भारत सरकार–रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ– 226011
Tele/Fax : 0522-2452581
E-mail:dirpnloco@gmail.com

सत्यमेव जयते

Government of India
Ministry of Railways
Research, Designs &
Standards Organization,
LUCKNOW-226011

No. EL/3.2.19/3-Phase

Dated 11.02.2019

प्रधान मुख्य विद्युत् इंजीनियर 1. मध्य रेलवे, मुम्बई सीएसटी –400 001 2. पूर्व मध्य रेलवे, हाजीपुर–844 101 3. पूर्व तटीय रेलवे, चन्द्रषेखरपुर, भुबनेश्वर–751 023 4. पूर्व रेलवे, फेयर्ली प्लेस, कोलकाता–700 001 5. उत्तर मध्य रेलवे, ब्लाक ए–2, सुबेदारगंज इलाहाबाद – 211 033 6. उत्तर रेलवे, बड़ौदा हाऊस, नई दिल्ली–110 001 7. उत्तर पश्चिम रेलवे जयपुर– 302006 8. उत्तर पूर्व रेलवे गोरखपुर– 273001 9. उत्तर पूर्व फ्रेन्टीयर रेलवे मालीगॉव गुवाहाटी–781011 10. दक्षिण मध्य रेलवे, रेल निलायम, सिकंदराबाद–500 371 11. दक्षिण पूर्व मध्य रेलवे, बिलासपुर – 495 004 12. दक्षिण पूर्व रेलवे, गार्डेनरीच, कोलकाता–700 043 13. दक्षिण रेलवे, पार्क टाउन, चेन्नई–600 003 14. दक्षिण पश्चिम रेलवे हुबली–580020 15. पश्चिम मध्य रेलवे, जबलपुर–482 001 16. पश्चिम रेलवे, चर्चगेट, मुम्बई– 400 020 17. चित्तरंजन रेल इंजन कारखाना, चित्तरंजन– 713331 18. डीजल रेल इंजन कारखाना, वाराणसी–221004 19. डीजल आधुनिकीकरण कारखाना, पटियाला-147001	**Principal Chief Electrical Engineer,** 1. Central Railway, Mumbai, CST-400 001. 2. East Central Railway, Hazipur-844 101. 3. East Coast Railway, Chandrashekharpur, Bhubaneshwar-751 016. 4. Eastern Railway, Fairlie Place, Calcutta-700 001. 5. North Central Railway, Block-A, Subedarganj, Allahabad- 211 033. 6. Northern Railway, Baroda House, New Delhi-110 001. 7. North Western Railway, Jaipur- 302 006 8. North Eastern Railway, Gorakhpur-273001 9. North East Frontier Railway, Maligaon, Guwahati- 781011 10. South Central Railway, Secunderabad-500 071. 11. South East Central Railway, Bilaspur-495 004. 12. South Eastern Railway, Garden Reach, Kolkata-700 043. 13. Southern Railway, Park Town, Chennai-600 003. 14. South Western Railway, Hubli- 580020 15. West Central Railway, Jabalpur-482 001. 16. Western Railway, Churchgate, Mumbai-400 020 17. Chittaranjan Locomotive Works, Chittaranjan-713 331 18. Diesel Locomotive Works, Varanasi-221 004. 19. Diesel Modernization Works, Patiala-147001

SPECIAL MAINTENANCE INSTRUCTION NO. RDSO/2019/EL/SMI/0327, Rev '0', Dated 11.02.2019

1. **Title:** Procedure for testing & setting of Pressure Switches in E-70 & CCB brake System.

2. **Brief History:** A meeting was held at RDSO on 24.08.2018 to discuss reliability related issues of brake system, MOM was issued vide letter of even no dated 10.09.2018. The failure cases of pressure switches such as pressure setting disturbed and contact stuck up were discussed. Zonal Railways felt difficulties to set pressure values of pressure switches for various applications. The problem is identified for issuing of Special maintenance Instructions in consultation with OEMs and Zonal Railways.

3. **Scope of application:** WAG-9, WAP-7 & WAP-5 class of 3-Phase electric Locomotives.

4. **Agency of application**: All Electric loco sheds and workshops.

5. **Periodicity of implementation**: Follow SMI-298.

6. **Instructions to follow:**

6.1 **Test set-up:**

a. Record the part no./serial number of the pressure switch in the test report.
b. Make pneumatic connections of pressure switch as shown in schematic diagram & keep all cocks in closed position.
c. Set the pressure gauge G1 to upper limit of test pressure (Refer table in clause-7) using regulator R1.
d. For setting details, refer clause 7.
e. Ensure clean dry air supply to the inlet port of test rig is 10 Kg/cm^2.

6.2 **Leak test:**

a. Open cock C1, reading of Gauge G2 should be same as G1.
b. Check tightness at inlet port joints. No leakage is permitted and pressure should not drop in gauges.
c. Close cock C1 and open cock C2, Gauge G2 shall fall to zero pressure. Then close cock C2.

6.3 **Pressure switch connection with LED:**

6.3.1 For pressure switch without DIN plug connector:

a. Remove the cover by opening the 4 nos screws.
b. Connect the terminals of pressure switch to a LED for indication as shown in Test schematic.

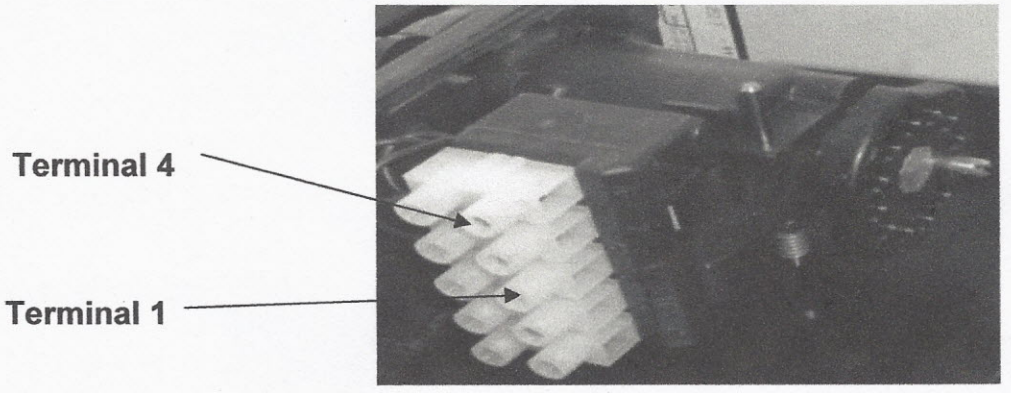


Fig.1

6.3.2 For pressure switch with DIN plug connector:

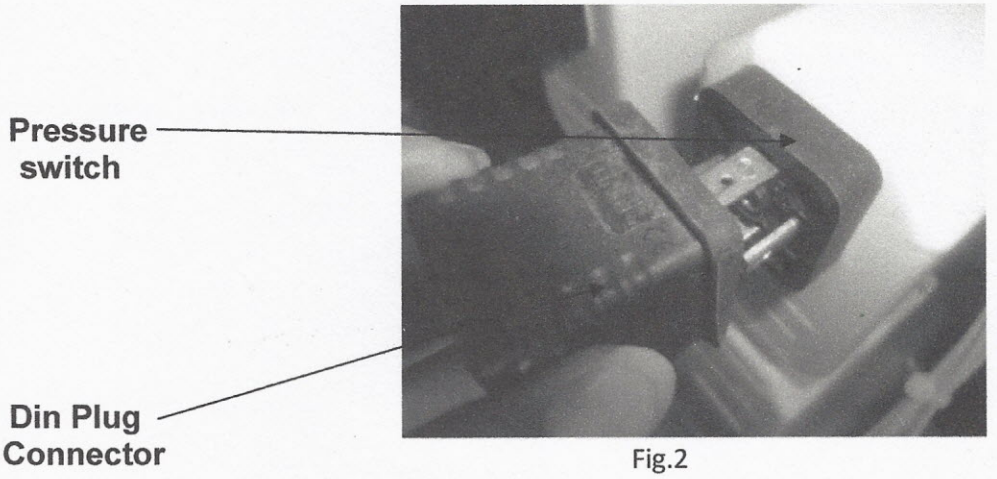


Fig.2

a. Remove the cover by opening the 4 nos. screws

b. Connect the DIN plug to the pressure switch to connect the LED for indication purpose as shown in fig.6

6.4 **Setting Rising (Pmax) pressure:**

a. Open cock C1 slowly and note the pressure in gauge G2 when the LED glows (pressure switch make contact). This is Pmax or rising pressure. If Pmax is not achieved follow the setting procedure as below:

b. Remove the lock screw as shown below:

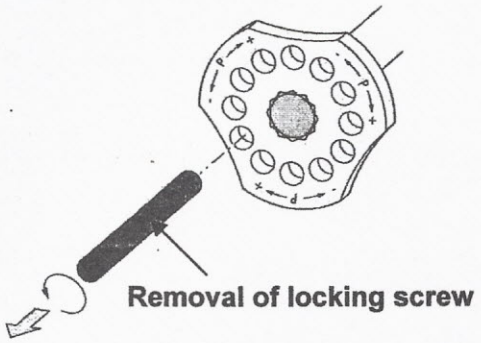


Fig.3

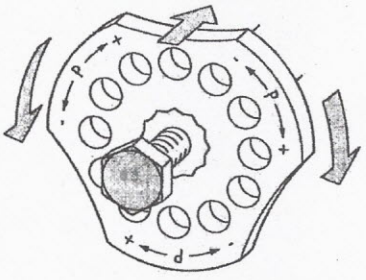
c. Adjust the plastic adjusting wheel knob along with the middle hexagonal metal screw to get the required pressure setting. Rotate clockwise to increase the pressure and anti-clockwise to decrease.

(Note: when Pmax is adjusted Pmin also will get varied accordingly)

6.5 **Setting Falling (Pmin) pressure:**

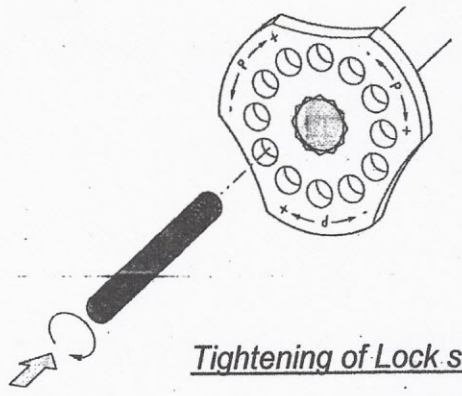
a. Close cock C1and open cock C2 slowly to drain the pressure and note the value of gauge G2 when LED turn off. This is Pmin.
b. Check if the falling pressure setting (Pmin) is achieved.
c. If not press the plastic adjusting wheel knob and rotate. Rotate (wheel knob only) clockwise to increase the pressure and anti clockwise to decrease as shown in fig.4.

(Note: when Pmin is adjusted, Pmax does not get varied)



Pmin (Falling pressure) adjustment

Fig. 4



Tightening of Lock screw

Fig. 5

d. After Pmax & Pmin are set, tighten the locking screw as shown in Fig.5
e. After setting the both falling and rising pressures individually, check once again the pressure and ensure no change in settings.

f. Close cock C1 and drain the pressure in G2 to zero by opening C2 fully.
g. Disconnect the electrical connection and provide the cover.
h. Remove the pressure switch from test Rig and seal to prevent ingress of contaminants.

Note: 1. For accurate calibration of brake cylinder pressure switch and direct brake pressure switch (item 7 & 8 of table in clause 7), 8 inches pressure gauges with range of 0-1 kg/cm² and least count of 0.005 kg/cm² are to be used.

2. For calibration of other pressure gauges, 6 inches or above pressure gauges with range 0-10 kg/cm2 and least count of 0.05 kg/cm2 are to be used.

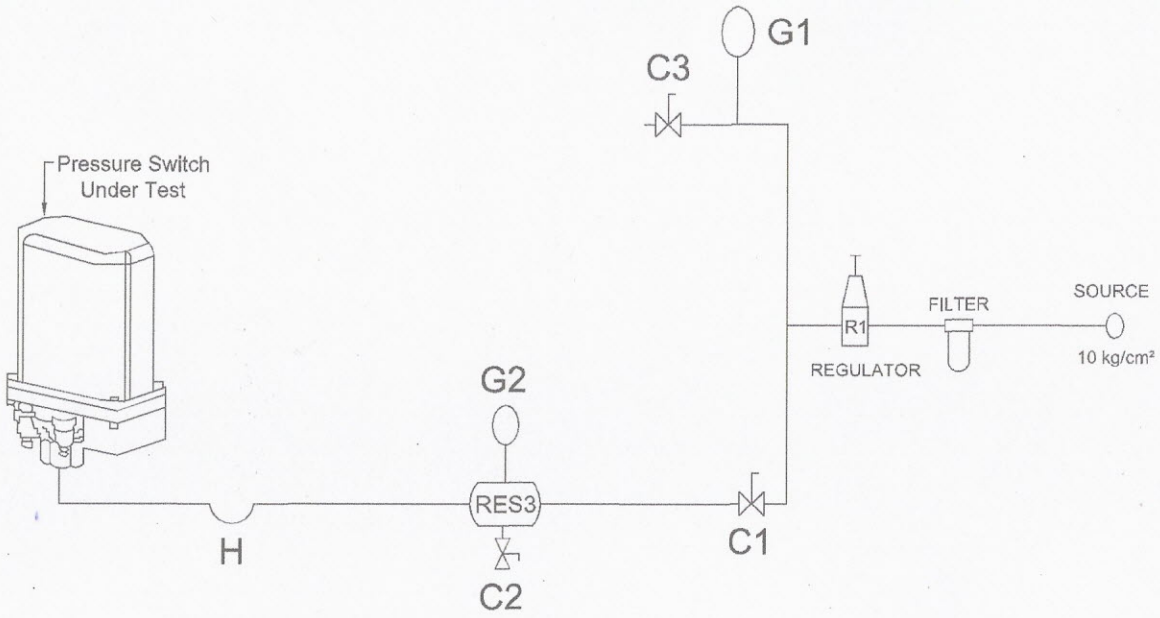
7. Pressure setting details:

SN	Description	Qty	Mode	Switch State	Pressure setting in kg/cm²	Tolerance	Remarks
1	Pressure switch Pantograph	2	RISING FALLING	CLOSE OPEN	5.50 4.50	±0.20	-
2	Auxiliary Compressor Pressure Switch	1	RISING FALLING	CLOSE OPEN	8.00 7.00	±0.15	-
3	Parking Brake Pressure switch	1	RISING FALLING	CLOSE OPEN	5.00 4.00	±0.10	-
4	Feed Pipe Pressure switch	1	RISING FALLING	CLOSE OPEN	5.60 5.00	±0.10	-
5	Main Compressor Pressure switch	1	RISING FALLING	CLOSE OPEN	10.00 8.00	±0.20	-
6	Low Main Reservoir Pressure switch	1	RISING FALLING	CLOSE OPEN	6.40 5.60	±0.15	-
7	Brake Cylinder Bogie Pressure Switch	2	RISING FALLING	CLOSE OPEN	0.65 0.30	±0.05	-
8	Direct Brake Pressure Switch	1	RISING FALLING	CLOSE OPEN	0.65 0.30	±0.05	-
9	Vigilance Pressure switch	1	RISING FALLING	CLOSE OPEN	2.0 1.5	±0.10	-
10	Venturi Valve Pressure Switch	1	RISING FALLING	CLOSE OPEN	5.00 4.00	±0.15	Pressure switch not available in CCB. Function covered through CCB software
11	Brake Pipe Pressure Switch	1	RISING FALLING	CLOSE OPEN	4.20 3.00	±0.15	Pressure switch not available in CCB. Function covered through CCB software

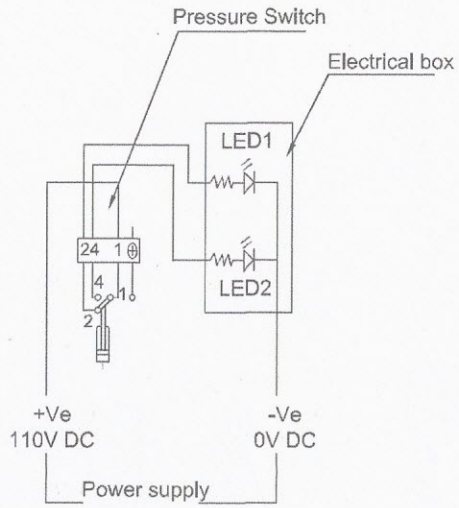
11/02/2019
(Aseem Kumar)
for Director General (Elect.)

Enclosures: Nil
COPY TO: AS PER STANDARD MAILING LIST NO. EL-M-4.2.3-19 (LATEST REVISION).

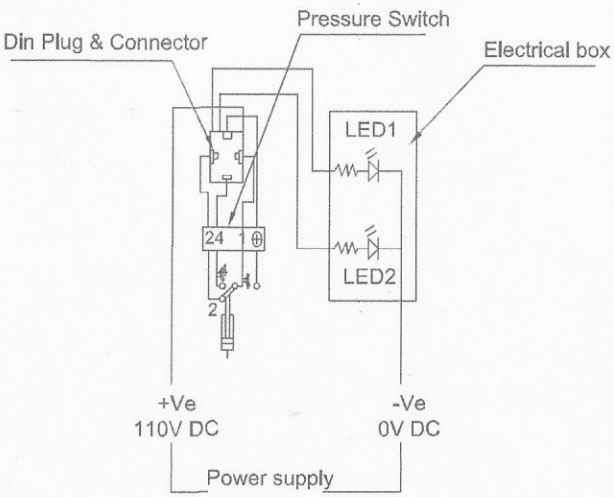
11/02/2019
(Aseem Kumar)
for Director General (Elect.)



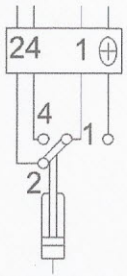
- G1 ,G2 - Pressure Gauges
- C1 ,C2,C3 - Cock
- R1 --- Regulator
- H --- 25 NB flexible hose
- RES3 --- 3 Litre Reservoir



ELECTRICAL SCHEMATIC
FOR PRESSURE SWITCH W /0 DIN PLUG
OPERATION



ELECTRICAL SCHEMATIC FOR
PRESSURE SWITCH W / DIN PLUG
OPERATION



Note:

1,2and 4 contacts are used in electrical wiring using push type terminals

1 & 4 NO
1 & 2 NC

TEST SCHEMATIC FOR PRESSURE SWITCH

11/2/2019