

HIRF/LIGHTNING - INSPECTION/CHECK

EFFECTIVITY: ALL

1. General

- A. HIRF means High-Intensity Radiated Fields.
- B. The electroele ctronic equipment, installed on the aircraft, is covered by electromagnetic fields that are generated by the systems installed on the aircraft or by external HIRF, because of a radar station, broadcasting station, or other aircraft. HIRF can cause unwanted interference with the installed equipment or wiring.
- C. The growing use of electronic systems and the simultaneous use of several structural parts made of composite material increase the concern about the vulnerability of the aircraft to the direct and indirect effects of lightning.
- D. The undesirable HIRF/LIGHTNING effects are prevented by:
 - Qualification of systems at predefined HIRF/LIGHTNING levels.
 - Installation of protective features such as harness shielding, special terminations, extensive use of electrical bonding, and use of copper for components embedded in composite structures.
- E. This section gives the procedures to do a detailed visual inspection on the electrical/electronic connectors, bonding jumpers, and conductive gaskets of the aircraft critical systems, installed in environmentally exposed areas, in flight control surfaces, and lightning current critical path areas. Examine them for possible degradation of HIRF/LIGHTNING protection features because of aircraft aging and operation in adverse environments.
- F. The procedures in this section are given in the sequence below. The tasks identified with (♦) are part of the Scheduled Maintenance Requirements Document (SMRD).

TASK NUMBER	DESCRIPTION	EFFECTIVITY
05-51-01-200-801-A	HIRF/LIGHTNING PROTECTION - IN-SPECTION	ALL



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AIRCRAFT
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TASK 05-51-01-200-801-A

EFFECTIVITY: ALL

2. HIRF/LIGHTNING PROTECTION - INSPECTION

A. General

- (1) This task gives the procedures to do a detailed visual inspection on the electrical/electronic connectors, bonding jumpers, and conductive gaskets of the aircraft critical systems, in regions without pressure, for possible degradation of the HIRF/Lightning protections.

- NOTE:
- Do not disassemble connectors when you do this task.
 - Do not remove the seal when you do this task.
 - Only remove system LRUs if it is necessary to get access to connectors.
 - If the connector is protected with heat-shrinkable boot, only remove the boot if it is damaged.
 - It is not necessary to do a check along the harness. If you find a damage to the harness, write it down and do the necessary repairs after the end of the task.

B. References

REFERENCE	DESIGNATION
AMM MPP 06-41-00/100	-
AMM TASK 28-11-01-000-801-A/400	FUEL-TANK ACCESS PANELS - REMOVAL
AMM TASK 28-11-01-000-802-A/400	FUEL-TANK ACCESS PANELS - REMOVAL
AMM TASK 28-11-01-400-801-A/400	FUEL-TANK ACCESS PANELS - INSTALLATION
AMM TASK 28-11-01-400-802-A/400	FUEL-TANK ACCESS PANELS - INSTALLATION
AMM TASK 29-10-00-860-802-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH EMDP
AMM TASK 32-00-02-910-801-A/200	SAFETY PIN OF THE NLG DOORS SOLENOID VALVE - INSTALLATION AND REMOVAL
AMM TASK 54-52-01-000-801-A/400	PYLON FAIRINGS - REMOVAL
AMM TASK 54-52-01-400-801-A/400	PYLON FAIRINGS - INSTALLATION
AMM TASK 71-11-01-000-801-A/400	ENGINE UPPER COWLING - REMOVAL
AMM TASK 71-11-01-400-801-A/400	ENGINE UPPER COWLING - INSTALLATION
S.B.145-32-0036	-
S.B.145-32-0046	-

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 036	Hydraulic platform	To get access to the task area	

- E. Auxiliary Items
Not Applicable
- F. Consumable Materials
Not Applicable
- G. Expandable Parts
Not Applicable
- H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Where applicable

I. Preparation

SUBTASK 841-002-A

- (1) On aircraft PRE-MOD. [S.B.145-32-0036](#), make sure that the pressure in hydraulic system 1 is fully released ([AMM TASK 29-10-00-860-802-A/200](#)).
- (2) On aircraft POST-MOD. [S.B.145-32-0036](#), install the safety pin of the NLG door solenoid valve ([AMM TASK 32-00-02-910-801-A/200](#)).
- (3) Put a "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" warning tag at the control wheels and control pedestal in the cockpit.
- (4) Deenergize the aircraft.
- (5) Put the hydraulic platform in the correct position and at the necessary height.

J. Inspect (Detailed Inspection) HIRF/Lightning Protection Systems Electrical and Electronic Connectors

SUBTASK 220-002-A

- (1) Nose HIRF/Lightning Protection - Inspection.
 - (a) Do a detailed visual inspection on the connectors and bonding jumpers shown in the tables, as follows:
 - 1 Make sure:
 - a That the connectors and backshells are tight, the shield termination at the tag-rings is attached, and there is no damage, corrosion, or deformation at the connector.
 - b If there is lockwire on the connector assembly, that it is not loose and, if the connector is protected with a heat-shrinkable boot, that there is no damage to the boot. If there is damage to the boot, replace the boot. Before you install the new boot, do the steps above.
 - c That the bonding jumpers are attached and that there is no damage, corrosion, or deformation at the bonding jumper.

(2)

Table 601 - CONNECTORS

CONNECTOR	ACCESS PANEL/ DOOR (Refer to AMM MPP 06-41-00/100)	HARNESS	SYSTEM
J1013	113CZ	W001	AHRS 1
J1012	113CZ	W001	AHRS 2
P1023	113CZ	W001	ADC 1
P1022	113CZ	W001	ADC 2
P0737	113CZ	W001	FRONT BULKHEAD
P0738	113CZ	W001	FRONT BULKHEAD
P0777	116	W015	FRONT BULKHEAD
P0772	116	W012	FRONT BULKHEAD
P0755	113CZ	W001	FRONT BULKHEAD
P0774	116	W014	FRONT BULKHEAD
P0771	115	W016	FRONT BULKHEAD
P0773	115	W017	FRONT BULKHEAD
P0042	711	W012	UP PROX SW 1/NLG
P0262 ^[1] P2834 ^[2]	711	W019	WOW PROX SW/NLG
P0043	711	W014	UP PROX SW 2/NLG
P0039	711	W016	DOWN PROX SW 1/NLG
P0040	711	W017	DOWN PROX SW 2/NLG

[1] PRE-MOD. S.B.145-32-0046.

[2] POST-MOD. S.B.145-32-0046.

(3)

Table 602 - BONDING JUMPERS

BONDING JUMPER	QUANTITY
NOSE LANDING GEAR	2

(4) Wing, Stub, and Fairing HIRF/Lightning Protection - Inspection.

(a) Do a detailed visual inspection on the connectors, bonding jumpers, and conductive gaskets shown in the tables, as follows:

1 Make sure:

- a That the connectors and backshells are tight, the shield termination at the tag-rings is attached, and that there is no damage, corrosion, or deformation at the connector.
- b If there is lockwire on the connector assembly, that it is not loose and, if the connector is protected with a heat-shrinkable boot, that there is

no damage to the boot. If the boot is damaged, replace the boot. Before the installation of the new boot, do the steps above.

- c That the bonding jumpers are attached and that there is no damage, corrosion, or deformation at the bonding jumper.
- d That there is no damage, erosion, deformation, or fluid contamination at the conductive gaskets.

(5)

Table 603 - CONNECTORS

CONNECTOR	ACCESS PANEL/ DOOR (Refer to AMM MPP 06-41-00/100)	HARNESS	SYSTEM
P0048 LEFT WING	731	W502	UP PROX 2 LDG - LEFT WING
P1138 LEFT WING	193BL	W502	REAR WING TO FUSE- LAGE FAIRING
MT005 LEFT WING	NOT APPLICA- BLE ^[3]	W502	FLUX VALVE 1
P2038 LEFT WING	195CL	W513	DW PROX SW 2
P0815 LEFT WING	195CL	W509	LEFT WING SPAR III
P0811 LEFT WING	195CL	W508	LEFT WING SPAR III
P0813 LEFT WING	195CL	W511	LEFT WING SPAR III
P0806 LEFT WING	195CL	W510	LEFT WING SPAR III
P0047 LEFT WING	731	W508	UP PROX SW 1 - LEFT WING
P0261 LEFT WING	731	W509	WOW PROX SW 1 - LEFT WING
P2037 LEFT WING	731	W513	DOWN PROX SW 2 - MAIN LANDING GEAR
P0045 LEFT WING	731	W511	DOWN PROX SW 1 - LEFT WING
P1192 LEFT WING ^[1] P2835 LEFT WING ^[2]	731	W510	WOW PROX SW 2 - LAND- ING GEAR
P1192 RIGHT WING ^[1] P2835 RIGHT WING ^[2]	721	W510	WOW PROX SW 2 - LAND- ING GEAR

[1] PRE-MOD. S.B.145-32-0046.

[2] POST-MOD. S.B.145-32-0046.

[3] Get access to the flux detector unit (TASK 34-21-02-000-801-A).

(5)

Table 603 - CONNECTORS (Continued)

CONNECTOR	ACCESS PANEL/ DOOR (Refer to AMM MPP 06-41-00/100)	HARNESS	SYSTEM
P0048 RIGHT WING	721	W502	UP PROX SW 2 LDG - RIGHT WING
P1138 RIGHT WING	193CR	W502	REAR WING-TO-FUSELAGE FAIRING
MT005 RIGHT WING	NOT APPLICABLE ^[3]	W502	FLUX VALVE 2
P2038 RIGHT WING	194CR	W513	DW PROX SW 2
P0815 RIGHT WING	194CR	W509	RIGHT WING SPAR III
P0811 RIGHT WING	194CR	W508	RIGHT WING SPAR III
P0813 RIGHT WING	194CR	W511	RIGHT WING SPAR III
P0806 RIGHT WING	194CR	W510	RIGHT WING SPAR III
P0047 RIGHT WING	721	W508	UP PROX SW 1 - RIGHT WING
P0261 RIGHT WING ^[1] P2833 RIGHT WING ^[2]	721	W509	WOW PROX SW 1 - RIGHT WING
P2037 RIGHT WING	721	W513	DOWN PROX SW 2
P0045 RIGHT WING	731	W511	DOWN PROX SW 1 - RIGHT WING
P0044	731	W503	DOWN PROX SW 2 - LEFT WING
P1232	721	W603	DOWN PROX SW 2 - RIGHT WING
P0793	191EL	W503	FWD WING-TO-FUSELAGE FAIRING
P0794	191FR	W603	FWD WING-TO-FUSELAGE FAIRING
P1060	193AL	W170	REAR WING-TO-FUSELAGE FAIRING
P1104	193AL	W170	FSCU - REAR WING-TO-FUSELAGE
P1103	193AL	W139	FSCU - REAR WING-TO-FUSELAGE

[1] PRE-MOD. S.B.145-32-0046.

[2] POST-MOD. S.B.145-32-0046.

[3] Get access to the flux detector unit (TASK 34-21-02-000-801-A).

(5)

Table 603 - CONNECTORS (Continued)

CONNECTOR	ACCESS PANEL/ DOOR (Refer to AMM MPP 06-41-00/100)	HARNESS	SYSTEM
P1106	193AL	W139	LEFT FLAP DRIVE MOTOR UNIT - REAR WING-TO-FU- SELAGE
P1108	193AL	W139	RIGHT FLAP DRIVE MO- TOR UNIT - REAR WING- TO-FUSELAGE

(6)

Table 604 - BONDING JUMPERS

BONDING JUMPER	QUANTITY
RIGHT WING-TO-STUB	3 ^[1] 1 ^[2]
LEFT WING-TO-STUB	3 ^[1] 1 ^[2]
RIGHT WING-TO-AILERON	2
LEFT WING-TO-AILERON	2
RIGHT MAIN LANDING GEAR	2
LEFT MAIN LANDING GEAR	2

[1] PRE-MOD. SB. 145-57-0032

[2] POST-MOD. SB. 145-57-0032

(7)

Table 605 - CONDUCTIVE GASKETS

CONDUCTIVE GASKETS	QUANTITY
FUEL TANK PANEL GASKETS ^[1]	20 (FOR EMB-145MR/MP/ER/EP/EU AND EMB-135ER MODELS) 22 (FOR EMB-145LR/LU AND EMB-135LR MODELS)

[1] Remove the fuel-tank access panels ([AMM TASK 28-11-01-000-801-A/400](#)) or ([AMM TASK 28-11-01-000-802-A/400](#)) as applicable.

(8) Engine, Tail Cone, and Empennage HIRF/Lightning Protection - Inspection.

(a) Do a detailed visual inspection on the connectors, bonding jumpers, and conductive gaskets shown in the tables, as follows:

1 Make sure:

- a That the connectors and backshells are tight, the shield termination at the tag-rings is attached, and that there is no damage, corrosion, or deformation at the connector.
- b If there is lockwire on the connector assembly, that it is not loose and, if the connector is protected with a heat-shrinkable boot, that there is no damage to the boot. If the boot is damaged, replace the boot. Before the installation of the new boot, do the steps above.

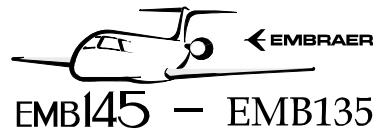
- c That the bonding jumpers are attached and there is no damage, corrosion, or deformation at the bonding jumper.
- d That there is no damage, erosion, deformation, or fluid contamination at the conductive gaskets.

(9)

Table 606 - ENGINES, TAIL CONE, AND EMPENNAGE

CONNECTOR	ACCESS PANEL/DOOR (Refer to AMM MPP 06-41-00/100)	HARNESS	SYSTEM
P1	NOT APPLICABLE ^[1]	W11 (BLUE)	FADEC "A"
P1	NOT APPLICABLE ^[1]	W14 (YELLOW)	FADEC "B"
P1	NOT APPLICABLE ^[1]	W11 (BLUE)	CIP T2.5
P1	NOT APPLICABLE ^[1]	W14 (YELLOW)	CIP T2.5
P5	NOT APPLICABLE ^[1]	W14 (YELLOW)	CIP P2.5 SENSOR B
P8	NOT APPLICABLE ^[1]	W11 (BLUE)	PMA
P8	NOT APPLICABLE ^[1]	W14 (YELLOW)	PMA
P7	NOT APPLICABLE ^[1]	W11 (BLUE)	N2 SENSOR A
P6	NOT APPLICABLE ^[1]	W11 (BLUE)	FPMU
P6	NOT APPLICABLE ^[1]	W14 (YELLOW)	FPMU
P3	NOT APPLICABLE ^[1]	W11 (BLUE)	CTL/IGNITION UNIT A
P3	NOT APPLICABLE ^[1]	W14 (YELLOW)	CTL/IGNITION UNIT B
P10	NOT APPLICABLE ^[1]	W14 (YELLOW)	-
J9	NOT APPLICABLE ^[1]	W14 (YELLOW)	ITT TRIM
J9	NOT APPLICABLE ^[1]	W11 (BLUE)	ITT TRIM
P0828	312AR	W302	REAR BULKHEAD - REAR FUSELAGE II
P0827	312AR	W301	REAR BULKHEAD - REAR FUSELAGE II

[1] Remove the upper cowling (AMM TASK 71-11-01-000-801-A/400).



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(9) Table 606 - ENGINES, TAIL CONE, AND EMPENNAGE (Continued)

CONNECTOR	ACCESS PANEL/DOOR (Refer to AMM MPP 06-41-00/100)	HARNESS	SYSTEM
P1085	324FR	W301	HSA - FIN SPAR II
P1087	324EL	W302	HSA - FIN SPAR II
P1086	324FR	W302	HSA - FIN SPAR II
P1088	324FR	W302	HSA - FIN SPAR II

(10) Table 607 - BONDING JUMPERS

BONDING JUMPER	QUANTITY
RIGHT ELEVATOR-TO-HORIZONTAL STABILIZER	2
LEFT ELEVATOR-TO-HORIZONTAL STABILIZER	2
RIGHT ELEVATOR TABS-TO-ELEVATOR	3
LEFT ELEVATOR TABS-TO-ELEVATOR	3
HORIZONTAL STABILIZER-TO-VERTICAL EMPENNAGE	2
EXTERNAL RUDDER-TO-INTERNAL RUDDER	2
INTERNAL RUDDER-TO-VERTICAL EMPENNAGE	2
RIGHT PYLON-TO-FUSELAGE	2
LEFT PYLON-TO-FUSELAGE	2
RIGHT NACELLE-PYLON	4
LEFT NACELLE-PYLON	4
RIGHT YOKE-ENGINE	6
LEFT YOKE-ENGINE	6

(11) Table 608 - CONDUCTIVE GASKETS

CONDUCTIVE GASKETS	QUANTITY
P-SHAPED CONDUCTIVE RUBBER AROUND PYLON-NACELLE FAIRING ^[1]	2

[1] Remove the pylon fairings ([AMM TASK 54-52-01-000-801-A/400](#)).

K. Follow-on

SUBTASK 842-002-A

- (1) On aircraft POST-MOD. [S.B.145-32-0036](#), remove the safety pin of the NLG-door solenoid valve ([AMM TASK 32-00-02-910-801-A/200](#)).
- (2) Do an inspection on the fuel quantity indication harness (TASK 28-41-00-200-801-A).



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NOTE: The inspection of fuel quantity indication harness is a part of Critical Design Configuration Control Limitations (CDCCL) in the Airworthiness Limitations (Section 6) of the Maintenance Review Board Report (MRB).

- (3) Install the fuel-tank access panels ([AMM TASK 28-11-01-400-801-A/400](#)) or ([AMM TASK 28-11-01-400-802-A/400](#)) as applicable.
- (4) Install the upper cowling ([AMM TASK 71-11-01-400-801-A/400](#)).
- (5) Install the pylon fairings ([AMM TASK 54-52-01-400-801-A/400](#)).
- (6) Remove the "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" tag from the cockpit.
- (7) Remove the hydraulic platform.