

## GROUP A.2.

## REMOVAL OF JUNCTION BOXES, PANELS AND SHELVES

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**Introduction**

1. The majority of the junction boxes, equipment panels and parts of the cabin shelves are designed for quick removal to facilitate servicing. This group describes the recommended methods of removing these units. The electrical disconnections required prior to engine removal are also included. For the location of all access doors quoted in this Group, reference should be made to Section 2, Chapter 4.

**REMOVAL****General**

2. Before removing any item of equipment, the following precautions must be observed:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) All disconnected ends of electrical cables must be insulated from each other and the airframe by binding with insulating tape. The cables should then be coiled back and stowed clear to prevent damage.
- (3) All disconnected plugs and sockets must be fitted with approved caps and covers to prevent the entry of foreign matter.
- (4) All bonding and earthing strips dis-

connected must be retained with the airframe and re-assembled when the component is re-installed.

**Engine removal disconnection points.**

3. The full procedure for removing the engine is contained in Section 4, Chapter 1. The electrical disconnections necessary when carrying out this operation, are repeated, however, in this Group for the guidance of electrical servicing personnel:-

- (1) Before preparing to remove the engine render the aircraft electrically safe, as described in Group A.1.

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(2) To remove the engine, it is first necessary to break down the aircraft at the rear transport joint. The action necessary to break down the electrical system at this point, consists of disconnecting cable assemblies C.10, C.11, C.12, C.84, PC.14, EX.5 and the U.H.F. tele-briefing connector TS.4 from their associated cable assemblies R.1, R.2, R.3, R.36, PC.15, EX.6 and TS.5. All these connections are located between the transport joint frames and access may be gained after removal of the transport joint butt-strap. It is also necessary to uncouple the gyro compass connector at its disconnection point which is located in the spine member, adjacent to the transport joint. The electrical circuits of the port and starboard rear fuel tank units should also be broken at the connectors, located on each side of the transport joint. Also, disconnect the exhaust gas thermometer cables from the terminal blocks located on frame 40B, port and starboard.

(3) To disconnect the electrical services from the engine, disconnect the cable assemblies C.3 and C.6 from the plugs mounted on the bottom starboard side of the engine compressor, to which access is obtained via the engine access door located just forward of the transport joint.

(4) Disconnect the H.T. leads from the engine igniter plugs mounted on number 3 and 6 combustion chambers,

access to which is obtained via the doors located just forward of the transport joint, one on each side of the centre fuselage.

#### NOTE . . .

*Extreme care must be taken to ensure that the insulators of the H.T. leads are not cracked or damaged in any way and action must be taken to protect these parts while the engine is being removed. It is also essential to seal the end connections of the H.T. leads and igniter plugs to prevent the entry of dirt or other foreign matter.*

(5) If it is required to remove the jet pipe from the rear fuselage, it is first necessary to remove the thermocouples from the jet pipe. Access to these may be gained by removing the fuselage tail cone.

#### Junction box 1

4. This junction box is mounted on the rear face of the main spar in the centre fuselage and access to it may be obtained via the engine starter access door in the undersurface of the centre fuselage. The recommended procedure for removing this box is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Open the engine starter access door.
- (3) Disconnect the earth lead EA.9 from earth point 9 located adjacent to the

lower right hand corner of J.B.1. (fig.1).

(4) Disconnect all the plugs and sockets on the cable assemblies at J.B.1. Seal off the plugs and sockets with approved caps and covers and stow the cable assemblies away from the box.

(5) Release the two fasteners at the lower corners of the box (fig.1) and lift the

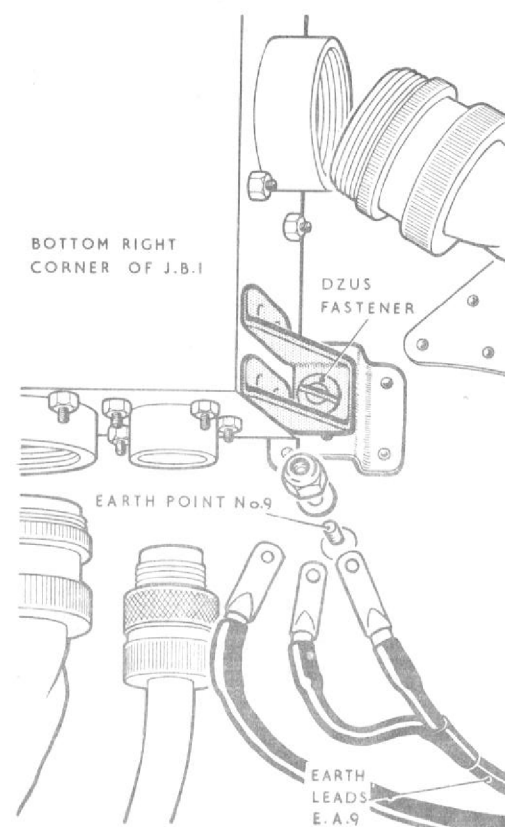


Fig.1. lower attachments and earth point 9

box upwards to disengage the two top mountings.

- (6) Lower the box and remove it from the aircraft, complete with earth lead EA.9.

#### Junction box 2

5. This junction box is mounted in the cabin above the aft portion of the port shelf. To remove it, proceed as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Disconnect the cable assembly F.24 from the plug on the rear end of the box. Seal off the plug and socket with an approved cap and cover.
- (3) Remove the lid of the box and disconnect all the leads of the cable assemblies F.42, F.43 and F.44 from the terminals in the box. Withdraw the cable assemblies through the grommets, insulate the cable ends and stow.
- (4) Release the box from its mountings by removing the two bolts, located one at each end inside the box, taking care to retain the distance tubes. Replace the lid on the box.
- (5) If it is required to remove the box, complete with cable assemblies F.42, F.43 and F.44, ignore operation (3) and disconnect these assemblies at their terminations, i.e. cabin element, magnetic amplifier and temperature

selector. The cable assemblies may then be coiled back to J.B.2 and the box removed, as in operation (4).

#### Note . . .

*To accomplish this operation, it will be necessary to remove the two portions of the cabin port shelf, as described in para. 16 and 17 to gain access. Any straps retaining the cable assemblies must also be disengaged.*

#### Junction box 3.

6. This junction box is mounted on the gearbox access door on the underside of the centre fuselage. The recommended procedure for removing this box is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Unfasten the gearbox access door and allow it to swing open on its hinge.
- (3) Disconnect the plug and socket of cable C.12 on junction box 3. Remove the lid and disconnect cables ES.1, ES.2, ES.4, ES.5 and ES.6 from the terminals; remove these cables with their grommets, from the box.
- (4) Remove the four bolts which retain the box to the door and withdraw the box from the aircraft. Replace the lid.
- (5) To remove this box complete with cables ES.1, ES.2, ES.4, ES.5 and ES.6 disconnect the plug and socket

of cable C.12 and disconnect the earth connection of cable ES.1 from earth point No. 9. Disconnect the remaining cables from the starter components, access to which may be gained through the engine starting access door.

#### A.C. junction box.

7. This box is mounted in the cabin on the starboard side between frames 12 and 13 just aft of cabin shelf. The recommended method of removing the box is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Disconnect cable assemblies AC.1, AC.2, AC.3 and AC.4 from the two inverters, located below the A.C. junction box, unclip these cables and coil them back to the junction box.
- (3) Disconnect all the cable assemblies at the plugs and sockets at the junction box. Seal off the plugs and sockets with approved caps and covers and stow the cables away from the box.
- (4) Disconnect the A.C. earth lead from earth point 1 located on the side wall of the starboard shelf at the rear end.
- (5) Release the junction box from the airframe by removing the four mounting screws and withdraw it from the aircraft, complete with the earth lead and the four inverter leads.

#### ARM junction box 1

8. This junction box is mounted on the fuel tank access door on the forward face of frame 19 above the battery platform and access to it may be obtained via the radio access door in the undersurface of the fuselage. The recommended procedure for removing the box is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Remove the radio access door.
- (3) Remove the lid of the box and disconnect all the leads of cable assemblies A.3 and A.4 from the terminals in the box. Withdraw the cable assemblies through the ferrules, insulate the cable ends, and stow. Replace the lid on the box.
- (4) Disconnect cable assembly A.7 from the top of the box, seal off the plug and socket with an approved cap and cover and stow the cable assembly clear of the box.
- (5) Disconnect the ARM earth cable from the earth studs below the box.
- (6) Release the box from its mounting by removing the two bolts located one at each end of the box.
- (7) The box may now be removed from the aircraft, complete with the ARM earth lead.

#### ARM junction boxes 3 and 5

9. These two junction boxes, ARM J.B.3 (*port*) and ARM J.B.5 (*starboard*), are positioned in the wheel-bays, forward of the undercarriage girder and just inboard of the undercarriage pivot castings. The recommended procedure for the removal of either of these boxes is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Gain access through the wheel bay.
- (3) Remove the junction box cover by releasing the four screws.
- (4) Disconnect all the leads from the terminal blocks, insulate the ends, and stow.
- (5) Unscrew the four pillars holding the terminal blocks to the platform. Remove the terminal blocks from the wheel bay.

#### Note . . .

*The platform is riveted to the upper skin of the wing and is, therefore, not readily removable.*

#### ARM junction boxes 4 and 6

10. These two junction boxes a ARM J.B.4 (*port*) and ARM J.B.6 (*starboard*), are positioned one in each outer wing. Access to these may be gained through the access doors in the wing skin. The recommended method of removing either of these boxes is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Release the appropriate access door.
- (3) Remove the junction box cover which is retained by four screws.
- (4) Disconnect all the leads from the terminal blocks, insulate the ends, and stow.
- (5) Unscrew the four pillars holding the terminal blocks to the platform. Remove the blocks through the access door.

#### Note . . .

*The platform is riveted to the upper skin of the wing and is, therefore, not readily removable.*

#### Camera junction box

11. The camera junction box is mounted between the top portions of frames 4 and 5, in the nose wheel bay. The recommended procedure for its removal is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Disconnect all the cable assemblies at the plugs and sockets at the junction box. Seal off the plugs and sockets with approved caps and covers and stow the cables away from the box.
- (3) Remove the lid of the box and disconnect the earth lead inside the box.

- (4) Release the box from its mounting by removing the four bolts and washers.

#### Air brake relay box

12. This box is mounted on the port side of the cabin, just aft of the hood control switchbox. To remove it, proceed as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Disconnect the plug and socket of cable assembly F.70. Seal off the plug and socket with an approved cap and cover.
- (3) Unscrew the two bolts which attach the box to the side of the fuselage.
- (4) Remove the box from the aircraft.

#### Supply panel

13. This panel is mounted in the radio bay on the starboard side between frames 16 and 19, and access to it may be gained via the radio access door in the undersurface of the front fuselage. The panel is located behind the generator control panel which must be removed first or hinged up out of the way, before the supply panel can be removed. The recommended procedure for removing the supply panel is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Remove the radio access door.

- (3) Disengage the four fasteners securing the generator control panel to the bottom of the supply panel, raise the control panel and retain it in this position by means of the ring and chain provided on the radio mounting structure. Alternatively, remove the control panel, as described in para. 14.

- (4) Disconnect cable assemblies C.1, C.2, C.4 and C.39 at the plugs located at the bottom of the panel. Seal off the plugs and sockets with approved caps and covers, and stow the cable assemblies away from the panel.

- (5) Disconnect all the leads of the remaining cable assemblies from the terminals on the panel. Remove the straps securing these leads, insulate all bare ends, coil up the cable assemblies and stow out of the way. Disconnect the leads from the circuit breakers below the supply panel, from the terminals on the panel. Disconnect the exhaust gas thermometer leads from the terminal block adjacent to plug and socket F.49.

- (6) Disconnect the two earth leads E5A from earth point 5 on the battery mounting. Remove any straps securing this lead and coil back to the supply panel.

- (7) Disengage the panel from the aircraft structure by removing the six screws from the forward and rear edge, together with the six nuts from the studs

projecting through the panel channel members.

#### Note . . .

*To gain access to these attachments, it may be necessary to bend the cable assemblies out of the way. Ensure that they are not damaged when removing the attachments.*

- (8) Withdraw the panel from the studs on the fuselage frames and remove it from the aircraft complete with earth leads E.5A.

#### Generator control panel.

14. This panel is mounted in front of the supply panel in the radio bay on the starboard side between frames 16 and 19. Access to it may be gained via the radio access door in the undersurface of the front fuselage. To remove this panel, proceed as follows:-

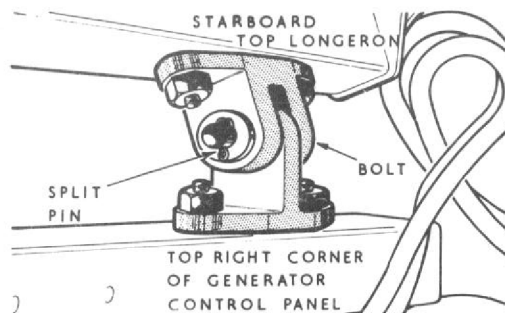
- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Remove the radio access door.
- (3) Disconnect cable assemblies C.37, C.38, F.52 and C.32 from the differential cut-outs and the battery relay mounted on the control panel. Remove any straps and clips securing these cable assemblies, insulate the bare cable ends and stow the assemblies away from the panel.
- (4) Remove the standby battery box as described in Group B.1.

- (5) Disengage the four fasteners securing the bottom of the panel and swing the panel up to gain access to cable assembly F.49 at the top of the supply panel.
- (6) Disconnect cable assembly F.49 from the plug located at the top of the supply panel. Seal off the plug and socket with an approved cap and cover.
- (7) With a second person supporting the panel, withdraw the two top hinge pins by removing the split-pins and washers (*fig.2*)
- (8) Lower the panel and remove it from the aircraft, complete with cable assembly F.49.

#### Leg panel

15. The leg panel is bolted to the cabin floor, just forward of the control column and below the centre instrument panel. The recommended procedure for removing it is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Disconnect the Bowden cable from the rudder bar release lever at the top of the leg panel and stow it away from the panel.
- (3) Disconnect cable assembly A.11 at the plug and socket break, located at the port side of the instrument panel mounting structure. Remove any straps



**Fig.2. Generator control panel upper attachment**

and clips securing the A.11 cable and coil the cable back to the leg panel. Fit an approved cap and cover to the plug and socket.

- (4) Disconnect cable assembly E.3/A from earth point 3, obtaining access via the hinged door in the port side of the leg panel (*fig.3*).
- (5) Disconnect all the plugs and sockets on the cable assemblies at the leg panel. Seal off the plugs and sockets with approved caps and covers and stow the cable assemblies away from the panel.
- (6) Release the leg panel from its mountings by removing the nine bolts from around the bottom, forward, and side faces of the panel. Remove the leg panel from the cabin complete with cable assembly E.3/A.

**Note . . .**

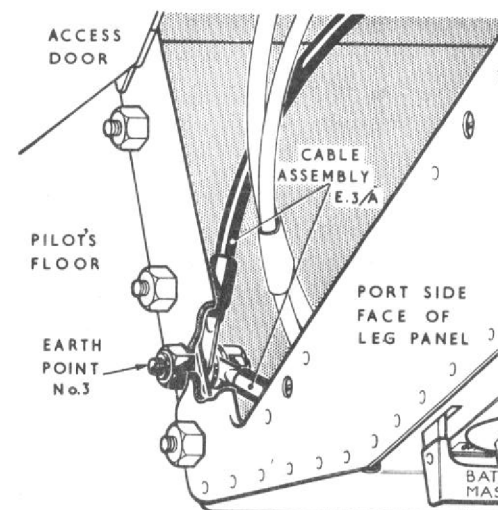
*Although it is possible to remove*

*the leg panel without disturbing the centre instrument panel, access is easier if this latter panel is removed first.*

#### Cabin port shelf (forward portion)

16. This removable portion of the cabin port shelf is located just inboard of the throttle box and the recommended method of removing it is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Remove the fourteen screws from around the side wall, rear edge and outboard side of the top panel. Raise the shelf to obtain access to the plug and socket breaks of cable assemblies FR.13 and F.19 and disconnect the cable assemblies.



**Fig.3. Earth point 3**

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- (3) Disconnect cable assemblies F.141, F.142, F.168 and F.19D from the equipment on the panel.
- (4) Remove the shelf from the cabin and seal off the plugs and sockets with approved caps and covers.

#### Cabin port shelf (rear portion)

17. This removable portion of the cabin port shelf is located just behind the throttle control. The recommended procedure for removing the shelf is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.
- (2) Disconnect all the plugs and sockets on the cable assemblies at the end plate at the rear end of the shelf. Seal off the plugs and sockets with approved caps and covers and stow the cable assemblies away from the shelf.
- (3) Release the shelf from the fixed structure by disengaging the fasteners. Raise the shelf to obtain access to cable F.44 to the temperature selector, and disconnect this cable assembly. Seal off the plug and socket with an approved cap and cover.
- (4) Remove the shelf from the cabin.

#### Cabin starboard shelf

18. The recommended procedure for removing this shelf is as follows:-

- (1) Render the aircraft electrically safe, as described in Group A.1.

- (2) Disconnect all the plugs and sockets of the cable assemblies at the end plate at the rear end of the shelf. Seal off the plugs and sockets with approved caps and covers and stow the cable assemblies away from the shelf.
- (3) Disconnect cable assemblies F.33A and F.33B from the A.C. junction box and the cable break point, fit approved caps and covers to the plugs and sockets and coil back the cable assemblies to the starboard shelf.
- (4) Release the shelf from the fixed structure by disengaging the fasteners around the top face and side wall.
- (5) Disconnect cable assembly F.5 from the plug mounting bracket at the forward end of the shelf (fig.4). Seal off the plug and socket with an approved cap and cover.
- (6) Disconnect the flat plug and socket connecting cable assembly F.117 to F.118. Stow cable assembly F.118 and cable assembly F.5 clear of the shelf.
- (7) Disconnect the socket connection from the I.F.F. control unit and stow the cable clear of the shelf.
- (8) Remove the radio compass control unit from the shelf, as described in Section 6, Chapter 1, and put the unit in a place of safety.
- (9) Disconnect the flexible drive from

the backplate on the shelf by unscrewing the knurled sleeve nut at the coupling; remove the flexible drive from the shelf by withdrawing it through the grommet. Stow the flexible drive clear of the shelf.

- (10) Release the two miniature plug and socket units (connected to cable assemblies Q.6C/27 and Q.EA/78 respectively) from the backplate by unscrewing the four spigot screws, taking care not to lose the nuts from behind the backplate.

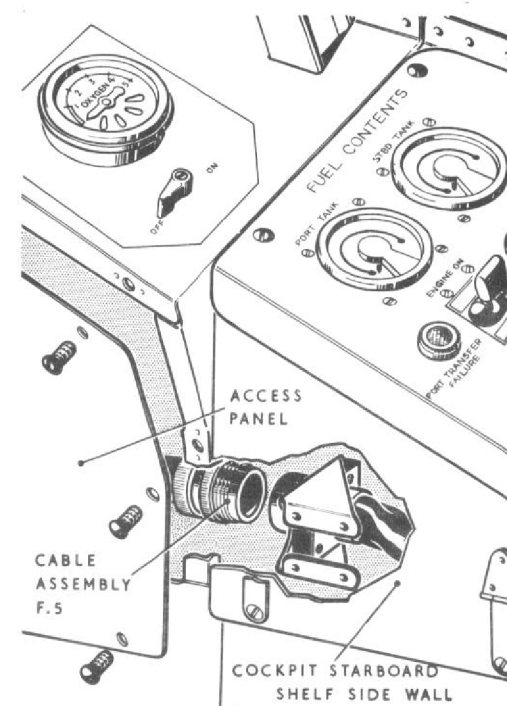


Fig.4. Plug at forward end of cockpit starboard shelf.

(11) Tape over the plug unit on cable assembly Q.EA/78 and stow the cable assembly clear of the shelf.

(12) Replace the socket unit attached to cable assembly Q.GC/27 in its position on the backplate, using two of the spigot screws. Replace the other two spigot screws in their places on the backplate.

(13) Remove the shelf from the cabin, complete with cable assemblies F.33A, F.33B, and F.149.

#### **Gun firing panel**

19. This panel is mounted in the radio bay, on frame 16, and access may be gained via the radio access panel in the under-surface of the front fuselage. To remove the panel, proceed as follows:-

(1) Render the aircraft electrically safe,

as described in Group A.1.

(2) Remove the radio access panel.

(3) Remove the I.F.F. coder unit from the radio mounting structure as described in Section 6, Chapter 2.

(4) Disconnect all the leads of cable assemblies F.21, F.47 and F.48 from the terminal blocks on the gun-firing panel. Insulate the bare ends of the leads and stow the cable assemblies away from the panel.

(5) Release the gun-firing panel from the fixed structure by removing the four screws, and withdraw it from the aircraft via the radio access panel.

#### **Cable assemblies**

20. The majority of the cable assemblies

are supported throughout their length by a number of plastic-covered metal clips and flexible plastic straps. The method of removing these assemblies is straightforward, if reasonable care is taken. When removing the cable assemblies which pass through the ducts at the bottom of the centre fuselage, it is essential to remove the outer threaded ring from the Mk.4 sockets, by disengaging the circlip, as the sockets will not pass through the ducts with these rings in position.

### **ASSEMBLY**

#### **General**

21. In most instances, the assembly of the units is a reversal of the removal procedure, but where there is any special assembly feature this is covered by a note in the appropriate paragraph of this group.



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