Chapter 5A

CONVERSION TO NORMAL BOMBING ROLE

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LIST OF ILLUSTRATIONS

DESCRIPTION

Introduction

1. The procedure for converting the aircraft from the Blue Steel to the normal bombing role is basically the reverse of that detailed in Chap.5, as outlined in the following paragraphs.

REMOVAL OF COMPONENTS

General

2. For removal of components from the bomb bay, the fairing doors can be initially opened to permit full access to all components and connections. Alternatively, the electrical and piping installations can be removed with the doors closed, the advantage being that a reduced number of support platforms will be required. This sequence of removals has been arranged using the former method.

3. The transportation trolley, 26DC/95447, should be positioned beneath the aircraft and all handling equipment removed from the trolley. The fairing doors are to be opened and secured, using the procedure detailed in Sect.5, Chap.5. Ensure that the electrical connections to the refrigeration pack, hydraulic unit, carrier beam, warm air system and optical link are disconnected as detailed in para.16.

WARNING...

Before any electrical connections are broken, ensure that all electrical supplies in or to the aircraft have been disconnected.

Fairing door support struts

4. Remove the fairing door support struts, together with the associated attachment pins, from the front and rear spars and the two support brackets from bomb arch 44·592.

Optical link mounting

5. Remove the optical link mounting by reversing the procedure detailed in Chap.5, para.37.

Hydraulic unit

6. Remove the hydraulic unit by reversing the procedure detailed in Chap.5, para.28. Seal off the cooling pipes and hydraulic hoses and secure the free ends to the unit. Refit the blanking caps to the connections on the Avery coupling bracket on the mechanism beam.

Refrigeration pack

7. Draining the refrigerant from the pack will not normally be required as the pack will be periodically examined and tested during storage. To remove the pack and the associated air vent and air bleed piping, reverse the procedures detailed in Chap.5, Seal off all open connections and secure the pack to the stowage crate together with the loose pipe assemblies, expansion units, clamps and support fittings. Refit the blanking cap 19/Z10237 to the expansion unit on bomb arch 95·967.

Carrier beam

8. To remove the carrier beam first disconnect and remove the two stabilising struts which extend between the beam and the rear crutching frame. Disconnect the A.L.S.U. piping, the twelve hydraulic hoses and release system cables, and remove the beam by reversing the procedure detailed in Chap.5, para.29 to 32. Seal and secure the fin gap door and hoisting system hoses which remain connected to the beam, and secure the release system cables in the beam stowage brackets. Position the beam in the mounting crate and secure to the trolley. Make the following connections in the bomb bay:-

(1) Reconnect the hydraulic hoses DC.202A/24.8 and DC.203A/25.4 port, and DC.203A/18.0 and DC.202A/18.0 starboard, to the adapter brackets mounted in the bomb bay at stations 130.53 and 171·842 respectively.

(2) Obtain the release cable stowage brackets and tie rods from the stowage trolley. Secure the brackets 80/Z9701 port, and 59/Z9701 starboard, to the support channels on bomb arch 171·842 using three bolts A25/1C. Connect the tie rods to the brackets and to the aircraft release cable turnbuckles.

(3) At the port and starboard aft face of bomb arch 171·842 remove the two blanks 178/Z9446 from the stowage brackets. Using new seals AS.5402, and the existing clamps, fit the blanks to the bomb bay supply ducting stub pipes.

Rear crutching frame

9. To remove the rear crutching frame, first disconnect the air supply pipe, 38/Z10050, and the two hydraulic hoses, at their connections to the Avery coupling bracket, at the starboard bomb bay rib, aft of bomb arch 225·227. Release the two bolts which secure the air supply pipe to the crutching frame, and remove the pipe complete with the Flexflyte duct and the warm air connection. Remove the rear crutching frame by reversing the procedure detailed in Chap.5 para.34.

Fairing doors

10. To remove the fairing doors, first disconnect and release the electrical cables, which are routed from the doors to the bomb bay, as detailed in para.17. With the transport trolley in position, remove the fairing doors, by reversing the procedure detailed in Chap.5, para.23 and secure the doors to the clamping blocks and support struts on the trolley.

Warm air components

11. Remove the store hot air supply piping, the heat exchanger assembly and the follow up resistor, FLJ/A/12, by reversing the procedure detailed in Chap.5, para.35 and 36. Blank off the open ends of the fixed pipes 2 and 3/Z10559 on bomb arches 201·369 and 225·227 respectively. Secure the heat exchanger, the support channels, loose pipes and clamp assemblies, together with the air supply piping removed from the rear crutching frame to the stowage crate.

Fairing door hinge brackets

12. The fairing door hinge brackets are to be removed from the six support channels each side of the bomb bay, by removing the hinge pins and attachment bolt assemblies. The main hinge pins will be required for installation of the bomb bay

doors and should be refitted to the support channels.

Fairing door sealing angles

13. Remove the fairing door sealing angles by reversing the procedure detailed in Chap.5, para.21.

Detachable fairings and access panels

14. Remove the detachable fairings from beneath the power compartment and No.2 tank bay, and the tank sump access panels, by reversing the procedure detailed in Chap.5, para.40. Retain the four bolts, two at each outboard position, at the attachment of the forward detachable fairing, to former 75F, for fitment of fairing D10520.

Shock absorbers

15. Remove the two shock absorbers from the structure beneath No.2 tank bay, by removing the four bolts at each attachment. Note that the anchor nuts at each outboard hole, also form part of the attachments for the sump access frames and with the shock absorbers removed, Phillips headed bolts AS.3297/3C are to be fitted at these positions.

Electrical equipment in bomb bay

16. To remove the electrical wiring and components from the bomb bay, first disconnect the cables from the refrigeration pack, hydraulic unit, carrier beam, warm air system and optical link, by reversing the procedures detailed in Chap.5, para. 44 to 48 respectively. Release the cable assemblies which are routed from the fairing doors, and finally remove the components and the loose cable assemblies from the bomb bay.

17. To release the fairing door cables.

(1) Disconnect the cables F2989, F2961, F2993, F2977, F2987, F2994 and F2995 from the break assembly at the starboard side of the front spar. Release the cable support clips and coil and stow the cables on the fairing door. Refit the blanking caps to the break assembly plugs.

(2) Disconnect the cables from plugs 855, 856, 857, 993 and 995 on junction box 97P. Disconnect the cable from the stowage plug aft of junction box 97P.

(3) Disconnect the cables from plugs 671, 846, 849 and 956 on distribution panel 85P. Release this group of cables from the support clips on bomb arch 151·919, and at the port and starboard sides of the bomb bay. Coil the cables together with those disconnected in item (2) and stow on the fairing door.

(4) Disconnect the five cables from T.B.1567 mounted on the bomb bay rib forward of bomb arch 279·092. Coil together cables F2819, F2820, F3082 and F3083 and stow on the fairing door. Temporarily coil the remaining cable 9/F2914.

(5) Disconnect cable 1/F3081 from plug 992 at the port side bomb bay rib aft of bomb arch 300·954. Coil and stow the cable on the fairing door.

(6) Disconnect the cables from plugs 670, 674, 839, 847, 848, 955 and 957 on distribution panel 85P.

(7) Disconnect the cable from plug 854 on junction box 97P and release this cable from the support clips on bomb arch 151·919. Coil the cable together with those disconnected in item (6) and stow on the fairing door.

18. To remove the components and loose cable assemblies from the bomb bay:-

(1) Disconnect the cables from plugs 994, 996 and 997 on junction box 97P and remove the cables.

(2) At the break assembly, V10297, attached to the starboard strut mounting, disconnect the cables from plugs 815, 816, 817, 818 and 819. Reconnect these cables to the stowage bracket, 5/V9036, fitted in the bomb bay roof above the strut mounting.

(3) Disconnect the cables from plugs 815, 816, 817, 818 and 819 on junction box 97P and release the cables from the support clip on the bomb bay hinge support channel. Remove the four bolts securing break assembly, V10297, to the strut mounting, and remove the break assembly complete with the cables.

(4) At the port side of the front spar, disconnect the eight cables from the plug break assembly and refit the protective caps to the break assembly plugs. Release the support clips for the branch cables which extend from this cable group across the mechanism beam. Disconnect branch cables 3/F3084 and 4/F2929 from the earthing points on the mechanism beam, withdraw the branch cables to the port side of the bomb bay and temporarily secure to the main cable run.

(5) Disconnect the cable from the refrigeration system hot air valve, fitted in the bomb bay roof forward of bomb arch 151·919. Release this cable from the support clips on the bomb arch and the rib stiffeners.

(6) Disconnect the branch cables 2/F 2926 from the a.c. earth and 2 and 5/F2931 from the d.c. earth aft of bomb arch 95·967.

(7) Disconnect branch cable 2/F3088 from the stowage on the port strut mounting and release from the support clips.

(8) At panel 85P disconnect the cables from plugs 672, 838, 840, 841, 842, 843, 844, 990 and 991. Release the support clips securing the cable run along the port side of the bomb bay and remove the cables.

(9) At the rear face of the bomb arch 279.092 release branch cable 9/F2914 from the support clips and re-tighten the clips. Remove cable F2914 from the cable trough and release the support clips on bomb arch 123·015. Disconnect the cable from plug 845 on panel 85P and remove the cable.

(10) Disconnect the cables from plugs 673, 675 and 944 on panel 85P and from plug 871 and 943 and socket 859 on junction box 97P. Remove the cables by releasing the clips on bomb arch 151·919.

(11) Disconnect the cables from the magnetic amplifier assembly V9950.

(12) At the starboard forward end of the bomb bay, locate the cables F2826 and F2935. Remove cable F2826 by disconnecting from the hydraulic cooling pressure switch. Connect cable F2935 to the stowage provided on the rib stiffener, between the bomb door hinge support channel and bomb arch 21·717, coil and secure the cable to the stiffener brackets.

(13) At the front spar centre position, locate the cables F2936, 2/F2927 and 4/T4882. Connect cable F2936 to the stowage on the starboard side of the forward crutch structure, coil and secure the cable to the structure bracket. Connect cables 2/F2927 and 4/T4882 to the stowages on the front spar web at the aircraft centre line position. Coil and secure the cables to the spar web anchor nuts.

(14) At the port side forward face of bomb arch 151·919 locate the cables 3 and 5/F3037 and 6/F3037. Connect these cables to the stowages on the bomb arch outboard of the hydraulic connector mounting bracket, coil and secure the cables.

(15) At the front spar, port of the aircraft centre line, locate panel 65P. Remove the panel cover, release the stowed cables F403 and 2/F404, and connect the cables to terminals A,B,C,D and E on the T.B.897. Refit the panel cover.

(16) Remove the magnetic amplifier assembly V9950, the distribution panel 85P, and the junction box 97P, by removing the four bolts at each attachment.

(17) Remove the terminal block, T.B. 1567, from the starboard bomb bay rib, forward of bomb arch 279·092, by removing the two attaching screws.

(18) Seal off the connections on all components and cable assemblies, and stow, together with the associated clips and hardware, on the transportation trolley.

Electrical equipment - crews compartment

19. In the crews compartment, remove the inertia navigator monitoring unit and the adapter box by reversing the procedure detailed in Chap.5. para.53. Convert panels 1P and 9P, and console 6P to the normal bombing role as follows:-

Pilots' centre instrument panel - 1P

20. Remove the fin position indicator C.5175Y Mk.154, and fit the bomb door and fin position indicator C.5175Y, Mk.15 to panel 1P by reversing the procedure detailed in Chap.5, para.52.

Bombing panel 9P

21. Remove the alternative bombing panel V9783, and the E.Q. control unit mounting panel, V10446, and refit panels, 1/V6581 and 24/V6317, as follows:-

(1) Release panel V10446 from the bottom left hand position, by removing the screw at the underside attachment and releasing the five captive screws on the panel face. Support the panel off the structure. Retain the screw for fitment of the replacement panel.

(2) Disconnect cable 63/V10206 from the E.Q. control unit and from plug 472 mounted on the aft diaphragm of the panel frame.

(3) Disconnect the remaining five cables from the E.Q. control unit.

(4) Disconnect the cables from the stowage plugs on panel V10446 and remove this panel complete with the E.Q. control unit.

(5) Release panel V9783 from the top position by releasing the eleven captive screws on the panel face. Support the panel off the structure.

(6) Disconnect the nine cables attached to the panel at the plug and socket

connections mounted on the aft diaphragm of the panel frame. Position the three cables identified, Panel lights, D.C. Power 1 and D.C. Power 2, which were previously connected to the E.Q. control unit, back over the cross rail forward of the structure, and remove the panel V9783.

(7) Support the alternative bombing panel 1/V6581 at the top position.

(8) Release the cable from the stowage socket on the forward face of former 246 and connect the cable to the switch selector and indicator.

(9) Release the three cables from the stowage plugs and socket on the aft face of former 246 and connect the cables to the appropriate connections on the bomb spacing unit.

(10) The two cables 2/V6517 and 5/V6517 which are attached to panel V6581, can be connected after the panel has been secured in position, using the hinged panels at the top centre and bottom right hand positions for access. Connect cable 2/V6517 to plug 470 on the aft diaphragm of the panel frame, and cable 5/V6517 to plug 473 on former 246. Secure the two hinged panels.

(11) Support the stowage panel 24/V 6317 at the bottom left hand position. Connect the two cables previously connected to the E.Q. control unit and identified, Port and Starboard E.Y. control respectively, and the three cables previously stowed on panel V10446, to the stowages on panel 24/V 6317. Secure the panel by means of the five captive screws on the panel face and the single screw at the bottom flange.

(12) At the starboard side forward face of the rear pressure bulkhead, locate the plug 132. Disconnect cable F3086 from this plug. Disconnect cable F197 from the stowage adjacent to plug 132 and reconnect cable F197 to plug 132. Reconnect cable F.3086 to the stowage.

Port console 6P

22. On the pilots' port console 6P remove the fin folding control panel V9802 and install the bomb door and jettison panel 4/V9301 by reversing the procedure detailed in Chap.5, para.51.

Stowage of components

23. The stowage boxes are each labelled to indicate the components which they accommodate. Stow all the removed components and handling equipment in their respective positions on the transportation trolley, 26DC/95447, and fit the protective canvas covers as applicable.

INSTALLATION OF COMPONENTS

General

24. The transportation trolley, 26DC/95448, complete with the normal bombing role components should be brought to a convenient working position near the aircraft. Prior to fitment to the aircraft, the bomb door seals should be checked for leaks, by immersing in water and inflating to 5 p.s.i. The system checks required after installation of the components are detailed in para.32.

Front fairing and access panels

25. To fit the front fairing, 1/D10520 and sump access panels 75 and 76/D 10520, reverse the procedure detailed in Chap.5, para.13, using the following screw and bolt assemblies at the respective attachments:-

(1) Bottom skin to centre section.
Screws 4/SS.4353 at side edges.
Screws 23/SS.4353 at sump access inboard edge.
Screws 8, 11 and 20/SS.4353 respectively at sump access forward edge.
Screws 27/SS.4353 at former 42F.
Screws 24/SS.4353 at former 57F.

(2) Forward attachment to nose wheel bay former 75F.
Four existing bolts at outboard positions.
Bolts A25/1C and A25/2C at the top and bottom intermediate positions respectively, together with washers SP.13C and stiffnuts AGS.2001/C1.
The intermediate bolts are to be fitted from the inside of the fairing.

(3) Support channels to centre section arch - bolts A25/4C.

(4) Fairing member side attachments to centre section arch - bolts A25/2C.

(5) Fairing extensions - screws 4,6, 10, 14 and 18/SS.4353 respectively and 2/SS.4353 at the inner radius.

(6) The attachment at the front spar is made in conjunction with fitment of the centre portion of the bomb door seal structure, as detailed in para.26.

Seal and sealing structure - front spar

26. The arrangement of the front spar seal and sealing structure is shown in Chap.5, fig.4. To fit the seal and sealing structure:-

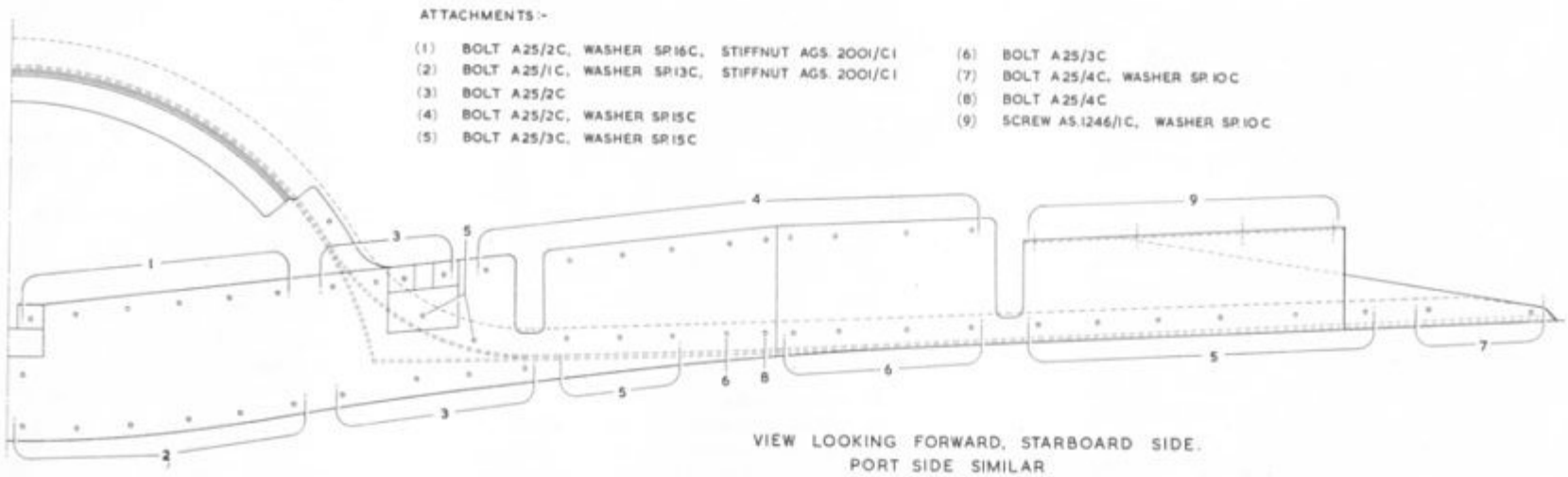

Fig.1. Seal structure to front spar attachments

(1) Remove the nine blanking screws from the centre section arch at the front spar position.

(2) Position the centre sealing structure to the front spar and secure, using bolts A25/2C, nine at the top attachment and one at each side attachment, to the spar web.

(3) Secure the structure to the forward fairing and the spar web, using the bolts and stiffnuts at the positions shown in fig.1.

(4) Fit the angle brackets 245 and 246/F9844, port and starboard respectively using two bolts A25/1C and washers SP.10C at each attachment.

(5) Secure the port and starboard sections of structure, using the bolts and screws at the positions shown on fig.1.

(6) Fit the port and starboard outboard cover plates to the structure and secure the seven Dzus fasteners and the two screws AS.1242/1C at each attachment.

(7) Position the port and starboard inboard cover plates on the structure. Position the inflatable seal on the cover plates to enter the three air connectors through the holes in the inboard cover plates. Connect the seal to the hoses at the ends of the air supply pipes.

(8) Fit the distance pieces in the lower attachment holes in the seal, fit the three retaining strips and secure the lower edge of the seal using screws AS.1248/6B and washers SP.10B.

(9) Position the port and starboard removable members between the inboard cover plates and the structure, and secure to the spar web using bolts A25/2C and washers SP.15C.

(10) Secure the centre removable member to the centre structure plate using two bolts A25/3C, washers SP.15C and stiffnuts AGS.2001/C1.

(11) Secure the inboard cover plates by engaging the Dzus fasteners and fitting the four screws AS.1248/1C

at the removable member positions.

(12) Secure the top edge of the seal using the special washers 70/D 10613 and screws AS.1248/1C.

(13) Disconnect the blanking cap from the air supply adapter at the port side of the spar web, and connect the air pipe 19/Q2074 to the adapter. Stow the blanking cap.

(14) Release the electrical cable from the stowage on the spar and connect to the bomb door seal valve.

Seal and structure - rear spar

27. The bomb door seal and the removable portion of the rear spar structure are shown in Chap.5, fig.6. To fit these components:-

(1) Support the structure 79/F10361 at the bottom centre position on the rear spar, and secure the forward face to the spar structure, using four countersunk bolts 3/SS.4353, two screws AS.1248/2C and nine bolts A25/2C. Secure the bottom skin using ten countersunk bolts 3/SS.4353. At the rear inner position secure each side of the structure to the rear fuselage using bolts A25/3C at the five forward positions and screw AS.1246/4C at the rear position.

(2) Unstow the two electrical cables from the structure, and connect the cable F1701 to the univalve on the spar forward face. Route cable F1665 across the rear face of the spar and connect to plug break 411.

(3) Position the seal and the retaining caps, port and starboard, to the spar structure and secure using sixty bolts and washers A25/½B and SP.13B.

(4) Obtain the air supply pipes 14 and 16/Q2074 and connect the pipes to the port and starboard rapid exhaust valves, respectively, and to the corresponding hose connections on the seal.

(5) Fit the access panel 8/D10981 beneath the power compartment and secure the Dzus fasteners.

Bomb door jacks, levers and piping

28. To fit the bomb door jacks, levers and piping to the front and rear spars, reverse the procedure detailed in Chap.5, para.15. New taper pins AGS.502/49, will be required to secure the spacer bushes to the jack and lever attachment pins. Note that when attaching the swivel blocks to the support brackets, the packing plates are to be positioned in the bracket channel.

Bombing gear universal couplings

29. Fit the universal couplings AT.62150 to the port and starboard intercostals between bomb arches 151.919 and 171.842, and secure, using the existing bolt assemblies.

Heating system components

30. To install the heating system components, reverse the procedure detailed in Chap.5, para.9. New seals AS.5403 will be required at the extension duct connections, and seal AS.5413 at the connection of the injector body to the cold air valve body. Connection of the electrical cables to the system components is as follows:-

1 and 2/F541 to inching control.
3/F541 to follow up resistor FLJ/A4.
5/F541 to cold air valve actuator.
1/F537 to hot air valve.
F538 to overheat switch.

Bomb bay doors

31. Manoeuvre the transportation trolley complete with the bomb bay doors into position beneath the aircraft. Install the bomb doors by reversing the procedure detailed in Sect.3, Chap.1, fig.21. Release the self-locking struts from the stowages in the bomb bay and connect to the doors. Release the micro switch cables which are stowed at the front and rear positions at the port and starboard sides of the bomb bay and connect to the door micro switches.

System checks

32. With the normal bombing role components refitted to the aircraft the following system checks are to be carried out:-

(1) Bleed the bomb door hydraulic system as required, as described in Sect.3, Chap.6.

(2) Check the bomb door setting as described in Sect.3, Chap.1.

(3) Check the bomb door seal system for leakage as described in Sect.3, Chap.7.

(4) Check the functioning of the cold air valve and the hot air valve in the bomb bay heating system as described in Sect.3, Chap.8.