

ACKNOWLEDGEMENT:

This report has been prepared, based on the Field trials of High Performance Rail Clamps on nominated Zonal Railways by a team of Track Design Directorate comprising the following officials:

1. Sh. Mahadeo Mahato, SSE/Track/RDSO (Author)
2. Sh. Akhilesh Kumar, ADE/Track/RDSO (Co-Author)

Assisted by:

Sh. Prince Srivastav, JE/Track/RDSO

Under guidance of:

Sh. J. R. Meena, JDST-VIII/RDSO

Details of firm's representatives of the HPRC clamps:**Robel Clamp:**

1. Trainer for Zonal Railways: Mr. Philip Hahn, OEM representative
2. Firm's representatives closely involved for field trials: Mr. Philip Hahn & Mr. Suraj Kumar, Manager-Technical Sales (M/s Premier India Agencies)

Codiun Clamp:

1. Trainer for Zonal Railways: Mr. Ian Dixon, Inventor
2. Firm's representatives closely involved for field trials:
Mr. Vinay Agnihotri(MD), Mr. R.K. Sharma(ED), Mr. Sohan Shah (Technician) & Mr. Sateesh Tiwari (Technician) -M/s Wontech Engg. Pvt. Ltd.

**FIELD TRIAL SCHEME FOR HIGH PERFORMANCE RAIL CLAMP (HPRC) OF
ROBEL CLAMP WITH FISHPLATES OF INDIAN RAILWAYS**

(Trial proposed on NR, NCR & WR)

1. Purpose: These High-Performance Rail Clamps (HPRC) will be used in-

- Emergencies i.e. Rail fracture/Weld failure
- In case of cut in LWR due to emergent situation
- While doing TRR or De- Stressing of LWR after successful field trial.

A. To be tested for:

- Fitment at various locations of cut/fractures for 52 kg and 60 kg rail section on PSC sleepers.
- Holding of rail ends against tensile forces.
- Holding of fishplates &/ or Joggled Fishplates after passing of trains i.e. No loosening of bolts of HPRC

B. Field Trials of offered HP Rail Clamps: The field trials of HPRC is to be done for the following drawings of Standard Fishplates/ Joggled Fishplates for 52 kg & 60 kg rails:

ROBEL Clamps: The field trials of **Robel** clamps shall be conducted with following IR fishplates as offered by firm:

Table-A

SN	Fishplates		Offered clamps for respective fishplates & applying torque	No. of Clamps per joint	Rate per clamp in Rs. (Excluding GST & Freight)
1	RDSO/T-3714 (Length= 1100 mm)	52 kg	ROBEL 68.05 version 6 (Torque-580 N-m)	1	94,390/-
2		60 kg	ROBEL 68.05 version 13 (Torque-580 N-m)	2	47,487/-
3	RDSO/T-5915 (Length= 1000 mm)	52 kg	ROBEL 68.05 version 6 (Torque-580 N-m)	1	94,390/-
4	RDSO/T-5916 (Length= 1000 mm)	60 kg	ROBEL 68.05 version 13 (Torque-580 N-m)	2	47,487/-
Joggled Fishplates					
1	RDSO/T-5848 Alt-1 (Length= 686 mm)	52 kg	Desired version to be supplied by the firm (Torque-As per new design)	To be quoted by the firm	
2	RDSO/T-5849 Alt-1 (Length= 686 mm)	60 kg			

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Note: Against the RFP, rates were quoted by the firm for minimum ordered quantity of 500 Units.

2. CRITERIA TO BE FOLLOWED FOR SELECTION OF FIELD TRIAL LOCATIONS BY NOMINATED ZONAL RAILWAYS:

The trial item is a safety item; hence 24 hrs stationary watchman shall be posted for tightening of clamp as per the stipulations and to monitor the performance of HPRC, round the clock.

A. PHASE-A (SPEED POTENTIAL 30 kmph to 50 kmph): Following provisions shall be followed:

- i) The field trial shall be started by using the clamp on loop line track with 30kmph speed potential for the period as specified in **Table-1** below.
- ii) For trial of HPRC, Torque (580 N-m as specified) shall be monitored and recorded in **Annexure-IIA**
- iii) After satisfactory performance of 30kmph on loop line track, the trial of HPRC shall be shifted to main line track, by imposing Speed Restrictions as per **Table-1**.
- iv) The special attention i. e. deep screening, destressing etc. given to track during the field trial period should be specifically recorded in the proforma with the detailed reason & date.
- v) During entire field trial, if any HPRC is changed due to crack/Breakage/Corrosion in Fishplate and or HPRC or any reason, the same must be recorded in **Annexure-IIA**.
- vi) In case, frequent/ abnormal loosening of clamp torque is observed or any adverse performance/ unsafe condition is observed, the trial shall be discontinued and appropriate action shall be taken to ensure safe passage of traffic under intimation to RDSO.

Table-1

S.N	Speed Restriction	Test sites location	Total trial period	Action to be taken
1.	30 kmph	Loop line track	7 days	Torque of bolts in N-m will be monitored after passing of every train. (Torque shall be measured by dial type Torque Wrench)
2.	30 kmph	Main line track	3 days	
3.	50 kmph*		7 days	

Trial shall preferably be continued on the same track locations of main line and shall be continued further if performance found satisfactory in previous speed. The details of monitoring shall be recorded in **Annexure-IIA**.

- B. After completion of PHASE-A field trial, Zonal Railways shall submit the performance report to RDSO. Subsequently, after getting further instruction from Railway Board/RDSO the trial of PHASE-B shall be conducted as per instructions given under PHASE-B.**
- C. PHASE-B (SPEED POTENTIAL UP TO 100 kmph):** Following provisions shall be followed:
- i)** After getting satisfactory performance for speed potential for 30kmph- 50kmph (**Phase-A**) and instructions received from Railway Board/RDSO, the trial shall be done on main line track for monitoring the performance up to 100 kmph. Accordingly, for this phase of trial, Zonal Railways shall choose main line track having a speed potential of 100 kmph or more.
 - ii)** The trial on main line track shall be started as per the speed specified in **Table-2**. The trial shall be started with speed 50 kmph and increased as per the guidance mentioned under **Table-2**.
 - iii)** The trial should preferably cover the stretches with sharp curves, steep gradients, heavy density routes, coastal areas etc. so as to represent different operating conditions which the product is likely to encounter during regular use. Trial shall be conducted preferably on each component as per drawings tabulated in para **1(B)**.
 - iv)** The speed of trial shall be increased after getting satisfactory passing of trains in previous lower speed. Trial shall be conducted upto speed 100 kmph, if performance found satisfactory in previous lower speed.
 - v)** Monitoring of trials shall be done for different speed potential for a period as specified under **Table-2**.
 - vi)** Details of monitoring shall be recorded in **Annexure-IIA**. Separate Annexures to be filled for HPRC of different types/drawings. The torque shall be measured with dial type torque wrench and filled in the desired column of **Annexure-IIA**.
 - vii)** The special attention given to track i. e. deep screening, destressing etc. during the field trial period should be specifically recorded in the **Annexure-IIA** with the detailed reason & date.

During entire field trial, if any HPRC is changed due any crack/Breakage/Corrosion in Fishplate and or HPRC or any other reason, the same must be recorded in the **Annexure-IIA**.

ix) In case, frequent/ abnormal loosening of clamp torque is observed or any adverse performance/ unsafe condition is observed, the trial shall be discontinued and appropriate action shall be taken to ensure safe passage of traffic under intimation to RDSO.

Table-2

S.N.	Speed Restriction	Test sites location	Total trial period	Action to be taken
1.	50 kmph*	Main line track	3 days	Torque of bolts in N-m will be monitored after passing of every train. (Torque shall be measured with Dial type Torque wrench)
2.	75 kmph*		20 days	
3.	100 kmph*		50 days	

* Trials shall preferably be continued in the same track locations and shall be continued further if performance found satisfactory in previous speed potential.

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Proforma for Monitoring the Performance of 'High Performance Rail Clamp'(HPRC)

(Trial proposed on NR, NCR & WR)

Firm's name:

Make of the Clamp: Robel clamp

1.0 General information:

- (a) Railway/ Division.....
- (b) Section (Name of line or branch).....
- (c) Traffic density (GMT).....(d) Sectional speed.....
- (e) Rail Section..... (f) Sleeper Density.....,
- (g) Ballast cushion.....mm (h) Condition of ballast compaction.....
- (i) Between stations.....to.....
- (j) Kilometerage.....to.....
- (k) Straight/Curve (Degree of curvature).....
- (l) Fishplate drawing no.....
- (m) High Performance Rail clamp version (as specified by OEM).....
- (n) Monitoring period from date.....to.....
- (o)Total GMT passed during monitoring period.....GMT

2.0 GENERAL REMARKS (observed during trials):**a) Regarding shifting & crack/breakage of:-**

Fishplates:.....

b) Regarding corrosion of:-

- 1) Rails:.....
- 2) Fishplates:.....

c) Other Remarks (If any):

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3.0 Details of Monitoring for HPRC field trial of Robel clamp (Trial proposed on NR, NCR & WR)

Annexure-IIA (Contd..)

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Note:

- i. **Separate Annexure shall be used for different Fishplate Drawings for separate locations.**
- ii. *** For 52 Kg Rails (Fishplate): Only one (Long Version clamp) of ROBEL 68.05 version 6 will be used on joint, that will be called as Clamp-1.**

For 60 Kg Rails (Fishplate): Two clamps for ROBEL 68.05 version 13 (Short Version) will be used on joint that will be called as Clamp-1 & Clamp-2.

iii. For Joggled Fishplates - Two numbers of clamps shall be used

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Annexure-2

FIELD TRIAL SCHEME FOR HIGH PERFORMANCE RAIL CLAMP (HPRC) OF CUDIUN CLAMP WITH FISHPLATES OF INDIAN RAILWAYS

(Trial proposed on SCR, ECR & SECR)

1. **Purpose:** These High-Performance Rail Clamps (HPRC) will be used in-
 - (a) Emergencies i.e. Rail fracture/Weld failure
 - (b) In case of cut in LWR due to emergent situation
 - (c) While doing TRR or De-Stressing of LWR after successful field trial.
- A. **To be tested for:**
 - (a) Fitment at various locations of cut/fractures for 52 kg and 60 kg rail section on PSC sleepers.
 - (b) Holding of rail ends against tensile forces.
 - (c) Holding of fishplates &/ or Joggled Fishplates after passing of trains i.e. No loosening of bolts of HPRC.
- B. **Field Trials of offered HP Rail Clamps:** The field trials of HPRC is to be done for the following drawings of Standard Fishplates/ Joggled Fishplates for 52 kg & 60 kg rails:

Codiun Clamp: The field trials of Codiun clamps shall be conducted with following IR fishplates as offered by firm:

Table-A

SN	Fishplates		Offered clamps for respective fishplates & applying torque	No. of Clamps per joint	Rate per Clamp in Rs. (Excluding GST & Freight)
1	RDSO/T-3714 (Length= 1100 mm)	52 kg	Codiun Clamp MK8 (Torque-400N-m)	2	98,236/-
2		60 kg		2	
3	RDSO/T-5850 to RDSO/T-5851 (Length= 1100 mm)	52 kg		2	
4		60 kg		2	
5	RDSO/T-5915 (Length= 1000 mm)	52 kg		2	
6	RDSO/T-5916 (Length= 1000 mm)	60 kg		2	
Joggled Fishplates					
1	RDSO/T-5551 (Length= 490 mm)	52 kg	Codiun Clamp MK8 (Torque-400N-m)	2	

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Table-1

S.N	Speed Restriction	Test sites location	Total trial period	Action to be taken
1.	30 kmph	Loop line track	7 days	Torque of bolts in N-m will be monitored after passing of every train. (Torque shall be measured by dial type Torque Wrench)
2.	30 kmph	Main line track	3 days	
3.	50 kmph*		7 days	

*Trial shall preferably be continued on the same track locations of main line and shall be continued further if performance found satisfactory in previous speed. The details of monitoring shall be recorded in **Annexure-2A**.

B. After completion of PHASE-A field trial, Zonal Railways shall submit the performance report to RDSO. Subsequently, after getting further instruction from Railway Board/RDSO the trial of PHASE-B shall be conducted as per instruction given under PHASE-B.

C. PHASE-B (SPEED POTENTIAL UP TO 100 kmph): Following provisions shall be followed:

- i) After getting satisfactory performance for speed potential for 30kmph- 50kmph (**Phase-A**) and instructions received from Railway Board/RDSO, the trial shall be done on main line track for monitoring the performance up to 100 kmph. Accordingly, for this phase of trial, Zonal Railways shall choose main line track having a speed potential of 100 kmph or more.
- ii) The trial on main line track shall be started as per the speed specified in **Table-2**. The trial shall be started with speed 50 kmph and increased as per the guidance mentioned under **Table-2**.
- iii) The trial should preferably cover the stretches with sharp curves, steep gradients, heavy density routes, coastal areas etc. so as to represent different operating conditions which the product is likely to encounter during regular use. Trial shall be conducted preferably on each component as per drawings tabulated in para **1(B)**.
- iv) The speed of trial shall be increased after getting satisfactory passing of trains in previous lower speed. Trial shall be conducted upto speed 100 kmph, if performance found satisfactory in previous lower speed.
- v) Monitoring of trials shall be done for different speed potential for a period as

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