SECTION 15

Gold Film Windscreen (PRE-MOD 1942)

1. Introduction. The gold film windscreen system provides an effective method of de-icing the pilots windscreen by heating a layer of gold film inserted between the laminations of the windscreen.

2. Windscreen. Each of the three windscreens at the pilots position contain three layers of gold film between the laminations of the windscreen. The three layers are connected in start arrangement, and are heated from the output of a three phase auto transformer. Also fitted between the laminations of the windscreen are two sets of sensing elements. One set is used for temperature control and overheat protection, the other is kept as a spare. Either set of sensing elements can be used.

3. Auto Transformer. This transformer is fitted to provide various voltage outputs to feed the gold film heaters. The input of the transformer is 115V per phase with outputs of between 81V to 140V per phase.

4. Controllers. These are used to control the supply from the auto transformer to the windscreen heaters. Control is achieved by alternately energising and de-energising the supply contactor to the heaters.

A bridge network is formed by resistor R3, sensing element S1, and the control windings of transductors XDR1 and XDR2. The outputs of XDR1 and XDR 2 are connected in push pull to control XDR3. With the bridge balanced, the output of XDR3 is insufficient to energise relay 1 in the control unit. If however the bridge is unbalanced due to a drop in temperature on the windscreen then the output of XDR3 increases to energise relay 1. Relay 1 then feeds 28V via relay 2 to energise the supply contactor which connects the output of the auto transformer to the heater elements. As the temperature increases the balance in the bridge is restored which drops the output of XDR3, de-energising relay 1 and hence the supply contactor.

A second bridge network formed by resistor R4, sensing element S2, and the control windings of transductor XDR4. Under normal operation the output of XDR4 is insufficient to energise relay 2. If, however, the bridge is unbalanced by an undue increase in temperature on the windscreen then relay 2 will energise. Relay 2 will de-energise the supply contactor to switch off the heater supply and the other operation of relay 2 is to feed 28V to fire the overheat indicator fuse.

5. Switching. Three different heat settings are available on the windscreen, low, medium, and high. These are obtained by selecting different voltage settings on the auto transformer.

(a) Low Heat is switched on by the operation of the entrance door micro switches when the entrance door is closed.

(b) Medium heat is switched on after completing low heat and then by the operation of the pressure head heater switch.

(c) High heat is switched on after completing (a) low heat, and (b) medium heat, and then by the operation of the windscreen de-icing switch.

A test switch is also fitted to test the operation of the low heat with the entrance door open.

6. Operation Low Heat. The operation described is for the centre windscreen but is descriptive of all windscreens.

Operation of the torque shaft and door micro switches or the low heat test switch feeds 28V from fuse 52 to energise relay 719 and via relays 711 and 714 to energise relay 715. Energising relay 719 feeds 200V 3 phase AC to the primary windings of the auto transformer and to the primary windings of the control unit transformers.

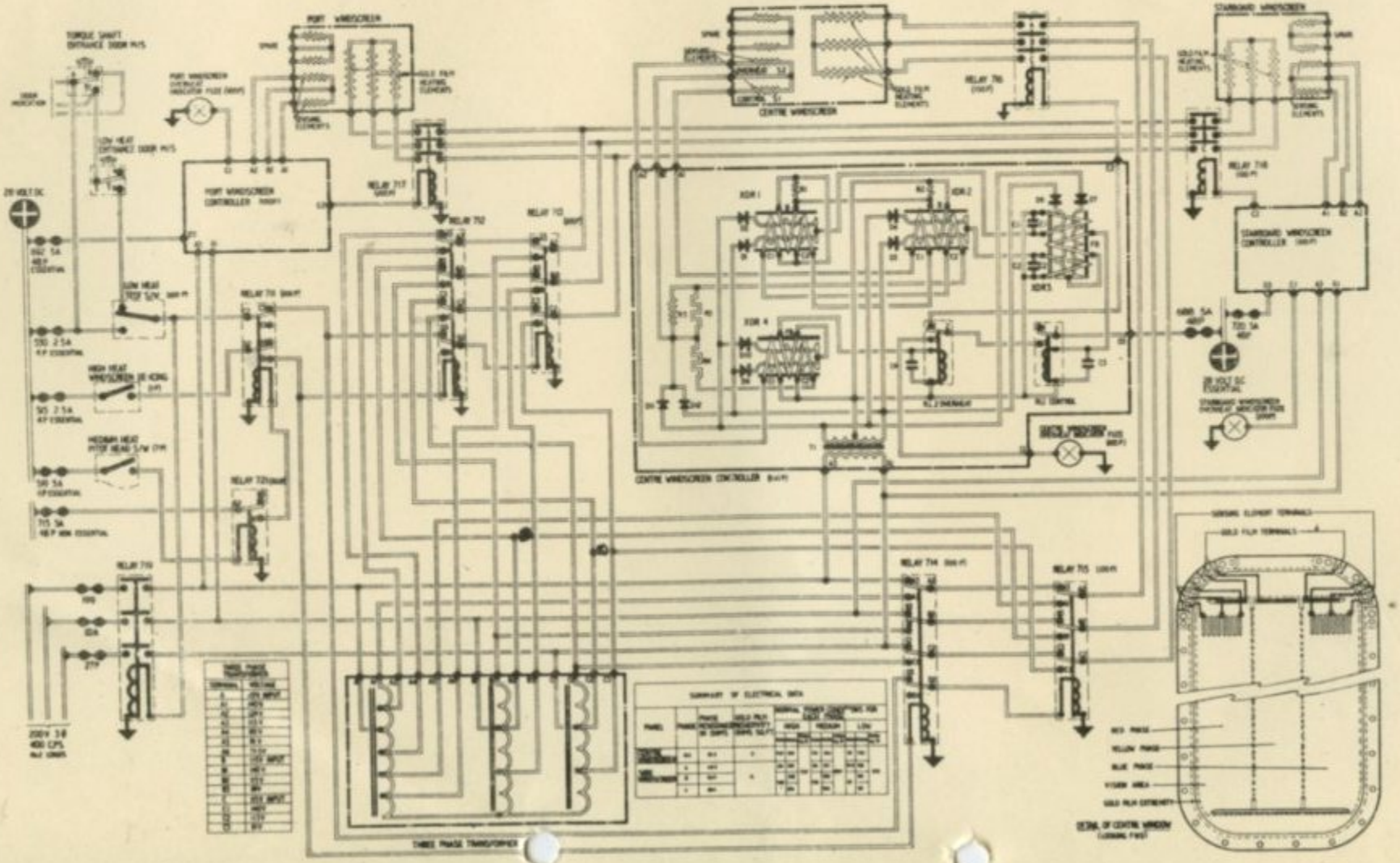
Energising of relay 715 connects the low voltage tappings A5 - B3 - C3 of the auto transformer to the supply contactor (relay 716) of the centre windscreen. Relay 716 is controlled by the centre control unit as described in paragraph.4.

7. Medium Heat. With low heat selected operation of the pressure head heater switch will feed 28V from fuse 519 to energise relay 721 which in turn energises relay 711 from fuse 715. Relay 711 in energising, de-energising relay 715 which disconnects the low voltage tappings A5 - B3 - C3 of the auto transformer to relay 716 and connects the Medium voltage tapping A - B - C of the auto transformer to relay 716.

8. High Heat. With medium heat selected operation of the windscreen de-icing switch will feed 28V from fuse 515 to energise relay 714 via relay 711. Relay 714 in energising disconnects the medium voltage tapping A - B - C of the auto transformer to relay 716 and connects the high voltage tappings A1 - B1 - C1 of the auto transformer to relay 716.

9. Component Location

Component	No.	Location
Gold Film Windscreens	3	Pilots windscreen
Auto Transformer	1	100 P under 2nd Pilots floor
Controllers	3	100 P
Indicator fuse	3	100 P
Test switch	1	100 P
Relays 711 712 713 714 715 715 717 718 721	9	100 P
Relay 719	1	Adjacent to 27P



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