

2237833/2024/O/o DY CME(D)/M/HQ/CR

Specification No.: WDG4/EL/PS/09

dlw	INDIAN RAILWAY DIESEL LOCOMOTIVE WORKS VARANASI	No.: WDG4/EL/PS/09
		ISSUE DATE: 02.05.2016
		REVISION: Rev. 01
		SHEET : 08
<div>SPECIFICATION FOR PACKING INSTRUCTION , I-MARKING AND SURFACE/ ANTI-RUST TREATMENT FOR ELECTRICAL COMPONENTS/ASSEMBLIES/EQUIPMENTS</div>		
<div>Revision History: Rev. 01: Specification revised thoroughly.</div>		

Prepared by SSE/EM & SSE/TC	Checked by ADE/Elect.	Approved by Dy. CDE/EM	Revision & Date
<div>02.5.16</div> <div>02.5.16</div>	<div>AKG</div> <div>03/5/16</div>	<div>03/5/16</div>	<div>Rev - 01</div> <div>Date - 03.05.16</div>

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<div> <div>7/05</div> <div>25/4</div> </div> <div> <div>25/6</div> </div>	<div>AKB</div>	<div> <div>28/5/16</div> </div>	<div>Rev. - 01</div> <div>Date- 03.05.16</div>

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**1. GENERAL**

This standard lays down instruction for packing of Electrical components/Assemblies/Equipment as well as provides guidelines regarding Identification marking and Surface/ Anti-rust treatment of items.

The components/Assemblies need to be supplied packed suitably to avoid physical damage and corrosion during transit, storage and easy handling.

This specification is for general guidance of the supplier and the responsibility of material reaching DLW in safe condition lies with the supplier.

**2. SCOPE**

1. Packaging of the items: This specification defines 5 types of packing processes identified by a two digit alpha code. This two digit alpha code is to be reflected in the shipping list/packing list.
2. Identification-Mark on item
3. Surface/ Anti-rust treatment of item

**3. TYPE OF PACKING**

The following 6 types of packing have been standardized for packing of general Electrical and electronic components/assemblies.

- 3.1 'OP' - Open Type
- 3.2 'PP' - Partially packed
- 3.3 'CP' - Crate packing – components/equipment requiring physical protection.
- 3.4 'CQ' - Case Packing – Small & medium components/Assemblies/equipment that require corrosion & physical protection.
- 3.5 'CR' - Case Packing – Electrical components/Assemblies which require special packing viz. water proof, shock proof etc.
- 3.6 'ESD' - Electrostatic discharge sensitive devices
- 3.7 'RP' - Drum/Real Packing for Cables

**4. DESCRIPTION OF TYPES OF PACKING**

The various types of packing, as standardized above, are described below.

**4.1 'OP'- Open Type**

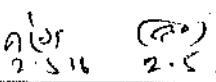
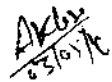
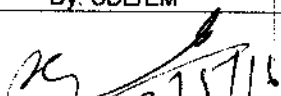
In case of components, which are not affected by dust and water do not require special protection & generally are not machined, shall be sent as open packages. This type of packing is used for following types of items:

DBR hatch ASM with short hood and any other similar items.

**4.2 'PP'– Partially Packed**

Components, which need special protection at selected portions only, shall be dispatched partially packed. Machined surfaces should not be allowed to come directly in contact with the wood. Such surfaces should be protected with Polyethylene coated Bitumen Hessian Kraft paper, foam sheets etc. This type of packing is used for following types of items:

Elbow liner with machined flange, fabricated large components with machining, inlet pipe, Stay ring, Spiral casing quadrants, Foundation ring, Runner envelope, Lower cone with door etc.

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**4.3 'CP' – Crate Packing – General**

Assemblies/Components which need only physical protection from the point of view of handling shall be dispatched duly packed in crates. However, these components may be sent in wooden crates/Corrugated paper box/cartons (to be decided based on the basis of weight for easy handling) after covering with Polyethylene/plastic sheet or wrapping with jute bag wherever necessary. This type of packing is used for following types of items:

Master controller, Terminal lugs/Receptacle, Sockets/Pins, Bus Bars, Rigid Conduits, Conduit fittings, Pipes, Fan supports, CPLG, Insulated CDTs, Snap-ONs, Cable ties, Heat Shrink Tubes, Strain Reliefs, Clamp cable, Sleeving Insulations, Rubber Cleats, Flexible conduits, Conduits and Cable ASM, Grommet, Label, Tape Silicon Rubber, Cable Sealing System, Seal & Wire, Tie Anchors, Spare wire cap, Spacer Cable, Cap Plug for Alternator, Bushings (Phenolic/metallic), Cable Harness, wooden blocks etc. Fabricated large/medium components without machining such as sheet metal parts, Stud Plate ASM, Shield Starter Motor, Cover ASM, Pipe Clamps, Pad-Tapings etc also are supplied in crate packing. In case of rigid conduit, both the ends shall be plugged with plastic cap to prevent damage of threads.

Wherever necessary soft packing material e.g. hays, straw, thermocol etc. be provided inside the wooden box to protect any damage to dispatched material while packing/unpacking.

In case of wooden crate, bottom frame of crates to be made of wooden planks & should have proper support of wooden batons of suitable length to facilitate lifting by fork lifter.

**NOTE:** Cable harness to be kept in box in tied condition that it should not be spread during removing from the box. Cable harness ends i.e. open/ lugs/ connector to be kept in secure condition to avoid physical damages.

**LEAD ACID / Ni-Cd BATTERIES:** Each Lead Acid Battery to be packed in wooden crates. Suitable cushioning by expanded polyethylene foam sheet, Thermocol etc shall be provided between Body and wooden crate. In case of Ni-Cd batteries, 04/05 batteries shall be covered by polythene sheet before packing in Ply-wood case (minimum ½ inches).

**4.4 'CQ' – Case Packing – Machined Components/Assemblies/Equipments**

Small & Medium sized components/assemblies/equipment due to size/weight & to avoid handling and pilferage, problems shall be packed in Case/Containers. Item should be kept in such condition that it should not tumble while handling.

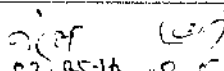
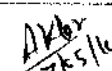
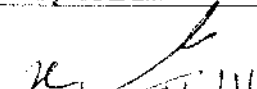
Wherever required adequate quantity of silica gel or VCI powder/Tablets, packed in thin muslin cloth cotton or other type bags shall be suitably placed.

Small machines/components of less weight shall be provided with suitable cushioning, Wood Wool/expanded polyethylene foam sheet, if used, shall be sandwiched between polyethylene sheets and sealed.

The component inside the case shall be entirely covered with a polyethylene sheet wherever required. This type of packing is used for following types of items:

Fitted bolts, highly finished components like springs, Control console etc.

**4.5 'CR' – Case Packing – Electrical & Electronic Components/Assemblies****4.5.1 Small sized delicate equipments:**

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Delicate components likely to be damaged e.g. gauges, instruments etc, are to be wrapped in waxed paper or polyethylene air bubble film, foam sheet and packed in cartons manufactured from corrugated Fibre Board.

Adequate quantity of Silica gel packed in cotton bags are to be suitably placed in the cartons. The cartons shall be entirely covered with a polyethylene sheet of suitable thickness, before being packed in the cases. VCI Powder/Tablets can be used as an alternative to Silica Gel.

Empty space in the cartons shall be filled with small chips of expanded polystyrene (Thermo Cole), Wood Wool etc. This type of packing is used for following types of items:

Delicate Electrical/Electronic components such as Light fittings, Level indicators, gauges & instruments, relays, Limit switches, Pressure relays, Resistance thermometers, Terminal Boards, Brush Holder Assembly CA, Brush Holder Assembly of TA, Metal connector, CPC plug, Governor & its components, Slip Ring ASM-MACH, Seal Ring, Fuse, Slip Ring Assembly, Housing ASM-Bearing, Sleeve-Bearing, Cap-Bearing, Sheet ASM cover, Cover ASM Slip Ring, Cab Fan, Receptacle 27 Pole, MCB, Circuit breaker, Contactor etc.

In case of overseas suppliers, boxes should be made of sea worthy wood. International firms supplying items directly to DLW may use their own standard packing with prior approval of DLW.

#### 4.5.2 Medium/Large sized equipments/Assemblies:

Medium sized components/Assemblies likely to get damaged during handling, pilferage and moisture shall be wrapped with adequately thick plastic sheet before packed in suitable Case/Box and should be properly secured on bottom plate of box/case to avoid any kind of damage. Thermocol, Foam sheet etc. to be provided on electrical panels before packing in wooden box to avoid physical damage while removing item from box.

Adequate quantity of Silica gel is to be suitably placed in the plastic sheet. VCI (Volatile corrosion Inhibitor) Powder/Tablets can be used as an alternative to Silica Gel.

The exposed machined surfaces and Terminal box shall be covered with foam sheet or similar item with the help of tape. The terminal leads/lugs shall also be covered with foam sheet or similar item with the help of tape and shall be properly secured. This type of packing is used for following types of items:

Electrical components/assemblies such as Traction Alternators, ECC#1, ECC#2, ECC#3, ECC#4, ECC#5, TCC, Rectifier, Traction motors, Transformers, Inverter, Battery Charger, HVAC, Starter Motor, Blowers, Field Coil 64V for stator Motor, Frame commutator end starter motor, Brush Plate ASM for stator motor, Armature 64V for starter motor, Dust Bin Blower Motor, TLPM, Switch Panel ASM, Radiator Cooling Fan, DB Fan ASM, DB Grids, Radial DBR, Crow bar resister, Auxiliary Generator, Stator and Coil ASM, Armature & Rectifier mounting ASM, Cab Heater & Small Motors etc.

In case of overseas suppliers, boxes should be made of sea worthy wood. International firms supplying items directly to DLW may use their own standard packing with prior approval of DLW.

#### 4.6 ESD:

The type of ESD packing shall include one or more of the following:

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- A. Conductive tubes or containers: Surface resistivity shall not exceed  $10^5$  ohms per square. If the tube or magazine is fabricated of metal which tends to oxidize, the surface shall be treated to prevent formation of insulated oxides.
- B. Conductive bags: Surface resistivity shall not exceed  $10^5$  ohms per square.
- C. Conductive foam: Surface resistivity shall not exceed  $10^4$  ohms per square. The material shall be non corrosive
- D. Multi-layer bags: these are metalized or laminated bags having at least three distinct layers, outside which is conductive, the middle layer of polyester for strength and the inside layer of polyethylene for antistatic. Square and inside  $10^{13}$  ohms per square.

Note: Conductive packaging is preferred over antistatic packaging whenever possible

#### 4.7 'RP'-Drum/Real Packing for Cables

Cables shall be dispatched on non returnable reels of width not more than 22 inches and dia. not more than 48 inches.

Normally, only continuous length shall be allowed on each reel. However, if more than one length is packaged per reel approval shall be obtained from CDE/DLW prior to dispatch. The number of lengths shall be clearly marked on the outside of the reel and joints shall be made in such a manner that they are easily detected.

### 5. TYPICAL CONSTRUCTION OF PACKING CASES.

#### 5.1 General

The components/assemblies are to be packed as per clause 4.3, 4.4 & 4.5 depending on the type of the component/assemblies, before they are ready to be put into the wooden case/crates.

#### 5.2 Material

The packing wood shall be coniferous timber for general packing purposes.

#### 5.3 Preparation of Packing Case

- 5.3.1 The base of the case shall be made of wooden batons & planks giving necessary reinforcement, such that the bottom of the equipment is at a height of 100 to 200 mm or suitable height from the ground level depending upon size and weight of equipment. Box will be designed in such a way that they can be lifted easily by Forklifts and EOT.

NOTE: However for packing cases of smaller size equipment can be at a height of 40 mm (min) from the ground level.

- 5.3.2 In case of "CR" - Packing viz. Electrical & Electronic components & instruments/assemblies, a rubber sheet, strips/expanded polyethylene foam sheet, preferably suitable thick, shall be fixed on to the base to act as cushioning to the equipment.
- 5.3.3 Place the components/cartons with corrosion inhibitors duly applied wherever necessary and place suitably, thin muslin cloths or similar bags of activated Blue Silica Gel to, wherever necessary, alternatively VCI Powder or Tablet may be used.
- 5.3.4 Cover the whole equipment with polyethylene sheet of at least 100 micron thickness, on all sides preferably by a single piece.

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- 5.3.5 For indoor panels/equipment, provide suitable packing batons with covering of thermo Cole/expanded soft polyethylene foam/polyethylene air bubble film wrapped with suitable cords, to avoid cutting of the polyethylene sheet so that finished surface is not damaged.
- 5.3.6 Empty space in the box shall be filled with adequate cushioning material e.g. Thermo cole chips, wood wool etc. to avoid movement and shocks. Alternatively put wooden blocks/batons wherever necessary.
- 5.3.7 In case of overseas suppliers, boxes should be made of sea worthy wood.
- 5.3.8 International firms supplying items directly to DLW may use their own standard packing with prior approval of DLW

## 6. GENERAL PRECAUTIONS:

- 6.1 Whenever felt necessary, the top of packing boxes, of important items, shall be made tapered/inclined.
- 6.2 While fixing the nails during packing necessary care shall be taken to ensure that materials used for protection inside the case e.g. Paper, Polyethylene sheet, Coir etc. do not get damaged.
- 6.3 Wherever possible, equipment shall be bolted to the case, and secured to the bottom in preference to the sides or ends, Large washers are to be provided to distribute the pressure.
- 6.4 It shall be ensured that all stencil marks outside the casing shall be of water proof material to prevent obliteration in transit.

## 7. IDENTIFICATION MARK:

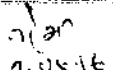
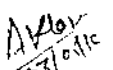

### 7.1 I-MARK ON ITEM:

Supplier needs to provide proper identification mark on manufactured item at suitable places. I- mark can easily be visible while part is fitted at preferred place. The identification mark should be of such type, that it can not be erased easily i.e. shall be Punched, Embossed, Engraved, Non erasable laser ink written.

I-mark is generally containing

- Supplier name,
- Item description, Model No and serial number
- Month and Year of manufacture
- Technical Details of the item, wherever applicable, shall also be indicated as I-Mark.

However, the items like Brush Holder Assembly CA, Brush Holder Assembly of TA , Slip Ring ASM-MACH, Seal Ring, Slip Ring Assembly, Housing ASM-Bearing, Sleeve-Bearing, Cap-Bearing, Sheet ASM cover, Cover ASM Slip Ring, plugs, terminal receptacle, terminal lugs, sockets/pins, cable tie, spare wire cap, caps, clamps, cleat, insulated CDT, Snap-ON, Label, Grommets, bushing, Insulator, Seal & wire, spacer cable and any other similar type of items which are in small size and indicating above details are not possible, only suitable firm's I-mark should be provided.

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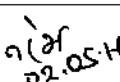
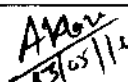
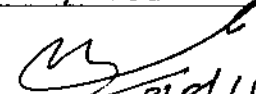
**7.2 PACKING CONDITION:**

The following information will be provided by suppliers on packing box

- i. Address of consignee.
- ii. DLW Purchase Order no.
- iii. Item Description and Part No.
- iv. Year of Manufacturing
- v. Manufacturer details
- vi. Marking showing upright position
- vii. Marking showing umbrella (i.e. for machines/components to be stored under covered storage).

**8. SURFACE/ANTI RUST TREATMENT**

Suitable painting /proper Anti-Rust Treatment to be done on supplied item by firm where applicable. Open non painted metal surface, Machined surfaces, Non Plated fasteners, Screw and studs cavity etc. are generally should be treated as preferred location for antirust treatment.

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