

Chapter 2

LOAD BANK

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Leading Particulars

Load Bank Ground Equipment Ltd. Part No.141.

INTRODUCTION

1. The load bank consists of two separate trolley mounted units designated, MASTER and SLAVE. They are used in conjunction with the Single Channel Tester Type E.T.601, as described in 4343V, Vol.1, Sect.6, Chap.1, for load testing the aircraft generator, Type 154, fitted to the Britannia aircraft.

2. The combined loads of the two units when operated in parallel are as follows:-

- (1) 66kW at 200/208V a.c. 400c/s 3 phase.
- (2) 52kW at 112V d.c.
- (3) 26kW at 28V d.c.

Each trolley provides half to total load, the a.c. being balanced at unity p.f.

A hand operated brake is located at the front on the right hand side.

DESCRIPTION

GENERAL

3. The chassis is of fabricated steel construction mounted on four solid rubber tyred wheels, and is provided with a towing bar for transportation.

4. Access to the control panel of both units is made available by a roller shutter door on the right hand side, and contains all the instrumentation and control switches. The master unit incorporates an additional ammeter in each load section to indicate the total current, when operating in parallel with the slave unit.

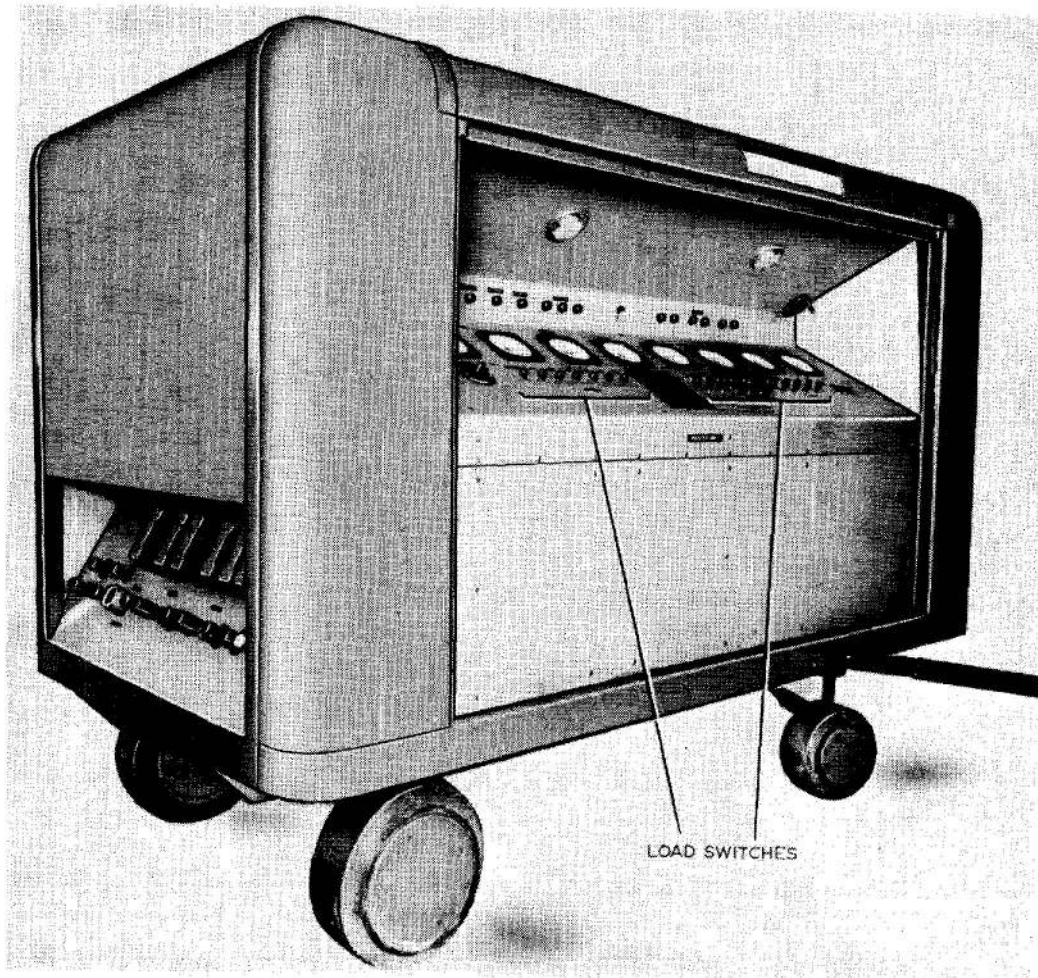


Fig.1. Load Bank

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5. At the rear of each trolley are located the fuses and load terminals which enable the external connections to be made. The contactors are located beneath the control panel as illustrated in fig.2 and together with the three cooling fans, are supplied from a 400/440V, 50c/s, 3 phase source.

LOAD RESISTORS

6. All the loads are non-inductive, and over the 28V d.c. range is infinitely variable, whereas in the other two

sections it can only be increased in increments of 1kW.

7. The 28V d.c. 1kW variable resistor is fitted to the master unit, and located in the top right hand corner of the control panel.

CIRCUIT PROTECTION

8. Each load section is provided with a thermostat, which operates, if the equipment overheats, due to failure of

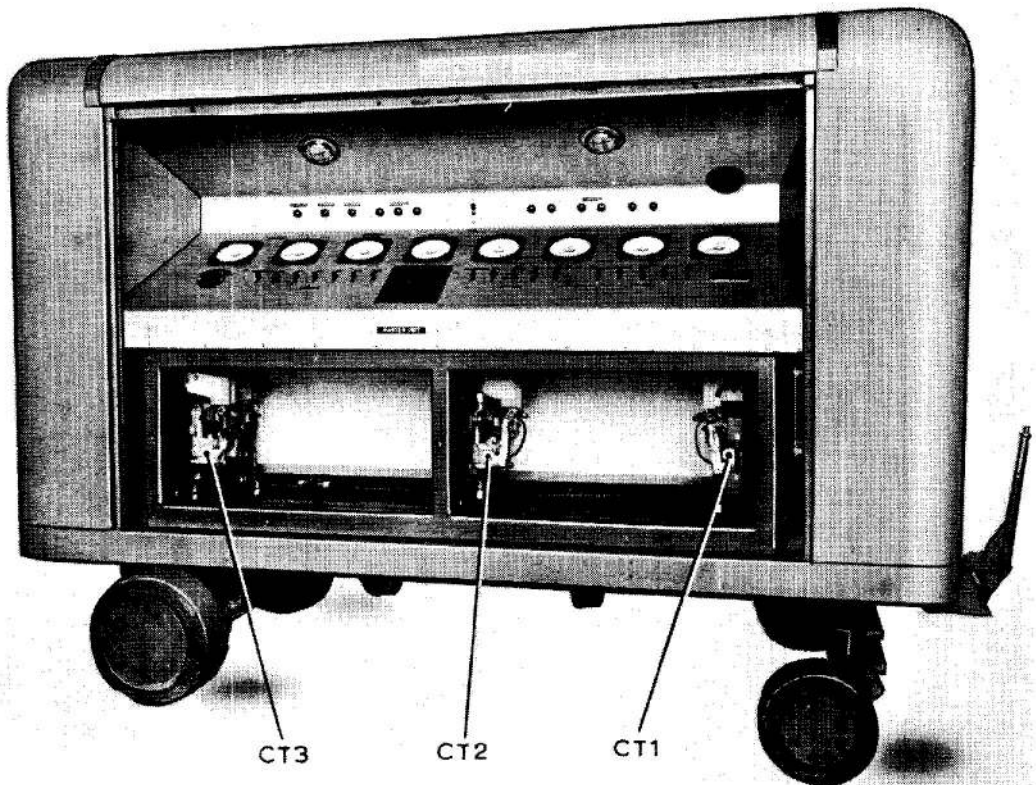


Fig.2. Load Bank with Side Panel Removed

R E S T R I C T E D

the cooling fans. Overload protection is provided by the fuses.

OPERATION

9. If the MASTER unit is used separately, the generator is connected to the load terminals as follows:-

- (1) 28V d.c. output - terminals 8+ and 9-
- (2) 112V d.c. output - terminals 5+ and 6-
- (3) 208V a.c. output - terminals $L_1 L_2 L_3$

10. The supply is applied to the control circuit by operating the rotary switch (S22) on the control panel, and selection of the load banks achieved by operating the appropriate switches.

11. When the MASTER and SLAVE units are operated in parallel the generator output is connected to the MASTER unit as shown in Table 1, and the SLAVE unit is connected to the MASTER unit as shown in Table 2.

TABLE 1

Load Connections for Parallel Operation

Generator Output Voltage	Terminals on Master Unit
28V d.c.	7+ 9-
112V d.c.	4+ 6-
208V a.c.	$L_1 L_2 L_3$

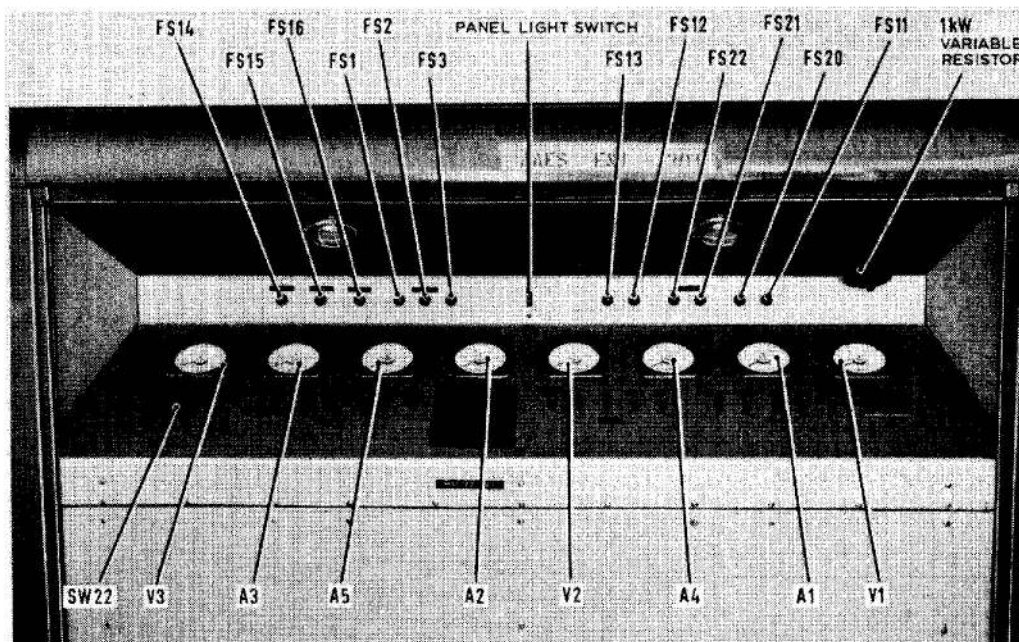


Fig.3. Control Panel

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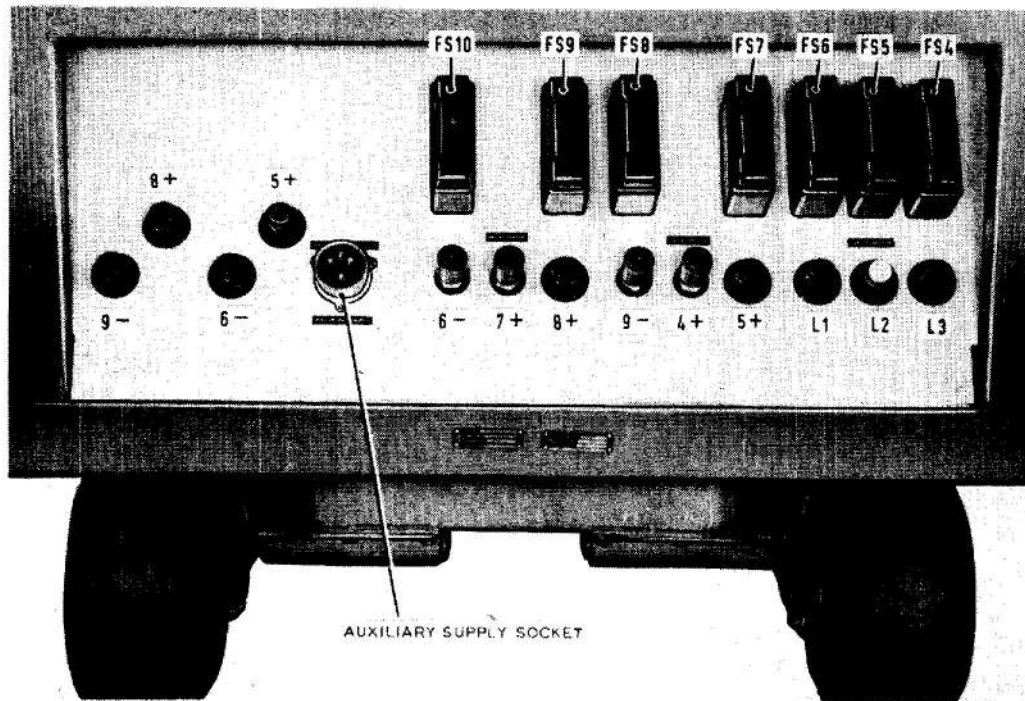


Fig.4. Terminal Panel on Master Unit

TABLE 2

Master to Slave
Unit Connections

Terminals on MASTER	Terminals on SLAVE
8+ 9-	8+ 9-
5+ 6-	5+ 6-
L ₁ L ₂ L ₃	L ₁ L ₂ L ₃

SERVICING

CHASSIS

12. The wheel hubs and steering turntable should be lubricated periodically with grease LG-280 and the brake checked and adjusted when necessary.

13. The chassis is mounted on rubber suspension and this requires no attention apart from examination for deterioration.

CONTACTORS

14. All the contactors are manufactured by Geipel Ltd., and a typical type is illustrated in fig.6. The individual characteristics of the different types are given in Table 3.

TABLE 3

Contactor Details			
Cct Ref.	Type	Coil Resistance	Pull in Voltage
C2	250A SP	100	375V
C3	100A DP	75	375V
C4-C6	107A SP	75	375V
C1	500A DP	19.4	195V

15. The contacts should be examined for signs of pitting and burning as described in A.P.4343, Vol.1, Sect.11, Chap.2.

16. The procedure for dismantling a contactor is as follows (fig.6):-

- (1) Remove split pin and spindle.
- (2) The armature and cross bar are now removed as one assembly.
- (3) Remove coil retaining clip.
- (4) Remove damping ring.
- (5) The coil can now be removed.

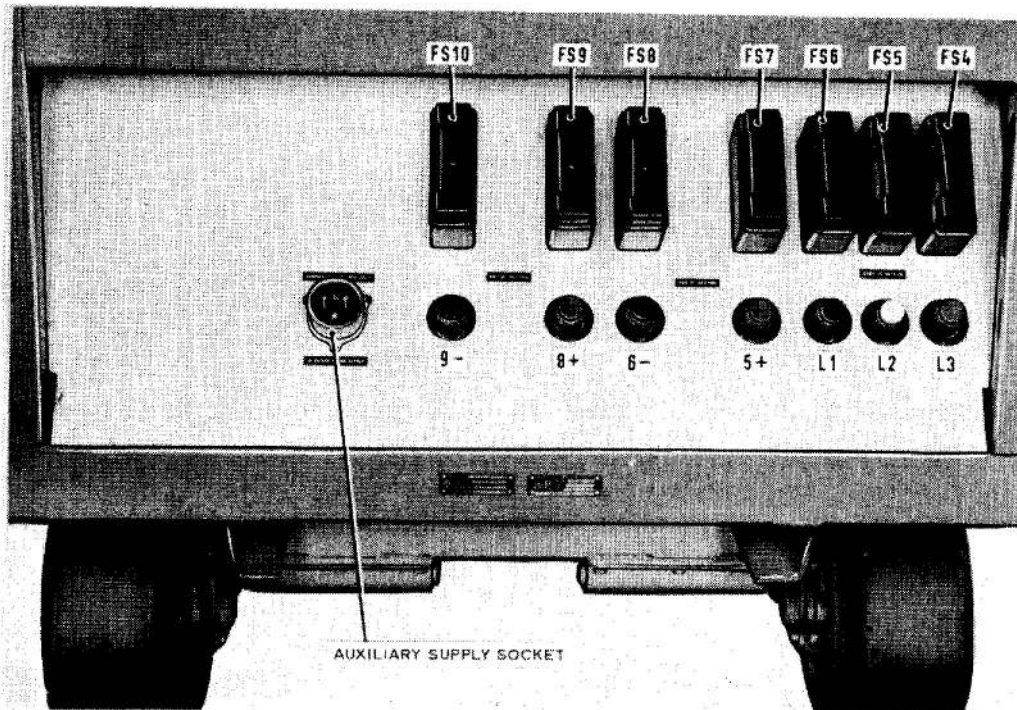


Fig.5. Terminal Panel on Slave Unit

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17. Removal of moving contacts (fig.6)

- (1) Remove the locknut and the retaining nut.
- (2) Remove the contact spring and the two cup-washers.
- (3) Replace the contact.

(4) Re-assemble in the reverse order.

(5) When the contact is re-assembled the length of the compressed contact spring should be 1 in.

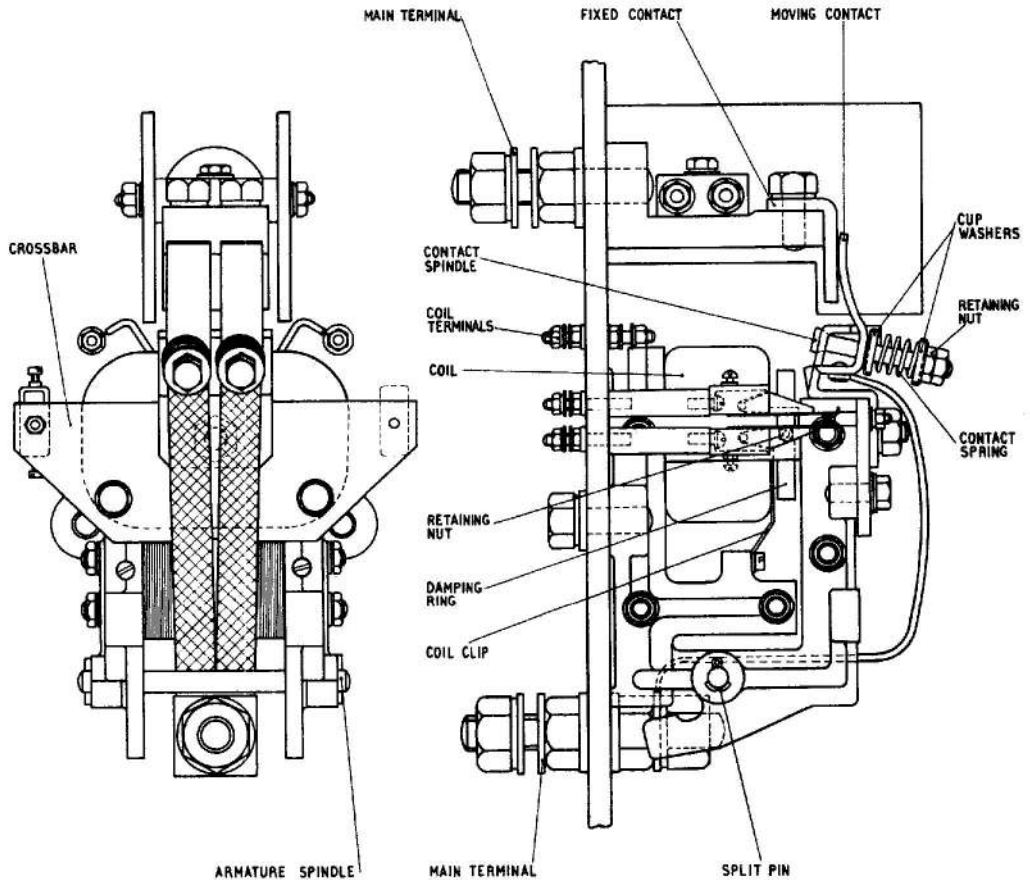


Fig.6. Typical Contactor

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FANS

18. The fan motors are of the totally enclosed, squirrel cage type. Check that the fans run smoothly and without vibration. If vibration does occur it may be due to one of the following causes:-

- (1) build up of deposits on impeller blades
- (2) bearing wear
- (3) damage to impeller

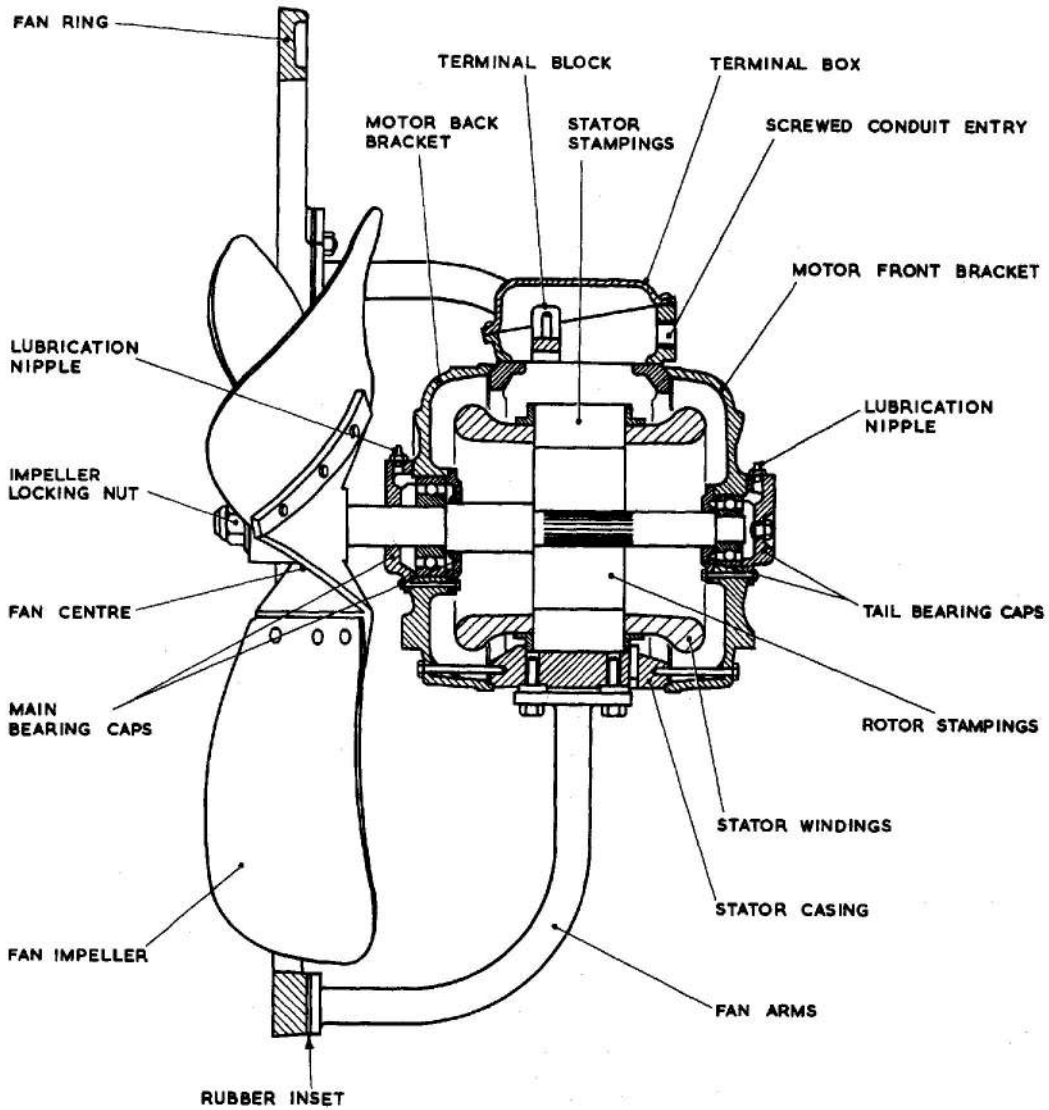


Fig.7. Fan Motor

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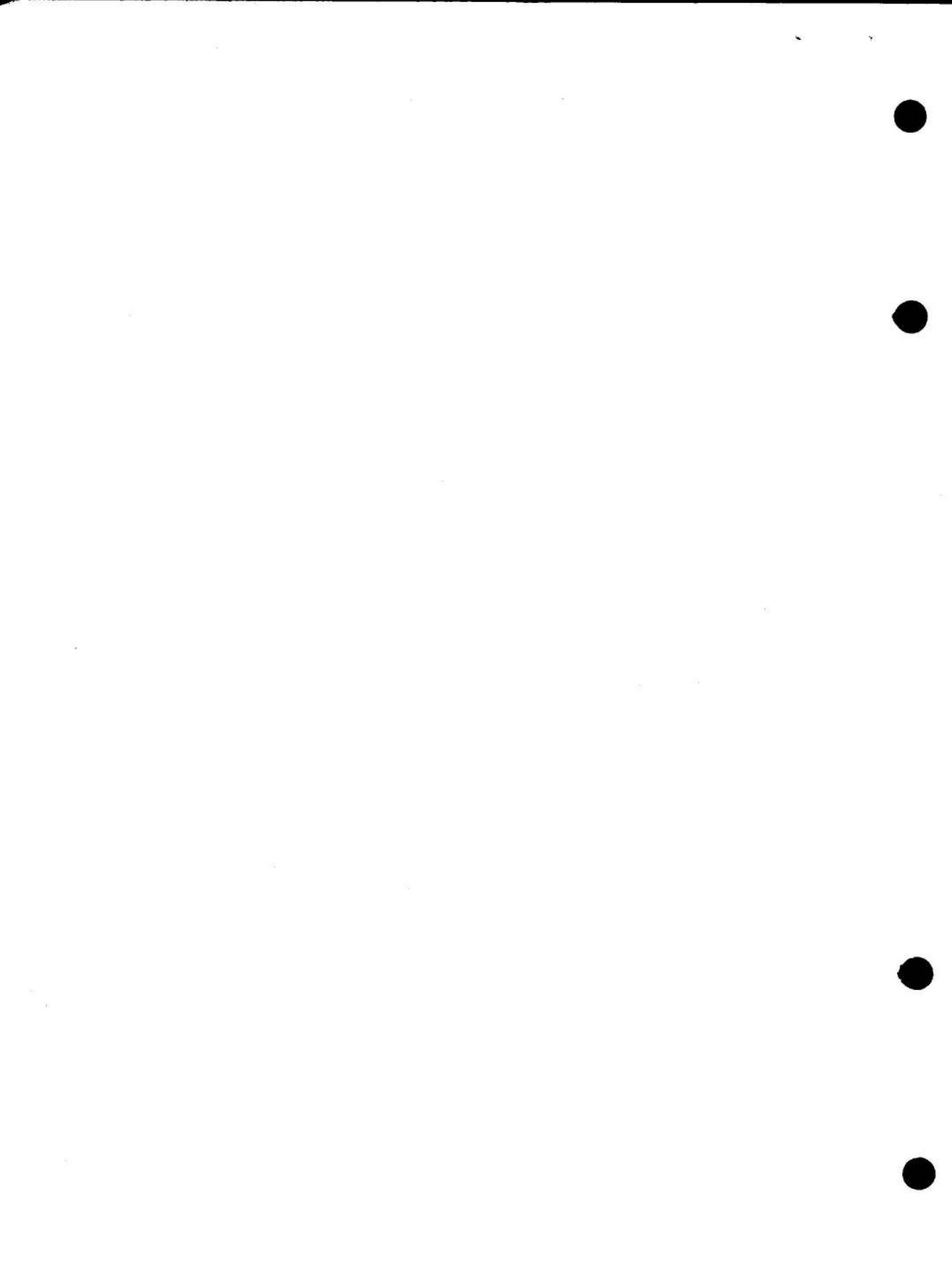
19. If any of the last two arise the worn or damaged items should be renewed with reference to the sectional view of the fan in fig.7.

20. The bearings are a clearance fit on the shaft and a push fit in the housing.

21. The fan motor bearings are to be lubricated through the grease nipples with grease XG.271. This should be done every 3 months when the fan is run continuously, or at periods specified in the relevant servicing schedule.

TABLE 4
List of Components

A1	0-500A d.c. (Master Unit only)	FS4-6	HRC.100A
A2	0-250A d.c.	FS7,8	HRC.250A
A3	0-100A d.c.	FS9,10	HRC.500A
A4	0-1000A d.c. (Master Unit only)	FS11-13	10A. Rewirable
A5	0-500A d.c.	FS14-19	10A. Rewirable
V1	0-40V d.c.	FS20-22	5A
V2	0-160V d.c.	S1-6	D.P.60A
V3	0-250V a.c. 400c/s	S7-21	D.P.30A
C1	500A, 28V d.c. SP	S22	3 pole ON/OFF
C2	250A, 112V d.c. SP	FAN 1	14 in. dia.
C3	100A, 250V a.c. DP	FAN 2	16 in. dia.
C4-C6	107A, 28V d.c. SP	FAN 3	18 in. dia.
FS1-3	HRC.30A		



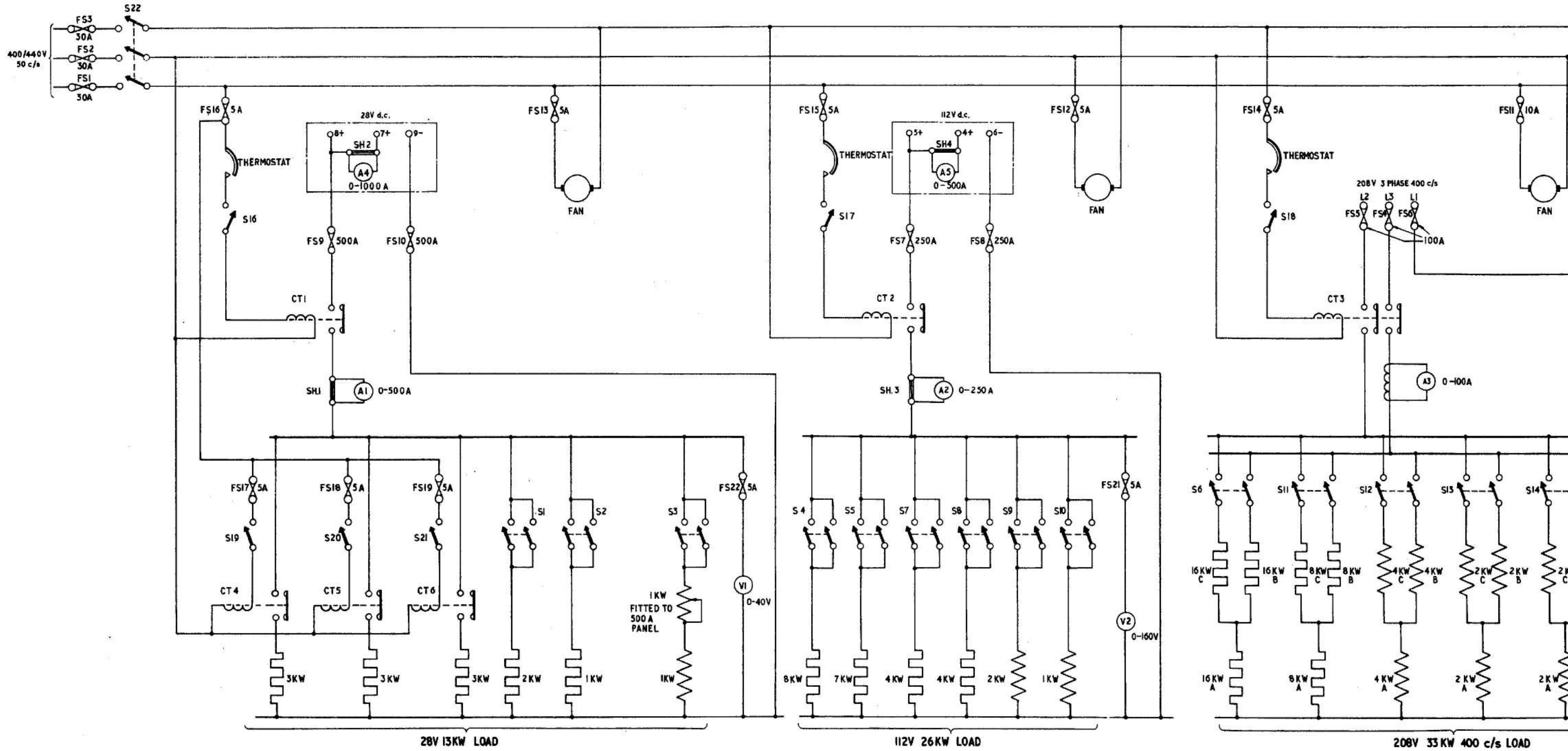


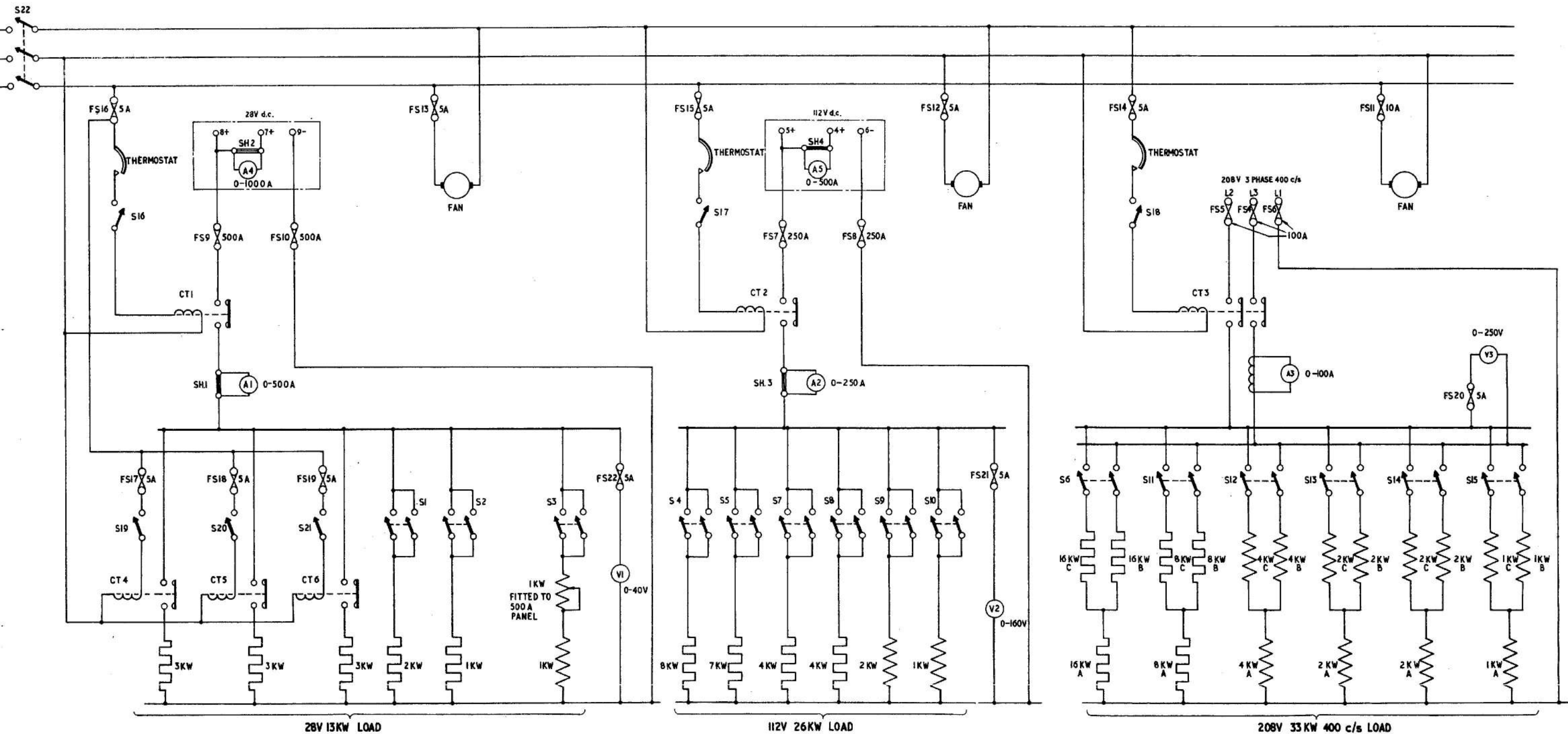
Fig. 8

Load bank - circuit diagram
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28V 13KW LOAD

112V 26KW LOAD

208V 33KW 400 c/s LOAD



Load bank - circuit diagram
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Fig. 8

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