

EAST COAST RAILWAY

CE's CIRCULAR NO. 21

Sub: Working of Track Machines – safety aspects

In order to ensure safe operation, working and running of track machines, the instructions have been given from time to time in several forms like manual, CE's circulars and letters etc. In this circular, efforts have been made to bring together all such instructions.

**(A) INDIAN RAILWAYS TRACK MACHINE MANUAL**

Chapter 4 of IRTMM also pertains to 'Rules for Movement and Working of Track Machines'. Certain important paras of this chapter are being reiterated below along with the Railway's additional instructions;

**Para 4.1 (i)**

Track machines are self-propelled machines, hereinafter referred to as machines. These machines shall be worked as a train except when attached in the rear of a train, they will be treated as part of that train. However, when self propelled, there is no need for a guard or a brake van. Hauling of another machine/coach /wagon which may be un-braked shall also be permitted. The machine operator should take adequate care to ensure safe running, especially in steep gradient sections.

**Railway's Additional Instruction** - The operator shall travel at a relatively reduced speed in steep gradient sections.

**Para 4.1 (ii)**

When more than one machines are required to work within the same block section, these machines may be allowed to move into the block section in a convoy under one authority as detailed in this chapter. In such situation all the track machines must leave and enter the section simultaneously one after another keeping adequate distance among them and with proper authority as detailed further in the next paras.

**Railway's Additional Instruction** - The distance between any two machines on move should not be less than 120 m at any time. The distance during working of track machines when speeds are very low should be at least 50 m.

**Para 4.1 (iii)**

In case of run through movement from one station to another station, upto three machines may be allowed under one authority to enter in a section with ruling gradient not steeper than 1 in 100. For gradient steeper than 1 in 100, only one machine shall be allowed at a time in the block section in case of run through movement.

**Para 4.1 (iv)**

Whenever the track machines are working in an integrated traffic block where other railways agencies are also working, the relevant instructions for integrated block working should be followed.

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**Railway's Additional Instruction** – The machines should never be closer to any other rolling stock, Loco, tower wagon etc. and a safe distance of 120 m should always be maintained.

**Para 4.2.1**

Each machine shall be under the direct charge of Section Engineer/Junior Engineer (machine) hereinafter called the 'Operator'. Number of railway staff on driving cab of each machine shall not exceed five. The operator shall have valid competency certificate as defined in para 4.3.

**Railway's Additional Instruction** – The machine shall never be left unmanned during a block. In extreme emergency and only after operator has tested reliability of the hand brakes shall apply hand brakes and fix the skid before going to attend some repairs to the machine but not before he has deputed at least one machine staff in the cabin.

**Para 4.2.2**

The track machine shall work under the direct supervision of an Engineering official, not below the rank of Section Engineer/Junior Engineer (P. Way), who will be responsible for taking the traffic block and for protection of the line while the work is in progress and also timely clearance of block after the completion of the work ensuring the safety of the track.

**Para 4.6.1**

The Junior Engineer/Section Engineer (P. Way) is responsible for protection of the site of work and also for protection of adjoining track(s) in case of infringement. He shall be conversant with the infringing conditions of the various machines. He shall also be responsible for safe condition of track before clearing the block after machine working.

**Railway's Additional Instruction** – Extra look out man shall be deputed by Junior Engineer/ Section Engineer (P. Way) to warn the P. way labour and machine staff of the approaching trains on the adjoining line(s).

**Para 4.6.2**

Some machines tend to foul the adjacent line, while working on double line section or in the yard like BRM, T-28 etc. If any part of a machine is likely to foul the adjacent line(s) while working, the Junior Engineer/Section Engineer (P. Way) shall request Station Master in writing to block the line(s). Such work shall only be undertaken if blocking of such adjoining line(s) has been permitted by the control and the Station Master and such adjoining lines have been protected.

**Para 4.6.3**

While exchanging private numbers with level crossings, the Station Master on either side shall inform all the level crossings equipped with telephones falling in the block section.

**Para 4.6.4**

While the track machines are moving in the block section in convoy, it will be the responsibility of the operators of these machines to maintain a minimum safe distance of 120 m from each other. If any of the machines is required to slowdown or stop due to some reason, the machine operator should ensure that red hand signal is displayed by waving vigorously. Where visibility is poor

such as curves and cuttings, appropriate speeds and safe distance should be maintained by the machine operators. While approaching the level crossings, operators of all track machines shall keep a vigil for any obstruction and whistle freely till the machine passes the level crossing.

**Railway's Additional Instruction** – The operator of the machine which slows down/stops shall display red hand signal by waving vigorously without fail. The operator of the machine in rear will always keep a sharp lookout for the movement of the machine in front and any signal from the operator/staff of that machine. He shall reduce speed of his machine on approach of level crossings, sharp curves, tunnels, points and crossings and poor visibility conditions like night time, foggy weather, rain or dust storms etc.

**Para 4.6.5**

When the machine is stabled, the operator shall ensure that it is clear of fouling marks and traps and not obstructing the adjacent line(s). He shall apply the hand brakes, skid etc., to prevent movement of the machine.

**Para 4.6.6**

The concerned points shall be set against the line on which the track machine is stabled and such points shall be secured with clamps or bolts and cotters and pad locks. The keys of such pad locks shall be kept in the personal custody of Station Master until the machine is ready to leave from siding or running line. The operator shall not relinquish charge until he has satisfied himself that the machine has been properly secured and protected as prescribed herein. During shunting on a line occupied by track machines, no machine shall be shunted without the presence of competent machine staff.

**Para 4.6.7**

Temporary buffers or skids shall be provided to prevent rolling of stabled machines.

**Para 4.6.8 (as per CS-3 & 4)**

Track machine working is likely to produce a dusty atmosphere and/or heavy noise pollution. Hence extra care is necessary at site to ensure safety of workers. For this, the following steps should be taken:

i) Hooters should be provided on the track machines. These hooters should preferably have remote control operation so that the lookout man standing around 150 m away from the track machine can operate the hooter to warn the staff working on/around the track machine about approaching train on adjoining track.

ii) Temporary 'Whistle Board' should be fixed on the adjoining track, which can be moved along with track machine worksite.

iii) It is necessary that all trains passing on the adjoining should be issued a caution order "OBSERVE HAND SIGNAL WHISTLE FREELY AND STOP, IF REQUIRED". Such caution order on the adjoining track is necessary due to high noise level caused by track machine and large concentration of staff working around it.

(iv) The vertical and lateral clearance for OHE, Signal post and any other structure should be checked and adjusted before clearing the Block. It shall be ensured by supervisor working with track machine that there should be no

infringement to Signal post, OHE and any other Structure as per schedule of Dimensions.

**Railway's Additional Instruction** – Sr DEN/DEN/ AEN/XEN(TM)/ AEN(TM) in whose jurisdiction machine is working should also check availability of hooters and temporary whistle boards at site, the issue of caution orders during their inspections.

**Para 4.7.1**

In the event of breakdown, the track machines shall be protected as per GR 6.03 and SR thereto by the machine staff, as directed by machine incharge.

**Para 4.7.3**

In case of failure of track machine in block section, the Junior Engineer/ Section Engineer (P. Way) may decide to push the disabled unit to the nearest station provided the brake power is in good condition. Otherwise, intimation shall be sent to the nearest Station Master through a messenger and to the Control through portable telephone asking for a light engine to tow the unit.

In case, machine incharge feels clearance of section is going to take long time, the assistance of Accident Relief Train shall be asked for immediately. Meanwhile the machine incharge shall take necessary action to rectify the defect(s).

**Para 4.8**

Each machine will run within the maximum permissible speed sanctioned for that type of machine on a particular section.

**Railway's Additional Instruction** – The speed as mentioned in annexure-4.3 of IRTMM shall be taken as the guidance and should never be exceeded when machine is self-propelled. However in ghat sections maximum speed should never exceed 60% of the speeds prescribed in Annexure-4.3 of IRTMM.

Proper caution order indicating maximum speed of the train when a track machine is attached to the train should be given to the train driver, through Station Master/Traffic Controller by the machine operator. The machine should be disengaged and lever secured properly before attaching the same in the train so as to avoid damage to gear system.

**Para 5.6 (including CS-5)**

The following precautions are essential for safe driving of the machine in sections involving steep gradients, sharp curves, deep cuttings high embankments etc.

- i) Drive only from the cabin corresponding to the direction of travel (except during small shunting movements where movement in opposite direction could be done with adequate precautions).
- ii) Do not drive the machine at speeds exceeding the prescribed speed for the section, this speed being further reduced over switches and speed restriction zones.
- iii) Never drive over slopes or descending gradients without putting into gear and do not switch off gear box key switch.

- iv) Do not let the RPM of the engine fall below 1000 and do not switch off the engine before the machine stops in gradient sections.
- v) Shift back to lower gears well in time in case of ascending/descending gradients.
- vi) Have a special check for the ZF gear box oil level and its working temperature.
- vii) Ensure proper working of pneumatic circuit and functioning of all components in the brake system.
- viii) Ensure availability of spares particularly in respect of items that are failure prone such as transmission gear like cardon shafts, coupling bolts etc. Availability of a skid is a must.
- ix) Also ensure proper working of horns and lights.
- x) Be on the look out for trespassers while negotiating sharp curves and also sound horns on such occasions.
- (xi) No run through movement shall be done in convoy while moving in Ghat Section. Only one machine shall be allowed to move for run through movement in Ghat Section at a time.

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(a) Normally machines shall not work in convoy while visibility of track is restricted due to sharp curves and steep gradients. Where the working of track machines in convoy is indispensable i.e. like deep screening, track relaying site etc., the necessary block protection shall be done as per para 806 of IRPWM and special precaution shall be taken as per para 811 of IRPWM for the first machine facing the direction of traffic in double line section and for the front and rear most machines in single line section.

(b) The minimum distance between the machines when working in convoy shall be 50 m to avoid collision between machines and danger to life of machine and P.Way staff working with machines.

(c) It shall be ensured that there is no infringement to that adjacent track due to any part of the machine working on the track.

#### **(B) CE'S CIRCULAR**

Vide CE/SER's circular no. 226, certain rules and procedures regarding working and movement of the track machines were framed. The important provisions of the same circular are reproduced below;

- 1.1 Track machine staff, operating the machines must have valid competency certificate issued by a Competent Officer of the Track Machine Organization authorizing him to operate the machine. For taking the machine in section for working or movement from one station to other station, the said staff should also have safety certificate issued by the Divisional Safety Officer to ensure that he is aware of safety rules pertaining to train operation.
- 1.2 Protection of line occupied by machine for working under traffic block, must be done by concerned P. Way Supervisor and in the absence of P.Way Supervisor, by the Machine Operator as per the laid down instructions in this regard given in the para 806 (1) of IRPWM.

- 1.3 Para No. 1227 of IRPWM on working of track machines should be followed.
- 1.4 It should be checked by AEN/TM & SSE/TT during their inspection of the machines that all the safety equipment including flasher light are available as laid down in para 4.4 of IRTMM and the same are in working condition. Any deficiency in this regard should be promptly made good by the Division/TT Organization.
- 2.1 As there is no proper route learning to track machine staff operating the machine, it should be ensured that when a machine is shifted from one station to other distant station and if the operator is not fully aware of the section/route, a P.Way Supervisor who is aware of that section/route must accompany the machine for the guidance of machine operator.
- 2.2 Camping Coach attached with machine should always remain in fit condition for movement and as such its schedule examination by TXR of the Division must be ensured. If there is no air brake system in the coach attached with the machine, it should be got done by the Division as early as possible.
- 2.3 The Division sparing the machine for other Division will ensure that the fuel tank is full to its capacity and one spare barrel of diesel oil is given to the machine before its departure to destination Division.
- 2.4 The destination Division in which machine has to work, will ensure that machine do not remain idle on its way for want of path.
- 2.5 For any reason, if any spare or consumable is required by the machine on its run, the concerned Division to which the machine is going to work will ensure availability of fuel, path etc. for which a responsible Supervisor shall be deputed with the machine by the receiving Division.

**ADDITIONAL PRECAUTIONS & INSTRUCTIONS**

In addition to the above, certain additional instructions regarding the working and movement of track machines and safety at track machine sites are given below;

- 1. For Non-signal movement of machine, operator must seek Pilot In/Out memo from the station. No such practice of relaying signal through body gesticulation should be accepted as authority for movement of machine in to the station.
- 2. Operator of machine must not move the machine over a point and crossing when it has not been clamped if it is so required like for hand operated points. Also, operator of UNIMAT should tamp Point & Crossing only after ensuring that point has been clamped after removing the stretcher bars.
- 3. No track machine should be allowed in to a block section if its' emergency system is not in working order. Functioning of emergency system should be checked daily as a part of daily maintenance of machine.
- 4. Each machine site should be equipped with the hooter arrangement which can be operated remotely or through Walkie-Talkie system, to relay audible warning well in advance to all the staff working near machine, in

case of double and multiple line sections.

5. Devices in track machine to protect the machine from damage during its working, must remain functional and to be used regularly.
6. Operator of track machine must ensure that necessary track protection on adjacent running line is available whenever such unit of the machine like wings of BRM, Chain trough of BCM and FRM, are extended during working as it may cause infringement to adjacent running lines.

**7. WORKING IN ELECTRIFIED TERRITORIES:**

- 7.1. No staff should be allowed to work or go within a distance of 2 m of the live parts of the OHE conductor without ensuring that a power block has been taken and the conductor has been earthed.
- 7.2. Track machines shall be painted with the danger sign and warning about live OHE wires. Instructions regarding not to climb on the top of the machine may also be written on both the sides of the machines, irrespective of the fact that machines are working in electrified territory or not.
- 7.3. Do's & Dont's of working in electrified territory for engineering staff should be followed without fail.

**8. OTHER SAFETY PRECAUTIONS:**

- 8.1. All the track machine staff should be counselled about taking adequate personal safety measures e.g. wearing hard leather shoes, using helmets and hand gloves whenever handling heavy machine parts.
- 8.2. All the track machine staff should also be made aware about dangers due to traffic on the adjoining lines when working in double and multiple lines sections. They should be strictly prohibited from going near the other line or stand on the other line
- 8.3. The staff should also be counselled about protection rule in case of emergency and first aid in case of injuries.

**9. ASSURANCE REGISTER:**

- 9.1. An assurance register should be kept in each machine in which Do's & Dont's and other safety rules to the staff should be pasted and signature of all the machine staff will be taken as a token of that they have read and understood the safety norms. Whenever a new staff joins the machine whether he has worked in any of the machine or not, he should be counselled for the safety norms and the signature taken in the assurance register with the mention of date. This will apply to all categories of staff working in the machine. The assurance register will be kept updated by the machine in-charge and the operator of the machine in case of machine in-charge not available for any reason.

SSE/TMs and AEN/TMs of the division shall ensure that assurance register is kept updated by checking these registers during their visits to the machines.

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It must be ensured by all the Divisions that the above instructions related to working and movement of track machines, are adhered to without any exception.

  
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Chief Track Engineer

No. W.4/374/Pt.I/CE Circular/

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Copy to:

Sr DEN(Co)/KUR, SBP & WAT – for information and circulation to all concerned including track machine officials.

All HODs, Dy HODs and Sr Scale and Jr Scale officer of Engg. Dept. at HQ - for information please.

Secy To GM – for kind information to GM.