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सत्यमेव
जयते

भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011

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

No. EL/3..2.19 (G)

Dated 12.04.2008

Chief Electrical Engineer,

- Central Railway, Mumbai CST- 400 001.
- Eastern Railway, Fairlie Place, Kolkata- 700 001
- East Cost Railway, Chandrasekharpur, Bhubaneswar- 751 016.
- Northern Railway, Baroda House, New Delhi-110 001
- North Central Railway, Hasting Road, Allahabad-211 001.
- Southern Railway, Park Town, Chennai-600 003
- South Central Railway, Rail Nilayam, Secunderabad -500 071
- South Eastern Railway, Garden Reach, Kolkata -700 043
- South Western Railway, Hubli.
- Western Railway, Churchgate, Mumbai-400 020
- West Central Railway, Jabalpur-482001
- South East Central Railway, Bilaspur-495004
- East Central Railway, Hazipur-844101 (Bihar)
- Chittaranjan Locomotive Works, Chittaranjan- 713 331

MODIFICATION SHEET No. RDSO/2008/EL/MS/0359, Rev.'0'

Dated 07.04.2008

1. TITLE :

Replacement of existing Nylon filter with sintered bronze filter in 1/2" & 3/8" air Strainer in the pneumatic circuit of Electric Locomotives.

2. OBJECT :

To eliminate the failure of the pressure switches & pneumatic valves due to ingress of dust, metallic scales etc. in the pneumatic circuit of Electric Locomotives.

3. EXISTING ARRANGEMENT :

In the existing arrangement of pneumatic pipe line 'T' type 1/2" and 3/8" Air Strainers are provided in the pneumatic circuit line of A9/SA9, SMGR, RGCP, RGE, SMGR, VCB, Panto circuits, Electro pneumatic control panels (Ba- panels), pneumatic horn, wiper and unloader valve.

These 'T' type air strainers are having Nylon/horsehair filters elements, which are not very effective. It is not possible to completely filter out finer dust/scales with the existing filtering elements. The pneumatic valves and pressure switches, therefore function erratically and result in loco failures.

4. MODIFIED ARRANGEMENT :

To improve the reliability of pneumatic circuit, the existing horsehair/nylon filter element in the existing 'T' type air strainer are proposed to be replaced with more effective sintered bronze filter element. Following actions are to be taken :-

- i) Take out the strainer portion from the 'T' air strainer body.
- ii) Take out the existing filtering fiber elements from the strainer.
- iii) Modify the strainer as follows :-
 - a) Cut off 40 mm cylindrical portion above threads, machine the seating portion for proper seating of the sintered filter element as per Drg BG-CG-K5031, Alt. '1'
 - b) Drill and tap at the centre of bottom having size M6 for fixing screw (M 6 x 80) for filter.
 - c) Insert the sintered bronze filter element in the strainer housing.
 - d) Tighten with rubber sealing gasket, plane washer and M-6 screw.
 - e) Fit the unit in the 'T' air strainer.

Chemical composition of Bronze Powder :

Constituents	Present
a) Copper	Remainder
b) Tin	9.5 - 11.5
c) Iron (Max.)	1.0
Phosphorous Max.	0.5
Acid in soluble, Max.	0.2
Total other element	0.5
Hydrogen loss, Max.	0.5

Testing Parameters

- | | | | |
|----|---|---|-------------------------|
| a) | Operating Pressure | - | 10 kg/cm ² |
| b) | Pressure Drop in clean condition (Initial) Max. | - | 0.1 kg/ cm ² |
| c) | Filtration Capacity | - | 50 Micron |
| d) | Temperature suitable upto | - | 200°C |
| e) | Porosity by volume | - | 35.50 % |
| f) | Density | - | 4.5 - 6.5 gm/cc |

Procedure for Cleaning the Filter Element :

'IA' Schedule

- i) Run pressurized water 3 - 4 kg/cm² through inside of element.
- ii) Let compressed air 3 - 4 kg/cm² through inside of element.
- iii) Dry

2nd 'IC' Schedule

- i) Acid dip for 30 second in water solution of HNO₃ 10% and H₂ SO₄ 35%
- ii) Run pressurized water 3-4 kg/cm² through inside of element.
- iii) Run compressed air 3-4 kg/cm² through inside of element
- iv) Dip for surface treatment in water solution of K₂ Cr₂ O₇ (Potassium Dichromate) 10% & H₂ SO₄ 5% for 10 to 15 second
- v) Flash out acid ion with pressurized water (3 - 4) kg/cm²
- vi) Run compressed air 3-4 kg/cm² through and drain water.
- vii) Dry

5. APPLICATION TO CLASS OF LOCOMOTIVE :

All conventional Electric Locomotives having ½' and 3/8' 'T' type Strainer (WSF Type)

6. MATERIAL REQUIRED :

- i) Sintered Bronze Filter element as per RDSO's Drg. No. BG-CG - K 5031, Alt. '1'
- ii) M - 6 x 80 full threaded screw / S. Steel or Brass.
- iii) Rubber gasket 1.5 mm thick 12.5 OD and 6.5 ID.
- iv) Plane washer brass 1.5 thick 12.5 as and 6.5 ID

7. **MATERIAL RENDERED SURPLUS :**

- i) Cut cylindrical portion of 40 mm length of strainer holder.
- ii) Existing filter elements.

8. **REFERENCE :**

As discussed during CELE Conference held at CLW/CRJ during Oct. 2007

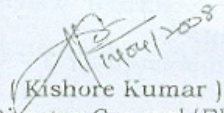
9. **MODIFICATION DRAWING :**

RDSO's Drg. No. BG-CG-K5031, Alt. '1'

10. **AGENCY FOR IMPLEMENTATION :**

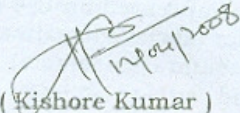
All Electric Loco Sheds & POH Shops & CLW/Chittaranjan

Encl: As above

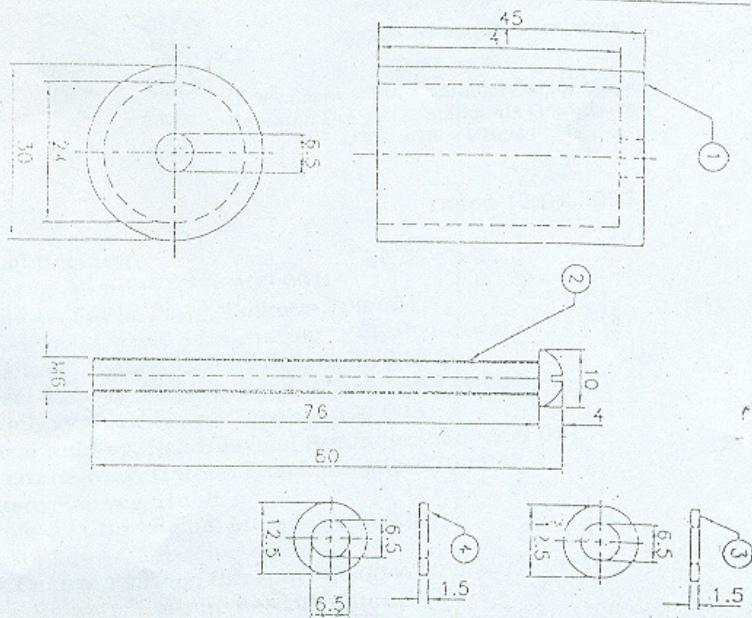

(Kishore Kumar)
for Director General/Elect.

Copy to : As per Standard Mailing List No. EL/M/0019, Ver. '2'

Encl: As above


(Kishore Kumar)
for Director General/Elect.

O/c



NOTE=

- 1) OPERATING PRESSURE : 10 kg/cm²
- 2) PRESSURE DROP IN CLEAN : 0.1 kg/cm²
- 3) CONDITIONS (INITIAL) MAX.
- 4) FILTRATION CAPACITY : 50 MICRON
- 5) TEMPERATURE SUITABLE UP TO : 200 C
- 6) MATERIAL : SINTERED BRONZE
- 7) THE DETAILED CLEANING PROCESS IS MENTIONED IN ROSO Drg. No. CG-K50312 Att. 1.
- 8) POROSITY BY VOLUME : 35-50%
- 9) DENSITY : 4.5-6.5 gm/cc

Chemical Composition of Bronze Powder

Constituents	Percent
Copper	Remainder
Tin	9.5-11.5
Iron, Max	1.0
Phosphorous, Max	0.5
Acid Insoluble, Max	0.2
Total other elements, Max	0.5
Hydrogen loss, Max	0.5

4. SEALING CASSET	1	RUBBER
3. PLAIN WASHER	1	BRASS
2. STUD	1	STEEEL
1. FILTER ELEMENT	1	SINTERED BRONZE

PREPARED BY :

EMU/MENU STOCK

AND 3/8" TYPE STRAINERS (WSF TYPE)

1	ITEM NO.	DESCRIPTION	QTY
1	CG-K50312	CG-K50312	1

CG	[C]	CG-K50312
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