



**ELECTRIC EQUIPMENT**

**FOR**

**RUSTON-BUCYRUS  
110 RB DIESEL-ELECTRIC  
EXCAVATOR**

**INSTRUCTIONS**

**FOR**

**OPERATION AND MAINTENANCE**

**Associated Electrical Industries Limited**

**Motor and Control Gear Division**

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## SECTION 2

## OPERATING INSTRUCTIONS AND SHOVEL/DAGLINE CONVERSION

## 2.1 OPERATING INSTRUCTIONS

The fuel supply to the diesel engine cannot be switched on until the main isolator IS1 is closed and the Reset pushbutton on the door of the alternator section of the control cubicle has been pressed. The Emergency Stop switch on the console should be in the pulled out position at this time.

Once the diesel engine is started the generator set begins to turn. The radiator fan motors, the exciter set motor and the oil pump motor are energised and run up with the alternator, and the lighting supply is made. If an overload relay on any of these motors should trip, the alternator exciter field is reduced to zero and the a.c. supply therefore fails, shutting down all a.c. auxiliaries. The diesel engine must be shut down before the relay can be reset. A carbon pile regulator is provided to maintain constant alternator output voltage.

Isolator IS on the a.c. section of the control cubicle is then closed. When the machine is a dragline the boom hoist motor can then be operated from the three point pushbutton station.

Pressing the Start pushbutton on the console energises contactor EX. When EX closes it completes the supply to the blower motors through three fuses common to them all and through individual thermal overloads, and also to a pilot contactor EXP, a normally open contact of which retains across the Start button. Another normally open EXP contact prepares the circuit for the coil of the compressor motor contactor and if the pressure switch is closed indicating that pressure is low, the compressor will start up and will thereafter stop and start automatically under the control of the pressure switch. If an overload trips on any of the blower motors or on the compressor, all these motors will be shut down. The overload relay must be reset in the a.c. section of the cubicle, so that IS must be opened, dropping out EX and EXP.

There is a normally open contact of EX in series with the coil of the field contactor FC1 and, provided all controllers are in the OFF position, the contactor will close as soon as the main exciter voltage has built up. Since variations in diesel engine speed will cause corresponding variations in exciter output voltage a second carbon pile regulator is provided to keep the voltage constant.

The field contactor has a normally open contact which retains across the OFF position interlocks of the controllers and if the machine is working as a shovel a limit switch is included in this circuit which opens if the boom is inadvertently raised above a safe limit.

The carbon piles are dismantled and re-assembled as described below, but one pile should be dealt with at a time.

1. Remove the armature stop screw (29) from the magnet core (4).
2. Slacken the locking screws (25) and remove the compression screw (19) threaded in the top bracket (20). Pass a stiff rod through the centre holes in the carbon washers and remove the complete pile stack by tilting the regulator.
3. Examine the carbon washers for marks of pitting or burning. Give the washers a gentle shake and blow with a jet of dry air to remove dust. If the pile is badly pitted it should be replaced with a new set of washers of the correct type. DO NOT HANDLE THE CARBON UNNECESSARILY.
4. Examine the ceramic tube, clean if necessary, and blow with a jet of dry air. A cracked or damaged tube should be replaced.
5. Examine the carbon insert in the compression screw and clean the surface if necessary by lightly rubbing on close-grained paper or fine crocus paper placed on a surface plate. See that the surface is perfectly flat after cleaning.
6. The carbon insert disc in the armature assembly should be examined and cleaned, if necessary, in the same way.
7. Ensure that the cooler and other parts are correctly aligned with the magnet case and that there is no fouling or binding of the armature contact in the ceramic tube. Binding may cause a sluggish or uneven change of pressure on the pile.
8. Thread the new pile on a stiff rod and insert in the tube.
9. Replace the compression screw (19), tighten to its original position and lock. See that the pressure arm (32) is horizontal before proceeding with the other pile.
10. Slacken the two core lockingscrews and turn the core (4) anti-clockwise until two threads are showing.
11. As a final check to establish that the pressure arm is horizontal, measure by means of inside calipers the distance "a" (Fig. 5). This must be the same on both piles.
12. Make a pencil mark across the compression screw (19) and bracket (20). Care must be taken that all subsequent movements of the pile compression screws are made equally on each pile.

Laminated shims are provided on either side between the cap and the pedestal to give adjustment so that a clearance of between 0.001" and 0.002" is obtained between the top of the globe housing and the inside of the cap. The cap must not pinch the housing.

### 3.3 GENERATOR SET CHAIN DRIVE

The chain is correctly adjusted when the equipment is despatched, but some bedding down may occur in the first few weeks of service and this will result in the chain becoming slack.

#### 3.3.1 Adjustment of Chain Tension

The inspection cover on the side of the chain case should first be removed. The locknuts on the jacking screws below the upper baseplate should then be loosened and the jacking screws screwed up until they just touch the underside of the baseplate.

The following should be slacked off:

- (a) The four nuts securing the plate carrying the oil seal on the swing generator shaft.
- (b) The bolts securing the chain case to the swing generator brackets.
- (c) The screw securing the earthing strip between the top baseplate and the lower machines.
- (d) The four nuts which secure the top baseplate and also hold the sets of shims in place.

Each of the jacking screws under the upper baseplate should then be turned by the same amount until chain tension is correct. This will be indicated by a permissible chain movement of 1" each side of a mean position, as tested through the inspection cover. Shims corresponding in thickness to the movement of the upper baseplate are then removed from above, and inserted below, the baseplate.

Care must be taken to centralise the oil seal about the shaft; the inner periphery of the oil seal carrier plate must be concentric with the shaft (a mirror may be helpful in checking this point).

The jacking screws should be screwed back a few turns and locked by means of the locknuts, and finally all nuts and screws should be tightened.

Chain tension should be checked at reasonable intervals as the chain case could be damaged if the chain becomes too slack.

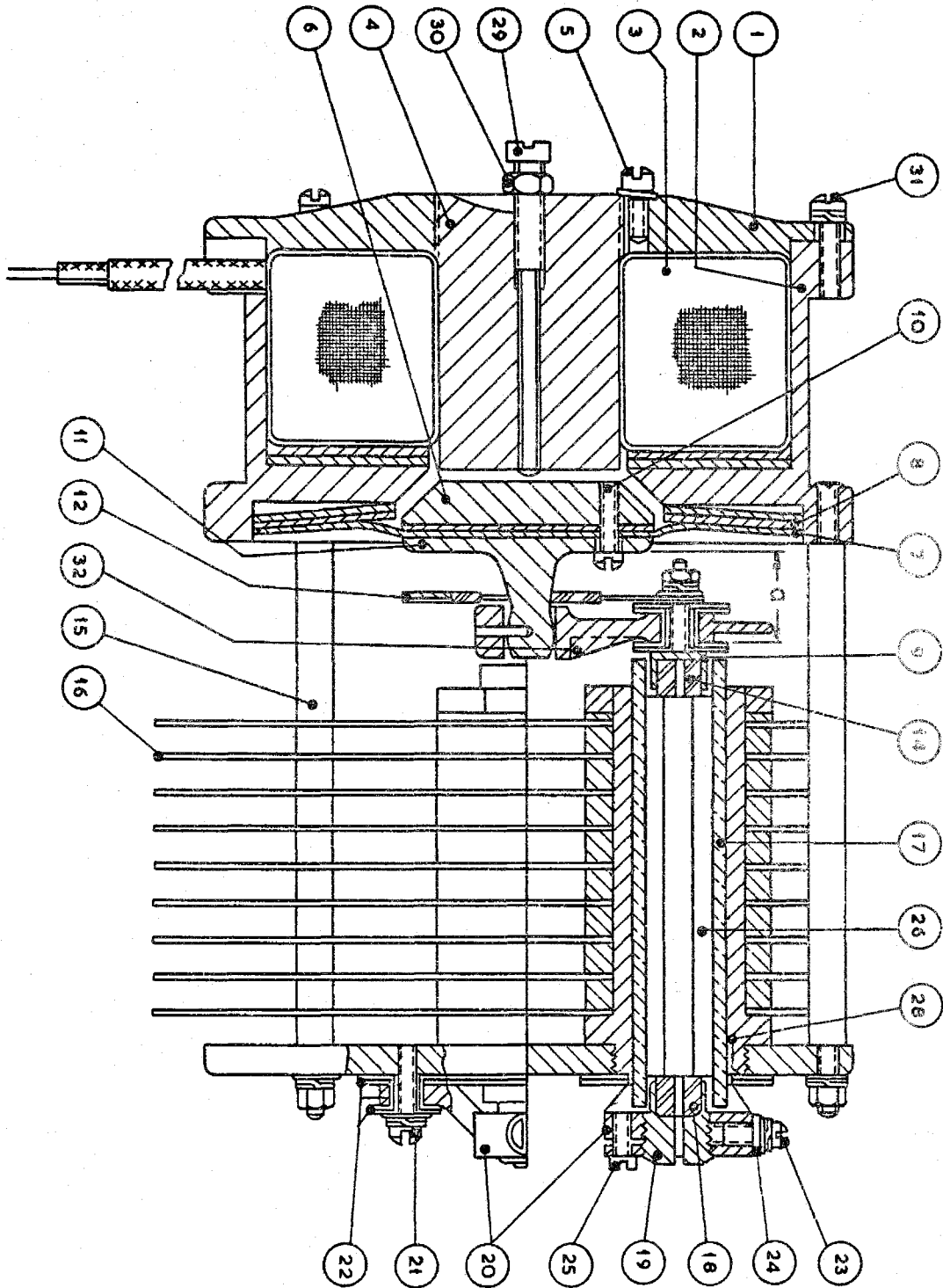


FIG. 5. ALTERNATOR AND EXCITER VOLTAGE REGULATOR

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