LIGHTNING STRIKE - INSPECTION/CHECK

EFFECTIVITY: ALL

1. General

   A. This section gives the procedure to do a general inspection/check after a lightning strike on the aircraft.

   B. Lightning:

      (1) Lightning always has two or more attachment points (one entry and one exit) on the aircraft skin.

      (2) Lightning usually attaches to the aircraft in zones of high curvature (for example nose, engine inlets).

      (3) Lightning moves back along the surface of the aircraft (swept stroke zone). This can cause a chain of scattered attachment points along a line in the direction of travel of the aircraft. During this sweeping movement, the lightning stays attached in the exit point.

   C. Effects on the aircraft structure and systems.

      The lightning strike can cause direct and indirect effects on the aircraft:

      (1) Direct effects.

         The direct effects are the physical damage related to signs such as:

         (a) Pitting/meltthrough:

            - This is the action of the electrical arc made when a lightning stroke attaches to the aircraft (arc root damage at the attachment points or damage caused by current flow which can also appear far from the attachment points).
            - Signs of a lightning attachment are pitting and scorch marks and paint discoloration.
            - On composite components, paint discoloration and skin puncturing and also some delamination of the fibers can occur. If there is skin puncturing, there can be damage to the grounded equipment below the composite-material fairings.

         (b) Resistive heating:

            - When lightning currents flow through an aircraft structure, energy is changed into heat along its path.
            - Resistive heating usually causes marks of the weld type, specially where the lightning current flows for some time.

         (c) Magnetic force:

            - The damage usually occurs where a small area causes the density of the current to be high.

         (d) Acoustic shock wave:

- When a lightning strike occurs, there is an acoustic shock wave. If the intensity of this shock wave is high, it can cause deformation of thin metal skins or rupture of thin composite skins.

(2) Indirect effects:

(a) Electromagnetic fields:

- The electromagnetic fields related to the lightning attachment can cause unwanted transient voltages and currents in the aircraft wiring and systems. In some conditions, the effect on the systems can be temporary and the systems can operate correctly again after the strike. In other conditions, the damage can be permanent and it will be necessary to replace parts.
- This electromagnetic fields can also magnetize some steel parts on the aircraft.

D. Aircraft zoning:

(1) The aircraft surfaces are divided into three zones, and each zone has different lightning attachment and/or transfer characteristics. Zones 1 and 2 can be divided again into A and B regions if there is the probability that the flash will hang on for a long time. They are defined as follows:

(a) Zone 1: Surfaces of the aircraft for which there is a high probability of initial lightning flash attachment (entry or exit).

1 Zone 1A: Initial attachment point with low probability of flash hang-on; for example, a leading edge.

2 Zone 1B: Initial attachment point with high probability of flash hang-on; for example, a trailing edge.

(b) Zone 2: Surfaces of the aircraft across which there is a high probability that a lightning flash will be swept by the airflow from a zone 1 point of initial flash attachment.

1 Zone 2A: A swept stroke zone with low probability of flash hang-on; for example, wing midspan.

2 Zone 2B: A swept stroke zone with high probability of flash hang-on; for example, an elevator trailing edge.

(c) Zone 3: Zone 3 includes all of the aircraft areas not included in zone 1 and zone 2 regions. In zone 3 there is a low probability of an attachment of the direct lightning flash arc. Zone 3 areas can carry large quantities of electrical current but only by direct conduction between some pair of direct or swept stroke attachment points.

E. 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*
05-50-01-200-801-A	LIGHTNING STRIKE - GENERAL INSPECTION	ALL
05-50-01-200-802-A	FORWARD FUSELAGE AND NOSE LANDING GEAR - DETAILED INSPECTION	ALL

(Continued)

TASK NUMBER	*DESCRIPTION*	*EFFECTIVITY*
05-50-01-200-803-A	CENTER FUSELAGE MAIN LANDING GEARS AND WING STUB - INSPECTION	ALL
05-50-01-200-804-A	WINGS - DETAILED INSPECTION	ALL
05-50-01-200-805-A	ENGINE NACELLE - DETAILED INSPEC-TION	ALL
05-50-01-200-806-A	REAR FUSELAGE AND EMPENNAGE - DETAILED INSPECTION	ALL

TASK 05-50-01-200-801-A
EFFECTIVITY: ALL

2. LIGHTNING STRIKE - GENERAL INSPECTION

A. General

(1) This task gives the procedure to do a general inspection after a lightning strike.

(2) When you do the inspection, look for all the usual signs of lightning strike damage, which are:

- Burning or scorching of the aircraft skin.
- Pitting damage to the aircraft skin.
- Discoloration of the surface finish.
- Loose or missing rivets.
- Damaged or loose components.
- Damage to the aircraft structure.

(3) The ground persons must write the related data in the LIGHTNING STRIKE INCIDENT REPORT form (Figure 604) and send the form for EMBRAER to complete the lightning data base.

Part I of the LIGHTNING STRIKE INCIDENT REPORT form is for the flight crew and is shown in the Airplane Operation Manual, vol. 1, page block 1-03-70.

(4) All events reported by the crew must be checked in addition/conjunction with this inspection.

(5) The lightning attachment zones are shown in Figure 601.

(6) The bonding jumpers are used to be a very low resistance path for the current from one part of the aircraft structure to other one. The electrical bonding map (AMM TASK 20-13-21-210-801-A/200) shows the primary bonding jumpers that are in the most probable path of a lightning strike.

NOTE: Some external mounted bonding jumpers are required, but they are not essential for all flights. The aircraft can be dispatched without some of these bonding jumpers, following the maintenance instructions in electrical bonding map (AMM TASK 20-13-21-210-801-A/200). For damaged bonding jumpers in other locations, call Embraer Technical Support to receive proper orientation.

(7) As a result of this task, you will have to do detailed inspections on the areas affected by the lightning strike. This is an example of inspection (Figure 603) and detailed inspection that is necessary in this case:

(a) After a general inspection, you find out that the lightning entry point was the nose and the exit point was the horizontal stabilizer.

(b) Marks come into view on the fuselage between the entry and exit point.

(c) With the lightning inspection map (Figure 603), you find out that a detailed inspection on these areas is necessary:

- Forward Fuselage and Nose Landing Gear.

- Center Fuselage, Main Landing Gears, and Wing Stub.
- Rear Fuselage and Empennage.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 05-50-01-200-802-A/600	FORWARD FUSELAGE AND NOSE LANDING GEAR - DETAILED INSPECTION
AMM TASK 05-50-01-200-803-A/600	CENTER FUSELAGE MAIN LANDING GEARS AND WING STUB - INSPECTION
AMM TASK 05-50-01-200-804-A/600	WINGS - DETAILED INSPECTION
AMM TASK 05-50-01-200-805-A/600	ENGINE NACELLE - DETAILED INSPECTION
AMM TASK 05-50-01-200-806-A/600	REAR FUSELAGE AND EMPENNAGE - DETAILED INSPECTION
AMM TASK 20-13-01-910-801-A/200	DISPLAY UNIT - DEGAUSSING
AMM TASK 20-13-21-210-801-A/200	ELECTRICAL BONDING MAP - STANDARD PROCEDURES
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
S.B.145-32-0036	-
SB145-32-0036	-

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) Put the hydraulic platform in the correct position and at the necessary height.

J. Inspection (Figure 602)

SUBTASK 212-002-A

(1) Carefully examine and write down visible damaged areas for each of these items:

(a) Forward Fuselage and Nose Landing Gear:

1 Aircraft skin panel (specially the radome skin panel and the cockpit window structure).

2 Nose landing gear.

3 Nose landing light and taxi lights.

4 Doors (specially the battery compartment door, the hydraulic compartment door, and the NLG-doors).

5 Protruding components (specially the ice detectors, the pitot tubes, the angle-of-attack vanes, the TAT probes, and the anemometric static ports).

6 Antennas.

7 Primary bonding jumpers (TASK 20-13-21-700-801-A).

(b) Center Fuselage, Main Landing Gears, Wing Stub.

1 Center fuselage and wing stub skin panels.

2 Fairings.

3 LH and RH main landing gears.

4 Fuselage doors (specially MLG doors).

5 Antennas.

6 Upper and lower red beacon lights.

7 Primary bonding jumpers (TASK 20-13-21-700-801-A).

(c) Wings:

1 Skin panels, leading edges, and wing tip fairings.

2 Flight control surfaces (specially their trailing edges).

3 Wing access panels.

4 Navigation, strobe, and landing lights.

5 Static dischargers on the aileron and wing tips.

6 Primary bonding jumpers (TASK 20-13-21-700-801-A).

(d) Engine Nacelles:

1 Engine air intake.

2 Skin panels of nacelles.

3 Exhaust nozzle.

4 Visible rubber gaskets.

5 Primary bonding jumpers (TASK 20-13-21-700-801-A).

(e) Vertical and Horizontal Stabilizers:

1 Dorsal fin and vertical stabilizer skin panels.

2 Rudders skin panel (specially their trailing edge).

3 Horizontal stabilizer skin panel (specially the horizontal stabilizer tip fairings, the leading edge, and the trailing edge).

4 Elevator skin panel (specially the elevator tip fairings, and the trailing edges).

5 Antennas.

6 Static dischargers.

7 Navigation and strobe lights.

8 Primary bonding jumpers (TASK 20-13-21-700-801-A).

(2) As a function of the results of item (1), do the detailed inspections as necessary, as follows:

(a) Use the results of item (1) to identify the main entry and exit points of the lightning strike. Compare to the numbers in a circle of the inspection map (Figure 602).

(b) Do the detailed inspection on the zones between the entry and exit points, refer to inspection map (Figure 603).

Table 601 - LIGHTNING STRIKE - DETAILED INSPECTION REFERENCE

Area where the damage is found	Task that must be done
Forward Fuselage and Nose Landing Gear	AMM TASK 05-50-01-200-802-A/600

Table 601 - LIGHTNING STRIKE - DETAILED INSPECTION REFERENCE (Continued)

Area where the damage is found	Task that must be done
Center Fuselage, Main Landing Gears, and Wing Stub	AMM TASK 05-50-01-200-803-A/600
Wings	AMM TASK 05-50-01-200-804-A/600
Engine Nacelles	AMM TASK 05-50-01-200-805-A/600
Rear Fuselage, and Empennage	AMM TASK 05-50-01-200-806-A/600

(c) If damage is found in zones that are not on the path between the entry and exit points, do an inspection also in these zones.

(d) If damage is found, but you are not sure of the main entry and exit points of the lightning strike, examine all aircraft zones.

K. Cockpit Interior - Inspection

SUBTASK 212-003-A

(1) Fully inspect the cockpit interior.

(2) On the instrument panel, examine the displays. If they are magnetized, their colors can be changed. If it occurs, degauss the Display Units (DU) (AMM TASK 20-13-01-910-801-A/200).

(3) Replace the unserviceable components (Refer to AMM).

L. Follow-on

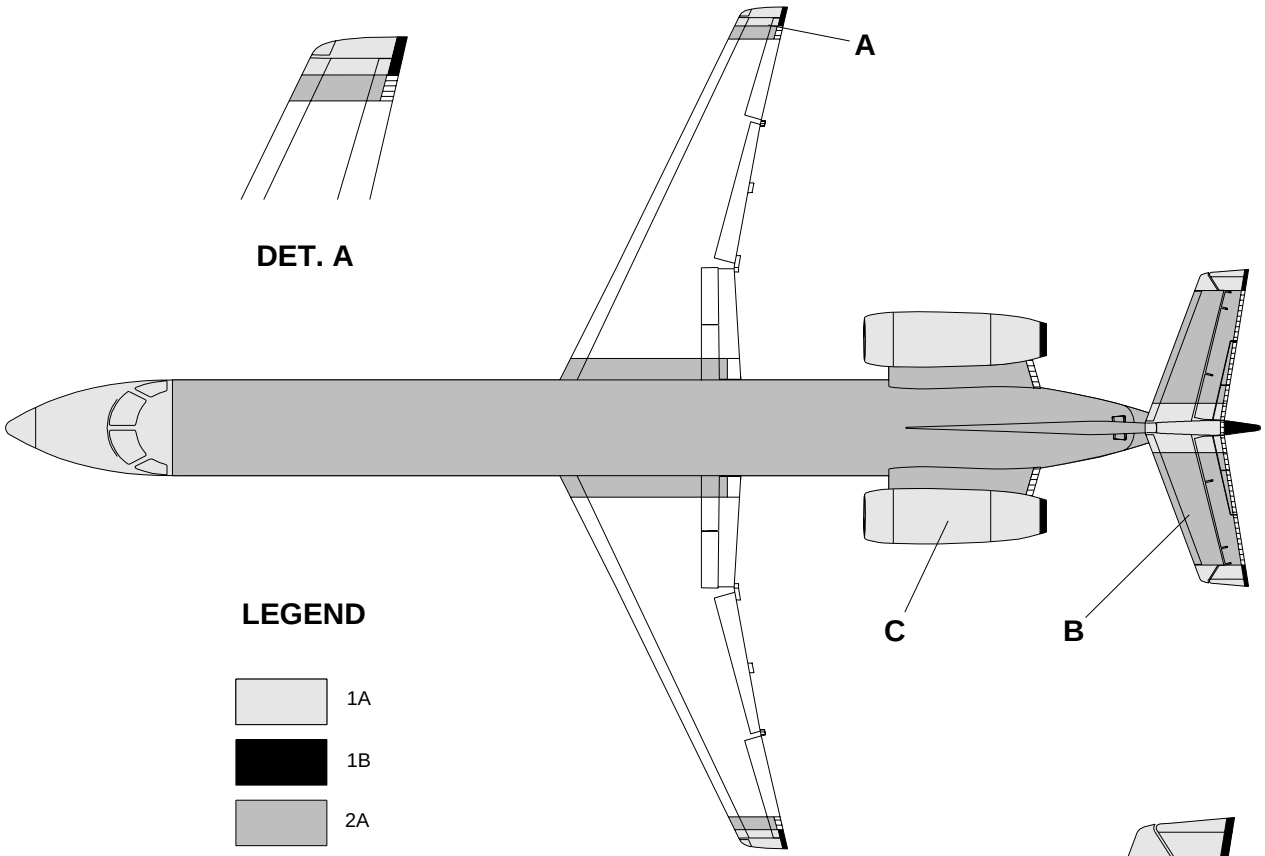
SUBTASK 842-002-A

(1) On aircraft POST-MOD SB145-32-0036, remove the safety pin of the NLG-door solenoid valve (AMM TASK 32-00-02-910-801-A/200).

(2) Remove the "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" tag from the cockpit.

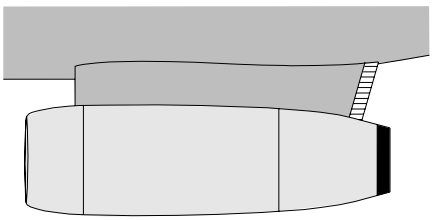
(3) Remove the hydraulic platform.

EFFECTIVITY: ALL
Lightning Zoning
Figure 601 - Sheet 1

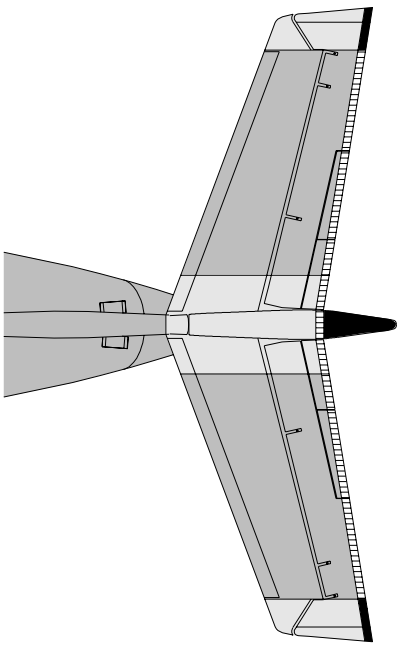


DET. A

LEGEND



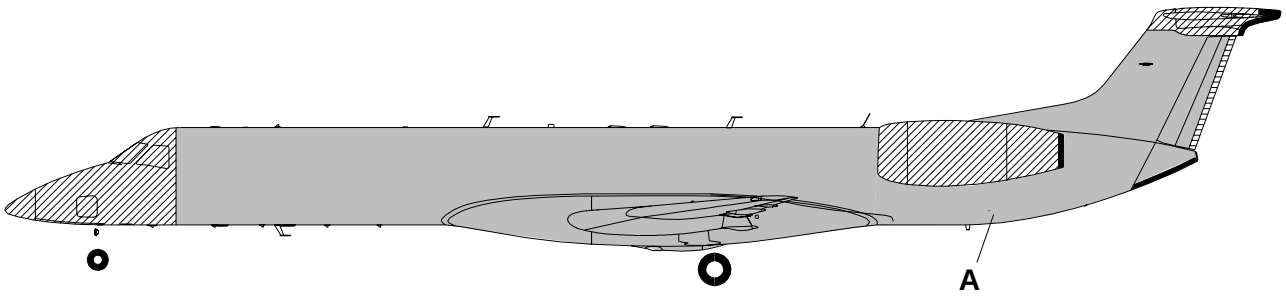
DET. C



DET. B

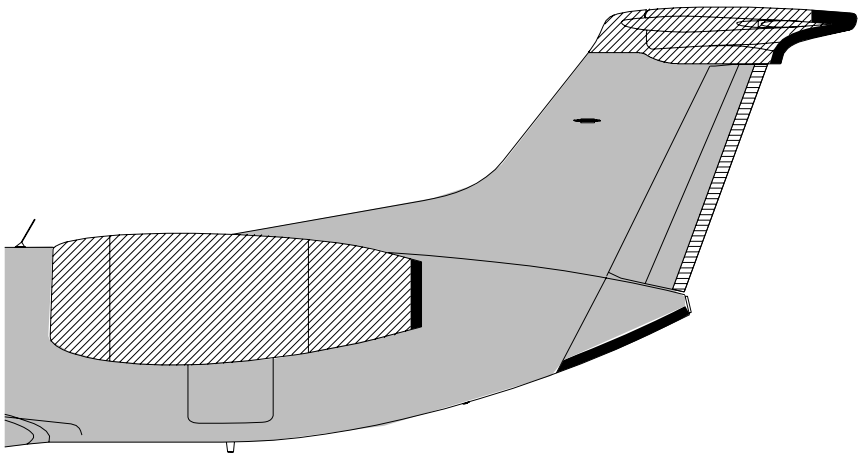
145AMM050001.MCE A

EFFECTIVITY: ALL
Lightning Zoning
Figure 601 - Sheet 2

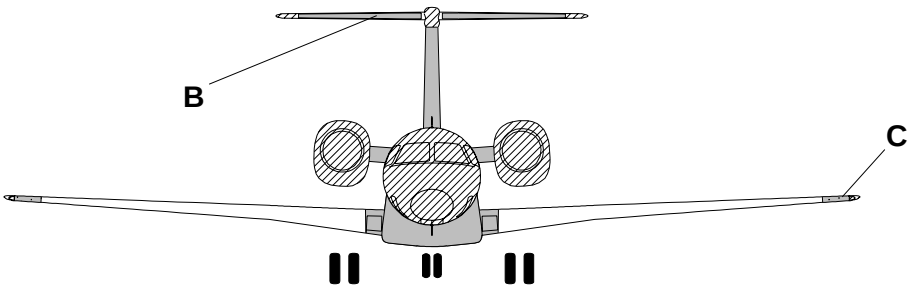


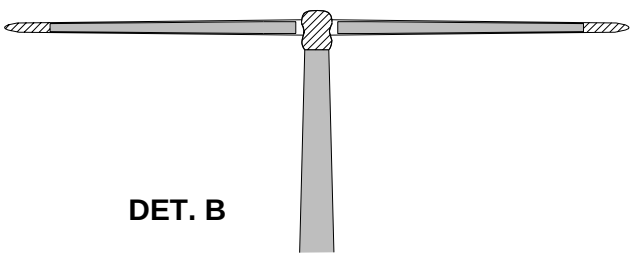
LEGEND

1A
1B
2A
2B
3



DET. A





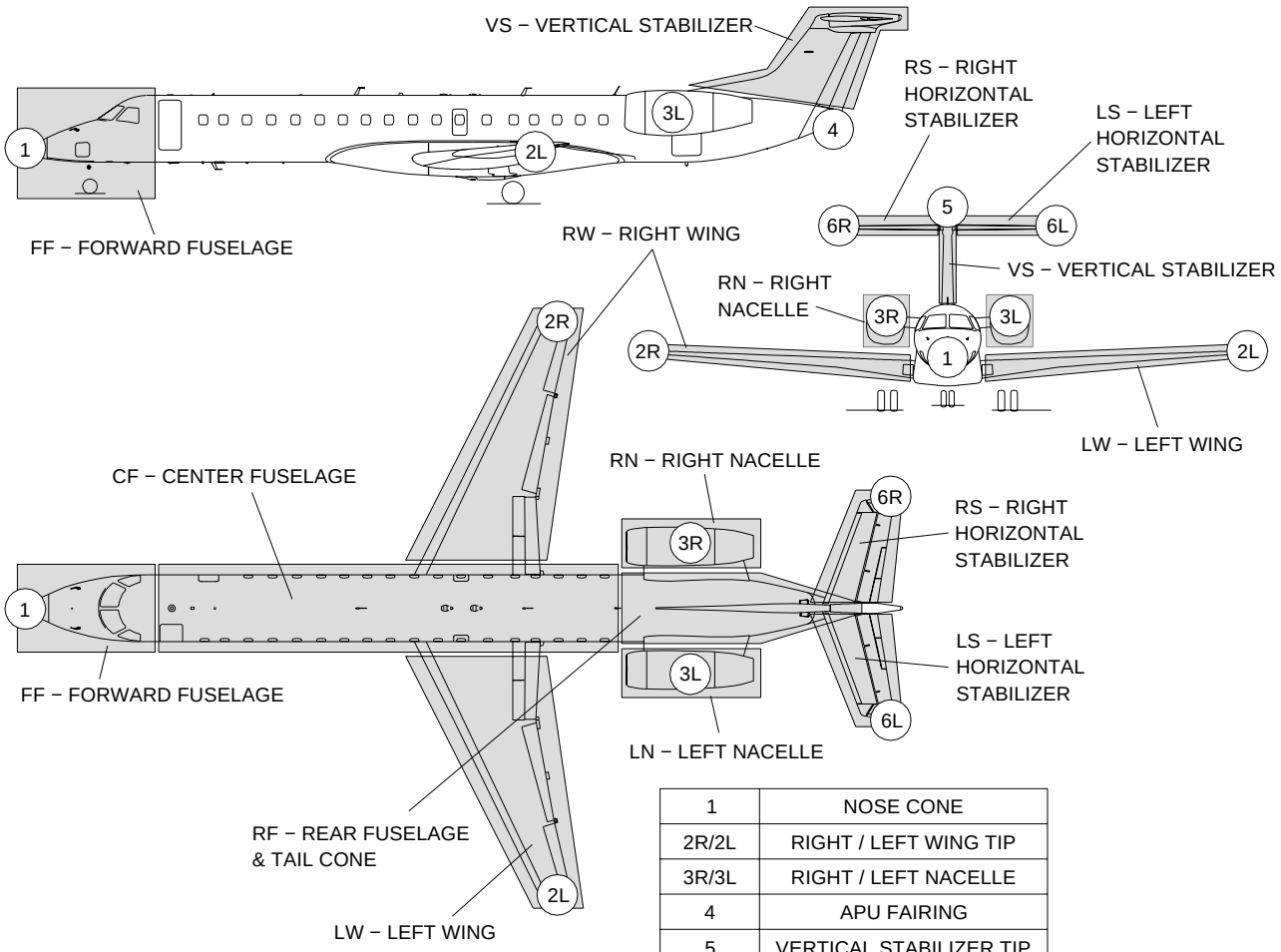
DET. B

DET. C

145AMM050002.MCE A

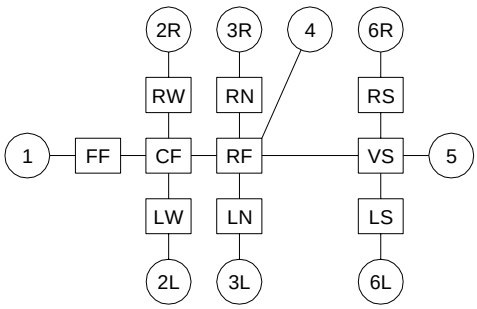
EFFECTIVITY: ALL

Lightning Inspection Map
Figure 602



1	NOSE CONE
2R/2L	RIGHT / LEFT WING TIP
3R/3L	RIGHT / LEFT NACELLE
4	APU FAIRING
5	VERTICAL STABILIZER TIP
6R/6L	RIGHT / LEFT HORIZONTAL STABILIZER TIPS

LIGHTNING ENTRY / EXIT POINTS



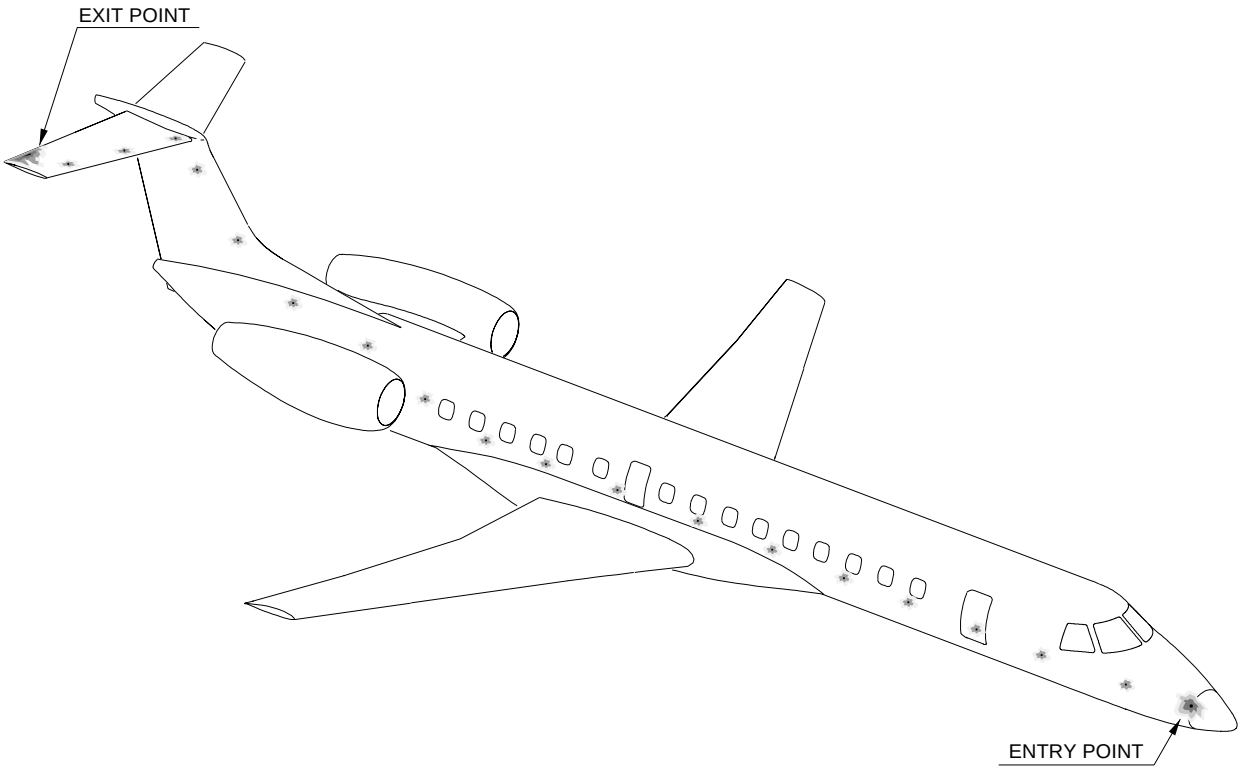
FF	FORWARD FUSELAGE
CF	CENTER FUSELAGE & PYLONS
RW/LW	RIGHT / LEFT WING
RF	REAR FUSELAGE & TAIL CONE
RN/LN	RIGHT / LEFT NACELLE
VS	VERTICAL STABILIZER
RS/LS	RIGHT / LEFT HORIZONTAL STABILIZER

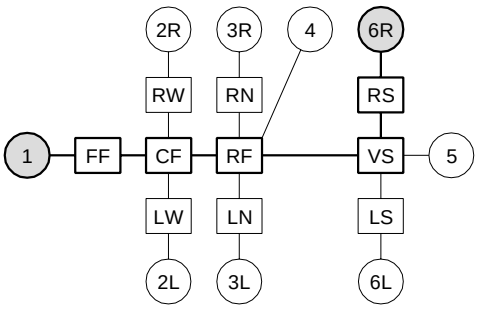
DETAILED INSPECTION ZONES

EM145AMM050569B.DGN

EFFECTIVITY: ALL

Lightning Inspection Map - Example
Figure 603





LIGHTNING INSPECTION MAP

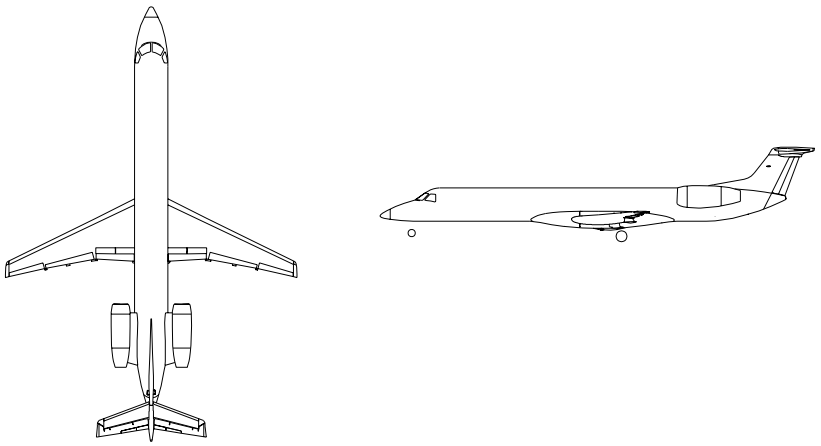
145AMM050568.MCE

EFFECTIVITY: ALL
Lightning Strike Incidence Form
Figure 604

Part II (to be completed by ground crew):

Please mark stroke attachment points (burn marks) on aircraft sketch below.

Indicate whether top or bottom, forward or aft, etc.



Attach photographs of struck area, if possible, or enlargement sketch of struck area.

Describe any damage to aircraft structure or external component believed to be the result of the lightning strike, especially burn through holes at skin, their location and diameter:

_____
_____
_____
_____
_____
_____

Describe any damage to avionics or electrical components believed to have occured as a result of the lightning strike:

_____
_____
_____
_____
_____
_____

Part II completed by: _____

145AMM050004.MCE A

TASK 05-50-01-200-802-A
EFFECTIVITY: ALL

3. FORWARD FUSELAGE AND NOSE LANDING GEAR - DETAILED INSPECTION

A. General

(1) This task gives the procedure to do a detailed inspection/check on the forward fuselage and nose landing gear after a lightning strike on the aircraft.

(2) Refer to the bonding map to see the primary bonding jumpers of this area (AMM TASK 20-13-21-210-801-A/200). If you find damage or incorrectly attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

NOTE:
- The repair allowed for the bonding jumpers is the installation of a new bonding jumper in case of damaged or missing bonding jumper. If the bonding jumper is incorrectly attached, install it again.
- Some external mounted bonding jumpers are required, but they are not essential for all flights. The aircraft can be dispatched without some of these bonding jumpers, following the maintenance instructions in the bonding map (AMM TASK 20-13-21-210-801-A/200).

(3) When you do the inspection, look for all the usual signs of lightning strike damage, which are:

- Burning or scorching of the aircraft skin
- Pitting damage to the aircraft skin
- Discoloration of the surface finish
- Loose or missing rivets
- Damaged or loose components
- Damage to the aircraft structure

(4) If there is damage to the aircraft structure, refer to the structural repair manual. The SRM has the approved damage limits and repair procedures.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 20-13-01-910-802-A/200	LANDING GEARS WINGS MOUNTS AND ENGINE YOKES - DEGAUSSING
AMM TASK 20-13-21-210-801-A/200	ELECTRICAL BONDING MAP - STANDARD PROCEDURES
AMM TASK 20-13-21-700-801-A/200	ELECTRICAL BONDING TEST - STANDARD PROCEDURES
AMM TASK 29-10-00-860-802-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH EMDP
AMM TASK 30-31-00-700-801-A/500	PITOT AND ANEMOMETRIC STATIC PORT HEATING - OPERATIONAL CHECK

(Continued)

REFERENCE	*DESIGNATION*
AMM TASK 30-31-00-700-802-A/500	PRESSURIZATION STATIC PORT HEATING - OPERATIONAL CHECK
AMM TASK 30-32-00-700-801-A/500	AOA SENSOR HEATING - OPERATIONAL CHECK
AMM TASK 30-33-00-700-801-A/500	TAT SENSOR HEATING - OPERATIONAL CHECK
AMM TASK 30-80-00-700-801-A/500	ICE DETECTION SYSTEM - OPERATIONAL TEST
AMM TASK 32-00-02-910-801-A/200	SAFETY PIN OF THE NLG DOORS SOLENOID VALVE - INSTALLATION AND REMOVAL
AMM TASK 33-41-00-700-801-A/500	LANDING LIGHTS - OPERATIONAL TEST
AMM TASK 33-42-00-700-801-A/500	TAXI LIGHTS - OPERATIONAL TEST
AMM TASK 34-13-00-790-801-A/500	PITOT/STATIC SYSTEM - CHECK FOR LEAK
AMM TASK 34-25-00-700-802-A/500	STANDBY MAGNETIC COMPASS - FUNCTIONAL CHECK
AMM TASK 34-32-00-700-801-A/500	VOR/ILS SYSTEM OPERATIONAL TEST
AMM TASK 34-42-00-700-801-A/500	WEATHER RADAR SYSTEM OPERATIONAL TEST
AMM TASK 34-43-00-700-801-A/500	TCAS - OPERATIONAL TEST
S.B.145-32-0036	-
SB145-32-0036	-
TASK 34-42-00-700-802-A	-

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Forward Fuselage and Nose Landing Gear

I. Preparation

SUBTASK 841-003-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 the hydraulic platform in the correct position and at the necessary height.

J. Inspection

SUBTASK 212-004-A

(1) Examine the interior and exterior of the radome for burns, change of color, and other damage, and examine the bonding jumpers for damage and defective attachment. If there are signs of damage, refer to the SRM to find the specific information applicable to your case. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(2) In the radome compartment, examine the components of the weather radar system for damage. If damage is found, do an operational test of the system (AMM TASK 34-42-00-700-801-A/500) or (TASK 34-42-00-700-802-A), as applicable.

(3) Examine the glide slope antenna and its mounting for damage. If damage is found, do a functional test of the system (AMM TASK 34-32-00-700-801-A/500).

(4) Examine the skin panels of the nose fuselage section for burns, change of color, and other damage. If there are signs of damage, refer to the SRM to find the specific information applicable to your case.

(5) Examine the window structures of the cockpit for burns, cracks and other damage. If there are signs of damage, refer to the SRM to find the specific information applicable to your case.

(6) Examine the battery compartment door, hydraulic compartment door, NLG-doors and their door hinges for damage, and examine the bonding jumpers for damage and defective attachment. If you find damage, refer to the SRM to find the specific information applicable to your case. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(7) If the landing gear was in the down position at the time of the lightning strike, examine it as follows:

(a) Examine the NLG structure and the points where it is attached for signs of heating or arcing, change of color, burns and other damage. Replace the affected components if you find signs of heating or arcing.

(b) Examine the bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(c) Fully examine the electrical harness and components for change of color and burns.

(8) Measure magnetization at the nose landing gear and, if necessary, degauss it (AMM TASK 20-13-01-910-802-A/200).

NOTE: If a lightning hits the nose landing gear, it can cause a strong magnetic field in the strut assembly. This can cause a large error in the standby compass indication.

(9) If the nose landing gear was magnetized, do the functional check of the standby magnetic compass (AMM TASK 34-25-00-700-802-A/500).

(10) Examine these components for damage:

- Ice detectors.
- Pitot tubes
- Angle-of-attack vanes
- TAT probes
- Anemometric static ports
- TCAS II bottom antenna
- Landing light
- Taxi lights

Do one of these checks, as applicable, on the system that you found damaged:

(a) Ice detector heating system (AMM TASK 30-80-00-700-801-A/500).

(b) Pitot and anemometric static port system (AMM TASK 30-31-00-700-801-A/500).

(c) Pitot static leak (AMM TASK 34-13-00-790-801-A/500).

(d) Angle-of-attack vane heating system (AMM TASK 30-32-00-700-801-A/500).

(e) TAT probe heating system (AMM TASK 30-33-00-700-801-A/500).

(f) Pressurization static-port heating system (AMM TASK 30-31-00-700-802-A/500).

(g) TCAS II system (AMM TASK 34-43-00-700-801-A/500).

(h) Landing light (AMM TASK 33-41-00-700-801-A/500).

(i) Taxi lights (AMM TASK 33-42-00-700-801-A/500).

(11) Replace the unserviceable components as per AMM.

K. Follow-on

SUBTASK 842-003-A

(1) On aircraft POST-MOD SB145-32-0036, remove the safety pin of the NLG-door solenoid valve (AMM TASK 32-00-02-910-801-A/200).

(2) Remove the hydraulic platform.

TASK 05-50-01-200-803-A
EFFECTIVITY: ALL

4. CENTER FUSELAGE MAIN LANDING GEARS AND WING STUB - INSPECTION

A. General

(1) This task gives the procedure to do a detailed inspection/check on the center fuselage, main landing gears, and wing stub after a lightning strike on the aircraft.

(2) Refer to the bonding map to see the primary bonding jumpers of this area (AMM TASK 20-13-21-210-801-A/200). If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

NOTE:
- The repair allowed for the bonding jumpers is the installation of a new bonding jumper in case of damaged or missing bonding jumper. If the bonding jumper is incorrectly attached, install it again.
- Some external mounted bonding jumpers are required, but they are not essential for all flights. The aircraft can be dispatched without some of these bonding jumpers, following the maintenance instructions in the bonding map (AMM TASK 20-13-21-210-801-A/200).

(3) When you do the inspection, look for all the usual signs of lightning strike damage, which are:

- Burning or scorching of the aircraft skin
- Pitting damage to the aircraft skin
- Discoloration of the surface finish
- Loose or missing rivets
- Damaged or loose components
- Damage to the aircraft structure

(4) If there is damage to the aircraft structure, refer to the structural repair manual. The SRM has the approved damage limits and repair procedures.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 32-10-01/400	-
AMM TASK 20-13-01-910-802-A/200	LANDING GEARS WINGS MOUNTS AND ENGINE YOKES - DEGAUSSING
AMM TASK 20-13-21-210-801-A/200	ELECTRICAL BONDING MAP - STANDARD PROCEDURES
AMM TASK 20-13-21-700-801-A/200	ELECTRICAL BONDING TEST - STANDARD PROCEDURES
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

(Continued)

REFERENCE	*DESIGNATION*
AMM TASK 33-47-00-700-801-A/500	ANTICOLLISION LIGHTS - OPERATIONAL TEST
S.B.145-32-0036	-
SB145-32-0036	-

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Center Fuselage, Main Landing Gears, Wing Stub

I. Preparation

SUBTASK 841-004-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) Put the hydraulic platform in the correct position and at the necessary height.

J. Inspection

SUBTASK 212-005-A

(1) Examine the center fuselage and wing stub skin panels for damage. If there are signs of damage, refer to the SRM to find the specific information applicable to your case.

(2) Examine all the fuselage doors and fairings for damage, and examine the bonding jumpers for damage and defective attachment. If there are signs of damage, refer to the SRM to find the specific information applicable to your case. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(3) Examine the main landing-gear doors for burns, change of color, and other damage. If you find damage, refer to the SRM to find the specific information applicable to your case.

(4) If the main landing gears were down at the time of the lightning strike or if you find damage on the main landing gear doors, do these procedures:

(a) Examine the main landing gear bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(b) For aircraft with bonding jumper on the trailing arm (Figure 605), examine the main landing gear for signs of heating or arcing damage, and attachment points that cause color change of enamel or chrome, burns, painting/corrosion prevention compound blistering or balling, and other damages. Replace the affected components as per AMM.

(c) For aircraft with bonding jumper on the trailing arm (Figure 605), examine the bonding jumper (1) on the trailing arm for damage and defective attachment. If you find damage or defective attachment, repair it (AMM TASK 20-13-21-700-801-A/200).

(d) For aircraft without bonding jumper on the trailing arm (Figure 605), examine the main landing gear for signs of heating or arcing damage, and attachment points that cause color change of enamel or chrome, burns, painting/corrosion prevention compound blistering or balling, and other damages. If there are signs of lightning strike damage, replace the main landing gear (AMM MPP 32-10-01/400). To restore the main landing gear, send it to the manufacturer's facility or to an authorized workshop.

NOTE: You must refer to the applicable CMM to do the maintenance actions for the component.

(e) Fully examine the electrical harness and components for change of color and burns.

(f) Measure magnetization at the main landing gears and, if necessary, degauss it (AMM TASK 20-13-01-910-802-A/200).

NOTE: If a lightning hits the main landing gear areas, it can cause a strong magnetic field in the main landing gears.

(5) Examine all antennas on the upper and lower fuselage. If damage is found, do a functional test on the related system.

(6) Examine the red beacon lights on the upper and lower fuselage. If you find damage, do an operational test of the red beacon lights (AMM TASK 33-47-00-700-801-A/500).

(7) Replace the unserviceable components as per AMM.

K. Follow-on

SUBTASK 842-004-A

(1) On aircraft POST-MOD SB145-32-0036, remove the safety pin of the NLG-door solenoid valve (AMM TASK 32-00-02-910-801-A/200).

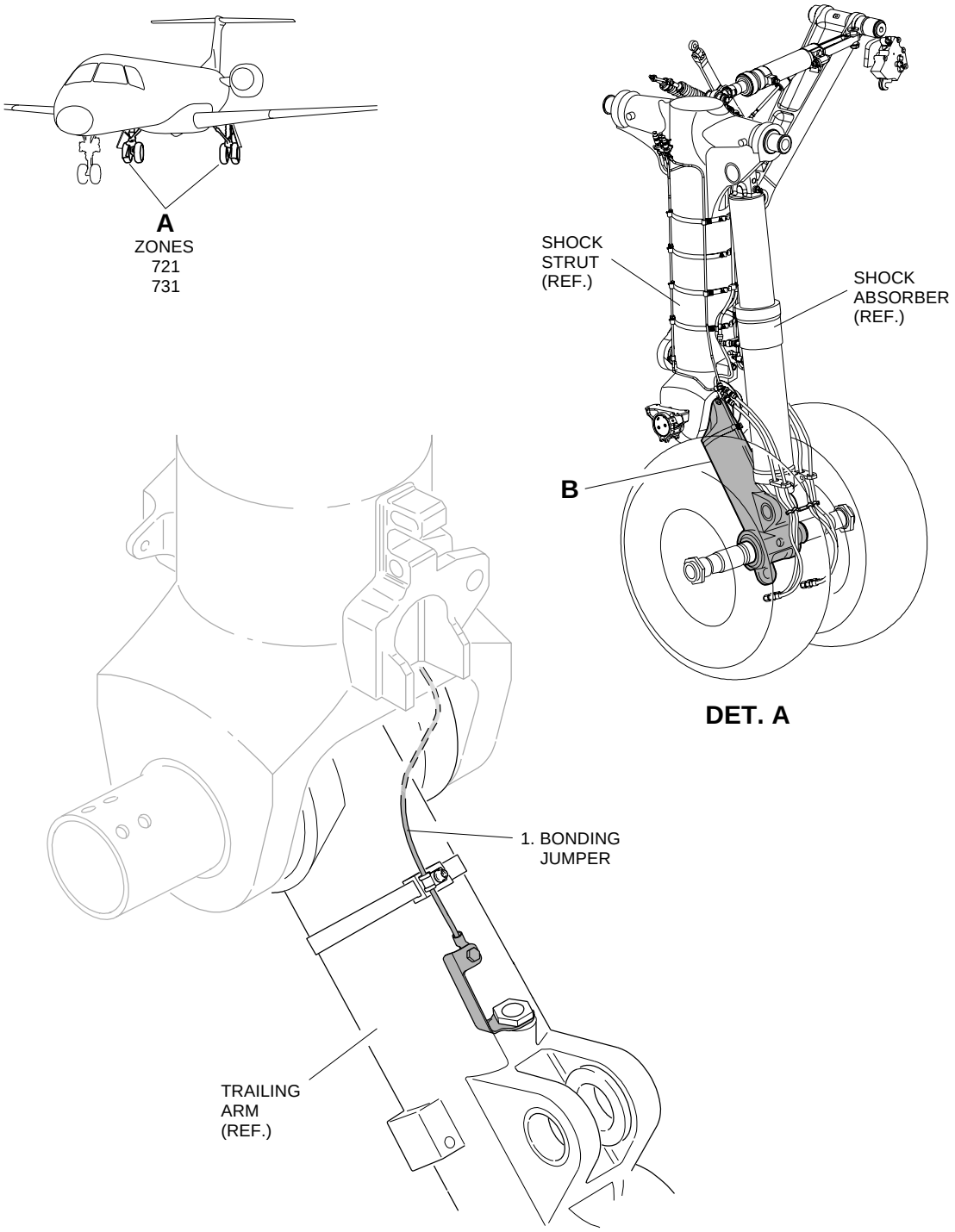
(2) Remove the "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" tag from the cockpit.

(3) Remove the hydraulic platform.

EFFECTIVITY: ACFT WITH BONDING JUMPER ON THE TRAILING ARM

Trailing Arm Bonding Jumper - Detailed Inspection

Figure 605



EM145AMM050740A.DGN

TASK 05-50-01-200-804-A
EFFECTIVITY: ALL

5. WINGS - DETAILED INSPECTION

A. General

(1) This task gives the procedure to do a detailed inspection/check on the wings after a lightning strike on the aircraft.

(2) Refer to the bonding map to see the primary bonding jumpers of this area (AMM TASK 20-13-21-210-801-A/200). If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

NOTE:
- The repair allowed for the bonding jumpers is the installation of a new bonding jumper in case of damaged or missing bonding jumper. If the bonding jumper is incorrectly attached, install it again.
- Some external mounted bonding jumpers are required, but they are not essential for all flights. The aircraft can be dispatched without some of these bonding jumpers, following the maintenance instructions in the bonding map (AMM TASK 20-13-21-210-801-A/200).

B. References

REFERENCE	*DESIGNATION*
AMM TASK 20-13-01-910-802-A/200	LANDING GEARS WINGS MOUNTS AND ENGINE YOKES - DEGAUSSING
AMM TASK 20-13-21-210-801-A/200	ELECTRICAL BONDING MAP - STANDARD PROCEDURES
AMM TASK 20-13-21-700-801-A/200	ELECTRICAL BONDING TEST - STANDARD PROCEDURES
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
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 33-41-00-700-801-A/500	LANDING LIGHTS - OPERATIONAL TEST
AMM TASK 33-43-00-700-801-A/500	NAVIGATION LIGHTS - OPERATIONAL TEST
AMM TASK 33-47-00-700-801-A/500	ANTICOLLISION LIGHTS - OPERATIONAL TEST
S.B.145-32-0036	-
SB145-32-0036	-
TASK 34-21-02-700-802-A	-

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the Task	Wings

I. Preparation

SUBTASK 841-005-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) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP TRAVEL AREA.

(4) Make sure that the aircraft is safe for maintenance.

(5) Set the flaps to the 45-degree position.

(6) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(7) On the Circuit Breaker Panel, open the FLAP 1 and FLAP 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

(8) Put a "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" warning tag at the control wheels and control pedestal in the cockpit.

(9) Put the hydraulic platform in the correct position and at the necessary height.

J. Inspection

SUBTASK 212-006-A

(1) Examine the skin panels of the wings for damage. Carefully examine the leading edges and wing tip fairings. If you find damage, examine the flame arrester in the fuel-system vent outlet for damage.

(2) Examine the wing navigation and strobe lights for damage. If you find damage, do an operational test of the navigation lights (AMM TASK 33-43-00-700-801-A/500) and strobe lights (AMM TASK 33-47-00-700-801-A/500).

(3) Examine all the wing flight-control surfaces for damage. Carefully examine their trailing edges, hinges, and flap rollers. Examine the bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(4) On the wing tip fairings and ailerons, examine the static dischargers and their attachment points for damage.

(5) Examine the landing lights for damage. If you find damage, do an operational test of the landing lights (AMM TASK 33-41-00-700-801-A/500).

(6) Do this item on aircraft with AHRS AH-800.

(a) NOTE: The wing tips must not have magnetic parts installed. If a lightning hits the wing tips where there are magnetic parts, it can cause a strong magnetic field in the wing tips. This can cause a large error in the flux detector indication.

Measure magnetization at the wing tips and make sure that they are not magnetized (AMM TASK 20-13-01-910-802-A/200).

(b) NOTE: If a lightning hits the wings, it can cause a strong magnetic field in the wings. This can cause a large error in the flux detector indication.

Measure magnetization at the wing components (such as flap actuators, flap transmission brake, and aileron primary mechanical controls) and, if necessary, degauss them (AMM TASK 20-13-01-910-802-A/200).

(c) If you find magnetized components, do the functional check of the AHRS flux detector unit (TASK 34-21-02-700-802-A).

(7) Replace unserviceable components (Refer to AMM).

(8) If you find damage to the aircraft structure, repair the related parts (Refer to SRM).

K. Follow-on

SUBTASK 842-005-A

(1) On the Circuit Breaker Panel, close the FLAP 1 and FLAP 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.

(2) Remove the "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" tag from the cockpit.

(3) Energize the aircraft with External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(4) Set the flaps to the 0-degree position.

(5) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(6) On aircraft POST-MOD SB145-32-0036, remove the safety pin of the NLG-door solenoid valve (AMM TASK 32-00-02-910-801-A/200).

(7) Remove the hydraulic platform.

TASK 05-50-01-200-805-A
EFFECTIVITY: ALL

6. ENGINE NACELLE - DETAILED INSPECTION

A. General

(1) This task gives the procedure to do a detailed inspection/check on the engine after a lightning strike on the aircraft.

(2) Refer to the bonding map to see the primary bonding jumpers of this area (AMM TASK 20-13-21-210-801-A/200). If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

NOTE:
- The repair allowed for the bonding jumpers is the installation of a new bonding jumper in case of damaged or missing bonding jumper. If the bonding jumper is incorrectly attached, install it again.
- Some external mounted bonding jumpers are required, but they are not essential for all flights. The aircraft can be dispatched without some of these bonding jumpers, following the maintenance instructions in the bonding map (AMM TASK 20-13-21-210-801-A/200).

B. References

REFERENCE	*DESIGNATION*
AMM TASK 20-13-01-910-802-A/200	LANDING GEARS WINGS MOUNTS AND ENGINE YOKES - DEGAUSSING
AMM TASK 20-13-21-210-801-A/200	ELECTRICAL BONDING MAP - STANDARD PROCEDURES
AMM TASK 20-13-21-700-801-A/200	ELECTRICAL BONDING TEST - STANDARD PROCEDURES
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 71-11-01-000-801-A/400	ENGINE UPPER COWLING - REMOVAL
AMM TASK 71-11-01-400-801-A/400	ENGINE UPPER COWLING - INSTALLATION
AMM TASK 71-52-01-000-801-A/400	ENGINE BONDING STRAPS - REMOVAL
AMM TASK 71-52-01-200-801-A/600	ENGINE BONDING STRAPS - VISUAL INSPECTION
Rolls-Royce Maintenance Manual CSP34022	-
S.B.145-32-0036	-
SB145-32-0036	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
412		LH Engine Upper Cowling
413		RH Engine Cowling Door
414		LH Engine Pylon

(Continued)

ZONE	PANEL/DOOR	LOCATION
422		RH Engine Upper Cowling
423		LH Engine Cowling Door
424		RH Engine Pylon

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Workstand	To get access to the engine	1

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Rear Fuselage, and Empennage

I. Preparation

SUBTASK 841-006-A

(1) On the circuit breaker panel, open the circuit breakers below and attach a "DO-NOT-CLOSE" tag to it:

- START 1.
- START 2.

(2) 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).

(3) 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).

(4) Put a "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" warning tag at the control wheels and control pedestal in the cockpit.

(5) Put the workstand in the work area.

J. Inspection

SUBTASK 212-007-A

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

(2) Examine the engine air intake, exhaust nozzle, and all nacelle surfaces. If damage is found, examine:

- The engine accessories.
- The engine cowling hinges and bonding jumpers. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(3) Examine the engines for damage (Refer to Rolls-Royce Maintenance Manual CSP34022).

(4) NOTE: It is not necessary to remove the pylon upper fairing to examine the yoke-engine bonding jumpers because the upper cowling was removed in step (1).

Examine the engine yoke bonding jumpers for damage and defective attachment (AMM TASK 71-52-01-200-801-A/600). Replace as necessary (AMM TASK 71-52-01-000-801-A/400).

(5) NOTE: If a lightning hits the engine area, it can cause a strong magnetic field in the engine yokes and mounts.

Measure magnetization at the engine yokes and mounts. If necessary degauss them (AMM TASK 20-13-01-910-802-A/200).

(6) Examine the P-shaped conductive rubber around the pylon-nacelle fairing for fire or heat damage.

(7) Replace the unserviceable components (Refer to AMM).

(8) If you find damage to the aircraft structure, repair the related parts (Refer to SRM).

(9) Install the upper cowling (AMM TASK 71-11-01-400-801-A/400).

K. Follow-on

SUBTASK 842-006-A

(1) On aircraft POST-MOD SB145-32-0036, remove the safety pin of the NLG-door solenoid valve (AMM TASK 32-00-02-910-801-A/200).

(2) Remove the "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" tag from the cockpit.

(3) Remove the workstand from work area.

(4) On the circuit breaker panel, close the circuit breakers below and remove the "DO-NOT-CLOSE" tag from it:

- START 1.
- START 2.

TASK 05-50-01-200-806-A
EFFECTIVITY: ALL

7. REAR FUSELAGE AND EMPENNAGE - DETAILED INSPECTION

A. General

(1) This task gives the procedure to do a detailed inspection/check on the rear fuselage, and empennage, after a lightning strike on the aircraft.

(2) Refer to the bonding map to see the primary bonding jumpers of this area (AMM TASK 20-13-21-210-801-A/200). If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

NOTE:
- The repair allowed for the bonding jumpers is the installation of a new bonding jumper in case of damaged or missing bonding jumper. If the bonding jumper is incorrectly attached, install it again.
- Some external mounted bonding jumpers are required, but they are not essential for all flights. The aircraft can be dispatched without some of these bonding jumpers, following the maintenance instructions in the bonding map (AMM TASK 20-13-21-210-801-A/200).

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-42-00/100	-
AMM TASK 05-50-01-200-805-A/600	ENGINE NACELLE - DETAILED INSPECTION
AMM TASK 20-13-01-910-802-A/200	LANDING GEARS WINGS MOUNTS AND ENGINE YOKES - DEGAUSSING
AMM TASK 20-13-21-210-801-A/200	ELECTRICAL BONDING MAP - STANDARD PROCEDURES
AMM TASK 20-13-21-700-801-A/200	ELECTRICAL BONDING TEST - STANDARD PROCEDURES
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 33-43-00-700-801-A/500	NAVIGATION LIGHTS - OPERATIONAL TEST
AMM TASK 33-47-00-700-801-A/500	ANTICOLLISION LIGHTS - OPERATIONAL TEST
AMM TASK 55-11-01-000-801-A/400	HORIZONTAL-TO-VERTICAL-STABILIZER BONDING JUMPERS - REMOVAL
AMM TASK 55-36-00-000-801-A/400	TAIL BOOM - REMOVAL
AMM TASK 55-36-00-400-801-A/400	TAIL BOOM - INSTALLATION
S.B.145-32-0036	-
S.B.145-55-0028	-
SB145-32-0036	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
324	324EL	Area between spar I and spar II
324	324FR	Area between spar I and spar II
325	325CL	Area between spar II and spar III
325	325DL	Area between spar II and spar III
326	326DL	Rudder I

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Rear Fuselage, and Empennage

I. Preparation

SUBTASK 841-007-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) Put the hydraulic platform in the correct position and at the necessary height.

J. Inspection

SUBTASK 212-008-A

(1) NOTE: It is not necessary to remove the two seal fairings. Remove only one: the LH or the RH seal fairing.

Remove the RH or the LH seal fairing (AMM TASK 55-36-00-000-801-A/400) and do as follows:

(a) On aircraft PRE-MOD. S.B.145-55-0028, replace the two horizontal-to-vertical stabilizer bonding jumpers (AMM TASK 55-11-01-000-801-A/400).

(b) On aircraft POST-MOD. S.B.145-55-0028, examine the horizontal-to-vertical stabilizer bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(2) Do this item if you did not do the detailed inspection on the engine nacelle (AMM TASK 05-50-01-200-805-A/600).

(a) NOTE: If a lightning hits the engine area, it can cause a strong magnetic field in the engine yokes and mounts.

Measure magnetization at the engine yokes and mounts. If necessary degauss them (AMM TASK 20-13-01-910-802-A/200).

(3) Examine the rear fuselage skin panels for damage.

(4) Examine the dorsal fin and the vertical stabilizer for damage. Carefully examine the leading edges.

(5) Examine the rudders for damage. Carefully examine the bearings between rudder one and the empennage, the bearings between rudder two and rudder one, their hinges, and trailing edges. Examine the bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(6) Open access panels 325CL, 325DL, and 326DL (AMM MPP 06-42-00/100). Carefully examine the rudder actuators and their bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(7) Open access panels 324EL and 324FR (AMM MPP 06-42-00/100). Carefully examine the horizontal stabilizer actuators and their bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(8) Examine the elevators for damage. Carefully examine their hinges, and trailing edges. Examine the bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(9) Carefully examine the bearings between the horizontal stabilizer and elevators and between the elevators and the tabs for damage. Examine the bonding jumpers for damage and defective attachment. If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(10) Examine the horizontal stabilizer for damage. Carefully examine the leading edges, tips, and trailing edges.

(11) Examine the horizontal stabilizer fairings for damage, specially the rear fairing.

(12) Examine the tail boom for burns, change of color, and other damage.

(13) Examine the navigation lights for damage, and examine the bonding jumpers installed in the rear navigation light support for damage and defective attachment. If there are sings of damage in the navigation lights, do an operational test of the navigation lights

(AMM TASK 33-43-00-700-801-A/500). If you find damage or defective attachment in the bonding jumpers, repair them (AMM TASK 20-13-21-700-801-A/200).

(14) Examine the strobe light for damage. If you find damage, do an operational test of the strobe lights (AMM TASK 33-47-00-700-801-A/500).

(15) Examine the static dischargers and their attachment points for damage.

(16) Replace unserviceable components (Refer to AMM).

(17) If you find damage to the aircraft structure, repair the related parts (Refer to SRM).

(18) Install the RH or the LH seal fairing as applicable (AMM TASK 55-36-00-400-801-A/400).

K. Follow-on

SUBTASK 842-007-A

(1) Close the panels 325CL, 325DL, 326DL, 324EL, and 324FR (AMM MPP 06-42-00/100).

(2) On aircraft POST-MOD SB145-32-0036, remove the safety pin of the NLG-door solenoid valve (AMM TASK 32-00-02-910-801-A/200).

(3) Remove the "DO-NOT-OPERATE-THE-FLIGHT-CONTROLS" tag from the cockpit.

(4) Remove the hydraulic platform.