GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
RESEARCH DESIGNS AND STANDARDS ORGANISATION
MANAK NAGAR LUCKNOW - 226 011

No.EL/3.2.19 Dated: 30.01.1997

SPECIAL MAINTENENCE INSTRUCTION NO. RDSO/ELRS/SMI/184

ASCERTAINING THE PROPER FUNCTIONING OF 'NRV'

1. BRIEF HISTORY:

Frequent burning of main compressor motor is a perennial problem in Electric Locomotives. During investigations of burnt motors, it has been found that NRVs fitted in the main compressor circuit plays a major role as the starting current of the main compressor motor is directly proportional to the pressure in the pipe line between compressor and NRV. Studies conducted at Elect. Loco Shed, Gomoh have shown that different make of ARKs perform with different efficiencies and a result excessive strain comes on main compressor motor during starting of NRV fitted is not performing properly. During co-ordination meeting held at RDSO/Lucknow between RDSO, CLW, Railways & M/s kiroloskar Co. Ltd. on 23.10.96, it was decided that separate maintenance instructions on NRVs will be issued by RDSO to Railways.

2. TITLE:

As certaining the proper functioning including discnarzed rate of $1\frac{1}{4}$" NRV used in the pneumatic circuit of Electric Locomotive.

3. APPLICATION

For all Electric Locomotives provided either with IRAVB2 brake system or IRAB2 break system.

4. OBJECT:

Prevention of main compressor motor from burning due to bace pressure generated to mal-functioning or less discharge rate of 1-1/4" NRV fitted in the main compressor circuit.

5. PROCEDURE

5.1 PREPARATION OF TESTING:

i) The set up required to test the functioning of non return valve has been shown in the Annexure enclosed.

ii) The capacity reservoir 'R2' should be connected with the outlet port 'B' of test NRV only for the TEST No. I & III.

iii) The inlet port 'A' of test NRV should normally be connected to supply reservoir 'R1' with the help of necessary pipelines.

iv) Supply pressure at 10 Kg/cm sq. should be connected to charge the supply reservoir 'R1'.

v) To start with, all the cocks shown in the test set up should be closed.

5.2 TEST No. I:

Leakage Test:

i) Open cock 1 and then cock 2.

ii) Both pressure gauges should now be in balance and should read 10.0 kg/cm sq.

iii) Test all over the body and the valve cap of NRV with soap and water. There must be no leakaze.

5.3 TEST No.II

NRV OPERATION & DISCHARGE RATE:

i) Open cock No.1 and charge the supply reservoir 'R1' to 10 kg/cm sq.

ii) Open cock 2 and check that a strong blow of air is passing from the outlet/ 'B' of test NRV.

iii) Close cock 2 and then cock 1 and proceed as follows to ascertain the discharged rate of test NRV:-

a) Open cock 1, charge the reservoir 'R1' to 10 kg/cm sq. and then close cock 1.

b) Open cock 2 fully and simultaneously start the stop watch.

c) Keep a watch on the pressure gauge fitted on the supply reservoir 'R1' and note the time for the pressure to drop from 10 kg/cm sq. to 0 kg/cm sq. in a step of 2 Kg/cm Sq .

d) Repeat the above steps from (a) to (c) for each NRV to be tested.

e) Discharge time of NRV for a reservoir capacity of 450 liters from 10-kg/cm sq. to 0 Kg/cm sq. should not be more than 45 seconds.

5.4 TEST No.III:

REVERSE LEAKAGE OF NRV:

i) Connect the piping from capacity reservoir 'R2' to the outlet port 'B' of test NRV.

ii) Open cock 2 slowly untill the pressure in the capacity reservoir 'R2' reaches 2.2 kg/cm sq.

iii) Close cock 2 and open cock 3.

iv) The pressure in the capacity reservoir R2 must not fall by more than .25 Kg/cm sq. in two minutes.

v) The above steps from (1) to (iv) should be repeated atleast three times.

vi) The similar tests as above from (I) to (iv) should also be carried out with pressure in capacity reservoir 'R2' at 8 kg/cm sq. and 10 kg/cm sq.. The drop in pressure in reservoir 'R2' must not exceed .25 kg/cm sq. in two minutes in either tests.

v) Close cock 1, open cock 3 and cock 4 before disconnecting the test non return vlave.

6. DRAWING/SKETCH:

It is enclosed as RDSO Drawing No. SK.EL. 4399.

7. RESULTS:

Based on the test results of the study carried out by Electric Loco Shed, Gomoh, it is recommended that only M/s. Escorts Ltd. or M/s. Recon make of teflon seated NRVs should be used by the Sheds/Shops.

8. AGENCY FOR IMPLEMENTATION:

All Electric Loco Sheds & Work shop of Indian Railways.

9. PERIDIOCITY OF IMPLEMENTATION:

During AOH/IOH and POH.

10. REFERENCE:

i) CLW Test Specification No. M/EL/57/T.S.O

ii) Study conducted by Electric Loco Shed, Gomoh on the rate of discharge of various makes of NRVs.

11. DISTRIBUTION:

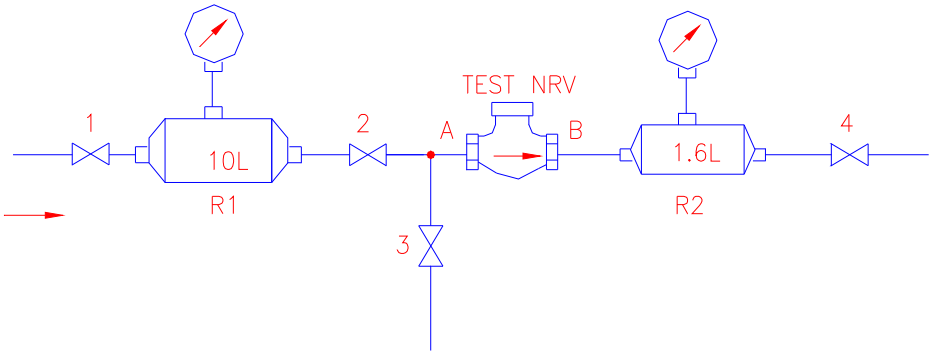
As per enclosed list.

(O. H. Pandey)

Encl: As above

For Director General/Elect.

SET UP TO TEST NON-RETURN VALVE (NRV) FUNCTIONING INCLUDING DISCHARGING RATE



NOTE:-

(1) CLOSE COCK 1 AND OPEN COCK 3 & 4 BEFORE DISCONNECTING THE TEST NRV

(2) THE NRV MAY BE LAPPED ON ITS SEAT USING FINE GRINDING PASTE & FINALLY WITH THIN TALLOW (1-2 mg.)

(3) 1,2&4 ARE ISOLATING COCKS 3-IS DRAIN COCK.

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APPROVED BY:- FOR D.G.

ELECTRICAL DIRECTORATE

RDSO.	SKEL-4399