Chapter 1 GENERAL INFORMATION

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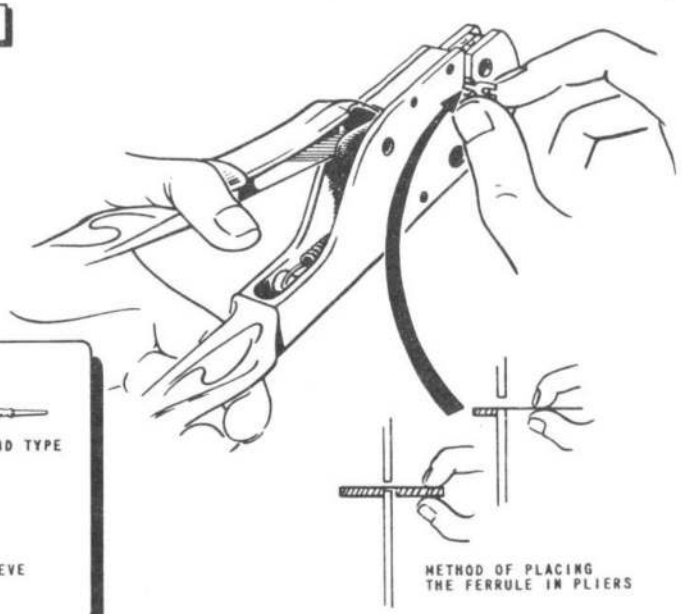
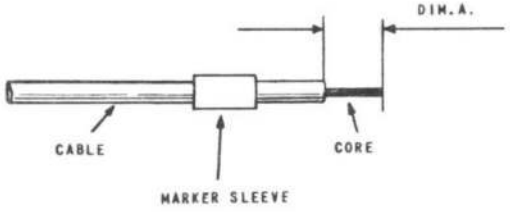
CRIMP SIZE	CABLE TYPE AND RATING				HELLERMAN TOOL	HELAPRENE SLEEVE	DIM. A (INCHES)	
	TERSIL	NYVIN	EFGLAS	PREN			IN-LINE	TAGS
0	22 20	22 20	22 20	4 6	MK 3/0	NL 8140		0.125
1	18 16	18 16	18 16	9 12	MK 3/1	NL 8141	0.20	0.15
2	14.	14.	14.	18.	MK 3/2	NL 8142		

DETAIL A



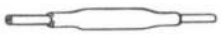
METHOD OF PLACING THE FERRULE IN PLIERS

PREPARATION OF CABLE END

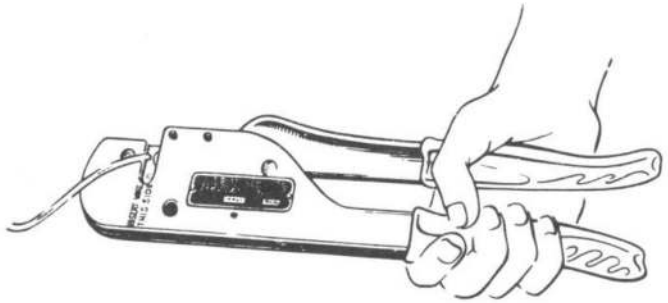


EXAMPLES OF FINISHED CRIMPS

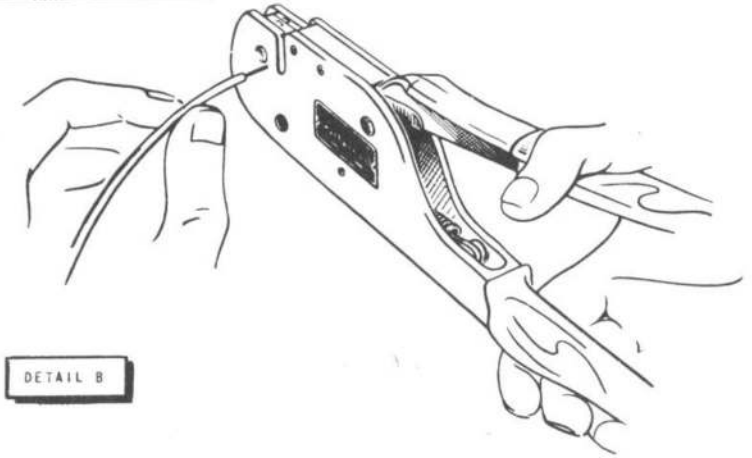
EYE, SPADE, TAPER-PIN, OR TAG END TYPE



IN-LINE TWIN-GRIP TYPE, COVERED WITH HELAPRENE SLEEVE



DETAIL C



DETAIL B

FIG.1. CRIMPED JOINTING PROCEDURE

IA-9027-1

DESCRIPTION

◀Introduction

1. This chapter now incorporates the modifications listed below:-

Mod.1922 To make provision for and introduce a pilot operated switch for the A.I.23 Recorder.

Mod.4090 To introduce aircraft wiring for ventral tank vent valve heater.

Mod.4240 To introduce brushless a.c. alternator Type AE 2071 and brushless d.c. generator Type AE 2519 Mk.2, in lieu of existing system.

Mod.4371 To cut-off 3-phase supplies to the 115V 3-phase busbar in the event of a single phase failure.

Mod.4499 Radar IFF/SSR. To incorporate the requirements of SRIM 3339.

Mod.4551 To make provision for and introduce a 10 per cent over-frequency warning.

2. The information contained in this chapter is relevant to the entire electrical installation since it relates to the wiring and distribution systems, circuit identification, earthing points, fuses, bonding and screening, and other items of electrical equipment throughout the aircraft. Further particulars or details of any circuit or circuits classified in this section will be found in the associated chapter.

Power distribution

3. The primary power supplies are provided by a 200-volt, 3-phase, 400 Hz ▶ a.c. generator, a 28.5-volt d.c. generator, and two 24-volt batteries. From these supply sources, power is distributed to the load circuits through main and subsidiary fuse and distribution boxes, transformers, and junction boxes. With the exception of some equipment and special-purpose wiring, e.g., thermocouple leads, all aircraft wiring consists of screened or unscreened Tersil or Efglas, used either as individual cables or as the cores of cable assemblies. Cable looms, and the cores of individual cable assemblies, are held together by Helvin strapping. Between frames 23 and 53, the main cables are run in external ducts which extend along each side of the fuselage. At the forward and aft pressure bulkheads the main cable assemblies pass through pressure-tight bungs, and the smaller cables are connected to bulkhead-type fittings. Connection to equipment is generally made by plug and socket units of which there are many variants ranging from the Plessey standard and Mk.4 series to American AN-series connectors. Plug and socket breaks are provided in the cable runs at the transport joint, the wing roots, and certain test points, and in-line crimped connections occur in many cable assemblies at points between the extremities of the cables. Terminations in junction and distribution boxes are made by crimped or soldered quick-release tags or ferrules. Where a number of items in a particular circuit are connected in parallel (e.g., lighting units), taper pin connectors are used at the junction points.

Cable identification

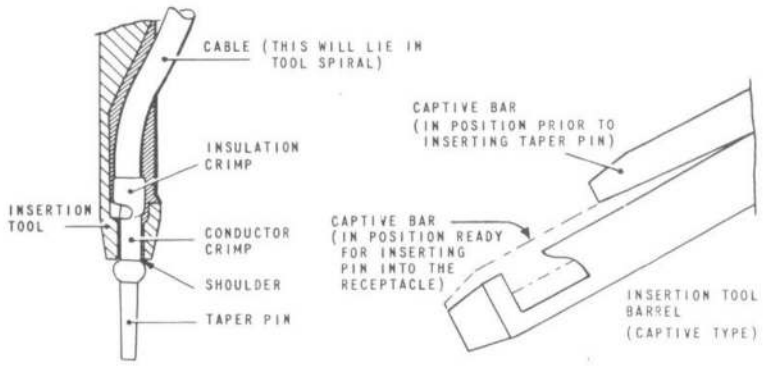
4. Each cable or cable assembly has a combined letter and number reference which is printed on rubber identification sleeves at the cable extremities. The cores of cables fitted with multi-pole connectors have identification sleeves which bear the number or letter references corresponding with those of the connector pins. The reference P1-B would thus be interpreted as core B, or pin B, of cable P1. On routeing diagrams, connector pins are represented by heavy dots at the relevant junction and termination points.

Cable ratings

5. Cable ratings are marked in accordance with the American system which employs a series of numbers indicative of the cross-sectional area. These numbers are printed in black at approximately every five inches along the braiding of each cable. The routeing diagrams included in each chapter show the ratings and the various types of cable used. Cable types and symbols in use are:-

Cable Type	Symbol
Uniefglas	F
Uniefglasmet	FM
Unitersil	T
Unitersilmet	TM
Uninyvin	N
Equipment wire	Q

The wire gauge number is added after the symbol letter.



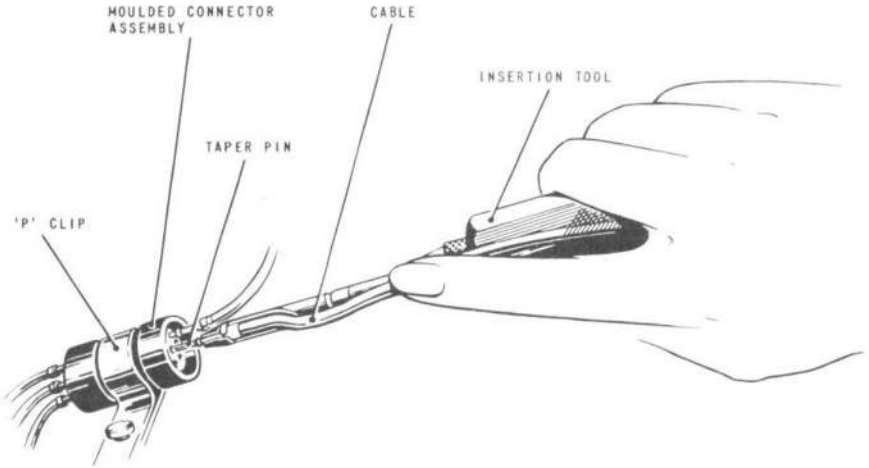
NOTE...
TWO TYPES OF A-MP INSERTION TOOL MAY BE USED FOR TAPER PIN CONNECTIONS. THEY ARE:-
(a) 380310/SERIES, HAVING A 'PULL-TO-TEST' FEATURE.
(b) 380518/SERIES, A CAPTIVE TYPE TOOL, WHICH RETAINS THE TAPER PIN UNTIL AN OBLIGATORY "PULL-TO-TEST" RELEASES IT.

PROCEDURE

(1) PLACE THE TAPER PIN IN THE INSERTION TOOL, WITH THE SHOULDER OF THE PIN JUST BELOW THE TIP OF THE TOOL. THE CABLE WILL THEN LIE IN THE SPIRAL GROOVE.

(2) IF A CAPTIVE TYPE TOOL IS BEING USED, THE TOOL HEAD SHOULD BE PUSHED BACK INTO THE TOOL BODY, WITH THE TAPER PIN IN POSITION. THIS WILL KEEP THE PIN IN THE TOOL THROUGHOUT INSERTION, UNTIL AN OBLIGATORY 'PULL-TO-TEST' RELEASES IT.

(3) INSERT THE PIN INTO THE DESIRED CONNECTOR ASSEMBLY SOCKET, MAKING SURE THAT THE APPROACH IS SQUARE AND IN LINE. PUSH STRAIGHT DOWN ON THE TOOL HANDLE WITH A STEADY MOTION, UNTIL A CLICK IS HEARD. USE ONLY A ONE DRIVE STROKE OR DAMAGE MAY BE DONE TO THE CONNECTOR ASSEMBLY.



(4) PULL-TO-TEST, TYPE(A)
WITH THIS TOOL, THE CONNECTION IS TESTED BY SLOWLY PULLING STRAIGHT BACK ON THE SLEEVE OF THE TOOL UNTIL THE SLEEVE BARELY MOVES. PULL SHOULD THEN BE RELEASED, IF THE PIN IS STILL IN POSITION A GOOD CONNECTION IS ASSURED.

(5) PULL-TO-TEST, TYPE(B)
USING THE CAPTIVE TYPE TOOL, THE CONNECTION CAN BE TESTED, AFTER INSERTION, BY A SLOW UPWARD PULL ON THE TOOL. THIS WILL RELEASE THE CAPTIVE BAR, AT A TENSION WHICH IS SET, ALLOWING THE TAPER PIN TO BE REMOVED FROM THE TOOL. IF THE PIN IS STILL IN POSITION IN THE CONNECTOR ASSEMBLY A GOOD CONNECTION IS ASSURED.

(6) EXTRACTION
SHOULD IT BECOME NECESSARY TO BREAK THE CONNECTION, EITHER FOR TESTING OR RENEWAL PURPOSES, THE TAPER PIN MAY BE EXTRACTED FROM ITS HOUSING BY SETTING THE PIN AND ITS ASSOCIATED CABLE INTO THE TOOL, AND GENTLY PULLING UNTIL THE JOINT IS BROKEN.

FIG.2. METHOD OF INSERTING TAPER PINS

Spare cores

6. The ratings, cable references, and termination points, of all spare cores are shown on the routeing diagrams included in this chapter.

Circuit identification

7. A list of circuit references which comply with the Standard Identification Scheme is given in Table 2. Each reference consists of a group letter and, where necessary, a circuit letter (or letters), and a number which changes progressively after each equipment item in the circuit. References are printed on identification sleeves fitted to the internal wiring of the relevant unit, box, or panel, and to cable cores which are not terminated by multi-pole connectors.

Equipment compartments *(fig.4)*

8. The main equipment compartment is situated to the rear of the aft pressure bulkhead, the equipment being mounted above and on each side of the engine air duct. Several equipment units are installed in the fuselage spine, which extends from the rear pressure bulkhead to the fin. The forward equipment compartment is above the engine air duct in front of the forward pressure bulkhead. A number of smaller compartments on each side of the fuselage are described in the relevant groups of this chapter.

Instrument panels

9. The essential flight instruments are grouped on the main instrument panel, mounted centrally in front of the pilot. Arranged on either side of the main panel are the port and starboard instrument panels, the former carrying a number of miscellaneous instruments and the latter having those instruments associated with the engine services mounted upon it. The pilot's attack sight and the weapon system C.R.T. screen are fitted immediately above the main instrument panel. A number of navigational and armament instruments and controls are fitted to the port and starboard coaming panels.

Consoles

10. Most of the control switches for the electrical, radio and radar services are fitted on port and starboard consoles which extend along each side of the cockpit. The centre console carries the U.H.F. and Tacan offset computer control units.

SERVICING

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

11. The following servicing instructions are applicable to all electrical circuits and are supplementary to the special instructions given in any other chapter of this section.

(1) 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. Other warning instructions which are applicable when servicing or testing a particular system are given in the relevant chapter.

(2) Before pressurizing the pitot system for test purposes, the fuses for the alighting gear control circuit must be withdrawn, except when functional checks are to be made on this particular circuit.

(3) During servicing, the fire extinguisher fuses must be withdrawn, except when making functional tests on the fire extinguisher system. On completion of all servicing operations, or before running the engines, the fuses must be inserted.

(4) Before connecting external supplies to the aircraft, check that the DOWN push-button of the alighting gear control switch is depressed, and that the emergency override device on the UP push-button is in the normal position; also check that the pitot head heaters are switched off.

(5) The aircraft batteries must be isolated during servicing, except when making tests relevant to the battery supply system. When d.c. power is required for servicing operations and functional tests, an external supply must be used. External d.c. supplies, for use during alighting gear testing and adjustments, can be applied direct to the main battery busbar by disconnecting the main battery and connecting an extension cable to the aircraft battery connector. The extension cable, details of which are given in Table 4 and fig. 10, is to be manufactured locally.

(6) When making insulation tests, all earth or airframe connections associated with the circuit under test should be interrupted. Circuits containing capacitors must not be tested at a voltage in excess of the voltage rating of the capacitors, or rupturing of the capacitor dielectric may result.

(7) Plugs and sockets should be cleaned and serviced in accordance with the instructions given in A.P.4343, Vol.1.

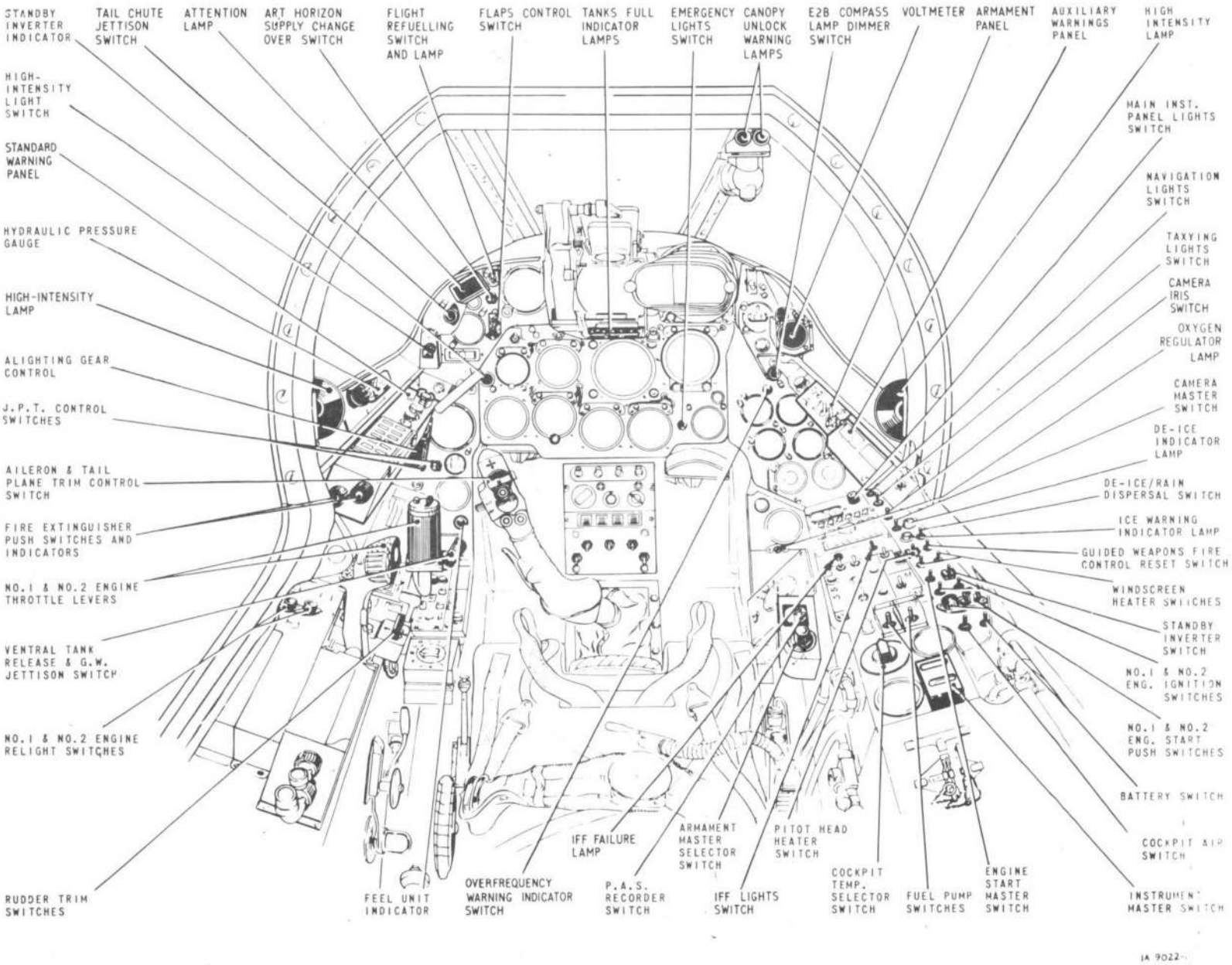


FIG. 3. ELECTRICAL EQUIPMENT – COCKPIT

◀ MOD. 4551 AND 4499 EMBODIED ▶

(8) When examining cables, particular attention should be given to points where the cables pass over sharp edges, and also in high temperature regions where deterioration of the insulation may occur.

(9) Information on the servicing of relays is continued in A.F.4343C, and A.P.113D series.

(10) Since the filaments of fuses are not visible, continuity tests between the fuse terminals should be made periodically.

(11) When tracing faults, reference should be made to the circuit and routeing diagrams in the relevant chapter in this section.

Crimped connections

12. The method of jointing or terminating cable cores by crimping is outlined in the following schedule and illustrated in fig.1. Details of the size of compression tool and jointing accessories for various types of cable are given in tabulated form on the illustration.

Procedure

In-line connection

(1) Place the insulating marker sleeve on the cable, well clear of the end to be crimped.

(2) Fit the Helaprene sleeve over the cable, using the correct Hellerman 3-pronged tool.

(3) Cut back the insulation to the dimension *(Dim.A, in-line)* given on fig. 1, taking care not to damage the conductors.

(4) Check that the connector ferrule is the correct size for the cable being used.

(5) Take the correct Hellerman compression tool for the connector ferrule and cable being crimped *(fig.1)* and squeeze the handles of the tool together to release the ratchet device. This will allow the handles to spring apart ensuring that the compression dies are fully open. Holding the tool with the open dies uppermost, insert the connector as shown in the illustration i.e. with the connecting slot between the two barrels. (There is an instruction on the Hellerman tool, indicating the correct entry of the ferrule). When the conductor edge of the terminal barrel is butting the inner face of the tool, squeeze the tool handles together and take up to the first latch of the ratchet; this will retain the terminal in the tool.

(6) Push the prepared end of the cable into the barrel of the connector, taking great care that all the conductor strands enter the crimp, until the insulation is held fully in the insulation crimp.

(7) Squeeze the tool handles together until the ratchet releases, and the tool will re-open easily.

Note...

Do not force the handles apart.

(8) Compression is then complete and the connection may be removed from the tool. Check that both the conductor and the insulation have been crimped, and that no deformation of the other half of the connector has taken place whilst crimping.

(9) Repeat operation 1 to 8 to join the extension cable to the other end of the connector.

(10) Fit the Helaprene sleeve over the completed crimp, ensuring that it is fully insulated.

Eye, spade, tag, or taper pin connections

(11) The procedure for terminating cable cores with eye, spade, tag, or taper pin fittings is similar to that for in-line jointing. The insulation should be cut back to the dimension *(Dim.A, tags)* given in fig.1.

Note...

When fitting terminals in some locations, it may be expedient to place the terminal on the cable before locating it in the tool.

Taper pin connector assemblies

13. The method of inserting taper pin terminations into a connector assembly is described and illustrated in fig.2. This diagram also bears instructions for testing the connections so formed, and extracting the taper pins for testing or renewal.

Engine bay cables

14. When renewing cables in the engine bays, the cable sheathing should be

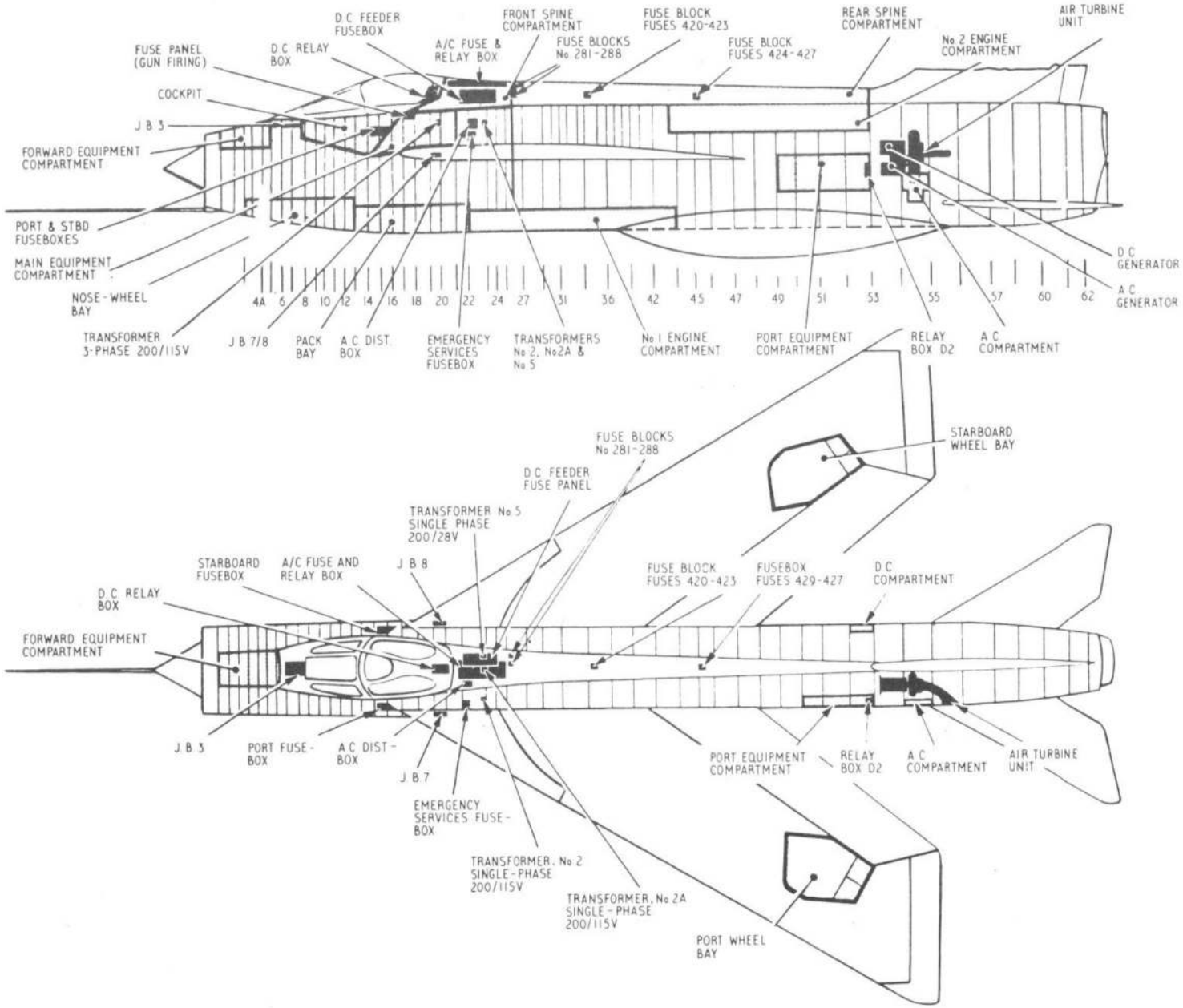


FIG. 4. LOCATION OF EQUIPMENT

treated, where necessary, with oil-resistant coating, Spec.No.D.T.D.900/4501. This should be applied with a brush to a thickness of 0.03 to 0.05 in.

Note...
The oil-resistant coating must not be used on, or allowed to make contact with, perspex or laminated glass.

When the coating has set sufficiently, it should be treated with one brush-applied coat of oil-resistant sealing, Spec.No.D.T.D.900/4506.

Note...
The sealing must be applied within one hour after mixing, and must not be used on, or allowed to make contact with, plug and socket connectors.

Bonding and screening

15. Bonding and screening throughout the aircraft components and structure becomes necessary in order to render the aircraft suitable for radio reception and transmission, by eliminating possible sources of interference. The bonding also reduces the risk of fire caused through sparking between adjacent parts of the aircraft structure, by connecting together all metallic parts to form an electrically continuous system of low and unvarying resistance.

16. In the Lightning aircraft, all bonding and screening of metallic parts, junction boxes, control panels, generators, motors, instruments, control surfaces, hydraulic pipes, cables, etc., is done in a variety of ways. Fig.5 details various types of bonding found on the aircraft and also gives a list of all units, normally bonded to the airframe, from which it may be desired to test. Table 1 lists the points from which a routine check on the effectiveness of the aircraft bonding is normally made. It also includes a check on the conductivity of the nose-wheel tyre.

17. Information on bonding and screening is given in A.P.1464D, Vol.1, Part 2, Sect.1 and on bonding checks in AvP 84. The Type B bonding tester is described in A.P.4343J, Vol.1, Sect.3.

TABLE 1
Bonding checks

Note... *All checks relative to the main earth (E9)*

Bonding of front fuselage
Bonding of rear fuselage
Bonding of fin
Bonding of rudder
Bonding of engine hatches, No.1 and No.2
Bonding of port wing (measured at wing tip)
Bonding of port trailing edge flap
Bonding of port aileron
Bonding of port leading edge flap
Bonding of port u/c leg and door
Bonding of port elevator
Bonding of starboard wing (measured at wing tip)
Bonding of starboard trailing edge flap
Bonding of starboard aileron
Bonding of starboard leading edge flap
Bonding of starboard u/c leg and door
Bonding of starboard elevator
Bonding of nose u/c leg
Bonding of nose u/c doors (port and starboard)
Conductivity of nose-wheel tyre

TABLE 2

Circuit identification scheme

IDENT	CIRCUIT
A	**ARMAMENT**
AA	Gun firing
AC	Gyro gunsight
AD	Gun purging
AE	Firestreak
AF	Rockets
B	**PHOTOGRAPHIC**
BA	Gun camera
C	**CONTROL SURFACES**
CA	Air brake control
CB	Flap control
CC	Tail-plane trim control
CD	Aileron trim control
CE	Rudder trim control
CF	Hydraulic pressure warnings
CG	Feel unit
D	**INSTRUMENTS**
DA	Air brake indicator
DB	Flap indicator
DC	Tail-plane trim indicator
DD	Aileron trim indicator
DE	Rudder trim indicator
DH	Alighting gear indicator
DK	Brake pressure indicator
DL	Fatigue meter
E	**ENGINE INSTRUMENTS**
EC	Fuel pressure warning
EE	Oil pressure warning
EF	Jet pipe temperature warning
EG	Engine speed
EL	Fuel contents
F	**FLIGHT INSTRUMENTS**
FB	Emergency lighting
FC	Master reference gyro
FD	Autostabilizer
FE	Pitot head heater
FG	100,000 ft altimeter
FH	Stand-by horizon
G	**ALIGHTING GEAR**
GA	Alighting gear control
GC	Hydraulic services pressure gauge
GD	Braking parachute jettison
GE	165-knot pressure switch relay Armament safety relay
H	**HEATING-AIR CONDITIONING**
HB	Cockpit heating and air conditioning
HC	De-mister blower motor
HD	Fuel tank vent valve heating
HG	Windscreen heating
HL	Engine anti-icing. Ice warning
HN	De-icing. Rain dispersal
J	**IGNITION**
JA	High energy ignition units
K	**ENGINE CONTROL**
KA	Engine start and relight
KF	Engine reheat
L	**LIGHTING**
LA	Cockpit lighting
LC	External lighting (navigation)
LD	Taxying lights
M	**MISCELLANEOUS**
MB	Canopy power control
MC	Power operated seat
P	**D.C. POWER**
PC	Generator field circuit
PE	Battery busbar
PF	Distribution feeders
PL	Generator busbar
PR	Nodistron supply
PT	Generator test
PW	Power failure warning
PX	Instrument supplies
Q	**FUEL SYSTEM**
QA	Fuel selector valves
QC	Fuel pumps (port)
QD	Fuel pumps (starboard)
QH	Refuelling system
R	**RADIO**
RA	Instrument landing system (I.L.S.)
RH	Tacan
RP	U.H.F. supplies
RY	Telebriefing
S	**RADAR**
SS	Search
SX	Recognition
V	**D.C. CONTROL OF A.C. SYSTEMS**
VA	A.C. generator control and excitation
VB	Heater control

continued...

TABLE 2 Circuit identification scheme - *continued*

IDENT	CIRCUIT	IDENT	CIRCUIT	IDENT	CIRCUIT
W	**WARNING AND EMERGENCY**		**WARNING AND EMERGENCY** - *continued*		**A.C. POWER** - *continued*
WB	Cockpit pressure warning	WN	Canopy operation warning	XF	400 Hz, 3-phase, 115-volt, Red phase
WC	Engine fire warning	◀ WP	Air turbine overfrequency warning		
WD	Engine fire extinguisher	WT	Test facilities	XG	400 Hz, 3-phase, 115-volt, Blue phase
WE	Inertia crash switch system				
WG	Oxygen flow warning	**X**	**A.C. POWER**	XH	400 Hz, 3-phase, 115-volt, White phase
WH	Air turbine underspeed	XA	400 Hz, 3-phase, 200-volt, phase A		
WK	Standard warning system	XB	400 Hz, 3-phase, 200-volt, phase B	XK	400 Hz, single-phase, 28-volt, line
WL	Canopy release warning	XC	400 Hz, 3-phase, 200-volt, phase C		
WM	A.C. generator power failure warning	XD	400 Hz, single-phase, 115-volt, line	XM	400 Hz, 200-volt, neutral
		XE	400 Hz, single-phase, 115-volt, neutral	XN	Neutral or earth
				Y	spare cores ▶

TABLE 3

Details of fuses and associated circuits

Note...*N.F. = Wiring installed but fuse not fitted S = Spare fuse*

FUSE NO.	RATING (amp)	CIRCUIT REF.	SERVICE	FUSE NO.	RATING (amp)	CIRCUIT REF.	SERVICE	FUSE NO.	RATING (amp)	CIRCUIT REF.	SERVICE
PORT FUSEBOX				**PORT FUSEBOX** - *continued*				**PORT FUSEBOX** - *continued*			
1	N.F.	WG2	Oxygen pressure failure warning	10	2.5	DD1	Aileron trim indicator	20	15	QC4	D.C. fuel pump (port)
				11	2.5	EC1	Fuel pressure warning (No.1 engine)	21	2.5	QC5	A.C. fuel pump control (port)
◀ 2	–	–	S	12	2.5	EE1	Oil pressure warning (No.1 engine)	22	2.5	VB2	Windscreen heating control (centre panel) switch
3	2.5	CB4	Flaps - pressure switch relay	13	5	HL1	Anti-icing (No.1 engine)	23	2.5	VB4	Windscreen heating control (side panel)
4	5	CD1	Aileron trim	14	10	JA1	H.E. ignition (No.1 engine)	24			S ▶
5	2.5	CD2	Aileron trim control	15	5	KA1	Starting (No.1 engine)	25	5	CG1	Feel unit cut-out
6	2.5	CF1	No.1 hydraulic pressure failure warning	16	10	KF1	Reheat (No.1 engine)	26	2.5	CE1	Rudder trim
7	5	WP1	Over frequency warning	17	2.5	KF5	Nozzle position indicator (No.1 engine)	27	2.5	DE1	Rudder trim indicator
8	2.5	LA3	Cockpit lighting (port console)					28	2.5	FH1	Stand-by horizon
9	2.5	DB4	Flaps position indicator (port)	18	–	–	S	29	5	GA1	Alighting gear control
				19	5	QA1	Fuel cock control (port)	30	5	GD1	Parachute jettison

continued...

TABLE 3 Details of fuses and associated circuits - *continued*
Note... *N.F. = Wiring installed but fuse not fitted S = Spare fuse*

FUSE NO.	RATING (amp)	CIRCUIT REF.	SERVICE
PORT FUSEBOX - *continued*			
31	5	HB1	Cockpit air shut-off valve
32	15	QC3	No.3 d.c. fuel pump (port)
33	10	JA3	H.E. ignition unit (No.1 engine)
34	2.5	LA1	Cockpit lighting
35	–	–	S
36	5	LC1	Navigation lights
37	–	–	S
38	–	–	S
39	–	–	S
40	–	–	S
◀ 41	5	HN1	Rain dispersal and de-ice ▶
42	20	PX1	Instrument supply control
43	–	–	S
44	2.5	PX7	Supply relay (pre Mod.4371) / S (post Mod.4371)
45	2.5	PX4	Flight instrument c/o control
46	–	–	S
47	–	–	S
48	2.5	WB1	Cockpit pressure warning light
STARBOARD FUSEBOX			
49	10	FE2	Pitot head heater (stand-by supply)
50	2.5	CB2	Flap control
51	5	CC1	Tail-plane trim
52	2.5	CC2	Tail-plane trim control
53	2.5	CF2	No.2 hydraulic pressure failure warning
54	2.5	WM1	A.C. generator failure warning
55	5	HL2	De-icing
56	2.5	DB2	Flaps position indicator (starboard)
57	2.5	DC1	Tail-plane position indicator
58	2.5	EC2	Fuel pressure warning (No.2 engine)
59	2.5	EE1	Oil pressure warning (No.2 engine)
60	2.5	GE1	Pitot pressure switch (A/G)
61	10	JA2	H.E. ignition unit (No.2 engine)
62	5	KA4	Starting (No.2 engine)
63	10	KF4	Reheat (No.2 engine)
64	2.5	KF8	Nozzle position indicator (No.2 engine)
65	2.5	LA4	Cockpit lighting
66	5	QA2	Fuel cock control (starboard)
67	15	QD4	D.C. fuel pump (starboard)
68	2.5	QD5	A.C. fuel pump control (starboard)
69	5	QH1	Refuelling
70	5	SX1	I.F.F.
71	2.5	VB5	Windscreen heating control (centre panel)
72	–	–	S
73	2.5	LA5	Cockpit lighting
74	–	–	S
75	2.5	WT1	Test switch (auxiliary warnings panel)
76	2.5	DA1	Air brake position indicator
77	2.5	DH1	Alighting gear position indicator
78	2.5	DK1	Brake pressure indicator
79	–	–	S
80	2.5	FH2	Stand-by horizon emergency supply
81	10	JA4	H.E. ignition unit (No.2 engine)
82	2.5	WC31	Firewire test
83	10	LD1	Taxying lights
84	–	–	S
85	–	–	S
86	10	PX2	115-volt instrument supply control
87	–	–	S
88	–	–	S
89	5A	PX22	Inverter control
90	15	QD3	No.3 fuel pump (starboard)
91	2.5	DL1	Fatigue meter
92	2.5	VB1	Heaters master switch
93	2.5	VB6	De-mister blower
94	2.5	WG1	Oxygen flow indicator
95	2.5	WH1	Air turbine stall warning
96	–	–	S
D.C. FEEDER FUSE PANEL			
97	–	–	S

continued...

TABLE 3 **Details of fuses and associated circuits** - *continued*

Note... *N.F.* = *Wiring installed but fuse not fitted* *S* = *Spare fuse*

FUSE NO.	RATING (amp)	CIRCUIT REF.	SERVICE
D.C. FEEDER FUSE PANEL – *continued*			
98	–	–	S
99	15	SS1	A.I.23
100	7.5	AD1	Gun purging
101	2.5	WL2	Canopy release
102	–	–	S
103	15	MC1	Seat positioner
104	7.5	RH2	Tacan
105	5	EL1	Fuel contents (port)
106	5	EL2	Fuel contents (starboard)
107	5	PW1	D.C. generator failure warning
108	2.5	FD1	Autostabilizer
109	20	PF1	Port fusebox feeder
110	20	PF2	Starboard fusebox feeder
111	20	PF3	Port fusebox feeder
112	20	PF4	Starboard fusebox feeder
◀ 113	7.5	RP4	U.H.F. test
114	5	SX	I.F.F. system failure
115	10	RP2	U.H.F. stand-by
116	5	RP3	U.H.F. change-over
117	5	VA1	A.C. ground supply
118	5	SX	I.F.F. supply relay control post Mod. 4499
119	5	SX	I.F.F. aerial switch unit supply post Mod. 4499
120	–	–	S
121	2.5	PX21	M.R.G. (d.c. supply)
122	2.5	PX1	M.R.G. (d.c. stand-by supply)
123	5	HB2	Cockpit temp. control
124	20	PX6	Inverter (d.c. supply)
125	–	–	S
126	–	–	S
127	2.5	VA6	A.C. generator test
128	20	RA1	I.L.S. supply
129	5	GE2	Armament safety relay
D.C. FEEDER FUSE PANEL – *continued*			
130	10	BA1	G90 camera control
131	5	AF1	Rocket control
132	2.5	AF5	Rocket emergency retract
133	10	AA1	Gun firing control
134	5	CA1	Air brake Mach switch
135	–	–	S
136	–	–	S
137	10	AE1	Firestreak control
138	10	AE3	Firestreak G.D. relay
139	5	AD2	Gun purging interlock
140	5	AC1	P.A.S. control
141	7.5	PJ4	Control and protection unit supply (post Mod.4092/4240)
142	–	–	S
143	2.5	AC2	P.A.S. (d.c. supply)
144	2.5	BA2	Camera recorder
145	30	AE7	Firestreak rocket firing
146	40	RP1	U.H.F. (A.F. unit)
147	–	–	S
	160	PL	D.C. generator busbar (post Mod.4092/4240)
–	150	PL	D.C. generator busbar
–	160	KA6	Engine I.P.N. starter
–	160	KA7	Engine I.P.N. starter
FORWARD EQUIPMENT COMPARTMENT			
149	5A	SS13	A.I. recorder
150	5A	SS14	A.I. recorder test
151	–	–	S
152	–	–	S
EMERGENCY SERVICES FUSEBOX			
153	10	AE5	Firestreak emergency jettison 1
154	10	AE6	Firestreak emergency jettison 2
155	20	WE1	Inertia switch circuit
156	10	WE2	Battery isolation
EMERGENCY SERVICES FUSEBOX – *continued*			
157	10	WD2	Fire extinguishers (No.2 engine)
158	10	WD1	Fire extinguishers (No.1 engine)
159	5	VA6	Alternator reset (post Mod.4240)
160	2.5	WC1	Fire warning (No.1 engine)
400	2.5	WN1	Canopy operation
401	2.5	MB1	Canopy operation
402	2.5	WC2	Fire warning (No.2 engine)
403	–	–	S
404	–	–	S
405	–	–	S
406	–	–	S
407	5	RY1	Telebriefing
A.C. FUSE-AND-RELAY BOX			
197	2.5	WCF1	Fire detection (No.1 engine)
198	–	–	S
199	5	XGC1	Instrument supply transformer
200	5	XFA1	Output sensing (post Mod.4371)
201	7.5	XF1	115-volt instrument supply (c/o relay) ▶
202	2.5	FHF1	Stand-by horizon
203	–	–	S
204	2.5	FDF1	Autostabilizer
205	–	–	S
206	2.5	EFF2	No.2 J.P.T. amplifier
207	5	FGF1	Servo altimeter
208	5	FCF1	Master ref. gyro J.B.
209	2.5	HBF2	Cabin temperature control unit

continued...

TABLE 3 Details of fuses and associated circuits - *continued*

Note... *N.F. = Wiring installed but fuse not fitted S = Spare fuse*

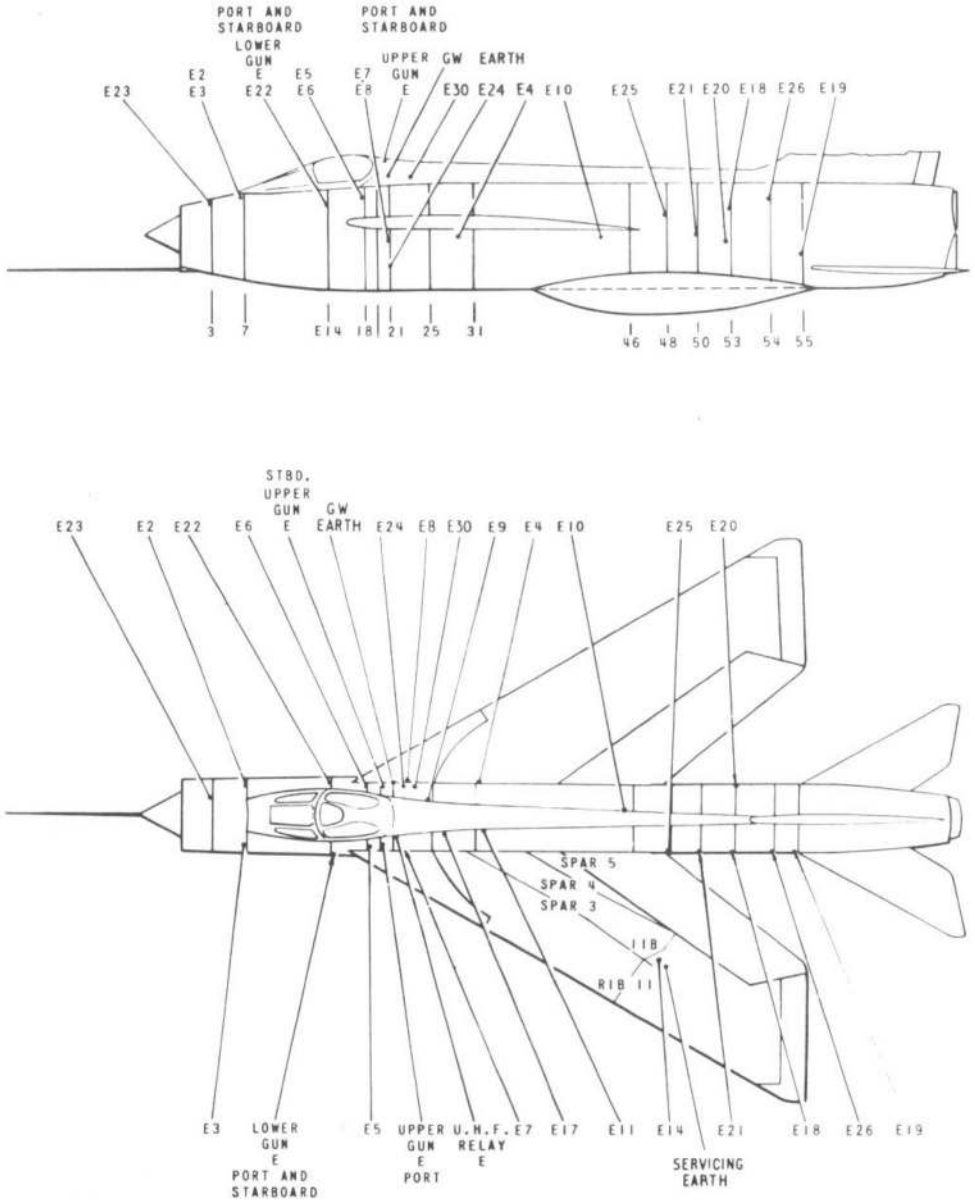
FUSE NO.	RATING (amp)	CIRCUIT REF.	SERVICE
A.C. FUSE-AND-RELAY BOX - *continued*			
210	2.5	HGF1	Windscreen heating control (centre panel)
211	2.5	EFF4	No.2 J.P.T. servo-potentiometer
◀ 212	5	SXD1	I.F.F. relay supply (pre Mod.4499)
			I.F.F. supply (post Mod.4499)
213	7.5	XG1	115-volt instrument supply (c/o relay)
214	2.5	FGH1	Stand-by horizon
215	–	–	S
216	2.5	FDG1	Autostabilizer
217	2.5	EFG1	No.1 J.P.T. amplifier
218	–	–	S
219	2.5	EFG5	No.1 J.P.T. servo-potentiometer
220	5	FCG1	Master reference gyro J.B.
221	2.5	HGB1	Cockpit temperature control unit
222	2.5	WCG1	Fire detection (No.2 engine)
223	–	–	S
224	5	RHD2	Tacan
225	10	XA4	200/115-V 3-phase instrument supply transformer
226	–	–	S
227	7.5	XA7	200/115-V single-phase transformer
228	2.5	HCA1	De-mister blower
229	2.5	ACA1	P.A.S. Mk.1
A.C. FUSE-AND-RELAY BOX - *continued*			
230	10	HGA1	Windscreen (centre) heater supply transformer
231	7.5	HGA9	Windscreen (centre) control supply
232	7.5	HGA3	Windscreen (side) heater supply transformer
233	5	AA43	Gun firing power unit
234	7.5	QCA1	No.1 fuel pump (port)
235	7.5	QCA2	No.2 fuel pump (port)
236	–	–	S
237	7.5	QDA1	No.1 fuel pump (starboard)
238	7.5	QDA2	No.2 fuel pump (starboard)
239	–	–	S
240	7.5	XB2	200/28-V single-phase transformer
241	10	XB4	200/155-V 3-phase instrument supply transformer
242	7.5	XB6	200/155-V single-phase transformer
243	7.5	XB7	200/115-V single-phase transformer
244	2.5	HCB1	De-mister blower
245	10	HGB1	Windscreen (centre) heater supply transformer
246	7.5	HGB3	Windscreen (side) heater supply transformer
247	2.5	ACB1	P.A.S. Mk.1
248	5	AAB3	Gun power
249	7.5	QCB1	No.1 fuel pump (port)
250	7.5	QCB2	No.2 fuel pump (port)
A.C. FUSE-AND-RELAY BOX - *continued*			
251	2.5	HGB9	Windscreen (centre) control supply
252	7.5	QDB1	No.1 fuel pump (starboard)
253	7.5	QDB2	No.2 fuel pump (starboard)
254	–	–	S
255	7.5	XC2	200/28-V single-phase transformer
256	10	XC4	200/115-V 3-phase instrument supply transformer ▶
257	–	–	S
258	7.5	XC6	200/155-V single-phase transformer
259	2.5	HCC1	De-mister blower
260	2.5	ACC1	P.A.S. Mk.1
261	10	HGC1	Windscreen heating (centre panel)
262	–	–	S
263	7.5	QCC1	No.1 fuel pump (port)
264	7.5	QCC2	No.2 fuel pump (port)
265	N.F.	Y139	–
266	7.5	QDC1	No.1 fuel pump (starboard)
267	7.5	QDC2	No.2 fuel pump (starboard)
268	–	–	S
269	20	XK11	Main heating supply
270	5	GCK1	Hydraulic services pressure gauge
271	–	–	S
272	10	FEK1	Pitot head heater
273	5	HDK3	Vent valve heater (port)
274	5	HDK4	Vent valve heater (starboard)

continued...

TABLE 3 Details of fuses and associated circuits - *continued*

Note... *N.F.* = *Wiring installed but fuse not fitted* *S* = *Spare fuse*

FUSE NO.	RATING (amp)	CIRCUIT REF.	SERVICE
A.C. FUSE-AND-RELAY BOX - *continued*			
275	5	HDK5	Vent valve heater (port)
◀ 276	5	HDK	Ventral tank vent valve heater (post Mod.4099) ▶
277	5	HDK2	Vent valve heater (starboard)
278	–	–	S
279	–	–	S
280	–	–	S
SPINE BREAK FR.25			
281	10	SSA1	A.I. supply (ground)
282	10	SSB1	A.I. supply (ground)
283	10	SSC1	A.I. supply (ground)
284	–	–	S
SPINE BREAK FR.25 - *continued*			
285	–	–	S
286	–	–	S
287	–	–	S
288	–	–	S
D.C. COMPARTMENT FR.52-53 STARBOARD			
408	5	PT1	Voltmeter
409	–	–	S
410	20	GD2	Parachute jettison
411	–	–	S
412	5	JA5	Reheat ignition (No.1 engine)
413	5	JA6	Reheat ignition (No.2 engine)
D.C. COMPARTMENT FR.52-53 STARBOARD - *continued*			
414	7.5	HL3	Ice warning
415	7.5	PC1	D.C. generator field
SPINE FLOOR FR.17			
	2	XJ1	Gun firing unit
	2	XJ2	Gun firing unit
	2	XJ3	Gun firing unit
	2	XJ4	Gun firing unit
REAR SPINE FR.35			
	10	KA8	Starting (No.1 engine)
	10	KA9	Starting (No.2 engine)



EARTH NO.	LOCATION	BONDED TO AIRFRAME FROM:-
E2	STBD. FORE AND AFT DIAPHRAGM, FR.6-7	ELECTRICAL EQUIPMENT IN COCKPIT
E3	PORT FORE AND AFT DIAPHRAGM, FR.6-7	ELECTRICAL EQUIPMENT IN COCKPIT
E4	FR 29, STBD ABOVE STRINGER 15	J.B.4
E5	FR.18 PORT GUN-BEAM WEB	A.C. FUSE-AND-RELAY BOX, D.C. RELAY BOX, PORT FUSE AND DISTRIBUTION BOX
E6	FR.18 STBD. GUN-BEAM WEB	A.C. DISTRIBUTION BOX, D.C. RELAY BOX, STBD. FUSEBOX
E7	FR.21 PORT LOWER GUN LONGERON	J.B.7
E8	FR.21 STBD. LOWER GUN LONGERON	J.B.8
E9	FR.24 SPINE COMPARTMENT, PORT SIDE	MAIN BATTERY NO.1
E10	FR.41 PORT SIDE BETWEEN STRINGERS 9-10	MAIN BATTERY NO.2
E11	SIDE MEMBER OF RELAY MOUNTING, FR.34-35 SPINE	PUMP UNITS, NO.1 AND NO.2 ENGINES
E14	RIB 11B, SPAR 3, PORT WING	GROUND SUPPLY PLUG
E17	FR.26 SPINE, PORT SIDE	A.C. GENERATOR TEST AND CONTROLS
E18	FR.53 PORT	
E19	FR.55 PORT	D2 RELAY BOX
E20	FR.53 STARBOARD	D.C. COMPARTMENT
E21	FR.50 PORT	I.F.F. EQUIPMENT
E22	FR.14 STARBOARD	ARMAMENT RELAY BOX
E23	FORWARD EQUIPMENT COMPARTMENT FR.3 STARBOARD	OVERRUN CONTROL UNIT AND G.G.S. RECORDER
E24	FR.21 STARBOARD	GW
E25	FR.48 PORT BETWEEN STRINGERS 8-9	H.E. IGNITION UNIT
E26	FR.54 PORT	A.C. GENERATOR
E30	FR 23-24 STBD	D.C. GENERATOR
UPPER GUN EARTH,STBD	AFT PRESSURE BULK-HEAD, STBD.	GUN FIRING RELAY BOX
UPPER GUN EARTH,PORT	AFT PRESSURE BULK-HEAD, PORT	GUN FIRING RELAY BOX
LOWER GUN EARTH,STBD	FR.14 PORT	GUN FIRING RELAY BOX
LOWER GUN EARTH,PORT	FR.14 PORT	GUN FIRING RELAY BOX
GW EARTH	DIAPHRAGM NO.4, STBD. SIDE EXTENSION TO E22	GW
U.H.F.EARTH	FR.20A PORT SIDE	U.H.F. RELAY BOX
SERVICING EARTH	PORT WHEEL WELL	RIB 11B

ON THE RE-CONNECTION OF EARTH LEADS THE TERMINALS OR STUDS SHOULD BE PAINTED WITH BLUE OIL-BASE PAINT REF.NO.338-1076

FIG.5. EARTH POINT LOCATION

◀ MINOR AMENDMENTS ▶

Note...
All checks to be carried out using a Type B bonding tester, as detailed in A.P.4343, Vol.1, Sect.24.

CHECK FROM E9 (MAIN EARTH TERMINAL)
TO

J.B.3
Port fusebox
Starboard fusebox
D.C. relay box
A.C. fuse-and-relay box
D.C. feeder fuse panel
H.E. ignition units (with cables)
Water boiler
Water separator
Heat exchanger
Combined valve unit (fwd. equip. comp.)
Air bottle for No.1 & No.2 controls
Aileron accumulator for No.1 & No.2 controls
Wheel brake accumulator
Service system accumulator
Air pipes
Hydraulic pipes
Pilot's seat rail guide
Oxygen bottle
M.R.G. distribution box
Starboard console panel
Starboard instrument panel
Port instrument panel
Port coaming panel
Armament relay box
Artificial horizon control box
I.L.S. control unit
Tacan control unit
NESA windscreen control unit
Gun-firing power unit
Transformer/relay box assembly
Earth points E2, E3, E4, E7, E8, E9, E22, E23, E24
A.C. generator
D.C. generator
Accessory drive unit and fan
Reheat ignition units (with cables)
D2 relay box
Voltage regulator (fr.54-55)
Control panel (fr.54-55)
Starter ignition units (with cables)
Starter control units
A.C. control panel
Voltage regulator amplifier
Iso-propyl nitrate fuel tank
Starter pump units (P and S)
Reheat fuel pumps (No.1 and No.2 eng.)
Rudder actuator
Tail-plane actuator
Air turbine shut-off valve
Accumulators and air bottles (fr.55-56)
Accumulators (feel system)
Hydraulic reservoir (No.1 and No.2 controls)
Hydraulic reservoir (general services)
Heat exchanger (aux.air system)
I.F.F. coder unit
Cable ducting in No.1 eng. jet pipe bay
J.B.4
Fire bottles (P and S)
Earth points E4, E10, E11, E14, E19, E20, E21, E26
Stainless steel flexible conduits
Rudder
Fin
Air brake doors (P and S)
Elevators (P and S)
Parachute container doors
Hinged door (fr.52)
Port wing aileron
Port wing (measured from wing tip)
Port wing trailing edge flap
Port alighting gear main leg
Port alighting gear door
Ventral tank
Starboard alighting gear door
Starboard alighting gear main leg
Starboard wing trailing edge flap
Starboard wing (from wing tip)
Starboard aileron
Hinged spine portion of rear fuselage
No.2 engine
Hinged spine portion of front fuselage
J.B.7
Main equip. comp. doors (P and S)
J.B.8
No.1 engine
Nose-wheel doors (P, S, and rear)
Forward equipment compartment door
Canopy structure
Torque shaft break (spar 1)
Armament pack
No.1 engine hatch
No.2 engine hatch
*Conductivity of nose-wheel tyre
Pilot's seat
A.I. display unit
A.I.23 controller
A.I. recorder
A.I. scanner (radar head)
P.A.S. gunsight
P.A.S. controller
L.E. fuel tank (P and S)
L.E. fairing (P and S)
Recuperator inlet (P and S, spar 1)
Fuel pipes (P and S)
Hydraulic pipes
Fuel pump inlet (P and S, spar 1)
Air pipes (P and S)
Pressure head
I.L.S. glide path receiver
I.L.S. localizer receiver
I.F.F. transmitter/receiver
H.E. ignition units (with cables No.2 hatch)
Tacan coupling unit
Tacan transmitter/receiver
U.H.F. transmitter/receivers
U.H.F. homing R.F. unit
U.H.F. homing A.F. unit
U.H.F. control unit and switch panel
I.F.F. and S.I.F. control units
Throttle servo amplifier
Main instrument panel
M.R.G.
Autopilot computer
Autopilot junction box
Autostabilizer amplifier
Compass amplifier
Flight refuelling wing probe

*The conductivity of nose-wheel tyre is measured between the terminal and a light alloy plate placed under the wheel.

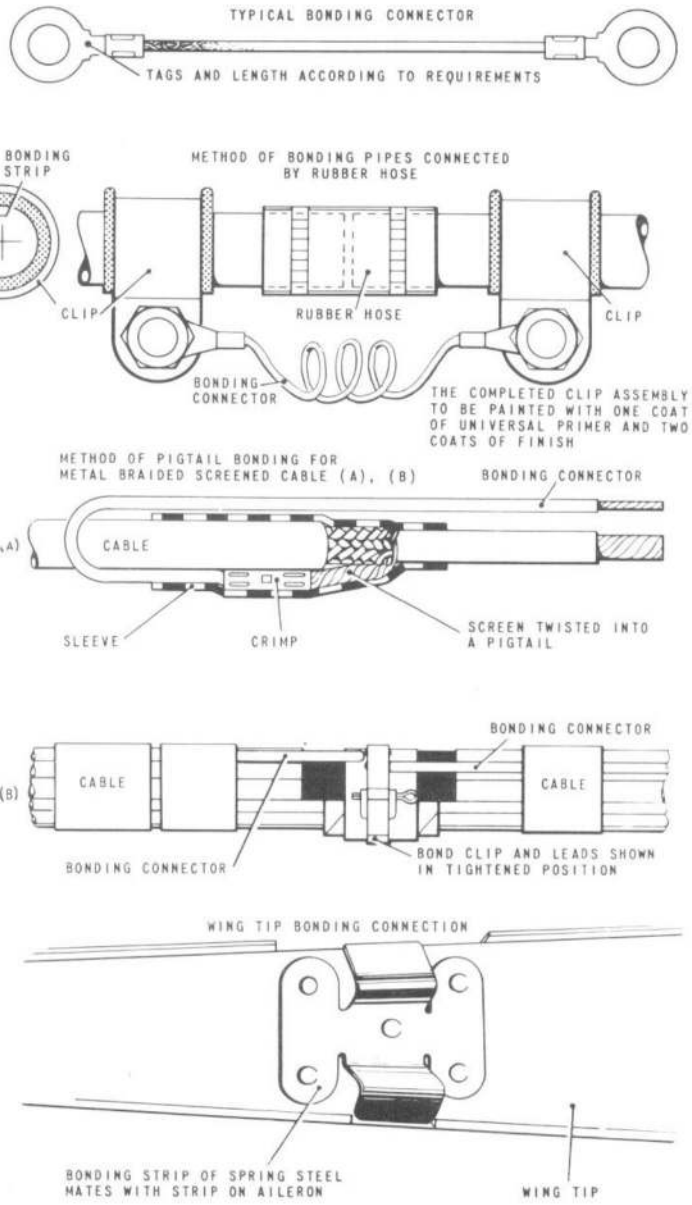


FIG. 6. ELECTRICAL BONDING

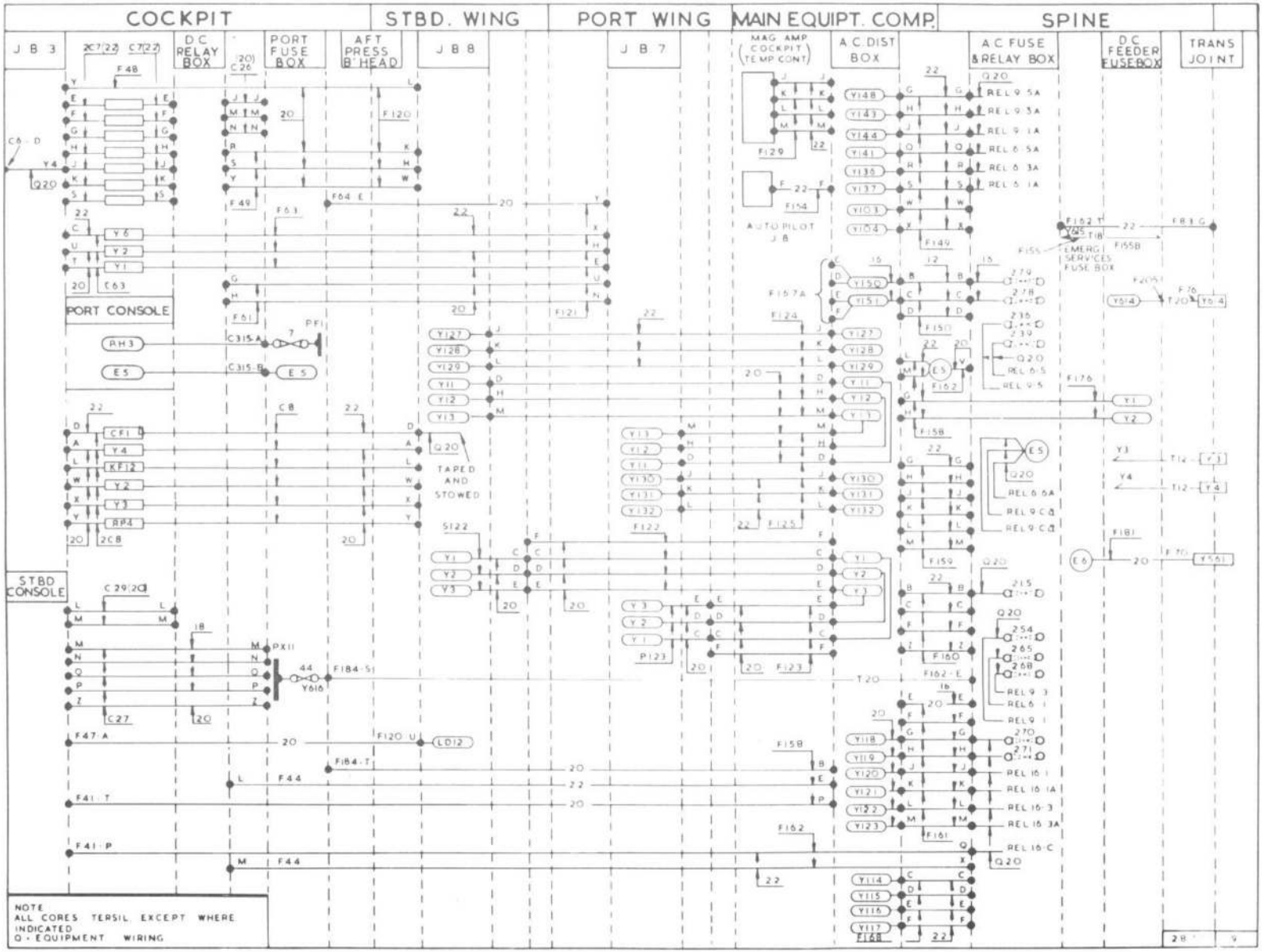


FIG.7. SPARE CORES – FRONT FUSELAGE (1)

◀MOD. 4240 EMBODIED▶

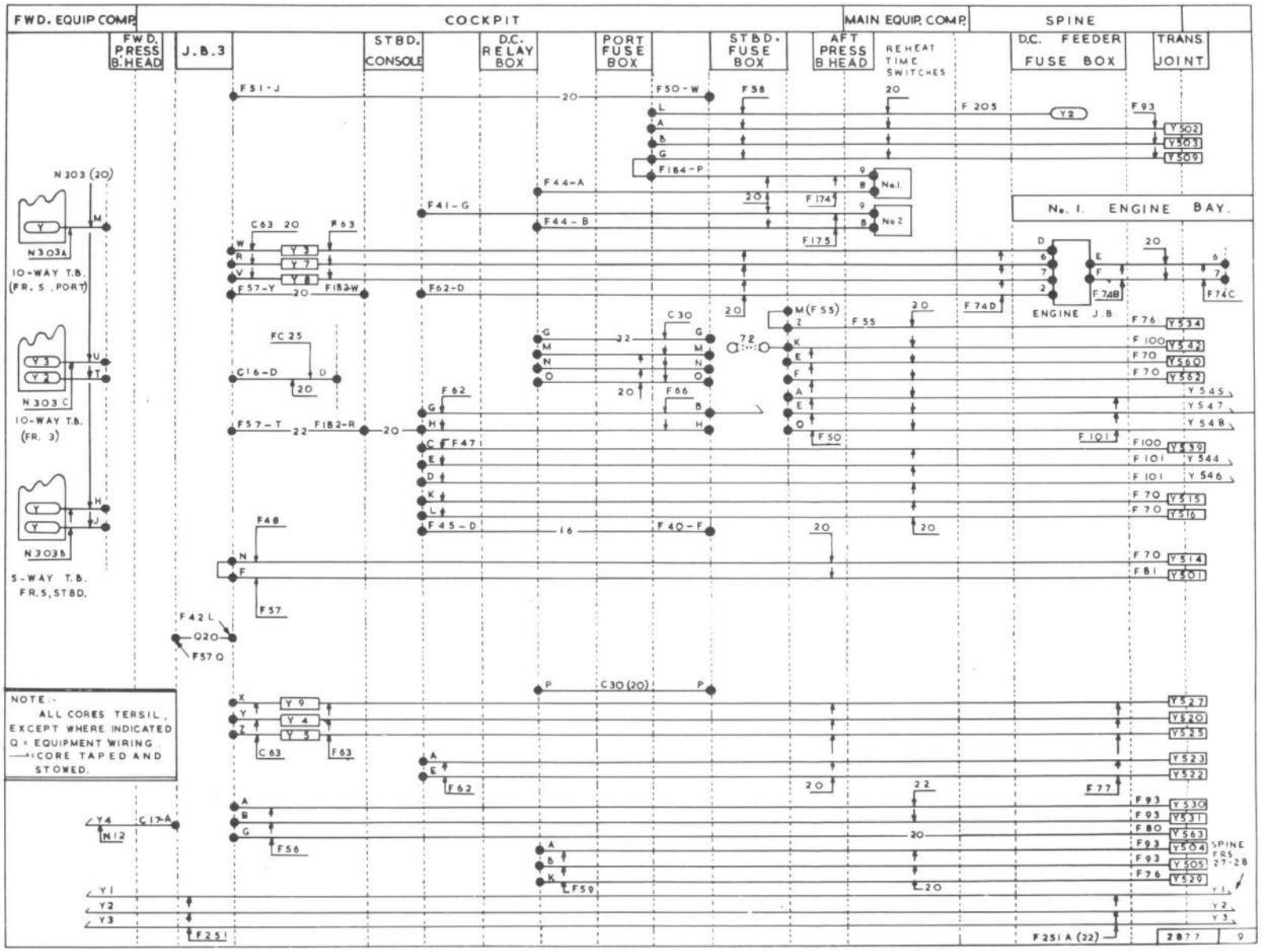


FIG. 8. SPARE CORES - FRONT FUSELAGE (2)

◀ MOD. 1922 & 4551 EMBODIED ▶

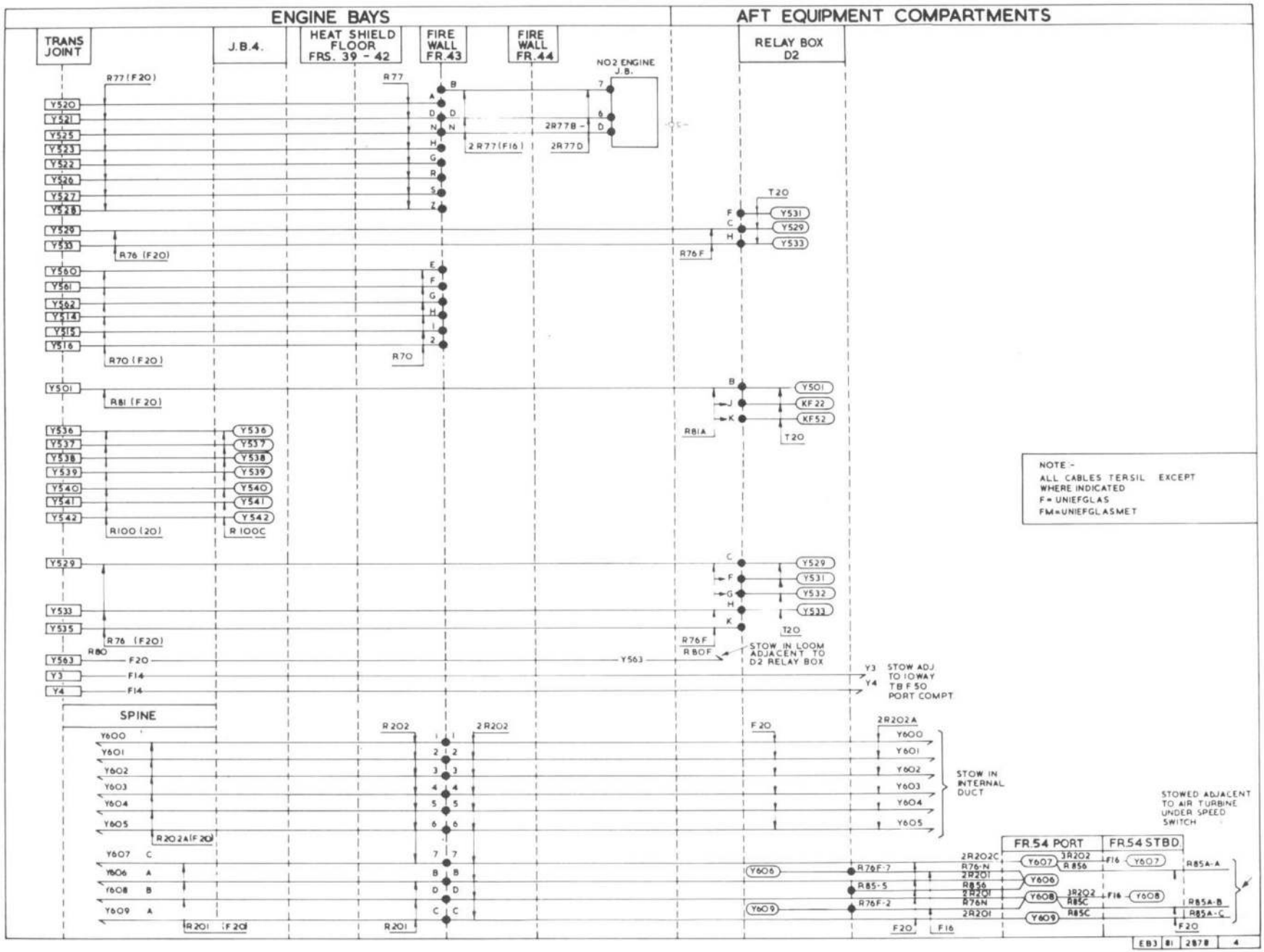


FIG. 9. SPARE CORES-REAR FUSELAGE

◀ MOD. 4240 & 4551 EMBODIED ▶

TABLE 4

Details of equipment for d.c. supply extension cable (Ref.No.26DK/37488)

Sect/Ref.	Description	Quantity	Remarks
5CY/4376383	Circuit breaker 15 amp	1	
5CY/5314	Plug fixed 28-volt	1	As fitted to aircraft
5J/4335378	Connector, Cannon	1	As used on Type J battery
5A/4900	Socket free, 200-volt, Type 4	1	Rubber shroud only required
5E/2982	Cable, heavy duty	25 ft	
	Paxolin sheet	As required	
	Rubber strip	As required	

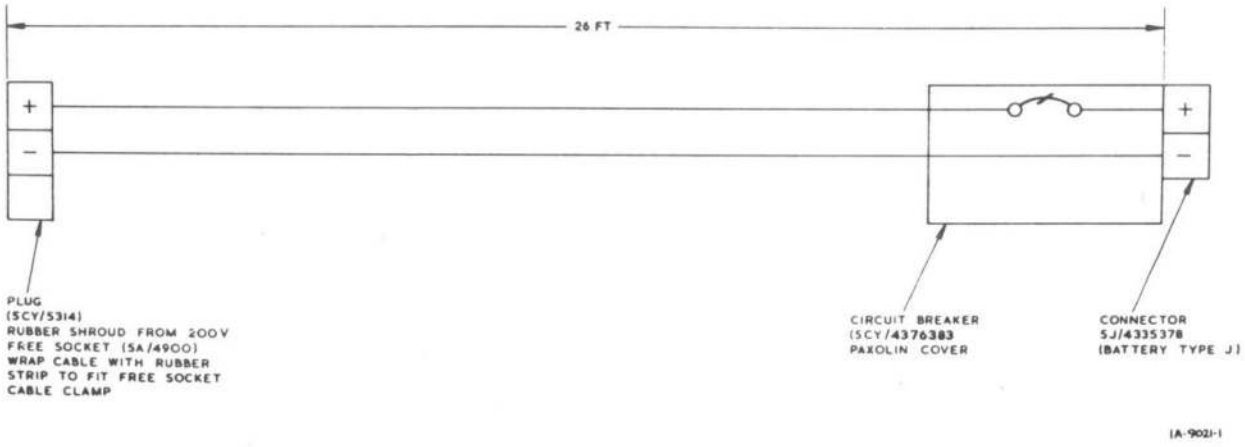


Fig. 10. External d.c. supply extension cable