

**SPECIFICATION FOR WHEEL SET EARTHING EQUIPMENT****1.0 SCOPE:**

This specification covers the requirements of design manufacture and supply of complete wheel set earthing equipment for the wheel set to prevent return current flow through the axle bearings and likely damage. Thus the earthing contact system acts as a current bridge that creates a connection by means of wiper contact (brush) from the stationary bogie frame to the rotating wheel set. This equipment is required for earthing of bogie of LHB type coaches with wheel diameter up to 920mm and operational speed up to 160 Km/Hr.

**2.0 SCOPE OF SUPPLY:**

A	Wheel Set Earthing Equipment complete with stainless steel braided earthing cable.	Drawing No. LW71231 alt. 'a'	1 set
B	Earthing resistor assembly 0.1Ω Mounting bracket Grounding cable	Drg. No. LW71246 Drg. No. LW71247 Drg. No. LW71248	3 set
C	Stainless Steel braided earthing cable of 95 mm <sup>2</sup> X 750mm in length with crimping sockets at both ends.	Drg. No. LW71249	1 nos. to be supplied loose

The cables shall be electron beam copper cables conforming to RCF specification no. EDTS132 (latest revision).

**3.0 SERVICE CONDITIONS:**



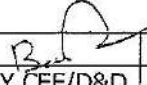
The equipment shall be sturdy and suitable for the following service conditions normally to be met in service:

**3.1 Environmental Conditions :**

- Ambient : 5°C to 55°C
- Humidity : upto 95% during rainy season
- Altitude : Max:1000 m above sea level

**3.2 Working Conditions:**

- Train Speed : 160Kmph max.
- Vibration & Shocks :

EDTS101	C	10.12.09				1 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE

## - Vibrations :

- a) Maximum vertical acceleration : 1.0 g
- b) Maximum lateral acceleration : 0.5 g
- c) Maximum longitudinal acceleration : 3.0 g
- d) Frequency and amplitude :

Sinusoidal form of vibrations, the frequency 'f' lies between 1 Hz and 100 Hz and their amplitude 'a', expressed in mm, is given as a function 'f' by the equations:

$a = 25/f$  for values of f between 1 Hz and 10 Hz

$a = 250/f^2$  for values of 'f' between 10Hz and 100Hz

- Shocks : 3g in all direction as per IEC-571.

**4.0 GOVERNING SPECIFICATIONS :**

4.1 Reference shall be made to the following standard specifications:-

1	UIC- 552 VE	Electrical power supply for train taken from train cable
2	UIC-533	Protection by Earthing of metallic parts of vehicles
3	IEC-77	Rules for Electric Traction Equipment.
4	IS: 617	Aluminium and aluminium alloy ingots and castings for general engineering purpose
5	IS:4454	Steel wires for cold formed springs
6	IS: 13466	Brushes for electrical machines

The supplier shall furnish the details of all International standards viz. IEC/DIN/ VDE/EN to which the equipment shall conform to.

**5.0 TECHNICAL DATA :**

A) Earthing brush assembly:

Allowable current	400A
Maximum current	600A for 5 minutes
Short circuit capacity	10 KA for 10 ms
Contact resistance	5-20mΩ as per UIC 533 VDE123
Milivolt drop	<500 mV

EDTS101	C	10.12.09				2 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE

Short circuit resistance	10 KA (approx.) for 10 mS
Nominal voltage	500 V
No. of brushes	2
Effective contact surface/ contact pressure	16cm <sup>2</sup> /3.5 Kg per sq.cm

Cable cross section	95 mm <sup>2</sup>
Assembly unit	Axle shaft
Weight	8.0 Kg (Max.)
Cable end termination along with accessories	Suitable for M10 screw



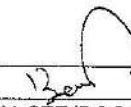
## B) Earthing Resistor:

Resistance	0.1 $\Omega$ $\pm$ 10%
Weight	1.4 Kg
Continuous current	15.0 A
Max. Current	2000 A for approx 0.1 seconds

Type, make and technical details shall be got approved from CEE/RCF before bulk production.

## 6.0 FUNCTIONAL REQUIREMENTS:

- 6.1 The system is required to provide alternative path for the return current of train supply in the electrified tracks, thus preventing flow of the return current through axle bearings by means of the earthing contact and thus preventing the damage to the bearings due to electromechanical reactions in the presence of current in the bearing elements.
- 6.2 Resistances are provided to restrict the return current from certain bogie parts and providing return current path through pre-determined low resistance path.
- 6.3 The electrical wiring diagram of the earthing contact and resistance shall be as per LHB drawing no (3) 11.078-101-00.
- 6.4 The overall general arrangement of the earthing contact shall be as per modified design as per RCF drawing no. LW71231 alt. 'a'

EDTS101	C	10.12.09				3 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE

- 6.5 The general arrangement and dimensional details of the earthing Resistors shall be as per drawing no. LW71246.
- 6.6 The system shall ensure sufficient allowance for wear of the Brushes corresponding to the performance requirements and design conditions.
- 6.7 The system shall ensure smooth running of brushes in the support System without possibility of bearing getting jammed or blocked.
- 6.8 Earthing equipment shall sustain all the shocks and vibrations over A wide range of frequencies as the system has no damping or suspension arrangement.
- 6.9 The equipment shall be designed to ensure simple inspection Possibilities with clearly measurable criterion for replacement For expendable parts and for checking of functionality. The Inspection results shall not exceed the following criterion:
- First inspection after being put up into service<sup>3</sup> after a running Distance of 3,00,000 Kms.
  - Maximum two functional inspections at a running distance of at Least 10,00,000 Kms.
- 6.10 The earthing brush system must be designed so that its function Can be guaranteed under valid applicable conditions for at least one million Km or a service life of 5.0 years without maintenance.

#### 7.0 CONSTRUCTIONAL REQUIREMENTS:

- 7.1 The earthing contact system shall be of axial construction. It shall have Simple and fast assembly and dismantling earthing parts with installation conditions according to externally supported wheel sets. The compensation of any possible bogie clearance in the axial direction must be ensured by an adjusting mechanism.
- 7.2 Load bearing parts shall be suitable for a working life of 15 years.
- 7.3 The material pairing of the wearing parts is to be aligned to the performance requirements. Attention must be paid to an adequate protection taking into consideration the operational conditions.

EDTS101	C	10.12.09	XZ	1	B. S. S.	4 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE

- 7.4 The equipment shall be designed to withstand ferric oxide dust (abrasion of the wheels/track) oil and grease, urine, faeces, kitchen waste (from restaurant cars), stoning from flying ballast on track.
- 7.5 The cleaning/ washing of the equipment shall be with high pressure water (upto 40 bar i.e 40.77 Kg/cm<sup>2</sup>)

#### 7.6 HOUSING COMPLETE TO DRAWING NO. LW71232 alt 'a'

- 7.6.1 The housing and cover arrangement shall be casted in aluminium alloy Casting material to IS:617 grade 4450M with overall dimensions as shown in drawing no. LW71232 alt.' a' The detail dimensions of housing and cover are shown in drawing no. LW71233 alt. 'a' and LW71234 alt. 'a' respectively.
- 7.6.2 The housing shall be mounted with the axle box of the bogie and shall House the complete brush holder assembly.
- 7.6.3 Two nos. cable entry holes shall be provided as shown in the drawing for Taking out the earthing cable in either direction. One of the holes shall be used for bringing out the earthing cable by providing suitable gland of reputed make for complete protection against dust and water. The other hole shall be covered with the help of blanking plug of stainless steel material as per drawing no. LW71236.
- 7.6.4 V-grooves of size 2mmX3mm shall be provided in the housing as per Drawing no. LW71233 alt. 'a' for sealing purpose with the axle box of the bogie.
- 7.6.5 Cover/Lid shall be provided with an O-ring of size Ø2 X Ø140, neoprene Rubber (60% neoprene, 40% rubber ) for proper sealing and prevent water/moisture ingress. The cover shall be fixed with the help of Ellen screws such that the screw heads are embedded in the cover in fully engaged condition.
- 7.6.6 Data related to operation and maintenance shall be screen printed on an Aluminium plate and riveted on the outside of the housing to ensure clear visibility to the operator. The size of the instruction plate shall be maintained within 150mm X75mm.
- 7.6.7 The cover shall be spring loaded and hinged at one end as per drawing no. LW71234 alt. 'a' to keep it closed position in case of failure of cover screws to prevent dust entry into the housing. Stainless steel inserts/grub screws shall be embedded in the housing for cover screws as shown in drawing no. LW71233 alt. 'a'.

EDTS101	C	10.12.09	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	5 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE

- 7.6.8 A transparent, unbreakable, fire retardant polycarbonate inspection cover shall be provided on the front cover for visual inspection after every trip. The fixing arrangement of inspection cover shall be IP-67 protected against water ingress.

#### 7.7 BRUSH HOLDER ASSEMBLY TO DRAWING NO. LW71237 :

- 7.7.1 The brush holder shall be as per drawing no. LW71238 and shall be CuZn 37Pb material. Destructive chemical test for conformation of material by inspecting agency shall be done as type and acceptance test.
- 7.7.2 The brush holder shall be secured with the housing of the earthing Equipment with the help of 3 nos., M8 X 35mm studs and Hex. Head Nyloc nuts as shown in drawing no. LW71231 alt. 'a' All hardware used shall be of stainless steel material.
- 7.7.3 The brush holder shall be so designed to accommodate 2 nos. spring-Loaded sliding type carbon brushes. The sliding grooves shall have adequately finished internal surfaces to ensure smooth motion of the carbon brushes.
- 7.7.4 A clip spring arrangement to drawing no. LW71240 shall be provided for Adequate and uniformly distributed pressure on the carbon brushes to ensure its functional requirements. Proper looking system of spring arrangement shall be available in the brush holder body to prevent dislodging/malfunctioning during train movement.

#### 7.8 CARBON BRUSH ASSEMBLY TO DRAWING NO. LW71239 :

- 7.8.1 Carbon brush assembly Shall comprise of metal graphite (SKM9) carbon Blocks of grade BE14-Z1 of M/s Elca- Carbon Lorraine or BM- 51 of M/s Assam Carbon or any other RDSO approved make. Proof of purchase of material from approved source shall be submitted to the inspecting agency during type/acceptance test.
- 7.8.2 Carbon brushes shall be legibly marked by engraving on the carbon block For maximum worn out limit at 8.0 mm from wiper contact surface indicating replacement of carbon brushes.
- 7.8.3 Copper braided cables (20mm<sup>2</sup>X2 nos.) with overall dia. 5.0 mm X 100mm Shall be embedded firmly in the carbon blocks and provided with tongue type crimping sockets of approved make on the other ends. The braiding of the cables shall be silver plated to a minimum thickness of 5.0 microns in assembled condition and suitable for current carrying capacity of carbon brushes as mentioned in clause 5.0.

EDTS101	C	10.12.09	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	6 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE



**7.9 RING OILER ASSEMBLY TO DRAWING NO. LW71241 alt 'a' :**

7.9.1 Ring oilier assembly shall comprise of ring oilier to drawing no LW71242 alt. 'a' and slip assembly to drawing No. LW71243.

7.9.2 The ring oilier shall be made with GGG 40 material composition.

7.9.3 Slip assembly to drawing no. LW71243 shall be made of Tin Bronze (Cu Sn6) material conforming to ISO:427 and secured with ring oilier with the help of a securing lock of spring steel material as shown in drawing no. LW71241 alt. 'a' Destructive chemical test for conformation of material by inspecting agency shall be done as type and acceptance tests.

**8.0 TESTS :****8.1 Type tests :**

All the type tests shall be carried out on a prototype unit. The firm Manufacturing for first time shall get prototype approval from CEE/RCF.

**8.2 Acceptance Test :**

Acceptance test shall be carried out by an inspecting authority nominated By the purchaser at the works of the manufacturer, on the samples picked up by the inspecting authority.

**8.3 Routine tests:**




Routine tests shall be carried out on each unit by the manufacturer at his works to ensure compliance with the specification and the drawings.

The supplier shall furnish complete details of all valid international standards viz. VDE/EN/DIN/UIC applicable for the testing of complete equipment. Firm shall also submit type test programme and results from reputed national/ international Laboratories in this regard clearly describing all the type tests conducted on the unit.

**9.0 GENERAL SPECIAL CONDITIONS :**

9.1 The tendered shall offer clause wise comments on the specification eight conforming the acceptance of the clause or indicate deviation there from specifically.

9.2 Normally no post tender deviation shall be accepted. Deviation if any may be advised at tender stage only.

EDTS101	C	10.12.09				7 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE

- 9.3 The firm should have adequate experience of design, development and manufacturing of similar equipment for rolling stock applications for the last few years.
- 9.4 Manufacturing and the testing facilities for carrying out the quality work shall be specially submitted with the tender.
- 9.5 The firm shall maintain date-wise in house quality control records etc. for process inspection and testing, the same shall be made available to the inspection official during type testing.
- 9.6 The manufacturer shall prepare a test procedure programme, which shall Define the tests proposed for the individual production phases and get it approved from CEE/RCF. The supplier shall provide the purchaser with conformation of adherence to the technical requirements defined in both this generic specification and the relevant individual specification by means of certificates giving the results of the tests performed.
- 9.7 For Inspection of 70 sq .mm & 95 sq. mm stainless steel cables Assemblies to drawing nos. LW71245 alt. 'a' LW71248 & LW71249 braiding of done side of cable shall be kept uncrimped for inspection. Only after lot inspection by inspecting authority, the crimping shall be done on both sides.
- 9.8 The permissible torque values shall be as specified in table given below :

Sr. No.	Hardware	Size & type	Recommended torque
1	Hardware used to fasten the brush holder with the housing.	Verbus ripp screw M8	40Nm (max)
2	Hardware used to fasten the earthing cable with the brush holder.	Hex. Hd. Bolt M10	30Nm (max)
3	Hardware used to fasten the cover with the housing.	Allen screw M8	25Nm (max)
4	Hardware used to fasten the oilier ring with the axle end.	Hex. Hd. Bolt M8	40Nm (max)

## 10.0 APPROVALS :

- 10.1 The following documents for the development and design of the Equipment shall be prepared and got approved from CEE/RCF by the Supplier before taking up prototype manufacture.

- A set of drawings relating to schematics and construction with complete Bill of material and parts lists.
- Type and endurance tests to be conducted on prototype to achieve the

EDTS101	C	10.12.09	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	8 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY.CEE/D&D	PAGE



Performance and life of the equipment.

- Instructions regarding mounting of equipment.
- Maintenance and repair instructions with information about trouble shooting.

The supplier may also be required to attend joint reviews regarding the development of prototype unit.

#### 11.0 ENCLOSURES :

- i) LHB drawing No. (3) 11.0788-101-00
- ii) Drawing No. LW71231 alt. 'a'
- iii) Drawing No. LW71232 alt. 'a'
- iv) Drawing No. LW71233 alt. 'a'
- v) Drawing No. LW71234 alt. 'a'
- vi) Drawing No. LW71235 alt. 'a'
- vii) Drawing No. LW71236 alt. 'nil'
- viii) Drawing No. LW71237 alt. 'nil'
- ix) Drawing No. LW71238 alt. 'nil'
- x) Drawing No. LW71239 alt. 'nil'
- xi) Drawing No. LW71240 alt. 'nil'
- xii) Drawing No. LW71241 alt. 'a'
- xiii) Drawing No. LW71242 alt. 'a'
- xiv) Drawing No. LW71243 alt. 'nil'
- xv) Drawing No. LW71244 alt. 'nil'
- xvi) Drawing No. LW71245 alt. 'a'
- xvii) Drawing No. LW71246 alt. 'nil'
- xviii) Drawing No. LW71247 alt. 'nil'
- xix) Drawing No. LW71248 alt. 'nil'
- xx) Drawing No. LW71249 alt. 'nil'
- xxi) Drawing No. LW71250 alt. 'nil'
- xxii) Drawing No. LW71253 alt. 'nil'
- xxiii) Drawing No. LW71254 alt. 'nil'

EDTS101	C	10.12.09	<i>82</i>	<i>[Signature]</i>	<i>[Signature]</i>	9 of 9
SPEC.NO.	REV	DATE	SSE/CAD	SEE/DESIGN	DY. CEE/D&D	PAGE

**AMENDMENT NO. 1**  
**TO**  
**SPECIFICATION FOR WHEEL SET EARTHING EQUIPMENT**  
**EDTS-101(REV.-C)**

The amendment is being issued in view of failure of Wheel set earthing equipment w.r.t. failure of flange bolt. The drawing No. LW-71231 has been modified w.r.t. item 12, the material and specification has been revised.

S.No.	Cl. of the Spec	Existing	Revised
1.	2 A	Drawing No. LW-71231 alt. 'a'	Drawing No. LW-71231 alt. 'e'
2.	11 (ii)	Drawing No. LW-71231 alt. 'a'	Drawing No. LW-71231 alt. 'e'

For approved sources, RDSO identified reputed vendors for supply of axle end high tensile cap screws should be used from the following sources:-

1. M/s. D.N. Sircar S.K. Dass Pvt. Ltd., 36/3, W.Road, Howrah.
2. M/s. Deepak Fasteners Ltd., E-535 to 538, Focal Point, Phase VI, Ludhiana.
3. M/s. Lakshami Precision Screws Ltd., Hisar Road, Rohtak, Haryana.
4. M/s. Pioneer Nuts & Bolts (P) Ltd, 13-b, Friends Industrial Estate, Focal point, Ludhiana.
5. M/s. Pooja Forge Ltd., 14/4, Mathura Road, Faridabad.

EDTS-101	'C'	05-10-2012				01 of 01
Spec. No.	Rev.	Date	SSE/CAD	SEE/D	Dy.CEE/D&D	Page

### Corrigendum-1 to Spec. No. EDTS-101 Rev.'c' Amd.-1

This corrigendum is issued to specification for Wheel Set Earthing Device i.e. EDTS101, Rev. C, Am-1 to incorporate test requirements and modifications in housing for Earthing brush assembly and isolating bush as mentioned below:

#### **Clause 5.0 (B) Technical Data:-**

##### **Earthing Resistor:**

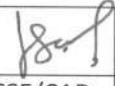

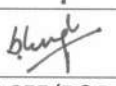
Weight may be read as 1.3 Kg approx. in place of 1.4 Kg.

Resistance of the earthing resistor unit shall be fixed with isolated studs on both sides. Body of the resistor unit shall be fabricated from minimum 2mm CRCA sheet to IS: 513-94 grade 'DD' and filled with sand encompassing the resistance wire.

#### **Clause 8.4 and 8.5 added:**

##### **8.4 Test Description:**

Sr. No	Test Description	Clause no. of spec.	Type test	Accep. Test	Routine Test
1.	Dimensional & Visual Inspection	Cl.8.5.1	√	√	√
2.	Chemical composition	Cl.8.5.1 & 8.5.1.1	√	√	X
3.	Contact Resistance Test for Earthing Brush Assembly	Cl. 5.0 (A) (Should be between 5-20 miliOhms)	√	√	√
4.	Mili volt drop tests of earthing brush assembly	Cl.8.5.2	√	√	√
5.	Earthing resistor				
	a) Measurement of Resistance of Earthing Resistor	Cl. 5.0 (B)	√	√	√
	b) Test for continuous current (Rated 15 A )	Cl. 5.0 (B) To be conducted for 30 minutes	X	√	√
	c) Test for continuous current (Rated 15 A )	Cl. 5.0 (B) To be conducted till saturation. Max. Temp. rise to be recorded	√	X	X
	d) Test for 2000 A for approx 0.1 second	Cl. 5.0 (B)	√	X	X

EDTS101 REV.C , AM-1	1	11-Sep-14				1 of 3
SPEC. NO.	CORR.	DATE	SSE/CAD	AEE/D	DY.CEE/D&D	PAGE

6.	Insulation Resistance (IR) test	Cl.8.5.3	√	√	√
7.	High Voltage (HV) test	Cl.8.5.4	√	√	√
8.	Degree of protection test	Cl.8.5.5	√	√ (\$)	X
9.	Test for spring steel for earthing brush assembly	Observed load should be between 10 to 15 N at 40 mm deflection before and after usage of carbon brush ( i.e.: crossing worn out limit of carbon brush)	√	X	X

## 8.5 Method of Tests:

### 8.5.1 Dimensional and Visual inspection checks & Chemical Composition:



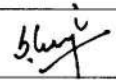
The earthing unit assembly and its components shall be inspected visually and the dimensions shall be measured and recorded as per the relevant drawings mentioned in Clause from 7.0 to 7.9 and others drawings mentioned in Annexure. The castings shall be free from cracks, blow holes and shall have smooth finish. Firm shall also submit the detailed chemical report of the chemical analysis of the material conforming to the specification from reputed govt. /NABL accredited lab.

**8.5.1.1** Chemical composition of the components of Wheel Set Earthing Equipment shall be tested as per standard sampling plan of the inspecting agency however sampling plan for testing of Aluminium housing shall be as mentioned below:

Qty. Offered	No. of Samples to be tested
0 to 100	1 no.
101 to 200	2 nos.
201 to 300	3 nos.
..... and like wise	

### 8.5.2 Milivolt drop test:

The Milivolt drop shall be measured across the brush contact by passing the rated current when the steady state condition is achieved. The steady state condition is reached when last 3 consecutive readings are approximately constant. The Milivolt drop between two contacts should not be more than 500 Milivolt.

EDTS101 REV.C , AM-1	1	11-Sep-14				2 of 3
SPEC. NO.	CORR.	DATE	SSE/CAD	AEE/D	DY.CEE/D&D	PAGE

**8.5.3 Insulation Resistance (IR) test:**

The insulation resistance shall be measured by 500 V, DC megger. The insulation resistance shall be measured between housing and brush holder assembly and shall not be less than 100 MΩ before HV and after HV test

**8.5.4 High Voltage (HV) test:**

High voltage test shall be conducted by applying test voltage between housing and brush holder assembly by applying 2.5 KV for one minute.

The IR value recorded after the test shall not be less than 100MΩ.

**8.5.5 Degree of protection test:**

Degree of protection for the complete unit shall be got tested by the firm from any NABL recognized laboratory as per IEC 60529 conforming to IP-65. The test results shall be submitted at the time of prototype testing. Suitable arrangement shall be made by the firm to cover the base of the housing for conducting this test.

(S) For acceptance test the sampling plan shall be as under.




Qty. Offered	No. of Samples to be tested
0 to 100	1 no.
101 to 200	2 nos.
201 to 300	3 nos.
..... and like wise	

**Clause 11.0:**

**Enclosures:** The drawings at S.No.is given below are amended as follows:

S.No	Existing drg. no.	Revised drg. no.
III	Drawing no. LW71232 alt.'c'	Drawing no. LW71232 alt.'d'
IV	Drawing no. LW71233 alt.'a'	Drawing no. LW71233 alt.'b'
XV	Drawing no. LW71244 alt.'nil'	Drawing no. LW71244 alt.'a'
XVII	Drawing no. LW71246 alt. 'nil'	Drawing no. LW71246 alt. 'a'

**Note:** Isolating bush to drawing no. LW71244 alt.'nil' altered as LW71244 alt. 'a' , however any other design for isolation of brush holder assembly and housing may be provided. (Prior approval shall be taken before bulk manufacture from RCF).

EDTS101 REV.C , AM-1	1	11-Sep-14				3 of 3
SPEC. NO.	CORR.	DATE	SSE/CAD	AEE/D	DY.CEE/D&D	PAGE




## Corrigendum - 2 to Spec. No. EDTS101, Rev.-'C', Amd.-1, Corr.-1

This corrigendum is issued to specification for Wheel Set Earthing Device i.e. EDTS101, Rev.-'C'. Am-1, Corr.-1 to change the material of earthing cables from copper to aluminium. The following drawings are modified:

### Clause - 11.0:

**Enclosures :** The drawings are at S. No. is given below are amended as follows:

S. No.	Existing Drg. No.	Revised Drg. No.
XVI	LW71245, Alt.-'a'.	LW71245, Alt.-'b'.
XIX	LW71248, Alt.-'Nil'.	LW71248, Alt.-'a'.
XX	LW71249, Alt.-'Nil'.	LW71249, Alt.-'a'.

<b>EDTS-101 Rev.-'C', Am-1, Corr.-1</b>	'2'	September 26, 2014				1 of 1
Spec. No.	Corr.	Date	SSE/CAD	AEE/D	DY.CEE/D&D	PAGE



### Corrigendum-3 to Specification no.EDTS101, Rev. C,Am-1, Corr-1 & 2

This corrigendum is issued to specification for Wheel Set Earthing Device i.e. EDTS101, Rev. C, Am-1, Corr-1 & 2 to incorporate the RDSO drg. of Hex. head screw for earthing device.

The following modification/changes have mentioned below:-

1. Approved sources for Item-12 of the drg.no.LW71231, Alt-'e' given in AM-1 may be treated as deleted.
2. Corrigendum -2 withdrawn.
3. Drg.no. CG-15070, Alt-'nil' is applicable for Item-12 of the drg.no.LW71231, Alt-'e'

EDTS-101 REV.-'c' AM-1,Corr-1&2	3	26-08-2015	<i>High</i>	<i>Low</i>	<i>blung</i>	1 of 1
SPEC. NO.	CORR.	DATE	SSE/CAD	SEE/D	DY.CEE/D&D	PAGE