 00181) from left quadrant (4).
 - 16. Remove rigging pin (2) (AGE NO. 00181) from pilot and copilot control column (1).



FOLLOW ON MAINTENANCE:

- 1. Close the access panels 553A, 553B and 553C.
- 2. Remove maintenance platform (AGE NO. 00074).
- 3.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 4. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform the functional test:
 - A.MEASUREMENT OF AILERON MANOEUVRE EFFORT (without hydraulic) (refer to para 2-6).










Figure 2-16 RH Aileron Quadrant (Aileron Pulley) -Removal and Installation (sheet 2/4)





Figure 2-16 RH Aileron Quadrant (Aileron Pulley) -Removal and Installation (sheet 3/4)







Figure 2-16 RH Aileron Quadrant (Aileron Pulley) -Removal and Installation (sheet 4/4)

TCH.1C-27J-2-27JG



2-21 SYNCRO SHAFT - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Remove Pilot and Copilot seat (refer to manual TCH.1C-27J-2-25JG).
- 4.Open the access panels 213DZ, 213CZ, 213BZ and 213AZ (214AZ, 214BZ and 214CZ).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	60,00	
Removal	AFM	2	40,00	
Installation	AFM	2	45,00	
Follow Maintenance	AFM	2	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 410 (Min.) Total Time Detention System: 205 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	4,00
00012	PIN, COTTER	MS24665-374	1,00
00013	NUT, SELF-LOCKING	H14-4	12,00
00033	PIN, COTTER	MS24665-162	4,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-21.1 REMOVAL (refer to figure 2-17, sheet 1/4), (refer to figure 2-17, sheet 2/4), (refer to figure 2-17, sheet 3/4) and (refer to figure 2-17, sheet 4/4)
 - 1.Insert a rigging pin (1) (AGE NO. 00181) in the LH/ RH (2) control wheel in order to set them in neutral position.
 - 2. Insert a rigging pins (47 and 50) (AGE NO. 00181) in the LH sector group (48) and in the RH sector group (49) located in the center wing section.
 - 3. Remove the retaining clips (27, 29, 30, 35, 37 and 38) and acting on the turnbuckles (28, 31, 36 and 39) slowly release the tension of the LH and RH aileron cabin cables (7 and 11). (If is necessary remove the LH/ RH AILERON CABIN CABLE in accordance with maintenance task remove/replace LH / RH aileron cabin cable (refer to para 2-7).



- 2-21.1 REMOVAL (refer to figure 2-17, sheet 1/4), (refer to figure 2-17, sheet 2/4), (refer to figure 2-17, sheet 3/4) and (refer to figure 2-17, sheet 4/4) (Cont'd)
 - 4. Remove the retaining clips (51, 52, 54 and 56) and acting on the turnbuckles (57, 58, 59 and 60) between frames 10 and 12 slowly release the tension of the LH and RH aileron fuselage cables (53 and 55). If is necessary remove the LH / RH AILERON FUSELAGE CABLE in accordance with maintenance task remove/replace LH / RH aileron fuselage cable (refer to para 2-7).
 - 5. Remove from RH / LH quadrant (6 and 10) the cotter pins (24, 32, 40 and 41). Discard removed cotter pins.
 - 6. Remove the cables (7 and 11) from RH / LH quadrant (6 and 10).
 - 7. Remove from aircraft RH support (45) and LH support (14) by removing bolts (3, 13, 22 and 46), washers (4, 15, 21 and 44) and self locking nuts (5, 16, 20 and 43). Discard removed self locking nuts.
 - 8. Remove from the aircraft the syncro-shaft (9) complete with LH support (14) and RH support (45) and place it on workbench.
 - 9. Remove from LH quadrant (10) the support (14) by removing bolt (23), washer (19), castellated nut (17) and cotter pin (18). Discard removed cotter pin.
 - 10. Remove from RH quadrant (6) the RH support (45) by removing bolt (42).
 - Remove from RH quadrant (6) the syncro-shaft (9) by removing bolts (8), washers (34), and self locking nuts (33). Discard removed self locking nuts.
 - Remove from LH quadrant (10) the syncro-shaft (9) by removing bolts (12), washers (25), and self locking nuts (26). Discard removed self locking nuts.
 - 13. Remove syncro-shaft (9).



- 2-21.2 INSTALLATION (refer to figure 2-17, sheet 1/4), (refer to figure 2-17, sheet 2/4), (refer to figure 2-17, sheet 3/4) and (refer to figure 2-17, sheet 4/4)
 - 1. Position syncro-shaft (9) on workbench.
 - 2. Connect at the LH quadrant (10) the syncro-shaft (9) by using bolts (12), washers (25), and new self locking nuts (26) (LCM NO. 00013).
 - 3. Connect at the RH quadrant (6) the syncro-shaft (9) by using bolts (8), washers (34), and new self locking nuts (33) (LCM NO. 00013).
 - 4. Connect at the RH quadrant (6) the support (45) by using bolt (42).
 - 5. Connect at the LH quadrant (10) the support (14) by using bolt (23), washer (19), castellated nut (17) and new cotter pin (18) (LCM NO. 00012).
 - 6.Connect at the aircraft the syncro-shaft (9) complete with LH support (14) and RH support (45).
 - 7.Connect at the aircraft RH support (45) and LH support (14) by using bolts (3, 13, 22 and 46), washers (4, 15, 21 and 44) and new self locking nuts (5, 16, 20 and 43) (LCM NO. 00013).
 - 8. Install on grooves of the RH / LH quadrant (6 and 10) the cables (7 and 11).
 - 9. Insert in the RH / LH quadrant (6 and 10) the new cotter pins (24, 32, 40 and 41) (LCM NO. 00010 and 00033).

CAUTION

Do not perform the complete tension of the cable.



- 2-21.2 INSTALLATION (refer to figure 2-17, sheet 1/4), (refer to figure 2-17, sheet 2/4), (refer to figure 2-17, sheet 3/4) and (refer to figure 2-17, sheet 4/4) (Cont'd)
 - 10. Connect the retaining clips (51, 52, 54 and 56) and acting on the turnbuckles (57, 58, 59 and 60) between frames 10 and 12. (If has been removed, replace the LH / RH AILERON FUSELAGE CABLE in accordance with maintenance task remove/replace LH / RH aileron fuselage cable (refer to para 2-7).
 - 11. Connect the retaining clips (27, 29, 30, 35, 37 and 38) and acting on the turnbuckles (28, 31, 36 and 39). If has been removed, replace the LH / RH AILERON CABIN CABLE in accordance with maintenance task remove/replace LH / RH aileron cabin cable (refer to para 2-7).
 - 12. Perform cable tension (refer to para 2-7).
 - 13. Remove a rigging pins (47 and 50) (AGE NO. 00181) from LH sector group (48) and from RH sector group (49) located in the center wing section.
 - 14. Remove a rigging pin (1) (AGE NO. 00181) from LH / RH control wheel (2).

FOLLOW ON MAINTENANCE:

- 1.Close the access panels 213DZ, 213CZ, 213BZ and 213AZ (214AZ, 214BZ and 214CZ).
- 2.Install Pilot and Copilot seat (refer to manual TCH.1C-27J-2-25JG).
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).





(sheet 1/4)





Figure 2-17 Syncro Shaft - Removal and Installation (sheet 2/4)















2-22 RUDDER CONTROL SYSTEM - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	2	300,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 600 (Min.) Total Time Detention System: 300 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00008	Fixture, pedal force measurement	A34151-000
00054	Kit, torque wrenches	G0001200001-001**
00106	Templates, rudder check	G0342730001
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None



Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.

PROCEDURE:

- 2-22.1 RUDDER TRAVEL CHECK (Normal condition) (refer to figure 2-18, sheet 1/6) and (refer to figure 2-18, sheet 5/6)
 - 1. Install stadia for Rudder travel Check.
 - 2. Connect Hydraulic Test Cart (AGE NO. 00262) with the related adaptor to ground connection of hydraulic system No. 1 and No. 2 and supply the hydraulic pressure to 20.7 MPa (3000 psi).
 - 3. Insert rigging pin in the forward quadrant.
 - 4. Check that Rudder Trim Electrical Actuator (8) is in neutral position at 226 mm (access panel 322E).
 - 5. Insert rigging pin in the rear quadrant (12) following procedure at 6 point if you can; otherwise disconnect the Centering Spring (14), the Feal Spring (13) and the Input Rod (11) from the Rudder Actuator (9), try to insert the rigging pin again and, if it is impossible, perform the follow procedures: ADJUSTMENT OF PILOT PEDAL TO FORWARD QUADRANT (refer to para 2-26), ADJUSTMENT AND CONTROL CABLES TENSION (refer to para 2-23), PILOT AND COPILOT PEDALS ASSY CONNECTION (refer to para 2-26), ADJUSTMENT OF PEDAL AND RUDDER END-OF-TRAVEL STOPS (refer to para 2-26).
 - 6. If the rigging pin can be inserted freely on the rear quadrant (12) and the Rudder Surface is not at 0° position, disconnect the Centering Spring (14) and the Feel Spring (13), rigging the Input Rod (11) to adjust the Rudder to 0° position.



- 2-22.1 RUDDER TRAVEL CHECK (Normal condition) (refer to figure 2-18, sheet 1/6) and (refer to figure 2-18, sheet 5/6) (Cont'd)
 - 7.Adjust the Centering Spring (14) and the Feel Spring (13) to insert freely connecting bolts.
 - 8. Install the template (AGE NO. 00106) for rudder travel check and check that the rudder surface is to 0° position.
 - 9. Connect the hydraulic test cart (AGE NO. 00262) plus the related adaptor to the ground connection of hydraulic systems No. 1 and No. 2.
 - 10. Supply the hydraulic pressure to 20.7 MPa (3000 psi) and set the flowrate to 95 l/min.
- 2-22.2 PILOT SIDE CHECK (refer to figure 2-18, sheet 2/6)
 - 1.Press the Pilot left pedal (2) from neutral to fully forward and maintain. Check that the rudder travel is $35^{\circ} \pm 0.2^{\circ}$ leftwards.
 - 2. Release the left pedal (2).
 - 3. Press the Pilot right pedal (1) from neutral to fully forward and maintain. Check that the rudder travel is $35^{\circ} 0^{\circ} / + 0.2^{\circ}$ rightwards.
 - 4. Release the right pedal (1).
- 2-22.3 COPILOT SIDE CHECK (refer to figure 2-18, sheet 2/6)
 - 1.Press the Copilot left pedal (2) fully forward and maintain. Check that the rudder travel is: (Pilot demand leftwards) -0.5° / + 0° leftwards.
 - 2. Release the left pedal (2).
 - 3. Press the Copilot right (1) pedal fully forward and maintain. Check that the rudder travel is: (Pilot demand rightwards) -0.5° /+0° rightwards.
 - 4. Release the right pedal (1).



2-22.4 FUNCTIONAL TEST WITH HYDRAULIC SISTEM NO.1 ONLY (refer to figure 2-18, sheet 2/6)

- 1. Restore the hydraulic pressure in the No. 1 system to 3000 psi, (210 kg/cm²), then annulthe hydraulic pressure in the No. 2 system.
- 2. Press the Pilot left pedal (2) fully forward and maintain. Check that the rudder travel is still $35^{\circ} \pm 0.2^{\circ}$ leftwards.
- 3. Release the left pedal (2).
- 4. Press the Pilot right pedal (1) fully forward and maintain. Check that the rudder is still 35° 0° / + 0.2° rightwards.
- 5. Release the right pedal (1).

2-22.5 FUNCTIONAL TEST WITH HYDRAULIC SISTEM NO.2 ONLY (refer to figure 2-18, sheet 2/6)

- 1. Restore the hydraulic pressure in the No. 2 system to 3000 psi, (210 Kg/cm²) then annul the hydraulic pressure in the No. 1 system.
- 2. Press the Pilot left pedal (2) fully forward and maintain. Check that the rudder travel is still $35^{\circ} \pm 0.2^{\circ}$ leftwards.
- 3. Release the left pedal (2).
- 4. Press the Pilot right pedal (1) fully forward and maintain. Check that the rudder travel is still 35° - 0° / + 0.2° rightwards.
- 5. Release the right pedal (1).
- 6. Press the pilot right pedal fully forward and maintain. Check that the rudder deflection is still35 -0 / +0.2 rightwards.
- 7. Release the right pedal.
- 8. Restore the Hydraulic pressure in the No. 1 and No. 2 system to 3000 psi (210 Kg/cm²).



- 2-22.6 RUDDER ACCUMULATOR (refer to figure 2-18, sheet 4/6)
 - 1.On the FCS2 control panel (7) set AIR SPEED selector (6) on AUTO.
 - 2. Ensure both hydraulic circuit are powered to 3000psi (210 Kg/cm²).
 - 3. Annul hydraulic pressure to servo-rudder and contemporaneously press one pedal on end stroke and verify that the rudder travel 35°.
- 2-22.7 RUDDER FREE TRAVEL CHECK (refer to figure 2-18, sheet 1/6)
 - 1. Disconnect the Hydraulic power and actuator.
 - 2. Install the template (AGE NO. 00106) and set the rudder to zero position corresponding to the zero marked on tool.
 - 3. Fully tighten the rudder mechanical stops to avoid their intervention.
 - 4. Move by hand the rudder fully leftwards and fully rightwards and check that the rudder moves 37.5° at least in both directions respect to neutral position. Furthermore check the rudder travel is free without interference.
 - 5. Adjust the rudder mechanical stops so that the surface is stopped at $37^{\circ} + 0.5^{\circ} / -0^{\circ}$ to the left and to the right.

2-22.8 CHECK OF RETURN TO NEUTRAL POSITION (refer to figure 2-18, sheet 2/6)

- 1. Install the template (AGE NO. 00106) on the fuselage tail cone.
- 2. Push the Copilot pedal (1) until the rudder moves to 5°, then release it rapidly. Check that the rudder returns to 0° \pm 1°.
- 3. Push the left pedal (2) until the rudder moves to 5° , then release it rapidly. Check that the rudder returns to 0° \pm 1°.

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2-22.8 CHECK OF RETURN TO NEUTRAL POSITION (refer to figure 2-18, sheet 2/6) (Cont'd)

- 4. Push rapidly the Copilot pedal (1) fully and rapidly return to neutral position. Check that the rudder surface does not swing excessively.
- 2-22.9 PEDAL ASSY PILOT (COPILOT) STOPS ADJUSTMENT, (refer to figure 2-18, sheet 2/6), (refer to figure 2-18, sheet 3/6) and (refer to figure 2-18, sheet 4/6)
 - 1. Install the template (AGE NO. 00106) on the fuselage tail cone.
 - 2. Ensure that the feel spring unit (13) is connected to the rear quadrant (12) and to the trim actuator lever (10) and no rigging pin is inserted in the rear quadrant (12).
 - 3.Connect the hydraulic test stand (AGE NO. 00106) supply systems No. 1 and No. 2 at 3000 psi (210 Kg/cm).
 - 4. Press Pilot (Copilot) right pedal (1) until the rudder moves to 35° -0° / + 0.2° rightwards (read on the template).
 - 5. Adjust the mechanical stop (4) , against the adjustment group (5), then release the pedal (1).
 - 6. Tighten the lock nut (3), then press again the Pilot (Copilot) right pedal (1) and check that the rudder travel is still 35° -0° / + 0.2° rightwards.
 - 7. Release the Pilot (Copilot) right pedal (1) to neutral position.
 - 8. Press Pilot (Copilot) left pedal (2) until the rudder moves to $35^{\circ} \pm 0.2^{\circ}$ leftwards (read on the template).
 - 9. Adjust the mechanical stop (4) , against the adjustment group (5), then release the pedal (2).
 - 10. Tighten the lock nut (3), then press again the pilot (copilot) left pedal (2) and check that the rudder travel is still $35^{\circ} 0^{\circ} / + 0.2^{\circ}$ leftwards.



- 2-22.9 PEDAL ASSY PILOT (COPILOT) STOPS ADJUSTMENT, (refer to figure 2-18, sheet 2/6), (refer to figure 2-18, sheet 3/6) and (refer to figure 2-18, sheet 4/6) (Cont'd)
 - 11. Release the Pilot (Copilot) left pedal (2) to neutral position.
- 2-22.10 SYSTEM RESTORATION (refer to figure 2-18, sheet 1/6)
 - 1. Turn off and disconnect the hydraulic from ground connection.
 - 2. Remove any template (AGE NO. 00106) installed.
- 2-22.11 FRICTION MANOUVRE EFFORT AND BREAK-OUT CHECK (refer to figure 2-18, sheet 1/6) and (refer to figure 2-18, sheet 6/6)
 - 1.Ensure that both hydraulic systems are powered at 3000 psi (210 Kg/cm²).
 - 2. Ensure that the Pilot and Copilot rudder pedals (1 and 2) are in neutral position.
 - 3 With the test equipment for pedals effort (AGE NO. measurement (80000 plus the dinamometer installed on the left pedal (2), apply a load until the left pedal (2) begins to move. Check that the breakout force is 90 N (20.23 lbf) (9.17 kg) max.
 - 4. Push the left pedal (2) stepwise until to reach the mechanical stop. Read the related effort value on dynamometer (loading phase) and record on the Table 2-4.
 - 5. Release the left pedal (2).
 - 6. Remove the test equipment (AGE NO. 00008) from the left pedal (2) and install on the right pedal (1).
 - 7. Push the right pedal (1) stepwise until to reach the mechanical stop. Read the related effort value on dynamometer (loading phase) and record on the Table 2-4.



2-22.11 FRICTION MANOUVRE EFFORT AND BREAK-OUT CHECK (refer to figure 2-18, sheet 1/6) and (refer to figure 2-18, sheet 6/6) (Cont'd)

- 8. Release the right pedal (1).
- 9. Calculate the friction value at 0.59 in, 1.18 in and 2.95 in (15 mm, 45 mm and 75 mm) of right (1) and left (2) pedal travel and check that it is 85 N (8.66 kg)(19.10 lbf) max.
- 10. Check that the obtained effort manoeuvre values are in accordance to Table 2-4.

NOTE

The friction value is defined as the half difference of the two values measured during loading and unloading phase at the same rudder pedal stroke. The pedal pushing effort is considered positive, while the pedal pulling effort is considered negative. The rudder clockwise (leftward) deflection is considered positive, while the rudder counter clockwise deflection (rightward) is considered negative.

LEFT PEDAL	EFFORT ALLOWED	EFFORT MEASURED
+0.59 in (+15 mm)	+90 N ÷ +200 N	
+1.77 in (+45 mm)	+230 N ÷ +390 N	
+2.95 in (+75 mm)	+380 N ÷ +570 N	
-0.59 in (-15 mm)	-120 N ÷ -230 N	
-1.77 in (-45 mm)	-300 N ÷ -430 N	
-2.95 in (-75 mm)	-510 N ÷ -660 N	
RIGHT PEDAL	EFFORT ALLOWED	EFFORT MEASURED
+0.59 in (+15 mm)	+90 N ÷ +200 N	
+1.77 in (+45 mm)	+230 N ÷ +390 N	

Table 2-4. Effort requirements - Rudder

(Cont'd)



Table 2-4. Effort requirements - Rudder (Cont'd)

+2.95 in (+75 mm)	+380 N ÷ +570 N	
-0.59 in (-15 mm)	-120 N ÷ -230 N	
-1.77 in (-45 mm)	-300 N ÷ -430 N	
-2.95 in (-75 mm)	-510 N ÷ -660 N	

FOLLOW ON MAINTENANCE:

None





NOTE: ALL DIMENSIONS ARE IN INCHES (IN MILLIMETERS)

Figure 2-18 Rudder Control System - Functional Test (sheet 1/6)





Figure 2-18 Rudder Control System - Functional Test (sheet 2/6)





Figure 2-18 Rudder Control System - Functional Test (sheet 3/6)









Figure 2-18 Rudder Control System - Functional Test (sheet 5/6)







TOOL POSITIONING FOR PEDAL ACTUATING FORCES MEASUREMENT

Figure 2-18 Rudder Control System - Functional Test (sheet 6/6)



2-23 RUDDER CONTROL CABLE TENSION -ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 120 (Min.) Total Time Detention System: 60 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00113	Tensiometer	T60-1001C8-1A**
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.



PROCEDURE:

- 2-23.1 ADJUSTMENT AND CONTROL CABLES TENSION (refer to figure 2-19, sheet 1/5), (refer to figure 2-19, sheet 2/5), (refer to figure 2-19, sheet 3/5) and (refer to figure 2-19, sheet 4/5)
 - 1. Ensure that the forward quadrant (2) is in neutral position and insert a rigging pin (AGE NO. 00181) (1).
 - 2.Lock the forward tension regulator (5) by means of a proper tool.
 - 3. Insert a rigging pin (8) (AGE NO. 00181) on the rear axle in order to lock the rear quadrant (9).
 - 4. Install the control cables between the forward and rear quadrant then stretch them, by means of the turnbuckles (3, 4, 6, 7, 10 and 11) located at frame 9 and 41, at a load twice the expected pre-load 54 lb (24.49 kg) (AGE NO.00113).
 - 5. Remove the rigging pins (1 and 8) (AGE NO. 00181) from the forward quadrant (2) and the rear axle and perform 25 complete pedal cycles at least.
 - 6. Set the control cable to the correct load of 27 lb (12.25 kg).
 - 7. Check that the terminal lugs are tightened on the turnbuckle coupling with the same number of turns. Furthermore check that no more than 3 threads are visible on each terminal lug.
 - 8. Unlock the tension regulator (5) by removing the tool previously installed.
 - 9. Check that the control cables are stretched in according to the diagram (refer to figure 2-19, sheet 5/5).
 - 10. Measure the clearance between the forward (2) and rear (9) quadrants end and the cable guard bolt for the whole rudder control and check that is in the following range: 1 to 1.6 mm.



FOLLOW ON MAINTENANCE:

None





Figure 2-19 Rudder Control Cable Tension - Adjustment (sheet 1/5)





Figure 2-19 Rudder Control Cable Tension - Adjustment (sheet 2/5)





(sheet 3/5)





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REGULATOR POSITION

Figure 2-19 Rudder Control Cable Tension - Adjustment (sheet 5/5)

TENSION REGULATOR (SARMA)
TCH.1C-27J-2-27JG



2-24 RUDDER CABLE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Remove Pilot seat (refer to manual TCH.1C-27J-2-25JG).
- 5. Disable Cargo Ramp.
- 6.Open the access panels 211DZ, 322E, 322B and 130AD.
- 7.Open secondary insulation panels in left side rear fuselage.

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	80,00	
Removal	AFM	2	50,00	
Installation	AFM	2	60,00	
Follow Maintenance	AFM	2	80,00	

Recomended Personnel:

Periodicity: AR - AS REQUIRED Total Maintenance Time: 540 (Min.) Total Time Detention System: 270 (Min.)





AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	2,00
00011	NUT, SELF-LOCKING	H14-3	4,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-24.1 REMOVAL. Proceed as follows:
 - A.Lock the quadrant (cockpit under floor) and rear rudder quadrant in the vertical fin by means of rigging pins.
 - B.Toggle the tension regulator at frame 7 (bulkhead separating flight compartment from cargo compartment).
 - C.Open secondary insulation panels in left side rear fuselage.
 - D.Remove the two fair lead in the following way:

(Cont'd)



2-24.1 REMOVAL. Proceed as follows: (Cont'd)

- -Unscrew the two bolts, collect washers and nuts, and remove the fair lead.
- E.Remove the two cotter pins that fix the rudder cable with rudder quadrant.
- F. Remove the plates fair leads around of the rudder cables between rear skin and vertical fin in the following way:
- 1. unscrew bolts, collect washer and plates.
 - A.Remove the cable lock clevis on the rear rudder quadrant (vertical fin) in the following way:
 - -Unscrew the two bolts, collect washers and nuts, and remove the cable-lock clevis.
 - B. Unscrew completely the turnbuckles.
 - C. Remove the guard pins.
 - D. Remove the rudder cable.

2-24.2 INSTALLATION. Proceed as follows:

- A. Install the new rudder cable.
- B. Position the Rudder cables on the rudder quadrant (Cockpit Under floor), then insert the two cotter pins in order to fix the cable with rudder quadrant.

(Cont'd)



2-24.2 INSTALLATION. Proceed as follows: (Cont'd)

- C.By means of turnbuckles stretch the rudder cable.
- D. Install the two fair leads in the following way:
 - -Install the fair lead, position the washers, insert the bolts and screw the nuts $(25 \div 28 \text{ in lb})$.
- E.Position the rudder cable on the rear rudder quadrant (Vertical Fin).
- F.Install the cable-lock clevis in the following way:

-Install the clevis, position the washers, insert the bolts and screw the nuts $(20 \div 25 \text{ in lb})$.

- G.Insert the rigging guards.
- H.Remove the rigging pins insert in order to lock quadrants.
 - I.Do not perform complete stretching of the cable.

FOLLOW ON MAINTENANCE:

- 1.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 3. Install Pilot seat (refer to manual TCH.1C-27J-2-25JG).
- 4. Enable Cargo Ramp.



- 5. Close the access panels 211DZ, 322E, 322B and 130AD.
- 6. Remove maintenance platform (AGE NO. 00074).
- 7. Close secondary insulation panels in left side rear fuselage.
- 8. Perform the functional test:
 - A.RUDDER CONTROL SYSTEM (refer to para 2-22)
 - B.FRICTION MANOUVRE EFFORT AND BREAK-OUT CHECK (refer to para 2-22).
 - C.RUDDER FREE TRAVEL CHECK (refer to para 2-22).
 - D.CHECK OF RETURN TO NEUTRAL POSITION (refer to para 2-22).







Figure 2-20 Rudder Cable - Removal and Installation (sheet 1/5)







Figure 2-20 Rudder Cable - Removal and Installation (sheet 2/5)





Figure 2-20 Rudder Cable - Removal and Installation (sheet 3/5)





Figure 2-20 Rudder Cable - Removal and Installation (sheet 4/5)





Figure 2-20 Rudder Cable - Removal and Installation (sheet 5/5)



2-25 RUDDER TRIM TRAVEL - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Open the access panels 913A, 913B and 913H .

2. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	10,00	
	ELT	1	10,00	
Test	AFM	1	60,00	
	ELT	1	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 140 (Min.) Total Time Detention System: 70 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00106	Templates, rudder check	G0342730001
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None



Safety Conditions:

Be aware of information contained in Paragraph (refer to para 2-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

- 2-25.1 RUDDER TRIM TRAVEL CHECK (Normal OPERATING) (refer to figure 2-21, sheet 1/3), (refer to figure 2-21, sheet 2/3) and (refer to figure 2-21, sheet 2/3)
 - 1. Ensure on the FCS 1 Control Panel (103VE) (3), verify that the cover guard of the RUDDER EMER switch (5) is lowered.
 - Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 3. Connect the hydraulic test cart (AGE NO. 00262) plus the related adaptor to the ground connection of hydraulic systems No. 1 and No. 2.
 - 4. Install the template (AGE NO. 00106) for rudder travel check and check that the rudder surface is to 0° position.
 - Ensure that following circuit breakers are closed: FLIGHT CONTROL RUDDER TRIM CNTR (1CC) (8) located on Overhead Circuit Breakers Panel (271VE) (6) in position F 1, FLIGHT CONTROL RUDDER TRIM EMERG (2CC) (7) located on Overhead Circuit Breakers Panel (271VE) (6) in position F 3 and FLIGHT CONTROL RUDDER TRIM IND (9CC) (8) located on Overhead Circuit Breakers Panel (271VE) (6) in position F 2.
 - 6. Perform a trim complete travel, through the normal trim switch on the FCS 1 Control Panel (103VE) (3), from all leftwards to all rightwards (or vice versa) and verify that there are no interferences in the trim actuator area, artificial feel unit and trim transmitter.

- 2-25.1 RUDDER TRIM TRAVEL CHECK (Normal OPERATING) (refer to figure 2-21, sheet 1/3) , (refer to figure 2-21, sheet 2/3) and (refer to figure 2-21, sheet 2/3) (Cont'd)
 - 7.On FCS1 control panel (3), set the RUDDER selector (4) to NOSE RH and maintain. Visually check that the rudder moves to $11.6^{\circ} \pm 1^{\circ}$ rightwards. The rudder indication of the COMBINED TRIM INDICATOR (1) must show about 11.6° right. Release the RUDDER selector (4).

NOTE

If the rudder moves to $11.6^{\circ} \pm 1^{\circ}$ on left and right, read on template, while the indicator in cockpit is not accord, to verify the transmission lever. If the rudder doesn't move to $11.6^{\circ} \pm 1^{\circ}$ on left and right, read on template, to verify the actuator trim.

- 8.Set the RUDDER selector (4) to NOSE LH and maintain. Visually check that the rudder moves to $11.6^{\circ} \pm 1^{\circ}$ leftwards. The rudder indication of the COMBINED TRIM INDICATOR (1) must show about 11.6° left. Release the RUDDER selector (4).
- 9. Perform a trim complete travel, using the normal trim switch, from all leftwards to all rightwards (or viceversa) and verify that the time required is in the range 13 thru 20 seconds.
- 10. Lift the cover guard of the RUDDER EMER switch (5). Select the RUDDER selector (4) to left and right position and visually check that the rudder does not move.
- 11.Disconnect external AC power supply from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 12. Turn off hydraulic test cart (AGE NO. 00262) and disconnect it from aircraft.



- 2-25.2 RUDDER TRIM TRAVEL CHECK (Emergency OPERATING) (refer to figure 2-21, sheet 1/3) , (refer to figure 2-21, sheet 3/3) and (refer to figure 2-21, sheet 2/3)
 - 1.Install the template (AGE NO. 00106) on the fuselage tail cone, and check that the rudder surface is to 0° position.
 - Ensure that following circuit breaker are closed: FLIGHT CONTROL RUDDER TRIM CNTR (1CC) (9) located on Overhead Circuit Breakers Panel (271VE) (6) in position F 1, FLIGHT CONTROL RUDDER TRIM EMERG (2CC) (7) located on Overhead Circuit Breakers Panel (271VE) (6) in position F 3 and FLIGHT CONTROL RUDDER TRIM IND (9CC) (8) located on Overhead Circuit Breakers Panel (271VE) (6) in position F 2.
 - 3. Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 4. Connect the hydraulic test cart (AGE NO. 00262) plus the related adaptor to the ground connection of hydraulic systems No. 1 and No. 2.
 - 5.On the FCS 1 Control Panel (103VE) (3), raise the cover guard of the RUDDER EMER switch (5).
 - 6. Set the RUDDER EMER switch (5) to NOSE RH and maintain. Visually check that the rudder moves to $11.6^{\circ} \pm 1^{\circ}$ rightwards. The rudder indication of the COMBINED TRIM INDICATOR (1) must show about 11.6° right. Release the RUDDER EMER switch (5).
 - 7. Set the RUDDER EMER switch (5) to NOSE LH and maintain. Visually check that the rudder moves to $11.6^{\circ} \pm 1^{\circ}$ leftwards. The rudder indication of the COMBINED TRIM INDICATOR (1) must show about 11.6° left. Release the RUDDER EMER switch (5).
 - 8. Verify that the time required is in the range 13 thru 20 seconds.

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- 2-25.2 RUDDER TRIM TRAVEL CHECK (Emergency OPERATING) (refer to figure 2-21, sheet 1/3) , (refer to figure 2-21, sheet 3/3) and (refer to figure 2-21, sheet 2/3) (Cont'd)
 - 9. Lower the cover guard of the RUDDER EMER switch (5).
 - 10. Remove the template (AGE NO. 00106).
 - 11. Disconnect external AC power supply from aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 12. Turn off hydraulic test cart (AGE NO. 00262) and disconnect it from aircraft.

FOLLOW ON MAINTENANCE:

1. Close the access panels 913A, 913B and 913H.







Figure 2-21 Rudder Trim Travel - Functional Test (sheet 1/3)





NOTE: ALL DIMENSIONS ARE IN INCHES (IN MILLIMETERS)

Figure 2-21 Rudder Trim Travel - Functional Test (sheet 2/3)





Figure 2-21 Rudder Trim Travel - Functional Test (sheet 3/3)



2-26 RUDDER PEDAL - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	120,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 120 (Min.) Total Time Detention System: 120 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
80000	Fixture, pedal force measurement	A34151-000
00106	Templates, rudder check	G0342730001
00181	Kit, flight controls rigging pins	11G001-C052200-801
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.



PROCEDURE:

- 2-26.1 ADJUSTMENT OF PILOT PEDAL TO FORWARD QUADRANT (refer to figure 2-22, sheet 1/6) and (refer to figure 2-22, sheet 2/6)
 - 1. Set the Pilot pedal in neutral position by inserting the rigpin (1) (AGE NO. 00181).
 - 2. Set the forward quadrant (7) in neutral position by inserting the rigpin (6) (AGE NO. 00181).
 - 3. Adjust the linkage rod (4) connecting lever on frame 2 to pulley and connect between Pilot pedal assy (2) and the lever on the forward axle.
 - 4. Check the correct engagement verifying that the terminal lugs of the linkage rod (4) are tightened so that no more than 3 threads are visible on each terminal lug.
 - 5. Remove the rigpin (1) (AGE NO. 00181) from Pilot pedal .
 - 6. Remove the rigpin (6) (AGE NO. 00181) from forward quadrant (7).
- 2-26.2 PILOT AND COPILOT PEDALS ASSY CONNECTION (refer to figure 2-22, sheet 2/6)
 - 1. Ensure that both pedal assy are in neutral position.
 - 2. Adjust the linkage rod (4) at the dimension 43.3 in (1100 mm).
 - 3. Connect the linkage rod (4) between the two pedal assy so that the connecting bolts (3 and 5) can be inserted freely.
- 2-26.3 ADJUSTMENT OF PEDAL AND RUDDER END-OF-TRAVEL STOPS (refer to figure 2-22, sheet 4/6), (refer to figure 2-22, sheet 3/6), (refer to figure 2-22, sheet 5/6) and (refer to figure 2-22, sheet 6/6)
 - 1. Install the manoeuvre effort test equipment (AGE NO. 00008) on the Copilot pedal assy

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- 2-26.3 ADJUSTMENT OF PEDAL AND RUDDER END-OF-TRAVEL STOPS (refer to figure 2-22, sheet 4/6), (refer to figure 2-22, sheet 3/6), (refer to figure 2-22, sheet 5/6) and (refer to figure 2-22, sheet 6/6) (Cont'd)
 - 2. Install the template for rudder travel check (AGE NO. 00106).
 - 3. Ensure that the spring feel unit (10) is connected and no rigging pin is inserted.
 - 4. Connect Hydraulic Test Stand (AGE NO. 00262) and supply the hydraulic systems No. 1 and No. 2 to 1000 psi (70 kg/cm²).
 - 5.By means of test equipment (AGE NO. 00008), push forward the Copilot left pedal until the rudder position is 35 -0° /+0.25° leftwards.
 - 6. With the left pedal pressed as per step 4, adjust the mechanical stop (9) on copilot assy against pedal lever, then release the pedal.
 - 7. Tighten the lock nut (8), then press again the Copilot left pedal and check that the rudder travel is still 35 -0° /+0.25° leftwards.
 - 8. Release the Copilot left pedal to neutral position.
 - 9. Move the manoeuvre effort test equipment (AGE NO. 00008) to the Pilot right pedal assy.
 - 10.By means of test equipment (AGE NO. 00008), push forward the pilot right pedal until the rudder position is 35 -0° /+0.25° rightwards.
 - 11. With the Pilot right pedal pressed as per step 9., adjust the mechanical stop (9) on Pilot assy against pedal lever, then release the pedal.
 - 12. Tighten the lock nut (8), then press again the Pilot right pedal and check that the travel rudder is still 35 -0° /+0.25° rightwards.
 - 13. Release the Pilot right pedal to neutral position.



- 2-26.3 ADJUSTMENT OF PEDAL AND RUDDER END-OF-TRAVEL STOPS (refer to figure 2-22, sheet 4/6), (refer to figure 2-22, sheet 3/6), (refer to figure 2-22, sheet 5/6) and (refer to figure 2-22, sheet 6/6) (Cont'd)
 - 14. Remove the manoeuvre effort test equipment (AGE NO. 00008) from the Pilot pedal assy and the template rudder travel check (AGE NO. 00106).





Figure 2-22 Rudder Pedal - Adjustment (sheet 1/6)







Figure 2-22 Rudder Pedal - Adjustment (sheet 2/6)



LEFT SIDE SHOWN RIGHT SIDE IS OPPOSITE





Figure 2-22 Rudder Pedal - Adjustment (sheet 3/6)







TOOL POSITIONING FOR PEDAL ACTUATING FORCES MEASUREMENT

Figure 2-22 Rudder Pedal - Adjustment (sheet 4/6)





(sheet 5/6)





NOTE: ALL DIMENSIONS ARE IN INCHES (IN MILLIMETERS)

Figure 2-22 Rudder Pedal - Adjustment (sheet 6/6)

Alenia Aermacchi

2-27 RUDDER ACTUATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate external hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Discharge hydraulic pressure by operating the rudder pedals.
- 4. Position maintenance platform (AGE NO. 00074).
- 5. Open the access panel 322E.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	20,00	
Removal	AFM	2	30,00	
Installation	AFM	2	40,00	
Follow Maintenance	AFM	2	20,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 220 (Min.) Total Time Detention System: 110 (Min.)





AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00034	PIN, COTTER	MS24665-300	2,00
00035	NUT, SELF-LOCKING	MS21042L4	9,00

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-27.1 REMOVAL. Remove the rudder actuator as follows:

WARNING

DO NOT MOVE THE RUDDER PEDALS OR RUDDER SURFACE WHILE PERFORMING THIS OPERATION. IF YOU DO NOT OBEY THESE SAFETY PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGETO THE EQUIPMENT MAY OCCUR.

A. Insert a rigpin into rudder quadrant.

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2-27.1 REMOVAL. Remove the rudder actuator as follows: (Cont'd)

WARNING

NITROGEN VAPOR IS TOXIC. OPEN ALL THE NITROGEN CHARGING VALVE VERY SLOWLY TO PREVENT NITROGEN VAPOR FROM COMINGIN TOUCH WITH THE EYES. DO NOT BREATHE THE NITROGEN VAPOR COMING OUT FROM THE NITROGEN CHARGING VALVE. IT COULD BE MIXED WITH HYDRAULIC FLUID. IF YOU DO NOT OBEY THESE SAFETY PRECAUTIONS, SEVERE INJURY MAY OCCUR.

- B.Unscrew the bolt that connects the bonding lead actuator on structure, collect washer and bolt and nut.
- C.Disconnect two electrical connectors from the actuator.
- D. For the two rods use the following procedure:
- 1. Remove the cotter pin from the rod connection;
- 2. unscrew the bolt that connect the rod with actuator;
- 3.collect washers nut and bush (only for input lever connection);
- 4. disconnect the rod. Repeat this operation for both rods.

(Cont'd)

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- 2-27.1 REMOVAL. Remove the rudder actuator as follows: (Cont'd)
 - A.Use a container or wiping cloth to collect drained fluid.
 - B.Unscrew the nut and disconnect the inlet and outlet pipe hydraulic system No. 1 and No. 2.
 - C.Close the pipes with plugs.
 - D.Close the four nipples on the actuator with plugs.
 - E.Move the rudder surface until end of travel in order to shorten the actuator to the minimum length;this operation must be performed to allow the exiting of the actuator.
 - F.Remove the two cotter pin from the connection bolts on the actuator, hold the actuator, unscrewthe two bolts.
 - G.Remove the actuator from the aircraft.
 - H.Position the actuator on the workbench.
 - I.Remove the four nipples from the actuator.
 - J.Unscrew the bolt that fixes bonding lead on the actuator, collect bonding lead and bolt.
 - K.Discard O-rings.



2-27.1 REMOVAL. Remove the rudder actuator as follows: (Cont'd)

CAUTION

Seal all open pipes and component holes to prevent entrance of unwanted material.

2-27.2 INSTALLATION. Install the Rudder actuator as follows:

NOTE

Lubricate all packings and O-ring with hydraulic fluid.

- A. Position the new actuator on the workbench.
- B.Position the bonding lead on the actuator and torque tighten the bolt in order to fix bonding lead with actuator.
- C. Insert a new O-rings on the four nipples.
- D. Torque tighten the four nipples on the actuator.
- E.Refill hydraulic oil into actuator, close the inlet/outlet hydraulic connections with plugs.
- F. Minimize the length of the Actuator.
- G. Install the actuator on the aircraft.



- 2-27.2 INSTALLATION. Install the Rudder actuator as follows: (Cont'd)
 - H.Hold the actuator and torque tighten to $252 \div 285$ in lb two connection bolts install the cotter pinon conenctions.
 - I. Remove the plugs from pipes.
 - J.Connect the inlet and outlet pipe hydraulic line No. 1 and No. 2 with the actuator, torque tighten the nut that connect pipe with actuator.
 - K.For the two rods use the following procedure:
 - 1. Reconnect the rod;
 - 2. place the bush (only on input lever connection), place the washers on connections insert the bolt on connection and position the nut on the bolt;
 - 3. torque tighten to $10 \div 29$ in lb the bolt;
 - 4. replace the cotter pin on the connection. Repeat this operation for both rods.
 - A.Reconnect the electrical connectors.
 - B.Reconnect the bonding lead actuator on the structure, position the washer, bolt and torque tighten the nut to $44 \div 48$ in lb.
 - C.Remove from aircraft the container with drained fluid or wiping cloths.

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2-27.2 INSTALLATION. Install the Rudder actuator as follows: (Cont'd)

CAUTION

Dont use the drained fluid collected to refill hydraulic circuit.lt is contaminated, discard it.

D.Connect electrical power.

E.Connect external hydraulic power.

F. Remove the rigpin from rudder quadrant.

FOLLOW ON MAINTENANCE:

- 1. Close the access panel 322E.
- 2. Remove maintenance platform (AGE NO. 00074).
- 3. Restore external hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform required:

A.RUDDER CONTROL SYSTEM (refer to para 2-22)





Figure 2-23 Rudder Actuator - Removal and Installation (sheet 1/3)

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Figure 2-23 Rudder Actuator - Removal and Installation (sheet 2/3)

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Figure 2-23 Rudder Actuator - Removal and Installation (sheet 3/3)

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TCH.1C-27J-2-27JG



2-28 RUDDER ACCUMULATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Open thermal insulation screen.
- 4. Disable cargo ramp control.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	15,00	
Installation	AFM	1	20,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 65 (Min.) Total Time Detention System: 65 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**





Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00027	PACKING, PREFORMED	M83461/2-908	1,00
00031	PACKING, PREFORMED	M83461/2-904	1,00

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-28.1 REMOVAL. Remove the Rudder accumulator as follows:

WARNING

INSTALL THE PROTECTION CAP ON THE PIPES AND THE ELECTRICAL CONNECTORS THAT YOU DISCONNECT. THIS WILL PREVENT INJURIES TO PERSONNEL AND DAMAGE TO THE EQUIPMENT.



2-28.1 REMOVAL. Remove the Rudder accumulator as follows: (Cont'd)

WARNING

OPEN ALL THE NITROGEN CHARGING VALVE VERY SLOWLY TO PREVENT NITROGEN VAPOR FROM COMING IN TOUCH WITH THE EYES. DO NOT BREATHE THE NITROGEN VAPOR COMING OUT FROM THE NITROGEN CHARGING VALVE; IT COULD BE MIXED WITH HYDRAULIC FLUID.

CAUTION

Seal all open pipes and component holes to prevent entrance of unwanted material.

- A. Remove the cover plate from the left fuselage side ramp area.
- B. Use container to collect drained fluid.
- C.Release the nitrogen pressure from the hydraulic accumulator.
- D.Check the completely dischargement of the hydraulic accumulator on the manometer.
- E.Unscrew nut and disconnect the sensorial pipe.
- F. Unscrew nut and disconnect inlet and outlet pipe.

(Cont'd)

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- 2-28.1 REMOVAL. Remove the Rudder accumulator as follows: (Cont'd)
 - G.Hold the accumulator, then unscrew the screws that lock the clamps fixing the accumulator.
 - H.Remove the accumulator from the aircraft.
 - I.Discard O-ring.
- 2-28.2 INSTALLATION. Install the Rudder accumulator as follows:

NOTE

Lubricate all packings and O-ring with hydraulic fluid.

- A.Install the Rudder accumulator.
- B.Hold the accumulator, then screw the screws that lock the clamps fixing the accumulator.
- C.Place new O-rings on the inlet and outlet pipe and connect it on the accumulator torque tightenthe nut on top of inlet and outlet pipe.
- D.Place new O-rings on the sensorial pipe and connect it on the accumulator torque tighten the nuton top of sensorial pipe.
- E.Remove from the aircraft the container with drained fluid.

(Cont'd)



2-28.2 INSTALLATION. Install the Rudder accumulator as follows: (Cont'd)

CAUTION

Dont use the drained fluid collected to refill hydraulic circuit because it is contamined. Discard it.

F.Install the cover plate on the left fuselage side ramp area.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Close thermal insulation screen.
- 4. Enable cargo ramp control.
- 5. Perform the functional test:
 A.RUDDER ACCUMULATOR (refer to para 2-22).





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TCH.1C-27J-2-27JG



2-29 LOAD FEEL SPRING - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panel 322E.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	20,00	
Removal	AFM	1	20,00	
Installation	AFM	1	25,00	
Follow Maintenance	AFM	1	20,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001

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AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	1,00

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-29.1 REMOVAL (refer to figure 2-25, sheet 1/2) and (refer to figure 2-25, sheet 2/2)

CAUTION

During maintenance operation not move the rudder command (pedals) and do not touch the rudder surface.

- 1. Insert the rigging pin (1) (AGE NO. 00181) in the rudder quadrant (2).
- 2. Remove the load-feel spring (5) from bellcrank (3) by removing bolt (4), washer (11), castellated nut (13) and cotter pin (12). Discard removed cotter pin.
- 3. Remove the load-feel spring (5) from fell unit lever (7) by removing bolt (6), washer (8), castellated nut (9) and cotter pin (10). Discard removed cotter pin.



- 2-29.2 INSTALLATION (refer to figure 2-25, sheet 1/2) and (refer to figure 2-25, sheet 2/2)
 - 1.Connect the load-feel spring (5) at the fell unit lever (7) by using bolt (6), washer (8), castellated nut (9) and new cotter pin (10) (LMC NO. 00052) . Torque tighten (AGE NO. 00054) to 10 thru 29 in lb.
 - 2. Connect the load-feel spring (5) at the bellcrank (3) by using bolt (4), washer (11), castellated nut (13) and new cotter pin (12) (LMC NO. 00052). Torque tighten (AGE NO. 00054) to 10 thru 29 in lb.
 - 3. Remove the rigging pin (1) (AGE NO. 00181) from rudder quadrant (2).
 - 4. Verify that the rudder is in neutral position.

FOLLOW ON MAINTENANCE:

- 1.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 3. Close the access panel 322E.
- 4. Remove maintenance platform (AGE NO. 00074).
- 5. Perform the functional test:
 - A.CHECK OF RETURN TO NEUTRAL POSITION (refer to para 2-22).
 - B.RUDDER CONTROL SYSTEM (refer to para 2-22)







Figure 2-25 Load - Feel Spring - Removal and Installation (sheet 1/2)

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Figure 2-25 Load - Feel Spring - Removal and Installation (sheet 2/2)

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2-30 RUDDER QUADRANT - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Open the access panels 212AZ, 212BZ, 214BZ, 213AZ, 130AH and 130AD.
- 4. Remove Pilot Seat (refer to manual TCH.1C-27J-2-25JG).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	60,00	
Removal	AFM	1	40,00	
Installation	AFM	1	50,00	
Follow Maintenance	AFM	2	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 330 (Min.) Total Time Detention System: 210 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
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AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	4,00
00011	NUT, SELF-LOCKING	H14-3	4,00
00012	PIN, COTTER	MS24665-374	1,00
00013	NUT, SELF-LOCKING	H14-4	4,00
00015	NUT, SELF-LOCKING	MS21042-L3	2,00
00052	PIN, COTTER	MS24665-153	1,00
00069	NUT, SELF-LOCKING	MS21043-3	1,00

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

- 2-30.1 REMOVAL. For remove the Rudder quadrant proceed as follows:
 - A.Unscrew the bolt that fix the cable guide on the Rudder quadrant, repeat the operation for the other guide.
 - B. Remove the two cotter pins from rudder quadrant that fix the rudder cable with the rudder quadrant and two cotter pins from L elevator tension regulator that fix the L elevator cable with the L elevator tension regulator.

(Cont'd)



- 2-30.1 REMOVAL. For remove the Rudder quadrant proceed as follows: (Cont'd)
 - C.Slack the Rudder Cables/L Elevator cables by means of turnbuckles in the upper cargo zone nearthe cabin (if is necessary Remove the Rudder cable/L elevator cable in accordance with maintenance task remove/replace rudder cable/L elevator cable).
 - D.Remove the cables from their seats on the Rudder quadrant / Elevator Tension Regulator No. 1.
 - E.Disconnect rudder input lever and Elevator input lever in the following way: unscrew the bolt collect washers and nuts, collect cotter pin.
 - F.Unscrew the two bolts fixing the assembly to the structure.
 - G.Remove the assembly from aircraft and position it on workbench.
 - H.Remove the cotter pin from the top of the three, then unscrew the nut that fixes the three withsupport, extract the support, collect nut and washers, left bearing inserted into the support.
 - I.Remove the nut spanner and washer from the top of rudder quadrant.
 - J.Remove the Rudder quadrant.



2-30.2 INSTALLATION. For install the Rudder quadrant proceed as follows:

- A.On workbench replace the Rudder quadrant.
- B.Insert the new rudder quadrant into assembly three, install the washer and the nut spanner on thetop of rudder pulley, then torque tighten the nut spanner.
- C. Insert the assembly support on the assembly three, then position washer nut and torque tighten the nut, install the cotter pin.
- D. Position the Assembly on the aircraft.
- E.Install the two bolts fixing the rudder quadrant support assembly with aircraft structure, then torquetighten the bolts.
- F.Insert a thickness to stop the pulley rotation.
- G.Position the L elevator cable on the L elevator tension regulator, then insert the two cotter pins inorder to fix cable with elevator tension regulator.
- H. Position the rudder cable on the rudder quadrant, then insert the two cotter pins in order to fix the rudder cable with quadrant.
 - I. Install the two guide on the Rudder quadrant.
- J. Position the washer, insert the bolt, then position the nut and torque tighten the bolt.
- K.Remove the thickness.

(Cont'd)

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2-30.2 INSTALLATION. For install the Rudder quadrant proceed as follows: (Cont'd)

- L.Connect Rudder input lever and Elevator input lever in the following way: place washer and nut onthe connection, screw the bolt.
- M. Stretch the Rudder Cables/Elevator Cables by means of turnbuckles in the upper cargo zone nearthe cabin (if the Rudder Cables/Elevator Cables has been removed, Install the Rudder Cables/ElevatorCables in accordance with maintenance task Remove/ Install Rudder Cables/Elevator Cables).

CAUTION

Do not perform the complete tension of the cable.

N.Perform elevator cable tension.

O.Perform rudder cable tension.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Remove Pilot Seat (refer to manual TCH.1C-27J-2-25JG).
- 4. Close the access panels 212AZ, 212BZ, 214BZ, 213AZ, 130AH and 130AD.

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5. Perform the functional test:

- A.RUDDER TRAVEL CHECK (refer to para 2-22) .
- B.FRICTION MANOUVRE EFFORT AND BREAK-OUT CHECK (refer to para 2-22).
- C.CHECK OF RETURN TO NEUTRAL POSITION (refer to para 2-39).





Figure 2-26 Rudder Quadrant - Removal and Installation (sheet 1/2)

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Figure 2-26 Rudder Quadrant - Removal and Installation (sheet 2/2)

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2-31 FCS 1 CONTROL PANEL (103VE) RUDDER TRIM - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	ELT	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

None

PROCEDURE:

- 2-31.1 CHECK OF FCS 1 CONTROL PANEL (103VE) RUDDER TRIM (refer to figure 2-27, sheet 2/3)
 - 1. Check that the following circuit breakers are closed:
 - A.FLAP ASYM (1CA) (8) located on Rear Mid Circuit Breakers Panel (451VE) (9) in position L 5 (refer to figure 2-27, sheet 3/3).

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- 2-31.1 CHECK OF FCS 1 CONTROL PANEL (103VE) RUDDER TRIM (refer to figure 2-27, sheet 2/3) (Cont'd)
 - B.FLAP ASYM (12CA) (7) located on Rear Upper Circuit Breakers Panel (452VE) (6) in position H 4 (refer to figure 2-27, sheet 3/3).
 - C.FLIGHT CONTROL FLAP IND (3CA) (2) located on Overhead Circuit Breakers Panel (271VE) (1) in position F 14 (refer to figure 2-27, sheet 1/3).
 - 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 3. Provide hydraulic power to the aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 4. Start up the avionics and check that there are no ACAWS messages concerning the flight controls.

WARNING

BEFORE PROCEED THROUGH THE NEXT STEPS BE CAREFUL THAT NOBODY IS WORKING ON THE RUDDER AREA.

CAUTION

Ensure that the rudder area is free from tools and other objects.

5.On the FCS 1 control panel (103VE) (3) set and hold momentarily the NORMAL TRIM selector (5) to NOSE LH position and check that the rudder moves toward left.



- 2-31.1 CHECK OF FCS 1 CONTROL PANEL (103VE) RUDDER TRIM (refer to figure 2-27, sheet 2/3) (Cont'd)
 - 6. Rise the EMERGENCY TRIM cover guard then set again the NORMAL TRIM selector (4) to NOSE LH and NOSE RH positions and check that the rudder remains in the last reached position.
 - 7.Set and hold momentarily the EMERGENCY TRIM selector (4) to NOSE RH and check that the rudder moves toward neutral then toward right position.
 - 8. Lower the EMERGENCY TRIM cover guard.
 - 9. Set the NORMAL TRIM selector (5) to NOSE LH until the rudder in order to reposition the rudder to the neutral position.

FOLLOW ON MAINTENANCE:

None





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FCS1 CONTROL PANEL (103VE)

Figure 2-27 FCS 1 Control Panel (103VE) Rudder Trim -Functional Test (sheet 2/3)

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2-32 RUDDER TRIM POSITION TRANSMITTER -ADJUSTMENT

INPUT CONDITION:

- Aircraft Applicability:
 - 04162, 04180
- **Required Conditions:**
 - 1. Perform Preparation (refer to para 1-1).
- Recomended Personnel:

Not Provided

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-32.1 For adjustment of position transmitter (refer to para 2-33).

FOLLOW ON MAINTENANCE:

None



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2-33 RUDDER TRIM POSITION TRANSMITTER -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Position maintenance platform (AGE NO. 00074).

Recomended Personnel:

Not Provided

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00370	NUT, SELF-LOCKING	MS14144L3	1,00

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-33.1 REMOVAL (refer to figure 2-28, sheet 1/2) and (refer to figure 2-28, sheet 2/2)

- 1. Open the access panels 322D and 322B.
- 2. Disconnect the electrical connector (10CCA) (1) from the rudder trim position transmitter (10CC) (4) .

(Cont'd)

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- 2-33.1 REMOVAL (refer to figure 2-28, sheet 1/2) and (refer to figure 2-28, sheet 2/2) (Cont'd)
 - 3. Disconnect from the lever (5) the rod (9) by removing bolt (10), washer (8), nut, self-locking (7) and pin (6). Discard removed nut, self-locking.
 - 4. Disconnect and remove from the aircraft structure the rudder trim position transducer (10CC) (4) by removing screws (2) and washers (3).
- 2-33.2 INSTALLATION (refer to figure 2-28, sheet 1/2) and (refer to figure 2-28, sheet 2/2)
 - 1. Position and install to the aircraft structure the rudder trim position transducer (10CC) (4) by using screws (2) and washers (3).
 - 2. Connect to the lever (5) the rod (9) by using bolt (10), washer (8), new nut, self-locking (LCM NO. 00370) (7) and pin (6).
 - 3. Connect the electrical connector (10CCA) (1) to the rudder trim position transmitter (10CC) (4) .
 - 4. Ensure that the rudder is to zero position.
 - 5. Adjust and connect the linkage rod between the rudder position transducer lever and rudder attachment point.
 - 6.Check that, on the Combined Trim Indicator (15CB) (11), the RUDDER indication (12) shows about 0°.
 - 7. It is necessary to re-adjust the linkage rod and /or the transducer lever to get 0°.
 - 8. Perform the fully trim travel leftward / rightward and check that, on the Combined Trim Indicator (15CB) (11), the RUDDER indication (12) shows about 11.6°.
 - 9. Close the access panels 322B and 322D.

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FOLLOW ON MAINTENANCE:

1. Remove maintenance platform (AGE NO. 00074).







Figure 2-28 Rudder Trim Position Transmitter - Removal and Installation (sheet 1/2)

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Figure 2-28 Rudder Trim Position Transmitter - Removal and Installation (sheet 2/2)

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2-34 RUDDER TRIM ELECTRICAL ACTUATOR -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panel 322E.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	20,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	20,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 105 (Min.) Total Time Detention System: 105 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N	
00054	Kit, torque wrenches	G0001200001-001**	
00074	Kit, aircraft assy platform	G0005100001	

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Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00014	NUT, SELF-LOCKING	MS21042L08	1,00
00052	PIN, COTTER	MS24665-153	2,00

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-34.1 REMOVAL. Remove the Rudder trim electrical actuator as follows:

CAUTION

Do not move the rudder pedals or rudder surface while performing this operation.

- A. Disconnect the two electrical connector.
- B.Unscrew the bolt linking the Rudder trim electrical actuator as follow:
- 1. remove the cotter pin;
- 2.unscrew the castellated nut and remove the flat washer;
- 3. remove the bolt;
- 4. remove the flat washer.

(Cont'd)



2-34.1 REMOVAL. Remove the Rudder trim electrical actuator as follows: (Cont'd)

- 5. remove the bushing.
 - A.Unscrew the two screw that connect the two bonding lead to Rudder trim electrical actuator.
 - B.Unscrew the linking bolt that connect the Rudder trim electrical actuator to the aircraft structure as follows:
- 6. remove the cotter pin;
- 7.unscrew the castellated nut and remove the flat washer;
- 8. remove the bolt;
- 9. remove the flat washer;
- 10. remove the bushing.

A.Remove the Rudder trim electrical actuator.

2-34.2 INSTALLATION. Install the Rudder trim electrical actuator as follows:

CAUTION

Do not move the rudder pedals or rudder surface while performing this operation.

(Cont'd)
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2-34.2 INSTALLATION. Install the Rudder trim electrical actuator as follows: (Cont'd)

NOTE

The rudder trimelectrical actuator in neutral position is 8.89 in (226mm) between the connection axis.

- A. Replace the Rudder trim electrical actuator.
- B. Connect the two electrical connector.
- C. Place the bushing, the flat washer and nut on the connection from Rudder trim electrical actuator to the aircraft structure, torque tighten lightly the bolt enough to insert the cotter pin, insert thecotter pin.
- D. Screw the two screw and connect the bonding lead to Rudder trim electrical actuator.
- E.Torque tighten the bolt linking the Rudder trim electrical actuator with mechanical linkage as follow:
- 1. insert the bushing and the bolt with the flat washer;
- 2.screw the castellated nut and torque tighten to $18 \div$ 20 in lb (0.207 \div 0.230 mkg);
- 3. replace the cotter pin.



FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Close the access panel 322E.
- 4. Remove maintenance platform (AGE NO. 00074).
- 5. Perform the functional test:
 - A.RUDDER TRIM TRAVEL FUNCTIONAL TEST (refer to para 2-25).





Figure 2-29 Rudder Trim Electrical Actuator - Removal and Installation

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2-35 RUDDER TRAVEL LIMITATION UNIT (RTLU) -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Supply the hydraulic system power (refer to manual TCH.1C-27J-2-00GV) .

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	60,00	
	ELT	1	180,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 240 (Min.) Total Time Detention System: 180 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00002	Kit, air data accessories	ADAC27J-945
00106	Templates, rudder check	G0342730001

Consumable Material Required:

None



Safety Conditions:

Be aware of information contained in Paragraph (refer to para 2-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-35.1 NORMAL OPERATING (RTLU CHEK WITH AIR DATA VALID (refer to figure 2-30, sheet 6/6), (refer to figure 2-30, sheet 1/6), (refer to figure 2-30, sheet 2/6), (refer to figure 2-30, sheet 4/6), (refer to figure 2-30, sheet 5/6) and (refer to figure 2-30, sheet 3/6)

NOTE

Ensure that the circuit breakers ENG 1 NIU 1 (5EN) (2) and ENG 2 NIU 2 (4EN) (1), respectively located on Rear Mid Circuit Breaker Panel (451VE) in position K 21 and on Rear Upper Circuit Breaker Panel (452VE) in position F 12 are opened.

- 1.Ensure that the AIR SPEED selector is to AUTO position.
- 2. Power-up the Avionics to get availability of the ACAWS and of the Air Data System (DADS) functionality.
- 3. Position the template (AGE NO. 00106) on the rudder and connect the Air Data test set (AGE NO. 00002) plus related adapter to the Pitot tubes and switch-on.
- 4. Ensure that the circuit breakers FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (4) located on Overhead Circuit Breaker Panel (271VE) in position F 11 and FLIGHT CONTROL Q-FEEL RTLU PWR (2CG) (5) located on Overhead Circuit Breaker Panel (271VE) in position F 10 are closed to feed the left and right channels of the Electronic Control Unit (Q-Feel powered).

(Cont'd)



- 2-35.1 NORMAL OPERATING (RTLU CHEK WITH AIR DATA VALID (refer to figure 2-30, sheet 6/6), (refer to figure 2-30, sheet 1/6), (refer to figure 2-30, sheet 2/6), (refer to figure 2-30, sheet 4/6), (refer to figure 2-30, sheet 5/6) and (refer to figure 2-30, sheet 3/6) (Cont'd)
 - 5. Simulate an increasing of aircraft speed to 150 kts by setting a dynamic pressure of 32.2 mbar (0.47 psi) in both channels, read on the template (AGE NO. 00106).
 - 6. Move the left pedal (7) to fully forward and check that the rudder travel is $35^{\circ} -0.2^{\circ} / +0.2^{\circ}$ leftwards, read on the template (AGE NO. 00106).
 - 7. Move the right pedal (6) to fully forward and check that the rudder travel is $35^{\circ} -0^{\circ} / +0.2^{\circ}$ rightwards, read on the template (AGE NO. 00106).
 - 8. Simulate an increasing of aircraft speed to 180 kt by setting a dynamic pressure of 64.3 mbar (0.93 psi) in both channels.
 - 9. Move the left pedal to fully forward and check that the rudder travel is 15 ± 1 leftwards, read on the template (AGE NO. 00106).
 - 10. Move the right pedal to fully forward and check that the rudder travel is $15^{\circ} \pm 1^{\circ}$ rightwards, read on the template (AGE NO. 00106).
 - 11. Simulate an increasing of aircraft speed to 280 kts by setting a dynamic pressure of 132.9 mbar (1.93 psi) in both channels.
 - 12. Move the left pedal to fully forward and check that the rudder travel is $4.25^{\circ} \pm 1^{\circ}$ leftwards, read on the template (AGE NO. 00106).
 - 13. Move the right pedal to fully forward and check that the rudder travel is $4.25^{\circ} \pm 1^{\circ}$ rightwards, read on the template (AGE NO. 00106).



2-35.2 MANUAL OPERATING (RTLU CHECK WITH AIR DATA NOT VALID) (refer to figure 2-30, sheet 2/6) , (refer to figure 2-30, sheet 4/6) , (refer to figure 2-30, sheet 5/6) , (refer to figure 2-30, sheet 6/6)

NOTE

If the MC software Block 2 is loaded, the caution Q-FEEL/TLU MAN SEL illuminates on ACAWS everytime the AIR SPEED selector is moved out of AUTO position.

- 1. Simulate a failure of the Air data system by deenergizing electrically the ADC1 and the ADC2.
- 2. Check that the ACAWS caution Q-FEEL/TLU AD FAIL plus related aural tone are activated, the FD message Q-FEEL/TLU AD FAIL appears on CMDU Maintenance Page and the MAN indication, on FCS control panel, illuminates flashing.
- 3. Set the air data system in manual mode by moving the AIR SPEED selector to LOW. Verify that the MAN indication, on FCS control panel, illuminates steady and the ACAWS caution message Q-FEEL/TLU MAN SEL appears on CMDU.
- 4. Move the left pedal (7) to fully forward and check that the rudder travel angle is 35° -0.2° /+ 0.2° leftwards, read on the template (AGE NO. 00106).
- 5. Move the right pedal (6) to fully forward and check that the rudder travel angle is 35° -0° /+ 0.2° rightwards, read on the template (AGE NO. 00106).
- 6. Move the AIR SPEED selector to MED position.
- 7. Move the left pedal (7) to fully forward and check that the rudder travel angle is $9.5^{\circ} \pm 1^{\circ}$ leftwards, read on the template (AGE NO. 00106).
- 8. Move the right pedal (6)to fully forward and check that the rudder travel angle is $9.5^{\circ} \pm 1^{\circ}$ leftwards, read on the template (AGE NO. 00106).
- 9. Move the AIR SPEED selector to HIGH position.

(Cont'd)



- 2-35.2 MANUAL OPERATING (RTLU CHECK WITH AIR DATA NOT VALID) (refer to figure 2-30, sheet 2/6) , (refer to figure 2-30, sheet 4/6) , (refer to figure 2-30, sheet 5/6) , (refer to figure 2-30, sheet 6/6) (Cont'd)
 - 10. Move the left pedal (7) to fully forward and check that the rudder travel angle is $5.4^{\circ} \pm 1^{\circ}$ leftwards, read on the template (AGE NO. 00106).
 - 11. Move the right pedal (6) to fully forward and check that the rudder travel angle is $5.4^{\circ} \pm 1^{\circ}$ rightwards, read on the template (AGE NO. 00106).
 - 12. Set the AIR SPEED selctor (3) in AUTO position.
 - 13. Verify that the ACAWS caution message Q-FEEL/TLU MAN SEL disappears from CMDU.
 - 14.The MAN indication. FCS control panel. on extinguishes. the ACAWS caution message Q-FEEL/TLU AD FAIL disappears from CMDU, the Q-FEEL/TLU AD FD message FAIL remains displayed until the clearing of CMDU is performed via SAMU.
 - 15. Simulate an aircraft speed of 280 Kts in both channels.
 - Disconnect the (2CDA) (8) (2CDB) (10) electrical connector from the RTLU (9) (in order to simulate a RTLU failure of one channel).
 - 17.Set the AIR SPEED selector to LOW position and verify the following conditions:
 - -the ACAWS caution message Q-FEEL/TLU MAN SEL appears on CMDU;
 - -the ACAWS warning message RUDDER TLU FAIL appears on CMDU while the warning aural tone is audible;
 - -the FD message RUDDER TLU FAIL appears on CMDU Maintenance Page.

(Cont'd)



- 2-35.2 MANUAL OPERATING (RTLU CHECK WITH AIR DATA NOT VALID) (refer to figure 2-30, sheet 2/6) , (refer to figure 2-30, sheet 4/6), (refer to figure 2-30, sheet 5/6), (refer to figure 2-30, sheet 6/6) (Cont'd)
 - 18. Operate the Pilot pedals fully left then rightwards and visually check that the pedals reach the end stroke.
 - 19. Open the circuit breakers 1CG (4) and 2CG (5) (precautionary) then reconnect the (2CDA) (8) (2CDB) (10) connector to the RTLU (9).
 - 20. Reclose the circuit breakers 1CG (4) and 2CG (5) and check the following conditions:
 - -the FD message RUDDER TLU FAIL remains displayed on CMDU Maintenance Page until clearing of CMDU is performed via SAMU.
 - 21.Set the AIR SPEED selector to AUTO position and wait 15 sec at least before to proceed to the next step. Verify that the ACAWS message Q-FEEL/TLU MAN SEL disappears on CMDU.

NOTE

This test has only the aim to verify the correct TLU operating after electrical disconnection.

22. Operate the Pilot pedals fully left then rightwards. Check that rudder travel is $4.25^{\circ} \pm 1^{\circ}$ leftward and rightward (breakdown check).

FOLLOW ON MAINTENANCE:

- 1. Disconnect external AC power supply from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Stop the hydraulic system power (refer to manual TCH.1C-27J-2-00GV).









Figure 2-30 Rudder Travel Limitation (RTLU) - Functional Test (sheet 2/6)





NOTE: ALL DIMENSIONS ARE IN INCHES (IN MILLIMETERS)

Figure 2-30 Rudder Travel Limitation (RTLU) - Functional Test (sheet 3/6)

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Figure 2-30 Rudder Travel Limitation (RTLU) - Functional Test (sheet 4/6)





Figure 2-30 Rudder Travel Limitation (RTLU) - Functional Test (sheet 5/6)





Figure 2-30 Rudder Travel Limitation (RTLU) - Functional Test (sheet 6/6)



2-36 OVERRIDE OPERATING (RTLU FUNCTIONAL CHECK IN OVERRIDE CONDITION) - MANUAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Supply hydraulic system power (refer to manual TCH.1C-27J-2-00GV).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	40,00	
	ELT	1	40,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 80 (Min.) Total Time Detention System: 40 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00002	Kit, air data accessories	ADAC27J-945
00048	Test set, digital pitot static	DPS-500
00106	Templates, rudder check	G0342730001



Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.

PROCEDURE:

2-36.1 OVERRIDE OPERATING (RTLU FUNCTIONAL CHECK IN OVERRIDE CONDITION) (refer to figure 2-31, sheet 4/4), (refer to figure 2-31, sheet 2/4), (refer to figure 2-31, sheet 3/4) and (refer to figure 2-31, sheet 1/4).

NOTE

This test has only the aiming to verify the correct OVRD operation. It requires the connection of the air data test set (AGE NO. 00048) and the installation of the rudder check template (AGE NO. 00106).

- 1. Simulate an increasing of aircraft speed to 280 Kts by setting a dynamic pressure of 1.927 psi (0.135 kg/cm2) in both channels.
- 2. Assure that the circuit breaker FLIGHT CONTROL Q-FEEL RTLU IND (5CD) (1) located on the Overhead circuit breakers panel (271 VE) in position F12 is engaged.
- 3.On FCS 2 Control Panel (104VE), assure that the RUDDER TLU OVERRIDE is deactivated (check that the lamp ON located on TLU OVRD pushbutton is not illuminated).

(Cont'd)



- 2-36.1 OVERRIDE OPERATING (RTLU FUNCTIONAL CHECK IN OVERRIDE CONDITION) (refer to figure 2-31, sheet 4/4), (refer to figure 2-31, sheet 2/4), (refer to figure 2-31, sheet 3/4) and (refer to figure 2-31, sheet 1/4). (Cont'd)
 - 4. Operate the pilot left pedal fully and check that the rudder surface moves to $4.25^{\circ} \pm 1^{\circ}$ leftwards.
 - 5. Maintaining the pilot left pedal pressed, press the TLU OVRD pushbutton, and check that the ACAWS caution RUDDER TLU OVERRIDE and the relevant aural tone are activated and the lamp ON pushbutton illuminates.
 - 6.Check that the rudder moves at least 5° more than the value obtained at step 4. (AGE NO. 00106).
 - 7. Still maintaining the pilot left pedal pressed, press again the pushbutton TLU OVRD pushbutton and check that the ACAWS caution RUDDER TLU OVERRIDE plus the relevant aural tone are de-activated and the lamp ON pushbutton extinguish.
 - 8. Check that the rudder returns at $4.25^{\circ} \pm 1^{\circ}$ leftwards.
 - 9. Release the left pedal and verify that the surface returns to its neutral position.
 - 10. Return the aircraft simulated speed to 0 Kts.

(Cont'd)



- 2-36.1 OVERRIDE OPERATING (RTLU FUNCTIONAL CHECK IN OVERRIDE CONDITION) (refer to figure 2-31, sheet 4/4), (refer to figure 2-31, sheet 2/4), (refer to figure 2-31, sheet 3/4) and (refer to figure 2-31, sheet 1/4). (Cont'd)
 - 11. Remove the template from rudder and test equipment from pedals. Disconnect air data test set and electrical/hydraulic external power.

FOLLOW ON MAINTENANCE:

- 1.Disconnect external AC power supply from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Stop hydraulic system power (refer to manual TCH.1C-27J-2-00GV) .





NOTE: ALL DIMENSIONS ARE IN INCHES (IN MILLIMETERS)

Figure 2-31 Overide Operating (Rtlu Functional Check in Override Condition) - Manual Test (sheet 1/4)











Figure 2-31 Overide Operating (Rtlu Functional Check in Override Condition) - Manual Test (sheet 3/4)





Figure 2-31 Overide Operating (Rtlu Functional Check in Override Condition) - Manual Test (sheet 4/4)



2-37 RUDDER TRAVEL LIMITATOR UNIT (RTLU) -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panels 322E and 322B.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	30,00	
Removal	ELT	1	20,00	
Installation	ELT	1	25,00	
Follow Maintenance	ELT	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 105 (Min.) Total Time Detention System: 105 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001



AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00015	NUT, SELF-LOCKING	MS21042-L3	1,00
00016	LOCK WIRE	MS20995C32	AR
00052	PIN, COTTER	MS24665-153	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-37.1 REMOVAL. Remove the Rudder travel limitator unit as follows:
 - A. Discharge residual pressure in the hydraulic Rudder accumulator by actuating the rudder pedal.
 - B. Insert the rigging pin in the quadrant.

CAUTION

Do not move the rudder pedals or rudder surface while performing this operation.

- C. Disconnect the two electrical connectors.
- D.Unscrew the bolt that connect the bonding lead with RTLU.

(Cont'd)



- 2-37.1 REMOVAL. Remove the Rudder travel limitator unit as follows: (Cont'd)
 - E.Unscrew the bolts linking the rods end to RTLU as follow:
 - 1. remove the cotter pins;
 - 2. unscrew the castellated nuts;
 - 3. remove the bolts;
 - 4. remove the flat washers and bush.

A. Disconnect the two rods end from RTLU.

- B.Unscrew the four bolts fixing the RTLU to the structure in the following way:
- 5. unscrew the bolts;
- 6. remove the flat washers.

A.Remove the RTLU.

2-37.2 INSTALLATION. Install the Rudder travel limitation unit as follows:

CAUTION

Do not move the rudder pedals or rudder surface while performing this operation.

A.Replace the RTLU in its location.

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2-37.2 INSTALLATION. Install the Rudder travel limitation unit as follows: (Cont'd)

- B. Torque tighten the four bolts fixing the RTLU to the structure as follow:
- 1. insert the flat washers in the bolts;
- 2. insert the bolts in the connections;
- 3. torque tighten the bolts;
 - A.Reconnect the two bearings rod end in the RTLU lever end connections.
 - B.Screw the bolts linking the two bearings rod end to RTLU as follow:
- 4. insert the flat washers in the bolts;
- 5. insert the bush in the connection;
- 6. insert the bolts in the connections;
- 7.torque tighten to 10 ÷ 29 in lb (0.115 ÷ 0.334 mkg) the castellated nuts;
- 8. insert the cotter pins;
 - A.Position the bonding lead on the structure, insert the washer, bolt and torque nut to $20 \div 25$ in $lb(0.230 \div 0.288 \text{ mkg}).$
 - B. Connect the two electrical connectors.
 - C.Remove the rigging pin from rudder quadrant.



FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Close the access panels 322E and 322B.
- 4. Remove maintenance platform (AGE NO. 00074).
- 5. Perform the functional test:
 - A.FUNCTIONAL CHECK OF RUDDER TRAVEL LIMITATION UNIT (refer to para 2-35).
 - B.OVERRIDE OPERATION (refer to para) .





Figure 2-32 Rudder Travel Limitator Unit (RTLU) -Removal and Installation (sheet 1/2)







RUDDER TRAVEL LIMITATOR UNIT

Figure 2-32 Rudder Travel Limitator Unit (RTLU) -Removal and Installation (sheet 2/2)

TCH.1C-27J-2-27JG



2-38 ECU (Q-FEEL/TLU) - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Open thermal insulation screen.
- 4. Disable cargo ramp control.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	5,00	
Removal	ELT	1	10,00	
Installation	ELT	1	10,00	
Follow Maintenance	ELT	1	5,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

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Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-38.1 REMOVAL. Remove the ECU (Q-FEEL) as follows:

WARNING

INSTALL THE PROTECTION CAP ON THE PIPES AND THE ELECTRICAL CONNECTORS THAT YOU DISCONNECT. THIS WILL PREVENT INJURIES TO PERSONNEL AND DAMAGE TO THE EQUIPMENT.

- A. Isolate hydraulic power system.
- B.Disconnect electrical power.
- C. Disable cargo ramp control.
- D.Open thermal insulation screen.
- E.Disconnect two electrical connectors.
- F.Unscrew the two fixing screws.
- G.Remove ECU (Q-FEEL/TU) from the aircraft.

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2-38.2 INSTALLATION. Install the ECU (Q-FEEL/TLU) as follows:

A. Install the ECU (Q-FEEL/TLU).

B. Screw the two fixing screws.

C. Reconnect the two electrical connectors.

D.Close thermal insulation screen.

E.Restore cargo ramp control.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Close thermal insulation screen.
- 4. Enable cargo ramp control.
- 5. Perform the functional test:
 - A. MANOUVRE EFFORT AND Q-FEEL FUNCTIONAL CHECK, Q-FEEL SYSTEM WARNING CHECK, Q-FEEL OPERATING (AIR DATA VALID) - LOW SPEED, Q-FEEL OPERATING (AIR DATA VALID) - MEDIUM SPEED and Q-FEEL OPERATING (AIR DATA VALID) - HIGH SPEED in accordance (refer to para 2-53).
 - B. TRIM TRAVEL CHECK (refer to para 2-46) .







Figure 2-33 ECU (Q-Feel/TLU) - Removal and Installation

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2-39 ELEVATOR CONTROL SYSTEM -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

Perform Preparation (refer to para 2-2) .

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	150,00	
	ELT	1	150,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 300 (Min.) Total Time Detention System: 150 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00034	Kit, dynamometers	A37781-000
00038	Kit, elevator balance tab check templates	A37901-000
00061	Kit, digital inclinometers	G0002700001
00065	Kit, elevator - trims check templates	G0002730001
00117	External Electrical Feeder 115/200 Va.c 400 Hz	26-6D
	or alternate:	
00262	Test stand, hydraulic system (diesel engine)	846805-D**

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Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 2-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

- 2-39.1 ELEVATORS FREE DEFLECTION CHECK (refer to figure 2-34, sheet 1/3)
 - 1. Ensure that left elevator is installed but not connected to the control line.
 - 2. Install the templates (AGE NO. 00065) for elevator travel check on the left elevator trailing edge.
 - 3. Put the double side adhesive tape on the top surface of the elevator, non in contact with its rivets, and position on it the digital inclinometer (AGE NO. 00061), parallel to the template.
 - 4. With the elevators in neutral position reset the inclinometer, then remove the template.
 - 5. Starting from left elevator to neutral position, move by hand the left surface fully upward and fully downward and check that the travel is $27.5^{\circ} + 0.5^{\circ} / -0^{\circ}$ in both conditions, without interferences.

NOTE

If the above travel values are not reached, adjust properly the end stop screws (located on the stabilizer) in order to satisfy the requirements. If necessary, perform the wire locking of the end stop screw.

- 6. Ensure that right elevator is installed but not connected to the control line.
- 7.Install the templates (AGE NO. 00065) for elevator travel check on the right elevator trailing edge.

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(Cont'd)


2-39.1 ELEVATORS FREE DEFLECTION CHECK (refer to figure 2-34, sheet 1/3) (Cont'd)

- 8. Put the double side adhesive tape on the top surface of the elevator, non in contact with its rivets, and position on it the digital inclinometer (AGE NO. 00061), parallel to the template.
- 9. With the elevators in neutral position reset the inclinometer, then remove the template.
- 10. Starting from right elevator to neutral position, move by hand the right surface fully upward and fully downward and check that the travel is 27.5° +0.5° / -0° in both conditions, without interferences.

NOTE

If the above travel values are not reached, adjust properly the end stop screws (located on the stabilizer) in order to satisfy the requirements. If necessary, perform the wire locking of the end stop screw.

- 2-39.2 ELEVATORS TRAVEL CHECK (refer to figure 2-34, sheet 1/3), (refer to figure 2-34, sheet 2/3) and (refer to figure 2-34, sheet 3/3)
 - 1. Supply the hydraulic pressure to 3000 psi (210 Kg/cm²) and set the flowrate to 25 lt/min (6.6 gpm) applied to the aircraft.
 - 2.Connect the external electrical feeder (AGE NO. 00117) to the aircraft and switch-on.
 - 3.On the Overhead Circuit Breaker Panel (271VE) (1), ensure that following circuit breakers are closed: FLIGHT CONTROL RUDDER TRIM CNTR (1CC) position F 1 (2) and FLIGHT CONTROL Q FEEL RTLU PWR (2CG) position F 10 (3) to feed the left and right channels of the Electronic Control Unit.



- 2-39.2 ELEVATORS TRAVEL CHECK (refer to figure 2-34, sheet 1/3), (refer to figure 2-34, sheet 2/3) and (refer to figure 2-34, sheet 3/3) (Cont'd)
 - 4. Install on both stabilizers surface, in correspondence of the trim tab outer end, the templates (AGE NO. 00065) for elevator travel check.
 - 5. Install on both elevators surface, in the area between balance tab and trim tab, the templates for balance tab travel check (AGE NO. 00038).
 - 6. Ensure that the control stick (4 and 5) is to neutral position.
 - 7. Move by hand slowly the pilot control stick from neutral to fully forwards (12.50° +0.25° /-0.00°) and maintain. Check the followings conditions:
 - -left elevator $25^{\circ} \pm 1^{\circ}$ downwards.
 - -right elevator 25° + 0°/-2° downwards;
 - 8. Return the Pilot control stick (5) to neutral position.
 - 9. Move by hand slowly the Pilot control stick (5) from neutral to fully backwards (13.50° +0.25° / -0.00°) and maintain. Check the following conditions:
 - -left elevator $25^{\circ} \pm 1^{\circ}$ upwards.
 - -right elevator 25° +0°/-2° upwards;
 - 10. Return the Pilot control stick (5) to neutral position.
 - 11. Move by hand slowly the copilot control stick (4) from neutral to fully forwards and maintain. Check the followings conditions:
 - -left elevator $25^{\circ} \pm 1^{\circ}$ downwards.
 - -right elevator 25° + 0°/-2° downwards;
 - 12. Return the Copilot control stick (4) to neutral position.
 - 13. Move by hand slowly the Copilot control stick (4) from neutral to fully backwards and maintain. Check the following conditions:

-left elevator $25^{\circ} \pm 1^{\circ}$ upwards.

-right elevator $25^\circ + 0^\circ/-2^\circ$ upwards;

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- 2-39.2 ELEVATORS TRAVEL CHECK (refer to figure 2-34, sheet 1/3), (refer to figure 2-34, sheet 2/3) and (refer to figure 2-34, sheet 3/3) (Cont'd)
 - 14. Return the Copilot control stick (4) to neutral position.
 - 15. Move by hand slowly the copilot control stick (4) from neutral to fully forwards and maintain. Check the followings conditions:

-left balance tab 14.6° \pm 0.5° / -1.3° upwards with respect to left elevator fully travel downwards;

-right balance tab $19.1^{\circ} \pm 1.2^{\circ}$ upwards with respect to right elevator fully travel downwards.

- 16. Return the Copilot control stick (4) to neutral position.
- 17. Move by hand slowly the copilot control stick (4) from neutral to fully backwards and maintain. Check the followings conditions:
 - -left balance tab 26.6° +0.5° /- 3.1° downwards with respect to left elevator fully travel upwards;
 - -right balance tab $20^{\circ} \pm 1.3^{\circ}$ downwards with respect to right elevator fully travel upwards.
- 18. Return the Copilot control stick (4) to neutral position.
- 19. Remove templates (AGE NO. 00065) to the stabilizers surface, in correspondence of the trim tab outer end.
- 20.Remove templates (AGE NO. 00038) to the elevators surface, in the area between balance tab and trim tab.
- 21.Remove hydraulic power to the aircraft (refer to manual TCH.1C-27J-2-00GV).
- 22. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2-39.3 ELEVATORS BREAKOUT FORCE CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3)
 - 1.Ensure that the hydraulic pressure in both systems No.1 and No. 2 is nulled.



- 2-39.3 ELEVATORS BREAKOUT FORCE CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3) (Cont'd)
 - 2. By means of dynamometer (AGE NO. 00034), apply a load until the Pitot control stick (5) begins to move. Check that the breakout force does not exceed 115 N.
 - 3. Return the Pilot control stick (5) to neutral position.
 - 4. Perform the same operations on the Copilot control stick (4) and verify the same value.
- 2-39.4 ELEVATORS MANOUVRE EFFORT CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3)
 - 1.By means of dynamometer (AGE NO. 00034) apply a load on the control stick (5).
 - 2. Check that the effort manoeuvre values obtained are within the following requirements:

0° to +3° 120 N max +3° to +9° 145 N max 0° to -3° 120 N max -3° to -9.6° 145 N max.

- 3. Return the Pilot control stick (5) to neutral position.
- 4. Perform the same operation on the Copilt control stick(4) and verify the same value.
- 2-39.5 ELEVATORS FRICTION CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3)
 - 1.By means of dynamometer (AGE NO. 00034) apply a load on the control stick (5).
 - 2. Record the manoeuvre effort and calculate the friction value at 3°, 6° and 9° of the control stick travel forward and backward.
 - 3. Check that friction does not exceed 110 N.

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2-39.5 ELEVATORS FRICTION CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3) (Cont'd)

NOTE

The friction value is defined as the half difference of the two values read during loading and unloading phase and at the same control stick angle. It is intended that the pulling effort is considered positive, while the pushing effort is considered negative.

- 4. Return the Pilot control stick (5) to neutral position.
- 5. Perform the same operations on the Copilot control stick and verify the same value.

FOLLOW ON MAINTENANCE:

None





NOTE: POSITIONING OF THE TEMPLATES ON THE RH ELEVATOR IS SYMMETRICAL





Figure 2-34 Elevator Control System - Functional Test (sheet 1/3)











Figure 2-34 Elevator Control System - Functional Test (sheet 3/3)

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2-40 ELEVATOR CONTROL SYSTEM -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

Perform Preparation (refer to para 2-2) .

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	150,00	
	ELT	1	150,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 300 (Min.) Total Time Detention System: 150 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00034	Kit, dynamometers	A37781-000
00038	Kit, elevator balance tab check templates	A37901-000
00061	Kit, digital inclinometers	G0002700001
00065	Kit, elevator - trims check templates	G0002730001
00117	External Electrical Feeder 115/200 Va.c 400 Hz	26-6D
	or alternate:	
00262	Test stand, hydraulic system (diesel engine)	846805-D**





Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 2-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

- 2-40.1 ELEVATORS FREE DEFLECTION CHECK (refer to figure 2-34, sheet 1/3)
 - 1. Ensure that left elevator is installed but not connected to the control line.
 - 2. Install the templates (AGE NO. 00065) for elevator travel check on the left elevator trailing edge.
 - 3. Put the double side adhesive tape on the top surface of the elevator, non in contact with its rivets, and position on it the digital inclinometer (AGE NO. 00061), parallel to the template.
 - 4. With the elevators in neutral position reset the inclinometer, then remove the template.
 - 5. Starting from left elevator to neutral position, move by hand the left surface fully upward and fully downward and check that the travel is $27.5^{\circ} + 0.5^{\circ} / -0^{\circ}$ in both conditions, without interferences.



2-40.1 ELEVATORS FREE DEFLECTION CHECK (refer to figure 2-34, sheet 1/3) (Cont'd)

NOTE

If the above travel values are not reached, adjust properly the end stop screws (located on the stabilizer) in order to satisfy the requirements. If necessary, perform the wire locking of the end stop screw.

- 6.Ensure that right elevator is installed but not connected to the control line.
- 7.Install the templates (AGE NO. 00065) for elevator travel check on the right elevator trailing edge.
- 8. Put the double side adhesive tape on the top surface of the elevator, non in contact with its rivets, and position on it the digital inclinometer (AGE NO. 00061), parallel to the template.
- 9. With the elevators in neutral position reset the inclinometer, then remove the template.
- 10. Starting from right elevator to neutral position, move by hand the right surface fully upward and fully downward and check that the travel is 27.5° +0.5° / -0° in both conditions, without interferences.



2-40.1 ELEVATORS FREE DEFLECTION CHECK (refer to figure 2-34, sheet 1/3) (Cont'd)

NOTE

If the above travel values are not reached, adjust properly the end stop screws (located on the stabilizer) in order to satisfy the requirements. If necessary, perform the wire locking of the end stop screw.

- 2-40.2 ELEVATORS TRAVEL CHECK (refer to figure 2-34, sheet 1/3), (refer to figure 2-34, sheet 2/3) and (refer to figure 2-34, sheet 3/3).
 - 1. Supply the hydraulic pressure to 3000 psi (210 Kg/cm²) and set the flowrate to 25 lt/min (6.6 gpm) applied to the aircraft.
 - 2.Connect the external electrical feeder (AGE NO. 00117) to the aircraft and switch-on.
 - 3.On the Overhead Circuit Breaker Panel (271VE) (1), ensure that following circuit breakers are closed: FLIGHT CONTROL RUDDER TRIM CNTR (1CC) position F 1 (2) and FLIGHT CONTROL Q FEEL RTLU PWR (2CG) position F 10 (3) to feed the left and right channels of the Electronic Control Unit.
 - 4. Install on both stabilizers surface, in correspondence of the trim tab outer end, the templates (AGE NO. 00065) for elevator travel check.
 - 5. Install on both elevators surface, in the area between balance tab and trim tab, the templates for balance tab travel check (AGE NO. 00038).

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- 2-40.2 ELEVATORS TRAVEL CHECK (refer to figure 2-34, sheet 1/3), (refer to figure 2-34, sheet 2/3) and (refer to figure 2-34, sheet 3/3). (Cont'd)
 - 6. Ensure that the control stick (4 and 5) is to neutral position.
 - 7. Move by hand slowly the pilot control stick from neutral to fully forwards (12.50° +0.25° /-0.00°) and maintain. Check the followings conditions:

-left elevator $25^{\circ} \pm 1^{\circ}$ downwards.

-right elevator $25^{\circ} + 0^{\circ}/2^{\circ}$ downwards;

- 8. Return the Pilot control stick (5) to neutral position.
- 9. Move by hand slowly the Pilot control stick (5) from neutral to fully backwards (13.50° +0.25° / -0.00°) and maintain. Check the following conditions:

-left elevator $25^{\circ} \pm 1^{\circ}$ upwards.

-right elevator $25^{\circ} + 0^{\circ}/-2^{\circ}$ upwards;

- 10. Return the Pilot control stick (5) to neutral position.
- 11. Move by hand slowly the copilot control stick (4) from neutral to fully forwards and maintain. Check the followings conditions:

-left elevator $25^{\circ} \pm 1^{\circ}$ downwards.

-right elevator $25^{\circ} + 0^{\circ}/2^{\circ}$ downwards;

(Cont'd)



- 2-40.2 ELEVATORS TRAVEL CHECK (refer to figure 2-34, sheet 1/3), (refer to figure 2-34, sheet 2/3) and (refer to figure 2-34, sheet 3/3). (Cont'd)
 - 12. Return the Copilot control stick (4) to neutral position.
 - 13. Move by hand slowly the Copilot control stick (4) from neutral to fully backwards and maintain. Check the following conditions:

-left elevator $25^{\circ} \pm 1^{\circ}$ upwards.

-right elevator $25^\circ + 0^\circ/-2^\circ$ upwards;

- 14. Return the Copilot control stick (4) to neutral position.
- 15. Move by hand slowly the copilot control stick (4) from neutral to fully forwards and maintain. Check the followings conditions:

-left balance tab $14.6^{\circ} + 0.5^{\circ}$ / -1.3° upwards with respect to left elevator fully travel downwards;

- -right balance tab $19.1^{\circ} \pm 1.2^{\circ}$ upwards with respect to right elevator fully travel downwards.
- 16. Return the Copilot control stick (4) to neutral position.
- 17. Move by hand slowly the copilot control stick (4) from neutral to fully backwards and maintain. Check the followings conditions:

-left balance tab 26.6° +0.5° /- 3.1° downwards with respect to left elevator fully travel upwards;

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2-40.2 ELEVATORS TRAVEL CHECK (refer to figure 2-34, sheet 1/3), (refer to figure 2-34, sheet 2/3) and (refer to figure 2-34, sheet 3/3). (Cont'd)

-right balance tab $20^{\circ} \pm 1.3^{\circ}$ downwards with respect to right elevator fully travel upwards.

- 18. Return the Copilot control stick (4) to neutral position.
- 19. Remove templates (AGE NO. 00065) to the stabilizers surface, in correspondence of the trim tab outer end.
- 20. Remove templates (AGE NO. 00038) to the elevators surface, in the area between balance tab and trim tab.
- 21.Remove hydraulic power to the aircraft (refer to manual TCH.1C-27J-2-00GV).
- 22. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).

2-40.3 ELEVATORS BREAKOUT FORCE CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3).

- 1. Ensure that the hydraulic pressure in both systems No.1 and No. 2 is nulled.
- 2.By means of dynamometer (AGE NO. 00034), apply a load until the Pitot control stick (5) begins to move. Check that the breakout force does not exceed 115 N.
- 3. Return the Pilot control stick (5) to neutral position.
- 4. Perform the same operations on the Copilot control stick (4) and verify the same value.



- 2-40.4 ELEVATORS MANOUVRE EFFORT CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3).
 - 1.By means of dynamometer (AGE NO. 00034) apply a load on the control stick (5).
 - 2. Check that the effort manoeuvre values obtained are within the following requirements:

0° to +3° 120 N max. +3° to +9° 145 N max. 0° to -3° 120 N max. -3° to -9.6° 145 N max.

- 3. Return the Pilot control stick (5) to neutral position.
- 4. Perform the same operation on the Copilt control stick(4) and verify the same value.

2-40.5 ELEVATORS FRICTION CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3).

- 1.By means of dynamometer (AGE NO. 00034) apply a load on the control stick (5).
- 2. Record the manoeuvre effort and calculate the friction value at 3°, 6° and 9° of the control stick travel forward and backward.
- 3. Check that friction does not exceed 110 N.

(Cont'd)



2-40.5 ELEVATORS FRICTION CHECK (Without hydraulic) (refer to figure 2-34, sheet 3/3). (Cont'd)

NOTE

The friction value is defined as the half difference of the two values read during loading and unloading phase and at the same control stick angle. It is intended that the pulling effort is considered positive, while the pushing effort is considered negative.

4. Return the Pilot control stick (5) to neutral position.

5. Perform the same operations on the Copilot control stick and verify the same value.

FOLLOW ON MAINTENANCE:

None





NOTE: POSITIONING OF THE TEMPLATES ON THE RH ELEVATOR IS SYMMETRICAL





Figure 2-35 Elevator Control System - Functional Test (sheet 1/3)











Figure 2-35 Elevator Control System - Functional Test (sheet 3/3)



2-41 ELEVATOR CONTROL CABLE TENSION -ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 60 (Min.) Total Time Detention System: 60 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00113	Tensiometer	T60-1001C8-1A**
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.



PROCEDURE:

- 2-41.1 ADJUSTEMENT OF CONTROL CABLES TENSION (refer to figure 2-36, sheet 5/5), (refer to figure 2-36, sheet 2/5), (refer to figure 2-36, sheet 1/5) and (refer to figure 2-36, sheet 3/5)
 - 1.Insert a rigging pin (1 and 3) (AGE NO. 00181) diameter 0.193 in (4.915 mm) in each of the two rear quadrants (2 and 4) between frames 43 and 44.
 - 2. Insert a rigging pin (6) (AGE NO. 00181) diameter 0.312 in (7.95 mm) in each of the forward quadrant (7).
 - 3. Lock the tension regulator (5) by means of proper tool.
 - 4. Remove the clips (8, 9 and 13) from the turnbuckle (10, 11 and 12) located at FR 8, FR 24 and FR 25.
 - 5. Acting on the turnbuckles, stretch the control cables in two mechanical linkages at a load twice (AGE NO. 00113) the expected pre-load (70 daN).
 - 6. Remove the rigging pins (AGE NO. 00181) (1, 3 and6) and perform 25 control sticks complete travel at least.
 - 7. Set the cables pre-load to 35 daN read on the Tensiometer (AGE NO. 00113) and verify that the rigging pins (AGE NO. 00181) (1 and 3) in the rear quadrants (2 and 4) can be inserted freely.

NOTE

Do not leave the rigging pins inserted.

8. Unlock the tension regulator and stretch the cables so that the regulator is positioned according to the Equation:

Regulator Scale = [$0.0792 \times \text{number}$ of celsius degrees (°C)] + 13, 75. Verify that the regulator is positioned according to (refer to figure 2-36, sheet 5/5).

2-41.1 ADJUSTEMENT OF CONTROL CABLES TENSION (refer to figure 2-36, sheet 5/5), (refer to figure 2-36, sheet 2/5), (refer to figure 2-36, sheet 1/5) and (refer to figure 2-36, sheet 3/5) (Cont'd)

NOTE

When the cables stretching is complete, check that the terminal lugs are tightened on the turnbuckle coupling with the same number of turns. Furthermore check that no more than 3 threads are visible on each terminal lug.

- 9. Measure the clearance between all quadrants end and the cable guard bolt for the whole elevator control and check that is in the range 0.039 to 0.062 in (1 to 1.6 mm).
- 10. Install the clips (8, 9 and 13) on the turnbuckles (10, 11 and 12) located at FR 8, FR 24 and FR 25.
- 2-41.2 AUTOPILOT CONTROL CABLES TENSION (refer to figure 2-36, sheet 1/5) and (refer to figure 2-36, sheet 4/5)
 - 1.Insert a rigging pin (AGE NO. 00181) (1) diameter 0.193 in (4.915 mm) in the left rear quadrant (2).
 - 2. Set the winding drum cables to neutral position.
 - 3. Remove the four clips (14, 16 and 18) from the two turnbuckles (15 and 17).
 - 4. Stretch the autopilot control cables (AGE NO. 00113) by means of the turnbuckles (15 and 17).
 - 5. Check that the control cables are stretched in according to: (refer to figure 2-36, sheet 5/5)
 - 6.Install the four clips (14, 16 and 18) on the two turnbuckles (15 and 17).
 - 7. Remove a rigging pin (1) (AGE NO. 00181) from left rear quadrant (2).

(Cont'd)



2-41.2 AUTOPILOT CONTROL CABLES TENSION (refer to figure 2-36, sheet 1/5) and (refer to figure 2-36, sheet 4/5) (Cont'd)

NOTE

When the cables stretching is complete, check that the terminal lugs are tightened on the turnbuckle coupling with the same number of turns.Furthermore check that no more than 3 threads are visible on each terminal lug.

FOLLOW ON MAINTENANCE:

None













(sheet 3/5)







Figure 2-36 Elevator Control Cable Tension - Adjustment (sheet 4/5)







2-42 ELEVATOR TENSION REGULATOR -REMOVAL AND INSTALLATION

INPUT CONDITION:

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Aircraft Applicability:
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04162, 04180

Required Conditions:

- 1. Close the cargo door if open.
- 2. Perform ELEVATOR TRIM (normal/standby) to '0' position.
- 3. Discharge hydraulic pressure and isolate hydraulic power.
- 4. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5. Remove Pilot and Copilot seat refer to (refer to manual TCH.1C-27J-2-25JG).
- 6. Remove the LH (RH) ballistic protection panels from flight compartment.
- 7. Remove the fwd track LH (RH) assy.
- 8. Open the access panels 211DZ and 130A (211GZ and 130D).
- 9. Position maintenance platform (AGE NO. 00074).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	80,00	
Removal	AFM	2	60,00	
Installation	AFM	2	80,00	
Follow Maintenance	AFM	2	80,00	

Periodicity: AR - AS REQUIRED



Total Maintenance Time: 600 (Min.) Total Time Detention System: 300 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	4,00
00011	NUT, SELF-LOCKING	H14-3	4,00
00012	PIN, COTTER	MS24665-374	2,00
00013	NUT, SELF-LOCKING	H14-4	2,00
00025	NUT, SELF-LOCKING	MS21043-4	2,00
00052	PIN, COTTER	MS24665-153	5,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-42.1 REMOVAL (refer to figure 2-37, sheet 1/4) , (refer to figure 2-37, sheet 4/4) , (refer to figure 2-37, sheet 2/4) and (refer to figure 2-37, sheet 3/4)
 - 1.Insert rig pins (AGE NO. 00181) to rear elevator quadrant.



NOTE

Perform steps 2, 3 and 4 to remove Pilot tension regulator else go to step 5.

- 2. Open the access panels 322E and 322B.
- 3.Insert rig pin (AGE NO. 00181) to rear rudder quadrant.
- 4. Insert the rig pins (AGE NO. 00181) (3) to control wheel (4) LH and RH.

NOTE

Perform steps 6, and 7 to remove Pilot tension regulator else go to step 8.

- 5. Remove access panel 130AD.
- 6. Insert the block spacer to the rudder tension regulator (LH side) in order to maintain the spring position.
- 7.Insert block to the LH (RH) elevator tension regulator (19 and 58).
- 8.Loosen the bolts (14 and 36) that fix the cables guards (15 and 35) on the rudder quadrant (12). Collect bolts (14 and 36), self-locking nuts (17 and 33) and washers (16 and 34). Discard removed the self-locking nuts.
- 9. Loosen the flanged guard pins (69 and 71) from the lower tension regulator support (70). Collect nuts and washers.
- 10. Slack the rudder cables (13 and 38) (only for the LH side) and LH (RH) elevator cables (23 and 62) by means of turnbuckles (1 and 2) in the upper cargo zone near the cabin.
- 11. Disconnect the cables (13, 23, 38 and 62) from their seats by removing and discarding the cotter pins (18, 20, 28, 32, 59 and 67) from the rudder quadrant (12) (LH side only) and from the LH (RH) elevator tension regulator quadrant (19 and 58).



- 2-42.1 REMOVAL (refer to figure 2-37, sheet 1/4), (refer to figure 2-37, sheet 4/4), (refer to figure 2-37, sheet 2/4) and (refer to figure 2-37, sheet 3/4) (Cont'd)
 - Disconnect the cables (13, 23, 38 and 62) from the rudder quadrant (12) (LH side only) and from the LH (RH) elevator tension regulator quadrants (19 and 58).

NOTE

Perform steps 14 to remove Pilot tension regulator else go to step 15.

- 13. Disconnect the rudder input lever (30) by removing the cotter pin (31), castellated nut (11) washer (9) and bolt (10). Discard the cotter pin.
- 14. Disconnect the elevator input levers (27 and 66) by removing the cotter pins (25 and 64), castellated nuts (24 and 63), washers (26 and 65) and bolts (29 and 68). Discard removed the cotter pins.
- 15. Disconnect rod assy LH (RH) (6 and 47) to the support assy LH (RH) (45 and 57) upper axle by removing the bolts (5 and 46), washers (7 and 48) and self-locking nuts (8 and 49). Discard removed the self-locking nuts.
- 16. Disconnect the support assy LH (RH) (45 and 57) to upper axles assembly from the structure by removing the bolts (40 and 54), washers (39 and 55) and lower self-locking nuts (37 and 56). Discard removed the self-locking nuts.
- 17. Disconnect the support assy LH (RH) (45 and 57) to upper axles assembly from the structure by removing the cotter pins (42 and 52), washers (43 and 51), castellated nuts (41 and 53) and upper bolts (44 and 50). Discard removed the cotter pins.
- 18. Remove the assembly from aircraft.



- 2-42.1 REMOVAL (refer to figure 2-37, sheet 1/4), (refer to figure 2-37, sheet 4/4), (refer to figure 2-37, sheet 2/4) and (refer to figure 2-37, sheet 3/4) (Cont'd)
 - 19. On workbench, remove the nuts spanner (22 and 61) and washers (21 and 60) from the bottom of LH (RH) elevator tension regulator (19 and 58). Collect nuts spanner and washers.
 - 20.On workbench, extract the LH (RH) elevator tension regulator (19 and 58) from the assembly and remove it.
- 2-42.2 INSTALLATION (refer to figure 2-37, sheet 1/4), (refer to figure 2-37, sheet 4/4), (refer to figure 2-37, sheet 2/4) and (refer to figure 2-37, sheet 3/4)
 - 1.On the workbench, insert the new LH (RH) elevator tension regulator (19 and 58) to the assembly.
 - 2.On workbench, insert the position washer (21 and 60) on the elevator tension regulator (19 and 58) side.
 - 3. On workbench, tighten the nuts spanner (22 and 61) and torque (AGE NO. 00054) tighten to 195 to 200 in Ib (2.24 to 2.30 mkg). Lock the washers (21 and 60).
 - 4. Position the tension regulator assembly to the aircraft structure.
 - 5. In order to connect the supports assembly (45 and 57) with the aircraft insert the bolts (40, 44, 50 and 54).
 - 6. In order to connect the supports assembly (45 and 57) with the aircraft insert to the lower part the washers (39 and 55) and the new self-locking nuts (LCM NO. 00025 and LCM NO. 00013) (37 and 56). Torque (AGE NO. 00054) tighten to 59 to 66 in lb (0.67 to 0.76 mkg) the self-locking nuts.



- 2-42.2 INSTALLATION (refer to figure 2-37, sheet 1/4), (refer to figure 2-37, sheet 4/4), (refer to figure 2-37, sheet 2/4) and (refer to figure 2-37, sheet 3/4) (Cont'd)
 - 7. In order to connect the supports assembly (45 and 57) with the aircraft insert to the upper part the washers (43 and 51) and the castellated nuts (41 and 53). Torque (AGE NO. 00054) tighten to 30 to 40 in lb (0.34 to 0.46 mkg) the castellated nuts. Insert the new cotter pins (LCM NO. 00052) (42 and 52).
 - 8. Insert the LH (RH) rod assy (6 and 47) to the supports (45 and 57) assy upper axle.
 - 9. In order to install the rod assy (6 and 47) insert the bolts (5 and 46), the washers (7 and 48) and the new self-locking nuts (LCM NO. 00025 and LCM NO. 00013) (8 and 49). Torque (AGE NO. 00054) and tighten to 59 to 66 in lb (0.67 to 0.76 mkg) the self-locking nuts.

NOTE

Perform step 10 to install Pilot tension regulator else go to step 11.

- 10. In order to connect the rudder input lever (30) insert the bolt (10) the washer (9) and tighten the castellated nut (11). Tighten (AGE NO. 00054) the nut to 25 to 71 in lb (0.28 to 0.81 mkg) and insert the new cotter pin (LCM NO. 00052) (31).
- 11. In order to connect the LH (RH) elevator input levers (27 and 66) insert the bolts (29 and 68) the washers (26 and 65) and tighten the castellated nuts (24 and 63). Tighten (AGE NO. 00054) the nuts to 25 to 71 in Ib (0.28 to 0.81 mkg) and insert the new cotter pins (LCM NO. 00052) (25 and 64).
- 12. Insert rig pin to rudder (12) (LH side only) and elevator LH (RH) quadrants (19 and 58).

(Cont'd)



- 2-42.2 INSTALLATION (refer to figure 2-37, sheet 1/4), (refer to figure 2-37, sheet 4/4), (refer to figure 2-37, sheet 2/4) and (refer to figure 2-37, sheet 3/4)) (Cont'd)
 - Position the LH (RH) elevator cables (23 and 62) on the LH (RH) elevator tension regulator (19 and 58), then insert the new cotter pins (LCM NO. 00010 and LCM NO. 00012) (20, 28, 59 and 67) in order to fix cables (23 and 62) with elevator tension regulator (19 and 58).

NOTE

Perform steps 14 and 15 to install Pilot tension regulator else go to step 16.

- Position the rudder cables (13 and 38) on the rudder quadrant (12), then insert the new cotter pins (LCM NO. 00010) (18 and 32) in order to fix the rudder cables (13 and 38) with quadrant (12).
- 15. Position the cable guards (15 and 35) on the forward rudder quadrant (12) and insert the bolts (14 and 36) the washers (16 and 34) and new self-locking nuts (LCM NO. 00011) (17 and 33). Torque (AGE NO. 00054) and tighten 25 to 28 in lb (0.28 to 0.32 mkg) the self-locking nuts.
- 16. Position the nut, washer and screw and tighten (AGE NO. 00054) 25 to 28 in lb (0.28 to 0.32 mkg) the flanged guard pins (69 and 71).
- 17. Repeat the operation for the opposite side.

NOTE

Perform step 18, 19 and 20 to install Pilot tension regulator else go to step 21.

 Perform cables tension with a manual tension regulator acting to the turnbuckles (1 and 2) of the two sides of the rudder line acting alternatively on the turnbuckles (1 and 2).

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- 2-42.2 INSTALLATION (refer to figure 2-37, sheet 1/4), (refer to figure 2-37, sheet 4/4), (refer to figure 2-37, sheet 2/4) and (refer to figure 2-37, sheet 3/4)) (Cont'd)
 - 19. To perform the tension value (refer to para 2-23) .
 - 20. Remove the block spacer from the rudder tension regulator.
 - 21. Perform cables tension with a manual tension regulator acting to the turnbuckles (1 and 2) of the LH (RH) elevator acting alternatively to both sides of each cable loop.
 - 22. To perform the tension value (refer to para 2-41) .
 - 23. Remove the block spacer from LH (RH) automatic elevator tension regulator (19 and 58).
 - 24. Remove rig pins (AGE NO. 00181) (3) from the LH and RH control wheel (4).
 - 25.Remove rig pin (AGE NO. 00181) to rear rudder quadrants.

NOTE

Perform step 26 to install Pilot tension regulator else go to step 27.

- 26.Remove rig pin (AGE NO. 00181) from rear rudder quadrants.
- 27. Remove rig pin (AGE NO. 00181) from rudder (12) (LH side only) and elevator LH (RH) quadrants (19 and 58).

FOLLOW ON MAINTENANCE:

- 1.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).



NOTE

Perform step 3 to install Pilot tension regulator else go to step 4.

- 3. Perform functional test RUDDER TRAVEL CHECK (refer to para 2-22).
- 4. Perform functional test FRICTION MANOEUVRE AND BREAK-OUT CHECK (refer to para 2-22), CHECK OF RETURN TO NEUTRAL POSITION (refer to para 2-22).
- 5. Close the access panels 211DZ and 130A (211GZ and 130D).

NOTE

Perform steps 6, 7 and 8 to install pilot tension regulator else go to step 9.

- 6. Close the access panel 322E and 322B.
- 7. Remove maintenance platform (AGE NO. 00074).
- 8. Close the access panel 130AD.
- 9. Replace the fwd track LH (RH) assy.
- 10. Replace the LH (RH) panels of the ballistic protection on flight compartment.
- 11.Install Pilot (Copilot) seat (refer to manual TCH.1C-27J-2-25JG).











Figure 2-37 Elevator Tension Regulator - Removal and Installation (sheet 2/4)





Figure 2-37 Elevator Tension Regulator - Removal and Installation (sheet 3/4)







FORWARD TENSION REGULATOR

ICN-02-A-273005-A-A0170-00145-A-01-1 Figure 2-37 Elevator Tension Regulator - Removal and Installation (sheet 4/4)

TCH.1C-27J-2-27JG



2-43 ELEVATOR CABLE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Disable Cargo Ramp.
- 4. Open thermal insulation screen.
- 5. Remove Pilot (Copilot) seat (refer to manual TCH.1C-27J-2-25JG) in order to get access to LH (RH) elevator cable.
- 6.To gain access to LH (RH) elevator cable, open the access panels:

A.212AZ (212EZ). B.212BZ (212DZ). C.214BZ (213BZ). D.213AZ. E.130AH (130AE). F.130AD (130AG).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	60,00	
Removal	AFM	2	60,00	
Installation	AFM	2	80,00	
Follow Maintenance	AFM	2	60,00	

TCH.1C-27J-2-27JG



Periodicity: AR - AS REQUIRED Total Maintenance Time: 520 (Min.) Total Time Detention System: 260 (Min.)

AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	6,00
00011	NUT, SELF-LOCKING	H14-3	4,00

Safety Conditions:

Be aware of information SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-43.1 REMOVAL. Proceed as follows:
 - A.Lock the LH (RH) control stick and the LH (RH) Rear Quadrant.
 - B.By means of turnbuckles release the cable tension.
 - C.Remove the two fairlead in the following way:
 - -Unscrew the two bolts, collect washer and nuts for each fairlead, then remove the fairleads.
 - -Remove the two cotter pin that fix the Elevator cable to Elevator Rear Quadrant.



2-43.1 REMOVAL. Proceed as follows: (Cont'd)

- -On the LH (RH) Elevator Tension Regulator remove the two cotter pins that fix the L (R) Elevator Cable to LH (RH) Elevator Tension Regulator.
- D. Unscrew completely the turnbuckles.
- E.Remove the Elevator Cable.

2-43.2 INSTALLATION. Proceed as follows:

- A. Install the new elevator cable.
- B. Install the cable on the rear LH (RH) Elevator Rear Quadrant and insert the two cotter pins inorder lo fix the cable to the rear quadrant.
- C.Install the cable on the LH (R H) Elevator Tension Regulator and insert the two cotter pins in orderlo fix the cable to the Elevator Tension Regulator.
- D. Install the two fairleads in the following way:
 - -Install the fairlead, position the washers, insert the bolts and turn the nuts.
- E.By means of turnbuckles stretch the elevator cable.

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2-43.2 INSTALLATION. Proceed as follows: (Cont'd)

CAUTION

Do not perform the complete tension of the cable.

FOLLOW ON MAINTENANCE:

- 1. Perform Elevator Cable Tension.
- 2. Perform the functional test:
 - A.MANOUVRE EFFORT AND Q-FEEL FUNCTIONAL CHECK (refer to para 2-53) .
 - B.CHECK OF RETURN TO NEUTRAL POSITION (refer to para 2-44).
 - C.ADJUSTMENT OF NEUTRAL POSITION (refer to para 2-44).
 - D.ELEVATOR CONTROL SYSTEM (refer to para 2-41), (refer to para 2-44) and (refer to para 2-47).
- 3. Close thermal insulation screen.
- 4. Install Pilot (Copilot) seat (refer to manual TCH.1C-27J-2-25JG).
- 5. Close the access panels:
 - A.212AZ (212EZ).
 - B.212BZ (212DZ).
 - C.214BZ (213BZ).
 - D.213AZ.
 - E.130AH (130AE).
 - F.130AD (130AG).
- 6.Disconnect external electrical power (refer to manual TCH.1C-27J-2-00GV) .
- 7.Disconnect external hydraulic power (refer to manual TCH.1C-27J-2-00GV) .

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8. Enable Cargo Ramp function.







Figure 2-38 Elevator Cable - Removal and Installation (sheet 1/4)











(sheet 3/4)





Figure 2-38 Elevator Cable - Removal and Installation (sheet 4/4)





2-44 ELEVATOR SURFACES, MEASUREMENT AND PLAY - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 1-1).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	2	220,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 440 (Min.) Total Time Detention System: 220 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00006	Jam override adapter	ATCN6050
00016	Sling assy, horizontal stabilizer	A34781-000
00034	Kit, dynamometers	A37781-000
00038	Kit, elevator balance tab check templates	A37901-000
00053	Power unit (diesel motor)	GPU 50 MDI1ALN**
00062	Kit, comparators	G0002700002
00065	Kit, elevator - trims check templates	G0002730001
00065	Kit, elevator - trims check templates	G0002730001



AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801
00263	Test stand, hydraulic system (electric engine)	846805-E**

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	1,00
00016	LOCK WIRE	MS20995C32	AR
00017	PIN, COTTER	MS24665-134	2,00
00022	PIN, COTTER	MS24665-86	1,00
00052	PIN, COTTER	MS24665-153	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-44.1 ADJUSTMENT OF ELEVATOR NEUTRAL POSITION (refer to figure 2-39, sheet 1/6), (refer to figure 2-39, sheet 2/6), (refer to figure 2-39, sheet 3/6) and (refer to figure 2-39, sheet 4/6)
 - 1.Install the template (AGE NO. 00065) on LH (RH) elevator trailing edge.
 - 2.Insert a rigging pin 0.193 in (4.915 mm) (1 and 3) (AGE NO. 00181) in the LH (RH) rear quadrants (2 and 4).

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- 2-44.1 ADJUSTMENT OF ELEVATOR NEUTRAL POSITION (refer to figure 2-39, sheet 1/6), (refer to figure 2-39, sheet 2/6), (refer to figure 2-39, sheet 3/6) and (refer to figure 2-39, sheet 4/6) (Cont'd)
 - 3. Adjust the LH (RH) linkage rod (23) as per its nominal dimension and connect it between the LH (RH) bellcranck (25) on the LH (RH) rear quadrant and the LH (RH) elevator control lever (24), taking care to maintain aligned the reference mark on the lever and on the rear quadrant.
 - 4. Check that the LH (RH) elevator is to $0^{\circ} \pm 0.25^{\circ}$ read on the template (neutral position).
 - 5. If necessary, adjust properly the LH (RH) linkage rod(5) to set the LH (RH) elevator to neutral position.
 - 6. Verify the correct engagement of the threads end. Check that no more than 3 threads are visible on each terminal lug.
 - 7. Verify that the difference of neutral position between left and right elevator does not exceed 0.1°.
 - 8. Remove rigging pin (AGE NO. 00181) (1 and 3) from LH (RH) rear quadrant (2 and 4).
 - 9. Remove the template (AGE NO. 00065) from the LH (RH) elevator trailing edge.
- 2-44.2 MEASUREMENT OF ELEVATOR CONVENTIONAL PLAY - LEFT ELEVATOR LOADING (refer to figure 2-39, sheet 4/6)
 - 1.Install the template (AGE NO. 00065) on LH (RH) elevator trailing edge.
 - 2. Stiffen by proper tools (AGE NO. 00016) the LH Stabilizer in order to avoid loss of reading accuracy on elevator.
 - Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).

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2-44.2 MEASUREMENT OF ELEVATOR CONVENTIONAL PLAY - LEFT ELEVATOR LOADING (refer to figure 2-39, sheet 4/6) (Cont'd)

- 4. Connect the hydraulic test cart (AGE NO. 00263), via the adaptor, to the aircraft and supply both hydraulic systems at 3000 psi (210 Kg/cm²).
- 5. Insert and remove a 0.193 in (4.915 mm) diameter rigging pin (AGE NO. 00181) in the proper hole of the Pilot or Copilot control column in order to check that it is in neutral position.
- 6. Fit on the template, installed on the left elevator trailing edge the comparator (AGE NO. 00062) and set it to zero.

NOTE

The comparator must be no more zeroed until the test is terminated.

NOTE

Care should be taken to apply the load to the elevator T.E. and not to the tab T.E.

- 7. Apply, by a dynamometer (AGE NO. 00034), on the left elevator trailing edge, a vertical load and measure the elevator displacement as follows:
 - A.Gradually apply a load upwards up to 250 N maximum, leaving out the reading on the comparator.
 - B. Stepwise unload, every 50 N, up to zero load and simultaneously read, on the comparator, the related displacement value of the left elevator.
 - C. Stepwise load downwards, every 50 N, up to 250 N maximum and simultaneously read, on the comparator, the related displacement value of the left elevator.



2-44.2 MEASUREMENT OF ELEVATOR CONVENTIONAL PLAY - LEFT ELEVATOR LOADING (refer to figure 2-39, sheet 4/6) (Cont'd)

- D. Stepwise unload, every 50 N, up to zero load and simultaneously read, on the comparator, the related displacement value of the left elevator.
- E.Stepwise load upwards, every 50 N, up to 250 N maximum and simultaneously read, on the comparator, the related displacement value of the left elevator.
- 8. Put the values obtained in a diagram (refer to figure 2-39, sheet 5/6) and draw a graph, load applied Vs surface displacement.
- 9. To calculate correctly the backlash (refer to figure 2-39, sheet 5/6) proceed as follows after that the diagram load applied vs surface displacement has been drawn:
 - A.Draw the tangent to the highest point of the unloading curves (U1 and U2) and of the loading curves (L1 and L2) up to the intersection with the surface displacement axis.
 - B. The backlash value C1 is the distance between the intersection of the lines U1 and L2 read on the surface displacement axis.
 - C.The backlash value C2 is the distance between the intersection of the lines U2 and L1 read on the surface displacement axis.
 - D.The total resulting backlash C is defined as the mean value between C1 and C2.
- 10. Check, from the graph, that the backlash C is 1.5 mm max (0.2°).
- 11.Remove from the left elevator trailing edge the comparator (AGE NO. 00062).
- 12. Remove both hydraulic and electric power to the aircraft.

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- 2-44.2 MEASUREMENT OF ELEVATOR CONVENTIONAL PLAY - LEFT ELEVATOR LOADING (refer to figure 2-39, sheet 4/6) (Cont'd)
 - 13. Remove the stiffening tools (AGE NO. 00016) from the LH stabilizer.
- 2-44.3 MEASUREMENT OF ELEVATOR CONVENTIONAL PLAY - RIGHT ELEVATOR LOADING (refer to figure 2-39, sheet 4/6)
 - 1.Install the template (AGE NO. 00065) on LH (RH) elevator trailing edge.
 - 2. Stiffen by proper tools (AGE NO. 00016) the RH Stabilizer in order to avoid loss of reading accuracy on elevator.
 - 3. Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 4. Connect the hydraulic test cart (AGE NO. 00263), via the adaptor, to the aircraft and supply both hydraulic systems at 3000 psi (210 Kg/cm²).
 - 5. Insert and remove a 0.193 in (4.915 mm) diameter rigging pin (AGE NO. 00181) in the proper hole of the Pilot or Copilot control column in order to check that it is in neutral position.
 - 6. Fit on the template, installed on the left elevator trailing edge the comparator (AGE NO. 00062) and set it to zero.

NOTE

The comparator must be no more zeroed until the test is terminated.

NOTE

Care should be taken to apply the load to the elevator T.E. and not to the tab T.E.

7. Apply, by a dynamometer (AGE NO. 00034), on the right elevator trailing edge, a vertical load and measure the elevator displacement as follows:

(Cont'd)



- 2-44.3 MEASUREMENT OF ELEVATOR CONVENTIONAL PLAY - RIGHT ELEVATOR LOADING (refer to figure 2-39, sheet 4/6) (Cont'd)
 - A.Gradually apply a load upwards up to 250 N maximum, leaving out the reading on the comparator.
 - B.Stepwise unload, every 50 N, up to zero load and simultaneously read, on the comparator, the related displacement value of the right elevator.
 - C.Stepwise load downwards, every 50 N, up to 250 N maximum and simultaneously read, on the comparator, the related displacement value of the right elevator.
 - D. Stepwise unload, every 50 N, up to zero load and simultaneously read, on the comparator, the related displacement value of the right elevator.
 - E.Stepwise load upwards, every 50 N, up to 250 N maximum and simultaneously read, on the comparator, the related displacement value of the right elevator.
 - 8. Put the values obtained in a diagram (refer to figure 2-39, sheet 5/6) and draw a graph, load applied Vs surface displacement.
 - 9. To calculate correctly the backlash (refer to figure 2-39, sheet 5/6) proceed as follows after that the diagram load applied vs surface displacement has been drawn:
 - A.Draw the tangent to the highest point of the unloading curves (U1 and U2) and of the loading curves (L1 and L2) up to the intersection with the surface displacement axis.
 - B. The backlash value C1 is the distance between the intersection of the lines U1 and L2 read on the surface displacement axis.

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2-44.3 MEASUREMENT OF ELEVATOR CONVENTIONAL PLAY - RIGHT ELEVATOR LOADING (refer to figure 2-39, sheet 4/6) (Cont'd)

- C. The backlash value C2 is the distance between the intersection of the lines U2 and L1 read on the surface displacement axis.
- D.The total resulting backlash C is defined as the mean value between C1 and C2.
- 10. Check, from the graph, that the backlash C is 1.5 mm max (0.2°).
- 11.Remove from the right elevator trailing edge the comparator.
- 12. Remove from the elevator the templates.
- 13. Remove both hydraulic and electric power to the aircraft.
- 14. Remove the stiffening tools (AGE NO. 00016) from the RH stabilizer.

2-44.4 ADJUSTMENT OF ELEVATOR CONTROL OVERRIDE MECHANISM UNCOUPLING FORCE (refer to figure 2-39, sheet 2/6)

- 1. Install tool jam override adapter (AGE NO. 00006) on control stick in order to apply a dynamometer (AGE NO. 00034).
- 2. Measure uncoupling force: if override mechanism uncouples at a load different from 132.276 lb \pm 5.511 lb (60 kg \pm 2.5 kg).
- 3. Disconnect link (17) from stop link (9) by removing bolt (11) , washers (8 and 10) , roller (22) , nut (7) and cotter pin (6). Discard removed cotter pin.
- 4. Disconnect link (17) from lever (16) by removing bolt (12) , washer (13) , nut (18) and cotter pin (19) (LCM NO. 00017). Discard removed cotter pin.
- 5. Remove lock wire (15).
- 6. Loosen nut (14) screw out bolt (21) and washer (20).

(Cont'd)

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- 2-44.4 ADJUSTMENT OF ELEVATOR CONTROL OVERRIDE MECHANISM UNCOUPLING FORCE (refer to figure 2-39, sheet 2/6) (Cont'd)
 - 7. Adjust until uncoupling value is obtained.
 - 8. Safety nut (14) with lock wire (15).
 - 9. Reset the elevator control override mechanism using jam override resetting tool (AGE NO. 00006).
 - 10. Connect link (17) at the lever (16) by using bolt (12) , washer (13), nut (18) and new cotter pin (19) (LCM NO. 00017).
 - 11.Connect link (17) at the stop link (9) by using bolt (11) , washers (8 and 10), roller (22) , nut (7) and new cotter pin (6) (LCM NO. 00017).
 - 12. Remove tool jam override adapter (AGE NO. 00006) on control stick and dynamometer (AGE NO. 00034).
- 2-44.5 ADJUSTMENT OF BALANCE TAB NEUTRAL POSITION (refer to figure 2-39, sheet 4/6) and (refer to figure 2-39, sheet 6/6)
 - 1. Fit balance tab travel templates (AGE NO. 00038) on LH and RH elevators.
 - 2. Bring LH (RH) tab to neutral position, adjusting rod connecting intermediate lever to tab. The LH (RH) balance tab must be at $0^{\circ} \pm 15^{\circ}$ as read on the template (AGE NO. 00038).
 - 3. Remove the templates (AGE NO. 00038) from LH and RH elevators.
- 2-44.6 MEASUREMENT OF INNER TABS CONVENTIONAL PLAY (refer to figure 2-39, sheet 1/6)
 - 1.Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 2. Connect the hydraulic test cart (AGE NO. 00263), via the adaptor, to the aircraft and supply both hydraulic systems at 3000 psi (210 Kg/cm²).

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2-44.6 MEASUREMENT OF INNER TABS CONVENTIONAL PLAY (refer to figure 2-39, sheet 1/6) (Cont'd)

- 3. Stiffen by proper tools (AGE NO. 00016) the LH (RH) elevator in order to avoid loss of reading accuracy.
- 4.Insert a 0.193 in (4.915 mm) diameter rigging pin (AGE NO. 00181) (1 and 3) in LH and RH quadrants (2 and 4) at frames 43 and 44.
- 5.Install on LH (RH) elevator balance tab the template (AGE NO. 00038).
- 6.Fit on the LH (RH) balance tab template, the comparator (AGE NO. 00062) and set it to zero

NOTE

The comparator must be no more zeroed until the test is terminated.

NOTE

Care should be taken to apply the load to the balance tab T.E. and not to the elevator T.E.

- 7. Apply, by a dynamometer (AGE NO. 00034), on the left balance tab trailing edge, a vertical load and measure the balance tab displacement as follows:
 - A.Gradually apply a load upwards up to 30 N maximum, leaving out the reading on the comparator.
 - B. Stepwise unload, every 5 N, up to zero load and simultaneously read, on the comparator, the related displacement value of the left balance tab.
 - C. Stepwise load downwards, every 5 N, up to 30 N maximum and simultaneously read, on the comparator, the related displacement value of the left balance tab.

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2-44.6 MEASUREMENT OF INNER TABS CONVENTIONAL PLAY (refer to figure 2-39, sheet 1/6) (Cont'd)

- D.Stepwise unload, every 5 N, up to zero load and simultaneously read, on the comparator, the related displacement value of the left balance tab.
- E.Stepwise load upwards, every 5 N, up to 30 N maximum and simultaneously read, on the comparator, the related displacement value of the left balance tab.
- 8. Put the values obtained in a diagram and draw a graph, load applied Vs left balance tab displacement.
- 9. To calculate correctly the backlash (refer to figure 2-39, sheet 5/6) proceed as follows after that the diagram load applied vs surface displacement has been drawn:
 - A.Draw the tangent to the highest point of the unloading curves (U1 and U2) and of the loading curves (L1 and L2) up to the intersection with the surface displacement axis.
 - B. The backlash value C1 is the distance between the intersection of the lines U1 and L2 read on the surface displacement axis.
 - C. The backlash value C2 is the distance between the intersection of the lines U2 and L1 read on the surface displacement axis.
 - D.The total resulting backlash C is defined as the mean value between C1 and C2.
- 10. Check, from the graph, that the backlash C is 0.082 in (2.1 mm).
- 11.Remove from the LH (RH) balance tab trailing edge the elevator check template (AGE NO. 00038) and comparator (AGE NO. 00062).
- 12. Repeat steps 5 thru 10 for RH balance tab. Results must be the same.

2-44.6 MEASUREMENT OF INNER TABS CONVENTIONAL PLAY (refer to figure 2-39, sheet 1/6) (Cont'd)

- 13. Remove a 0.193 in (4.915 mm) diameter rigging pin (1 and 3) (AGE NO. 00181) from LH and RH quadrants (2 and 4) at frames 43 and 44.
- 14. Remove both hydraulic and electric power to the aircraft (refer to manual TCH.1C-27J-2-00GV).
- 15. Remove the stiffening tools (AGE NO. 00016) from the LH (RH) elevator.

FOLLOW ON MAINTENANCE:

None







Adjustment (sheet 1/6)





Figure 2-39 Elevator Surfaces, Measurement and Play -Adjustment (sheet 2/6)









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NOTE: POSITIONING OF THE TEMPLATES ON THE RH ELEVATOR IS SYMMETRICAL



Adjustment (sheet 4/6)







Figure 2-39 Elevator Surfaces, Measurement and Play -Adjustment (sheet 5/6)





Figure 2-39 Elevator Surfaces, Measurement and Play -Adjustment (sheet 6/6)





2-45 PITCH TRIM CONTROL SYSTEM -ADJUSTMENT

INPUT CONDITION:

- Aircraft Applicability:
 - 04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 1-1).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 60 (Min.) Total Time Detention System: 60 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00023	Kit elevator balance tab slack measurement	A35603-000
00065	Kit, elevator - trims check templates	G0002730001
00113	Tensiometer	T60-1001C8-1A**
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

None



Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-45.1 ADJUSTMENT OF EMERGENCY TRIM TAB NEUTRAL POSITION (refer to figure 2-40, sheet 2/4) and (refer to figure 2-40, sheet 3/4)
 - 1. Move by hand the LH (RH) trim tab and check that it moves without interference to at least 11° upward and downward.
 - 2. Set the drum (7) in neutral position checking that the dimension between the Shaft assy (6) and the Drum Rod assy (5) is 0.81 ± 0.062 in (20.6 ± 1.6 mm).
 - 3. Move by hand the trim tab to zero position (use template: elevator trim check template (AGE NO. 00065).
 - 4. Connect the linkage rod (fail safe type) from the Rod assy (5) drum to the trim tab slot.
 - 5. Check that the trim tab is to $0^{\circ} \pm 0.5^{\circ}$.

NOTE

If the trim tab doesn't satisfy the requirement, properly operate on the knurl plate.

- 6.Insert the rigging pin (8) (AGE NO. 00181) into the drum (7).
- 7. Install the control cable on drum (7) and verify that it is winded up on drum (7) for at least 3 turns.
- 8. Remove the rigging pin (8) (AGE NO. 00181) from the drum (7).
- 9. Pull one of two control cable end in order to move the trim tab surface and verify that it moves to $10^{\circ} \pm 1^{\circ}$ downwards. Pull the other control cable end and verify that the trim tab moves to $10^{\circ} \pm 1^{\circ}$ upwards.

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- 2-45.1 ADJUSTMENT OF EMERGENCY TRIM TAB NEUTRAL POSITION (refer to figure 2-40, sheet 2/4) and (refer to figure 2-40, sheet 3/4) (Cont'd)
 - 10. Check tension of trim tab control cable end of drums connection cable. (refer to figure 2-40, sheet 1/4)
 - 11.Insert a rigging pin (AGE NO. 00181) (3) in the LH and RH drums (4).
 - Perform the cables stretching by means of the turnbuckles (2) in accordance (refer to figure 2-40, sheet 1/4) as follows:
 - A.Acting by turnbuckles (2) stretch the cables (1) to the nominal value.
 - B.Check by tensiometer (AGE NO. 00113) the accordance to (refer to figure 2-40, sheet 1/4).
 - C.Remove rigging pin from LH and RH drum.
 - D.Perform 25 cycles of manoeuvre acting by hand on the cables (2).
 - E.Recheck the cable tension in accordance to (refer to figure 2-40, sheet 1/4), if necessary, stretch again the cables and repeat these actions until the value are constant.
 - F.Insert the rigging pin (AGE NO. 00181) (3) in the LH (RH) drum (4).
 - G.Acting on turnbuckles (2) slack one cable and stretch the other so that the rigging pin (AGE NO. 00181) (3) can freely fit to the RH (LH) drum (4).
 - 13. When the cables stretching is complete, check that the terminal lugs are tightened on the turnbuckle coupling by the same number of turns. Furthermore check that no more than 3 turns are visible on each terminal lug.
 - 14. Adjust and connect the linkage rod between the trim position transducer lever and the lever assy.


2-45.2 MEASUREMENT OF TRIM TABS CONVENTIONAL PLAY (refer to figure 2-40, sheet 4/4)

- 1.Fit tools balance tabs slack measurement kit (AGE NO. 00023) to LH and RH elevators (in correspondence of each tab central hinge), and fit a dial gauge to each template.
- 2. Insert a 0.193 in (4.915 mm) (AGE NO. 00181) (9 and 11) diameter rigpin in left (10) and right (12) rear quadrants.
- 3. Apply a load of 2.204 lb (1 Kg) to LH elevator outer tab trailing edge downwards. Note the corresponding displacement on dial gauge. Plot each one of the two values on the related axis obtaining a positive point.
- 4. Repeat step 3. applying loads of 4.409, 6.613, 8.818 and 11.023 lb (2, 3, 4 and 5 kg) downwards on LH elevator trim tab trailing edge noting the related tab displacements. Obtain consequently four other positive points.
- 5. Repeat steps 3. and 4. applying loads upwards in order to obtain five negative points.
- 6. Join positive points, then negative points in order to obtain points 0+ and 0 on the axis.
- 7. The distance between points 0+ and 0- (LH elevator trim tab conventional play) must not exceed 0.062 in (1.6 mm).
- 8. Repeat steps 3. thru 7. for RH elevator trim tab: results must be the same.
- 9. Remove devices mentioned in steps 1. and 2.

FOLLOW ON MAINTENANCE:

None





TRIM CABLES TENSION REGULATION (TOLERANCE 2.5 KG)



Figure 2-40 Pitch Trim Control System - Adjustment (sheet 1/4)





Figure 2-40 Pitch Trim Control System - Adjustment (sheet 2/4)







Figure 2-40 Pitch Trim Control System - Adjustment (sheet 3/4)







2-46 ELEVATOR TRIM TRAVEL - OTHER CHECK

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	60,00	
	ELT	1	180,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 240 (Min.) Total Time Detention System: 180 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00065	Kit, elevator - trims check templates	G0002730001
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 2-1) SAFETY PRECAUTIONS before performing maintenance.



PROCEDURE:

- 2-46.1 NORMAL OPERATING (refer to figure 2-41, sheet 1/4) , (refer to figure 2-41, sheet 2/4) , (refer to figure 2-41, sheet 3/4)
 - 1.Use the hydraulic test stand (AGE NO. 00262) and ensure that the hydraulic systems are pressurized at 20.7 MPa (3000 psi).
 - 2. On the FCS 2 Control Panel (104VE) (3), ensure that the MODE switch (Emergency Trim) is to NORM and that the cover guard of the PITCH STBY switch (Stand-by Pitch Trim) is lowered.
 - 3. Ensure that the circuit breaker FLIGHT CONTROL PITCH NORM (20CG) (5) located on Overhead Circuit Breakers Panel (271VE) (4) in position F 9 is closed.
 - 4. Simulate an aircraft low speed of 100 kts by setting a dynamic pressure of 16.3 mbar in both channels.
 - 5. By the control wheel trim button, perform a complete travel nose up and nose down (or vice versa) and verify that there are no interference in the trim actuator area, artificial feel unit and trim transmitter.

NOTE

During the trim travel manoeuvre, do not prevent the control stick movement.

- 6. Set the trim button, on the control wheel, to NOSE UP and keep on. Check that the elevators move to $11.25^{\circ} \pm 1^{\circ}$ upwards. The normal pitch trim indicator must show about 11.25° up. Release the normal trim switch.
- 7.Set the trim button to NOSE DOWN and maintain. Check that the elevators move to $7.5^{\circ} \pm 1^{\circ}$ downwards. The normal pitch trim indicator must show about 7.5° down. Release the normal trim switch.



- 2-46.1 NORMAL OPERATING (refer to figure 2-41, sheet 1/4), (refer to figure 2-41, sheet 2/4), (refer to figure 2-41, sheet 3/4) (Cont'd)
 - 8. By the control wheel trim button, perform a complete travel, from full nose up to full nose down (or vice versa) and check that the manoeuvre time required is 10 ± 2 sec.
 - 9. Move the AIR SPEED selector (7) to LOW position.
 - 10. Set the trim button, on the control wheel, to NOSE UP and keep on. Check that the elevators move to 11.25° ± 1° upwards. The normal pitch trim indicator must show about 11.25° up. Release the normal trim switch.
 - 11.Set the trim button to NOSE DOWN and maintain. Check that the elevators move to $7.5^{\circ} \pm 1^{\circ}$ downwards. The normal pitch trim indicator must show about 7.5° down. Release the normal trim switch.
 - 12. By the control wheel trim button, perform a complete travel, from full nose up to full nose down (or vice versa) and check that the manoeuvre time required is 20 ± 2 sec.
 - 13. Move the AIR SPEED selector (7) is to AUTO position.
 - 14. Simulate an aircraft high speed of 280 kts by setting a dynamic pressure of 132.9 mbar in both channels.
 - 15. Set the trim button, on the control wheel, to NOSE UP and keep on. Check that the elevators move to 11.25° ± 1° upwards. The normal pitch trim indicator must show about 11.25° up. Release the normal trim switch.



- 2-46.1 NORMAL OPERATING (refer to figure 2-41, sheet 1/4), (refer to figure 2-41, sheet 2/4), (refer to figure 2-41, sheet 3/4) (Cont'd)
 - 16. Set the trim button to NOSE DOWN and maintain. Check that the elevators move to $7.5^{\circ} \pm 1^{\circ}$ downwards. The normal pitch trim indicator must show about 7.5° down. Release the normal trim switch.
 - 17.By the control wheel trim button, perform a complete travel, from full nose up to full nose down (or vice versa) and check that the manoeuvre time required is 20 ± 2 sec.
- 2-46.2 STAND-BY TRIM OPERATING CHECK (refer to figure 2-41, sheet 1/4) , (refer to figure 2-41, sheet 3/4)
 - 1. Ensure that the aircraft speed is set at 280 kts.
 - 2. Raise the cover guard of the PITCH STBY switch and verify that the ACAWS advisory message STBY PITCH TRIM SEL appears on CMDU.
 - 3.Set the PITCH STBY switch (2) to NOSE UP and maintain. Check that the elevators move to $11.25^{\circ} \pm 1^{\circ}$ upwards. The normal pitch trim indicator shows about 11.25° up. Release the standby trim switch.
 - 4. Set the PITCH STBY switch (2) to NOSE DN and maintain. Check that the elevators move to $7.5^{\circ} \pm 1^{\circ}$ downwards. The normal pitch trim indicator shows about 7.5° down. Release the standby trim switch.
 - 5.By the PITCH STB switch (2), perform a complete travel, from full nose up to full nose down (or vice versa) and check that the manoeuvre time required is 20 ± 2 sec.
 - 6. Simulate an aircraft low speed of 100 kts by setting a dynamic pressure of 16.3 mbar in both channels.



- 2-46.2 STAND-BY TRIM OPERATING CHECK (refer to figure 2-41, sheet 1/4), (refer to figure 2-41, sheet 3/4) (Cont'd)
 - 7.By the PITCH STB switch (2), perform a complete travel, from full nose up to full nose down (or vice versa) and check that the manoeuvre time required is 10 ± 1 sec.
 - 8. Lower the cover guard of the PITCH STBY switch and verify that the ACAWS advisory message STBY PITCH TRIM SEL disappears on CMDU.
- 2-46.3 EMERGENCY OPERATING (refer to figure 2-41, sheet 1/4), (refer to figure 2-41, sheet 2/4), (refer to figure 2-41, sheet 3/4) and (refer to figure 2-41, sheet 4/4)
 - 1.Connect the AC external electrical supply to the aircraft and switch on (refer to manual TCH.1C-27J-2-00GV).
 - 2. Annul the hydraulic pressure in both systems No. 1 and No. 2.
 - 3. Fit the templates (AGE NO. 00065) for elevator and trim tab travel check on both surfaces.
 - 4. Ensure that the circuit breaker FLIGHT CONTROL ELEV TRIM TAB EMER (1CT) (6) located on Overhead Circuit Breakers Panel (271VE) (4) in position F 5 is closed.
 - 5. Raise the cover guard and set the MODE switch (Emergency Pitch Trim) to EMER and verify that the ACAWS caution message EMER PITCH TRIM SEL appears on CMDU while the caution aural tone is audible.
 - 6. Set the trim button, on the control wheel, to NOSE UP and maintain. Check that the trim tabs move to $10^{\circ} \pm 1^{\circ}$ downwards. The emergency pitch trim indicator shows about 10° up.



- 2-46.3 EMERGENCY OPERATING (refer to figure 2-41, sheet 1/4), (refer to figure 2-41, sheet 2/4), (refer to figure 2-41, sheet 3/4) and (refer to figure 2-41, sheet 4/4) (Cont'd)
 - 7. Set the trim button, on the control wheel, to NOSE DN and visually check that the left and right Trim Tab move to $10^{\circ} \pm 1^{\circ}$ upwards. Furthermore check that the emergency pitch trim indicator shows about 10° down.
 - 8.On the Pilot control wheel, set the trim button to NOSE DOWN and, as soon as trim tabs begin to move, set the trim button, on Copilot control wheel to NOSE UP.
 - 9. Verify that the trim tabs stop to move.
 - 10. Perform an emergency trim complete travel, from all downwards to all upwards (or vice versa) and check that the manoeuvre time required is 15 ± 1 sec.
 - 11. Remove the templates (AGE NO. 00065) for elevator and trim tab travel check from both surfaces.
 - 12. Disconnect electric power to the aircraft (refer to manual TCH.1C-27J-2-00GV).

FOLLOW ON MAINTENANCE:

None











Figure 2-41 Elevator Trim Travel - Other Check (sheet 2/4)











NOTE:

POSITIONING OF THE TEMPLATES ON THE RH ELEVATOR IS SYMMETRICAL



Figure 2-41 Elevator Trim Travel - Other Check (sheet 4/4)



2-47 ELEVATOR COMPONENTS - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 1-1).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	100,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 100 (Min.) Total Time Detention System: 100 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00114	Clinometer	MCL90
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	2,00
00052	PIN, COTTER	MS24665-153	3,00



Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-47.1 ADJUSTMENT PILOT (COPILOT) CONTROL STICK TO FORWARD QUADRANT (refer to figure 2-42, sheet 1/4) and (refer to figure 2-42, sheet 2/4)
 - Insert a 0.19 in (4.915 mm) (AGE NO. 00181) diameter rigging pin (1) in the proper hole of the Pilot (2) (Copilot (3)) control wheel in order to set it in neutral position.
 - 2. Install the clinometer (AGE NO. 00114) on the Pilot (Copilot) control stick and perform the calibration procedure of the clinometer (zero position).
 - 3. Remove the rigging pin (1) (AGE NO. 00181).
 - 4. Slowly move the Pilot (2) (Copilot (3)) control stick forward until the inclinometer (AGE NO. 00114) display shows 12.5°.
 - 5. Adjust the forward stop bolt (11) against the control stick and tighten the lock nut (10).
 - 6. Slowly move the Pilot (2) (copilot (3)) control wheel backward until the clinometer display shows 13.5°
 - 7. Adjust the rear stop bolt (8) against the control wheel and tighten the lock nut (9).
 - 8. Set the Pilot (2) (Copilot (3)) control wheel to neutral position.
 - 9. Insert the diameter rigging pin (35) 0.31 in (7.95 mm) in the LH (RH) forward quadrant (36).
 - 10.Insert a rigging pin (1) 0.19 in (4.915 mm)(AGE NO. 00181) in the proper hole of Pilot control wheel (2).



- 2-47.1 ADJUSTMENT PILOT (COPILOT) CONTROL STICK TO FORWARD QUADRANT (refer to figure 2-42, sheet 1/4) and (refer to figure 2-42, sheet 2/4) (Cont'd)
 - 11. Disconnect the LH (RH) linkage rod (22) from LH (RH) bellcrank (34) by removing bolt (27), washer (25), bushings (26 and 28), castellated nut (24) and cotter pin (23). Discard removed cotter pin.
 - Disconnect the LH (RH) linkage rod (22) from LH (RH) forward quadrant (18) by removing bolt (17), washer (19), castellated nut (20) and cotter pin (21). Discard removed cotter pin.
 - 13. Adjust the LH (RH) linkage rod (22) as for drawing dimension (ref. 355 mm).
 - 14. Connect the LH (RH) linkage rod (22)at the LH (RH) forward quadrant (18) by using bolt (17), washer (19), castellated nut (20) and new cotter pin (21) (LMC NO. 00052).
 - 15. Connect the LH (RH) linkage rod (22) at the LH (RH) bellcrank (34) by using bolt (27), washer (25), bushings (26 and 28), castellated nut (24) and new cotter pin (23) (LMC NO. 00052).
 - 16. Disconnect the LH (RH) linkage rod (16) from LH (RH) bellcrank (34) by removing bolt (33), washer (31), bushings (32), castellated nut (30) and cotter pin (29). Discard removed cotter pin.
 - 17. Disconnect the LH (RH) linkage rod (16) from LH (RH) control stick (12) by removing bolt (4), washer (13), special washer (6), spring (5), spacer (7), castellated nut (14) and cotter pin (15). Discard removed cotter pin.
 - 18. Adjust the LH (RH) linkage rod (16) as for drawing dimension (ref. 350 mm).

(Cont'd)



2-47.1 ADJUSTMENT PILOT (COPILOT) CONTROL STICK TO FORWARD QUADRANT (refer to figure 2-42, sheet 1/4) and (refer to figure 2-42, sheet 2/4) (Cont'd)

- 19. Connect the LH (RH) linkage rod (16) at the LH (RH) control stick (12) by using bolt (4), washer (13), special washer (6), spring (5), spacer (7), castellated nut (14) and new cotter pin (15) (LMC NO. 00010).
- 20. Connect the LH (RH) linkage rod (16) at the LH (RH) bellcrank (34) by using bolt (33), washer (31), bushings (32), castellated nut (30) and new cotter pin (29) (LMC NO. 00052).
- 21.Check that the LH (RH) rod axis (22) and the LH (RH) lever axes (18) are positioned at $90^{\circ} \pm 1^{\circ}$.

NOTE

If necessary, to obtained the above requirement, adjust properly the RH linkage rod (22). Would this not be enough, adjust also the RH linkage rod (16).

- 22. Check for correct engagement of the sliding terminal through the inspection hole. No more than 3 threads must be visible.
- 23. Remove both rigpins (1 and 35) (AGE NO. 00181).
- 2-47.2 CENTERING SPRING ADJUSTMENT (refer to figure 2-42, sheet 3/4) and (refer to figure 2-42, sheet 4/4)

NOTE

The following procedure is valid for left side. For right side is similar.

1.Insert a 0.193 in (4.915 mm) (AGE NO. 00181) (37 and 39) diameter rigging pin to the LH and RH rear quadrants (38 and 40) to ensure neutral position.



- 2-47.2 CENTERING SPRING ADJUSTMENT (refer to figure 2-42, sheet 3/4) and (refer to figure 2-42, sheet 4/4) (Cont'd)
 - 2. Disconnect centering spring (46) from LH (RH) elevator actuator (41) by removing bolt (42), washer (43), bushing (47), castellated nut (44) and cotter pin (45). Discard removed cotter pin.
 - 3. Remove the lock wire (48), then acting on the locking nut (49), adjust the centering spring (46), so that the fixing bolt enters freely on the LH (RH) elevator actuator (41) (centering spring set to neutral position).
 - 4. Tighten (AGE NO. 00054) the locking nut (49) and lock it with new lock wire (48).
 - 5. Verify the correct engagement of the threads end. Check that no more than 3 threads are visible on each terminal lug.
 - 6. Connect centering spring (46) at the LH (RH) elevator actuator (41) by using bolt (42), washer (43), bushing (47), castellated nut (44) and new cotter pin (45) (LCM NO. 00010).
 - 7. Remove a 0.193 in (4.915 mm) (AGE NO. 00181) (37 and 39) diameter rigging pin from LH and RH rear quadrants (38 and 40).

FOLLOW ON MAINTENANCE:

None





(sheet 1/4)









Figure 2-42 Elevator Components - Adjustment (sheet 2/4)





Figure 2-42 Elevator Components - Adjustment (sheet 3/4)







DETAIL LEFT SIDE SHOWN RIGHT SIDE IS OPPOSITE CENTERING SPRING

Figure 2-42 Elevator Components - Adjustment (sheet 4/4)

Alenia Aermacchi

2-48 CONTROL WHEEL - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect external AC power supply from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Remove the Chart Holder (refer to manual TCH.1C-27J-2-33JG).
- 3. Open the access panels 711A, 712A, 130B and 130C.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Removal	AFM	1	40,00	
Installation	AFM	1	50,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 90 (Min.) Total Time Detention System: 90 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00020	KEY WASHER	68867-101	1,00



Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-48.1 REMOVAL. Remove control wheel as follows:
 - A. Disconnect the electrical connector (51VEA Pilot side) (52VEA Copilot Side) located at the bottom of the control column pilot (cockpit underfloor), if it is necessary cut the tie wraps, extract all pins from the connector (51VEA pilot side or 52 VEA Copilot side the bigger one in order to complete the harness extraction from the control conlumn).
 - B.On the Control Wheel, unlock the key washer, then unscrew the center bolt, collect key washer and bolt.
 - C.Acting on the Control Wheel, carefully remove it from its seat by pulling backwards; during this operation carefully pull the wiring harness out of the control column until completion of extraction.
 - D.Position Control Wheel on workbench, then extract and collect the retainings pins.
- 2-48.2 INSTALLATION. To install the control wheel proceed as follows:

TCH.1C-27J-2-27JG



2-48.2 INSTALLATION. To install the control wheel proceed as follows: (Cont'd)

WARNING

TO PREVENT PERSONNEL INJURY, KEEP AWAY FROM THE FLIGHT CONTROL SURFACES DURING MAINTENANCE.

- A. Position the new control wheel on the workbench; install the retaining pins.
- B. On the control column carefully insert the Control wheel wire harness through control column, until reaching the bottom of the control column (cockpit underfloor), if it necessary replace tie wraps previously removed, then re-insert the pins into the connector (51VEA Pilot side or 52VEA Copilotside).
- C.Torque tighten the bolt to 430 lb in and lock the key washer in order to fix the control wheel.
- D. Connect the electrical connector (51VEA Pilot Side or 52VEA Copilot side) on the bottom of the control column (cokpit underfloor).

FOLLOW ON MAINTENANCE:

- 1.Install the Chart Holder (refer to manual TCH.1C-27J-2-33JG).
- 2. Close the access panels 711A, 712A, 130B and 130C.



3. Perform a functional check MEASUREMENT OF AILERON MANOEUVRE EFFORT (refer to para 2-6), ADJUSTMENT PILOT (COPILOT) CONTROL STICK TO FORWARD QUADRANT (refer to para 2-47), ADJUSTMENT OF CONTROL CABLES TENSION (refer to para 2-41).





Figure 2-43 Control Wheel - Removal and Installation





2-49 HYDRAULIC ACCUMULATORS SHUT-OFF VALVE - FUNCTIONAL TEST

INPUT CONDITION:

- Aircraft Applicability:
 - 04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	40,00	
	ELT	1	40,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 80 (Min.) Total Time Detention System: 40 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.



PROCEDURE:

- 2-49.1 HYDRAULIC ACCUMULATORS SHUT-OFF VALVE CHECK (refer to figure 2-44, sheet 1/4) , (refer to figure 2-44, sheet 2/4) , (refer to figure 2-44, sheet 3/4) and (refer to figure 2-44, sheet 4/4)
 - 1. Simulate the hydraulic system HP condition as follows:
 - A. disconnect the aircraft connector (2) from the LOW PRESSURE ACMP 2 switch (28 DE) (1) and fit a short between the pins B and C;
 - B.disconnect the aircraft connector (3) from the LOW PRESSURE ACMP 1 switch (29 DE) (4) and fit a short between the pins B and C.
 - 2. Close the circuit breakers located on Overhead Circuit Breakers Panel (271VE) (5):
 - A. HYDRAULICS CNTR ACMP 1 (4DE) (6) in position B 7.
 - B.HYDRAULICS CNTR ACMP 2 (3DE) (7) in position B 8;
 - C.HYDRAULICS LOW PRESS CHNL 1 (18DE) (8) in position B 9;
 - 3. Ensure that the pushbutton ACCUMULATOR (10), on FCS 2 Control Panel (104VE) (9), is de-selected (lamp ON extinguished).
 - 4. Supply the hydraulic systems No. 1 and No. 2 at 3000 psi (210 Kg/cm²) for a few minutes.
 - 5. Remove the short from the connector (28 DEA) (2) (to simulate the system 2 LP condition), then annul the hydraulic pressure in the system No. 2.
 - 6. Remove the short from the connector (29 DEA) (3) (to simulate the system 1 LP condition), then annul the hydraulic pressure in the system No. 1.



- 2-49.1 HYDRAULIC ACCUMULATORS SHUT-OFF VALVE CHECK (refer to figure 2-44, sheet 1/4) , (refer to figure 2-44, sheet 2/4) , (refer to figure 2-44, sheet 3/4) and (refer to figure 2-44, sheet 4/4) (Cont'd)
 - 7. Perform complete manoeuvres by the control stick in pitch direction (from neutral to fully forward, then to fully backwards and returning to neutral) and check that the number of manoeuvres is at least 6 (transient accumulator discharged) before the pressure gauge of the elevator system No. 2 accumulator shows 1000 psi. The pressure gauge of the elevator system No. 1 two accumulators must continue to indicate 3000 psi.
 - 8. Activate the reserve hydraulic accumulators by pressing the ACC (10) pushbutton (lamp ON illuminated).
 - 9. Perform complete manoeuvres by the control stick in pitch direction (from neutral to fully forward, then to fully backwards and returning to neutral) and check that the number of manoeuvres is at least 6 before the pressure gauge of the elevator system No. 1 two accumulators show 1000 psi.
 - 10. At test completion de-select the pushbutton ACC (10) and open the circuit breakers located on Overhead Circuit Breakers Panel (271VE) (5):
 - A.HYDRAULICS CNTR ACMP 1 (4DE) (6) in position B 7.
 - B.HYDRAULICS CNTR ACMP 2 (3DE) (7) in position B 8;
 - C.HYDRAULICS LOW PRESS CHNL 1 (18DE) (8) in position B 9;
 - 11. Reconnect properly the aircraft connector (28 DEA)
 - (2) and (29 DEA) (5) to the (28 DE) (1) and (29 DE)
 - (4) LOW PRESSURE switches.

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- 2-49.1 HYDRAULIC ACCUMULATORS SHUT-OFF VALVE CHECK (refer to figure 2-44, sheet 1/4) , (refer to figure 2-44, sheet 2/4) , (refer to figure 2-44, sheet 3/4) and (refer to figure 2-44, sheet 4/4) (Cont'd)
 - Use the hydraulic test stand (AGE NO. 00262) to restore hydraulic pressure in the systems No. 1 and No. 2 to 3000 psi (210 Kg/cm²).

FOLLOW ON MAINTENANCE:

None







Figure 2-44 Hydraulic Accumulators Shut-Off Valve -Functional Test (sheet 1/4)

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Functional Test (sheet 2/4)

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Figure 2-44 Hydraulic Accumulators Shut-Off Valve -Functional Test (sheet 4/4)

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2-50 LH (RH) ELEVATOR ACTUATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

```
Aircraft Applicability:
```

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Discharge hydraulic system pressure before removing any hydraulic component.
- 3. Discharge hydraulic pressure from three elevator hydraulic accumulators (two hydraulic accumulators of the system No 1 and the hydraulic accumulator of the system No 2).
- 4. Put in the flight compartment a warning target :
 - A.DO NOT MOVE THE CONTROL COLUMN.
 - B.DO NOT OPEN RAMP AND CARGO.
 - C.DO NOT SUPPLY THE HYDRAULIC SYSTEM.
- 5. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 6. Disable Ramp & Cargo system.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Removal	AFM	1	20,00	
Installation	AFM	1	25,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 45 (Min.) Total Time Detention System: 45 (Min.)



AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00031	PACKING, PREFORMED	M83461/2-904	2,00
00032	O-RING, PREFORMED	M83461/2-906	2,00
00043	HYDRAULIC FLUID	MIL-PRF-83282D	AR
00052	PIN, COTTER	MS24665-153	5,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-50.1 REMOVAL. Remove elevator actuator as follows:

WARNING

TOPS MUST BE FIXED ON PIPES AFTER REMOVAL.OPEN ALL THE NITROGEN CHARGING VALVE VERY SLOWLY TO PREVENT NITROGEN VAPOR FROM COMING IN TOUCH WITH THE EYES.DO NOT BREATHE THE NITROGEN VAPOR COMING OUT FROMTHE NITROGEN CHARGING VALVE, IT COULD BE MIXED WITH HYDRAULIC FLUID.



2-50.1 REMOVAL. Remove elevator actuator as follows: (Cont'd)

NOTE

Install the protection cap on the pipes and the electrical connectors that you disconnect.

- A.Disconnect the two electrical connectors from LH (RH) actuator 11CGA (6CGA) and 11CGB(6CGB).
- B.Disconnect the jumper from actuator as follow: remove the cotter pin, unscrew the nut, remove the washers and the bolt.
- C.Use a container to collect the drained fluid. Unscrew the nuts and disconnect the four flexible pipesfrom the actuator: inlet and outlet of system No 1 inlet and outlet of the system No 2.
- D.Close the four flexible pipe by caps.
- E.Close the four connections on the actuator by caps.
- F.Disconnect the input lever from actuator as follow: remove the cotter pin, unscrew the nut remove washers the bolt and the bushing.
- G.Disconnect the centering spring lever from the actuator as follow:
- 1. remove the cotter pin,
- 2. unscrew the nut,

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2-50.1 REMOVAL. Remove elevator actuator as follows: (Cont'd)

- 3. remove washers, the bolt and the bushing.
 - A.Disconnect the actuator casing from the LH (RH) lever as follow:
- 4. remove the cotter pin,
- 5. unscrew the nut,
- 6. remove washers, the bolt and the bushing.
 - A. Hold by hand and disconnect the actuator rod from the structure as follow:
- 7. remove the cotter pin,
- 8. unscrew the nut,
- 9. collect washer, nuts and bush.
 - A. Remove the actuator from the aircraft.
 - B. Position the actuator on the workbench.
 - C.Remove the four nipples from the actuator and discard the O-rings.
- 2-50.2 INSTALLATION. The installation procedure for elevator actuator is the following:



2-50.2 INSTALLATION. The installation procedure for elevator actuator is the following: (Cont'd)

CAUTION

Seal all open pipes and component holes to prevent entrance of unwanted material.

NOTE

Lubricate all packings and O-ring with hydraulic fluid.

- A. Position the new actuator on the workbench.
- B. Insert a new O-rings on the four nipples.
- C.Screw and apply a torque on the four nipples on the actuator.
- D.Refill of hydraulic fluid the actuator and close the four hydraulic connections by caps.
- E.Install the actuator on the appropriate seat on the aircraft.
- F.Hold the actuator, insert the bushing on the actuator rod , align it with the appropriate Beam Bracing of the structure and insert the bolt.
- G.Insert the bushing on the hole of the actuator casing, align the holes LH (RH) lever and insert the bolt.

- 2-50.2 INSTALLATION. The installation procedure for elevator actuator is the following: (Cont'd)
 - H.On the both bolts; place a washer, a nut, torque tighten to 43 thru 50 in lb (0.495 \div 0.576 mkg)and install the relative cotter pin.
 - I. Remove the caps from pipes.
 - J.Connect the inlet and outlet flexible pipes of the hydraulic system No 1 and hydraulic system No2, tighten the nuts that connect the four flexible pipes to hydraulic actuator.
 - K.Connect the input lever to actuator as follow:
 - 1. place the bushing to appropriate seat,
 - 2. align the holes,
 - 3. insert the bolt, the washers and the nut,
 - 4.screw and tighten to 43 thru 50 in lb (0.495 thru 0.576 mkg) and insert the cotter pin.
 - A.Connect the centering spring lever to actuator as follow:
 - 5. insert the bushing on the roller bearing,
 - 6.align the holes,
 - 7.insert the bolt, the washers and the nut, screw and tighten to 18 thru 20 in lb (0.207 thru0.230 mkg).

(Cont'd)

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- 2-50.2 INSTALLATION. The installation procedure for elevator actuator is the following: (Cont'd)
 - A.Connect the two electrical connectors to LH (RH) actuator 11CGA (6CGA) and 11CGB (6CGB).

FOLLOW ON MAINTENANCE:

- 1. Bleed the actuator.
- 2. Perform functional tests as described in ELEVATORS FREE DEFLECTION CHECK (refer to para 2-39), ELEVATORS TRAVEL CHECK WITHOUT HYDRAULIC POWER (refer to para 2-39), MANOUVRE EFFORT AND Q-FEEL FUNCIONAL CHECK and NORMAL OPERATING (AIR DATA VALID) (refer to para 2-53).
- 3. Remove the container with the drained fluid from the aircraft.

CAUTION

Don 't use the drained fluid collected to refill the hydraulic circuit. It is contaminated.

- 4. Enable cargo ramp.
- 5. Remove the warning target from the flight compartment.





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Figure 2-45 LH (RH) Elevator Actuator - Removal and Installation (sheet 2/2)

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TCH.1C-27J-2-27JG

2-51 ELEVATOR TRIM POSITION TRANSMITTER -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Position maintenance platform (AGE NO. 00074).

Recomended Personnel:

Not Provided

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00009	NUT, SELF-LOCKING	H14-08	1,00
00069	NUT, SELF-LOCKING	MS21043-3	3,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-51.1 REMOVAL (refer to figure 2-46, sheet 1/2) and (refer to figure 2-46, sheet 2/2)

- 1. Loosen 16 fixing screws the panel on the LH elevator.
- 2. Open the access panel 332F.

(Cont'd)

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- 2-51.1 REMOVAL (refer to figure 2-46, sheet 1/2) and (refer to figure 2-46, sheet 2/2) (Cont'd)
 - 3. Disconnect from the position transducer emergency trim (3CT) (5) the electrical connector (3CTA) (6).
 - 4. Disconnect from the position transducer emergency trim (3CTA) (5) the connection rod (3) by removing bolt (4), washer (2) and nut, self-locking (1). Discard removed nut, self-locking.
 - 5. Disconnect and remove from the aircraft structure the position transducer emergency trim (3CT) (5) by removing bolts (9), washers (8) and nuts, self-locking (7). Discard removed nuts, self-locking.
- 2-51.2 INSTALLATION (refer to figure 2-46, sheet 1/2) and (refer to figure 2-46, sheet 2/2)
 - 1. Position and install to the aircraft structure the position transducer emergency trim (3CT) (5) by using bolts (9), washers (8) and new nuts, self-locking (LCM NO. 00069) (7).
 - 2. Connect to the position transducer emergency trim (3CTA) (5) the connection rod (3) by using bolt (4), washer (2) and new nut, self-locking (LCM NO. 00009) (1).
 - 3. Connect to the position transducer emergency trim (3CT) (5) the electrical connector (3CTA) (6).
 - 4. Ensure that the LH emergency trim tab is to zero position.
 - 5. Adjust and connect the linkage rod between the position LH emergency trim transducer lever and LH emergency trim attachment point.
 - 6.Check that, on the Combined Trim Indicator (15CB) (10), the EMERGENCY indication (11) shows about 0°.
 - 7. It is necessary to re-adjust the linkage rod and /or the transducer lever to get 0°.

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2-51.2 INSTALLATION (refer to figure 2-46, sheet 1/2) and (refer to figure 2-46, sheet 2/2) (Cont'd)

- 8. Perform the fully emergency trim travel upward and downward and check that, on the Combined Trim Indicator (15CB) (10), the EMERGENCY indication (11) shows about 10°.
- 9. Close the access panel 332F.

FOLLOW ON MAINTENANCE:

1. Remove maintenance platform (AGE NO. 00074).







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INDICATOR (15CB)

ICN-02-A-273030-A-A0170-00178-A-01-1

Figure 2-46 Elevator Trim Position Transmitter - Removal and Installation (sheet 2/2)

> 27-30-30 2-431



2-52 ELEVATOR EMERGENCY TRIM ACTUATOR -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).

2. Disable Cargo Ramp Function.

- 3. Lock the elevators by gust lock.
- 4. Open thermal insulation screen.

Recomended Personnel:

NONE

Periodicity: AR - AS REQUIRED Total Maintenance Time: 130 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.



PROCEDURE:

2-52.1 REMOVAL. Proceed as follows:

- A.Remove the two electrical connectors from the Elevator emergency trim actuator.
- B.Disconnect the bonding lead by unscrewing the bolt, collect the washer and nut.
- C. Insert the rigging pin in the central drum.
- D.Remove the connection link on the transmission chains.
- E.Remove the transmission chains.
- F.Unscrew the four fixing bolts, collect washers and nuts.
- G.Remove the spacers.
- H. Remove the elevator emergency trim actuator.
- 2-52.2 INSTALLATION. Proceed as follows:

NOTE

Before installing the elevator emergency trim actuator perform the following task to find the neutral position (0) of trim actuator. The actuator has two limit stop microwitches (16 revolutions) from one end to the other.



2-52.2 INSTALLATION. Proceed as follows: (Cont'd)

CAUTION

Do not turn manually the Emergency Trim Actuator Shaft during maintenance.

- A.Connect the Emergency trim actuator to 8CTA and 8CTB connectors.
- B.Battery SW On.
- C.Close circuit breaker FLIGHT CONTROL ELEV TRIM TAB EMER (1CT), located on the Overhead Circuit Breakers Panel (271VE) in position F 5.
- D.Select the emergency control switch on FCS 2 Control Panel (104VE) to Emerg.
- E.Move the pitch and roll trim switch to UP position till the trim actuator reaches the end of its course.
- F.Move the pitch and roll trim switch to DOWN and count the numbers of rotation of the Emergency Trim Actuator gear until it reaches the end of its course, divide the number of rotation by two to find the central position (0).
- G.Move the pitch and roll trim switch to UP position until the Emergency Trim Actuator reaches the rotation numbers of the previous operation.
- H.Battery SW to OFF, Emergency Control switch ON (FCS 2 Control Panel (104VE)) to NORMAL.

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2-52.2 INSTALLATION. Proceed as follows: (Cont'd)

- I.Close circuit breaker FLIGHT CONTROL ELEV TRIM TAB EMER (1CT), located on the Overhead Circuit Breakers Panel (271VE) in position F 5.
- J.Disconnect the electrical connectors 8CTA and 8CTB.
- K.Insert the spacers.
- L.Install elevator emergency trim actuator.
- M.Position the four fixing bolts, install washers and nuts then torque tighten the bolts.
- N. Reconnect the transmission chains.
- O.Replace the connection locks.
- P. Remove the rigging pin from central drum.
- Q.Reconnect the electrical connectors to 8CTA and 8CTB.
- R.Reconnect the bonding lead by install washer and nut, then tight the bolt.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2. Enable Cargo Ramp Function.
- 3. Close thermal insulation screen.





4. Perform the functional test: A.EMERGENCY OPERATING (refer to para 2-46).





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27-30-35 2-438



2-53 MANOUVRE EFFORT AND Q-FEEL -FUNCTIONAL CHECK

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	40,00	
Test	AFM	1	120,00	
	ENG	1	120,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 320 (Min.) Total Time Detention System: 160 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00002	Kit, air data accessories	ADAC27J-945
00007	Fixture, control stick force/travel measurement	ATCN6149
00034	Kit, dynamometers	A37781-000
00061	Kit, digital inclinometers	G0002700001
00262	Test stand, hydraulic system (diesel engine)	846805-D**





Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.

PROCEDURE:

- 2-53.1 MANOEUVRE EFFORT AND Q-FEEL FUNCTIONAL CHECK (refer to figure 2-48, sheet 1/4) and (refer to figure 2-48, sheet 2/4)
 - 1.Install on the Pilot control stick the fixture (AGE NO. 00007).
 - 2. Install on the Pilot control stick the inclinometer (AGE NO. 00061).
 - 3.Connect the dynamometer (AGE NO. 00034) to the fixture (AGE NO. 00007).
 - 4. Connect the air data test set plus (AGE NO. 00002) related adaptor to the Pitot tubes and switch-on.
 - 5. Power-up the Avionics to get availability of the ACAWS and of the Air data system (DADS) functionality by inserting the following circuit breakers on RH Overhead Circuit Breaker Panel (230 VE) (4):
 - A.AIR DATA SYS ADC 1 (7FF) (5) in position H 9;
 - B.AIR DATA SYS ADC 2 (8FF) (6) in position H 10;
 - C.AIR DATA SYS SPTU 1 (9FF) (7) in position H 11;
 - D.AIR DATA SYS SPTU 2 (10FF) (8) in position H 12.



2-53.1 MANOEUVRE EFFORT AND Q-FEEL FUNCTIONAL CHECK (refer to figure 2-48, sheet 1/4) and (refer to figure 2-48, sheet 2/4) (Cont'd)

NOTE

Ensure that the circuit breakers ENG 1 NIU 1 (5EN) (12) and ENG 2 NIU 2 (4EN) (10) respectively located on Rear Mid Circuit Breakers Panel (451VE) (11) in position K 21 and on Rear Upper Circuit Breakers Panel (452VE) (9) in position F 12 are opened.

- 2-53.2 Q-FEEL OPERATING (AIR DATA VALID) LOW SPEED (refer to figure 2-48, sheet 3/4)
 - 1.Ensure that the elevator surface are to neutral position.
 - 2.On the FCS 2 Control Panel (104VE) (13), set the AIR SPEED selector (14) to AUTO position.
 - 3. Simulate an aircraft low speed of 100 kts by setting a dynamic pressure of 16.3 mbar in both channels. Check that the caution Q-FEEL/TLU AD FAIL is not illuminated on the ACAWS.

CAUTION

During the execution of the next para be sure that the elevators movement area is free of obstacles.

4. By means of dynamometer (AGE NO. 00034), apply a load until the control stick begins to move. Check that the breakout force is 34.5 N (7.75 lbf) max.



2-53.2 Q-FEEL OPERATING (AIR DATA VALID) - LOW SPEED (refer to figure 2-48, sheet 3/4) (Cont'd)

- 5. By means of dynamometer (AGE NO. 00034), move the control stick stepwise at, 6°, 9° and fully forward (against the mechanical stop). Read and record the related effort value on dynamometer (loading phase) for each step.
- 6. Return the control stick to 9°, 6°. Read and record the related effort value on dynamometer (AGE NO. 00034) (unloading phase) for each step.
- 7. Set the control stick to neutral position.
- 8. Move the control stick at 6°, 9° and fully backward (against the mechanical stop). Read and record the related effort value on dynamometer (AGE NO. 00034) (loading phase) for each step.
- 9. Return the control stick to 9°, 6°. Read and record the related effort value on dynamometer (AGE NO. 00034) (unloading phase) for each test.
- 10. Set the control stick to neutral position.
- 11. Check that the effort manoeuvre values obtained are within the requirements described in Table 2-6.
- 12. Calculate the friction value at 6° and 9° of the control stick travel forward and backward and check that it does not exceed 30 N.

NOTE

The friction value is defined as the half difference of the two values read during loading and unloading phase and at the same control stick angle. It is intended that pulling effort is considered positive, while pushing effort is considered negative.



Table 2-5. Effort requirements - Control Stick (low speed)

CONTROL STICK FORWARD	EFFORT ALLOWED MAX	EFFORT MEASURED
+6°	100 ÷ 150 N	
+9°	145 ÷ 205 N	
CONTROL STICK BACKWARD	EFFORT ALLOWED (REF. ONLY)	EFFORT MEASURED
CONTROL STICK BACKWARD -6°	EFFORT ALLOWED (REF. ONLY) 125 ÷ 180 N	EFFORT MEASURED

2-53.3 Q-FEEL OPERATING (AIR DATA VALID) -MEDIUM SPEED

- 1. Simulate an increasing of aircraft speed to 197 kts by setting a dynamic pressure of 64.3 mbar in both channels.
- 2.By means of dynamometer (AGE NO. 00034), apply a load until the control stick begins to move. Check that the breakout force is 46 N max (4.69 Kg).
- 3. Repeat PREPARATION (refer to para 2-39).
- 4. Check that the effort manoeuvre values obtained are within the requirements described in Table 2-7.
- 5. Calculate the friction value at, 6° and 9° of the control stick travel and check that it does not exceed 40 N (4.07 Kgf).

NOTE

The friction is defined as the half difference of the two values measured during loading and unloading phase at the same control stick check point. The pushing effort is considered positive, while the pulling effort is considered negative. The control stick forward deflection is considered positive while the control stick rearward deflection is considered negative.

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Table 2-6. Effort requirements - Control Stick (medioum speed)

CONTROL STICK FORWARD	EFFORT ALLOWED	EFFORT MEASURED
+6°	240 ÷ 300 N	
+9°	360 ÷ 430 N	
CONTROL STICK BACKWARD	EFFORT ALLOWED (REF. ONLY)	EFFORT MEASURED
-6°	265 ÷ 325 N	
-9°	400 ÷ 470 N	

2-53.4 Q-FEEL OPERATING (AIR DATA VALID) - HIGH SPEED

- 1. Simulate an increasing of aircraft speed to 280 kts by setting a dynamic pressure of 132.9 mbar in both channels.
- 2. By means of dynamometer (AGE NO. 00034), apply a load until the control stick begins to move. Check that the breakout force is 57.5 N max.
- 3. Repeat PREPARATION (refer to para 2-39).
- 4. Check that the effort manoeuvre values obtained are within the requirements described in Table 2-8.
- 5. Calculate the friction value at, 6° and 9° of the control stick travel and check that it does not exceed 50 N (11.24 lb) (5.10 Kg).

NOTE

The friction is defined as the half difference of the two values measured during loading and unloading phase at the same control stick check point. The pushing effort is considered positive, while the pulling effort is considered negative. The control stick forward deflection is considered positive while the control stick rearward deflection is considered negative.

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Table 2-7. Effort requirements - Control Stick (high speed)

CONTROL STICK FORWARD	EFFORT ALLOWED (REF. ONLY)	EFFORT MEASURED
+6°	335 ÷ 400 N	
+9°	505 ÷ 585 N	
CONTROL STICK BACKWARD	EFFORT ALLOWED (REF. ONLY)	EFFORT MEASURED
-6°	345 ÷ 420 N	
-9°	535 ÷ 615 N	

2-53.5 Q-FEEL OPERATING (AIR DATA NOT VALID) (refer to figure 2-48, sheet 3/4) and (refer to figure 2-48, sheet 4/4)

- 1. Simulate a failure of the Air data system by de-power electrically the ADC 1 and the ADC 2.
- 2. Check that the caution Q-FEEL/TLU AD FAIL appears on ACAWS and the MAN indication (15), on FCS Control Panel (13), illuminates flashing and the FD message 2730008 Q-FEEL/TLU AD FAIL appears on CMDU (16) Maintenance Page.
- 3. Set the air data system in manual mode by moving the AIR SPEED selector (14) to LOW. Verify that the MAN indication (15), on FCS2 Control Panel (13), illuminates steady and the ACAWS caution message Q-FEEL/TLU MAN SEL appears on CMDU (16).
- 4. By means of dynamometer (AGE NO. 00034), set the control stick to 6° and 9° forward. Check that the effort required is: 190 N and 260 N max.
- 5. Return the control stick to neutral position.
- 6.By means of dynamometer (AGE NO. 00034), set the control stick to 6° and 9° backward. Check that the effort required is: 250 N and 350 N max.



- 2-53.5 Q-FEEL OPERATING (AIR DATA NOT VALID) (refer to figure 2-48, sheet 3/4) and (refer to figure 2-48, sheet 4/4) (Cont'd)
 - 7. Move the AIR SPEED selector (14) to MED position and verify that the ACAWS caution message Q-FEEL/TLU MAN SEL is still displayed on CMDU (16).
 - 8. By means of dynamometer (AGE NO. 00034), set the control stick to 6° and 9° forward. Check that the effort required is: 280 N and 400 N max.
 - 9. Return the control stick to neutral position.
 - 10. By means of dynamometer (AGE NO. 00034), set the control stick to 6° and 9° backward. Check that the effort required is: 310 N and 440 N max.
 - 11.Move the AIR SPEED selector (14) to HIGH position and verify that the ACAWS caution message Q-FEEL/TLU MAN SEL is still displayed on CMDU (16).
 - 12. By means of dynamometer (AGE NO. 00034), set the control stick to 6° and 9° forward. Check that the effort required is: 370 N and 530 N max.
 - 13. Return the control stick to neutral position.
 - 14. By means of dynamometer (AGE NO. 00034), set the control stick to 6° and 9° backward. Check that the effort required is: 400 N and 580 N max.
 - 15. Set the AIR SPEED selector (14) to AUTO position and verify that the ACAWS caution message Q-FEEL/TLU MAN SEL disappears on CMDU (16).
 - 16. Restore the electrical power to ADC1 and ADC 2 and verify the following conditions:
 - A.the MAN indication (15), on FCS2 Control Panel (13), extinguishes;
 - B.the ACAWS caution message Q-FEEL/TLU AD FAIL disappears on CMDU (16) (also the messages ADC 1 / 2 extinguish);

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(Cont'd)

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- 2-53.5 Q-FEEL OPERATING (AIR DATA NOT VALID) (refer to figure 2-48, sheet 3/4) and (refer to figure 2-48, sheet 4/4) (Cont'd)
 - C.the FD message Q-FEEL/TLU AD FAIL remains displayed until the clearing of CMDU (16) is performed via SAMU (17).
 - 17. Return the aircraft simulated airspeed to 0 Kts.
 - Move the AIR SPEED selector (14) to AUTO position and verify that the ACAWS caution message Q-FEEL/TLU MAN SEL disappears on CMDU (16).
 - 19. Restore the electrical power to the ADC 1 and ADC 2 and verify that:
 - A.the MAN indication (15), on FCS2 Control Panel (13), extinguishes;
 - B.the ACAWS caution message Q-FEEL/TLU AD FAIL disappears on CMDU (16) (also the messages ADC 1 / 2 extinguish);
 - C.the FD message Q-FEEL/TLU AD FAIL remains displayed until the clearing of CMDU (16) is performed via SAMU (17);

D.set the aircraft simulated airspeed to 0 Kts.

Table 2-8. Effort requirements - Control Stick (high speed)

CONTROL STICK FORWARD	EFFORT ALLOWED (REF. ONLY)	EFFORT MEASURED
+6°	335 ÷ 400	
+9°	505 ÷ 585	
CONTROL STICK BACKWARD	EFFORT ALLOWED (REF. ONLY)	EFFORT MEASURED
CONTROL STICK BACKWARD -6°	EFFORT ALLOWED (REF. ONLY) 345 ÷ 420	EFFORT MEASURED



- 2-53.6 CHECK OF RETURN TO NEUTRAL POSITION -CONTROL STICK - AUTO CONDITION
 - 1. Supply the hydraulic systems No. 1 and No. 2 to 3000 psi (210 kg/cm²).
 - 2. Install the inclinometer (AGE NO. 00061).
 - 3. Check that the control stick is to neutral position, the pitch trim is on neutral and that the elevator surface is to 0° +/-1° position.
 - 4. Move by hand the Pilot control stick backwards of about midstroke, then release it rapidly and check that the control stick returns to $0^{\circ} \pm 1^{\circ}$ (read on the inclinometer).
 - 5. Move by hand the Pilot control stick forwards of about midstroke, then release it rapidly and check that the control stick returns to 0° ± 1° (read on the inclinometer).
 - 6. Move the control stick forwards until the elevators move to about 5° downwards, then release it rapidly. Check that the control stick returns to $0^{\circ} \pm 1^{\circ}$ (read on the inclinometer).
 - 7. Move by hand rapidly, the control stick to fully pitch-up and rapidly return the control stick to neutral position. Check that, during control stick manoeuvre, the elevator surfaces do not swing excessively.
 - 8. Move by hand rapidly, the control stick to fully pitch-down and rapidly return the control stick to neutral position. Check that, during control stick manoeuvre, the elevator surfaces do not swing excessively.
- 2-53.7 Q-FEEL SYSTEM WARNING CHECK (refer to figure 2-48, sheet 3/4) and (refer to figure 2-48, sheet 4/4)

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- 2-53.7 Q-FEEL SYSTEM WARNING CHECK (refer to figure 2-48, sheet 3/4) and (refer to figure 2-48, sheet 4/4) (Cont'd)
 - Ensure that with the circuit breakers FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) located on Overhead Circuit Breaker Panel (271VE) (1) in position F 11 and FLIGHT CONTROL Q-FEEL RTLU PWR (2CG) (3) located on Overhead Circuit Breaker Panel (271VE) (1) in position F 10 are closed.
 - 2.Open the circuit breaker FLIGHT CONTROL Q-FEEL RTLU (1CG) (2) and check that the following messages illuminate on ACAWS:
 - A.Q-FEEL SNGL CHNL FAIL (caution);
 - B.NORM PITCH TRIM FAIL (caution);
 - C.RUDDER TLU FAIL (this warning is related to the rudder) (warning).
 - 3. FD messages on CMDU (16) Maintenance Page:
 - A.2730006 Q-FEEL SNGL CHNL FAIL;
 - B.2730004 NORM PITCH TRIM FAIL;
 - C.2720001 RUDDER TLU FAIL.
 - 4. Open the circuit breaker Q-FEEL RTLU (2CG) (3) and check that the following additional messages illuminate on ACAWS:
 - A.Q-FEEL FAIL (warning);
 - -STBY PITCH TRIM FAIL (caution);
 - -Q- FEEL/TLU AD FAIL (caution).
 - 5.FD messages on CMDU (16) Maintenance Page: -2730003 Q-FEEL FAIL;
 - -2730002 STBY PITCH TRIM FAIL:
 - -2730008 Q-FEEL/TLU AD FAIL.



- 2-53.7 Q-FEEL SYSTEM WARNING CHECK (refer to figure 2-48, sheet 3/4) and (refer to figure 2-48, sheet 4/4) (Cont'd)
 - 6. Close the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) and FLIGHT CONTROL Q-FEEL RTLU PWR (2CG) (3) and check that all six above indications extinguish within 10 sec. All the six above mentioned FD messages remain displayed until the clearing of the CMDU (16) is performed via SAMU (17).
 - 7.Open the circuit breaker FLIGHT CONTROL Q-FEEL RTLU (2CG) (3) and check that the following message illuminate on ACAWS:

-Q-FEEL SNGL CHNL FAIL;

-STBY PITCH TRIM FAIL;

- -RUDDER TLU FAIL.
- 8. Open also the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) and check that the following additional message illuminate on ACAWS:

-Q-FEELFAIL;

-NORM PITCH TRIM FAIL;

-Q-FEEL/TLU AD FAIL.

- 9. Close the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) and Q-FEEL RTLU (2CG) (3) and check that all six above indications extinguish within 10 sec. All the six above mentioned FD messages remain displayed until the clearing of the CMDU (16) is performed via SAMU (17).
- 10. Open the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) (the cautions Q-FEEL SNGL CHNL FAIL, NORM PITCH TRIM FAIL and the warning RUDDER TLU FAIL illuminate on ACAWS).
- 11. Disconnect the (7CGA) aircraft connector from PITCH FEEL ACTUATOR LEFT.

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- 2-53.7 Q-FEEL SYSTEM WARNING CHECK (refer to figure 2-48, sheet 3/4) and (refer to figure 2-48, sheet 4/4) (Cont'd)
 - 12. Close the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) and check that the caution Q-FEEL SNGL CHNL FAIL continues to remain illuminated, (the other two message extinguish). The FD messages remain displayed until clearing of CMDU (16) is performed via SAMU (17).
 - 13. Open the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (2CG) (3) and verify that the ACAWS messages Q-FEEL FAIL, STBY PITCH TRIM FAIL, RUDDER TLU FAIL appear on CMDU (16). The related FD messages appear on CMDU (16) Maintenance Page.
 - 14. Disconnect the (8CGA) aircraft connector from PITCH FEEL ACTUATOR RIGHT.
 - 15. Close the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (2CG) (3) and check that only the ACAWS message Q-FEEL FAIL remains displayed while STBY PITCH TRIM FAIL, Q-FEEL SNGL CHNL FAIL and RUDDER TLU FAIL disappear. The FD messages remain displayed until clearing of CMDU (16) is perfomed via SAMU (17).
 - 16. Disconnect the circuit breakers FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) and FLIGHT CONTROL Q-FEEL RTLU PWR (2CG) (3), (all the indications illuminate).
 - 17. Reconnect the (7CGA) and (8CGA) connectors.
 - 18. Close the circuit breaker FLIGHT CONTROL Q-FEEL RTLU PWR (1CG) (2) and FLIGHT CONTROL Q-FEEL RTLU PWR (2CG) (3) and check that all indications extinguish.
 - 19. Ensure that on the ECU front panel the LED display shows the following codes: L100, L200, R100, R200.

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FOLLOW ON MAINTENANCE:

None




Test (sheet 1/4)

















Figure 2-48 Elevator Control System Q-Feel - Functional Test (sheet 4/4)

Alenia Aermacchi

2-54 LH (RH) PITCH FEEL TRIM UNIT - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Disable Cargo Ramp Function.
- 4. Open thermal insulation screen .

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	10,00	
Removal	AFM	1	50,00	
Installation	AFM	1	55,00	
Follow Maintenance	AFM	1	10,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 125 (Min.) Total Time Detention System: 125 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00181	Kit, flight controls rigging pins	11G001-C052200-801





Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-54.1 REMOVAL (refer to figure 2-49, sheet 1/2) and (refer to figure 2-49, sheet 2/2)
 - 1.Lock the Control Wheel (2) and the Elevator rear quadrants (3 and 9) in neutral position by means of rigging pins (1, 4 and 8) (AGE NO. 00181).

CAUTION

The PITCH TRIM ACTR (DRIVE) (13) and the PITCH TRIM ACTR (SLAVE) (12) must be set to Rig position. If it is not possible to position the TRIM to rigged position it can be adjusted manually until this position is reached.

- 2. Remove PITCH TRIM ACTUATOR DRIVE (13) ((refer to para 2-56))and PITCH TRIM ACTUATOR SLAVE (12) ((refer to para 2-57)).
- 3. Remove LH (RH) Q-FEEL ACTUATOR (5) ((refer to para 2-55)).
- 4. Hold the pitch Feel Trim Unit (6) and remove bolts (7), washers (10) and self locking nuts (11) fixing Pitch Feel Trim Unit (6) to Airframe. Discard removed self locking nuts.
- 5. Remove Pitch feel trim unit (6) from the aircraft.



- 2-54.2 INSTALLATION (refer to figure 2-49, sheet 1/2) and (refer to figure 2-49, sheet 2/2)
 - 1. Position the Pitch feel Trim Unit (6) on its seat, then insert the bolts (7), position the washers (10) and new self locking nuts (11). Torque the bolts (AGE NO. 00054).
 - 2.Replace LH (RH) Q-FEEL ACTUATOR (5) ((refer to para 2-55)).

CAUTION

The PITCH TRIM ACTR (DRIVE) (13) and the PITCH TRIM ACTR (SLAVE) (12) must be set to Rig position. If it is not possible to position the TRIM to rigged position it can be adjusted manually until this position is reached.

- 3. Replace PITCH TRIM ACTUATOR DRIVE (13) ((refer to para 2-56)) and PITCH TRIM ACTUATOR SLAVE (12) ((refer to para 2-57)).
- 4. Unlock the Elevator rear quadrants (3 and 9) and the Control Wheel (2), remove rigging pins (1, 4 and 8) (AGE NO. 00181) inserted.

FOLLOW ON MAINTENANCE:

- 1. Enable Cargo Ramp Function.
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4. Close thermal insulation screen.
- 5. Perform the functional test:
 - A.MANOEUVRE EFFORT AND Q-FEEL FUNCTIONAL CHECK (refer to para 2-53).













2-55 LH (RH) Q-FEEL ACTUATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 2. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Disable Cargo Ramp Function.
- 4. Open thermal insulation screen.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	10,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	10,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

NOTE

This procedure is valid for LH Q-FEEL Actuator. For RH Q-Feel Actuator is similar.

2-55.1 REMOVAL (refer to figure 2-50)

CAUTION

Install protection caps on the disconnected electrical connectors.

- 1. Disconnect electrical connector (7CGA) (1) from the Q-FEEL Actuator (7CG) (4).
- 2.Disconnect the bonding lead (7) by removing screw (5) and washer (6).
- 3. Hold the Q-FEEL Actuator (7CG) (4) and remove bolts (2), washers (3 and 8) castellated nuts (9) and cotter pins (10). Discard removed cotter pins.
- 4. Remove Q-FEEL Actuator (7CG) (4).

2-55.2 INSTALLATION (refer to figure 2-50)

- 1. Install Q-FEEL Actuator (7CG) (4).
- 2. Hold the LH Q-FEEL Actuator (7CG) (4), install it on its seat, insert the bolts (2), washers (3 and 8) and castellated nuts (9), then torque tighten to 90 100 in lb (AGE NO. 00054).
- 3. Insert new cotter pins (10) on the Q-FEEL Actuator connection.

(Cont'd)



2-55.2 INSTALLATION (refer to figure 2-50) (Cont'd)

4. Reconnect the bonding lead (7) using bolt (5) and washer (6) then Torque tighten the bolt to 8 - 10 In Ib (AGE NO. 00054).

NOTE

Remove protection caps from the electrical connectors to be installed.

5. Reconnect electrical connector (1) with Q-FEEL Actuator (7CG) (4).

FOLLOW ON MAINTENANCE:

- 1. Close thermal insulation screen.
- 2. Enable Cargo Ramp Control.
- 3.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 4. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform the functional test:
 - A.MANOEUVRE EFFORT AND Q-FEEL FUNCTIONAL CHECK (refer to para 2-53) .





Installation



2-56 PITCH TRIM ACTUATOR (DRIVE) - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Disable Cargo Ramp Function.
- 4. Open thermal insulation screen.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	10,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	10,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-2) before performing maintenance.

PROCEDURE:

- 2-56.1 REMOVAL (refer to figure 2-51, sheet 2/2) and (refer to figure 2-51, sheet 1/2)
 - 1.Lock in neutral position the control wheel (2), the rear elevator axles (4 and 10) and the Pitch Feel Trim Units (5 and 7) by means of rigging pins (3, 6, 8 and 9) (AGE NO. 00181).

CAUTION

Install protection caps on the disconnected electrical connectors.

- 2. Disconnect the two electrical connectors (10CGA and 10CGB) (20 and 21) from the Pitch trim actuator (drive) (18).
- 3. Disconnect the bonding lead (28) by removing screw (11) and washer (29).
- 4. Hold the Pitch trim actuator (drive) (18) and remove bolt (26), washers (24 and 25) castellated nut (22) and cotter pin (23). Discard removed cotter pin.



2-56.1 REMOVAL (refer to figure 2-51, sheet 2/2) and (refer to figure 2-51, sheet 1/2) (Cont'd)

CAUTION

The PITCH TRIM ACTR (DRIVE) (18) and the PITCH TRIM ACTR (SLAVE) (17) must be set to rig position. If it is not possible to position the TRIM to rigged position it can be adjusted manually until this position is reached.

- 5. Remove bolts (13 and 15), washers (12 and 14) and self locking nuts (19 and 27) and disconnect the Pitch trim actuator (drive) (18) from Pitch feel trim unit (7). Discard removed self locking nut.
- 6. Disconnect the shaft (16) that connect the Pitch trim actuator (drive) (18) to Pitch trim actuator (slave) (17).
- 2-56.2 INSTALLATION (refer to figure 2-51, sheet 2/2) and (refer to figure 2-51, sheet 1/2)

CAUTION

The PITCH TRIM ACTR (DRIVE) (18) and the PITCH TRIM ACTR (SLAVE) (17) must be set to rig position. If it is not possible to position the TRIM to rigged position it can be adjusted manually until this position is reached.

- 1. Position the Pitch trim actuator (drive) (18).
- 2. Fix the Pitch trim actuator (drive) (18) to the Pitch feel trim unit (7) using bolts (13 and 15), washers (12 and 14) and new self locking nuts (19 and 27).

(Cont'd)

TCH.1C-27J-2-27JG



2-56.2 INSTALLATION (refer to figure 2-51, sheet 2/2) and (refer to figure 2-51, sheet 1/2) (Cont'd)

- 3. Hold the Pitch trim actuator (drive) (18), insert the bolt (26), washers (24 and 25) and castellated nut (22), then torque tighten to 90 100 in lb (AGE NO. 00054).
- 4. Insert new cotter pin (23) in the Pitch trim actuator (drive) connections.
- 5. Connect the Pitch trim actuator (drive) (18) to the shaft (16) that join Pitch trim actuator (drive) (18) to Pitch trim actuator (slave) (17).
- 6. Reconnect the bonding lead (28) using bolt (11) and washer (29) then Torque tighten the bolt to 8 10 In Ib (AGE NO. 00054).

NOTE

Remove protection caps from the electrical connectors to be installed.

- 7.Connect the two electrical connectors (10CGA and 10CGB) (20 and 21) to the Pitch trim actuator (drive) (18).
- 8. Remove rigging pins (3, 6, 8 and 9) (AGE NO. 00181) from control wheel (2), the rear elevator axles (4 and 10) and the Pitch Feel Trim Units (5 and 7).

FOLLOW ON MAINTENANCE:

- 1. Close thermal insulation screen.
- 2. Enable Cargo Ramp Function.
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).

Perform the functional test:

A. TRIM TRAVEL CHECK (refer to para 2-46) .









Figure 2-51 Pitch Trim Actuator (Drive) - Removal and Installation (sheet 2/2)



2-57 PITCH TRIM ACTUATOR (SLAVE) - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Disable Cargo Ramp Function.
- 4. Open thermal insulation screen.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	10,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	10,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-57.1 REMOVAL (refer to figure 2-52, sheet 2/2) and (refer to figure 2-52, sheet 1/2)
 - 1.Lock in neutral position the control wheel (2), the rear elevator axles (4 and 10) and the Pitch Feel Trim Units (5 and 7) by means of rigging pins (3, 6, 8 and 9) (AGE NO. 00181).

CAUTION

Install protection caps on the disconnected electrical connectors.

- 2. Disconnect the electrical connectors (13CGA) (24) from the Pitch trim actuator (slave) (26).
- 3. Disconnect the bonding lead (12) by removing screw (14) and washer (13).
- 4. Hold the Pitch trim actuator (slave) (26) and remove bolt (19), washers (20 and 21) castellated nut (23) and cotter pin (22). Discard removed cotter pin.



2-57.1 REMOVAL (refer to figure 2-52, sheet 2/2) and (refer to figure 2-52, sheet 1/2) (Cont'd)

CAUTION

The PITCH TRIM ACTR (DRIVE) (28) and the PITCH TRIM ACTR (SLAVE) (26) must be set to rig position. If it is not possible to position the TRIM to rigged position it can be adjusted manually until this position is reached.

- 5. Disconnect the shaft (27) that connect the Pitch trim actuator (drive) (28) to Pitch trim actuator (slave) (26).
- 6. Remove bolts (16 and 18), washers (15 and 17) and self locking nuts (11 and 25) and disconnect the Pitch trim actuator (slave) (26) from Pitch feel trim unit (5). Discard removed self locking nut.
- 2-57.2 INSTALLATION (refer to figure 2-52, sheet 2/2) and (refer to figure 2-52, sheet 1/2)

CAUTION

The PITCH TRIM ACTR (DRIVE) (28) and the PITCH TRIM ACTR (SLAVE) (26) must be set to rig position. If it is not possible to position the TRIM to rigged position it can be adjusted manually until this position is reached.

- 1. Position the Pitch trim actuator (slave) (26).
- 2. Fix the Pitch trim actuator (slave) (26) to Pitch feel trim unit (5) using bolts (16 and 18), washers (15 and 17) and new self locking nuts (11 and 25).

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2-57.2 INSTALLATION (refer to figure 2-52, sheet 2/2) and (refer to figure 2-52, sheet 1/2) (Cont'd)

- 3. Hold the Pitch trim actuator (slave) (26), insert the bolt (19), washers (20 and 21) and castellated nut (23), then torque tighten to 90 100 in lb (AGE NO. 00054).
- 4. Insert new cotter pin (22) in the Pitch trim actuator (slave) connections.
- 5.Connect the Pitch trim actuator (slave) (26) to the shaft (27) that join Pitch trim actuator (drive) (28) to Pitch trim actuator (slave) (26).
- 6. Reconnect the bonding lead (12) using bolt (14) and washer (13) then Torque tighten the bolt to 8 10 In Ib (AGE NO. 00054).

NOTE

Remove protection caps from the electrical connectors to be installed.

- 7.Connect the electrical connectors (13CGA) (24) to the Pitch trim actuator (slave) (26).
- 8. Remove rigging pins (3, 6, 8 and 9) (AGE NO. 00181) from control wheel (2), the rear elevator axles (4 and 10) and the Pitch Feel Trim Units (5 and 7).

FOLLOW ON MAINTENANCE:

- 1. Close thermal insulation screen.
- 2. Enable Cargo Ramp Function.
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).

Perform the functional test:

A. TRIM TRAVEL CHECK (refer to para 2-46) .









Installation (sheet 2/2)



2-58 PILOT (COPILOT) STICK SHAKER ACTUATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Open the access panels 711A, 712A, 130B and 130C.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	15,00	
Removal	ELT	1	15,00	
Installation	ELT	1	20,00	
Follow Maintenance	ELT	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 65 (Min.) Total Time Detention System: 65 (Min.)

AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00023	NUT, SELF-LOCKING	H14-06	2,00

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Safety Conditions:

1.Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-58.1 REMOVAL. Proceed as follows:

- A.Disconnect the electrical connector 119VP (120VP) from the bottom of Pilot (Copilot) control Column.
- B.Slide the harness up from the bottom of the pilot (copilot) control column, if it is necessary cut the tie wraps in order to carry out harness extraction.
- C.Unscrew the screws on the clamps that fix Pilot (Copilot) Stick Shaker from Pilot (Copilot) Control Stick and release the clamps.
- D. Unscrew two cable holders.
- E. Remove the Pilot (Copilot) stick shaker actuator.

2-58.2 INSTALLATION. Proceed as follows:

- A. Position the Pilot (Copilot) stick shaker actuator.
- B. Close the two clamps and screw the screws on the clamps that fix the stick shaker with the control column.
- C. Screw two cable holders.

(Cont'd)



2-58.2 INSTALLATION. Proceed as follows: (Cont'd)

- D.Connect the electrical connector from bottom of the Pilot (Copilot) Stick Shaker to the Pilot (Copilot) control stick.
- E.If previously removed, replace the tie wraps in order to fix harness.

FOLLOW ON MAINTENANCE:

- 1.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 2.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Perform the functional test:
 - A.STALL WARNING SYSTEM TEST MODE (refer to para 2-61).
- 4. Close the access panels 711A, 712A, 130B and 130C.





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2-59 JOM - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	2	30,00	
Test	AFM	2	40,00	
Follow Maintenance	AFM	2	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 200 (Min.) Total Time Detention System: 100 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00034	Kit, dynamometers	A37781-000
00079	Locking tool for copilot control stick	G0312730001

Consumable Material Required:

None



Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.

PROCEDURE:

- 2-59.1 JOM FUNCTIONAL TEST (refer to figure 2-54, sheet 1/2) and (refer to figure 2-54, sheet 2/2)
 - 1. Move the AIR SPEED selector (1) to LOW position on the FCS2 control panel (2).
 - 2.Lock the Copilot control wheel by means of the locking tool (AGE NO. 00079).
 - 3.By a dynamometer (AGE NO. 00034), apply increasing load to the pilot control stick nose up and nose down 600 to 750 N (134.89 to 168.61 lb) (61.18 to 76.48 kg) until the JOM (3) disconnection occurs.
 - 4. The ACAWS warning message PITCH DISCONNECT appears on CMDU while the warning aural tone is audible.
 - 5. The FD message 2730007 PITCH DISCONNECT appears on CMDU Maintenance Page.

WARNING

WHEN THE JOM DISCONNECTION OCCURS, THE LOAD APPLIED RAPIDLY DISCHARGES. BE CAREFUL WHEN THE INCREASING LOAD IS APPROACHING THE DISCONNECTION VALUE TO AVOID INJURY TO THE PERSONNEL.



NOTE

A strong noise shall be heard as advise of the JOM unlocking.

NOTE

If the unlocking value obtained is out of tolerance it is needed to perform a JOM new calibration according to dedicated procedure.

- 6. Close the JOM (3) in accordance with the related procedures and check that the ACAWS warning message PITCH DISCONNECT disappears on CMDU while the warning aural tone ceases.
- 7. The FD message PITCH DISCONNECT remains displayed until the clearing of the CMDU is performed via SAMU.
- 8. Move the AIR SPEED selector (1) to HIGH position.
- 9. Repeat the test as per steps 2 to 7 using the dynamometer (AGE NO. 00034) and check that unlocking jam override mechanism disconnection occurs at 900 N (202.33 lb) (91.77 kg) max.

FOLLOW ON MAINTENANCE:

- 1. Unlock the copilot control wheel by removing the locking tool (AGE NO. 00079).
- 2. Remove the dynamometer (AGE NO. 00034).













2-60 JAM OVERRIDE MECHANISM (J.O.M.) -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Disable Cargo Ramp.
- 4. Open thermal Insulation Screen.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 95 (Min.) Total Time Detention System: 95 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N	
00181	Kit, flight controls rigging pins	11G001-C052200-801	
00227	Jam override resetting tool	26H-G2262735004-001	



Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	1,00
00017	PIN, COTTER	MS24665-134	1,00
00025	NUT, SELF-LOCKING	MS21043-4	8,00
00052	PIN, COTTER	MS24665-153	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-60.1 REMOVAL. Proceed as follows:
 - A.Lock the elevator rear axles in the neutral Position.
 - B.Remove the elctrical connector from the center of J.O.M.
 - C.Screw the bolts from the connection rods (One for L rod and one for R rod).
 - D.Disconnect the two rods from the extremity of the J.O.M.
 - E.Unscrew 16 bolts that fix J.O.M. with aircraft structure (4 on R connection, 4 on L connection, 4 onR intermediate connection and 4 on L intermediate connection).
 - F.Remove the J.O.M.


2-60.2 INSTALLATION. Proceed as follows:

- A.Ensure that the L and R rear quadrants are to neutral position (rigging pins inserted).
- B. Install the J.O.M. assy on the support structure and lock it in neutral position with the proper rigging pin dia 7.95 mm.
- C.Screw 16 bolts that fix J.O.M. with aircraft structure (4 on R connection, 4 on L connection, 4 onR intermediate connection and 4 on L intermediate connection).
- D.Reconnect the two rods on the extremity of the J.O.M.
- E.Position the bushing, position the washers, insert the bolt and position the nut, then Torque tighten on connection rods the two bolts (1 for R and 1 for L).
- F.Reconnect the elctrical connector on the center of J.O.M.
- G.Remove all rigging pins previuosly inserted.

FOLLOW ON MAINTENANCE:

- 1. Close thermal Insulation Screen.
- 2. Enable Cargo Ramp.
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform the functional test:





A.JOM FUNCTIONAL TEST (refer to para 2-59) .





and Installation (sheet 1/3)







Figure 2-55 Jam Override Mechanism (JOM) - Removal and Installation (sheet 2/3)





Figure 2-55 Jam Override Mechanism (JOM) - Removal and Installation (sheet 3/3)





2-61 STALL WARNING SYSTEM ON/OFF - OTHER CHECK

INPUT CONDITION:

- Aircraft Applicability:
 - 04162, 04180
- **Required Conditions:**
 - 1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	NAV	1	20,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 20 (Min.) Total Time Detention System: 20 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.

PROCEDURE:

- 2-61.1 STALL WARNING SYSTEM ON/OFF CHECK (refer to figure 2-56)
 - 1.Press the GCAS Menu select key on one of the SAMUs (1) to get the "GCAS and STALL" page.

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2-61.1 STALL WARNING SYSTEM ON/OFF CHECK (refer to figure 2-56) (Cont'd)

- 2.Toggle the STALL WARN ON/OFF SAMU selection to OFF (line select key 1R) to turn the Stall Warning System to OFF and verify that:
 - -the OFF legend on the GCAS and STALL page is highlighted;
 - -the ACAWS caution message SWS OFF appears on CMDU;
 - -the MASTER CAUTIONS lights illuminate;
 - -the caution aural tone in the head-phones is activated.
- 3. Toggle the STALL WARN ON/OFF SAMU selection to ON (line select key 1R) to turn the Stall Warning System to ON and verify that:
 - -the ON legend on the GCAS and STALL page is highlighted;
 - -the ACAWS caution message SWS OFF disappears on CMDU;
 - -the MASTER CAUTIONS lights extinguish;
 - -the caution aural tone in the head-phones is de-activated.

FOLLOW ON MAINTENANCE:

None









Figure 2-56 Stall Warning System on/off - Other Check



2-62 STALL WARNING SYSTEM - TEST MODE

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	ELT	1	25,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 25 (Min.) Total Time Detention System: 25 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.

PROCEDURE:

- 2-62.1 STALL WARNING SYSTEM TEST MODE Refer to (refer to figure 2-57).
 - 1. Ensure that the GCAS and STALL page is displayed on both SAMU (4).

(Cont'd)



- 2-62.1 STALL WARNING SYSTEM TEST MODE Refer to (refer to figure 2-57). (Cont'd)
 - 2.Set the engine throttle levers (3) below FLT IDLE position (< 30.4°).
 - 3. Verify that the pushbuttons STICK SHAKER PILOT (1) and COPILOT (2) (FCS control panel) are not selected. (The "OFF" legend on pushbutton extinguished).
 - 4. Select STALL TEST from the GCAS and STALL page by pressing the Line Select key Right 2.
 - 5. Verify that the following conditions occur for the duration of the test (approx. 5 sec.):
 - -the STALL TEST legend on both SAMU pages is highlighted;
 - -the STALL special alert is displayed on PFD (4) red colour and flashing;
 - -the STALL voice warning is audible on headset ;

-both the stick shakers are activated.

- 6. After approximately 5 seconds, verify that:
 - -the STALL TEST legend on both SAMU pages is no longer highlighted;
 - -the STALL special alert disappears from PFD;

(Cont'd)



2-62.1 STALL WARNING SYSTEM TEST MODE Refer to (refer to figure 2-57). (Cont'd)

- -the STALL voice warning on headset is de-activated;
- -both the stick shakers are de-activated.

FOLLOW ON MAINTENANCE:

None





Figure 2-57 Stall Warning System - Test Mode



2-63 ELEVATOR ACCUMULATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Close the cargo and the ramp doors if open.
- 2. Disable cargo ramp and cargo door controls.
- 3. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 4. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV) .
- 5. Position maintenance platform (AGE NO. 00074).
- 6. Open thermal insulation screen.

Recomended Personnel:

Not Provided

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00031	PACKING, PREFORMED	M83461/2-904	8,00
00073	PACKING, RETAINER	MS28773-04	3,00



Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

2-63.1 REMOVAL. Remove elevator accumulator as follows:

NOTE

Install the protection cap on the pipes and the electrical connectors that you disconnect.

WARNING

OPEN ALL THE NITROGEN CHARGING VALVE VERY SLOWLY TO PREVENT NITROGEN VAPOR FROM COMING IN TOUCH WITH THE EYES. DO NOT BREATHE THE NITROGEN VAPOR COMING OUT FROM THE NITROGEN CHARGING VALVE; IT COULD BE MIXED WITH HYDRAULIC FLUID.

CAUTION

Seal all open pipes and component holes to prevent entrance of unwanted material.

- A.Remove the cover plate from the left (right) fuselage side ramp area.
- B.Use container to collect drained fluid.

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2-63.1 REMOVAL. Remove elevator accumulator as follows: (Cont'd)

NOTE

Perform step I for LH side.

Perform step J for RH side.

- C.Release the nitrogen pressure from both hydraulic accumulators and check the completely dischargement on both manometers.
- D.Release the nitrogen pressure from the hydraulic accumulator and check the completely dischargement on the manometer.
- E. Unscrew nut and disconnect the nitrogen pipe.
- F. Unscrew nut and disconnect inlet and outlet pipes.
- G. Disconnect the electrical connector.
- H. Hold the accumulator and loose the clamps.
 - I.Remove the accumulator from the support. Collect the clamps.
- J. Discard O-rings.
- 2-63.2 INSTALLATION. Install elevator accumulator as follows:





2-63.2 INSTALLATION. Install elevator accumulator as follows: (Cont'd)

NOTE

Lubricate all packings and O-ring with hydraulic fluid.

- A. Position the clamps on the accumulator.
- B. Position the accumulator on its support.
- C.Hold the accumulator, then tight and lock the clamps fixing the accumulator.
- D.Place new O-rings on the inlet and outlet pipe and connect it on the accumulator torque tighten the nut on top of inlet and outlet pipe.
- E.Place new O-rings on the nitrogen pipe and connect it on the accumulator torque tighten the nut on top of nitrogen pipe.
- F.Connect the electrical cable.
- G.Remove from the aircraft the container with drained fluid.

CAUTION

Dont use the drained fluid collected to refill hydraulic circuit.lt is contamined, discard it.



2-63.2 INSTALLATION. Install elevator accumulator as follows: (Cont'd)

H.Install the cover plate on the left (right) fuselage side ramp area.

FOLLOW ON MAINTENANCE:

- 1. Close thermal insulation screen.
- 2. Remove maintenance platform (AGE NO. 00074).
- 3. Enable cargo ramp and cargo door funciton.
- 4. Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- Perform the functional test HYDRAULIC ACCUMULATORS SHUT-OFF VALVE CHECK(refer to para 2-49).







Figure 2-58 Elevator Accumulator - Removal and Installation (sheet 1/3)

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Figure 2-58 Elevator Accumulator - Removal and Installation (sheet 2/3)

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Figure 2-58 Elevator Accumulator - Removal and Installation (sheet 3/3)

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2-64 FLAP CONTROL SYSTEM - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	250,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 250 (Min.) Total Time Detention System: 250 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00034	Kit, dynamometers	A37781-000
00062	Kit, comparators	G0002700002
00067	Kit, flaps check templates	G0002750001
00113	Tensiometer	T60-1001C8-1A**
00181	Kit, flight controls rigging pins	11G001-C052200-801
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None



Safety Conditions:

Be aware of information contained in Paragraph (refer to para 1-2) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

- 2-64.1 ADJUSTMENT OF FLAP CONTROL LEVER (refer to figure 2-59, sheet 1/9) and (refer to figure 2-59, sheet 2/9)
 - 1. Set the flap control lever (1), in the flight deck, to UP position.
 - 2. Lock the quadrant (5) at the frame No. 3 by inserting a rigging pin (4) 8 mm (AGE NO. 00181) in the proper hole of the quadrant support.
 - 3. Insert a rigging pin (6) 4.915 mm (00181) in the last quadrant (7) at the center wing.
 - 4. Lock the tension regulator by means of a proper tool.
 - 5. Increase the tension of the flap control cables and stretch them (AGE NO. 00113), by means of two turnbuckles (2 and 3) at frame No. 11, at a load of 36.71 kg (80.93 lb) (twice the nominal preload).
 - 6. Remove both rigging pins (4 and 6) (AGE NO. 00181) and perform 25 cycles at least (from UP to DOWN and vice versa) of the flap control lever (1).
 - 7. Set the pre-load to 18.35 kg (40.45 lb) after that the rigging pin (4) (AGE NO. 00181) on frame No. 3 has been inserted and verifying that the rigging pin (4) enters freely in the last quadrant (5). Do not leave it inserted.
 - 8. Remove the locking tool from the tension regulator and check the flap control cables are stretched in accordance to the (refer to figure 2-59, sheet 4/9).

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2-64.1 ADJUSTMENT OF FLAP CONTROL LEVER (refer to figure 2-59, sheet 1/9) and (refer to figure 2-59, sheet 2/9) (Cont'd)

NOTE

When the cables stretching is complete, check that the terminal lugs are tightened on the turnbuckle coupling with the same number of turns. Furthermore check that no more than 3 threads are visible on each terminal lug.

2-64.2 FLAP CONTROL FRICTION CHECK (refer to figure 2-59, sheet 1/9)

- 1. Unlock the flap control lever (1) from the geared sector and maintain by connecting a suitable spacer.
- 2.By means of dynamometer (AGE NO. 00034) check that the friction of the flap control in both manoeuvre ways does not exceed 20.23 lb (9.18 kg).
- 2-64.3 BACKLASH MEASUREMENTS OF FLAP WITH FLAPS RETRACTED
- 2-64.4 LEFT OUTBOARD FLAP (refer to figure 2-59, sheet 5/9)
 - 1. Ensure that the left outboard flap is to zero position.
 - 2. Fit on the left outboard flap trailing edge the backlash test equipments (AGE NO. 00067) and set the comparator to zero.

NOTE

The comparator must be no more zeroed until the test is terminated.

3. Apply, on the left outboard flap trailing edge, a vertical load (AGE NO. 00034) and measure the left outboard flap displacement as follows:

A. Gradually apply a load (AGE NO. 00034) upwards up to 22.40 lb (10.20 kg), maximum, leaving out the reading on the comparator.

(Cont'd)



2-64.4 LEFT OUTBOARD FLAP (refer to figure 2-59, sheet 5/9) (Cont'd)

- B. Stepwise unload, every 4.45 lb (2.04 kg), up to zero load and simultaneously read, on the comparator, the related displacement value of the left aileron.
- C.Stepwise load downwards, every 4.45 lb (2.04 kg), up to 22.40 lb (10.20 kg) maximum and simultaneously read, on the comparator, the related displacement value of the left outboard flap.
- D. Stepwise unload, every 4.45 lb (2.04 kg), up to zero load and simultaneously read, on the comparator, the related displacement value of the left outboard flap.
- E.Stepwise load upwards, every 4.45 lb (2.04 kg), up to 22.40 lb (10.20 kg) maximum and simultaneously read, on the comparator, the related displacement value of the left outboard flap.
- F.Draw a diagram load applied vs left outboard flap displacement and calculate the backlash Check that the backlash is not greater than 0.3 mm.
- 2-64.5 LEFT INBOARD FLAP (refer to figure 2-59, sheet 5/9)
 - 1.Remove the backlash test equipments (AGE NO. 00067) from the left outboard flap and install them to the left inboard flap.
 - 2. Repeat on the left inboard flap the backlash procedure of left outboard flap as per step 2 and 3. Check that the backlash is not greater than 0.3 mm.



2-64.6 RIGHT OUTBOARD FLAP (refer to figure 2-59, sheet 5/9)

- 1.Remove the backlash test equipments (AGE NO. 00067) from the left inboard flap and re-install them to the right outboard flap.
- 2. Repeat on the right outboard flap the backlash procedure of left outboard flap as per step 2 and 3. Check that the backlash is not greater than 0.3 mm.
- 2-64.7 RIGHT INBOARD FLAP (refer to figure 2-59, sheet 5/9)
 - 1.Remove the backlash test equipments (AGE NO. 00067) from the right outboard flap and re-install them to the right inboard flap.
 - 2. Repeat on the right inboard flap the backlash procedure of left outboard flap as per step 2 and 3. Check that the backlash is not greater than 0.3 mm.
- 2-64.8 LEFT INBOARD FLAP (refer to figure 2-59, sheet 1/9)
 - 1. Extend the flaps moving the flap control lever (1) to 1 position.
 - 2. Manually move the left inboard flap laterally fully towards one side. Perform a sign on the fixed part.
 - 3. Manually move the left inboard flap laterally towards the opposite side. Perform a sign on the fixed part and check, by difference between the two signs, that the lateral backlash does not exceed 3.5 mm.
 - 4. Reset the left inboard flap as initial condition.

2-64.9 LEFT OUTBOARD FLAP

- 1. Manually move the left outboard flap laterally fully towards one side. Perform a sign on the fixed part.
- 2. Manually move the left outboard flap laterally towards the opposite side. Perform a sign on the fixed part and check, by difference between the two signs, that the lateral backlash does not exceed 3.5 mm.
- 3. Reset the left outboard flap as initial condition.



2-64.10 RIGHT INBOARD FLAP

- 1. Manually move the right inboard flap laterally fully towards one side. Perform a sign on the fixed part.
- 2. Manually move the right inboard flap laterally towards the opposite side. Perform a sign on the fixed part and check, by difference between the two signs, that the lateral backlash does not exceed 3.5 mm.
- 3. Reset the right inboard flap as initial condition.

2-64.11 RIGHT OUTBOARD FLAP

- 1. Manually move the right outboard flap laterally fully towards one side. Perform a sign on the fixed part.
- 2. Manually move the right outboard flap laterally towards the opposite side. Perform a sign on the fixed part and check, by difference between the two signs, that the lateral backlash does not exceed 3.5 mm.
- 3. Reset the right outboard flap as initial condition.
- 2-64.12 LEFT OUTBOARD FLAP (refer to figure 2-59, sheet 1/9), (refer to figure 2-59, sheet 5/9) and (refer to figure 2-59, sheet 6/9)
 - 1. Extend the flaps fully down moving the flap control lever (1) to DOWN position.
 - 2. Apply by hand a vertical load from downwards to upwards, to the flap T. E. and verify that the vertical backlash is not greater than 10 mm and that there is no backlash between roller and track roller.
 - 3. Repeat same procedure of step 2 on the other three flaps surface and check the same result.
 - 4. Return the flap control lever (5) to UP position and check that the flaps retract (AGE NO. 00067) to 0° \pm 3.5 mm.
 - 5. Fit flap templates (AGE NO. 00067) to the top surface of LH and RH outer wings.
 - 6. Use the hydraulic test stand (AGE NO. 00262) supply No. 1 and No. 2 hydraulic systems at 3000 psi (210 kg/cm²).

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- 2-64.12 LEFT OUTBOARD FLAP (refer to figure 2-59, sheet 1/9), (refer to figure 2-59, sheet 5/9) and (refer to figure 2-59, sheet 6/9) (Cont'd)
 - 7.Using the flap control lever (1), bring flaps to 0°, as read on the templates (AGE NO. 00067).
 - 8. Check that between the rubber buffers of flap track pins and related rollers there is a clearance of 0.006 in \pm 0.002 in (1.5 mm \pm 0.5 mm). If this result is not obtained, adjust properly the above mentioned pins. If these pins are already in contact, reset the flap tracks.
 - 9. Release hydraulic pressure in No. 1 and No. 2 systems.
 - 10. Remove templates (AGE NO. 00067).
- 2-64.13 MEASUREMENT OF FLAPS CONVENTIONAL PLAY (refer to figure 2-59, sheet 1/9), (refer to figure 2-59, sheet 5/9), (refer to figure 2-59, sheet 6/9) and (refer to figure 2-59, sheet 7/9)
 - 1. With flaps retracted, fit flap templates (AGE NO. 00067), to the top surface of LH and RH outer wings.
 - 2. Fit the tools contained in flap play measurement kit to the templates and fit a gauge (AGE NO. 00062) to each tool.
 - 3. By a 22.046 lb (10 kg) dynamometer (AGE NO. 00034), apply a load of 4.409 lb (2 kg) downwards to LH outer flap trailing edge (in correspondence of the flap centre line). Note the corresponding displacement on dial gauge. Plot each one of the two values on the related axes obtaining a positive point.
 - 4. Repeat step 3 applying loads of 8.818-13.227-17.636 and 22.046 lb (4-6-8 and 10 kg) (AGE NO. 00034) to LH outer flap trailing edge noting the related flap displacements. Obtain consequently other four positive points.
 - 5. Repeat steps 3 and 4 applying loads upwards in order to obtain five negative points.



- 2-64.13 MEASUREMENT OF FLAPS CONVENTIONAL PLAY (refer to figure 2-59, sheet 1/9), (refer to figure 2-59, sheet 5/9), (refer to figure 2-59, sheet 6/9) and (refer to figure 2-59, sheet 7/9) (Cont'd)
 - 6. Join positive points, then negative points in order to obtain points 0+ and 0- on the axis.
 - 7. The distance between points 0+ and 0- (LH outer flap vertical conventional play) must not exceed 0.012 in (0.3 mm).
 - 8. Repeat steps 3 thru 7 for the other three flaps. Results must be the same.
 - 9.Use the hydraulic test stand (AGE NO. 00262) and supply No. 1 and No. 2 hydraulic systems at 3000 psi (210 kg/cm²).
 - 10. Bring flap control lever (1) to DN.
 - 11.Manually apply a load vertically upwards to LH outer flap trailing edge. The vertical play read on dial gauge (AGE NO. 00062) must not exceed 3.937 in (10 mm).
 - 12. Repeat step 11 for the other three flaps. Results must be the same.
 - 13. Bring flap control lever (1) in the first notch below UP so that the flaps extend of few degrees.
 - 14. Manually apply a load horizontally and transversally to LH outer flap trailing edge. The horizontal play read on dial gauge must not exceed 0.138 in (3.5 mm).
 - 15. Repeat step 14 for the other three flaps. Results must be the same.
 - 16. With flaps retracted completely, apply manually a load from downwards to upwards and vice versa, checking that the rollers do not have vertical play.
 - 17. Release hydraulic pressure in No. 1 and No. 2 systems.
 - 18. Remove devices mentioned in steps 1 and 2.



- 2-64.14 ADJUSTMENT OF FLAP POSITION TRANSMITTER ON LH OUTER WING (refer to figure 2-59, sheet 1/9), (refer to figure 2-59, sheet 7/9), (refer to figure 2-59, sheet 8/9) and (refer to figure 2-59, sheet 9/9)
 - 1. Disconnect connectors (7CAB) and (7CAA) (8 and 11) from the transmitter (9).
 - 2. Check the resistance between pins F and D of connectors (7CAB) and (7CAA) (8 and 11). Resistance of transmitter must be 500 ohm ± 5 ohm. By rotating the transmitter shaft (10) clockwise the resistance must increase.
 - 3. Connect connectors (7CAB) and (7CAA) (8 and 11) to the transmitter (9).
 - Check that circuit breaker FLAPS IND (3CA) (12) located on Overhead Circuit Breakers Panel (271VE) (13) in position F 14 is closed.
 - 5.Use the hydraulic test stand (AGE NO. 00262) and supply No. 1 and No. 2 hydraulic systems at 3000 psi (210 kg/cm²).
 - 6. Using the control lever (1) operate flaps several times, checking that the indicator (14) reading on the pedestal corresponds to the position reached by the flaps. If necessary adjust control shaft of LH position transmitter (9). It should be considered that, if the shaft (10) of LH transmitter is rotated clockwise the shaft of RH transmitter will have to be rotated the same number of turns but counterclockwise.

FOLLOW ON MAINTENANCE:

None









Figure 2-59 Flap Control System - Adjustment (sheet 1/9)





Figure 2-59 Flap Control System - Adjustment (sheet 2/9)









Figure 2-59 Flap Control System - Adjustment (sheet 3/9)







Figure 2-59 Flap Control System - Adjustment (sheet 4/9)







Figure 2-59 Flap Control System - Adjustment (sheet 5/9)









Figure 2-59 Flap Control System - Adjustment (sheet 7/9)




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2-65 FLAPS HYD SYS NO. 1 - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1.Refer to General Note (refer to para 2-5) before performing functional test.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	150,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 150 (Min.) Total Time Detention System: 150 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00061	Kit, digital inclinometers	G0002700001
00067	Kit, flaps check templates	G0002750001

Consumable Material Required:

None

Safety Conditions:

None



PROCEDURE:

2-65.1 CHECK OF FULL POSITION (refer to figure 2-60)

- 1. Ensure that the NORM legend is illuminated on the flap selection pushbutton (2) HYD SYS (No. 1 hydraulic system selected). If not, press to select.
- 2. Move the flap control lever (1) to FULL position and check the following conditions:
 - -the outboard flaps extend to $45^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the inboard flaps extend to $20^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the position difference between left inboard and right inboard and also between left outboard and right outboard flaps surface must not be greater than 1°.
- 3. Move the flap control lever (1) to UP position and check that the flaps retract to up position.

2-65.2 INTERFERENCE CHECK

Perform a complete aileron manoeuvre in conjunction with a flaps extension / retraction manoeuvre and verify that during the movement there are no interferences neither between aileron and flaps nor between flaps and fixed parts.

2-65.3 TIME MANOEUVRE CHECK (refer to figure 2-60)

- 1. Extend the flaps to FULL position and verify that the manoeuvre time is 19 to 21 sec.
- 2. Retract the flaps to UP and verify that the manoeuvre time is 19 to 21 sec.

2-65.4 CHECK OF POSITION 1 (refer to figure 2-60)

1. Move the flap control lever (1) to 1 position and check the following conditions:

-the outboard flaps extend to $11.25^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));

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2-65.4 CHECK OF POSITION 1 (refer to figure 2-60) (Cont'd)

- -the inboard flaps extend to $5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
- -the manoeuvre time must be between 4.5 and 5.5 sec;
- -the position difference between left inboard and right inboard and also between left outboard and right outboard flaps surface must not be greater than 1°.
- 2. Extend completely the flaps. Return the flap control lever (1) to 1 position and check the following conditions:
 - -the outboard flaps retract to $11.25^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the inboard flaps retract to $5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the manoeuvre time (from FULL to 1) must be between 14.0 and 15.5 sec.
- 3. Retract the flaps to UP.

2-65.5 CHECK OF POSITION 2 (refer to figure 2-60)

- 1. Move the flap control lever (1) from UP to 2 position and check the following conditions:
 - -the outboard flaps extend to $22.5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the inboard flaps extend to $10^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the manoeuvre time must be between 9.5 and 10.5 sec;
 - -the position difference between left inboard and right inboard and also between left outboard and right outboard flaps surface must not be greater than 1°.



2-65.5 CHECK OF POSITION 2 (refer to figure 2-60) (Cont'd)

- 2. Extend completely the flaps. Return the flap control lever to 2 position and check the following conditions:
 - -the outboard flaps retract to $22.5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the inboard flaps retract to $10^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the manoeuvre time (from FULL to 2) must be between 9.5 and 10.5 sec.
- 3. Retract the flaps to UP.
- 2-65.6 CHECK OF POSITION 3 (refer to figure 2-60)
 - 1. Move the flap control lever (1) from UP to 3 position and check the following conditions:
 - -the outboard flaps extend to $33.75^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the inboard flaps extend to $15^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the manoeuvre time must be between 14.0 and 15.5 sec;
 - -the position difference between left inboard and right inboard and also between left outboard and right outboard flaps surface must not be greater than 1°.
 - 2. Extend completely the flaps. Return the flap control lever to 3 position and check the following conditions:
 - -the outboard flaps retract to $33.75^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the inboard flaps retract to $15^{\circ} \pm 1^{\circ}$ (read on digital inclinometer (AGE NO. 00061));
 - -the manoeuvre time (from FULL to 3) must be between 4.5 and 5.5 sec.
 - 3. Retract the flaps to UP.



FOLLOW ON MAINTENANCE:

None







Figure 2-60 Flaps Hyd Sys No. 1 - Functional Test



2-66 FLAPS HYD SYS NO. 2 - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

NOTE

In case of the FLAP CONTROL SYSTEM troubleshooting requires to perform the flap rigging, it is necessary to perform the below desribed functional test / adjustement by respecting the following order :

- 1. Adjustement of flap control lever.
- 2. Visual check as described (refer to para 2-68) INSTALLATION, step from 9 to 11.
- 3. Bungee installation (refer to para 2-76).
- 4. Flaps adjustement (refer to manual TCH.1C-27J-2-57JG).

5. Flap functional check from hyd sys No. 1.

PREPARATION (refer to figure 2-61, sheet 7/7) , (refer to figure 2-61, sheet 1/7) , (refer to figure 2-61, sheet 2/7) and (refer to figure 2-61, sheet 3/7)

- 1. Supply the hydraulic pressure to 3000 psi, (210 kg/cm²). Set the flow rate at least 6.6 gpm (25 lt/min).
- 2. Install the template (AGE NO. 00067) for flaps surfaces travel check. Do not install the two brackets on the template.

NOTE

When the templates installation are required, apply a light force on the template itself in order to reduce or annull the possible offset due to skin surface waveness.



- 3. On flap control panel, ensure that the flap control lever (4) is to UP position and the flap surfaces are retracted (0 position).
- 4. Fit on the inner and outer flaps surfaces the four inclinometer (AGE NO. 00061) (use biadhesive tape), non in contact with their rivets. Switch on the inclinometer (AGE NO. 00061) and perform the proper calibration so that the inclinometer (AGE NO. 00061) assume their zero reference with the flaps up position (related angle shall be set). Remove the template (AGE NO. 00067).
- 5. Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 6.Close the following circuit breaker to feed the flap system:
 - A.FLAP ASYM (1CA) (9) located on Rear Mid Circuit Breaker Panel (451VE) (8) in position L 5.
 - B.FLAP ASYM (12CA) (7) located on Rear Upper Circuit Breaker Panel (452VE) (6) in position H 4.
 - C.FLIGHT CONTROL FLAP IND (3CA) (3) located on Overhead Circuit Breaker Panel (271VE) (3) in position F 14.
- 7. Power-up the avionic system in order to have the availability the cockpit displays (ACAWS and FD Maintenance Page).
- Connect headset to the external socket of the interphone system and switch on the system. (refer to manual TCH.1C-27J-2-23JG).
- 9. It is assumed that left and right flap transducer have been already checked (as resistance requirement) before installation. The main characteristics are, anyway, reported in Table.





Flap lever position	Outer Flap Surface Travel	Nominal Resistence-ohms	Position % of applied nominal voltage to the transducer
UP	0° - 1mm / +7mm	33.8	6.76 %
1	11.25°	135.2	27.04 %
2	22.5°	231	46.02 %
3	33.75°	331	66.02 %
Full	45°	422	84.40 %

Table 2-9. Flap adjustment and specification

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	150,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 150 (Min.) Total Time Detention System: 150 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00034	Kit, dynamometers	A37781-000
00061	Kit, digital inclinometers	G0002700001
00067	Kit, flaps check templates	G0002750001
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

None



Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-5) before performing maintenance.

PROCEDURE:

- 2-66.1 CHECK OF FULL POSITION (refer to figure 2-61, sheet 1/7) and (refer to figure 2-61, sheet 7/7)
 - 1. Press the flap selection pushbutton to illuminate the ALT legend (No. 2 hydraulic system selected).
 - 2. Move the flap control lever (4) to FULL position and check the following conditions:
 - A.the outboard flaps extend to $45^{\circ} \pm 1^{\circ}$ (read on digital inclinometer);
 - B.the inboard flaps extend to $20^{\circ} \pm 1^{\circ}$ (read on digital inclinometer);
 - C.the manoeuvre time must be between 19 and 21 sec.
 - 3. Retract the flaps to UP position and verify that the surfaces retract to 0° thru 3.5 mm and that the manoeuvre time is between 19 and 21 sec.
- 2-66.2 CHECK OF POSITION 1 (refer to figure 2-61, sheet 1/7) and (refer to figure 2-61, sheet 7/7)
 - 1. Move the flap control lever (4) to 1 position and check the following conditions:
 - A.the outboard flaps extend to $11.25^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - B.the inboard flaps extend to $5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - C.the manoeuvre time must be between 4.5 and 5.5.
 - 2. Extend completely the flaps.
 - 3. Return the flap control lever (4) to 1 position and check the following conditions:

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- 2-66.2 CHECK OF POSITION 1 (refer to figure 2-61, sheet 1/7) and (refer to figure 2-61, sheet 7/7) (Cont'd)
 - A.the outboard flaps retract to $11.25^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - B.the inboard flaps retract to $5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - C.the manoeuvre time (from FULL to 1) must be between 14.0 and 15.5.
 - 4. Retract the flaps to UP.
- 2-66.3 CHECK OF POSITION 2 (refer to figure 2-61, sheet 1/7) and (refer to figure 2-61, sheet 7/7)
 - 1. Move the flap control lever (4) from UP to 2 position and check the following conditions:
 - A.the outboard flaps extend to $22.5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - B.the inboard flaps extend to $10^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - C.the manoeuvre time must be between 9.5 and 10.5 sec.
 - 2. Extend completely the flaps.
 - 3. Return the flap control lever (4) to 2 position and check the following conditions:
 - A.the outboard flaps retract to $22.5^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - B.the inboard flaps retract to $10^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - C.the manoeuvre time (from FULL to 2) must be between 9.5 and 10.5 sec.
 - 4. Retract the flaps to UP.



- 2-66.4 CHECK OF POSITION 3 (refer to figure 2-61, sheet 1/7) and (refer to figure 2-61, sheet 7/7)
 - 1. Move the flap control lever (4) from UP to 3 position and check the following conditions:
 - A.the outboard flaps extend to $33.75^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - B.the inboard flaps extend to $15^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - C.the manoeuvre time must be between 14.0 and 15.5 sec;
 - D.the position difference between left inboard and right inboard and also between left outboard and right outboard flaps surface must not be greater than 1°.
 - 2. Extend completely the flaps. Return the flap control lever (4) to 3 position and check the following conditions:
 - A.the outboard flaps retract to $33.75^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - B.the inboard flaps retract to $15^{\circ} \pm 1^{\circ}$ (read on digital inclinometer).
 - C.the manoeuvre time (from FULL to 3) must be between 4.5 and 5.5 sec;
 - 3. Retract the flaps to UP.
 - 4. Press the flaps selection pushbutton to illuminate NORM legend.
- 2-66.5 CHECK OF FLAP TRAVEL AND CLEARANCE (refer to figure 2-61, sheet 1/7), (refer to figure 2-61, sheet 7/7), (refer to figure 2-61, sheet 6/7), (refer to figure 2-61, sheet 4/7) and (refer to figure 2-61, sheet 5/7)
 - 1. On flap control panel, ensure that the flap control lever (4) is to UP position and the flap surfaces are retracted (0 position).



- 2-66.5 CHECK OF FLAP TRAVEL AND CLEARANCE (refer to figure 2-61, sheet 1/7), (refer to figure 2-61, sheet 7/7), (refer to figure 2-61, sheet 6/7), (refer to figure 2-61, sheet 4/7) and (refer to figure 2-61, sheet 5/7) (Cont'd)
 - 2.Fit flap templates (AGE NO. 00067) to LH and RH outer wings.
 - 3. Fit on the inner and outer flaps surfaces the four inclinometers (AGE NO. 00061) (use biadhesive tape), non in contact with their rivets. Switch on the inclinometer (AGE NO. 00061) and perform the proper calibration so that the inclinometers (AGE NO. 00061) assume their zero reference with the flaps up position (related angle shall be set). Remove the template (AGE NO. 00067).
 - 4. Supply No. 1 and No. 2 hydraulic systems at 1100 psi \pm 50 psi, flow 13 gpm (77 kg/cm² \pm 3.5 kg/cm², flow 50 l/min).
 - 5. Check that the circuit breakers: (refer to figure 2-61, sheet 2/7) and (refer to figure 2-61, sheet 3/7)
 - A.FLAP ASYM (1CA) (9) located on Rear Mid Circuit Breaker Panel (451VE) (8) in position L 5.
 - B.FLAP ASYM (12CA) (7) located on Rear Upper Circuit Breaker Panel (452VE) (6) in position I 3.
 - C.FLIGHT CONTROL FLAP IND (3CA) (3) located on Overhead Circuit Breaker Panel (271VE) (2) in position F 14.
 - 6.Set hydraulic system selection switch (1) (pedestal) to NORMAL. FLAPS HYD SYS 1 light must come on.
 - 7.Set flap control lever (4) to FULL. The outer flaps must extend to $45^{\circ} \pm 1^{\circ}$ as read on the inclinometers (AGE NO. 000061) and on flight compartment indicator. The inner flaps must extend to $20^{\circ} \pm 1^{\circ}$ as read on the inclinometers (AGE NO. 000061).



2-66.5 CHECK OF FLAP TRAVEL AND CLEARANCE (refer to figure 2-61, sheet 1/7), (refer to figure 2-61, sheet 7/7), (refer to figure 2-61, sheet 6/7), (refer to figure 2-61, sheet 4/7) and (refer to figure 2-61, sheet 5/7) (Cont'd)

NOTE

If a hydraulic pressure of 1100 psi \pm 50 psi is not sufficient to operate flaps check transmission for friction interference, crawling or incorrect adjustments.

- 8. Set flap control lever (4) to UP. The flaps must retract to up position.
- Supply No. 1 and No. 2 hydraulic systems at 3000 psi, (210 kg/cm²), flow at least 6.6 gpm (flow 25 l/min).
- 10. Set flap control lever (4) to FULL. Flaps must reach the position shown in step 5. The position of the pair of flaps must not differ by more than 1°. Extension time must be 19 to 21 seconds.
- 11. Set flap control lever (4) to UP. The flaps must retract to up position. Retraction time must be 19 to 21 seconds.
- 12. Set hydraulic system selection switch (1) (pedestal) to ALT. FLAPS HYD SYS 2 light must come on.
- 13. Repeat operations described in steps 8. and 9. Results must be the same.
- 14. Bring the flap control lever (4) from UP position to an intermediate position between 20° and 25° corresponding to the longest notch on the grooved sector. The outer flaps must extend to $22^{\circ} 30' \pm 1^{\circ}$ as read on the inclinometers (AGE NO. 00061) and on the flight compartment indicator. The inner flaps must extend to $10^{\circ} \pm 1^{\circ}$ as read on the inclinometers (AGE NO. 00061). The positions of the pairs of flaps must not differ by more than 1° . Extension time must be from 9.5 to 10.5 seconds.



- 2-66.5 CHECK OF FLAP TRAVEL AND CLEARANCE (refer to figure 2-61, sheet 1/7), (refer to figure 2-61, sheet 7/7), (refer to figure 2-61, sheet 6/7), (refer to figure 2-61, sheet 4/7) and (refer to figure 2-61, sheet 5/7) (Cont'd)
 - 15. Move flap control lever (4) from intermediate position to FULL and then move it back to intermediate position. The same results as in step 9. must be obtained.
 - 16. Check flap control for freedom of movement, absence of interference and losses of hydraulic fluid.
 - 17. Move flap control lever (4) to UP and check that the clearance between the top surface of the inner flaps and the wing trailing edge is between 0.078 in and 0.354 in (2 mm and 9 mm), check that the clearance between the top surface of the outer flaps and the wing trailing edge is between 0.078 in and 0.354 in (2 mm and 9 mm), (the outer wing trailing edge must not be deflected by the flaps), check that the clearance between the top surface of the outer flaps and the trailing edge of the spoilers is between 0.078 in and 0.354 in (2 mm and 9 mm) (spoiler trailing edge must not be deflected by the flaps), check that the clearance between the flaps and the panels on the outer wing underside must not exceed a value between 0.314 in and 0.452 in (8 mm and 11.5 mm), check that the clearance between the flaps and the panels on the inner wing underside must not exceed a value between 0.118 in and 0.413 in (3 mm and 10.5 mm), check that the clearance between the outer flap and the inner flap is 0.393 in \pm 0.118 in (10 mm \pm 3 mm) and the clearances between the inner flap and the fuselage are 0.787 in \pm 0.196 in and 1.220 in \pm 0.196 in (20 mm ± 5 mm and 31 mm ± 5 mm).
 - 18. With flap control lever (4) to UP set the ailerons to neutral position by operating one control wheel.



- 2-66.5 CHECK OF FLAP TRAVEL AND CLEARANCE (refer to figure 2-61, sheet 1/7), (refer to figure 2-61, sheet 7/7), (refer to figure 2-61, sheet 6/7), (refer to figure 2-61, sheet 4/7) and (refer to figure 2-61, sheet 5/7) (Cont'd)
 - 19. Insert a 0.193 in (4.915 mm) diameter rigging pin (AGE NO. 00181) in the differential lever at rib 24 of right and left outer wings.
 - 20. Check that the clearance between outer flaps and ailerons is 0.314 thru 0.787 in (8 thru 20 mm).
 - 21.Remove 0.193 in (4.915 mm) diameter rigpin, bring control lever to FULL position, lower LH aileron until alignment with LH outer flap.
 - 22. Check that horizontal clearance between aileron and flap in down position is greater than or equal to 0.196 in (5 mm).
 - 23. Repeat the check on RH outer wing. The results must be the same.
 - 24. Retract the flaps to 0°.
 - 25. Remove the inclinometers (AGE NO. 00061) and the adhesive tapes.
 - 26.Release hydraulic pressure in No. 1 and No. 2 systems.
- 2-66.6 MEASUREMENT OF FLAP CONTROL FRICTION FORCE (refer to figure 2-61, sheet 1/7) and (refer to figure 2-61, sheet 7/7)
 - 1. Pull flap control lever (4) from grooved sector and keep it free by inserting a spacer.
 - 2. Apply a 22.045 lb (10 kg) dynamometer (AGE NO. 00034) (5) to the end of the flap control lever (4) and measure the maneuver force required to move the lever from UP to FULL. The maneuver force must not exceed 19.841 lb (9 kg).
 - 3. Remove the spacer mentioned in step 1. and the dynamometer (AGE NO. 00034) mentioned in step 2.

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2-66.6 MEASUREMENT OF FLAP CONTROL FRICTION FORCE (refer to figure 2-61, sheet 1/7) and (refer to figure 2-61, sheet 7/7) (Cont'd)

4. Place flap control lever (4) to UP position.

FOLLOW ON MAINTENANCE:

None









Figure 2-61 Flap Hyd Sys No. 1 - Functional Test (sheet 2/7)

















Figure 2-61 Flap Hyd Sys No. 1 - Functional Test (sheet 6/7)







2-67 FLAP CONTROL CABLE TENSION -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	40,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 40 (Min.) Total Time Detention System: 40 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-5) before performing maintenance.



PROCEDURE:

- 2-67.1 CHECK OF FLAP CONTROL CABLE TENSION (refer to figure 2-62, sheet 3/3), (refer to figure 2-62, sheet 1/3) and (refer to figure 2-62, sheet 2/3)
 - 1.Lock the forward quadrant (3) on the frame No. 3 by inserting a rigging pin (1) (AGE NO. 00181) dia. 8 mm.
 - 2. Insert a rigging pin (5) (AGE NO. 00181) dia. 4.915 mm in the last quadrant (4) located in the centre wing.
 - 3. Lock the tension regulator (6) by locking tool.
 - 4. Stretch the flap control cables (2) , by means of two turnbuckles at frame No. 11, at a load of 360 N (twice the nominal preload).
 - 5. Remove the rigging pins (1 and 5) (AGE NO. 00181) from the forward quadrant (3) and from the quadrant (4) located in center wing.
 - 6.On the FCS1 control panel move the flap control lever from UP to DOWN position and viceversa, performing 25 cycles at least.
 - 7. Set the pre-load to 180 N after that the rigging pin (1) (AGE NO. 00181) has been inserted in forward quadrant (3) on frame No. 3 and verifyng that enters freely in the last quadrant.

WARNING

DO NOT LEAVE THE RIGGING PIN INSERTED.

8. Remove the locking tool from the tension regulator and check the flap control cables (1) are stretched in accordance with the equations:

-Temp. Celsius degrees (° C) =[18.75 x (tension regulator position)] +20 [Sarma tension regulator] or

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- 2-67.1 CHECK OF FLAP CONTROL CABLE TENSION (refer to figure 2-62, sheet 3/3), (refer to figure 2-62, sheet 1/3) and (refer to figure 2-62, sheet 2/3)) (Cont'd)
 - -Temp. Celsius degrees (° C) =[12.4 x (tension regulator position)] -53.8 [Teleflex tension regulator].

NOTE

When the cables stretching is complete, check that the terminal lugs are tightened on the turnbuckle coupling with the same number of turns. Furthermore check that no more than 3 threads are visible on each terminal lug.

FOLLOW ON MAINTENANCE:

None





Figure 2-62 Flap Control Cable Tension - Functional Test (sheet 1/3)





Figure 2-62 Flap Control Cable Tension - Functional Test (sheet 2/3)







2-68 FLAP TENSION REGULATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3.Open the access panels 130AG, 130AE, 711A, 712A, 130B, 130C and 220FZ.
- 4. Position maintenance platform (AGE NO. 00074).
- 5. Open the access panels 553A, 553B and 553C.
- 6. Position emergency stair.
- 7. Open emergency exit door 885A.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	45,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	45,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 155 (Min.) Total Time Detention System: 155 (Min.)



AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00041	PIN, COTTER	MS24665-302	1,00
00052	PIN, COTTER	MS24665-153	1,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

- 2-68.1 REMOVAL (refer to figure 2-63, sheet 1/4) , (refer to figure 2-63, sheet 2/4) and (refer to figure 2-63, sheet 3/4)
 - 1.Gain access through the opened access panels and insert the rigging pin (1) (AGE NO. 00181) in the forward flap quadrant (2).
 - 2.Lock the flap quadrant (32) placed in the centre wing by means a rigging pin (33) (AGE NO. 00181).
 - 3. Lock the flap tension regulator (14) by means a proper tools.
 - 4. Remove the clips (28 and 29) from the turnbuckles (30 and 31) and slack the flap cables (3 and 4).
 - 5. Disconnect the first pulley (6) by removing bolt (20), washers (19 and 9), castellated nut (8) and cotter pin (7). Discard removed cotter pin.



- 2-68.1 REMOVAL (refer to figure 2-63, sheet 1/4) , (refer to figure 2-63, sheet 2/4) and (refer to figure 2-63, sheet 3/4) (Cont'd)
 - 6. Extract the flap cable (4) from first pulley (6).
 - 7.Disconnect the second pulley (24) by removing bolt (12), washers (13 and 22), castellated nut (23) and cotter pin (21). Discard removed cotter pin.
 - 8. Extract the flap cable (3) from second pulley (24).
 - 9. Remove the bolt (5), washer (27), castellated nut (26) and cotter pin (25) fixing the top of flap tension regulator (14) to the structure. Discard removed cotter pin.
 - Remove the bolt (11), washers (15 and 16), castellated nut (17) and cotter pin (18) fixing the bottom of flap tension regulator (14) to the lower support (10). Discard removed cotter pin.
 - 11. Remove the flap tension regulator (14).
- 2-68.2 INSTALLATION (refer to figure 2-63, sheet 1/4) , (refer to figure 2-63, sheet 2/4) and (refer to figure 2-63, sheet 3/4)
 - 1. Position the flap tension regulator (14).
 - 2. Fix the bottom of flap tension regulator (14) to the lower support (10) using bolt (11), washers (15 and 16), castellated nut (17) and new cotter pin (18) (LCM NO. 00041). Torque tighten to 135 thru 150 in lb (AGE NO. 00054).
 - 3. Fix the top of flap tension regulator (14) to the structure using bolt (5), washer (27), castellated nut (26) and new cotter pin (25) (LCM NO. 00052).Torque tighten to 30 thru 35 in lb (AGE NO. 00054).
 - 4. Insert the flap cable (4) in the first pulley seat (6).
 - 5. Connect the first pulley (6) to the flap tension regulator (14) using bolt (20), washers (19 and 9), castellated nut (8) and new cotter pin (7).



- 2-68.2 INSTALLATION (refer to figure 2-63, sheet 1/4) , (refer to figure 2-63, sheet 2/4) and (refer to figure 2-63, sheet 3/4) (Cont'd)
 - 6. Insert the flap cable (3) in the second pulley seat (24).
 - 7.Connect the second pulley (24) to the flap tension regulator (14) using bolt (12), washers (13 and 22), castellated nut (23) and new cotter pin (21).
 - 8. Remove the lock tension regulator proper tools with related red flag.
 - 9. Install the clips (28 and 29) to the turnbuckles (31 and 30) and stretch the flap cables (3 and 4).
 - 10. Remove the rigging pin (33) (AGE NO. 00181) from the flap quadrant (32) placed in the centre wing.
 - 11. Remove the rigging pin (1) (AGE NO. 00181) from the forward flap quadrant (2).

FOLLOW ON MAINTENANCE:

- 1. Close emergency exit door 885A.
- 2. Remove emergency stair.
- 3. Close the access panels 553A, 553B and 553C.
- 4. Remove maintenance platform (AGE NO. 00074).
- 5. Close the access panels 130AG, 130AE, 711A, 712A, 130B, 130C and 220FZ.
- 6.Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 7.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 8. Perform the functional test:

A.FLAP FUNCTIONAL CHECK (refer to para 2-65).

- 9. Perform a visual check on tension regulator scale and record the value displayed.
- 10. Check if the recorded value is according to the diagram (refer to figure 2-63, sheet 4/4).


- 11.If the recorded value are not according to the diagram (refer to figure 2-63, sheet 4/4), adjust control cable as follow:
 - A. Insert rigging pins (1 and 33) in the rear and forward quadrant (2 and 32).
 - B.Check the cable tension value using the tool for measurement of control cable tension.
 - C.If necessary adjust cable tension by means of turnbuckle (30 and 31).
 - D.Remove both rigging pins (1 and 33) from forward and rear quadrant (2 and 32).
 - E.Finally Check the value of cable tension if is according to the diagramm (refer to figure 2-63, sheet 4/4).





Figure 2-63 Flap Tension Refulator - Removal and Installation (sheet 1/4)





Figure 2-63 Flap Tension Refulator - Removal and Installation (sheet 2/4)







Figure 2-63 Flap Tension Refulator - Removal and Installation (sheet 3/4)







Figure 2-63 Flap Tension Refulator - Removal and Installation (sheet 4/4)





2-69 FLAP POSITION INDICATOR - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-5) before performing maintenance.

PROCEDURE:

- 2-69.1 CHECK OF FLAP POSITION INDICATOR (1) (refer to figure 2-64)
 - 1. Ensure that flap control lever (2) is to UP position and check that the flap indicator shows UP.

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2-69.1 CHECK OF FLAP POSITION INDICATOR (1) (refer to figure 2-64) (Cont'd)

- 2. Move the flap control lever (2) to 1 position and check that:
 - -the flap indicator position shows;
 - -the ACAWS caution FLAP ASYM is not displayed on CMDU (3).
- 3. Move the flap control lever (2) to 2 position and check that:
 - -the flap indicator position shows 2;
 - -the ACAWS caution FLAP ASYM is not displayed on CMDU (3).
- 4. Move the flap control lever (2) to 3 position and check that:
 - -the flap indicator position shows 3;
 - -the ACAWS caution FLAP ASYM is not displayed on CMDU (3).
- 5. Move the flap control lever (2) to FULL position and check that:
 - -the flap indicator position shows FULL;
 - -the ACAWS caution FLAP ASYM is not displayed on CMDU (3).
- 6. Return the flaps to UP position.

FOLLOW ON MAINTENANCE:

None

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Figure 2-64 Flap Position Indicator - Functional Test

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2-70 FLAP DRIVE CONTROL UNIT - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

NOTE

Ensure that aircraft is not electrically and hydraulic supplied.

- 1.Open the access panels 553A, 553B, 553C and 621Q.
- 2. Open the access panel 554A and remove life raft.
- 3. Loosen the panel located under the panel 554A.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	35,00	
Removal	AFM	1	60,00	
Installation	AFM	1	70,00	
Follow Maintenance	AFM	1	35,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 200 (Min.) Total Time Detention System: 200 (Min.)

AGE Required:

None



Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00010	PIN, COTTER	MS24665-155	2,00
00013	NUT, SELF-LOCKING	H14-4	6,00
00014	NUT, SELF-LOCKING	MS21042L08	4,00
00036	PIN, COTTER	MS24665-154	1,00
00052	PIN, COTTER	MS24665-153	1,00
00433	AEROSHELL 17	MIL-G-21164D	AR
00434	AEROSHELL 33MS077009	MIL-G-21164D	AR

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

2-70.1 REMOVAL (refer to figure 2-65, sheet 1/4) , (refer to figure 2-65, sheet 2/4) , (refer to figure 2-65, sheet 3/4) and (refer to figure 2-65, sheet 4/4)

NOTE

Position a container in order to collect drained hydraulic liquid

- 1.Remove the bungee (6) from the FDCU lever (5) by removing the cotter pin (2), bolt (12), washers (4 and 13) and nut (3). Discard removed the cotter pin.
- 2. Remove the bungee (1) from the flap quadrant lever (7) by removing the cotter pin (11), bolt (8), washer (9) and nut (10). Discard removed the cotter pin.
- 3. Remove clamp (22) connecting pipe (23) to the bracket (43) and clamps (14, 15 and 21) between pipes (23, 24 and 25).

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2-70.1 REMOVAL (refer to figure 2-65, sheet 1/4), (refer to figure 2-65, sheet 2/4), (refer to figure 2-65, sheet 3/4) and (refer to figure 2-65, sheet 4/4) (Cont'd)

CAUTION

Install protection caps on the disconnected electrical connectors and hoses.

- 4. Remove tube assy (23 and 24) (behind flap sector assembly).
- 5. Remove tee (16, 19 and 20) (which is on the left behind the autopilot motor of the aileron in order to disconnect the left side of pipe and remove the clamps (17 and 18) that connect them to the structure.
- 6. Loosen the self-locking nuts (54, 60, 70 and 72) that connect the bracket (43) to the rear spar of the central wing and collect related washers (53, 61, 62,67, 69 and 78) and bolts (52, 63, 66 and 76). Discard removed the self-locking nuts.
- 7. Unfasten the self-locking nuts (42 and 48) that connect the rods to the bracket from the life raft side. Discard removed the self-locking nuts.
- 8. Remove the cotter pins (47 and 77), loosen the castellated nuts (46 and 73) and remove the bolts (41 and 50) collecting the washers (44, 45, 74 and 75) that connect the bracket (43) to the drive unit (1).
- 9. Remove bracket (43) and rods (49 and 71) (which are still assembled).
- 10. Get access to the panel with 26 screws and disconnect the electrical connectors (34 and 35) which are identical (so, should be better to make a sign over them to avoid getting wrong).



- 2-70.1 REMOVAL (refer to figure 2-65, sheet 1/4), (refer to figure 2-65, sheet 2/4), (refer to figure 2-65, sheet 3/4) and (refer to figure 2-65, sheet 4/4) (Cont'd)
 - 11. From the right side disconnect return (26) and delivery (39), from the left side disconnect return (29) and delivery (30); disconnect check valve (27) and tube assy (28).
 - From the access panel 553C (left side) disconnect tube assy (31) with check valve (32) and from right side disconnect tube assy (36) and check valve (37).
 - 13. From 621Q disconnect tube assy (38) and collect.
 - 14. Remove the safety wire and loosen the screws (68) of the flap flanged rigid shaft (65), between FDCU (1) and the inner jackscrew (40) of the flap of the center wing.
 - 15. Extract it from the drive unit (1).
 - 16. Remove the safety wire and loosen the screws (81) of the flap frigid shaft (80), from outboard side of the flap arrester unit (79) and extract it.
 - 17. Remove stop unit (79) by removing the cotter pins (82 and 86), castellated nuts (83 and 85) and related bolts (88) and washers (84 and 87). Discard removed the cotter pins.
 - 18. Extract flap rigid shaft (51) from FDCU (1).
 - Remove cotter pin (64) and loosen the bolt (55) that fix FDCU (1) on the rear spar support (57) of the central wing and collect washers (56 and 58) and nut (59). Discard removed the cotter pin.
 - 20. Remove Hydraulic actuator (FDCU) (1).
- 2-70.2 INSTALLATION (refer to figure 2-65, sheet 1/4) , (refer to figure 2-65, sheet 2/4) , (refer to figure 2-65, sheet 3/4) and (refer to figure 2-65, sheet 4/4)

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2-70.2 INSTALLATION (refer to figure 2-65, sheet 1/4), (refer to figure 2-65, sheet 2/4), (refer to figure 2-65, sheet 3/4) and (refer to figure 2-65, sheet 4/4)) (Cont'd)

CAUTION

Before performing the following operations torque tighten for safety the up stop screws. At the end adjust them as described in paragraph ADJUSTMENT OF OUTER FLAPS (refer to para 2-64).

NOTE

Remove protection caps from the electrical connectors and hoses to be installed.

NOTE

Lubricate with grease (LCM NO. 00433 or LCM NO. 00434) before installing components jackscrews.

- 1. Check the level of the oil by means of the sight glass on the left side of the flap drive unit (1).
- 2. Repeat operations carried out during removal in reverse order except for connection of the mechanical transmission to the actuator.
- 3. Provide electrical and hydraulic power and place hydraulic system selection switch to NORMAL.
- 4. Supply few pressure to the hydraulic systems, just sufficient to move the hydraulic actuator and to move the actuator input lever fully left (aft looking forward).
- 5. When the actuator stops, fit a revolution meter to one grooved drive hole of the actuator.



- 2-70.2 INSTALLATION (refer to figure 2-65, sheet 1/4), (refer to figure 2-65, sheet 2/4), (refer to figure 2-65, sheet 3/4) and (refer to figure 2-65, sheet 4/4)) (Cont'd)
 - 6. Move the actuator input lever fully right, checking that it completes a travel of 2.047 in \pm 0.01 in (52 mm \pm 0.5 mm) and that the drive hole completes 150 \pm 1 turns clockwise, looking from RH side of the aircraft.
 - 7.Bring the FDCU input lever back to fully left, with the flaps completely retract, connect the rigid flanged shaft (65) between FDCU (1) and inner jackscrew (40) right side. Connect the flap rigid shaft (51) between FDCU (1) and flap arrester unit (79), being careful to alter the position of the jackscrew as little as possible and connect the bungee (1) (refer to para 2-76).

NOTE

To install the flanged shaft, tighten the two flanged screws, so join the two parts of the shaft. Insert one end in the FDCU and the other in the jackscrew, then reconnect the two parts of the flange with the two connecting screws and tighten up. Lock screws with safety wiring, using double twist method per MS33540.

FOLLOW ON MAINTENANCE:

- 1. Tighten the panel located under the panel 554A.
- 2. Close the access panel 554A and install life raft.
- 3.Close the access panels 553A, 553B, 553C and 621Q.
- 4. When installation is complete perform the FLAPS FUNCTIONAL CHECK (refer to para 2-65) and necessary adjustments (refer to para 2-64).





Installation (sheet 1/4)





Figure 2-65 Flap Drive Control Unit - Removal and Installation (sheet 2/4)





Figure 2-65 Flap Drive Control Unit - Removal and Installation (sheet 3/4)







Figure 2-65 Flap Drive Control Unit - Removal and Installation (sheet 4/4)



2-71 FLAP LEVER ASSY - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	40,00	
Removal	AFM	1	20,00	
Installation	AFM	1	25,00	
Follow Maintenance	AFM	1	40,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 125 (Min.) Total Time Detention System: 125 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.



PROCEDURE:

2-71.1 REMOVAL

1.Refer to FCS1 CONTROL PANEL Removal (refer to para 2-77).

2-71.2 INSTALLATION

1. Refer to FCS1 CONTROL PANEL Installation (refer to para 2-77).

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2-72 FLAP ARRESTER UNIT - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Set flap position down.
- 4. Position maintenance platform (AGE NO.00074).
- 5. Open the access panels 553A, 553B and 553C.
- 6. Open emergency exit door 885A.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	40,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	40,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 145 (Min.) Total Time Detention System: 145 (Min.)





AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	2,00
00433	AEROSHELL 17	MIL-G-21164D	AR
00434	AEROSHELL 33MS077009	MIL-G-21164D	AR

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

2-72.1 REMOVAL (refer to figure 2-66)

CAUTION

To prevent misalignment of control surfaces, do not move the screwjacks during this maintenance task.

- 1.Gain access through hatch 553A, 553B and 553C. Loosen the hexagonal-head screws on the Flap Flanged Rigid Shaft No. 4 flange (1 and 3).
- 2. Extract the two parts of Flap Flanged Rigid Shaft No. 4 (1 and 3) from Arrester Unit (2) and Flap Screwjack No. 4 (4).
- 3. Remove the Flap Flanged Rigid Shaft No. 4 (1 and 3).

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2-72.1 REMOVAL (refer to figure 2-66) (Cont'd)

- 4. Loosen the bolts (8, 12, 15 and 20) that fix flap arrester unit supports (17), installed on the rear spare wing, and collect washers (13, 14, 16 and 19).
- 5. Disconnect the flap arrester unit (2) with its support (17).
- 6. Disconnect the rigid shaft from flap power control unit. Gaining access via hatches 553A and 553C.
- 7. Position the Arrester Unit (2) on workbench and remove the cotter pins (5 and 10) from bolts (18) fixing the Flap Arrester Unit (2) to its support (17). Discard removed cotter pins.
- 8.Loosen the bolts (18) and collect the washers (7 and 11) and the nuts (6 and 9).
- 9. Remove Flap Arrester Unit (2).
- 10. By means of the Kit flaps rigging, check that there are no more than 155 turnation, in the case of more turnation discard the arrester unit (2), in case of maximum 155 turnation install the same arrester unit (2).
- 2-72.2 INSTALLATION (refer to figure 2-66)

NOTE

Lubricate all mechanical elements with oil before installation.

NOTE

Lubricate with grease (LCM NO. 00433 or LCM NO. 00434) before installing components jackscrews.

- 1. Position arrester unit (2) on workbench.
- 2. By means of the Kit flaps rigging, perform a complete travel of the flap arrester unit (2) and check that the number of revolutions is 155 minimum then perform 3 turns in the opposite way.

3. Insert the Flap Arrester Unit (2) in its support (17).

(Cont'd)

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2-72.2 INSTALLATION (refer to figure 2-66) (Cont'd)

- 4. Torque (AGE NO. 00054) tighten to 30 ÷ 35 in lb the bolts (18) fixing the flap arrester unit (2) to its support (17).
- 5. Install flap rigid shaft on Power Control Drive Unit (PCDU).
- 6.Install the new cotter pins (LCM NO. 00052) (5 and 10) on the Flap Arrester unit (2) connection.
- 7. Insert the flap arrester unit (2) in the flap rigid shaft (1 and 3).
- 8. Place the Flap Arrester Unit (2) with its support (17) in the fixed part of the wing.
- 9. Place the washers (13, 14, 16 and 19) in the Flap Arrester Unit support (17) connection.
- 10. Torque (AGE NO. 00054) tighten to 95 ÷ 105 in lb the bolts (8, 12, 15 and 20).
- 11.Insert the two parts of Flap Flanged Rigid Shaft No. 4 (1 and 3) between Arrester Unit (2) and Flap Jackscrew No. 4 (4).
- 12. Torque (AGE NO. 00054) tighten the two hexagonal-head screws on the Flap Flanged Rigid Shaft No. 4 flange (1 and 3).
- 13. Connect the flanged shaft (3) between the jackscrew (4) and flap arrester unit (2).

NOTE

To install the flanged shaft, tighten the two flanged screws, so join the two parts of the flanged shaft. Insert one end in the flap arrester unit and the other in the jackscrew, then reconnect the two parts of the flange with the two connecting screws and tighten up. Lock screws with safety wiring, using double twist method per MS33540.



2-72.2 INSTALLATION (refer to figure 2-66) (Cont'd)

14. Check that pushing the Flap Flanged Rigid Shaft No.4 (1 and 3) all on one side and then from the other, the groove in the opposite side is engaged for at least 14 mm in the related connection.

FOLLOW ON MAINTENANCE:

- 1. Close the access panels 553A, 553B and 553C.
- 2. Setting flap position up.
- 3. Close access door 885A.
- 4. Remove emergency stair.
- 5. Remove maintenance platform (AGE NO. 00074).
- 6. When installation is complete perform FLAPS FUNCTIONAL CHECK (refer to para 2-65).





Figure 2-66 Flap Arrester Unit - Removal and Installation

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Alenia Aermacchi

TCH.1C-27J-2-27JG

2-73 FLAP POSITION TRANSDUCER - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panel 532C (632C).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	25,00	
Removal	ELT	1	15,00	
Installation	ELT	1	20,00	
Follow Maintenance	ELT	1	25,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001

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Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00011	NUT, SELF-LOCKING	H14-3	3,00
00433	AEROSHELL 17	MIL-G-21164D	AR
00434	AEROSHELL 33MS077009	MIL-G-21164D	AR

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

NOTE

The LH flap position transducer is shown in the following subtask. The procedure for RH flap position transducer is similar.

2-73.1 REMOVAL (refer to figure 2-67)

CAUTION

Install protection caps on the disconnected electrical connectors.

- 1. Disconnect the electrical connectors (7CAA and 7CAB) (4 and 5) from the flap position transducer (7CA) (6).
- 2. Position a container (AGE NO. 00074) in order to collect drained hydraulic fluid.
- 3. Remove bolts (3, 14 and 15), flat washers (7, 10 and 12), self locking nuts (8, 9 and 11) that connect the flap position transducer (7CA) (6) to its support (13). Discard removed self locking nuts.

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2-73.1 REMOVAL (refer to figure 2-67) (Cont'd)

- 4. Disconnect the flap position transducer (7CA) (6) from the flap transducer shaft (2).
- 5. Remove the flap position transducer (7CA) (6).
- 6.Remove the flap transducer shaft (2) from the flap jackscrew (1).

2-73.2 INSTALLATION (refer to figure 2-67)

CAUTION

To prevent misalignment of control surfaces, do not move the screwjacks during this maintenance task.

NOTE

Before installation, lubricate all mechanical elements with oil.

NOTE

Lubricate with grease (LCM NO. 00433 or LCM NO. 00434) before installing components jackscrews.

- 1.Position the flap position transducer (7CA) (6) in the LH (RH) outboard wing.
- 2.Connect the other end of the flap transducer shaft (2) to the flap jackscrew (1).
- 3.Connect the flap position transducer (7CA) (6) to its support (13) using bolts (3, 14 and 15), flat washers (7, 10 and 12) and new self locking nuts (8, 9 and 11) (LMC NO. 00011). Torque tighten (AGE NO. 00054) to 25 thru 28 in lb.
- 4. Move the flap transducer shaft (2) toward the flap jackscrew (1) and then toward the flap position transducer checking the groove in the opposite side is engaged for at least 14 mm in the related connection.

(Cont'd)

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2-73.2 INSTALLATION (refer to figure 2-67) (Cont'd)

NOTE

Remove protection caps from the electrical connectors to be installed.

- 5. Connect the two electrical connectors (7CAA and 7CAB) (4 and 5) to the flap position transducer (7CA) (6).
- 6. Remove a container with drained hydraulic fluid.

FOLLOW ON MAINTENANCE:

- 1. Close the access panel 532C (632C).
- 2. Remove maintenance platform (AGE NO. 00074).
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4. Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5. When installation is complete perform the functional test FLAPS FUNCTIONAL CHECK (refer to para 2-65), (refer to para 2-78) and (refer to para 2-80).





Installation

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2-74 FLAP SWIVELEND ASSY - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Remove pilot seat (refer to manual TCH.1C-27J-2-25JG).
- 4.Open the access panels 210E, 210F, 711A, 712A, 130B and 130C.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	40,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	40,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 145 (Min.) Total Time Detention System: 145 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
27-50-4	5	

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AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00069	NUT, SELF-LOCKING	MS21043-3	1,00
00204	NUT, SELF-LOCK	NAS1726-3E	1,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

2-74.1 REMOVAL. Proceed as follows:

A. Forward quadrant doweling.

- B.Gain access to panels 130B and 130C and insert the rigging pin on the forward flap quadrant.
- C.Unscrew the bolt fixing the Flap Clevis to Flap Lever Assy and collect the washers and the nut.
- D.Remove the wire locking and unscrew the flap clevis.
- E.Take note the measure of flap cable assy thread, outside to flap slidingend assy.
- F.Unscrew the flap slidingend assy from flap cable assy.

(Cont'd)



2-74.1 REMOVAL. Proceed as follows: (Cont'd)

- G.Extract and remove the flap slidingend assy from flap cable assy.
- H.Remove the wire locking that fix the flap swivelend nut and the casing nut on the bottom of the flap swivelend assy.
 - I.Unscrew the flap casing assy, unscrew the two nuts that fix the flap swivelend assy on the structure.
- J.Remove the flap swivelend assy from the flap cable assy.
- 2-74.2 INSTALLATION. Proceed as follows:
 - A. Install the Flap Swivelend Assy.
 - B.Insert the Flap Swivelend Assy from Flap Cable Assy.
 - C.Position the flap swivelend assy on the structure.
 - D. Screw the two nuts that fix the flap swivelend assy on the structure and torque tighten to $106 \div 115$ in lb.
 - E.Screw the casing assy into the flap swivelend assy and torque tighten to $44 \div 53$ in lb.
 - F.Lock nuts with safety wire, using double twist method, per MS33540.

(Cont'd)



2-74.2 INSTALLATION. Proceed as follows: (Cont'd)

- G.Screw the flap slidingend assy on the flap cable assy till previously noted position.
- H.Screw the Flap Clevis to Flap Cable Assy till previously noted posiiton.
- I. Screw the flap clevis on the flap cable assy and torque tighten to $53 \div 62$ in lb between flap slidingend assy and flap clevis.
- J.Lock the safety wire using double twist method per MS33540.
- K.Place the washers and the nut in the Flap Clevis connection.
- L.Screw the bolt fixing the flap clevis to flap lever assy and torque tighten to $50 \div 75$ in lb.

FOLLOW ON MAINTENANCE:

- 1.Close the access panels 210E, 210F, 711A, 712A, 130B, 130C.
- 2. Install pilot seat (refer to manual TCH.1C-27J-2-25JG).
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform the functional test:
 - A.FLAP CONTROL CABLE TENSION (refer to para 2-67).
 - B.MEASUREMENT OF FLAP CONTROL FRICTION FORCE (refer to para 2-66).





Figure 2-68 Flap Swivelend Assy - Removal and Installation (sheet 1/2)




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2-75 FLAP POSITION INDICATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

- Aircraft Applicability:
 - 04162, 04180

Required Conditions:

1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	5,00	
Removal	ELT	1	10,00	
Installation	ELT	1	10,00	
Follow Maintenance	AFM	1	5,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:



Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

- 2-75.1 REMOVAL (refer to figure 2-69, sheet 3/3) , (refer to figure 2-69, sheet 1/3) and (refer to figure 2-69, sheet 2/3)
 - 1. Check that the following circuit breakers are opened:
 - -FLIGHT CONTROL FLAP IND (3CA) (2) located on Overhead Circuit Breakers Panel (271VE) (1) in position F 14;
 - -FLAP ASYM (12CA) (5) and FLAP ASYM (1CA) (7) located respectively on Rear Upper Circuit Breakers Panel (452VE) (3) in position H 4 and on Rear Center Circuit Breakers Panel (451VE) (6) in position L 5;
 - -ELECTRICAL SYS DC BUS 2 CNTR (24PA) located on Rear Upper Circuit Breakers Panel (452VE) (3) in position H 17.
 - 2. Remove the four screws (11) fixing the Flap Position Indicator (8) to the control instrument panel (9).
 - 3. Extract the Flap Position Indicator (8) from its location.

CAUTION

Install protection cup to the electrical connector that you disconnect.

- 4. Disconnect electrical connector (10) from Flap Position Indicator (8).
- 5. Remove Flap Position Indicator (8).



- 2-75.2 INSTALLATION (refer to figure 2-69, sheet 3/3) , (refer to figure 2-69, sheet 1/3) and (refer to figure 2-69, sheet 2/3)
 - 1. Place the Flap Position Indicator in its location on the control instrument panel (9).

NOTE

Remove protection cup from the electrical connector that you connect.

- 2.Connect the electrical connector (10) to the Flap Position Indicator (8).
- 3. Tighten the four screws (11) fixing the Flap Position Indicator (8).

FOLLOW ON MAINTENANCE:

- 1.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- Perform the functional test:
 A.FLAP POSITION INDICATOR (refer to para 2-69).





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2-76 BUNGEE BETWEEN PULLEY AND HYDRAULIC ACTUATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4. Open the access panels 553A, 553B, 553C and 621N.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	30,00	
Removal	AFM	1	10,00	
Installation	AFM	1	15,00	
Follow Maintenance	AFM	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 85 (Min.) Total Time Detention System: 85 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00052	PIN, COTTER	MS24665-153	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

- 2-76.1 REMOVAL (refer to figure 2-70, sheet 1/3) , (refer to figure 2-70, sheet 2/3) and (refer to figure 2-70, sheet 3/3)
 - 1.Insert rigging pin (8) (AGE NO. 00181) into the cable sector (12).
 - Gain access through opened access panels, disconnect preselection rod (bungee) (5) from flap hydraulic actuator control lever (1) by removing bolt (7), washers (6 and 4), castellated nut (2) and cotter pin (3). Discard removed cotter pin.
 - 3. Remove bolt (13), washer (11), castellated nut (10) and cotter pin (9) connecting preselection rod (bungee) (5) to the cable sector (12). Discard removed cotter pin.
 - 4. Remove preselection rod (bungee) (5).
- 2-76.2 INSTALLATION (refer to figure 2-70, sheet 1/3) , (refer to figure 2-70, sheet 2/3) and (refer to figure 2-70, sheet 3/3)
 - 1.On the flap position indicator panel (14) switch to NORMAL.
 - 2. Ensure that flap input lever (16), located on the FCS 1 Control Panel (103 VE) (15), is to up position.

(Cont'd)



- 2-76.2 INSTALLATION (refer to figure 2-70, sheet 1/3) , (refer to figure 2-70, sheet 2/3) and (refer to figure 2-70, sheet 3/3) (Cont'd)
 - 3. Gain access through opened access panels, manually hold flap hydraulic actuator control lever (1) fully LH and keep it in this position.
 - 4. Insert a 0.195 in (4.915 mm) diameter rigging pin (18) (AGE NO. 00181) into RH sector group (17).
 - 5. Adjust the preselection rod (bungee) (5) and install it in order to make the connecting bolts (7 and 13) engage freely.
 - 6. From this position disconnect again the spring rod and crew 1 turn the adjustable retainer.
 - 7. Connect again the preselection rod (bungee) (5) to hydraulic actuator lever (1) and the flap cable sector (12) using proper bolts (7 and 13), washers (6, 4 and 11), castellated nuts (2 and 10) and new cotter pins (3 and 9) (LCM NO. 00052). The spring must have a 0.039 in (1 mm) of traction precharge.
 - 8. Remove the rigging pin (18) (AGE NO. 00181) from RH sector group (17) and release the hydraulic supply.
 - 9. Remove the rigging pin (8) (AGE NO. 00181) from flap cable sector (12).

FOLLOW ON MAINTENANCE:

- 1.Close the access panels 553A, 553B, 553C and 621N.
- 2. Remove maintenance platform (AGE NO. 00074).
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).



5. When installation is complete perform FLAPS FUNCTIONAL CHECK (refer to para 2-65) and (refer to para 2-66).







Figure 2-70 Bungee Between Pulley and Hydraulic Actuator - Removal and Installation (sheet 1/3)













Figure 2-70 Bungee Between Pulley and Hydraulic Actuator - Removal and Installation (sheet 2/3)





Figure 2-70 Bungee Between Pulley and Hydraulic Actuator - Removal and Installation (sheet 3/3)



2-77 FCS1 CONTROL PANEL - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	5,00	
Removal	ELT	1	10,00	
Installation	ELT	1	10,00	
Follow Maintenance	AFM	1	5,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

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Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

2-77.1 REMOVAL (refer to figure 2-71)

- 1.Open FCS 1 Control Panel (103VE) (1) by loosening six dzus (2).
- 2. Remove the FLAP Lever Knob (3) by loosening the screw that fix it to lever (5).
- 3.Loosen the four screws (4) that fix the Flap Lever (5) to FCS 1 Control Panel (103VE) (1).

CAUTION

Install protection caps on the disconnected electrical connectors.

4.Lift the FCS 1 Control Panel (103VE) (1) and disconnect the electric connectors (103VEA and 103VEB) (6 and 7).

5. Remove FCS 1 Control Panel (103VE) (1).

2-77.2 INSTALLATION (refer to figure 2-71)

NOTE

Remove protection caps from the electrical connectors to be installed.

- 1.Connect the electric connectors (103VEA and 103VEB) (6 and 7) on the FCS 1 Control Panel (103VE) (1).
- 2. Place the FCS 1 Control Panel (103VE) (1) and tighten the screws (4) that fix it to flap lever (5).
- 3. Install the lever knob (3) using the screw that fix it to lever (5).
- 4. Install the FCS 1 Control Panel (103VE) (1) by tightening six dzus (2).

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FOLLOW ON MAINTENANCE:

- 1.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. When the installation is complete perform the following functional tests:
 - A.FCS1 CONTROL PANEL RUDDER TRIM -FUNCTIONAL TEST (refer to para 2-31) and FCS1 CONTROL PANEL LIFT DUMPER - FUNCTIONAL TEST (refer to para 2-87).
 - B.FLAP CONTROL FRICTION CHECK described in FLAP CONTROL SISTEM - ADJUSTMENT (refer to para 2-64).
 - C.FLAP HYD SYS NO. 1 FUNCTIONAL TEST (refer to para 2-65).
 - D.ACAWS INDICATION FUNCTIONAL TEST (refer to para 2-81).





Figure 2-71 FCS1 Control Panel - Removal and Installation

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2-78 FLAP ASYMMETRY CONTROL SYSTEM -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	ELT	1	40,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 40 (Min.) Total Time Detention System: 40 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-5) before performing maintenance.

PROCEDURE:

2-78.1 CHECK OF FLAP ASYMMETRY CONTROL SYSTEM (refer to figure 2-72, sheet 3/3), (refer to figure 2-72, sheet 1/3) and (refer to figure 2-72, sheet 2/3)

(Cont'd)



- 2-78.1 CHECK OF FLAP ASYMMETRY CONTROL SYSTEM (refer to figure 2-72, sheet 3/3), (refer to figure 2-72, sheet 1/3) and (refer to figure 2-72, sheet 2/3) (Cont'd)
 - 1. Check that the circuit breakers:
 - -FLAP ASYM (1CA) (2) located on Rear Mid Circuit Breaker Panel (451VE) (1) in position L 5;
 - -FLIGHT CONTROL FLAP IND (3CA) (4) located on Overhead Circuit Breaker Panel (271VE) (3) in position F 14;

are closed.

- 2. Ensure that the flaps are lowered.
- 3. Connect the left and right transducer (5) to the driving system by means of the telescopic shaft having care not to move the shaft (6) from their position.
- 4. Move the flaps from FULL to UP and check that during the movement the ACAWS caution message FLAP ASYM continues to be not displayed on CMDU.
- 5. Select the flap to FULL position.
- 6. Disconnect momentarily the right shaft (6) only.
- Rotate by hand counterclockwise the right transducer shaft (6), noting the turns, until the following conditions are met:
 - -the ACAWS caution message FLAP ASYM (code 0127011) appears on CMDU after about 5 turns of the right transducer shaft rotation;
 - -the MASTER CAUTION lights illuminate while the caution aural tone is audible;
 - -the FD message FLAP ASYM (code 2750001) appears on CMDU Maintenance Page.



2-78.1 CHECK OF FLAP ASYMMETRY CONTROL SYSTEM (refer to figure 2-72, sheet 3/3), (refer to figure 2-72, sheet 1/3) and (refer to figure 2-72, sheet 2/3) (Cont'd)

NOTE

If the caution FLAP ASYM does not appear after 5 turns, reset the right transducer shaft at its previous position then proceed with next step.

NOTE

If the caution FLAP ASYM appears before 5 turns, rotate the right transducer shaft clockwise of 5 turns and perform the next step.

8. Rotate by hand clockwise the right transducer shaft (6), noting the turns, until the ACAWS caution FLAP ASYM appears on CMDU. The caution must be displayed after about 5 turns of the right transducer shaft.

NOTE

The asymmetry range is 8 - 10 turns. The caution shall appear after rotation of 4 or 5 turns in both ways starting from the half range.

- 9. Rotate the right position transducer back of 5 turns and connect it to the driving system by means of telescopic shaft, having care not to move the shaft from its neutral position.
- 10. Verify the following conditions:
 - -the ACAWS caution message FLAP ASYM has disappeared from CMDU;
 - -the MASTER CAUTION lights extinguish while the caution aural tone is no more audible;

(Cont'd)



2-78.1 CHECK OF FLAP ASYMMETRY CONTROL SYSTEM (refer to figure 2-72, sheet 3/3), (refer to figure 2-72, sheet 1/3) and (refer to figure 2-72, sheet 2/3) (Cont'd)

-the FD message 2750001 FLAP ASYM remains displayed until the CMDU is cleared via SAMU.

11. Move the flaps to UP and check that during the movement the ACAWS caution FLAP ASYM is not displayed on CMDU.

FOLLOW ON MAINTENANCE:

None





Figure 2-72 Flap Asymmetry Control System - Functional Test (sheet 1/3)









Figure 2-72 Flap Asymmetry Control System - Functional Test (sheet 3/3)



2-79 FLAP COMPARATOR UNIT - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2.Open the access panels 553A, 553B, 553C, 554A and 621Q.
- 3. Remove life raft.
- 4. Remove the panel located under the access panel 554A.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	15,00	
Removal	ELT	1	10,00	
Installation	ELT	1	10,00	
Follow Maintenance	ELT	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 50 (Min.) Total Time Detention System: 50 (Min.)

AGE Required:

None



Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

- 2-79.1 REMOVAL (refer to figure 2-73).
 - 1. Remove cover from the avionic rack.

CAUTION

Install protection caps on the disconnected electrical connectors.

- 2.On the shelf (306VE) (10) of the avionic rack disconnect the connectors (306VEA, 306VEB, 306VEC and 306VEG) (5, 6, 7 and 8) on the front side of the flap comparator unit (1).
- 3. Remove the screws (2, 3, 4 and 9) connecting the flap comparator unit on the shelf (306VE) (10).
- 4. Remove flap comparator unit (1).
- 2-79.2 INSTALLATION (refer to figure 2-73).
 - 1. Position the flap comparator unit (1) on the shelf (306VE) (10) of the avionic rack.

(Cont'd)



2-79.2 INSTALLATION (refer to figure 2-73). (Cont'd)

2. Install the flap comparator unit (1) using the screws (2, 3, 4 and 9).

NOTE

Remove protection caps from the electrical connectors to be installed.

- 3. Connect the connectors (306VEA, 306VEB, 306VEC and 306VEG) (5, 6, 7 and 8) on the front side of the flap comparator unit (1).
- 4. Install the Velcro covering to the avionic rack in the cockpit.
- 5. Install the cover.

FOLLOW ON MAINTENANCE:

- 1.Connect the panel located under the access panel 554A.
- 2. Install life raft.
- 3.Close the access panels 553A, 553B, 553C, 554A and 621Q.
- 4. Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform the functional test
 - A.FLAP ASYMMETRY CONTROL SYSTEM (refer to para 2-78).









2-80 FLAP TRASDUCER VOLTAGE OUTPUT -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	ELT	1	20,00	
Test	ELT	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 50 (Min.) Total Time Detention System: 50 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

None

PROCEDURE:

- 1. Ensure that the flaps are to UP (1) position (refer to figure 2-74).
- 2. Disconnect the aircraft connector (2TAF) from the BIU NO. 2 (electrical rack (402 VE)).

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- 3.By means of external power feeder, supply 5 Vdc between the pins 32 (+) and 35 (-) of the connector (2TFA), then connect the DVM between the pins 34 (signal ref) and 33 (-) of the same connector.
- 4. Using the flap control lever (1), move the flaps at position shown in the following table and check that the voltage reading is as per the related collumn.
- 5. Remove the external power supply and DVM, then reconnect the aircraft connector (2TAF) to the BIU NO. 2.
- 6.Disconnect the aircraft connector (1TFA) from the BIU NO. 1 (avionic rack (302 VE)).
- 7.By means of external power feeder, supply 5V d.c. between the pins 32(+) and 35(-) of the connector(1TAF), then connect the DVM between the pins 34 (signal ref) and 33 (-) of the same connector.
- 8. Using the flap control lever (1), move the flaps at position shown in the following table and check that the voltage reading is as per the related collumn.
- 9. Remove the external power supply and DVM, then reconnect the aircraft connector (1TAF) to the BIU NO. 1.

Flap lever position	Flap angle surfaces	Voltage reading (V)	Voltage radio trasducer LH–RH
UP	0° -1mm / +7mm	0.33 ± 0.1	6.76 %
1	11.25°	1.35 ± 0.1	27.04 %
2	22.5°	2.3 ± 0.1	46.02 %
3	33.75°	3.3 ± 0.1	66.02 %
Full	45°	4.22 ± 0.1	84.40 %



FOLLOW ON MAINTENANCE:

None







Figure 2-74 Flap Trasducer Voltage Output - Functional Test

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2-81 ACAWS INDICATIONS - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	ELT	1	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 60 (Min.) Total Time Detention System: 60 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

None

PROCEDURE:

2-81.1 ADVISORY "FLAP LEVER UNLOCK"

- 1. Ensure the flap lever (1) is selected to UP.
- 2. Move and hold the flap lever (1) between the position UP and position 1 (without reaching the position 1) and verify that the ACAWS advisory message FLAP LEVER UNLOCK (code 0127094) appears on CMDU (2).

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2-81.1 ADVISORY "FLAP LEVER UNLOCK" (Cont'd)

- 3. Allow the flap lever (1) to reach the position 1 and verify that the ACAWS advisory FLAP LEVER UNLOCK disappears.
- 4. Move and hold the flap lever (1) between the position 3 and position FULL (without reaching the position FULL) and verify that the ACAWS advisory message FLAP LEVER UNLOCK appears on CMDU (2).
- 5. Allow the flap lever (1) to reach the position FULL and verify that the ACAWS advisory FLAP LEVER UNLOCK disappears.
- 6. Return the flap lever (1) to UP position.

2-81.2 SPECIAL ALERT "FLAPS"

- 1. Ensure that the following conditions are set:
 - A.Both the hydraulic systems are pressurized at 3000 psi, (210 kg/cm²).
 - B.The flaps selection pushbutton (3) is selected to NORM.
 - C. The engine 1 FADEC and the engine 2 FADEC are powered.
- 2. Set up the following conditions:
 - A. Simulate the aircraft GROUND condition.
 - B. Select the flaps to a position $\ge 9.75^{\circ}$ (i.e. flap lever to UP).

 $C.PLA \leq 50^{\circ}$ (i.e. GND IDLE).

- 3. Advance both engine 1 and engine 2 throttle (4 and 5) to a PLA \geq 50° (i.e. > FLT IDLE) and verify that the Special Alert FLAPS (code 0150304) is activated (repetitive voice alert and legend displayed on the PDF).
- 4. Select the flaps to a position $\ge 9.75^{\circ}$ but $\le 35.25^{\circ}$ (i.e. flaps lever to position 1 or 2) and verify that the Special Alert is de-activated.

(Cont'd)



2-81.2 SPECIAL ALERT "FLAPS" (Cont'd)

- 5. Select the flaps to a position \geq 35.25° (i.e. flaps lever to position FULL) and verify that the Special Alert is activated again.
- 6. Return back both engine 1 and engine 2 throttle (4 and 5) to a PLA \leq 50° (i.e. GND IDLE) and verify that the Special Alert is de-activated.
- 7. Select the flaps to a position between 6° and 17° (i.e. flaps lever to position 1). Supply airspeed, through the Air Data Test Set, at a value > 180 Kts and verify that the Special Alert is activated again.
- 8. Select the flaps out of the window 6 17° (i.e. flaps lever to UP) and verify that the Special Alert is de-activated.
- 9. Return the airspeed to zero and retract the flaps.

FOLLOW ON MAINTENANCE:

None


2-82 SPOILER CONTROL SYSTEM - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 1-1).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	30,00	
Test	AFM	1	180,00	
Follow Maintenance	AFM	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 240 (Min.) Total Time Detention System: 240 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00009	Kit, spoiler slack measurement	A34195-000
00034	Kit, dynamometers	A37781-000
00061	Kit, digital inclinometers	G0002700001
00062	Kit, comparators	G0002700002
00066	Fixture control wheel travel measurement	G0002731001
00181	Kit, flight controls rigging pins	11G001-C052200-801



Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

- 2-82.1 ADJUSTMENT SPOILER CONTROL LINE LH SIDE (refer to figure 2-75, sheet 1/3)
 - 1. Supply No 1 and No 2 hydraulic systems at 1000 psi, (70.310 kg/cm²).
 - 2. With the stem of LH spoiler servoactuator fully extended, adjust, if necessary, rod between servoactuator and lever so that there is a distance of 7.874 in (200) between the two connecting axes.
 - 3. If necessary, adjust spoiler control rod (3) so that left spoiler is aligned with outer wing trailing edge and at 0° +/- 15'.
 - 4. Repeat operations described in steps 2 and 3 on RH spoiler. Results must be the same.
 - 5. Release hydraulic pressure in No 1 and No 2 systems.
- 2-82.2 ADJUSTMENT OF SPILER NEUTRAL POSITION(refer to figure 2-75, sheet 1/3)
 - 1. Ensure that the left Lift Dumper actuator is disconnected.
 - 2. Insert one rigging pin Dia 0.193 in (4.915 mm) (4) (AGE NO. 00181) into the quadrant (1) of the LH outer wing, into the reverse control lever (2) and into the mechanical mixer (5).



2-82.2 ADJUSTMENT OF SPILER NEUTRAL POSITION(refer to figure 2-75, sheet 1/3) (Cont'd)

- 3. With the LH spoiler closed and the actuator fully extended, connect and adjust properly the spring rod between the reverse control lever and mechanical mixer so that the connecting bolts enter freely without loading the spring.
- 4. Adjust and install the spring rod between the quadrant on LH outer wing and the reverse control lever so that the connecting bolts enrty freely without loading the sping.
- 5. Remove the rigging pin (4) (AGE NO. 00181) in the quadrant (1) of the LH outer wing and from the reverse control lever (2).
- 6. Install properly on LH control wheel the tool (AGE NO. 00066) for control wheel travel measurement and the inclinometer (AGE NO. 00061).
- 7. Rotate the control wheel 4.5° leftwards and maintain.
- 8. Adjust properly and connect the rod connecting lever to mixer so that it can be connected freely.
- 9. Also remove the rigging pin (4) (AGE NO. 00181) from the mechanical mixer (5) and return the control wheel to neutral.
- 10. Increase slowly the hydraulic pressure to 3000 psi (210 kg/cm²) (AGE NO. 00262).
- 11. Rotate slowly leftwards the control wheel and check that the spoiler begins to move when the control wheel angle is $4.5^{\circ} \pm 0.5^{\circ}$.
- 12. Annul the hydraulic pressure.
- 2-82.3 ADJUSTMENT SPOILER CONTROL LINE RH SIDE (refer to figure 2-75, sheet 1/3)
 - 1.Ensure that the left Lift Dumper actuator is disconnected.

(Cont'd)



2-82.3 ADJUSTMENT SPOILER CONTROL LINE RH SIDE (refer to figure 2-75, sheet 1/3) (Cont'd)

- 2. Insert one rigging pin Dia 0.193 in (4.915 mm) (4) (AGE NO. 00181) into the quadrant (1) of the RH outer wing, into the reverse control lever (2) and into the mechanical mixer (5).
- 3. With the LH spoiler closed and the actuator fully extended, connect and adjust properly the spring rod between the reverse control lever and mechanical mixer so that the connecting bolts enter freely without loading the spring.
- 4. Adjust and install the spring rod between the quadrant on LH outer wing and the reverse control lever so that the connecting bolts enrty freely without loading the sping.
- 5. Remove the rigging pin (4) (AGE NO. 00181) in the quadrant (1) of the LH outer wing and from the reverse control lever (2).
- 6.Install properly on RH control wheel the tool (AGE NO. 00066) for control wheel travel measurement and the inclinometer (AGE NO. 00061).
- 7. Rotate the control wheel 4.5° rightwards and maintain.
- 8. Adjust properly and connect the rod connecting lever to mixer so that it can be connected freely.
- 9. Also remove the rigging pin (4) (AGE NO. 00181) from the mechanical mixer (5) and return the control wheel to neutral.
- 10. Use the hydraulic test stand (AGE NO. 00262), supply slowly the hydraulic pressure to 3000 psi (210 kg/cm²).
- 11. Rotate slowly rightwards the control wheel and check that the spoiler begins to move when the control wheel angle is $4.5^{\circ} \pm 0.5^{\circ}$.
- 12. Annul the hydraulic pressure.

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2-82.4 MEASUREMENT OF SPOILERS CONVENTIONAL PLAY (refer to figure 2-75, sheet 2/3) and (refer to figure 2-75, sheet 3/3)

- 1. Ensure that the left spoilers are closed.
- 2. Fit on the left spoilers trailing edge the backlash (AGE NO. 00009) test equipments and set the comparator (AGE NO. 00062) to zero.

NOTE

The comparator (AGE NO. 00062) must be no more zeroed until the test is terminated.

- 3. Use the hydraulic test stand (AGE NO. 00262), supply No. 1 and No. 2 hydraulic systems at 3000 psi (210 kg/cm²).
- 4. Apply, by the dynamometer (AGE NO. 00034), on the left spoilers trailing edge, a vertical load and measure the left spoilers displacement as follows:
 - A.Gradually apply a load upwards up to 22.48 lb (10.20 kg) maximum, leaving out the reading on the comparator (AGE NO. 00062).
 - B. Stepwise unload, every 4.50 lb (2.04 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left spoilers.
 - C. Stepwise load downwards, every 2.25 lb (1.02 kg), up to 11.24 lb (5.10 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left spoilers.
 - D.Stepwise unload, every 2.25 lb (1.02 kg), up to zero load and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left spoilers.



2-82.4 MEASUREMENT OF SPOILERS CONVENTIONAL PLAY (refer to figure 2-75, sheet 2/3) and (refer to figure 2-75, sheet 3/3) (Cont'd)

Stepwise load upwards, every 4.50 lb (2.04 kg), up to 22.48 lb (10.20 kg) maximum and simultaneously read, on the comparator (AGE NO. 00062), the related displacement value of the left spoilers.

- 5. Put the values obtained in a diagram and draw a graph, load applied Vs left spoilers displacement. Check, from the graph, that the backlash C is not greater than 0.4° 0,074 in (1.9 mm).
- 6. Remove the backlash test equipments (AGE NO. 00009) from the left spoiler and re-install them to the right spoilers.
- 7. Repeat the backlash procedure as per steps 1 to 6 applying the load on the right spoilers. Check that the backlash C is not greater than 0.4° 0,074 (1.9 mm).
- 8. At completion of the test, annul the hydraulic pressure on both systems.
- 9. Remove the backlash test equipments (AGE NO. 00009) from the right spoiler.

FOLLOW ON MAINTENANCE:

None





(sheet 1/3)







NOTE:

1 THE POSITIONING OF THE PLAY MEASURING DEVICE ON THE RH OUTER WING IS SYMMETRICAL

Figure 2-75 Spoiler Control System - Adjustment (sheet 2/3)





Figure 2-75 Spoiler Control System - Adjustment (sheet 3/3)





2-83 SPOILER CONTROL SYSTEM - FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	2	90,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 180 (Min.) Total Time Detention System: 90 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00013	Kit, spoiler check templates	A34321-000
00066	Fixture control wheel travel measurement	G0002731001

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-1) before performing maintenance.



PROCEDURE:

- 2-83.1 SPOILER TRAVEL AND CLEARANCE CHECK (refer to figure 2-76, sheet 5/6), (refer to figure 2-76, sheet 6/6), (refer to figure 2-76, sheet 2/6), (refer to figure 2-76, sheet 3/6), (refer to figure 2-76, sheet 4/6) and (refer to figure 2-76, sheet 1/6))
 - 1. Supply No. 1 and No. 2 hydraulic systems at 3000 psi, (210 kg/cm²), flow at least 6.6 gpm (25l/min) and extend flaps.
 - 2. Install spoiler template (AGE NO. 00013) on top surfaces of left and right outer wings.
 - 3. Remove the panel 532A and 632A , then fit a 0.193 in (4.915 mm) rig pin to the pulley near ribs 23 24 of both outer wings.
 - 4. Check that the spoilers are at $0^{\circ} \pm 0.25^{\circ}$ as read on the spoiler templates (AGE NO. 00013).
 - 5. Check that the clearance between the two spoilers is 0.393 in \pm 0.078 in (10 mm \pm 2 mm). Check that clearance between wing trailing edge and spoiler end is 0.255 in \pm 0.078 in (6.5 mm \pm 2 mm). Check that the clearance at spoiler leading edge is 0.137 in \pm 0.078 in (3.5 mm \pm 2 mm).
 - 6. Remove rigpin.
 - 7. Remove the chart holder from the control stick before installing the control wheel travel measurement tool (AGE NO. 00066).
 - 8. Fit control wheel travel measurement tool (AGE NO. 00066) on LH control wheel and, starting from neutral position, slowly turn control wheel to left. The LH spoiler must start moving when the control wheel has travelled $4.5^{\circ} \pm 0.5^{\circ}$.



- 2-83.1 SPOILER TRAVEL AND CLEARANCE CHECK (refer to figure 2-76, sheet 5/6), (refer to figure 2-76, sheet 6/6), (refer to figure 2-76, sheet 2/6), (refer to figure 2-76, sheet 3/6), (refer to figure 2-76, sheet 4/6) and (refer to figure 2-76, sheet 1/6)) (Cont'd)
 - 9. Turn the control wheel to left, making the control wheel travel in 5° increment. Read the corresponding angle of spoiler on the related spoiler template (AGE NO. 00013) (77.5° \pm 2°). The LH spoiler travel angle must be within the travel range shown in (refer to figure 2-76, sheet 6/6). The RH spoiler must remain in neutral position.
 - 10. Repeat operation described in steps 9. and 10. using the other control wheel. Results must be the same.
 - 11. Release pressure in No. 1 hydraulic system.
 - 12. Repeat operations described in steps 9. and 10. Results must be the same.
 - Release pressure in No. 2 hydraulic system and supply No. 1 system at 3000 psi, (210 kg/cm²),flow at least 6.6 gpm (25l/min).
 - 14. Repeat operations described in steps 9. and 10.
 - 15. Check the spoiler control mechanism for freedom of movement, absence of interference and hydraulic fluid leaks.
 - 16. Install panel 532A and 632A.
 - Remove the control wheel travel measurement tool (AGE NO. 00066), the spoiler templates (AGE NO. 00013) and release hydraulic pressure.
 - 18. Install the chart holder on the control stick.
- 2-83.2 CHECK OF SPOILER RETRACTION SYSTEM (refer to figure 2-76, sheet 2/6) and (refer to figure 2-76, sheet 3/6)



2-83.2 CHECK OF SPOILER RETRACTION SYSTEM (refer to figure 2-76, sheet 2/6) and (refer to figure 2-76, sheet 3/6) (Cont'd)

- 1.Check that the circuit breaker SPOILER EMERG (18CE) (2) installed on Overhead Circuit Breaker Panel (1) (271VE) in position F16 is closed.
- Supply No. 1 and No. 2 hydraulic system at 3000 psi, (210 kg/cm²), flow at least 6.6 gpm (25l/min).
- 3. Turn control wheel fully left and hold it in this position.
- 4.On FCS2 control panel (4) raise the guard cover of SPOILER switch (3), place the switch to IN and check that the LH spoiler retracts completely.
- 5. Repeat the operation for the RH spoiler, turning the control wheel to right. Results must be the same.
- 6.Place SPOILER switch (3) to NORM and lower the guard cover.
- 7. Release pressure in hydraulic systems.

FOLLOW ON MAINTENANCE:

None





Figure 2-76 Spoiler Control System - Functional Test (sheet 1/6)







NOTE : INSTALLATION OF ITEMS ON RH OUTER WING IS SYMMETRICAL

ICN-02-A-276000-A-A0170-00286-A-01-1

Figure 2-76 Spoiler Control System - Functional Test (sheet 2/6)









NOTE : THE ARRANGEMENT OF THE TEMPLATES ON THE R OUTER WING IS SYMMETRICAL

ICN-02-A-276000-A-A0170-00371-A-01-1

Figure 2-76 Spoiler Control System - Functional Test (sheet 4/6)









NOTE: ALL DIMENSIONS ARE IN INCH (IN MILLIMETRES)

Figure 2-76 Spoiler Control System - Functional Test (sheet 5/6)





CONTROL WHEEL TRAVEL

Figure 2-76 Spoiler Control System - Functional Test (sheet 6/6)





2-84 LIFT DUMPER CONTROL SYSTEM -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 60 (Min.) Total Time Detention System: 60 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00013	Kit, spoiler check templates	A34321-000
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-5) before performing maintenance.



PROCEDURE:

2-84.1 CHECK OF LIFT DUMPER TRAVEL (refer to figure 2-77, sheet 2/3), (refer to figure 2-77, sheet 3/3) and (refer to figure 2-77, sheet 1/3)

WARNING

DURING PERFORMANCE OF THIS PROCEDURE, THE SPOILERS EXTEND TO MAXIMUM TRAVEL FASTLY. NOBODY MUST BE PRESENT IN THE SPOILERS MOVEMENT AREA TO AVOID POSSIBLE INJURY.

- 1. Fit spoiler check template (AGE NO. 00013) to the top surface of LH and RH outer wings.
- 2. Power up the Avionics to get the cockpit displays availability and select the ACAWS page on the CMDU (4).
- 3.Use hydraulic test stand (AGE NO. 00262) and ensure that hydraulic systems 1 and 2 are powered to 20.7 MPa (3000 psi).
- 4. Close the circuit breaker LIFT DUMPER (1CE) (2) located on circuit breakers panel (271 VE) (1) position F 15.
- 5. Simulate the aircraft FLT condition (if necessary).
- 6.On the Flight Control System (FCS1) panel (5), set the LIFT DUMPER switch to ARMED (6) position and verify that the ACAWS advisory message LIFT DUMPER ARM appears on CMDU (4).
- 7.Set the Engine 1 and 2 throttles levers to GND IDLE and verify that the spoilers remain lowered.

8. Simulate the aircraft GROUND condition (if necessary) and verify that the spoilers extend to $90^{\circ} \pm 2^{\circ}$ read on spoiler check template (AGE NO. 00013).

(Cont'd)



- 2-84.1 CHECK OF LIFT DUMPER TRAVEL (refer to figure 2-77, sheet 2/3), (refer to figure 2-77, sheet 3/3) and (refer to figure 2-77, sheet 1/3) (Cont'd)
 - 9. Check that the left and right LIFT DUMPER indications (3) (ARROW) illuminate on the Front Overhead Control Panel (210VE) and the LIFT DUMPER ARM on CMDU (4) remains illuminated.
 - 10. Set the Engine 1 throttle lever beyond the FLT IDLE position and verify that the spoilers retract. Check that the LIFT DUMPER indications (3) extinguish and the LIFT DUMPER ARM on CMDU (4) remains illuminated.
 - 11. Return the Engine 1 throttle lever to GND IDLE position and verify that the spoilers extend again. Check that the LIFT DUMPER indications (3) illuminate.
 - 12. Set the Engine 2 throttle lever beyond the FLT IDLE position and verify that the spoilers retract. Check that the LIFT DUMPER indications (3) extinguish.
 - 13. Return the Engine 2 throttle lever to GND IDLE position and verify that the spoilers extend again. Check that the LIFT DUMPER indications (3) illuminate.
 - 14. Set the LIFT DUMPER switch (6) to OFF position and verify the following conditions:
 - A.the spoilers retract;
 - B.the LIFT DUMPER indications (3) on the Front Overhead Control Panel (210VE) extinguish;
 - C.the ACAWS advisory message LIFT DUMPER ARM disappears from the CMDU (4).



FOLLOW ON MAINTENANCE:

None







NOTE :

THE ARRANGEMENT OF THE TEMPLATES ON THE RH OUTER WING IS SYMMETRICAL

Figure 2-77 Lift Dumper Control System - Functional Test (sheet 1/3)







Figure 2-77 Lift Dumper Control System - Functional Test (sheet 2/3)



Figure 2-77 Lift Dumper Control System - Functional Test (sheet 3/3)



2-85 LIFT DUMPER ACTUATORS - ADJUSTMENT

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	45,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 45 (Min.) Total Time Detention System: 45 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801
00262	Test stand, hydraulic system (diesel engine)	846805-D**

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.



PROCEDURE:

2-85.1 LIFT DUMPER ACTUATORS ADJUSTMENT (refer to figure 2-78).

CAUTION

During the following operation nobody must be present in the spoilers movement area.

- 1.Connect the hydraulic test stand (AGE NO. 00262) and supply No. 1 and No. 2 hydraulic systems at 1000 psi (70.31 kg/cm²).
- 2. Ensure that the spoilers are at 0° position.
- 3. Insert the rigging pin (2) (AGE NO. 00181) into the mechanical mixer (1).
- 4. Ensure that the left and right Lift Dumper actuators are fully extended and connect them to the related lever of mechanical mixer and adjust if necessary.

FOLLOW ON MAINTENANCE:

None





Figure 2-78 Lift Dumper Actuators - Adjustment





2-86 LIFT DUMPER CONTROL SYSTEM - OTHER CHECK SPECIAL ALERTS

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	ELT	1	30,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 30 (Min.) Total Time Detention System: 30 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-5) before performing maintenance.

PROCEDURE:

2-86.1 CHECK OF SPECIAL ALERT (refer to figure 2-79)

1. Annul the hydraulic pressure in both systems.

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2-86.1 CHECK OF SPECIAL ALERT (refer to figure 2-79) (Cont'd)

- 2. Set-up the following conditions:
 - A.extend by hand and hold the right spoiler to fully position (the left spoiler must be closed);
 - B. simulate the aircraft GROUND condition;
 - C.Set both the throttles levers to a PLA > 50° (i.e. > FLT IDLE).
- 3. Verify that the Special Alert LIFT DUMPER is generated (legend displayed red colour on CMDU PFD (1) and the repetitive voice alert audible).
- 4. Retract by hand the right spoiler and check that the Special Alert LIFT DUMPER is de-activated.
- 5. Extend by hand and hold the left spoiler to fully position and check that the Special Alert LIFT DUMPER is generated.
- 6.Move back one engine throttle to a PLA < 50° (i.e. GND IDLE) and verify that the Special Alert LIFT DUMPER is de-activated.
- 7.Restore the aircraft normal conditions resetting left spoiler to retracted position and both engine throttles to GND IDLE position.



FOLLOW ON MAINTENANCE:

- 1. Turn off and disconnect the hydraulic test cart from ground test port.
- 2. Switch-off the power electrical supply.







Figure 2-79 Lift Dumper Control System - Other Check Special





2-87 FCS1 CONTROL PANEL LIFT DUMPER -FUNCTIONAL TEST

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

None

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	ELT	1	45,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 45 (Min.) Total Time Detention System: 45 (Min.)

AGE Required:

None

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 2-5) before performing maintenance.

PROCEDURE:

2-87.1 CHECK OF FCS1 CONTROL PANEL LIFT DUMPER (refer to figure 2-80, sheet 1/3) , (refer to figure 2-80, sheet 2/3) and (refer to figure 2-80, sheet 3/3)

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- 2-87.1 CHECK OF FCS1 CONTROL PANEL LIFT DUMPER (refer to figure 2-80, sheet 1/3) , (refer to figure 2-80, sheet 2/3) and (refer to figure 2-80, sheet 3/3) (Cont'd)
 - Check that the following circuit breakers are closed:
 A.FLAP ASYM (1CA) (15) located on Rear Mid Circuit Breaker Panel (451VE) (14) in position L 5.
 - B.FLAP ASYM (12CA) (13) located on Rear Upper Circuit Breaker Panel (452VE) (12) in position H 4.
 - C.FLIGHT CONTROL FLAP IND (3CA) (11) located on Overhead Circuit Breaker Panel (271VE) (10) in position F 14.
 - 2. Provide electrical power to the aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 3. Provide hydraulic power to the aircraft (refer to manual TCH.1C-27J-2-00GV).
 - 4. Start up the avionics and check that there are no ACAWS messages concerning the flight controls. Perform the following steps for rudder trim:

WARNING

BEFORE PROCEED THROUGH THE NEXT STEPS BE CAREFUL THAT NOBODY IS WORKING ON THE RUDDER AREA.

CAUTION

Ensure that the rudder area is free from tools and other objects.

(Cont'd)



- 2-87.1 CHECK OF FCS1 CONTROL PANEL LIFT DUMPER (refer to figure 2-80, sheet 1/3) , (refer to figure 2-80, sheet 2/3) and (refer to figure 2-80, sheet 3/3) (Cont'd)
 - 5. On the FCS 1 Control Panel (103VE) (1) set and hold momentarily the NORMAL TRIM selector (2) to NOSE LH position and check that the rudder moves toward left.
 - 6. Rise the EMERGENCY TRIM cover guard then set again the NORMAL TRIM to NOSE LH and NOSE RH positions and check that the rudder remains in the last reached position.
 - 7.Set and holdmomentarily the EMERGENCY TRIM selector (3) to NOSE RH and check that the rudder moves toward neutral then toward right position.
 - 8. Lower the EMERGENCY TRIM cover guard.
 - 9. Set the NORMAL TRIM selector (2) to NOSE LH until the rudder in order to reposition the rudder to the neutral position.

WARNING

BEFORE PROCEED THROUGH THE NEXT STEPS DISCONNECT THE HYDRAULIC POWER SUPPLY TO THE AIRCRAFT AND RELEASE THE RESIDUAL PRESSURE IN THE AIRCRAFT HYDRAULIC SYSTEM.

Perform the following steps for lift dumper:

- 10. Move one engine throttle (7) above the Flight Idle position.
- 11.On the FCS 1 Control Panel (103VE) (1) set the LIFT DUMPER switch (4) to ARMED position and check that the following ACAWS is displayed:

A.LIFT DUMPER ARMED

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(Cont'd)

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- 2-87.1 CHECK OF FCS1 CONTROL PANEL LIFT DUMPER (refer to figure 2-80, sheet 1/3) , (refer to figure 2-80, sheet 2/3) and (refer to figure 2-80, sheet 3/3) (Cont'd)
 - 12. Return the engine throttle (7) below the Flight Idle position.
 - 13. Move one engine throttle (7) above the Flight Idle position and check that the LIFT DUMPER ARMED message is illuminated again.
 - 14. Set the LIFT DUMPER switch (4) to OFF position and check that the LIFT DUMPER ARMED message extinguish.

Perform the following steps for stick shaker:

- 15.On the FCS1 Control Panel (103VE) (1) check that in the PILOT and COPILOT STICK SHAKERS pushbuttons (5 and 6) the OFF legend is not illuminated.
- 16. Select the GCAS and STALL page on the SAMU?s.
- 17.Set both the engine throttle levers (8 and 9) below Flight Idle.
- 18. Select STALL TEST from GCAS and STALL page by pressing the Line Select key right 2.
- 19. Verify that the aural and visual alerts are activated and that the shaker as well is activated.
- 20. Release the PILOT and COPILOT STICK SHAKERS pushbuttons (8 and 9) and check the following: A. The OFF legend illuminates.

B. The shakers stop.

21. Restore the STALL TEST function.



FOLLOW ON MAINTENANCE:

None





Figure 2-80 FCS1 Control Panel Lift Dumper - Functional Test (sheet 1/3)

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Figure 2-80 FCS1 Control Panel Lift Dumper - Functional Test (sheet 2/3)

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2-88 LH (RH) SPOILER ACTUATOR - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Position maintenance platform (AGE NO. 00074).
- 4.Open the access panels 532B and 532C (632B and 632C).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	30,00	
Installation	AFM	1	40,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 100 (Min.) Total Time Detention System: 100 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**
00074	Kit, aircraft assy platform	G0005100001

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AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00037	PACKING, PREFORMED	MS28778-6	2,00
00038	PACKING, PREFORMED	MS28778-5	2,00
00040	NUT, SELF-LOCKING	H14-5	4,00
00041	PIN, COTTER	MS24665-302	1,00
00052	PIN, COTTER	MS24665-153	1,00
00407	RETAINER, PACKING	MS9058-06	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-88.1 REMOVAL (refer to figure 2-81, sheet 1/2) and (refer to figure 2-81, sheet 2/2)

WARNING

HYDRAULIC FLUID IS ACID. PREVENT CONTACT WITH SKIN. PROTECTION CAPS MUST BE FIXED ON PIPES AFTER REMOVAL.

(Cont'd)



2-88.1 REMOVAL (refer to figure 2-81, sheet 1/2) and (refer to figure 2-81, sheet 2/2) (Cont'd)

CAUTION

Install protection caps on the disconnected electrical connectors and hoses.

CAUTION

To prevent misalignment, do not touch or move control surfaces during this maintenance task.

NOTE

Before removing the spoiler actuator, place the flaps in the down position.

- 1. Position the container in order to collect drained fluid.
- 2. Insert rigging pin (AGE NO. 00181) (1) on the bellcranck of the spoiler mechanical mixer box (2).
- 3. Disconnect the electric connector (50).
- 4. Disconnect nuts of the supply hydraulic pipes (6 and 12) of the hydraulic system No. 1 and No. 2 from unions (5 and 13). Close the pipes with a plugs.
- 5. Disconnect nut of the return hydraulic pipe (7) of the hydraulic system No. 1 from tee (8). Close the pipe with a plug.
- 6. Disconnect nut of the return hydraulic pipe (15) of the hydraulic system No. 2 from elbow (16). Close the pipe with a plug.
- Disconnect nut of the pipe (17) that connect the return pipe (7) of the lift dumper actuator LH (RH) from tee (8). Close the pipe with a plug.

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2-88.1 REMOVAL (refer to figure 2-81, sheet 1/2) and (refer to figure 2-81, sheet 2/2) (Cont'd)

- 8. Disconnect the rod (34) from spoiler actuator lever (30) by removing bolt (28), washers (29 and 31), nut (32) and cotter pin (33). Discard removed cotter pin.
- 9. Disconnect the rod (27) from spoiler actuator ram (23) by removing bolt (21), washers (22 and 24), nut (25) and cotter pin (26). Discard removed cotter pin.
- 10. Disconnect the spoiler actuator (3) from the aircraft structure support (39) by removing bolts (35, 36, 37 and 38), washers (40, 43, 45 and 47) and self locking nuts (41, 42, 44 and 46). Discard removed self locking nuts.
- 11. Remove the LH (RH) spoiler actuator (3).
- 12. Position the item on workbench and do the following operations:
 - A.Loosen the unions (5 and 13) and remove the preformed packings (4, 11, 14 and 20). Discard removed preformed packings.
 - B. Loosen the nut (9) and tee (8), remove the packing retainer (10) and preformed packing (11). Discard removed the packing retainer and preformed packing.
 - C.Loosen the nut (18) and elbow (16), remove the packing retainer (19) and preformed packing (20). Discard removed the packing retainer and preformed packings.
- 2-88.2 INSTALLATION (refer to figure 2-81, sheet 1/2) and (refer to figure 2-81, sheet 2/2)

NOTE

Lubricate all packings and O-ring with hydraulic fluid. If the packing is deteriorate change it before the installation.

(Cont'd)

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2-88.2 INSTALLATION (refer to figure 2-81, sheet 1/2) and (refer to figure 2-81, sheet 2/2) (Cont'd)

NOTE

Remove protection caps from the electrical connectors and hoses to be installed.

- 1. Position the item on workbench and to do the following operations:
 - A.Replace the preformed packings (LCM NO. 00038) (4 and 14) and torque (AGE NO. 00054) tighten the unions (5 and 13).
 - B.Replace the preformed packing (LCM NO. 00037) (11) and packing retainer (LCM NO. 00407) (10), torque (AGE NO. 00054) tighten the tee (8) and nut (9).
 - C.Replace the preformed packing (LCM NO. 00037) (20) and packing retainer (LCM NO. 00407) (19), torque (AGE NO. 00054) tighten the elbow (16) and nut (18).
 - D.Refill hydraulic oil into actuator, position plugs on inlet/outlet hydraulic connection.
- 2. Install the LH (RH) spoiler actuator (3).
- 3. Connect the spoiler actuator (3) at the support (39) by using bolts (35, 36, 37 and 38), washers (40, 43, 45 and 47) and new self-locking nuts (41, 42, 44 and 46) (LCM NO. 00040).
- 4. Replace the connection between the spoiler actuator lever (30) LH (RH) and rod (34) in the following way:
 - A. Insert the washer (29) in bolt (28).
 - B.Insert the bolt (28) in the connection of the spoiler actuator lever (30) LH (RH) with rod (34).
 - C.Replace the washer (31).
 - D.Replace the nut (32).
 - E.Torque (AGE NO. 00054) tighten the bolt to 30 \div 35 in lb.

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2-88.2 INSTALLATION (refer to figure 2-81, sheet 1/2) and (refer to figure 2-81, sheet 2/2) (Cont'd)

- F. Replace the cotter pin (LCM NO. 00052) (33).
- 5. Replace the connection between the spoiler actuator arm (23) LH (RH) and rod (27) in the following way:
 - A. Insert thet washer (22) in bolt (21).
 - B.Insert the bolt (21) in the connection of the spoiler actuator arm (23) LH (RH).
 - C. Replace the washer (24).
 - D.Replace the nut (25).
 - E.Torque (AGE NO. 00054) tighten the bolt to 230 \div 260 in lb.
 - F. Replace the cotter pin (LCM NO. 00041) (26).
- 6.Connect return pipe (17) of the LH (RH) lift dumper actuator to tee (8) in the following way:
 - A.Remove the plug of the pipe (17) and the plug of the actuator.
 - B.Connect the pipe (17) to tee (8) and torque (AGE NO. 00054) tighten nut.
- 7.Connect return hydraulic pipe (7) of the hydraulic system No. 1 in the following way:
 - A. Remove the plug of the pipe (7) and the plug of the actuator.
 - B.Connect pipe (7) to tee (8) and torque (AGE NO. 00054) tighten nut.
- 8. Connect return hydraulic pipe (15) of the hydraulic system No. 2 in the following way:

A. Remove the plug of the pipe (15).

- B.Connect pipe (15) to elbow (16) and torque (AGE NO. 00054) tighten nut.
- 9. Connect supply hydraulic pipe (12) of the hydraulic system No. 2 in the following way:

A. Remove the plug of the pipe (12).

(Cont'd)

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- 2-88.2 INSTALLATION (refer to figure 2-81, sheet 1/2) and (refer to figure 2-81, sheet 2/2) (Cont'd)
 - B.Connect pipe (12) to union (13) and torque (AGE NO. 00054) tighten nut.
 - 10. Connect supply hydraulic pipe (6) of the hydraulic system No. 1 in the following way:
 - A.Remove the plug of the pipe (6).
 - B.Connect pipe (6) to union (5) and torque (AGE NO. 00054) tighten nut.
 - 11. Connect the electric connector (48).
 - 12. Remove rigging pin (AGE NO. 00181) (1) on the bellcranck of the spoiler mechanical mixer box (2).
 - 13. Remove the container used for collect drained fluid.

NOTE

Don't use the drained fluid collected to refill hydraulic circuit.

FOLLOW ON MAINTENANCE:

- 1.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Restore hydraulic power system at 3000 psi, (210 kg/cm²) (refer to manual TCH.1C-27J-2-00GV).
- 3. Visually check for absence of hydraulic leakage through the coupling.
- 4. Close the access panels 532B and 532C (632B and 632C).
- 5. Perform the adjustment as described in ADJUSTMENT SPOILER CONTROL LINE LH SIDE (refer to para 2-82) and ADJUSTMENT SPOILER CONTROL LINE RH SIDE (refer to para 2-82).
- 6.Perform SPOILER CONTROL SYSTEM functional test (refer to para 2-83).
- 7.Perform the backlash of the spoiler surface (LH or RH) (refer to para 2-82).

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8. Restore Flap Normal Position.

9. Remove maintenance platform (AGE NO. 00074).







Figure 2-81 LH (RH) Spoiler Actuator - Removal and Installation (sheet 1/2)

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2-89 FCU RESTRICTOR VALVE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Disconnect external AC power supply from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Open the access panels 553A, 553B, 553C and 621N.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	10,00	
Installation	AFM	1	15,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 55 (Min.) Total Time Detention System: 55 (Min.)

AGE Required:

None

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00039	PACKING, PREFORMED	MS28778-4	1,00

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Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

2-89.1 REMOVAL (refer to figure 2-82)

CAUTION

Install protection caps on the disconnected hoses.

- 1.Use a container in order to collect drained hydraulic fluid.
- 2. Gain access through the opened access panels.
- 3. Loosen the nuts and disconnect the pipes (2, 3, 4, 6, and 8) from the FCU restrictor valves (1, 5, and 7).
- 4. Remove FCU restrictor valves (1, 5, and 7).
- 5. Discard removed preformed packing.

2-89.2 INSTALLATION (refer to figure 2-82)

CAUTION

Take care to respect position of the valve.

CAUTION

Don't use the drained hydraulic fluid collected to refill hydraulic circuit. It is contamined discard it.



2-89.2 INSTALLATION (refer to figure 2-82) (Cont'd)

NOTE

Remove protection caps from the hoses to be installed.

- 1. Insert new preformed packing.
- 2. Place the FCU restrictor valves (1, 5, and 7) in the inlet line and tighten nuts of tubes (2, 3, 4, 6 and 8).

NOTE

Remove a container with drained hydraulic fluid.

FOLLOW ON MAINTENANCE:

- 1. Connect the hydraulic supply to the aircraft.
- Connect external AC power supply to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Perform several flap extension than inspect the FCU restrictor valve for leakage.
- 4. Close the access panels 553A, 553B, 553C and 621N.





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2-90 LH (RH) LIFT DUMPER ACTUATOR -REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1. Set flap position down.
- 2. Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 3. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 4. Position maintenance platform (AGE NO. 00074)
- 5. Open the access panel 532C (632C).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	30,00	
Installation	AFM	1	35,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 95 (Min.) Total Time Detention System: 95 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**

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AGE No.	NOMENCLATURE	P/N
00181	Kit, flight controls rigging pins	11G001-C052200-801

Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00039	PACKING, PREFORMED	MS28778-4	1,00
00052	PIN, COTTER	MS24665-153	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

CAUTION

This procedure is valid for LH Lift Dumper Actuator. For RH Lift Dumper Actuator is similar.

2-90.1 REMOVAL (refer to figure 2-83, sheet 2/2) and (refer to figure 2-83, sheet 1/2)

CAUTION

Install protection caps on the disconnected hoses.

- 1.Lock the control wheel (2) using the rigging pin (1) (AGE NO. 00181).
- 2. Insert rigging pin (4) (AGE NO. 00181) in the mechanical mixer (3).

(Cont'd)

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- 2-90.1 REMOVAL (refer to figure 2-83, sheet 2/2) and (refer to figure 2-83, sheet 1/2) (Cont'd)
 - 3. Position a container in order to collect drained hydraulic fluid.
 - 4. Loosen the nuts and disconnect inlet pipe (17) and outlet pipe (10).
 - 5. Drain oil from actuator. Then close unions using plugs.
 - 6. Remove bolt (19), flat washer (20), castellated nut (22) and cotter pin (21) connecting LH lift dumper actuator (18) to bellcrank (3). Discard removed cotter pin.
 - 7. Remove bolt (9), flat washer (7), castellated nut (5) and cotter pin (6) connecting LH lift dumper actuator (18) to support (8). Discard removed cotter pin.
 - 8. Remove LH lift dumper actuator (18) and position on workbench, loosen unions and remove packing.
- 2-90.2 INSTALLATION (refer to figure 2-83, sheet 2/2) and (refer to figure 2-83, sheet 1/2)

NOTE

Lubricate all packings and O-ring with hydraulic fluid. If the packing is deteriorate change it before the installation.

NOTE

Remove protection caps from the hoses to be installed.

1. Position the new LH lift dumper actuator (18) on workbench, install the packing (14), the nut (13) and fitting (12).

NOTE

Verify that the length of new actuator is equal to the removed one, if not adjust it.

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2-90.2 INSTALLATION (refer to figure 2-83, sheet 2/2) and (refer to figure 2-83, sheet 1/2) (Cont'd)

- 2. Install union (16), retainer (11) and new preformed packing (15).
- 3.Lock the control wheel (2) using the rigging pin (1) (AGE NO. 00181)
- 4. Insert rigging pin (4) (AGE NO. 00181) in the mechanical mixer (3).
- Connect the LH lift dumper actuator end (18) to the support (8) using bolt (9), flat washer (7), castellated nut (5) and new cotter pin (6) (LCM NO. 00052). Torque tighten to 30 thru 35 in lb (AGE NO. 00054).

NOTE

If the mechanical mixer and LH lift dumper actuator terminals are not aligned perform adjustment by opereting on the actuator length regulator.

- 6. Connect the LH lift dumper actuator end (18) to the mechanical mixer (3) using bolt (19), flat washer (20), castellated nut (22) and new cotter pin (21) (LCM NO. 00052). Torque tighten to 30 thru 35 in lb (AGE NO. 00054).
- 7. Refill oil the actuator (18).
- 8. Remove the plug from return pipe.
- 9. Connect outlet pipe (10) and tighten nut.
- 10. Remove the plug from supply pipe.
- 11. Connect inlet pipe (17) and tighten nut.
- 12. Remove container used for collect drained fluid.
- 13. Remove rigging pin (4) (AGE NO. 00181) from the mechanical mixer (3).
- 14. Remove rigging pin (1) from the control wheel (2).



FOLLOW ON MAINTENANCE:

- 1. Close the access panel 532C (632C).
- 2. Remove maintenance platform (AGE NO. 00074).
- 3. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 4.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 5. Perform the functional test CHECK OF LIFT DUMPER TRAVEL (refer to para 2-84).





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Installation (sheet 2/2)

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2-91 LIFT DUMPER CONTROL VALVE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3.Open the access panels 913H, 913I, 913B, 913A and 621N.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	15,00	
Removal	AFM	1	10,00	
Installation	AFM	1	15,00	
Follow Maintenance	AFM	1	15,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 55 (Min.) Total Time Detention System: 55 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00074	Kit, aircraft assy platform	G0005100001

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-2) before performing maintenance.

PROCEDURE:

- 2-91.1 REMOVAL. Remove control valve as follows:
 - A.Position the container in order to collect drained fluid.
 - B.Disconnect electric connector.
 - C.Unscrew the nut and disconnect supply hydraulic pipe.
 - D.Close the pipe with a plug.
 - E.Unscrew the nut and disconnect return hydraulic pipe.
 - F.Close the pipe with a plug.
 - G.Unscrew the nut and disconnect inlet pipe to actuator.
 - H.Close the pipe with a plug.
 - I.Unscrew 4 bolts and remove 4 flat washers that fix lift dumper actuator with structure.
 - J. Remove the lift dumper control valve.

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2-91.2 INSTALLATION. The installation procedure of the control valve is the following:

- A.Refill oil into lift dumper control valve, close the holes with plug.
- B. Install the lift dumper control valve.
- C.Insert flat washers in bolts and torque tighten 4 bolts that fix lift dumper actuator.
- D. Remove plug from inlet pipe and from valve.
- E.Connect inlet pipe to actuator and torque tighten the nut.
- F.Remove plug from return pipe.
- G.Connect return hydraulic pipe and torque tighten the nut.
- H. Remove plug from pipe.
 - I.Connect supply hydraulic pipe torque tighten the nut.
- J.Connect electric connector.
- K.Remove the container used for collect drained fluid.

CAUTION

Dont use the drained fluid collected to refill the hydraulic circuit because it is contamined. Discard it.

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FOLLOW ON MAINTENANCE:

- 1. Close the access panels 913H, 913I, 913B, 913A and 621N.
- 2. Restore hydraulic power system (refer to manual TCH.1C-27J-2-00GV).
- 3.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 4. Perform the functional test LIFT DUMPER CONTROL SYSTEM (refer to para 2-84).

Figure 2-84 Lift Dumper Control Valve - Removal and Installation

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2-92 OPERATIONAL CHECK GUST - LOCK CONTROL

INPUT CONDITION:

- Aircraft Applicability:
 - 04162, 04180

Required Conditions:

1. Perform Preparation (refer to para 2-2).

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Test	AFM	1	60,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 60 (Min.) Total Time Detention System: 60 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N	
00113	Tensiometer	T60-1001C8-1A**	
00181	Kit, flight controls rigging pins	11G001-C052200-801	

Consumable Material Required:

None

Safety Conditions:

Be aware of information contained in Paragraph (refer to para 2-1) SAFETY PRECAUTIONS before performing maintenance.

PROCEDURE:

- 2-92.1 GUST LOCK CABLE TENSION (refer to figure 2-85, sheet 2/4), (refer to figure 2-85, sheet 3/4), (refer to figure 2-85, sheet 4/4) and (refer to figure 2-85, sheet 1/4)
 - 1. Insert a rigging pin (8) (AGE NO. 00181) in the cabin quadrant of gust-lock control (9).
 - 2.By means of turnbuckles (5 and 10) positioned in corrispondence of frame 11, 35, 36 and in the centre wing, stretch the control cables at a load twice the expected pre-load 128.14 lb (58.12 kg) (AGE NO. 00113).
 - 3. Remove the rigging pin (8) (AGE NO. 00181) and perform 25 cycles at least of the gust lock lever (6) on the Throttle Quadrant (7).
 - 4. Insert the rigging pin (8) (AGE NO. 00181) in the cabin quadrant of gust-lock control (9) and set the control cables pre-load to 64.07 lb (29.06 kg) (AGE NO. 00113).
 - 5. Check that the distance between the bellcrank and the frame 44 is 1.949 ± 0.079 in (49.5 \pm 2 mm).
 - 6.On the elevator gust lock control, the distance between the connecting bolt axis of the bellcrank (11) to the push-pull cable (12) and the frame 42 axis is 1.417 ± 0.079 in (36 ± 2 mm).
 - 7.On the aileron gust lock control, the distance between the axis of the connecting bolt of the control cable (14) to the bellcrank (15) and the rotation pin of the bellcrank is 1.024 ± 0.079 in (26 \pm 2 mm) towards the wing tip.
- 2-92.2 ADJUSTMENT AND CHECK OF UNLOCKING POSITION (refer to figure 2-85, sheet 3/4) and (refer to figure 2-85, sheet 4/4)

(Cont'd)

- 2-92.2 ADJUSTMENT AND CHECK OF UNLOCKING POSITION (refer to figure 2-85, sheet 3/4) and (refer to figure 2-85, sheet 4/4) (Cont'd)
 - 1. Having the elevator line control cables (17) correctly stretched and the levers positioned to fully forward (OFF position), adjust properly the push-pull cable (12) from the elevator control bellcrank (11)to the left and to the right bellcrank.
 - 2.On the aileron gust lock line, adjust the spring rod (13) to the bellcrank (15) so that the connecting bolts can be inserted freely.
 - 3.On the elevator gust lock line, adjust the spring rod (19) to the bellcrank on the left and right side so that the connecting bolts can be inserted freely.
 - 4. Recheck that the locking devices position of the elevator and of the aileron line, is still as:
 - A.on the elevator gust lock control, the distance between the connecting bolt axis of the bellcrank (11) to the push-pull cable (12) and the frame 42 axis is 36 ± 2 mm;
 - B.on the aileron gust lock control, the distance between the axis of the connecting bolt of the control cable (14) to the bellcrank (15) and the rotation pin of the bellcrank is 1.024 ± 0.079 in (26 ± 2 mm) towards the wing tip.
 - 5. Check that the clearance between the locking roller and elevator quadrant is \geq 0.157 in (\geq 4 mm).
- 2-92.3 LOCKING CONTROLS CHECK (refer to figure 2-85, sheet 3/4), (refer to figure 2-85, sheet 4/4) and (refer to figure 2-85, sheet 1/4)
 - 1. Ensure that the control wheels (1 and 2) is to neutral position in roll.
 - 2. Move the control stick (3 and 4) to fully forward to bring the elevator in pitch-up position.

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- 2-92.3 LOCKING CONTROLS CHECK (refer to figure 2-85, sheet 3/4), (refer to figure 2-85, sheet 4/4) and (refer to figure 2-85, sheet 1/4) (Cont'd)
 - 3. Move the gust lock lever (6) to fully backward (ON position) and set it in the properly seat.
 - 4. By moving slightly the control stick verify that both the elevator control and the aileron control are locked.
 - 5. Check that each locking roller enters properly in its seat in order to lock the quadrant. Further check that the locking roller does not come out from the quadrant external profile.
 - 6. Furthermore verify that the engine throttles are prevented to move forward.
- 2-92.4 UNLOCKING CONTROLS CHECK (refer to figure 2-85, sheet 3/4), (refer to figure 2-85, sheet 4/4) and (refer to figure 2-85, sheet 1/4)
 - 1. Extract the gust lock lever (6) from the ON position and verify that it returns to OFF position.
 - 2. Check the correct unlocking of the locking rollers (16).
 - 3.On the elevator gust lock control, the distance between the connecting bolt axis of the bellcrank (11) to the push-pull cable (12) and the frame 42 axis is 1.417 ± 0.079 in (36 ± 2 mm).
 - 4. On the aileron gust lock control, the distance between the axis of the connecting bolt of the control cable (14) to the bellcrank (15) and the rotation pin of the bellcrank is 1.024 ± 0.079 in (26 \pm 2 mm) towards the wing tip.
 - 5. Also verify that the engine throttles can be moved forward freely.

FOLLOW ON MAINTENANCE:

None










Figure 2-85 Operational Check Gust - Lock Control (sheet 2/4)



NOTE: ALL DIMENSIONS ARE IN INCHES (IN MILLIMETERS)





LOCKING SEAT



AILERON GUST LOCK LINE

Figure 2-85 Operational Check Gust - Lock Control (sheet 3/4)





 Alenia Aermacchi Einmeccanica Compar

2-93 ELEVATOR RIGID CABLE - REMOVAL AND INSTALLATION

INPUT CONDITION:

Aircraft Applicability:

04162, 04180

Required Conditions:

- 1.Disconnect electrical power from aircraft (refer to manual TCH.1C-27J-2-00GV).
- 2. Isolate hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3. Open thermal insulation screen.

Recomended Personnel:

PROCEDURE	MECH. CODE	QTY	TOTAL TIME (MIN.)	WORK ZONE
Input Condition	AFM	1	20,00	
Removal	AFM	2	30,00	
Installation	AFM	2	40,00	
Follow Maintenance	AFM	1	20,00	

Periodicity: AR - AS REQUIRED Total Maintenance Time: 180 (Min.) Total Time Detention System: 110 (Min.)

AGE Required:

AGE No.	NOMENCLATURE	P/N
00054	Kit, torque wrenches	G0001200001-001**





Consumable Material Required:

LCM No.	NOMENCLATURE	P/N	QTY
00022	PIN, COTTER	MS24665-86	2,00

Safety Conditions:

Be aware of information contained in SAFETY PRECAUTIONS (refer to para 1-1) before performing maintenance.

PROCEDURE:

2-93.1 REMOVAL (refer to figure 2-86, sheet 1/2) and (refer to figure 2-86, sheet 2/2)

WARNING

PERSONNEL AND EQUIPMENT SHALL REMAIN CLEAR OF CARGO RAMP AND DOOR AREA WHENEVER THE AUXILIARY HYDRAULIC SYSTEM IS PRESSURIZED. FAILURE TO COMPLY COULD INJURY PERSONNEL OR DAMAGE EQUIPMENT.

- 1. Remove the clips (1 and 4), then acting on the turnbuckles (2 and 3), slowly release the cable tension.
- 2. Disconnect the cable end (22) from bellcrank assy (21) at frame 42 by removing bolt (23), washer (20), castellated nut (19) and cotter pin (18). Discard removed cotter pin.
- 3. Loosen the cable end (22) from the cable (5).
- 4. Disconnect the cable end (15) from elevator locking lever assembly (10) by removing bolt (9), washer (11), castellated nut (13) and cotter pin (12). Discard removed cotter pin.

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TCH.1C-27J-2-27JG

- 2-93.1 REMOVAL (refer to figure 2-86, sheet 1/2) and (refer to figure 2-86, sheet 2/2) (Cont'd)
 - 5. Loosen the cable end (7) from the cable (5).
 - 6.Loosen the nuts (7 and 16) that lock the sheats (8 and 17) to the support at FR42 (6) and FR44 (14).
 - 7.Extract the cable (5) and remove the sheats (8 and 17).
- 2-93.2 INSTALLATION (refer to figure 2-86, sheet 1/2) and (refer to figure 2-86, sheet 2/2)

WARNING

PERSONNEL AND EQUIPMENT SHALL REMAIN CLEAR OF CARGO RAMP AND DOOR AREA WHENEVER THE AUXILIARY HYDRAULIC SYSTEM IS PRESSURIZED. FAILURE TO COMPLY COULD INJURY PERSONNEL OR DAMAGE.

- 1.Position the sheaths (8 and 17) and insert the cable (5).
- 2. Tighten the two cable ends (AGE NO. 00054) (15 and 22) on the cable (5).
- 3. Tighten the nuts (AGE NO. 00054) (7 and 16) that lock the sheats (8 and 17) to the support at FR42 (6) and FR44 (14).
- 4. Connect the cable end (15) at the elevator locking lever assembly (10) by using bolt (9), washer (11), castellated nut (13) and new cotter pin (12) (LMC NO. 00022).
- 5. Connect the cable end (22) at the bellcrank assy (21) at frame 42 by using bolt (23), washer (20), castellated nut (19) and new cotter pin (18) (LMC NO. 00022).

(Cont'd)



- 2-93.2 INSTALLATION (refer to figure 2-86, sheet 1/2) and (refer to figure 2-86, sheet 2/2) (Cont'd)
 - 6. Install the clips (1 and 4), then acting on the turnbuckles (2 and 3).

FOLLOW ON MAINTENANCE:

- 1. Close thermal insulation screen.
- 2. Restore hydraulic power (refer to manual TCH.1C-27J-2-00GV).
- 3.Connect electrical power to aircraft (refer to manual TCH.1C-27J-2-00GV).
- 4. Perform the functional test:
 - A.LOCKING CONTROLS CHECK (refer to para 2-92).
 - B.UNLOCKING CONTROLS CHECK (refer to para 2-92).
 - C.ADJUSTMENT AND CHECK OF UNLOCKING POSITION (refer to para 2-92).





Figure 2-86 Elevator Rigid Cable - Removal and Installation (sheet 1/2)

> 27-70-05 2-713









Figure 2-86 Elevator Rigid Cable - Removal and Installation (sheet 2/2)

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