Chapter 6 PROCEDURES FOLLOWING HAZARDOUS INCIDENTS

LIST OF CONTENTS

LIST OF APPENDICES

WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cockpit or performing any operations upon the aircraft.

General information

1. This chapter deals with the special checks to be made in addition to any normal servicing which may be due, following the report, on Form 700E, of a hazardous incident.

Hazardous incidents

2. A hazardous incident is one which could result in damage to the aircraft, the effects of which may not be immediately apparent. This class of damage can arise from:-

(1) A heavy landing

(2) Excessive g loading

(3) Flight through turbulent air

(4) Violent braking

(5) Hot gas leaks

(6) Lightning strikes

3. The checks listed in the associated appendix to this chapter are to be made, in addition to any normal servicing which may be due, whenever one of the above incidents is reported.

Servicing notes

4. The following instructions must be observed:-

(1) The examination and checks detailed in this chapter are to be carried out by a Senior N.C.O. assisted by tradesmen as required.

(2) Unless otherwise stated, damage found during this servicing is to be categorized and repaired in accordance with A.P. 101B-1000-6.

(3) The appendices to this chapter list renewals and adjustments to be made. Renewals are not to be commenced until all examinations are completed and the overall damage assessed.

Damage

5. Examine for damage, as required in this chapter, means an examination to ascertain that the value or usefulness of the item has not been impaired by:-

(1) Insecurity of attachments.

(2) Cracks in, or fracture of, structure and components.

(3) Corrosion or contamination.

(4) Structure distortion or skin wrinkling.

(5) Defective or missing rivets.

(6) Chafing, scoring or fraying.

(7) Broken locking devices.

APPENDIX I HEAVY LANDING

LIST OF CONTENTS

LIST OF TABLES

General information

1. This appendix lists points at which damage may occur after the aircraft has made a heavy landing. Whenever such an incident is reported, or evidence of it is found, the aircraft must be inspected before subsequent flight. The recommended checking sequence *(para.2)* must be followed, but, as the appendix has been prepared to cover all degrees of heavy landing, discretion is to be exercised as to the extent to which each examination is carried.

Checking sequence

2.

(1) Examine the alighting gear shock absorbers for normal and equal extension *(Chap.2)* and if necessary replenish and inflate them *(Sect.3, Chap.5)*.

(2) Jack and trestle the aircraft *(Chap.4)*.

(3) Inspect the crash switches; if both have tripped the fire extinguishers will have discharged.

(4) Examine the battery mountings for damage and the surrounding areas for spillage of electrolyte. If necessary neutralize the surrounding areas and restore the protective finish.

(5) Examine the main and nose undercarriages *(Table 1, items 1 and 2)*.

(6) Examine the airframe *(Table 1, item 3)*.

(7) Carry out the alighting gear functioning test *(Table 1, item 4)*.

(8) Carry out functioning tests on all instrument installations, particularly the flight instruments and autopilot *(Sect.7)*.

(9) Lower the aircraft on to its wheels and carry out a ground engine run. During this, check correct operation of all possible electrical, radio and radar installations by manipulating the cockpit controls and switches; check also for excessive airframe vibration. Locate and rectify any defects revealed by these checks.

(10) Flight test the aircraft and check all services in operating conditions.

TABLE 1
Alighting gear and airframe checks

WARNING Refer to the LETHAL WARNING marker card

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
1	**MAIN UNDERCARRIAGE**				
(1)	Main wheels	Remove and examine:-			
		(a) Tyres for casing fracture		(a) Fit serviced wheels and check tyre pressures	◀ 101B-1003/6-5, Vol.5, Pt.2 ▶
		(b) Wheels for damage and balance		(b) Renew wheel	
		(c) Brake units for damage		(c) Fit serviced brake units	
(2)	Shock-absorber struts	(a) Examine for leakage at:-			
		(i) Sliding tube		(i) Slight leaks - recharge strut	Sect.3, Chap.5
		(ii) Charging valve		(ii) Serious leaks - indicate gland failure - change strut	Sect.3, Chap.5
		(b) Examine for damage (caused by shock-absorber bottoming) at:-			
		(i) Half fork to sliding tube screwed joint	A.P.1803V, Sect.2, Chap.2	(i) Renew strut	
		(ii) Track toggle attachment lugs		(ii) Renew strut	
		(iii) Strut casing - examine for marking of metal on inboard side caused by contact with main-plane skin		(iii) Dress out damage and restore the protective finish	
		(iv) Wheel axle		(iv) Renew strut	Sect.3, Chap.5
		(v) Radius rod attachment lug		(v) Renew strut	
(3)	Radius rods	Examine for damage at:-			
		(a) Lower and upper attachment fittings - check pins and trunnions for shear	◀ A.P.105B-2204-1 ▶	(a) Dismantle and examine and if (b) necessary renew radius rod	◀ A.P.105B-2204-1 ▶
		(b) Knuckle joint			
		(c) Lock jack - check clearance between lock plunger and latch (0.002-0.005 in.)		(c) If gap is excessive, fit new securing bolts to the lock jack and recheck clearance	
		(d) Down-lock microswitch			

continued...

TABLE 1 Alighting gear and airframe checks - *continued*

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(4) Toggles	(a) Examine for damage (b) Check clearance at centre pin – 0.002 in.		(a) Renew strut (b) If (a) is satisfactory check toggle pins for damage. If necessary, renew pins and reset track	Sect.3, Chap.5 A.P.1803V. Sect.2, Chap.2 ◀ 101B-1003-1A, ▶ Sect.3, Chap.5
	(5) Retraction jack	(a) Examine for damage	A.P.1803U, Vol.6, Sect.3, Chap.5	(a) Renew jack	Sect.3, Chap.5
		(b) Check override setting		(b) Reset	Sect.3, Chap.5
	(6) Main attachment bracket	Examine for damage to bracket and bolts	Sect.3, Chap.5	If bracket is serviceable renew bolts	Sect.3, Chap.5
2	**NOSE UNDERCARRIAGE**				
	(1) Wheel and axle	(a) Remove tyre – inspect for casing fracture (b) Check wheel balance (c) Examine axle pin for damage	A.P.2337	Fit serviced wheel and tyre	
	(2) Shock-absorber strut	(a) Examine for leakage of:- (i) Shock absorber (ii) Charging valve	◀ A.P.1803V ▶ Sect.3, Chap.5	(a) Slight leaks – recharge strut (b) Serious leaks – indicate gland failure – change strut	Sect.3, Chap.5 Sect.3, Chap.5
		(b) Examine for damage at:- (i) Link fitting (ii) Shock-absorber lower attachment fittings, and remove pin. Check pin for bow and lug bores for impact damage (iii) Retraction jack attachment fitting – also check pin for shear (iv) Locking plunger (v) Shock-absorber locating dowel – remove dowel from top of shock absorber at rear side and inspect for shear (vi) Wheel fork	◀ A.P.1803V ▶ Sect.3, Chap.5	Renew strut	Sect.3, Chap.5

TABLE 1 Alighting gear and airframe checks - *continued*

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(4) Surrounding structure	Examine area surrounding the main pivot pin, and frame 13 shear web around jack attachment fittings for damage	101B-1000-6	Categorize and repair	101B-1000-6
3	**GENERAL STRUCTURAL CHECK**				
	(a) Engine mountings	Examine surrounding skin areas for signs of damage, particularly at No.2 engine starboard front mounting. Deeper examination is necessary only if damage is revealed	101B-1000-6	Categorize and repair	101B-1000-6
	(b) Rear fuselage	Examine the area surrounding the tail bumper for damage caused by possible ground contact. If damage is revealed, examine jet pipe mountings, and Firewire clip holes on tie rod at frame 62, for damage	101B-1000-6	Categorize and repair	101B-1000-6
	(c) Flaps	Examine the inboard and outboard jack pick-up lugs for signs of elongation or fracture	101B-1000-6	Categorize and repair	101B-1000-6
	(d) Ailerons ▶ ◀	Examine the aileron horn area, between the mass-balance and the hinge line, for buckling of the lower skin and for tension failure of rivets through the skin	101B-1000-6	Categorize and repair	101B-1000-6
	(e) Wheel bays	Examine the area at the forward outer corner of the wheel bays for buckling of the skin and the rib-flange and for rivet distortion	101B-1000-6	Categorize and repair	101B-1000-6
	(f) Airframe symmetry	Check the dimensions	Chap.4	Categorize and repair	101B-1000-6

continued...

TABLE 1 Alighting gear and airframe checks - *continued*

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
4	**ALIGHTING GEAR FUNCTIONING TEST**				
	(a) Hydraulic fluid reservoir	Replenish with oil OM-15	Sect.3, Chap.6		
	(b) Functioning test	(i) Retract the alighting gear using the hand pump and check for fouling and straining	Sect.3, Chap.5		
		(ii) Check the door and fairing clearances			
		(iii) Connect a Mk.3A ground servicing trolley to the services hydraulic system and raise and lower the alighting gear 5 times. While doing this check for correct locking in retracted and lowered positions, and check the operating times (Sect.3, Chap.6, Table 3)	Sect.3, Chap.6		

This page to be inserted in Sect 2, Chap 6,
facing Appendix 2.

APPENDIX 2
EXCESSIVE 'G' LOADING AND FLIGHT THROUGH TURBULENT AIR

List of Contents

General Information

1. Whenever excessive 'g' loading is reported, or evidence is found of such an occurrence, or large increases in fatigue meter reading are recorded, the checks given in para 2 must be carried out, and any necessary repairs effected before subsequent flight. For details of permitted repairs refer to AP 101B-1000-6. The checks are listed in order of probability of damage, and are shown in the three groups below in order of increasing severity:

(1) Checks (1)-(14) inclusive are mandatory when a 7g count is recorded on the aircraft fatigue meter or when the pilot reports that the maximum 'g' count for any configuration stated in the pilots notes have been exceeded.

(2) Checks (15)-(18) are mandatory whenever checks (1)-(14) reveal structural damage.

(3) Checks (19)-(27) are mandatory if structural damage is revealed whilst carrying out checks (15)-(18) inclusive.

▶ Para. 4 deleted. ◀

NOTE...

▶ (a) When the permissible 'g' limit (as stated in the pilots notes) has been exceeded with the aircraft in the single missile configuration, particular attention must be given to the checks relating to the fin and surrounding structure: ◀

(b) Excessive fuel leakage from existing drains or fuel seepage from the mainplanes is often a sign of overstressing of the aircraft and the cause should be investigated.

Checking Sequence

2. Proceed as follows:

(1) Check for buckling of the mainplane skin above the wheel wells and the inner skin inside the wells.

Note....

Do not regard the bump in the mainplane contour in this area as buckling.

(2) Check the airframe symmetry (Chap 4).

(3) Examine the panel fasteners which secure panels 41P, 43P and 45P for damage and failure.

(4) Examine Fin Skin for buckling and loose fasteners.

(5) Check for fuselage skin wrinkling in the region of the mainplane attachment angles.

(6) Remove access panels 121 and 122P and S and examine all pipes and cables disclosed thereby, for damage.

(7) Inspect for signs of local buckling and excessive closure of the butt gap at the forward and aft ends of the weapon pack (frames 13 and 22).

(8) Check the mainplane lower skin for fractures around the wheel well, particularly in the area door hinges. On aircraft pre mod 4861 at the spar 3 to rib 8 intersection of the main wheel bay cut-outs, call for CSDE/LIGHTNING/EDDY/16 to be carried out by NDT personnel. On aircraft post mod 4861 examine the skin area at the extremities of the repair plate.

(9) Check for skin cracks originating from the corners of the compressor bleed outlet in the No.2 engine hatch between frames 46 and 47 starboard.

This page to be inserted in Sect 2, Chap 6, facing the reverse of Appendix 2.

(10) Check for skin cracks in the region of the air-brake cavities.

(11) Check for cracks, in doubler or skin, originating at the corners of the auxiliary intake cut-outs above the main-plane, port and starboard.

(12) Remove the duct access panels along the mainplane centre joint and aft of spar 5 in No.2 engine intake duct. Using a suitable mirror and light source examine ▶ as far as possible for structural damage. ◀

(a) The stringers and Frames.

(b) The skin doubler at the lower boom of Spar 5.

(c) Spar 5 boom fillets between the mainplane rear main attachment brackets.

(13) Aircraft with a history of cracking under SI/LIT/153D & SI/LIT/168 and do not have Mod 4822 embodied in its entirety. Remove No.1 engine and the heat shields at the aft end of the roof of No.1 engine bay. Examine for damage in the following areas:

(a) Wing centreline rib bottom flange.

(b) Centreline rib flange.

(c) Cut out at the position of the 'nibbling' modification 4855. Apply CSDE/LIGHTNING/EDDY/17.

Note.....

Aircraft which have never cracked or which have Mod 4822 embodied in its entirety need not be inspected under check 13 above. However, if cracking is found in checks 1 to 12 and 14 see check 16.

(14) Check the fuselage skin panels below the wing between Frames 33 and 44, visually for buckling and cracks.

(15) Jack and trestle the aircraft.(Chap 4).

(16) Remove No.1 engine and the heat shields at the aft end of the roof of No.1 engine bay. (If not already removed under check 13). Examine for damage in the following areas:

(a) The mainplane joint plates.

(b) The skin doublers at the lower boom of spar 5.

(c) Spar 5 boom fillets between the main-plane rear main attachment brackets.

(e) If not already carried out proceed with check 13.

(17) Carry out SI/LIT/161, 163 and 168.

(18) Carry out SP 427 (A/F) and 429 (A/F).

(19) Remove No.1 engine jet pipe and No.2 engine and jet pipe.

▶ Sub-para (16d) deleted. ◀

(20) Examine the engine hatch attachment bolt fittings on frame 53 for damage.

(21) Carry out SP 125B (Prop).

(22) Carry out SP 138 (A/F), 403(A/F), 406(A/F) and 455(A/F).

(23) Carry out SI/LIT/167.

(24) Examine the stringer-to-frame attachments over the length of the fuselage underside for damage.

(25) Check for damage to frame 56 web and also the boom of spar 2 of the fin which is attached to frame 56.

(26) Remove access panel 80 and also the spine-to-fin-fillet fairing aft of the panel. Examine the fin front shear wall for damage in the fuselage attachment region both inside the fuselage and inside the fin.

(27) Refit the access panels, heat shields and the engines and jet pipes.

▶ Paras. 28, 29, 30, 31 deleted. ◀

MINISTRY OF DEFENCE
March 1982

A.P.101B-1003-1A

LIGHTNING F.MK.3 AIRCRAFT
GENERAL AND TECHNICAL INFORMATION

ADVANCE INFORMATION LEAFLET NO. 1/82

Insert this leaflet in A.P.101B-1003-1A, Sect.2, Chap.6, App.2, to face paragraph 1 to paragraph 2, sub-paragraph (8).

Sect.2, Chap.6, App.2

1. Para.2 sub-paragraph 7 to read as follows:-

Check the mainplane lower skin for fractures around the wheel well, particularly in the area of the door hinges. At the spar 3 to rib 8 intersection of the main wheel bay cut-outs, call for CSDE/LIGHTNING/EDDY/16 to be carried out by N.D.T. personnel.

Notes...

(1) The information contained in this leaflet will be incorporated by amendment action in due course.

(2) If, after receipt of this leaflet, an amendment list with a prior date and conflicting information is received, the information in this leaflet is to take precedence.

APPENDIX 2

EXCESSIVE 'G' LOADING AND FLIGHT THROUGH TURBULENT AIR

LIST OF CONTENTS

General information

1. Whenever excessive g loading is reported, or evidence is found of such an occurrence, or large increases in fatigue meter reading are recorded, the checks given in para. 2 must be carried out, and any necessary repairs effected before subsequent flight. For details of permitted repairs refer to A.P.101B-1000-6. The checks are listed in order of probability of damage, and are shown in the three groups below in order of increasing severity:-

(1) Checks (1) - (10) inclusive are mandatory when g limits for the aircraft, as defined in Pilot's Notes, have been exceeded.

(2) Checks (11) – (15) are mandatory whenever checks (1) – (10) reveal structural damage, or the maximum g has exceeded, by 10 per cent, the maximum allowable value given in Pilot's Notes.

(3) Checks (16) - (20) are mandatory if structural damage is revealed whilst carrying out checks (1) - (15) inclusive.

Note...

When the permissible g limit has been exceeded with the aircraft in the single missile configuration, particular attention must be given to the checks relating to the fin and surrounding structure.

Checking sequence

2. Proceed as follows:-

(1) Check for buckling of the main-plane skin above the wheel wells and the inner skin inside the wells.

Note...

Do not regard the bump in the main-plane contour in this area as buckling.

(2) Check the airframe symmetry *(Chap. 4)*.

(3) Examine the panel fasteners which secure panels 41P, 43P, and 45P for damage and failure.

(4) Check for fuselage skin wrinkling in the region of the main-plane attachment angles.

(5) Remove access panel 122P and S and examine all pipes and cables disclosed thereby, for damage.

(6) Inspect for signs of local buckling and excessive closure of the butt gap at the forward and aft ends of the weapon pack (frames 13 and 22).

(7) Check the main-plane lower skin for fractures around the wheel well, particularly in the area of the door hinges. At the spar 3 to rib 8 intersection of the main wheel bay cut-outs, call for CSDE/LIGHTNING/EDDY/16 to be carried out by N.D.T. personnel.

(8) Check for skin cracks originating from the corners of the compressor bleed outlet in the No. 2 engine hatch between frames 46 and 47 starboard.

(9) Check for skin cracks in the region of the air-brake cavities.

(10) Check for cracks, in doubler or skin, originating at the corners of the auxiliary intake cut-outs above the main plane, port and starboard.

(11) Jack and trestle the aircraft *(Chap. 4)*.

(12) Repeat (1) to (10) inclusive.

(13) Remove No. 1 engine.

(14) Remove the duct access panels along the main-plane centre joint and aft of spar 5 in No. 2 engine intake duct. Remove the heat shields at the aft end of the roof of No. 1 engine bay.

(15) Examine for damage in the following areas:-

(a) The main-plane joint plates.

(b) The skin doublers at the lower boom of spar 5.

(c) Spar 5 boom fillets between the main plane rear main attachment brackets.

(16) Remove No. 1 engine jet pipe and No. 2 engine and jet pipe.

(17) Examine the engine hatch attachment bolt fittings on frame 53 for damage.

(18) Examine the stringer-to-frame attachments over the length of the fuselage underside for damage.

(19) Check for damage to frame 56 web and also the boom of spar 2 of the fin which is attached to frame 56.

(20) Remove access panel 80 and also the spine-to-fin-fillet fairing aft of the panel. Examine the fin front shear wall for damage in the fuselage attachment region both inside the fuselage and inside the fin.

(21) Refit the access panels, heat shields and the engines and jet pipes.

1. Remove and destroy existing page "COMMAND TEMPORARY AMENDMENT NO 1".

2. This page is to be inserted in Section 2, Chapter 6 facing Appendix 3.

3. After note 3 add note:

   4. Following cases of brake parachute failure resulting in a chuteless landing, the brakes are to be inspected for signs of overheating and checked for wear. The brake wear records are to be amended to record the use of 5 additional landings.

APPENDIX 3

VIOLENT BRAKING OR UNUSUAL DRAG LOADS ON ALIGHTING GEAR

1. Following an emergency stop, violent braking or overheating, the wheels, tyres and brakes are to be removed for Bay Servicing.

2. Following cases of unusual drag loads on the alighting gear, e.g. travel over soft or unprepared ground the following checks are mandatory:-

Heavy Landing Checks – Appendix 1, para.2, sub-para.(2), (3), (4), (5) and (7).

◀ 3. Following cases of adverse ground handling, i.e., fracture of towing arm shear pin or harsh braking by the towing tractor, it is mandatory to remove the nose undercarriage assembly and inspect the lock plunger for damage. Wear limits are as detailed in A.P.104C-1205-16C. ▶

APPENDIX 4 FIRE INTEGRITY - HOT GAS LEAKS

LIST OF CONTENTS

LIST OF TABLES

General

1. Hot gas leaks are a potential fire hazard to the aircraft and it is important that inspection takes place to prevent their occurrence. There are a number of points and areas throughout the aircraft that require regular check and if necessary, remedial action should be taken whenever a leak has occurred. The following information classifies the type of leaks normally found and lists their location and the action to be taken.

Classification of leaks

2. These are broken down into two broad categories, LARGE and SMALL.

(1) LARGE leaks will in most cases be immediately detected by the firewall fire detection system. However, in a very few cases they may go undetected until a secondary failure, initiated by the leak occurs; these cases can be of a serious nature.

(2) SMALL leaks are unlikely to be serious unless a further failure (hydraulic or fuel leak) is present. It is possible that these leaks may in some cases remain undetected until servicing breakdown.

Checking sequence *(Table 1)*

3. The following table lists the recommended procedure for checking and rectification to be undertaken, but as the appendix has been prepared as a general guide, it will not necessarily cover every situation. Discretion is therefore to be exercised as to the extent to which each examination is carried out.

TABLE 1

Areas of examination

LARGE LEAKS usually occur at:-	(1) Engine exhaust muff/interpipe joints: No.1 engine, frames 39 to 43; No.2 engine, frames 51 to 53. (2) Interpipe/reheat pipe joints: No.1 and 2 engine, frames 55 to 57.
SMALL LEAKS mainly occur at:-	(1) Hot air system sliding joints: No.1 engine bay, frame 34; No.1 and 2 engine bay firewall, frame 42: No.2 engine bay, palouste tee, frame 49/50; No.2 engine bay, frame 51/52. (2) Engine exhaust muff sliding joints: No.1 engine bay, frames 39 to 43: No.2 engine bay, frames 51 to 53. (3) Reheat pipe exhaust outlet sliding joints: Jet-pipe bay, frames 55 to 57. (4) Engine bleed ducts: No.1 engine bay, frames 27 to 29; No.2 engine bay, frames 46 to 47.
Where a leak occurs at a joint in the above areas, items listed below, within 15 in. radially of the leak are to be examined.	

Item No.	Item	Operation
1	No.1 ENGINE BAY, FRAME 34	
	(a) Hydraulic in-line joints	Check all nuts and wire-locking for tightness and security. Examine area for signs of deterioration or leak contamination.
2	No.2 ENGINE BAY, FRAMES 39 to 43	
	(a) Hydraulic in-line joints	Check all nuts and wire-locking for tightness and security. Examine area for signs of deterioration or leak contamination.
	(b) Hydraulic system, heat exchanger	Replace bonded seals.
	(c) Filters	Replace bonded seals.
	(d) Flap selector	Bay service - replace internal seals. Replace all adapter and banjo union bonded seals.
	(e) Electrical cable looms	Examine for damage and deterioration.

continued...

TABLE 1 Areas of examination – *continued*

Item No.	Item	Operation
3	No.2 ENGINE BAY, FRAME 42	
	(a) Hydraulic and fuel in-line joints	Check all nuts and wire-locking for tightness and security. Examine area for signs of deterioration or leak contamination.
	(b) Fire-floor sealing	Examine for deterioration.
	(c) Pipe clips and fairleads	Examine for damage.
	(d) Electrical cable looms	Examine for damage and deterioration.
4	No.2 ENGINE BAY, FRAMES 49 to 50 (Palouste tee sliding piston)	
	(a) Hydraulic in-line joints	Check all nuts and wire-locking for tightness and security. Examine area for signs of deterioration or leak contamination.
	(b) Filter	Replace bonded seals.
	(c) Pipe clips and fairleads	Examine for damage and deterioration.
5	No.2 ENGINE BAY, FRAMES 51 to 53	
	(a) Hydraulic in-line joints	Check all nuts and wire-locking for tightness and security. Examine area for signs of deterioration or leak contamination.
	(b) Pipe clips and fairleads	Examine for damage and deterioration.
	(c) Electrical cable looms	Examine for damage and deterioration.
6	No.1 JET-PIPE BAY, FRAMES 55 to 57	
	(a) Accumulator	Examine bottom connections for deterioration of seals and hydraulic connections. (If heat shield is fire damaged or breached, replace the internal seal.)
	(b) Feel simulator	If the heat shield is breached, Bay Service.
	(c) Tail plane motor unit	If the heat shield is breached, Bay Service.
	(d) Fuel system reheat pipe joints	Check all nuts and wire-locking for tightness and security. Examine area for signs of deterioration or leak contamination.
	(e) Electrical cables	Where degradation of the cable duct has occurred, examine for damage and deterioration.

continued...

TABLE 1 Areas of examination – *continued*

Item No.	Item	Operation
7	No. 2 JET-PIPE BAY, FRAMES 55 to 57	
	(a) Air brake door lock jack connection	Replace bonded seals.
	(b) Air brake door lock jack	If heat shield is breached – Bay Service.
	(c) Rudder feel units	If heat shield is breached – Bay Service.
	(d) By-pass valve	Bay Service – replace bonded seals.
	(e) Hydraulic pressure switch	Bay Service.
	(f) Electrical cables	Examine for damage and deterioration.
8	AIRFRAME STRUCTURE	In all the above areas the airframe is to be examined to determine the extent of structural degradation. Refer to Sect. 2, Chap. 4 and ensure that the drainage holes provided in the airframe structure are not obstructed.

Appendix 5 LIGHTNING STRIKES

LIST OF CONTENTS

LIST OF TABLES

General information

1. Lightning strikes usually result in two types of damage, that caused by the actual strikes, and that caused by the discharge of static electricity which follows the strike. It is also possible that heavy static discharges may occur without the aircraft having been struck by lightning. Further, it is possible that certain aircraft components may become strongly magnetized, it being probable that during the lightning discharge heavy electrical currents flow in the metal airframe structure. The magnetic field produced by such electric current is the cause of magnetization, which is an undesirable factor in the vicinity of a compass.

2. A lightning strike usually causes burning of small circular holes of approximately 1/8 in. diameter, which may be clustered in one locality or scattered over a large area; results may also be indicated by burnt or discoloured skin, or rivets. Evidence of lightning strikes usually appears more prevalent in the area of the fin leading edge.

3. The effects of static discharge may occur as localized pitting or burning and may even result in circular holes of approximately 1/4 in. diameter. Evidence of static discharge usually appears more prevalent on trailing edges, in the lower aft fuselage area, radio aerials and the main-plane extremities, on the fin and tail-plane tips and trailing edges.

Examination procedure

4. Whenever a lightning strike or static electricity discharge is reported, or if it is suspected that these conditions may have been encountered, the aircraft must be examined for evidence of such, as tabulated subsequently, at the first opportunity following the incident. It is emphasised, however, that where the word 'Examine' is used, the signs of damage primarily being sought are those of lightning strikes and static discharge as defined in para. 2 and 3 respectively. The examination is divided into the following two categories:-

Table 1 Preliminary examination - intended only for aircraft landing away from base, to be followed upon return to base by:-

Table 2 Comprehensive examination - the normal procedure to be carried out at base on termination of flight.

Note...

Categorization does not of itself determine repair deferment policy. A decision to refer the rectification of ascertained damage must be related to the effect of the damage upon the airworthiness of the aircraft.

TABLE 1

Preliminary examination

Item No.	Item	Operation
1	(a) Ejection seat (b) Canopy jettisoning system	Ensure rendered safe.
2	FUSELAGE EXTERIOR	Examine, paying particular attention to nose section, perspex transparencies for crazing and fuselage underside.
3	TAIL-PLANE SURFACES	Examine, paying particular attention to trailing edges and tips.
4	(a) Fin (b) Rudder	Examine, paying particular attention to trailing edges.
5	MAIN-PLANE SURFACES	Examine, paying particular attention to outer leading edges, trailing edges, root-ends, air intakes and hinge areas of the control surfaces.
6	(a) Aileron surfaces (b) Flap surfaces (c) Air brakes	Examine, paying particular attention to trailing edges and hinge areas.
7	(a) Main-wheel units (b) Nose-wheel unit	If extended at time of incident:- Examine, paying particular attention to lower portions.
8	(a) Main flying controls (b) Flap (c) Air brakes	Operate each system through full range and check for smooth freedom of movement.
9	FIRE EXTINGUISHER DISCHARGED INDICATOR	Examine the nylon indicator discs. The associated extinguisher must be renewed if a disc is dislodged.
10	NAVIGATION LAMPS	Operate, and check for correct functioning.
11	ALL AERIALS	Examine.
12	(a) Radio equipment (b) Navigation equipment	Operate, and check for correct functioning.
13	PRESSURE HEAD	Examine.
14	COMPASS	Carry out check swing.
15	PYLONS AND PYLON STORES	Examine, paying particular attention to nose section and trailing edges.

TABLE 2

Comprehensive examination

Item No.	Item	Operation	A.P. Reference	Rectification
		AIRFRAME		
1	(a) Ejection seat (b) Canopy jettisoning system	Ensure rendered safe.	109B-0103-1 109F series	
2	FRONT FUSELAGE	Examine, paying particular attention to:- (a) perspex transparencies.		(a) Polish or renew as necessary
		(b) nose-wheel doors and underside.	101B-1000-6	(b) Repair as necessary
3	REAR FUSELAGE	Examine, paying particular attention to underside. Effect of static discharge is usually indicated by series of small holes along underside at approximate centre line.	101B-1000-6	Repair as necessary
4	(a) Tail plane (b) Fin	Examine, paying particular attention to trailing edges, tips, and hinge areas of control surfaces.	101B-1000-6	Repair or renew as necessary
5	RUDDER	(1) Examine, paying particular attention to trailing edges and hinge areas.	101B-1000-6	Repair or renew as necessary
		(2) Move rudder through full range of travel and check for freedom of movement and smooth operation.	Sect. 3, Chap. 4D	
6	MAIN PLANES	Examine, paying particular attention to outer leading edges, inboard under-surfaces, air intakes, trailing edges and hinge areas of flying controls, and skin joints.	101B-1000-6	Repair as necessary

continued...

TABLE 2 **Comprehensive examination** – *continued*

Item No.	Item	Operation	A.P. Reference	Rectification
		AIRFRAME – *continued*		
7	AILERONS	(1) Examine, paying particular attention to trailing edges.	101B-1000-6	Repair or renew as necessary.
		(2) Examine hinge assemblies, as far as practicable. If signs of static discharge or pitting are found, extend examination to include all bearing points in control system.		
		(3) Move ailerons through full range of travel and check for freedom of movement and smooth operation.	Sect.3, Chap.4C	
8	FLAPS	(1) Examine, paying particular attention to trailing edges.	101B-1000-6	Repair or renew as necessary.
		(2) Examine hinge assemblies. If signs of static discharge or pitting are found, extend examination to include all bearing points in flap control system.		
		(3) Disconnect flap-operating mechanism.	Sect.3, Chap.4F	
		(4) Move flaps through full range of travel and check for freedom and smooth operation.		
		(5) Reconnect flap-operating mechanism.		
		(6) Operate flap system through full range of travel and check for smooth operation.		
9	External stores and pylons	(1) Ensure that armament is rendered safe and examine for damage.	2852B, Vol.1	
		(2) Check the integrity of the circuits and operating system.	Sect.5, Chap.7	

continued...

TABLE 2 Comprehensive examination – *continued*

Item No.	Item	Operation	A.P. Reference	Rectification
		AIRFRAME – *continued*		
10	AIR-BRAKE ASSEMBLIES	(1) Extend and examine (2) Examine all hinge assemblies. If signs of static discharge or pitting are found, extend examination to operating jack bearings. (3) Operate air brakes and check for full and free movement and smooth operation.	Sect.3, Chap.4F	Renew as necessary
11	(a) Main-wheel units (b) Nose-wheel unit	If extended at time of incident:– Examine, paying particular attention to lower parts of shock-absorber struts and wheels.	2337, Vol.1 & 1803E, Vol.1	Renew as necessary
12	AIRCRAFT GENERALLY	If any aerials (or other protuberances) have broken away during incident, examine for incidental damage.		Renew aerials and repair damage as necessary
		ELECTRICAL		
13	(a) External lighting (b) Cockpit lighting	Operate, and check for correct functioning.	Sect.6, Chap.8	
		ENGINES		
14	Fire-extinguisher indicator	Examine the nylon indicator discs. The associated extinguisher must be renewed if a disc is dislodged.	Sect.4, Chap.5	Renew as necessary
		INSTRUMENTS		
15	COMPASSES	Test and carry out check swing.	A.P.112B series	Renew as necessary.

continued...

TABLE 2 Comprehensive examination – *continued*

Item No.	Item	Operation	A.P. Reference	Rectification
		RADIO		
16	AERIALS	Examine	Sect.8	Renew as necessary.
17	ALL CONNECTORS (Aerials to trans/rec.)	(1) Disconnect. (2) Examine, particularly end connections. (3) Check for continuity and leakage from conductor to outer screen.	Sect.8	Renew as necessary.
18	AERIAL SWITCH UNIT	(1) Examine, particularly connections and contacts. (2) Check for continuity and leakage from conductor to outer screen in both energized and de-energized conditions.	Sect.6, Chap.11	Renew as necessary.
19	ALL CONNECTORS	Reconnect.		
20	INSTALLATION	Operate and, using appropriate test equipment, check for correct functioning.	Sect.8	

10 IB-1003-1A/95/939952/3794-72/BAC/1405