एल.डब्ल्यू.आर. को तनाव मुक्त करना
DESTRESSING OF LWR

1. परिचय / Introduction

De-stressing is the operation undertaken with or without rail tensor to secure stress free conditions in the LWR/CWR at the desired/specified rail temperature. The work of destressing shall be done during a traffic block under the personal supervision of a JE or SSE/P.Way.

2. डीस्ट्रेससिंग तापमान / Destressing Temperature (t_d)

t_d is the average rail temperature during the period of fastening the rails to the sleepers after destressing LWR without the use of rail tensor. If rail tensor is used, t_d for all practical purposes is equal to t_o as defined in para 1.13 LWR manual. Range of t_d or t_o shall be within the limits of rail temperature shown below:-

a) Temperature Zone - I, II, III

Rail Section	Range
All sections	t_m to t_m+ 5^0C

b) Temperature Zone - IV

Rail Section	Range
i) 52kg & heavier	t_m + 5^0C to t_m +10^0C
ii) Others	t_m to t_m + 5^0C

3. रखरखाव के दौरान डीस्ट्रेससिंग / De-stressing During Maintenance

Abnormal behavior of LWR/CWR whenever gets manifested in one or more of the following, de-stressing shall be undertaken:

a) When the gap observed at SEJ
I. differs beyond limits specified in para 5.6.2 & 5.6.3 of LWR manual
II. exceeds the maximum designed gap of SEJ
III. When tip of tongue rail/corner of Stock Rail crosses the reference line.

b) After following special track maintenance operations in LWR
I. Through fittings renewal
II. Deep screening / mechanized cleaning of ballast
III. Lowering/Lifting of track
IV. Major realignment of curves
V. Sleeper renewal other than casual renewals
VI. Rehabilitation of bridges and formation causing disturbance to track

c) After restoration of track following an unusual occurrence
Unusual occurrences in LWR comprise of the following:-
I. Rail fractures or replacement of defective rail/ glued joint
II. Damage to SEJ/buffer rails
III. Buckling or tendency towards buckling
IV. Factors causing disturbance to LWR such as accidents, breaches etc.

d) If number of locations where temporary repairs have been done exceed three per km.

Destressing is done with or without rail Tensor. Here procedure is described for destressing of LWR on PSC sleepers track without use of Rail tensors.

4. रेल टेंसर के बिना एल. डब्ल्यू. आर. को तनावमुक्त करने की प्रक्रिया / Procedure for distressing of LWR on PSC sleeper track without use of Rail tensors.

4.1 Precautions to be taken

I. Whenever, it is decided to carry-out distressing operation, the complete length of LWR (i.e. from one SEJ to other) to be distressed.
II. The welded panel of about 500 m length on 4^0 curve to about 1000 m length on straight track it to be de-stressed at a time.
III. De-stressing of both the rails should be carried-out simultaneously.

IV. De-stressing operation should not be planned, when there is any chance of rain.

V. De-stressing to be carried out only during afternoon (i.e. after 12.00 hrs.) because rail temperature shoots-up rapidly during forenoon.

4.2 डीस्ट्रेससिंग के एक दिन पहले का काम / Works one day in advance of de-stressing

I. ERCs to be removed and re-fixed one by one after greasing to ensure that no ERC is in jammed condition.

II. The rail temperature to be recorded at every half intervals after 12.00 hrs., to ensure the time at which rail temperature reaches in the range of td^{0}C.

4.3 डीस्ट्रेससिंग के दिन काम / Works on the day of de-stressing

4.3.1 ट्रैफिक ब्लॉक से पहले / Before traffic block

I. About 40 gang-men to be arranged from amongst existing and adjoining gangs.

II. A speed restriction of 30 kmph to be imposed and two cuts at 'Á' to be made with the help of abrasive rail cutter at a gap of 23 mm in LWR at a distance of about 500 m to 1000m depending on curvature of track, starting from one end of SEJ and to be clamped with joggled fish plates and screw clamps along with the released rail out closure of 23 mm and supported on wooden block(s).

III. In case of curved track, one complete curve to be de-stressed at a time as far as possible, so that the location 'Á' falls on straight.

IV. Alternate ERCs to be removed in this stretch.

4.3.2 ट्रैफिक ब्लॉक के दौरान / During traffic block

I. A traffic block of about 2 hours is to be taken one hour in advance of the time when rail temperature had reached equal to tm+5^{0}C on previous day.

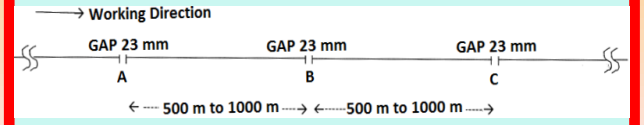
II. Balance alternate ERCs to be removed starting from both ends towards centre without leaving any ERC in position and rails to be lifted centrally over rail seat and placed on rollers at every 15th sleeper to permit the rails to move freely. In case of curve track, the rails should also be provided with lateral support with the help of side rollers. so that the rail panel remains centrally above respective rail seats. The rails should be struck with wooden mallet to help in free movement.

III. The existing damaged / unserviceable GRPs to be replaced by new GRPs.

IV. When the rail temperature is about to reach tm + 5°C, the SEJ end of the rail panel to he adjusted to the mean position so as to maintain gap as specified in Para 5.6 of LWR manual. The gap available at end 'A' to be checked and if required one more cut on existing rail of track adjacent to 'A' to be made by abrasive rail cutter to ensure housing of rail panels. Then the rail panels are to be put -back to rail seat and alternate ERCs to be fixed starting from middle towards the ends. The tightening of alternate ERCs to be completed when rail temperature is td °C.

V. The cut end 'A' of the rail panel along with suitable cut -rail closure (if the gap exceeds 23mm) to be clamped with joggled fish plates and screw clamps and to be supported properly on wooden block(s). Then the traffic blocks to be cancelled.

VI. Balance alternate ERCs also to be re-fixed at the earliest.



5. एलडब्ल्यूआर के आगामी पैनल की डीस्ट्रेसिंग / De-stressing of subsequent panel of LWR

I. Similar operations as indicated vide para 4.2 and 4.3 above to be repeated for de-stressing of subsequent panels of LWR, till other end of SEJ is reached. However, a gap of 23 to 25 mm to be kept for welding at cut end 'A' (previously made) at td ^{0}C while performing operation as indicated at para 4.3.2 (IV) for subsequent panel. Gap to be made by one or two cuts at other end of next panel, say at 'B' will depend on final gap at 'A' after performing operation in para 4.3.2 (IV) above.

II. During welding of the cut end 'A', rail temperature to be td^{0}C and sleeper fastenings for a length equal to breathing length (about 70 m in case of 52 kg. Rail/about 80 m in case of 60 kg. Rail) to be opened on both sides completely under traffic block.

6. रेल टेंसर के उपयोग के साथ एलडब्ल्यूआर को तनावमुक्त करना /Destressing of LWR with the use of rail tensors

6.1 सामान्य /General

i) The work of de-stressing shall be done during a traffic block under the personal supervision of a JE or SSE/P.Way.

ii) It is preferable to impose a speed restriction of 30 km/h before actually obtaining the traffic block and to loosen/remove fastenings on alternate sleepers to reduce total duration of the traffic block.

6.2 Prevailing Rail Temperature (t_p) is the rail temperature prevailing at the time when any operation connected with destressing is carried out.

6.3 Stress-free Temperature (t_o) is the rail temperature at which the rail is free of thermal stress. When tensors are utilised for the destressing operation the work has to be carried out at t_p, which shall be lower than stress-free temperature.

The extension to be applied by the tensor shall be calculated from the following formula:

Extension = L α (t_o - t_p)
where 'L' is the length of segment of the rail to which the extension is applied and 'α ' is the coefficient of linear expansion of rail steel.

6.4 Rail Tensor is a hydraulic or mechanical device used for stretching the rail physically.

6.5 Anchor Length (l_a) is the length of track required to resist the pull exerted on rails by the rail tensor at temperature tp. For practical purposes, this may be taken as equal to 2.5 metre per degree Celsius of (t_o – t_p) for BG and 4.5 metre per degree Celsius of (t_o - t_p) for MG.

6.6 संचालन के अनुक्रम / Sequence of operations

The procedure to be adopted for destressing consists of the following steps:-

i) Remove impediments to free movement of rail such as rail anchors, guard rails, check rails etc.

ii) Create gap of about 1 metre at the centre of LWR during a traffic block and insert a closure rail there at a restricted speed.

iii) Mark anchor lengths at either end of the proposed LWR.

Notes:

a) Anchor length shall be determined on the basis of the lowest value of t_p at which destressing is likely to be carried out.

b) Anchor length shall be increased suitably if the fastenings, rubber pads, liners or ballast conditions are poor.

iv) Erect marker pillars at the ends of anchor lengths on either side and at 100 metre intervals thereafter.

v) Obtain a traffic block when tp is less than the desired installation temperature (t_o), remove the closure rail at the centre and unfasten the full length of rails leaving only the anchor lengths at either end. Mount the rails on the rollers.

Note :

Side rollers shall also be used while undertaking destressing on curved track. Side supports on the inside of curve should be spaced at every n^{th} sleeper,

Where, n =
Radius of curve (R) x No. of sleepers per rail length / {50 x (t_o-t_p)}

Outside supports shall be used in addition at the rate of one for every three inside supports.

vi) Fix rail tensor across the gap at the centre and apply tension so as to get the required amount of extension as provided in Annexure –VII of LWR manual.

vii) Re-fasten the rails starting from the anchor lengths at either end after removing the rollers progressively and adjusting tension at the rail tensor to make sure that the required extension has been achieved at each marker pillar.

viii) Put paint marks on either side of the gap at the centre, spanning over the gap at a distance of 6.5 metre. Insert a closure rail of a length equal to (6.5 metre - 2 gaps for welding +1 mm for saw cut ends) and clamp.

ix) Release and remove the rail tensor.

ix) During another traffic block, weld both the joints of the closure rail at the centre.

ix) Equalise stress at the centre and at the anchor lengths.

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हमारा उद्देश्य /OUR OBJECTIVE

To upgrade maintenance technologies and methodologies and achieve improvements in productivity and performance of all railway assets and manpower which inter alia would cover reliability, availability for use, utilisation and efficiency.

भारत सरकार - GOVERNMENT OF INDIA
रेल मंत्रालय - MINISTRY OF RAILWAYS

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(An ISO: 9001-2008 certified organization)

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