Group 5 BOMB DOORS

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Warning . . .

Voltages in excess of 100 *volts a.c. or d.c. can be dangerous under certain circumstances. Personnel should, therefore, ensure that the electrical system is electrically safe before any servicing is attempted. Where it is essential that tests or adjustments are to be made with the electrical power switched on, the greatest care must be exercised.*

DESCRIPTION AND OPERATION

Introduction

1. Information on the layout and interpretation of the schematic wiring diagrams and the general modifications applicable to all aircraft can be obtained from the General Information group contained immediately after Section 5 marker card. The requirements for underwing nacelles has been cancelled, but the wiring is fitted to the aircraft, consequently, routeing diagrams are supplied and are labelled 'Reference only'; some of this wiring is now used for other systems and will be shown accordingly. Post Mod. 2612, 2645, 2646 or 2725 all the nacelle indicators on the radio crate are removed (*Chap.* 3).

General information

2. Prior to opening the fuselage bomb doors an air deflector at the rear end of the bomb bay has to be raised. The rear end of the deflector is hinged, so that when the bomb doors are open, the front end is raised and the rapid airflow through the bomb bay is deflected smoothly out of the aircraft, thus preventing buffeting, which might otherwise occur if the rear end of the bomb bay was vertical. The deflector is raised or lowered by two coupled, reversible, compound-wound electric motors driving a rack and pinion system. Each motor has an electro-magnetic brake.

Note. . .

Details of the bomb door control for the B/PR Mk. 1 *B/K/PR Mk.* 1 *and B/K Mk.* 1 *aircraft in their other than bomber roles will be found in the relevant chapters.*

3. The two bomb doors are each operated by three reversible, compound-wound electric motors. Each motor has an overload clutch and a built-in brake unit operated by either one of two solenoids. Under normal operation, one solenoid is used to release the brake when opening the doors and the other solenoid when closing the doors; under jettison conditions, the connections are reversed so that the solenoid used when closing the doors under normal conditions is now used when opening them. Thus if a brake solenoid goes unserviceable in the air during normal operation, it will not prevent or hinder the opening of the doors by the jettison system under emergency conditions. As two motors are sufficient to operate each door, ratchet solenoids are fitted to each motor to disengage the motor from the driving shaft in the event of failure of any one.

Control (*fig.* 1)

4. Control is from the cockpit by a 3-position master switch, mounted on the control pedestal, and a jettison switch, also on the control pedestal, having two positions NORMAL and JETTISON. When the master switch is in the OPEN position and the jettison switch is at NORMAL the circuit operates, first to raise the air deflector and then to operate the fuselage bomb doors. When in the CLOSE position the bomb doors close before the air deflector is lowered. When in the AUTO position the air deflector is raised as normal, but the opening of the bomb doors is now controlled by the N.B.S. relay in the radio crate; an isolating switch is provided by Mod. 2456 in the N.B.S. signal line and a doors opening pulse indicator lamp is also provided.

5. If the jettison switch is in the JETTISON position the circuit comes under the control of a time switch which controls the doors and deflector in the normal way, opening and closing them to a timed sequence. Under this condition as soon as the bomb doors have reached their open position, the jettison circuits for all bomb slips (*Chap.* 3, *Group* 1) are operated and the bombs are jettisoned, after which the doors are re-closed.

Safety devices (*fig.* 1, 4 *and* 5)

6. At the forward end of the bomb bay are three switches, a 2-way door control trip switch with TRIP and NORMAL positions, which enables the complete door control system to be tripped in either the open or closed condition, and two single-way door isolator switches with ISOLATE and NORMAL positions, one each for the port and starboard fuselage bomb doors. These switches isolate either bomb door in the open position, so that access is obtained to the service bay on the other side of the bomb bay. A warning lamp adjacent to the trip switch shows green when the door control is tripped.

WARNING. . .

(1) The TRIP switch at TRIP does not prevent operation of the doors by the BOMB JETTISON switch.

(2) After servicing has been completed in the bomb bay service bays, select OPEN with the bomb door control switch before selecting NORMAL on the door isolator switch and trip switch.

CIRCUIT OPERATION

(*fig.* 1 *to* 3)

7. Note. . .

Mod. 1520 *introduces micro switches Ref. No.* 5*CW*/4639 *in lieu of Ref. No.* 5*CW*/4638 *at all fuselage bomb door and air deflector positions and introduces additional micro switches in series with existing micro switches* 6, 8, 10, 11, 17 *and* 18.

Wing nacelles are not now to be fitted and therefore no description of their circuits is given. Wiring for them however, is fitted to the aircraft and routeing diagrams for reference only are supplied. Circuit operation may be divided, fundamentally, into three conditions (1) normal (2) N.B.S. or auto and (3) jettison operation.

Normal condition

8. Under the condition of normal operation, selection of the door control switch to OPEN (*fig.* 1) connects a supply from the starboard fuse panel D via the bomb door trip switch and the jettison switch, both in their NORMAL positions, to the operating coil R13 (*fig.* 1) of the deflector normal open relay, Type S2, mounted on the deflector roof beam at the aft end of the bomb bay via, one of the deflector up limit switches (17).

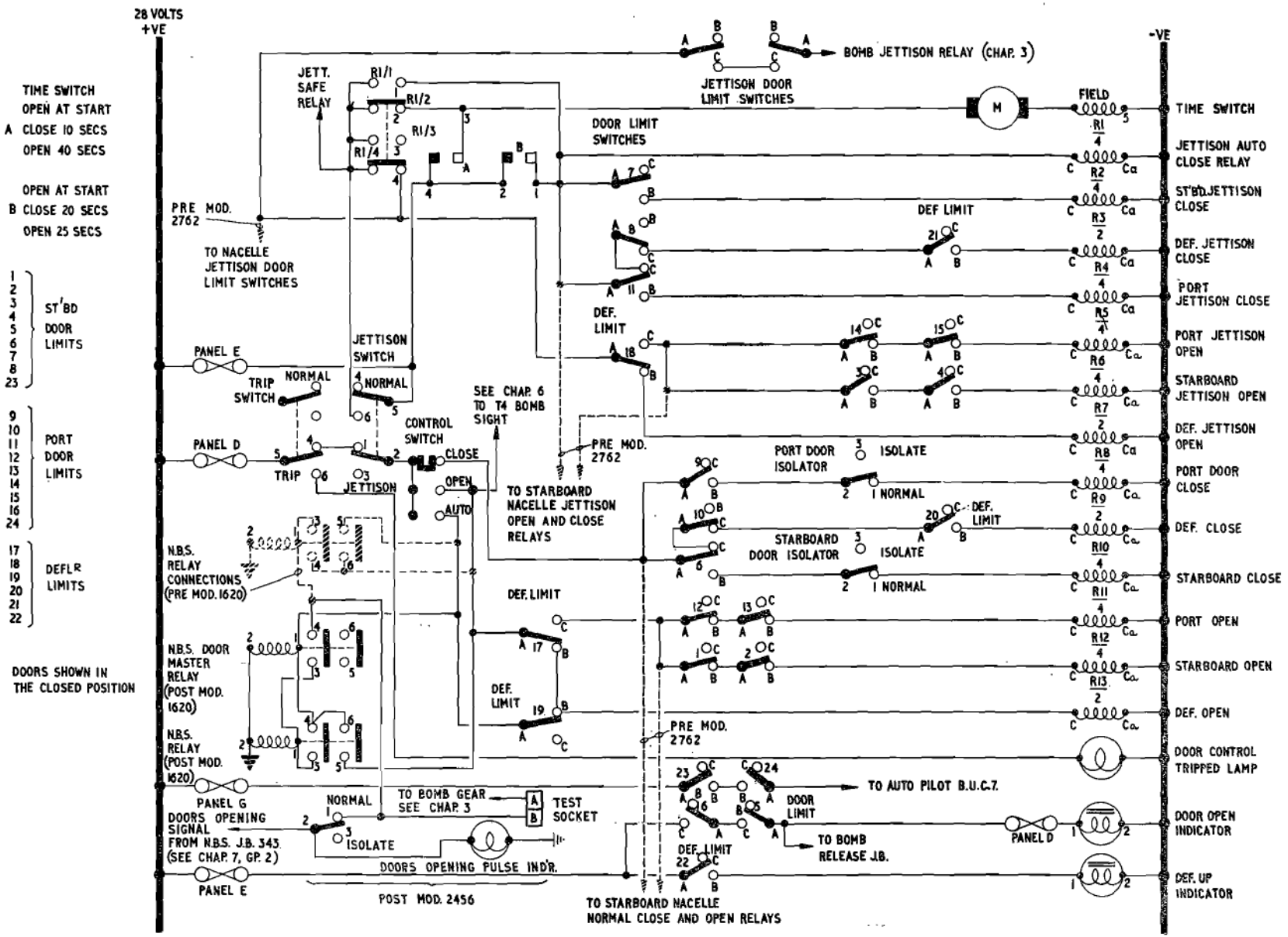

Fig. 1. Bomb bay and wing nacelle door control (pre-Mod. 1520) (1)

F.S./2

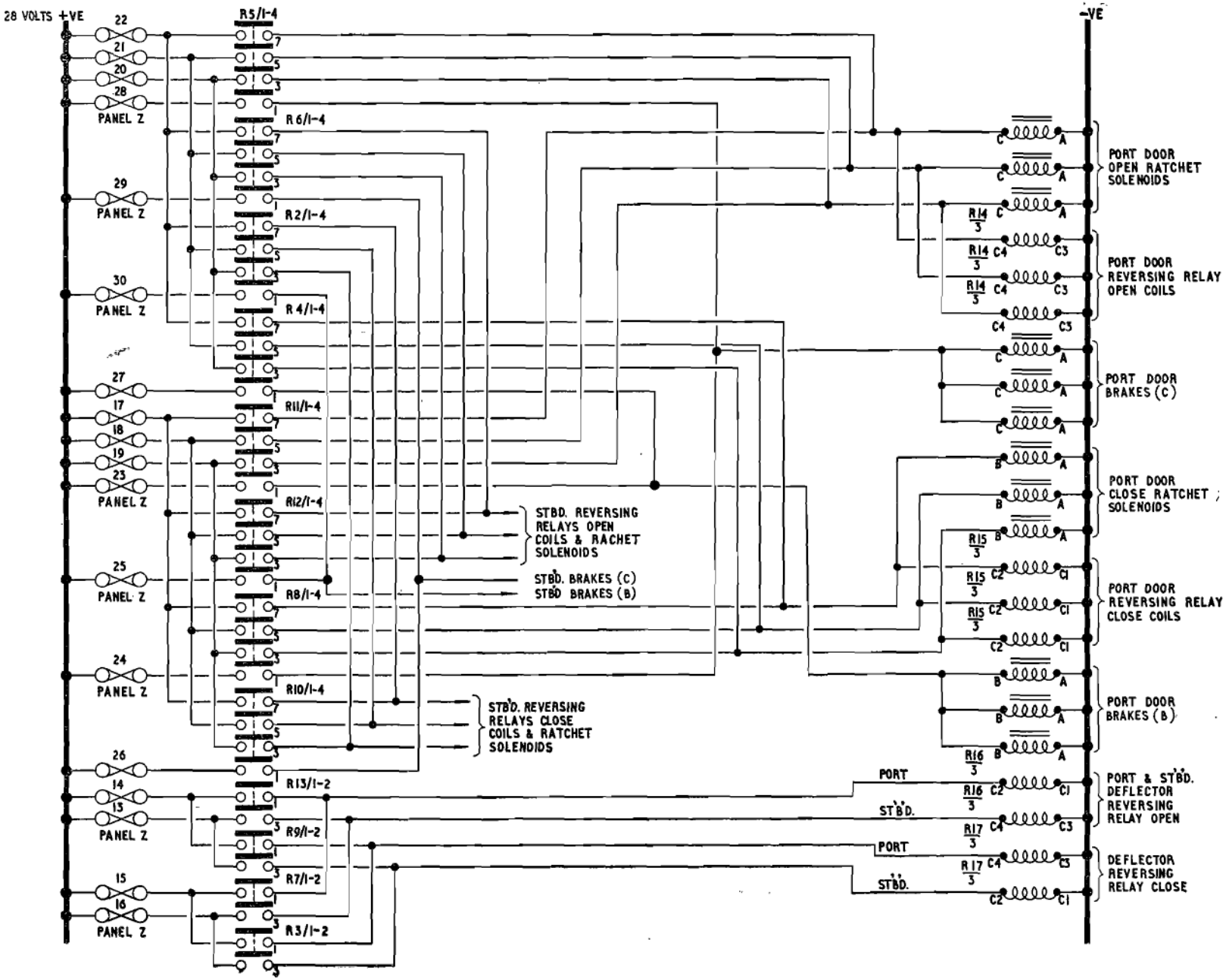

Fig. 2. Bomb bay doors control (2)

9. The relay operates (*fig.* 2) and connects (R13/1-2) two separate supplies from panel Z, to the 'open' coils of the two deflector motor reversing relays R16 (fig. 2) at, the aft end of the bomb bay. The two reversing relays operate (*fig.* 3) and connect R16/1-3 a 112 volt supply from panel J to the motors and their series connected brake solenoids. The brakes are simultaneously released with the starting of the motors.

10. The motors now operate and raise the deflector until it reaches its up position, when the deflector up limit switches (*fig.* 1) will change-over. Thus a supply from the port fuse panel E will be connected (switch 22) to the deflector position indicator on the control pedestal.

11. The original supply from the bomb door control switch will now be connected, switches 17, (and 17A, post Mod. 1520) to, the operating coils R11, R12 (*fig.* 1) of the two fuselage bomb door normal open relays, Type S4, mounted one in each of the bomb doors, via two series connected pairs of closed up limit switches, 12, 13 and 1, 2 respectively.

12. The fueselage bomb door normal open relays operate (R11/1-4, R12/1-4) (*fig.* 2) connecting supplies from panel Z to the 'open' coils of the door motor reversing relays R14 (*fig.* 2) mounted three in each of the doors. At the same time, supplies from panel Z are connected to one set of the duplicated door motor brake solenoids (pin B), (*fig.* 2) thus releasing the brakes, and 'to open' ratchet solenoids.

13. The motors will now operate, opening the fuselage bomb doors until they reach the limits of their travel, when the fuselage doors will open their up limit switches 1 and 2, 12 and 13 (*fig.* 1) disconnecting the supplies to the normal open relays (R11 and R12), which in turn, disconnect (R/11/1-4, R12/1-4) (*fig.* 2) the supplies to the open coils of the reversing relays R14 and to the brakes, thus the motors are disconnected from their supplies and the brakes are applied.

14. Further limit switches 6 and 9 (and 6A post Mod. 1520) (*fig.* 1) will also be operated, completing the circuits ready for closing the doors, interlocking the circuits (switch 10 and 10A post Mod. 1520) so that the deflector cannot close until the doors have closed and connecting (switches 5 and 16), an independent supply, from the starboard fuse panel E. to the bomb release junction box, and, via a fuse on panel D, to the fuselage bomb door open indicator on the control pedestal. Limit switches 23 and 24 connect a supply to the auto-pilot as the doors start to open.

15. When the bomb door selector switch is placed to the CLOSE position, the 28-volt supply is connected to the two fuselage bomb door normal 'close' relays R8 and R10 (*fig.* 1) Type S4, mounted one in each bomb door, via the closed door isolator switches and the door limit switches 6 and 9. These latter switches are set by the doors being in the open position.

16. The fuselage bomb door normal close relays operate (R8/1-4 and R10/1-4) (*fig.* 2) connecting supplies from panel Z to the 'close' coils of the door motor reversing relays R15 (*fig.* 2). At the same time supplies from panel Z are connected to the other set of the duplicated door motor brake solenoids (pin C), thus releasing the brakes, and to the 'close' ratchet solenoids.

17. All the reversing relays (*fig.* 3) will operate together, connecting their respective motors to their 112-volt supplies. The motors will now run in reverse, closing the fuselage bomb doors.

18. When the doors reach the closed position the limit switches (*fig.* 1) will change over completing the circuits ready for opening the doors, disconnecting the supplies to the fuselage doors open indicator and the bomb release system and disconnecting the supplies to the doors normal 'close' relays (R8 and R10). Operation of these relays (*fig.* 2) will disconnect the supplies (R8/1-4, R10/1-4) to the fuselage motor 'close' brake solenoids and the 'close' coils of the door normal reversing relays R15, which disconnect the door motors (*fig.* 3) and brake solenoids from their supplies, thus stopping the motors and applying the brakes.

19. Other fuselage door limit switches close the supply (switch 10 and 10A post Mod. 1520) (*fig.* 1) from the selector switch to the deflector normal close realy R9, to connect supplies to the 'close' coils of the two deflector motor reversing relays R17 (*fig.* 2), which will then connect the motors and brake solenoids (*fig*, 3) to their 112-volt supplies, thus releasing the brakes and starting the motors in reverse to lower the deflector.

20. When the deflector reaches its down position, limit switches are operated, switch 20 (*fig.* 1) disconnecting the supply to the deflector normal close relay (R9) which, disconnect the supply (R9/1-2) (*fig.* 2) to the 'close' coils of the motors reversing relays (R17).

21. These relays will then disconnect the motors and brake solenoids from their supply (R17/1-3) thus stopping the motors and applying the brakes. Further limit switches (*fig.* 1) are reversed (switches 17 and 19), resetting the circuit for raising the deflector and switch 22 disconnecting the supply to the deflector up indicator.

Auto position (*fig.* 1)

22. The selection of the door control switch to AUTO (*fig.* 1) connects the supply from panel D via the bomb door trip switch, the jettison switch, both in their NORMAL position, and the deflector limit switch 19, to the operating coil of the deflector normal 'open' relay R13, which operates and brings about the raising of the deflector as described for normal operation. When the deflector has reached its raised position, the limit switches are operated, switch 17 (and 17A post Mod. 1520) setting the circuit for raising the bomb doors.

23. Pre-Mod. 1620 (*fig.* 1) the supply from the auto position of the door control switch is also taken to the positive side of the contacts 5 - 6 of the N.B.S. relay, Type Q1, mounted on the radio crate. This relay is energized by a signal from the N.B.S. equipment, a hold-in circuit being made through both its sets of contacts, when closed, from the door control switch. The supply from the door control switch is also connected to the fuselage bomb doors normal 'open' relays R11, R12, via the bomb door limit switches 12, 13 and 1, 2, respectively, and the deflector limit switch 17 (and 17A post Mod. 1520) set by the deflector being in the raised position. This relay closes its contacts 3 - 4 so that the signal from the N.B.S. equipment can get through to and energize the coil of the N.B.S relay; contacts 3-4 connect the supply from the door control switch to its coil as a hold-in supply and contacts 5-6 connect the signal and the supply from the door control switch to the fuselage bomb doors normal 'open' relays R11 and R12, via the deflector limit switch 17 (and 17A post Mod. 1520) set by the deflector being open and the door limit switches 12, 13 and 1, 2 for port and starboard doors respectively.

24. Post Mod. 1620, the supply from the auto position of the door control switch is also taken to the positive side of the contacts of the N.B.S. relay, and also to the coil of the N.B.S. door master relay. Type Q1, mounted in the radio crate. This relay closes its contacts 3 - 4 so that the signal can get through to and energize the coil of the N.B.S. relay which closes its contacts. Contacts 3 - 4 connect the supply from the door control switch to its coil as a hold-in supply and contacts 5 - 6 connect the signal and the supply from the door control switch to the fuselage bomb doors normal 'open' relays as before.

25. The bomb doors will now operate as described for the normal condition. To close the doors the door control switch should be set to the CLOSE position when the circuits will operate as described for the normal condition.

Mod. 2456

25A. This Modification introduces isolating switches in the N.B.S. signal circuits for bomb door opening and bomb release, provides doors opening and bomb release pulse indicator lamps in the same circuits and introduces a test socket to enable an N.B.S. simulator to be used.

25B. The single-pole switch in the N.B.S./ bomb door circuit is mounted on the radio crate and when at NORMAL, allows the circuit to work (bomb doors switch at AUTO) as described in the preceeding paragraphs; in addition there is an indicator lamp adjacent to the switch which comes on

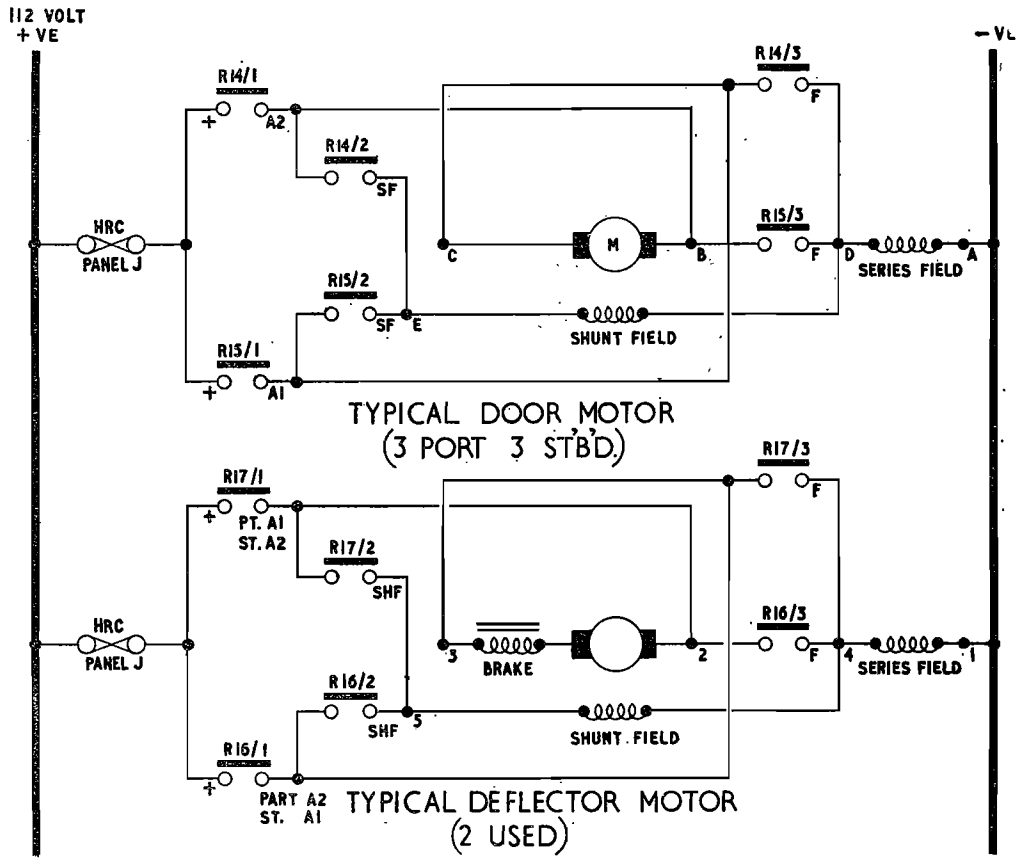

Fig. 3. Bomb bay doors control (3)

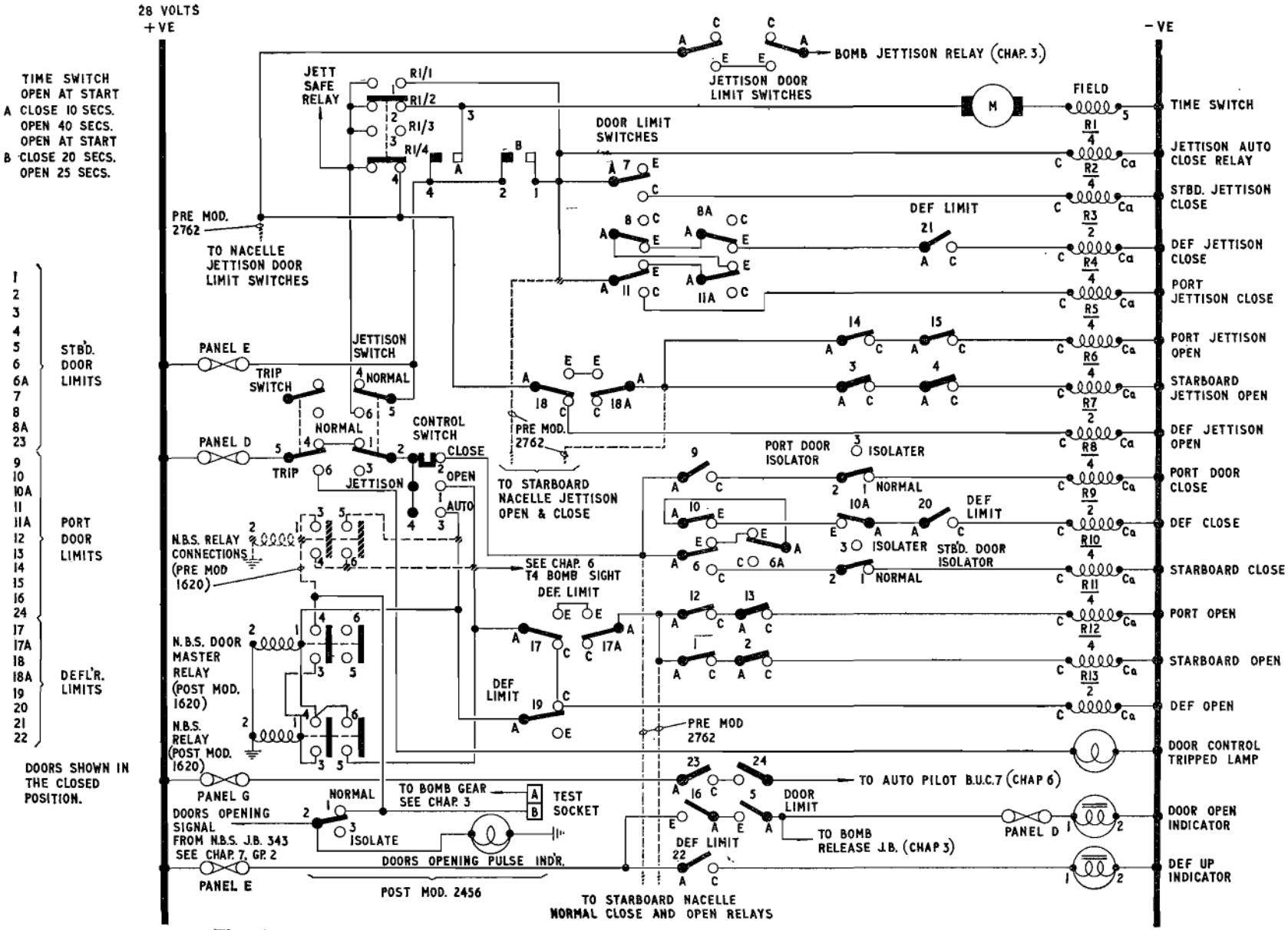

Fig. 4. Bomb bay and wing nacelle door control (post Mod. 1520, pre-Mods. 2364 and 2484)

when the N.B.S. doors opening signal is made. When the switch is at ISOLATE, the N.B.S. signal circuit is broken, thereby allowing the N.B.S. equipment to be serviced without interfering with the bomb door system, the release signal circuit can still be checked because the doors opening indicator lamp is on the N.B.S. side of the switch.

25C. The N.B.S. simulator can be connected to the socket provided near the isolating switches and with the isolating switches at ISOLATE can be used to provide artificial N.B.S. door opening pulses to check the bomb door system without feeding back into the N.B.S. equipment.

Jettison condition

Pre-Mods. 2364 *and* 2484 (*fig.* 1)

26. Under the jettison condition, when it is required to jettison the bomb load in an emergency, the bomb doors come under the control of a time switch mounted, together with its associated auto-close relay, R1, Type S2, on the 24-volt battery control panel at the forward end of the bomb bay.

27. When the jettison control switch is placed in the JETTISON position, a supply from the port fuse panel E is connected to the positive side of all the contacts on the auto-close relay R1. This same supply is directly connected to contacts A and B of the time switch.

28. One of the two normally closed contacts (R1/2) of the auto-close relay is connected to the time switch motor, which closes contact A within 10 seconds of starting. This contact A which remains closed until 40 seconds from the time of the switch starting, acts as a hold-in supply to the time switch motor during the complete sequence of the bomb jettison operation.

29. The other normally closed contact (R1/4) of the auto-close relay is connected to the fuselage bomb jettison relay, via the bomb door jettison limit switches. These are closed when the doors reach the open positions. This contact (R1/4) of the auto-close relay is also connected to the deflector jettison open relay R7 (*fig.* 1), mounted at the aft end of the bomb bay, via a deflector up limit switch 18. The relay operates (R7/1-2) (*fig.* 2) and connects two supplies from panel Z to the 'open' coils of the deflector motors reversing relays R16.

30. The deflector now operates as described for normal operation and, on reaching the raised position, the up limit switches are changed over. Switch 22 will close the circuit to the deflector up indicator and switch 18 (and 18A post Mod. 1520) will connect a supply from the deflector jettison open relay R7, to the operating coils of the fuselage port and starboard bomb door jetttison open relays, R5 and R6, mounted one in each bomb door, via two series-connected closed up limit switches in each case (14, 15 and 3, 4 respectively).

31. The fuselage bomb door jettison 'open' relays operate (*fig.* 2), connecting (R5/1-4), R6/1-4) supplies from panel Z to the open coils of the door motor reversing relays R14 to one set of the door motor brake solenoids (pin C) and to the 'open' ratchet solenoids.

32. All the reversing relays operate together (*fig.* 3), starting the motors, to open the bomb doors, and operating the limit switches as described for the normal condition, except that further up limit switches are operated (*fig.* 1), disconnecting the supplies to the jettison 'open' relays (switches 3, 4, 14, 15) hence stopping the motors and also setting the circuit to the jettison close relays ready for closing the door (switches 7, 8, 11 and 8A, 11A, post Mod. 1520).

33. The bombs will be jettisoned automatically as the doors reach the open position as stated above. Whilst the bomb doors have been opening, the time switch has been operating and it closes its contact B (*fig.* 1), 20 secs. after it has started. This allows sufficient time for the doors to open and the bombs to be jettisoned. When contact B closes, it connects the supply from the jettison switch to the operating coil of the auto-close relay R1 (*fig.* 1), which operates and closes a set of contacts.

34. These contacts (R1/1) act as a hold-in for the relay coil and connect the supply to the two fuselage bomb door jettison 'close' relays (R2 and R4), Type S4, (mounted one in each bomb door) via the door limit switches 7 and 11 set by the doors being in the open position.

35. The fuselage bomb door jettison 'close' relays operate (R2/1-4, and R4/1-4) (*fig.* 2), to connect supplies from panel Z to the 'close' coils of the door motor reversing relays R15, to the other set of door motor brake solenoids (pin B) and to the 'close' ratchet solenoids.

36. All the reversing relays operate together, starting the motors, closing the doors and operating the limit switches as described for the normal condition. The limit switches 7 and 11 for this jettison requirement disconnect the supplies to the door jettison 'close' relays R2 and R4 (*fig.* 1) thus stopping the motors, disconnecting the supplies to the bomb jettison relay, and switch 8 (and 8A post Mod. 1520) connects the supply from the auto-close relay, R1, via deflector limit switch 21, to the deflector jettison close relay R3 (*fig.* 1), which connects supplies to the 'close' coils of the deflector motor reversing relays R17 (*fig.* 2). These relays operate to start the motors which close the deflector as, described for the normal condition. When the deflector is closed, limit switch 21 (*fig.* 1) disconnects the jettison 'close' relay R3, from its supply, thus topping the motors.

37. The time switch which is still operating, opens its contacts B, 25 seconds and contacts A, 40 seconds after starting. When contacts A open the time switch is stopped. The auto-close relay R1 holds in until the jettison switch is moved to NORMAL.

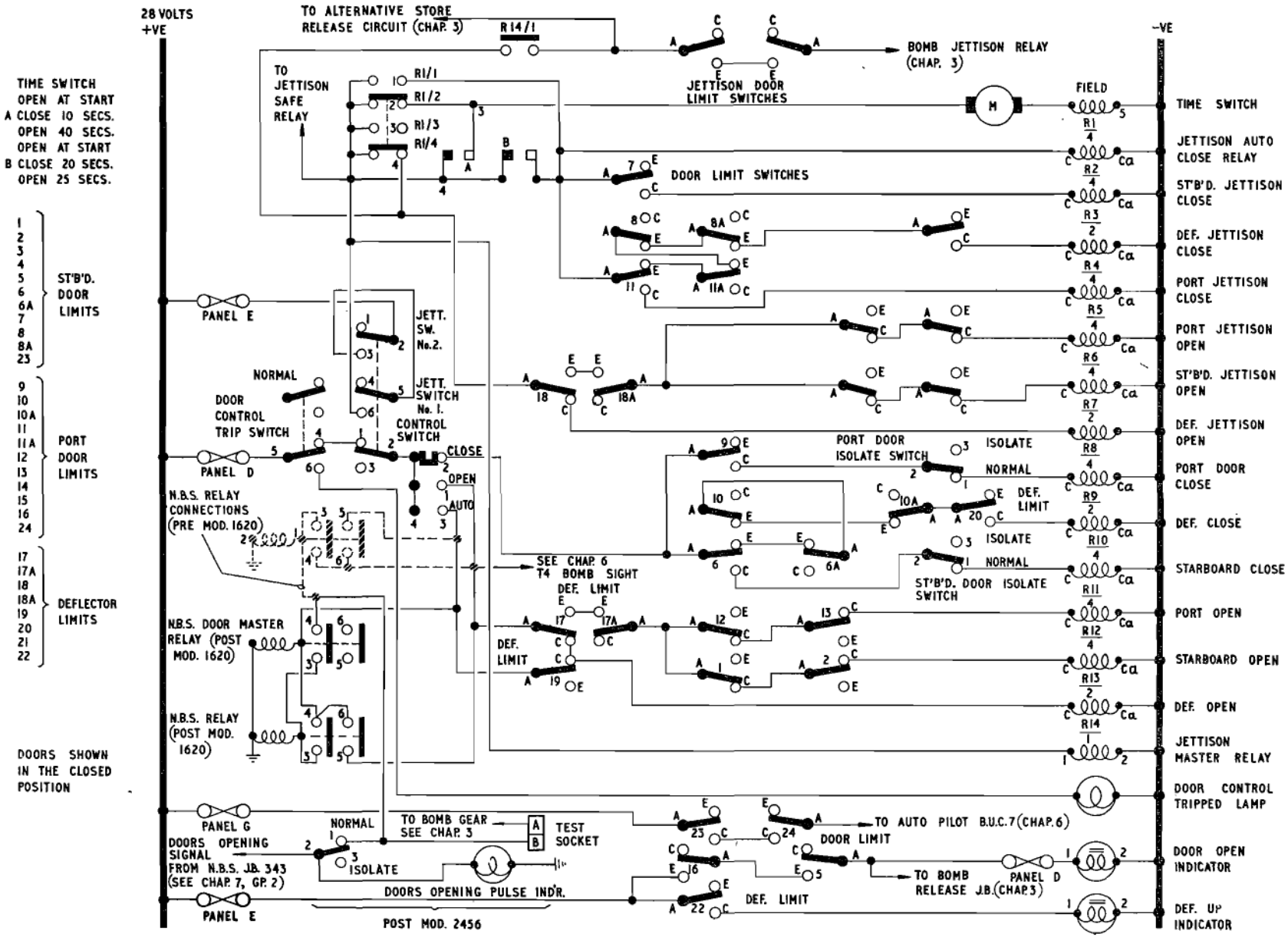

Fig. 5. Bomb bay doors control (post Mod. 1520, 2364, 2484 and 2762)

Jettison condition
Post Mod. 2364 (*fig.* 5)

Note. . .
Mod. 2364 *introduces a Relay Type Q3 jettison master relay, fitted in the accumulator compartment. The relay is connected between the jettison auto close relay and the supply from the alternative store release to the bomb jettison relay coil. This prevents the time switch being wound up, and operating to close the bomb doors. Only in the jettison condition is the relay R*14 *energized to close its contacts R*14/1 *to complete the supply to the bomb jettison relay coil via the jettison door limit switches.*

38. When JETTISON is selected a supply from panel E is connected to the jettison master relay R14. Contacts R14/1 operate to connect a supply from the same fuse through the normally closed contact R1/4 to the bomb jettison relay coil via the jettison door limit switches. The bomb doors and deflector operate as previously described.

Jettison condition
Post Mod. 2484 (*fig.* 5)

Note. . .
Mod. 2484 *introduces a single pole switch mounted on the pilots' control pedestal adjacent and strapped to the original jettison switch. This switch is fitted for safety reasons applicable to the bomb jettison circuits (Chap.* 2) *and is known as the jettison switch No.* 1.

39. When JETTISON is selected a supply from panel E is connected via jettison switches 1 and 2 to all the contacts on the positive side of the auto close relay R1 and to the positive side of contacts A and B of the time switch. The bomb doors and deflector then operate as previoulsy described.

Trip switch (*fig.* 1, 4 and 5)
40. When the trip switch is set to the TRIP postion, the supply from the starboard fuse panel D is connected to a green warning lamp. With the trip switch in the TRIP position the supply is isolated from the door control circuit.

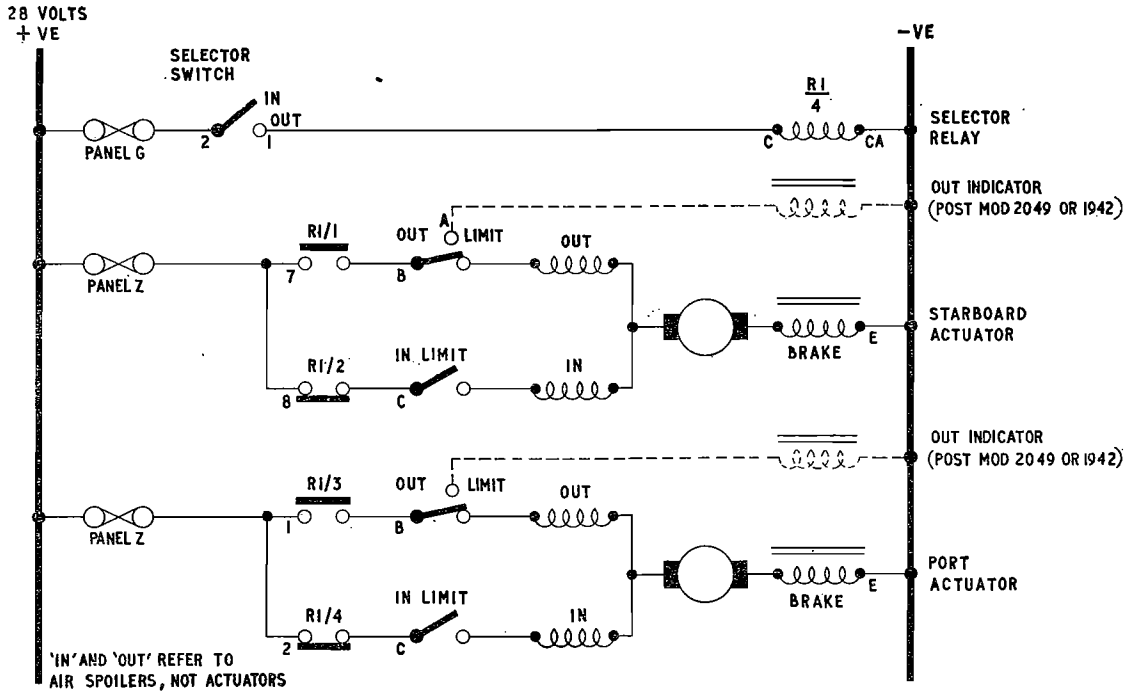

Fig. 6. Air spoiler control

Fuselage bomb doors isolator switches (*fig.* 1, 4 *and* 5)
41. There are two isolator switches, one for each bomb door. They are connected in the supplies to the door normal close relays R8 and R10 so that when the switches are in the ISOLATE position the doors can be opened but not closed.

Warning
It is important to note that even, though these switches are at ISOLATE, and the trip switch is at TRIP the doors WILL operate should the jettison switch be placed to JETTISON.

When using the ISOLATOR switches to position the doors to gain access through the bomb bay side wall access panels, the TRIP switch should be selected to TRIP when the doors are in the positions required. The CONTROL switch in the CABIN should then be selected OPEN so that when the isolator and trip switches are returned to NORMAL the doors will not close on the operator. The trip switch must not be returned to normal until it has been ascertained that all personnel are clear of the bomb bay, side wall access panels, and rear spar area.

Air spoiler control (*fig.* 6)
42. Two air spoilers, which are fitted under the battery floor at the forward end of the bomb bay, are lowered to break up the air flow over the bomb bay prior to certain types of bombs being released. Each air

spoiler is operated by an actuator having built-in brake and limit switches. The actuators are controlled by a 2-position switch labelled IN-OUT, at the 2nd navigator's position; post Mod. 2918, this switch is fitted with a guard.

43. When the switch is placed in the OUT position, a supply, from a fuse on panel G, is connected to the operating coil of the selector relay R1, Type S4, mounted below the battery floor. The relay operates (R1/1-4) and connects separate supplies from fuses on panel Z to the retract coils and brake release solenoids of the actuators, via their built-in normally closed (extend) limit switches.

44. The actuators will continue to operate until the 'extend' limit switches are opened, disconnecting the supply from the actuator and de-energizing the brake solenoid, thus applying the brakes. The normally open 'retract' limit switches will be closed as soon as the actuator leaves the retracted position, so that when the selector switch is placed to the IN position, the 'extend' fields of the actuators will be energized and the sequence of operation will be reversed thus, retracting the air spoilers. Positions of actuators are as follows :

Air spoilers extended—actuators retracted.

45. Mod. 1942 introduces magnetic indicators (Ref. No. 5CZ/4361) on the panel below the pilots' fuel panel for aircraft fitted with Mod. 339. Mod. 2049 introduces these indicators on aircraft not fitted with Mod. 339. The indicators are energized to show WHITE when the actuator out limit switches break, when the spoilers are fully extended (terminal A). As soon as the spoilers leave the fully extended position, the indicators are de-energized and show BLACK.

Bomb door indicators *(fig. 1, 4 and 5)*

46. Fitted on the control pedestal are two magnetic indicators, one for the bomb doors and one for the deflector. When the bomb doors are fully open, a supply from panel E is connected through the door limit switches 16 and 5, to a fuse in panel D then on to the magnetic indicator which shows WHITE when the doors are open and BLACK when they are closed. When the deflector is fully up the same supply from panel E passes through the deflector limit switch 22 to the magnetic indicator which shows WHITE when the deflector is open and BLACK when closed.

Air spoiler indicators *(fig. 6 and 7)*

47. Two magnetic indicators fitted on the panel below the pilot's fuel panel indicate WHITE when the air spoilers are in the fully extended position and show BLACK as soon as the air spoilers move from the fully extended position. When the air spoilers are in the fully extended position the out limit switches operate to disconnect the supplies from the port and starboard actuators and connect the same supplies to their respective indicators.

SERVICING

Introduction

48. The General Information Group, contained in Book 2 immediately after Section 5 marker card, gives a detailed description of the general tests to be applied to all aircraft circuits and the procedure to be adopted when servicing special circuits.

Note . . .

Setting instructions for all micro switches are given in the relative chapters of Book 1, Section 3.

Ground operational limits

49. To safeguard the bomb doors and deflector motor from damage, due to overheating, whilst the bomb doors are being serviced, it is essential that they are not operated longer than the following periods :

A series of five cycles with 30 minutes between each series.

Warning

After servicing has been completed in the bomb bay servicing bays, select OPEN with the bomb door control switch, before selecting NORMAL with the door isolator and trip switches.

Bomb doors

50. (1) Check the circuit fuses and connect 28-volt and 112-volt d.c. supplies to the external connections.

(2) Select OPEN with the control switch. Check that the deflector up indicator shows white and then the doors open indicator shows white. See that the deflector is up and the bomb doors are open.

(3) Select TRIP on the trip switch. Check that the door control tripped lamps come on.

(4) Select CLOSE with the control switch. The doors and deflector should not operate.

(5) Return the control switch to OPEN and the trip switch to NORMAL.

(6) Select ISOLATE on the port door isolator switch. Select CLOSE with the control switch. Check that the starboard door only has operated.

(7) Return the control switch to OPEN and the port door isolator switch to NORMAL.

(8) Repeat operations 6 and 7 for the starboard door checking that the port door only operates.

(9) Select CLOSE with the control switch. Check that the doors open indicator shows black and then the deflector open indicator shows black and that the doors and the deflector have operated.

(10) Select AUTO with the control switch. Check that the deflector indicator shows white and that the deflector only has operated.

(11) Operate the N.B.S. equipment to give a door opening signal, check that the doors open and door indicator shows white. Post Mod. 2456, the N.B.S./DOOR ISOLATE switch should be at NORMAL, check that door opening lamp comes on when signal is initiated.

(12) Select control switch to CLOSE. Check that bomb doors and deflector close, and the indicators show black.

(13) Post Mod. 2456, select N.B.S./ DOOR ISOLATE switch to ISOLATE and repeat items 10 and 11, check that deflector is raised and that doors do not open.

(14) Select CLOSE with the control switch. Check that the deflector indicator shows black and that the deflector has closed.

(15) Select JETTISON with the jettison switch. Check that the bomb doors and deflector open and then close.

(16) Return the jettison switch to NORMAL.

Air spoiler control

51. (1) Check the circuit fuses and connect a 28-volt d.c. supply to the external connection.

(2) Select OUT with the selector switch. Check that the air spoilers have operated and that the indicators show white.

(3) Select IN with the selector switch. Check that the air spoilers have operated and the indicators show black.

Periodic checks

52. It is essential that periodic checks are carried out on the commutators of the bomb door and deflector motors consisting of :

(1) Remove the commutator end cover.

(2) Check that the commutator is clean and not pitted.

(3) Check that there is no excessive play between the brushes and their holders.

(4) Check the lengths of the brushes.

Minimum brush lengths.

Bomb door motors	0·31 in.
Deflector motors	0·40 in.

Average times for operations on the ground

53. *Open*

Bomb door and deflector overall	5 ± 2 seconds
Deflector only	2 ± 1 second

Shut

Bomb door and deflector overall	5 ± 2 seconds
Deflector only	2 ± 1 second

Bomb door jettison

Overall	25 ± 5 seconds
Time lag in fully open position	12 seconds approx.

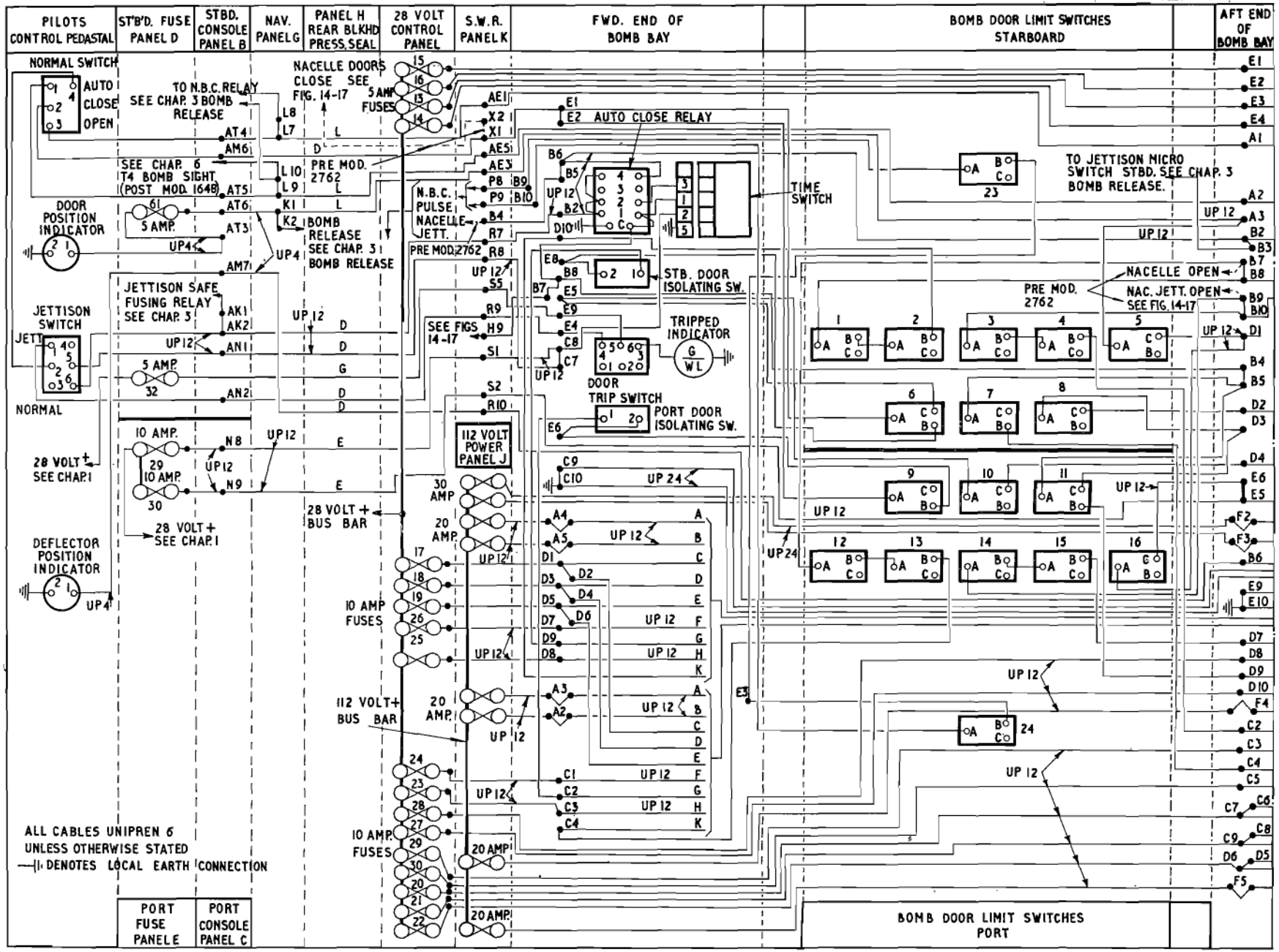

Fig. 8. (1)B.Mk.I Bomb door & air deflector control (pre Mods. 1520, 2364 and 2484)

RESTRICTED

70636 SHT. 1438-J

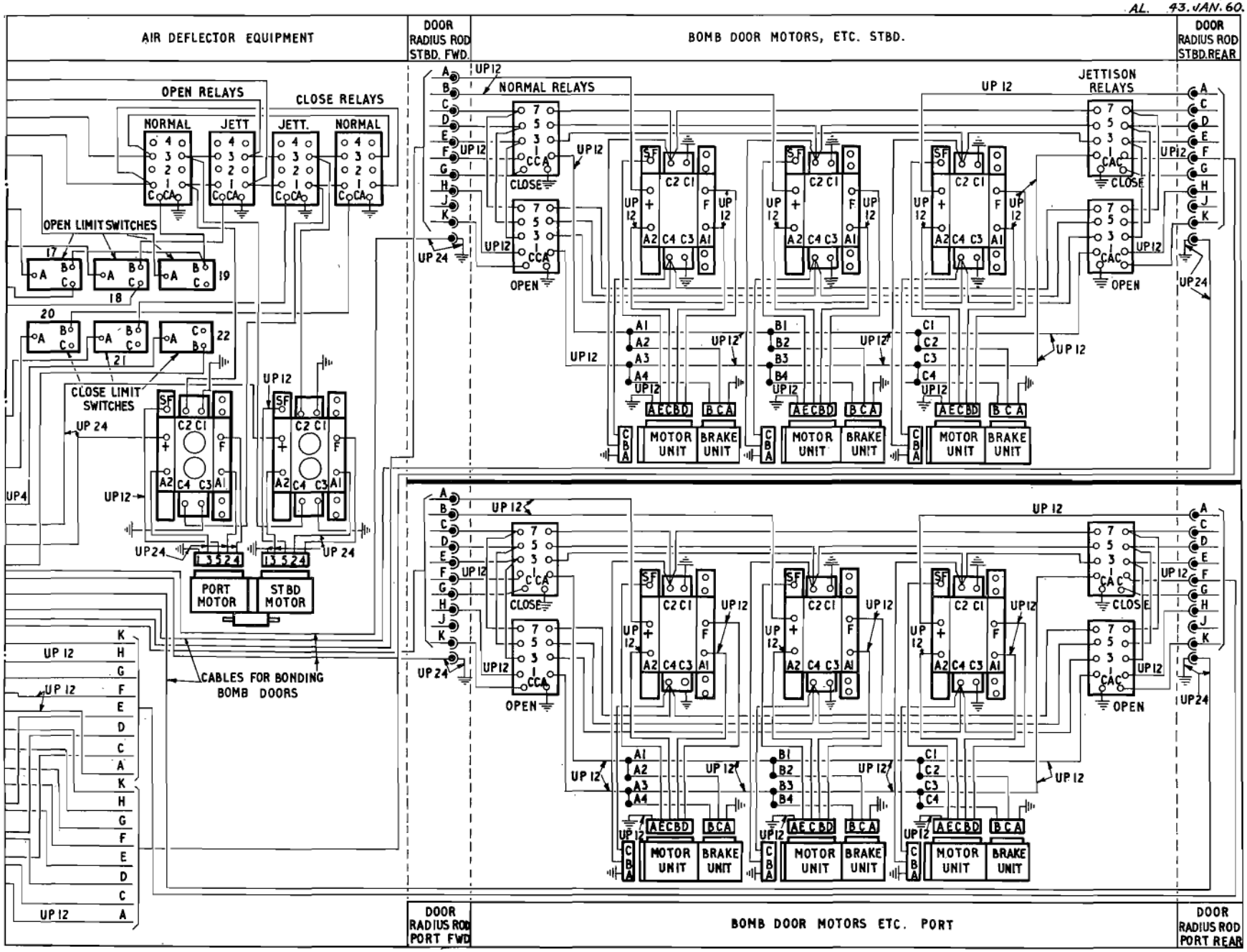

Fig. 8.(2) B.Mk.I Bomb door & air deflector control (pre Mods. 1520, 2364 and 2484)

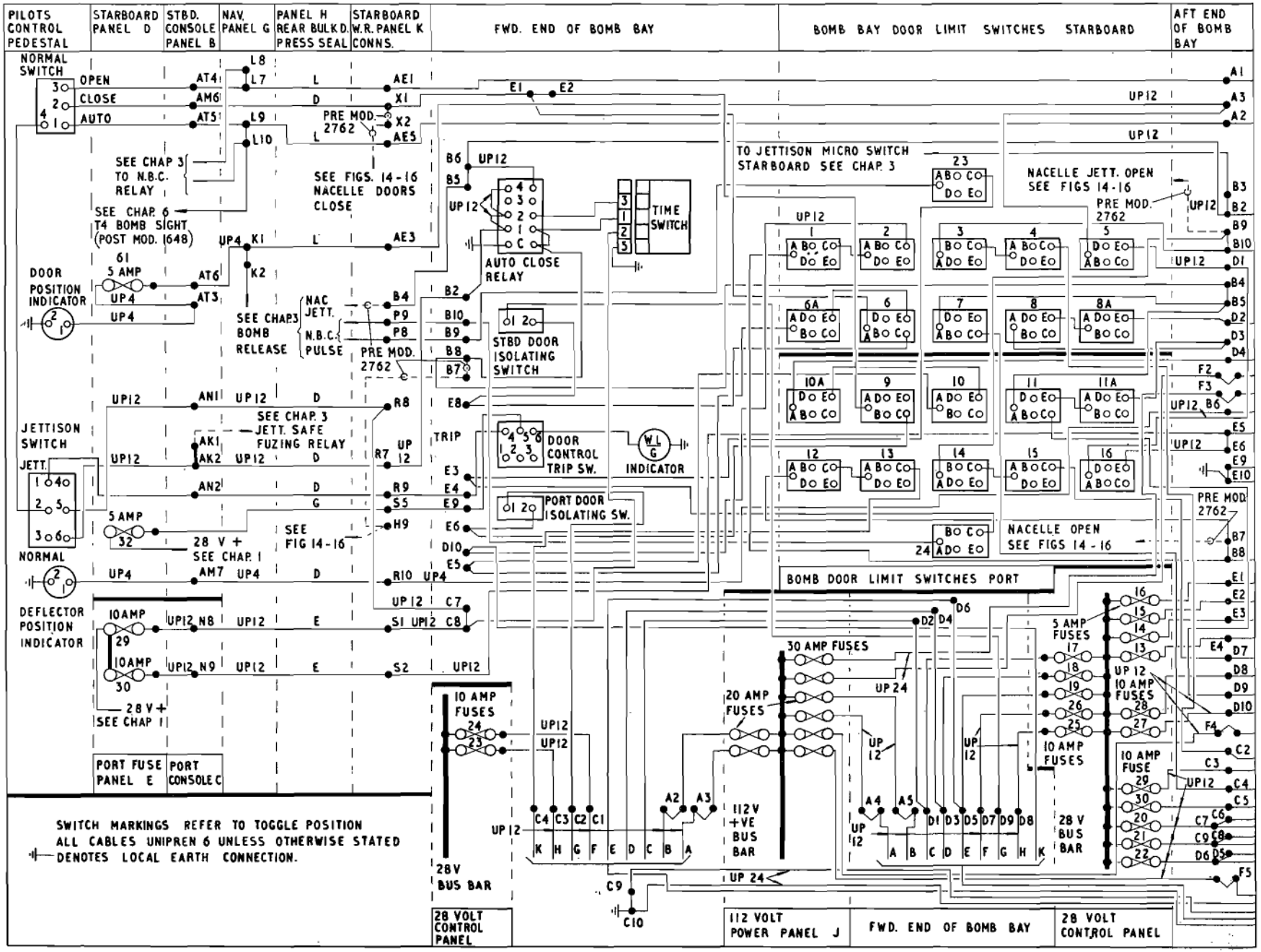

Fig. 9 (1) B.Mk.1 Bomb door and air deflector control (post Mod. 1520 pre Mods. 2364 and 2484)

RESTRICTED

70/36 SHT. 143-K

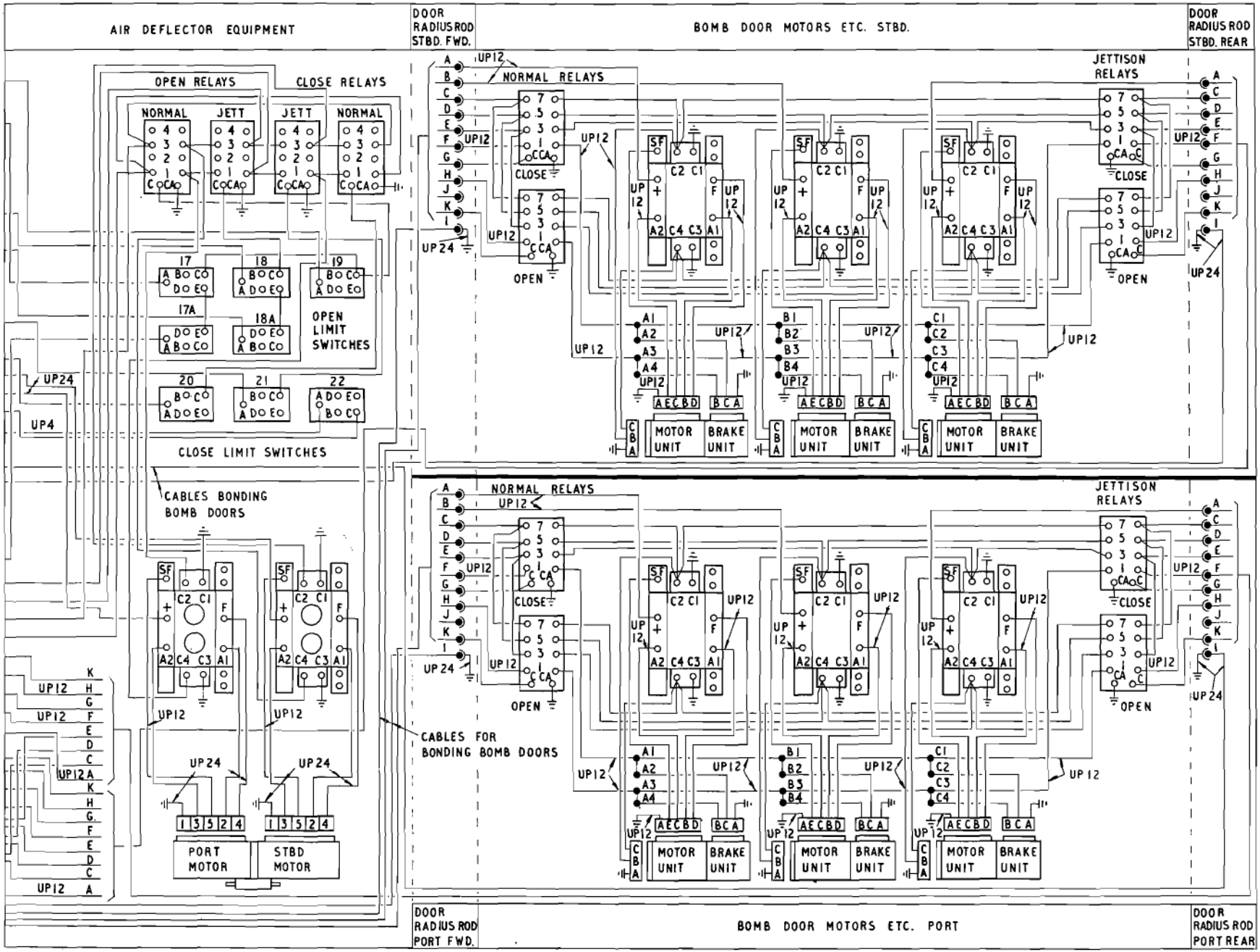

Fig. 9 (2) B.Mk.I Bomb door and air deflector control (post Mod. 1520 pre Mods. 2364 and 2484)

RESTRICTED

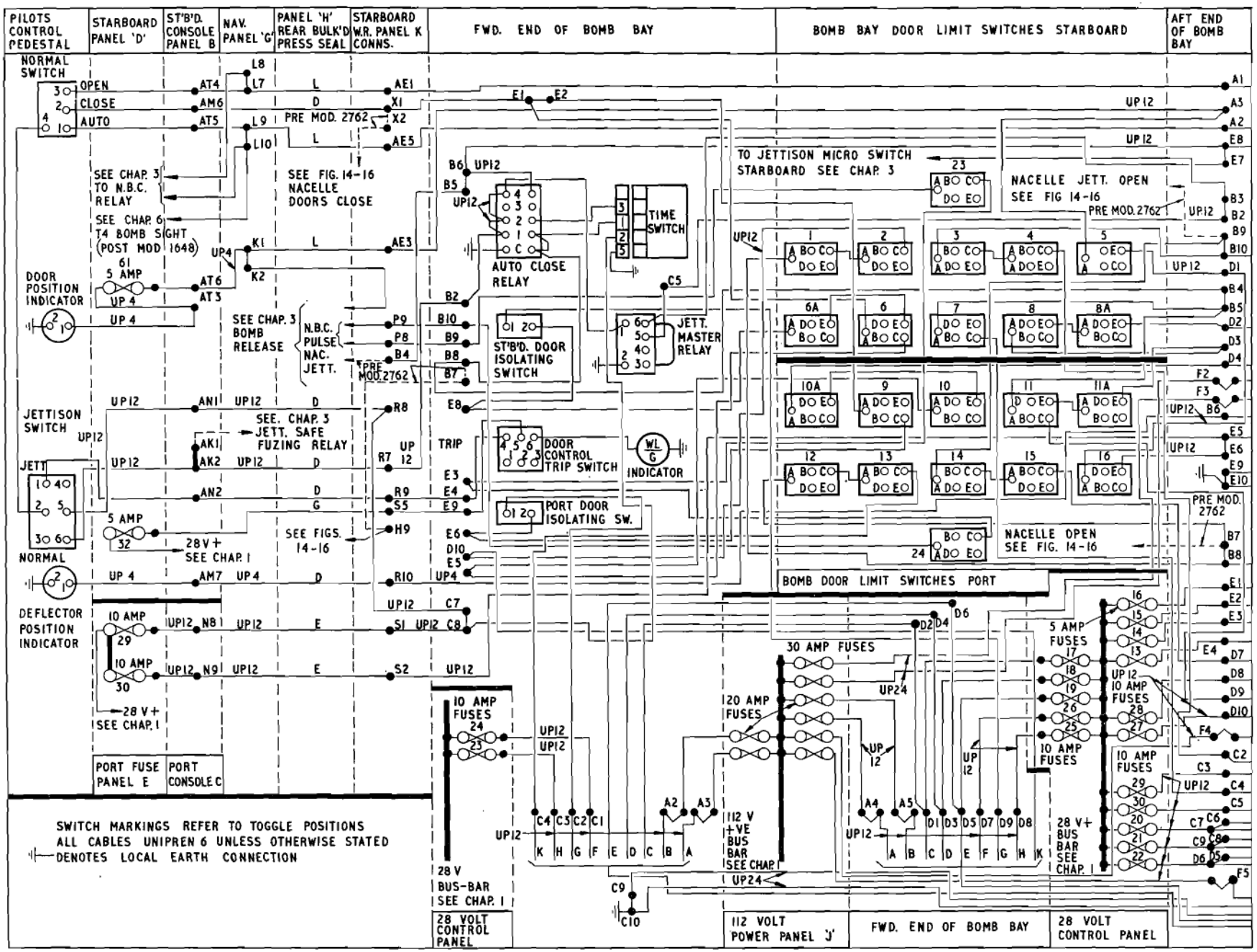

Fig. 10. (1) B. Mk. I Bomb door & air deflector control (post Mods. 1520 & 2364, pre Mod. 2484)

RESTRICTED

70636 SHT. 143-M

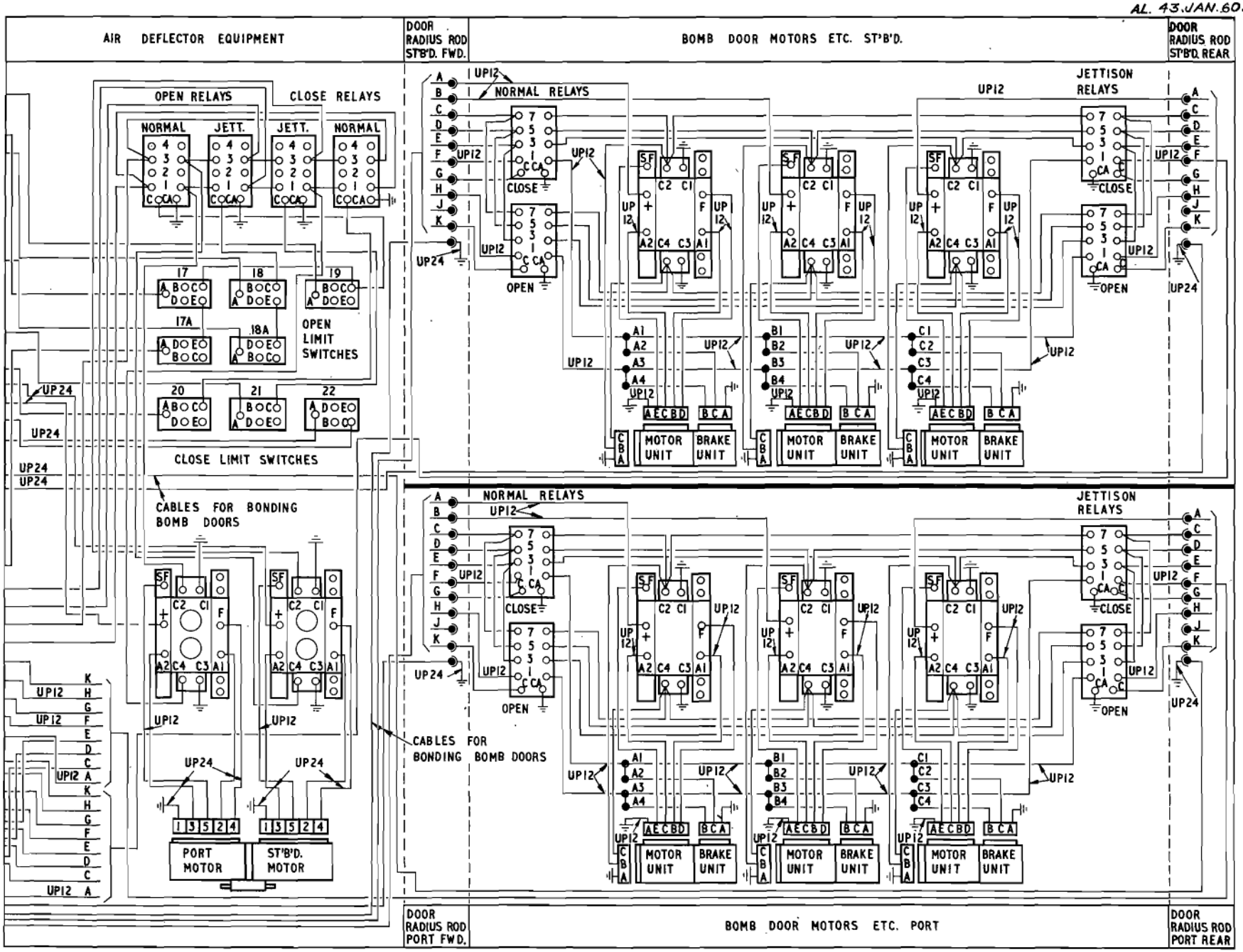

Fig. 10. (2) B. Mk.I Bomb door & air deflector control (post Mods. 1520 & 2364, pre Mod. 2484)

RESTRICTED

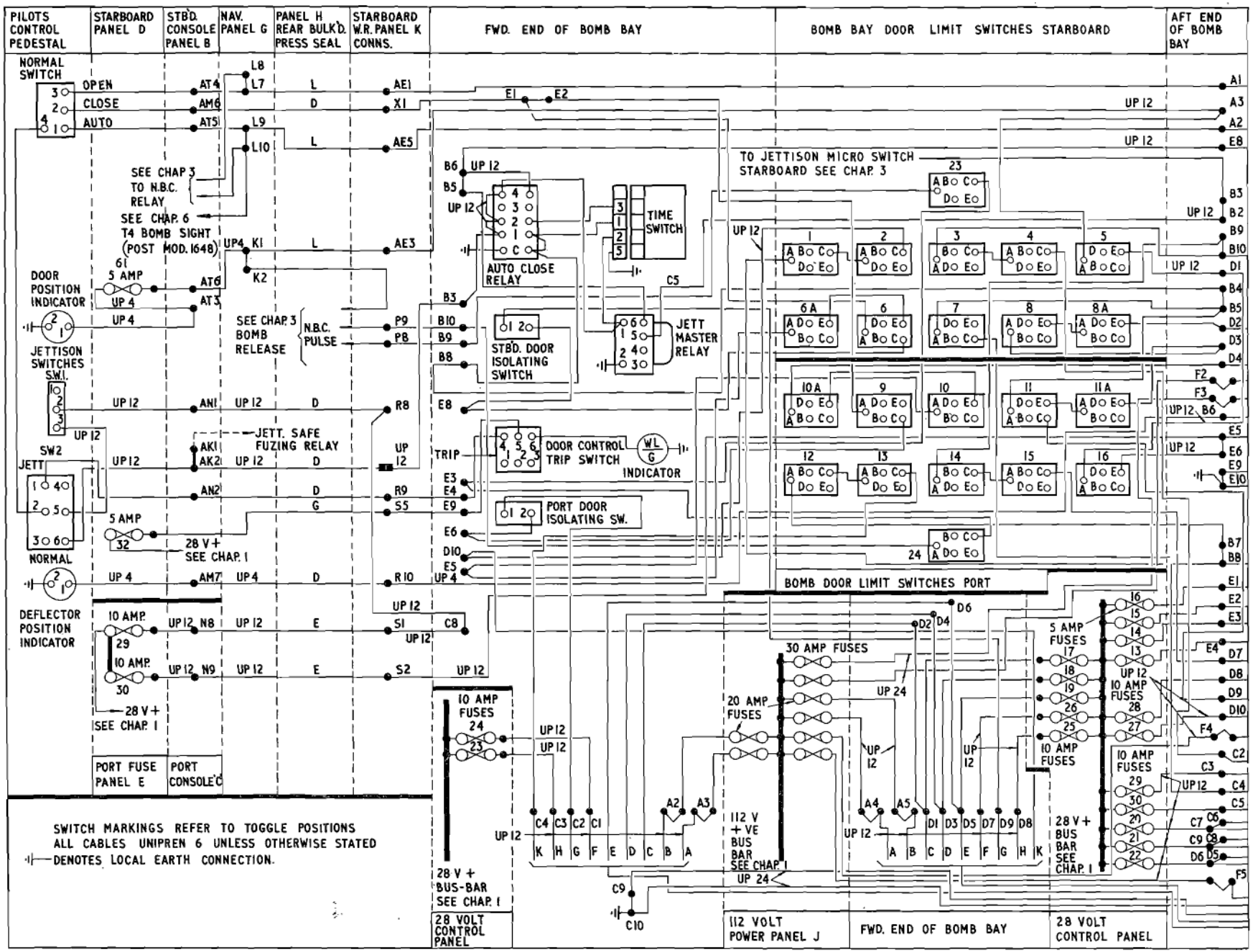

Fig. 11(1) B.Mk.1 Bomb door and air deflector control (post Mods. 1520. 2364. 2484. and 2762)

RESTRICTED

70636 SHT. 143-S

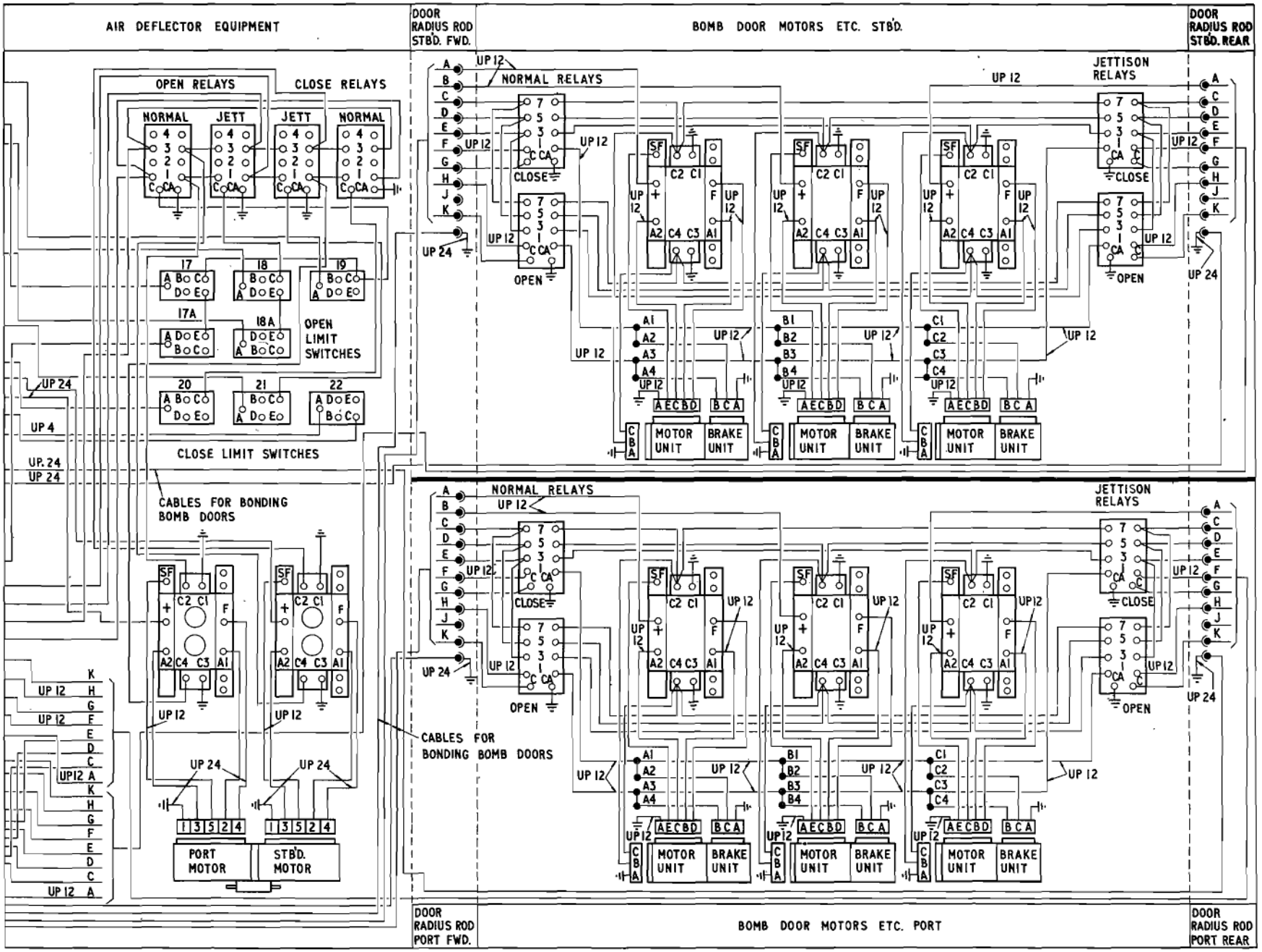

Fig. 11 (2) B.Mk.I Bomb door and air deflector control (post Mods. 1520. 2364. 2484 and 2762)

RESTRICTED

70636 SHT. 143-S

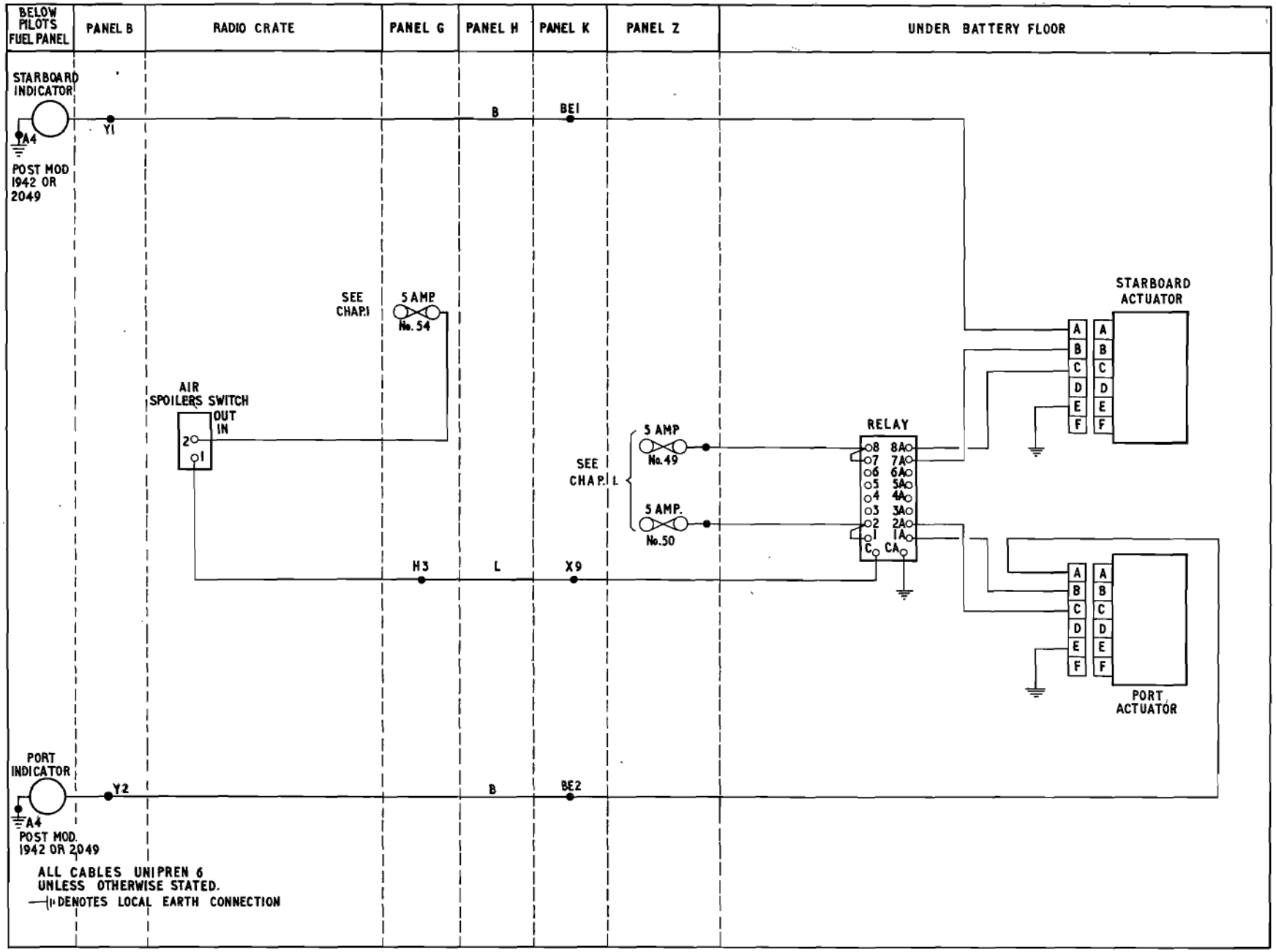

Fig. 12. Air spoiler control

RESTRICTED

75836 SHT402-D
67436 SHT.402-F

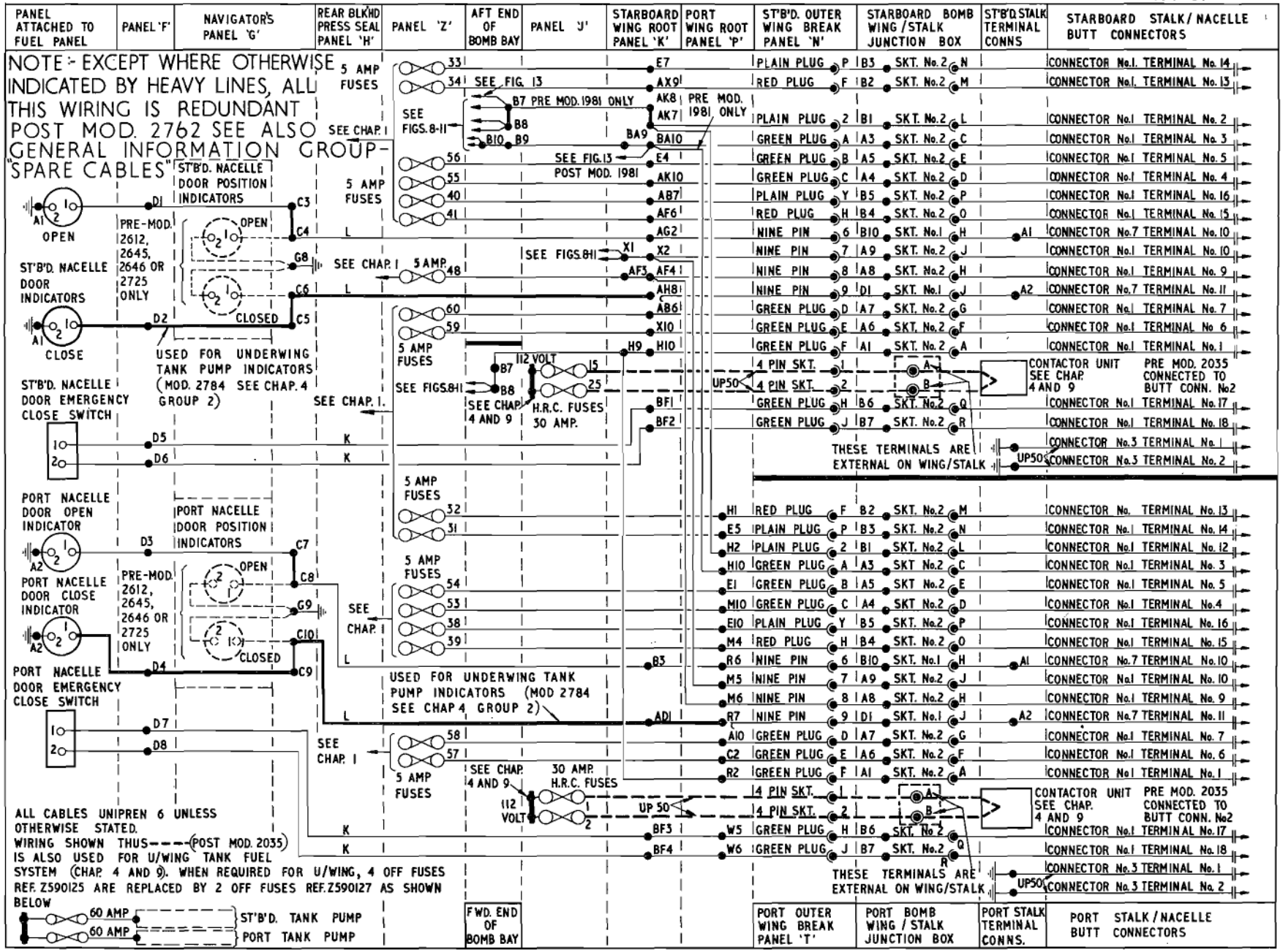

Fig. 14. Wing nacelle door control supply circuits (pre Mod 1835 and 1785)

RESTRICTED (ref. only)

75836 SHT. 413-D 67436 SHT. 413-D
67436 SHT. 160-F 67479 SHT. 321-D

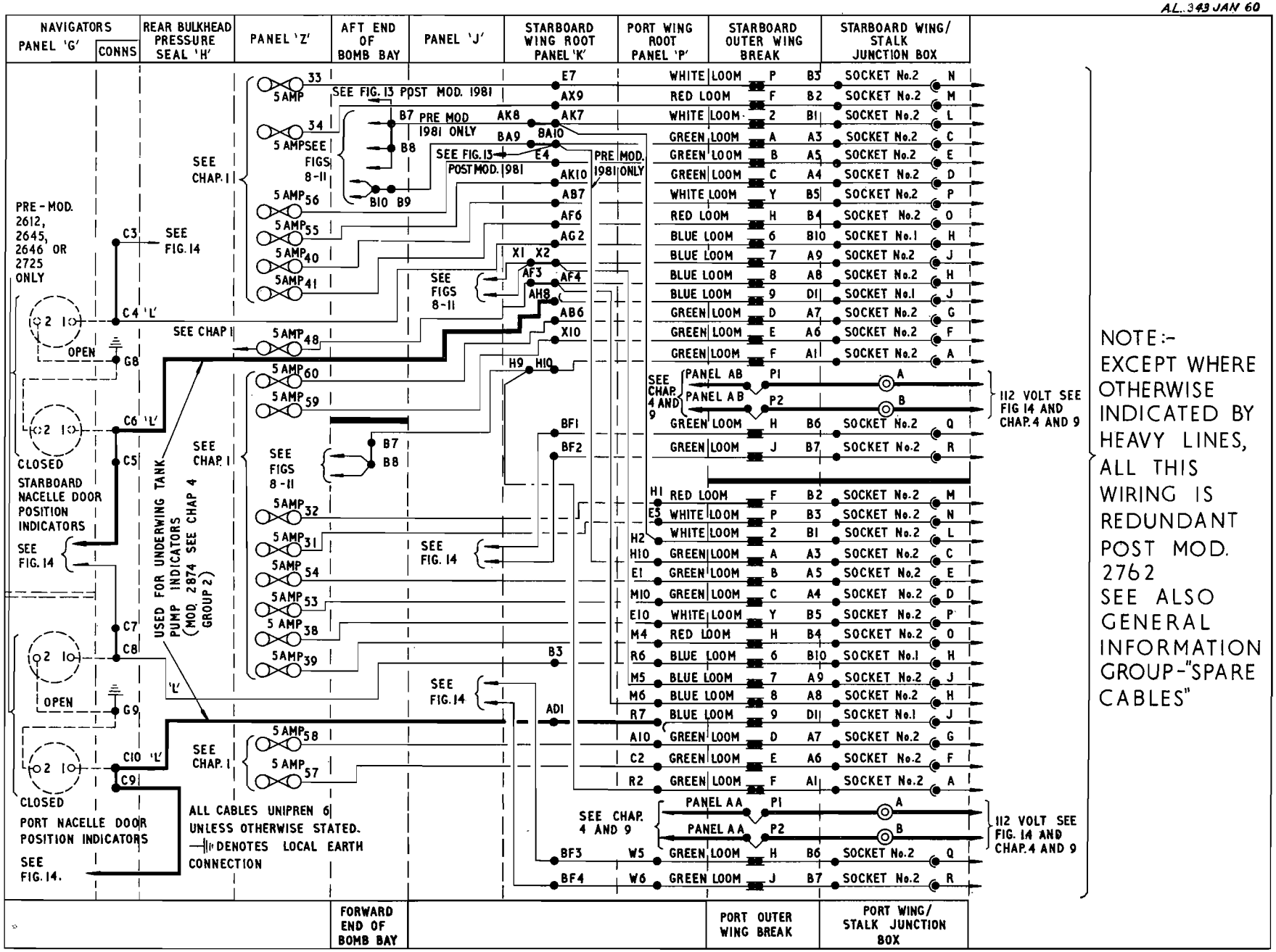

Fig. 15. Wing nacelle door control supply circuits (post Mods.1835 and 2035)

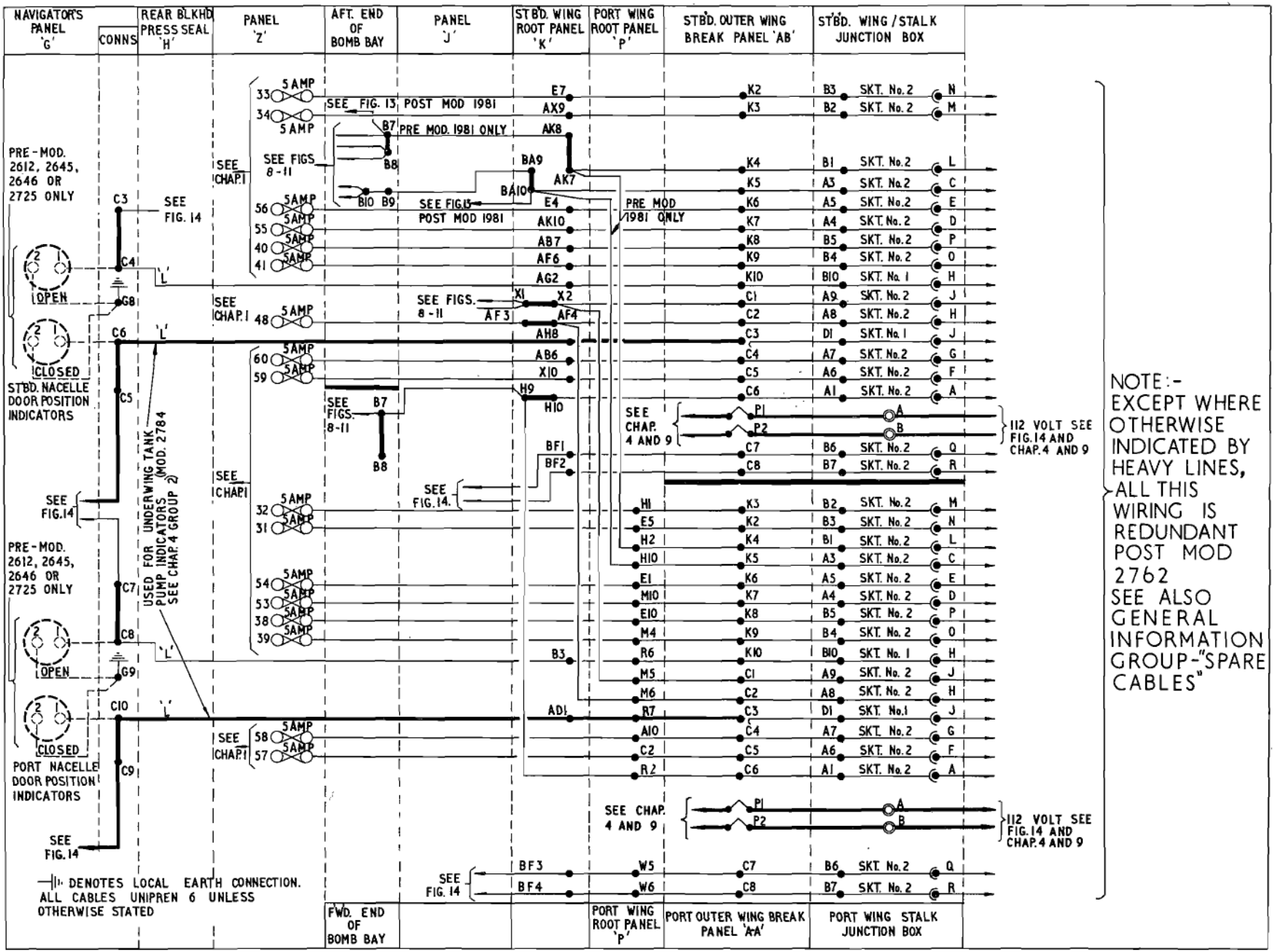

Fig. 16. Wing nacelle door control supply circuits (post Mods. 1785 and 2035)

RESTRICTED ref. only

75836 SHT. 160-G
70636 SHT 160-G

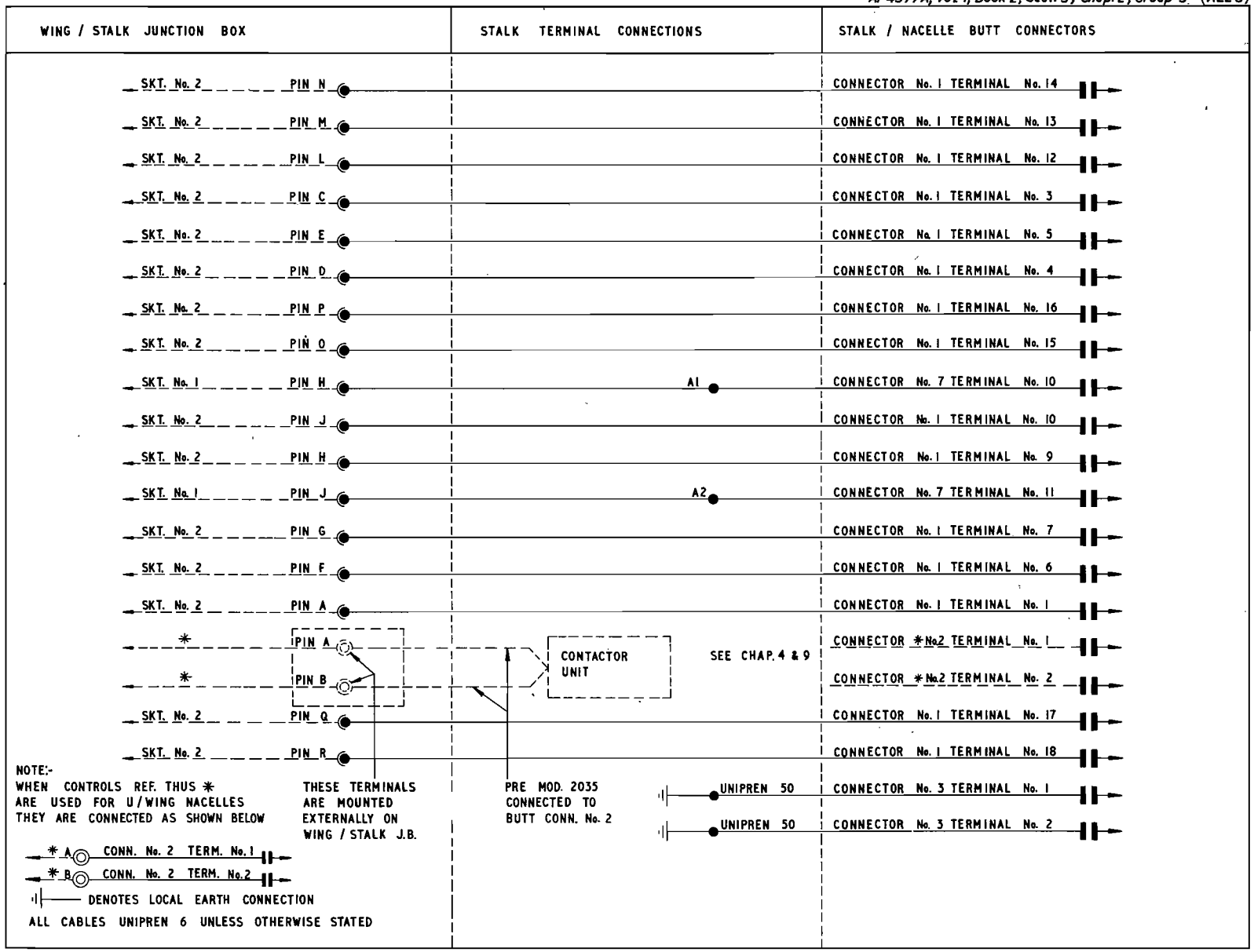

Fig. 17. Nacelle door controls (stalk equipment)

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8166 347862 12/58 625 C.B.&S. LTD. GP924

LIST OF APPENDICES

Appendix 1

BOMB DOORS (post Mod. 3171)

Introduction

1. Post Mod. 3171 the N.B.S. door master relay is energized by a signal from the N.B.S. J.B. Previously, it was energized directly from the bomb doors control switch in the AUTO position.

Circuit operation

2. The operation of the bomb doors in the AUTO position is as follows:—

Post Mod. 3171, Post Mod. 1620 the supply from the AUTO position of the door control switch is also taken to term. 6 of the N.B.S. relay and from there by a link to term. 4 of the N.B.S. door master relay, Type Q1, mounted in the radio crate. When a signal is passed from the N.B.S. J.B. through the N.B.S. NORMAL/ISOLATE switch, in the NORMAL position, to the coil of the N.B.S. door master relay, the relay is energized and closes contacts 3—4. The supply at 4, already mentioned, is passed to energise the coil of the N.B.S. relay which operates and closes contacts 3—4 and 5—6. A supply already at 4 is passed to its own coil to form a hold-in circuit. The supply at term. 6 is connected to the bomb doors normal 'open' relays R11 and R12, via the deflector limit switch 17 (and 17A post Mod. 1520) set by the open deflector and the door limit switches 12, 13 and 1, 2 for port and starboard doors respectively.

3. Fig. 1 of this appendix shows the alterations to the circuit Post Mod. 3171.

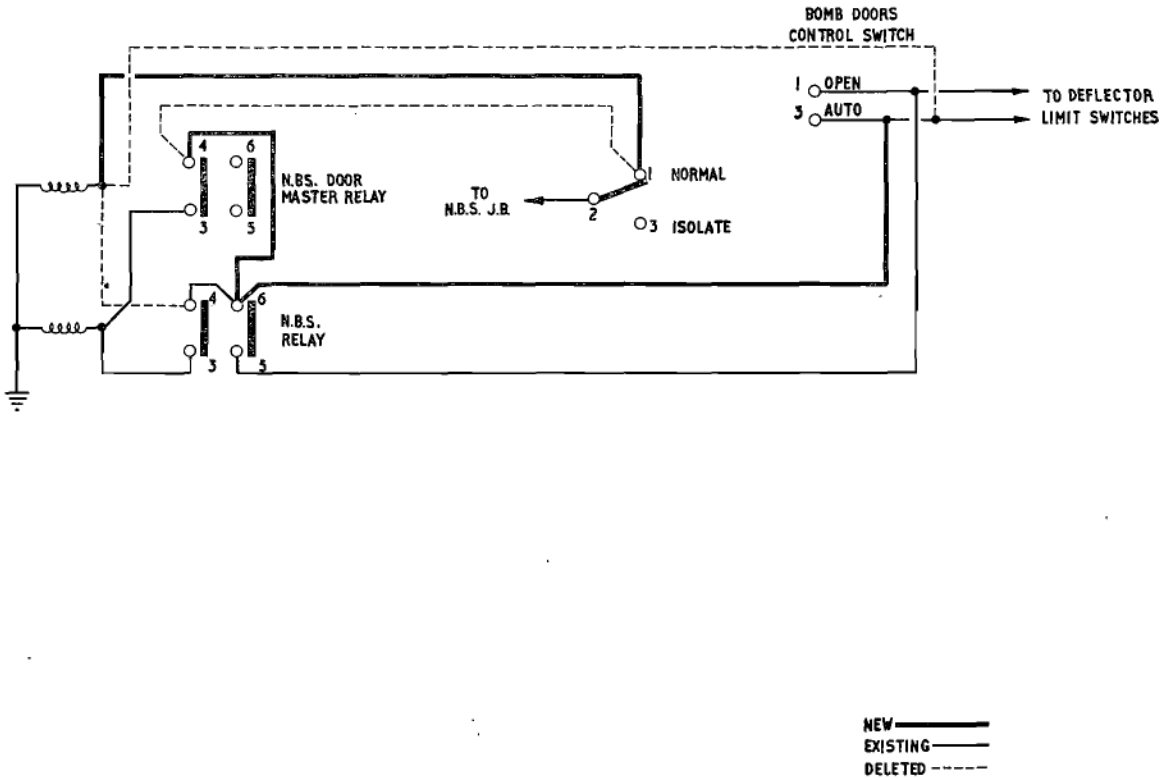

Fig. 1. Alteration to Figs. 4 and 5 (post Mod. 3171)

Appendix 2

BOMB DOORS (post Mod. 2385)

LIST OF ILLUSTRATIONS

Introduction

1. Mod. 2385 introduces a Control and a cut-off isolating relay in the 'Window' installation so that the 'Window' dispensers cannot be operated with the bomb doors or deflector selected open, unless a 'Window' emergency switch is operated. See Chap. 3, Group 4 for a description of the operation of the relays and switch. Figs. 1 and 2 of this appendix show the post Mod. wiring state.

Circuit operation

2. The bomb doors operate in exactly the same way as before except for the following:–
On selection of the Bomb doors control switch to OPEN, the supply at the Open terminal of the switch will also feed the coil of the 'Window' control relay, (Chap. 3, Group 4) energising the relay and cutting out the supplies to the 'Window' control units.
On selection of the Bomb doors control switch to Auto, the supply at the Auto terminal of the switch will also feed the coil of the 'Window' cut-off isolating relay, energising the relay and passing the feed to the 'Window' control relay coil, cutting out the 'Window' control units supplies.

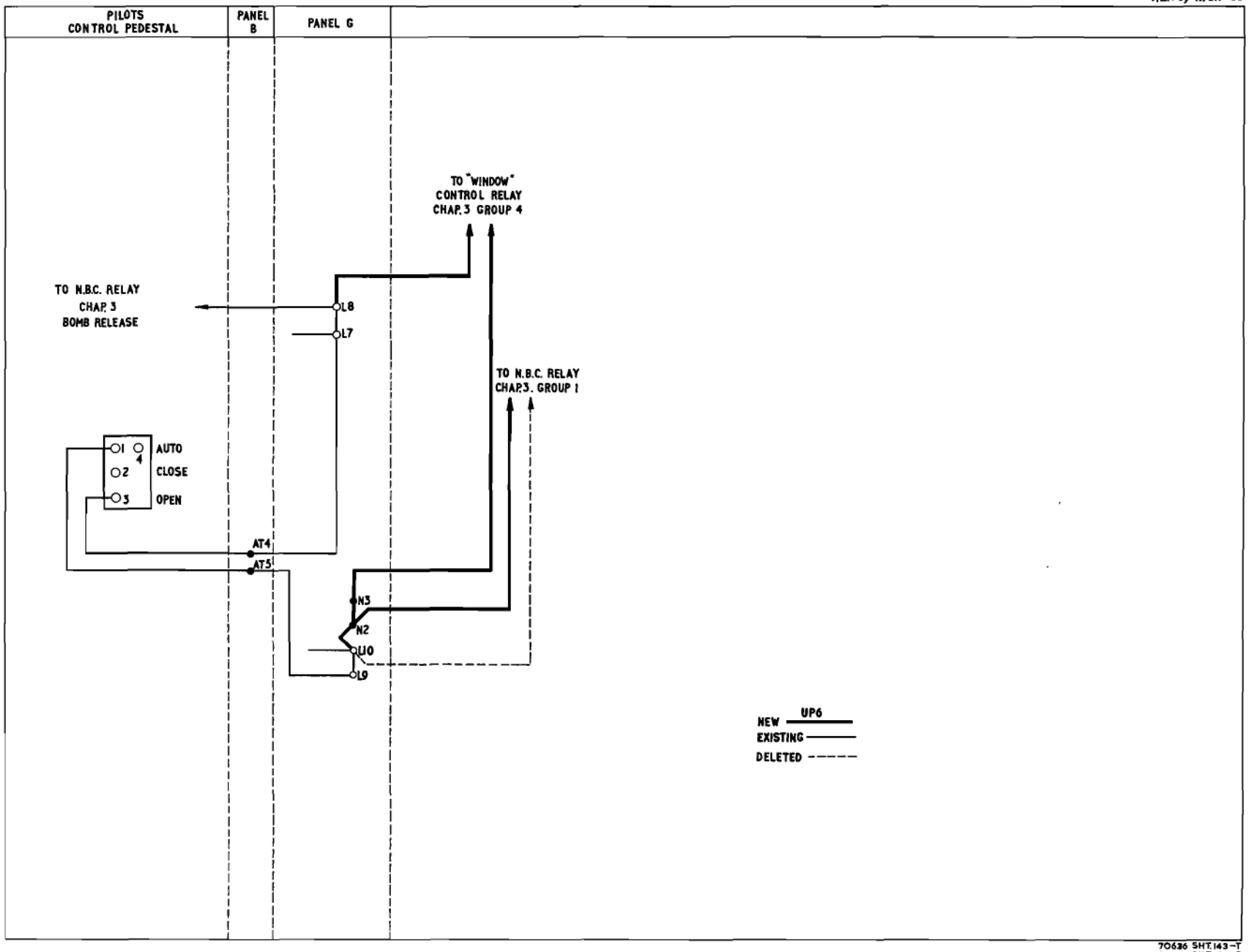

Fig.1 Alterations to Figs.8(1),9(1),10(1). and 11(1) (post Mod.2385)

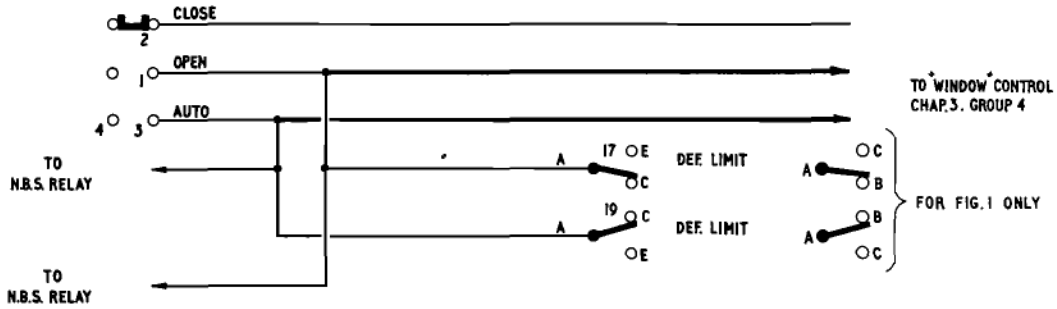

Fig.2 Alterations to Figs.1, 4 and 5 (post Mod.2385)

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