Government of India
Ministry of Railways
Research, Designs & Standards Organisation
Manak Nagar, Lucknow - 226 011

No. EL/3.2.10/5/J-6
Dated:15.10.1986

SUB: MAINTENANCE INSTRUCTION NO. RDSO/ELRS/SMI/131

SPECIAL MAINTENANCE INSTRUCTIONS FOR ENSURING PICK-UP AND DROP OUT FOR QCVAR RELAY TYPE VAG11/VAA11. OF ENGLISH ELECTRIC MAKE.

1. OBJECT

On closing DJ, occassionally the relay QCVAR was found to pick up, dropout and repickup in quick succession readmitting current into Arno through C118 and R118 for a short period. This maloperation might be continued to few locos only and sheds have not reported since this behaviour is of transient nature and does not effect loco performence.

1.1 The object of this SMI is to overcome the above maloperation.

2. Bhushwal shed experienced this problem some time back and the same was overcome after introduction of 50 m. f. 100V electrolytic condensor across the VAG coil. This introduces OFF delay for a short period of about 1 second.

2.2 This phenomenon was also noticed at Ghaziabad shed 3/4 years back. they were advised to control the pickup and dropout values of the relay. Once this controlled they have not experienced any further maloperation.

3. OBSERVATIONS

3.1 At Bhusawal shed one unmodified relay was set for 160 V pickupand 75 V dropout. The same relay was tried in 4 locos and was found to pick up without any maloperation.

3.2 At Ghaziabad shed further tests were carried out. In test room one relay was checked. It was found to have 157 V pickup ana 80 V dropout. The same relay was found to pick-up at 182V and dropout at 100V approximately when installed in the locomotive.

3.3 Initially it was thought that the relay instantaneously pick-up due to applied voltage from UV and dropsout due to inadequate potential availabe across the W winding before the Arno could establish as generator. However, test have revealed that relay is not picking up instantaneously since the applied voltage is around 75V. After delay of about 2 seconds the generated voltage starts increasing and approaches the pickup value and after the relay picks up the generated voltage further increases and stablises. Many locos were monitored and no chattering was observed. It is also observed that the voltage between W and N goes beyond 320 V.

4.0 DETAILS OF SPECIAL INSTRUCTIONS

4.1 In the VAG portion of the QCVAR relay the armature movement is designed as below:

a) In the de energised position the moving armature gets seperated from pole face with maximum gap. since this gap is fixed and is not adjustable, the same can not be manipulated for attering the pickup value. However, this value can be

slightly altered by varying the tension of the contact carrier strips to a limited extent.

b) In the energised position, definite air gap in ensured between the pale face and the moving armature with the help of a screw with a locknut, the dropout value can be controlled by adjusting this air gap.

4.2 Set the relay to pick up between 155 V to 160 V. If required adjust the contact pressure at 15 to 20 gms. Ensure identical gaps of about 1.5 mm in both the contacts.

4.3 Set the relay to have a dropout at 75V to 77V. If necessary, loosen the locknut and adjust the gap. The dropout voltage can be increased by increasing the air gap and vice-varsa.After few opeations of pick up and dropout, the locknut should be secured with a drop of adhesive paint. It may be noted that alteration of droput value does not altor the pick up value.

4.4 The pick- up and dropout values should be monitored with the help of an accurate voltmeter. It is observed that higher range voltmeters are generally used for this purpose in loco sheds. Test room panels shall be fitted with volt meters generally conforming to the following description.

voltmeter, square front, flush panel mounting type ---circular scale (4"or 6" as desired) with uniform divisions, triple range 0-150/300/600V ac. With a suitable selector switch. The meter shall be of class 1.0 accuracy conforming to IS: 1248.
This can be procured from M/s Automatic Electric, Thane Bombay, or from M/s.

MECO Instruments P Ltd. ,311 Bharat Indl. Estate- T.J. road, Sewree, Bombay-400 015.

4.5 Inspite of this adjustment, if chattering of relay is experienced, the respective loco numbers may please be communicated for further investigation. In such an event input voltage, all the four diodes, 27 K ohm resistor and relay coil shall be checked for normal values and proper function.

5. **REFERENCE:** Nil.

6. **APPLICATION:** ALL English electric make relays type. VAG11/VAA11for QCVAR application.

7. **AGENCY FOR IMPLEMENTATION:** POH shops and maintenance shops for the existing locos. M/s English and CLW should ensure for all the current and future supplies.

8. **DISTRIBUTION**: As per the list attached.

J.V.S.Sastri

DA: NIL

(TVS SASTRI)
for Director General/Electrical.