

Fax : (0522)-2452581
Telephone: (0522)-2465715
Telegram : 'RAILMANAK', Lucknow
Email : dsetplgroup@gmail.com



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/3.1.35/2/Elect

Dated: 14.01.2015.

Chief Electrical Engineers,

- Central Railway, 2nd floor, Parcel Office Bldg., Mumbai CST-400 001
- East Central Railway, Hazipur – 844 101 (Bihar)
- Eastern Railway, Fairlie Place, Kolkata -700 001
- North Central Railway, Allahabad – 211 001
- Northern Railway, Baroda House, New Delhi-110 001.
- South Central Railway, Rail Nilyam, Secunderabad – 500 071.
- South East Central Railway, Bilaspur-495 004.
- South Eastern Railway, Garden Reach, Kolkata-700 043
- Southern Railway, Park Town, Chennai-600 003
- West Central Railway, Jabalpur 482 001.
- Western Railway, Churchgate, Mumbai –400 020

MODIFICATION SHEET NO. RDSO/2015/EL/MS/0437, Rev.'0' Dated 06.01.2015

1.0 **Title:**

Modification sheet to avoid failure of temperature sensors due to increase in resistance value of temperature sensor cable shielding.

2.0 **Object:**

Presently, in three phase locomotives temperature sensor cable has been provided between TM temperature sensors and D slot card in SR control electronics rack in two parts. In 1st part, cable is provided between SR control electronics and Junction box and in 2nd part, cable is provided between junction box to TM temperature sensor. Proper earthing of shielding is provided on the sub-D side with body in 1st part however shielding on male connector side towards junction box has been provided by simply trapping the shielding wire between ferrule and end bell. In 2nd part, shielding on female connector ends i.e. towards junction box side is provided by simply trapping the shielding wire between ferrule and end bell however on cable fitting TM sensor side, it is provided by clamping module for shielding. It is observed that after a year or two, resistance value of temperature sensor shielding on connector side increases due to looseness of gripping between connector ferrule and end bell causing Loco failure due to Error P.S. Hardware. It has also been noticed that the shielding on cable fitting PG-16 side has not been done properly during manufacturing at CLW. It has been noted that sometimes pin-E of female and male connector at junction box side left blank and physically no pin on 'E' position has been provided which lead to non earthing of shielding throughout the length of cable. This issue was discussed in 36th MSG meeting held at Nasik as item 2 (New Items). As per decision of MSG recommendation shielding wire should be connected to pin E of the female and male connector in Junction box side and on the traction motor side it should be connected to the gland. CLW to amend specification suitably so that in new supply proper shielding and earthing is provided from supplier's end. In existing arrangement, suitable instructions are required to be issued by RDSO. This modification sheet is being issued in compliance of above.

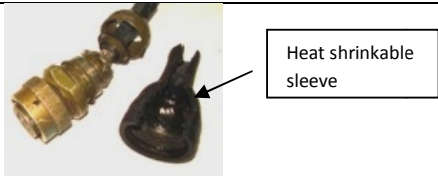
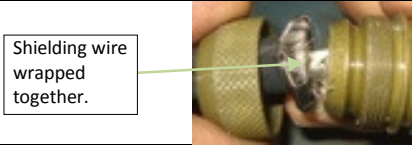
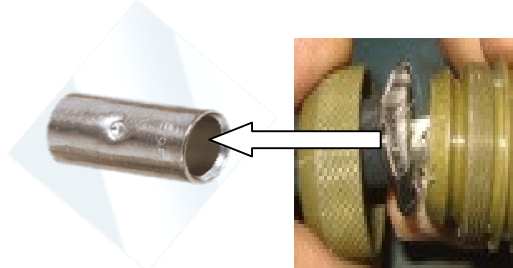

3.0 **Existing Arrangement with cross-references of respective design document:**
 In the existing arrangement, there are two deficiencies due to which proper earthing of shielding are not taking place. The details are as follows:

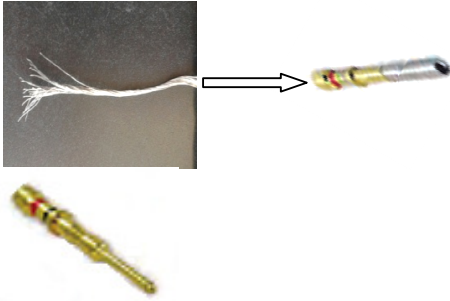




3.1 Proper earthing of shield wire has not been done at Junction box in both male and female connectors. In some cases earthing has been done however in some connectors (Both male and female), pin E has not been provided in male or female connector or both so that earthing of shield is not ensured throughout the length of cable from Sub-D up to temperature sensor. In some connectors, pin E is provided but not connected to shielding wire.

3.2 Proper earthing of shield wire has not been done at temperature sensor side.

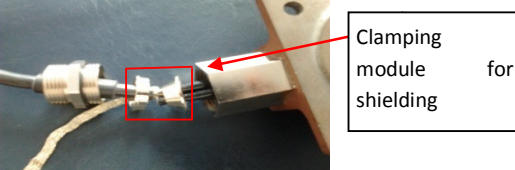
4.0 **Modified Arrangement to replace existing arrangement as given above in 3.0:** In the modified arrangement, the deficiencies given above needs to be addressed.

Case-1: Proper earthing of shield wire has not been done at Junction box in both male and female connectors however Pin E is provided. Ensure that pin E is earthed to body of connector by checking continuity between pin E and connector (male/female) body. If there is no continuity exists that means pin E is not connected to shield wire and earth. In some connectors (Both male and female), pin E has not been provided in male or female connector or both. In both cases following modification needs to be done:

S.No.	Instruction	Picture
1	Cut the existing heat shrinkable sleeve of male/female connector at Junction box side.	
2	Open the end bell of male/female and shielding Wire wrapped together.	
3	Insert wrapped shielding wire into one end of 1 sq. mm 2cm long copper tube butt connector and crimp the wrapped wire.	
4	Take wrapped shielding wire of 1 sq.mm and adequate length separately whose one end reach up to female/male pin of connector and put other end into copper tube butt connector inside approximately 1cm and crimp the wrapped wire at copper tube butt connector.	

5	Crimp other end of separately taken wrapped shielding wire as per 4 above on male or female pin or both as the case may be.	
6	Insert the 1.2 mm dia. heat shrinkable sleeve approximate 28mm length for covering the wrapped shielding wire and Shrink the sleeve with the help of heat gun.	
7	Insert the pin in to E' position of the male/female connector.	
7	Close the end bell.	
8	Cover the female/male connector with heat shrinkable sleeve "preform shrink part GR18"	
9	Shrink the sleeve with the help of heat gun.	

Case2: Proper earthing of shield wire has not been done at temperature sensor side. In order to address this deficiency, take following action: Open the temperature sensor side cable end. Check whether proper shield wire is connected to body as shown in below figure. If not, ensure following:

1	Insure that the shielding wire swathe 2-3 times, in side cable fitting PG-16 earth.	
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5.0 Application to class of locomotives:

WAP5, WAP7, WAG-9 and WAG-9H locomotives.

6.0 Material Required:

- (i) 6 female & male pin of 2.0 sq mm each.
- (ii) 250 cm, 1.2 sq mm dia heat shrinkable sleeve.
- (iii) 250 cm, 38.1 sq mm dia heat shrinkable sleeve per locomotive.

7.0 Material Rendered Surplus:

NIL.

8.0 Reference:

Railway Board letter No. 2013/Elect(TRS)/138/6 dated 17-01-14

9.0 Modification Drawing:

Some pictures are enclosed at Annexure-I.

10.0 Agency of Implementation:

CLW, POH workshops and Loco Sheds holding WAP5, WAP7, WAG-9 and WAG-9H 3-phase locomotives.

(A. K. Goswami)

for Director General/Elect.

Encl: As above,

Copy to:-

Secretary (Electric Traction), Railway Board, Rail Bhavan, New Delhi-110 001.	For kind information please.
1. Chief Electrical Engineer, Chittaranjan Locomotive Works, Chittaranjan-713 331. 2. Chief Works Manager, Electric Loco Workshop, Central Railway, Bhusawal-425 201. 3. Chief Works Manager, Electric Loco Workshop, Eastern Railway, Kancharapara, 24 Pargana (N) – 743145 (W.B.) 4. Chief Works Manager, Loco, Carriage & Wagon Works, Western Railway, Dahod, P.O. Freeland Gank – 389160 (Gujrat) 5. Sr. DEE (TRS), Electric Loco Sheds, <ul style="list-style-type: none">▪ Central Railway, Ajni (Nagpur)-440008.▪ Central Railway, Kalyan-421304 (Maharashtra)▪ East Central Railway, Gomoh-828 401▪ Eastern Railway, Howrah-711 106▪ Northern Railway, Ghaziabad (UP)-201 001.▪ North Central Railway, Fazalganj, Kanpur – 208 003▪ South East Central Railway, BMY Complex, Bhilai, Durg-490 025.▪ South Central Railway, Lallaguda, Secunderabad – 500 017.▪ South Eastern Railway, Tatanagar-831 002.▪ Southern Railway, Royapuram, Chennai-600 013.▪ West Central Railway, Tughlakabad, New Delhi-110 044.▪ Western Railway, Vadodara-390 002.	For information and necessary action please.

(A. K. Goswami)

for Director General/Elect

Encl: As above,