

S.R.17.02.7.3.48. 'Rail Bond' means an electrical connection across a joint in or between adjacent lengths of rail.

S.R.17.02.7.3.48.1. 'Bond continuity' means a rail bond used for maintaining continuity of the rail return circuits at points and crossings.

S.R.17.02.7.3.48.2. 'Bond cross' means a rail bond used for connecting together two rails of a track or rails of adjacent tracks.

S.R.17.02.7.3.48.3. 'Bond Joint' means an electrical connection across a joint between two adjacent lengths of rails as part of the track return.

S.R.17.02.7.3.48.4. 'Bond structure' means an electrical connection between the steel work of a track structure, bridge or station building, to which the traction overhead equipment is attached, and the track return.

S.R.17.02.7.3.48.5. 'Bond Impedance' means a special rail bond used to bridge an insulated rail Joint in AC track circuited sections in area equipped for electric traction.

S.R.17.02.7.3.49. 'Reversing handle' means a handle which controls the forward and reverse running of the traction motors and is fitted in such a manner that it can only be removed when the master controller is locked 'off'.

S.R.17.02.7.3.50. 'Single Unit Train' means the combination of a motor coach or motor coaches adopted by a railway administration as an operating unit.

S.R.17.02.7.3.51. 'Track return' means the track rails when used as the return conductor for the traction return current to the sub-station.

S.R.17.02.7.3.52. 'Traction' means electric traction.

S.R.17.02.7.3.53. 'Traction engine examiner' means an official responsible for inspection and maintenance of electric rolling stocks.

S.R.17.02.7.3.54. 'Traction Foreman (TFO)'.

S.R.17.02.7.3.54.1. 'Traction Foreman/Overhead Equipment (TFO/OHE)' means a subordinate for the area concerned responsible for the operation and maintenance of the overhead equipment and for the staff employed thereon.

S.R.17.02.7.3.54.2. 'Traction Foreman/Rolling stock (TFO/RS)' means a subordinate responsible to AEE/RS for the maintenance and/or inspection of electric rolling stock and for the staff employed thereon.

S.R.17.02.7.3.55. 'Traction Loco Controller (TLC)' means an official under the control of AEE/RS who will be responsible for booking of electric locomotives and running staff to meet the requirements of the traffic.

S.R.17.02.7.3.56. 'Traffic Block' means blocking of a track against movement of all traffic over a particular section.

### **17.03. Inspection of electrical way and works.—**

**The electrical way and works shall be inspected regularly in accordance with special instructions by officials nominated for the purpose and in accordance with the duties assigned to them.**

SR.17.03.1. Electrical way and works –

Railway servants employed on electrical way and works shall observe all General Rules 15.01 to 15.17, 2.05, 4.07 and 6.10 inclusive wherever applicable to electrical way and works except as otherwise provided in the rules contained in this chapter, and the Railway Administration shall prescribe on whom the duties of Inspector of Way and Works and the duties of Ganger devolve in each case together with any additional requirements thereto.

SR.17.03.2.1. The duties of the PWIs as stipulated in the General Rules inclusive, wherever applicable to electrical way and works shall devolve on the TFO/OHE and ATFO/OHE in so far as these duties relate to the respective items of electrical way and works in their charge.

SR.17.03.2.2. The duties of the Gangmate wherever applicable to overhead equipment, shall devolve on the overhead equipment Linesman.

SR.17.03.2.3 If due to any defect or damage to the overhead equipment, it is necessary to lower pantograph over any particular section of the running lines, the traction official concerned shall communicate with the TPC who in turn shall advise the SCOR for arranging the issue of necessary Caution Orders by the Station Master to the Loco Pilots concerned as per rules in force. The Caution Order shall specify the exact kilometreage and structure numbers between which the Loco Pilot shall lower the pantographs and coast through. In addition the Traction official asking for the Caution Order to be issued, shall arrange with the ATFO/OHE for the exhibition of suitable indication boards marking the beginning and ending of the affected section in which the Loco Pilot shall coast through with lowered pantograph.

SR.17.03.3.1. Overhead communication circuits - Adequate arrangements shall be made to Guard communication or electric lighting circuits crossing or running in close proximity to the overhead equipment.

SR.17.03.3.2. No conductor shall be erected over or alongside an electrified track, unless it is adequately guarded in accordance with the rules laid down for the purpose by the Railway Administration. This guard shall be effectively connected to earth.

SR.17.03.4. Inspection of Electrical Equipment - All electrical equipment shall be inspected regularly, in accordance with special instructions.

SR.17.03.4.1 The inspection of overhead equipment and electrical equipment at supply control posts shall be carried out periodically in accordance with instructions issued by the DEE/Tr.D.

SR.17.03.4.2 Electrical Equipment in rolling stock shall be inspected periodically in accordance with instructions issued by the DEE/RS.

SR.17.03.4.3.1. Engine crew of all trains shall be vigilant and keep a sharp look out while the train is in motion and watch the overhead equipment and report any defect noticed to the TPC/SCOR.

SR.17.03.4.3.2. When a defect on the overhead equipment which is likely to interfere with the smooth movement of the pantograph or cause damage to it, is noticed ahead, the Loco Pilot shall trip the circuit breaker and immediately lower the pantograph by placing the pantograph handle in the 'lower' position. An emergency stop should be made, if necessary.

SR.17.03.4.3.3. If the damage to overhead equipment is slight such as a slight break away of the contact wire from the droppers or catenary, it may be practicable to coast under the defective section, but the defect shall be reported to the TPC through the nearest emergency telephone circuit or in case this circuit is not available through any other telephone.

SR.17.03.4.3.4. In case of a major breakdown to overhead equipment requiring trains to be stopped, the Loco Pilot noticing such a breakdown, shall advise the TPC through the nearest emergency telephone circuit giving details of the breakdown and in case this circuit is not available, convey the information through the nearest Station Master on any other telephone circuit. The TPC, on receipt of such a message, shall pass on suitable instructions to the SCOR and if necessary, advise him to stop running of trains in the affected section.

SR.17.03.4.4.1. All breakdowns or defects noticed in the overhead equipment or in any other traction equipments, including continuity bonds, joint bonds, cross bonds, structural bonds by any railway servant, shall be reported immediately to the TPC. In case he cannot be contacted, the nearest Station Master or TFO/OHE or the AEE/Tr.D shall be advised. The Station Master, to whom such breakdown or defects are reported, shall convey the information immediately to the TPC through the SCOR. In case of failure of communications,

he shall use his discretion regarding movement of traffic and advise the nearest Traction Official.

SR.17.03.4.4.2. In case of breakage of an overhead line, the railway servant detecting it shall ensure that no person comes in contact with the line until an authorized person arrives on the spot. The authorized person shall take immediate action to make the affected line dead and earthed.

SR.17.03.4.4.3. In the event of break of contact wire of the overhead electrical equipment, the following precautions shall be taken for the safe working of signalling equipment:–

SR.17.03.4.4.3.1. The TPC/SCOR on receipt of an advice of break in traction overhead lines or confirmation of such an advice from the TPC shall immediately advise by the quickest possible means all the staff responsible for the maintenance and operation of the signalling equipment of the section where the catenary/contact wire has broken.

SR.17.03.4.4.3.2. The staff responsible for the operation of the signalling equipment of the section shall immediately check whether the block and other signalling equipment are working normally. If an abnormal working of any equipment is noticed, its working shall be immediately suspended and necessary action under the rules shall be taken.

SR.17.03.4.4.3.3. On receipt of this information the staff responsible for the maintenance of signalling of the section shall immediately proceed to the site and test all circuits and allied equipment paying particular attention to the outdoor signalling gear to ensure that no damage has taken place. An authorized representative of the S&T department shall submit a certificate that everything is working 'all-right' and send it to his superiors along with a detailed test report as soon as possible.

SR.17.03.4.5.1 All overhead line staff, when on patrol, shall watch the pantographs of passing electric rolling stock and if any defects are noticed, they shall report them to the TPC through the emergency telephone circuits or any other telephone, if emergency telephone circuit is not available, giving full particulars including the number of the electric rolling stock, the location of the defect and the time when the defect was noticed.

SR.17.03.4.5.2. The TPC shall communicate reports of a defective pantograph to the TLC who shall arrange to have the electric rolling stock stopped as soon as possible, for examination of the defective pantograph.

SR.17.03.4.6. TFO/OHE shall be responsible for the proper and efficient maintenance of all breakdown equipment, wiring trains, Tower Wagons, breakdown lorries, etc., so that they are always in a state of good repair. He shall ensure that they are equipped with full quantities of stores and spare parts as per approved inventory. All tools, tackles, straining screws, clamps, ropes and ladders shall be maintained in good condition and ready for use at all times.

SR.17.03.4.7. The staff concerned shall ensure that the equipment not in immediate use is always ready for service, except such equipment which may be under repair or overhaul.

SR.17.03.4.8. The supply of power may be interrupted due to fault in the overhead equipment in a switching station or a sub-station. When failure occurs, the TPC shall be informed at once over the control telephone. Full information shall be given on such occasions and if it is known that the fault is on the overhead equipment or on a cable, all particulars shall be given including the exact location of the fault and how it occurred. The TPC shall immediately, on receipt of such information, inform the CHC and make necessary arrangements for isolating the faulty section. He shall also inform the SCOR of the action taken by him and advise which section of the line is not available for working of electric trains.

SR.17.03.4.9. Special precautions by SCOR, Station Master and train crew on electrified sections when a section of OHE is found faulty.

SR.17.03.4.9.1. When a train comes to a stop in an electrified section and the cause of stoppage is not immediately obvious, the Loco Pilot and Guard shall immediately take action to protect the train in accordance with the rules made under Rule 6.03 and SRs there under.

SR.17.03.4.10.1. In the event of any OHE failure on a multiple line section for any reason and the OHE relating to the other line is in working order, 'single line' working is introduced in terms of procedure detailed under S.R.6.02.1.

SR.17.03.4.10.2. There may be occasion when this failure or tripping of OHE could be due to some accident and/or obstruction affecting the other tracks etc., also. If no adequate precaution is taken for running of this train on the other lines, there is a possibility of train/trains running into derailed wagons/coaches from the adjacent line/lines and/or some other obstruction causing side collision or derailment. To obviate this possibility, it has been decided that instructions as indicated in S.R. 17.09.16 should be followed by all concerned strictly with immediate effect.

SR.17.03.4.11. In order to reduce chances of collision on adjacent lines in electrified territory in case of an accident taking place on the other line, speed of the first train entering the section, from opposite direction where tripping has taken place for any reason, should be restricted to 35 KMPH during day and 20 KMPH during night after the section has been identified and isolated by the TPC.

SR.17.03.5.1. Access to Electrical equipment-

SR.17.03.5.1.1. Adequate precautions shall be taken to prevent unauthorized persons gaining access to electrical equipment. Such precautions shall be prescribed by the Railway Administration.

SR.17.03.5.1.2. No unauthorized person shall be permitted to have access to or to operate any switch or other apparatus which forms part of the electrical equipment or is used in connection therewith.

SR.17.03.5.2.1. The keys for all outdoor switches shall be kept locked in glass fronted box in the custody of the Station Master or other authorized person stationed conveniently nearby the switches. The keys shall be issued on demand only to authorized persons, whose signatures for receipt shall be obtained in a book maintained for this purpose.

SR.17.03.5.2.2.1. All chambers or enclosures containing live equipment shall be kept normally closed and locked, with the keys in the custody of the authorized person. A duplicate key shall be kept in a box with a fixed glass fronted cover in place notified by the DEE/Tr.D. The key may be removed by breaking open the glass cover of the box in case of emergency, by an authorized person. A record shall be maintained of every such use of the key.

SR.17.03.5.2.2.2 In the event of breaking the glass of box, the key or keys shall be kept in the safe custody of the Station Master until the glass is replaced. The TPC shall keep a record as to where such keys are kept, so that in case of emergency, he will be able to direct the staff concerned.

SR.17.03.5.2.2.3. When the glass cover is broken for taking out the duplicate key, the concerned Traction Foreman/OHE shall be immediately advised to replace the glass. The person replacing the glass shall obtain the signature of the authorized person who shall record the date of replacement of the glass.

SR.17.03.5.2.3. Any person while working in a chamber of enclosure containing electrical equipment, which under normal conditions is live, shall retain the keys of the chamber or enclosure. These keys shall be returned to the person in whose custody they are normally kept, immediately after the chamber or enclosure has been locked.

SR.17.03.5.2.4. Permit-to-work cards shall not be cancelled until the keys have been returned to the box or to the person in whose custody they are normally kept.

SR.17.03.5.3.1. In an emergency, the Station Master shall operate such switches as per specific direction of the TPC.

SR.17.03.5.3.2. In the event of a fault in the overhead equipment necessitating isolation of a section in addition to the faulty one, the ATFO/OHE or an authorised person shall arrange with the TPC, to isolate the healthy section also. However if necessary he shall himself open those switches which can be operated conveniently.

SR.17.03.5.3.3.1. Should the TPC wish to have any isolator switch opened or closed he shall ask the ATFO/OHE or Station Master or any authorised person to carry out the required switching operation. The person concerned shall after carrying out the orders, lock the switch either in 'open' or 'closed' position as the case may be and inform the TPC of the action taken. He shall not part with the key until receipt of further orders from the TPC. A record of such operation shall be maintained by the person concerned.

SR.17.03.5.3.3.2. The instructions regarding the parting with the keys shall be confirmed by exchange of PNs.

SR.17.03.5.3.4. Every Station Master shall be fully aware of the location of the isolator switches provided for the control of power supply to overhead equipment at the station or near the cabin and shall be conversant with the correct method of opening and closing the same in an emergency. The Station Master who holds a certificate of competency for operating the overhead switches issued by DEE/Tr.D or his authorised Inspector, shall only be posted at such stations where these switches have been provided. The Station Masters shall be examined for their competency in operating these switches once in three years (see SR 17.09.1.3)

SR.17.03.5.4. No person other than authorised maintenance staff, their assistants when accompanying them and persons provided with special permits issued by DEE/Tr. D, shall be admitted to supply control posts except the following:

1. A person escorted by the DEE/Tr.D or by the AEE/Tr. D.
2. A doctor summoned to attend to an accident case.
3. Electrical Inspector of the Government for the railway area concerned.
4. A person required by an officer to speak from a telephone installed in the premises.
5. No person lower than Linesman in rank, shall be allowed to enter an unattended supply control post alone.

#### **17.04. Permit-to-work on electrical equipment.—**

**If work is to be carried out adjacent to the electrical equipment or any other part thereof by other than the competent railway servant, such work shall be done only when and for such time as the person-in-charge of the work has obtained a written permit-to-work, duly signed and given by the railway servant authorised for the purpose by special instructions. He, in turn, shall issue the same only with the knowledge of the Traction Power Controller.**

S.R.17.04.1. Permit-to-work on electrical equipment and on works adjacent thereto.

S.R.17.04.1.1. If work is to be carried out adjacent to the electrical equipment or on any part thereof by other than authorised persons, such work shall be done only when and for such time as the person-in-charge of the work is in possession of written permit-to-work. Permit-to-work shall be obtainable on application in accordance with special instructions.

S.R.17.04.1.2 'Permit-to-work' shall only be issued by such authorised persons who are specially empowered for this purpose by the Railway administration. 'Permit-to-work' shall only be issued with the knowledge of the person who is responsible for the operation of power supply on the distribution system.