भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय MINISTRY OF RAILWAYS
(रेलवे बोर्ड RAILWAY BOARD)

No.2019/M(N)/204/6 (E. No. 3324111) Dated: 27.12.2023

The Principal Chief Mechanical Engineers
All Zonal Railways

Sub: Repair Procedures of Open Wagons.

Ref: RDSO's letter No MW/BOXHNL dated 30.11.2023 (copy enclosed).

Please find enclosed the repair guidelines for repairing cracks in BOXNHL wagons and other variants that have been issued by RDSO vide referred letter.

RDSO has also expressed difficulties in deputing an official for inspection and suggesting repair methodology in each case individually. It is therefore requested that deputing an RDSO official may be kept to the minimum unless deemed utmost necessary, since the Wagon directorate of RDSO has limited resources.

DA: As above

27.12.23

(Happy Walia)
EDME/Freight
Railway Board
Tel no. - 011-23047432
Email: edmef@rb.railnet.gov.in

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Fax : 91-0522-2452494
Tele/Fax: 0522- 2465773

Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011
DID (0522)2450115
DID(0522)2465310

No. MW/BOXNHL — As signed

EDME (Freight),
Railway Board,
Rail Bhawan,
New Delhi.

Sub: Repair Procedures of Open wagons.
Ref : Guideline for repair of damaged BOXNHL wagon **GL/Repair/BOXNHL/2022** issued vide letter No. MW/BOXNHL dated 17.06.2022.

1. The initial design of centre sill of BOXNHL wagon was of three pieces. This three piece design consisted two hot rolled end centre sills and a middle centre sill of CRF section between the two end centre-sills. The middle portion of centre sill has been strengthened by the addition of three stiffening plates at the bottom of flange. Approximately 5000 BOXNHL wagons have been manufactured with three piece centre sill.
2. The design of centre sill was further modified. The three piece centre sill was replaced by single piece CRF section Centre sill. From 2010, BOXNHL wagon is being produced with single piece CRF section centre sill.
3. Railways/Workshops/ROH depots have reported cracks in both designs of centre sills of BOXNHL wagons. For repair of cracks in both designs of centre sills of BOXNHL wagons, RDSO has issued following repair guidelines.

SN	Repair guidelines title with No.	Letter no. & date	Applicability
1	Recommended repairs for cases of weld failure in side stanchion of BOXNHL wagon. **(WD-14013-S-01)**	MW/BOXNHL dated 29.05.14	• Applicable for repair of weld failure of side stanchion C-channel with side stanchion back plate near sole bar location.
2	Failure in Bolster Bottom gusset plate of BOXNHL wagon in POH.	MW/BOXNHL dated 23.06.14	• Repair of gap between bolster bottom gusset plate and pivot filler support plate. • Repair of gap due to improper manufacturing practice.
3	Procedure for repair of centre sill of BOXNHL (Design-A&B) wagon **(WD-16002-S-01 Alt 1)**	MW/BOXNHL dated 08.01.16 & 21.11.17	• Repair of cracks developed in centre between bolsters. • Cracks developed in centre sill bottom flange and web.
4	Strengthen of centre sill during ROH/POH of BOXNHL wagon. **(WD-18051-S-01)**	MW/BOXNHL dated 02.07.18 & 20.05.22	• Strengthening of centre sill as preventive measure to avoid cracks between bolster.
5	Procedure for repair of defects/cracks in centre sill **(WD-20035-S-01 & 02)**	MW/BOXNHL dated 15.06.22	• Repair of cracks developed between bolster & headstock at back stop location.
6	Guideline for repair of damaged BOXNHL wagon “**GL/Repair/BOXNHL/2022**”	MW/BOXNHL dated 17.06.22	• Generalized repair procedures for repair of damages in BOXNHL wagon.
7	Centre sill repair for	MW/BOXNHL	• Unique type crack developed in centre

	Longitudinal crack at back stop location **(WD-22045-S-01)**	dated 15.06.22	sill near back stop location. • Repair procedure developed by wagon repair workshop. This has been included in RDSO issued guidelines for repair.
8	Repair procedure of bulge HAT section at draft gear location in BOXN wagon. **(WD-05066-S-01)**	Issued to all workshops of IR.	• Repair of centre sill at draft gear location where thinning of centre web has occurred.

4. The above issued RDSO's guidelines for repair of BOXNHL wagons are also applicable for repair of similar types of failures in other variants of BOXN/BOXNLW wagons.

5. Assessment of repairability of damaged BOXNHL, BOXN variants, BOXNLW etc. wagons should be done by concerned workshop/Zonal Railways, following RDSO's issued repair guidelines. Any wagon which cannot be repaired using RDSO issued repair procedures, Zonal Railways/Workshop should take decisions as per the extant guidelines.

6. However, it is observed that Zonal Railways are making repeated references for deputing RDSO officials for inspection and suggesting repair methodology in individual cases. Owing to limited resources, deputing RDSO's officials not only lead to delay but also affect works of Wagon Dte.

7. It is therefore requested that suitable guidelines may be issued to Zonal Railways to follow RDSO issued repair procedure and deputing of official from wagon design dte. for repair of individual wagon should be dispensed with.

DA: As above

Digitally Signed by Arvind Kumar
(Arvind Kumar)
Jr. Director/Wagon
For Director General/RDSO
Date: 30-11-2023 11:27:15
Reason: Approved

SL-1603

फैक्स / Fax : 91-0522-2452494
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK'Lucknow
टेलीफोन / Tele: 2465773 (DOT)
42921 (Rly.)

सत्यमेव जयते

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ –226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

No. MW/BOXNHL

May 29, 2014

मुख्य यांत्रिक अभियंता (यांत्रिक),

1. मध्य रेलवे, सी.एस.टी., मुम्बई–400 001
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता–700 001
3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली–110 001
4. दक्षिण रेलवे, पार्क टाउन, एस.सी.ओ– चेन्नई.600 003
5. दक्षिण मध्य रेलवे, सिकन्दराबाद,–500 371
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता.700 043
7. उत्तर पूर्व रेलवे, गोरखपुर–281 001
8. उत्तर पूर्व फ्रन्टियर रेलवे, मालीगॉव, गुवाहाटी.781 001
9. पश्चिम रेलवे, चर्चगेट, मुम्बई–400 020
10. पूर्व मध्य रेलवे, हाजीपुर, बिहार–844 101
11. उत्तर मध्य रेलवे, इलाहाबाद–211001
12. उत्तर पश्चिम रेलवे, जयपुर–302 006
13. दक्षिण पश्चिम रेलवे, बंगलौर–560 023
14. पश्चिम मध्य रेलवे, जबलपुर–482 2201
15. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्पलेक्स, बिलासपुर – 495004
16. ईस्ट कोस्ट रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर, उड़ीसा–016

Sub: Recommended repair in weld failures reported in side stanchion of BOXNHL wagons

Ref: (i) Reported subject failures vide ECR letter o. ECR/MEC/WAG/456 dtd 25.04.14
(ii) Subject failures highlighted by Sr. DME/MGS & Sr. DME/ECR during Wagon Builders meeting at RDSO on 11.12.2013.
(iii) Subject failures reported by SECR.
(iv) Dir, I&L, Kolkata letter No. Wagon. General dated 31.01.2014
(v) This office letter of even no. dated 31.01.2014.
(vi) Deliberations on the subject in the 7th WMG.
(vii) Trial fitment of recommended repair at MGS, ROH Depot on 22/23.04.2014

References above, Zonal Railways have been reporting weld failures in side stanchions used in BOXNHL wagons.

The subject issue has been studied/ inspected by RDSO. The reported failures are essentially weld joint failures of side stanchions C channel with the back plate. The failures are owing to manufacturing shortcomings – poor/no welding penetration or poor/no welding of C channel with back plate.

Despite the reported failures being the result of incorrect manufacturing, in order to totally eliminate the reported failures, the side stanchion design has been altered to eliminate the failing weld joint and the modified drawings communicated to all Wagon Builders. It is expected that all new BOXNHL wagons would be manufactured with the modified side stanchion design, thus eliminating the possibility of the reported weld failures.

For existing wagons, kindly find enclosed a sketch detailing the recommended repair that needs to be carried out by Zonal Railways on side stanchions wherein the reported weld failures are observed. Kindly note that a trial repair/fitment has been done by ECR(reference (vii) above) and the enclosed sketch has been finalized, based on the feedback gathered during the above trial repair.

Kindly note that the enclosed sketch is by no means the only suitable repair method and in case Zonal Railways can suggest a simpler/more effective/more practical repair procedure, the same be kindly communicated to RDSO. RDSO shall look forward to and evaluate all such suggestions. Kindly also note that the side stanchion with reported weld failures should be necessarily attended to, in order to avoid further, more serious failures or possible obstructions/ infringements to IR-SOD by bulging/broken/distorted side stanchion in BOXNHL wagons.

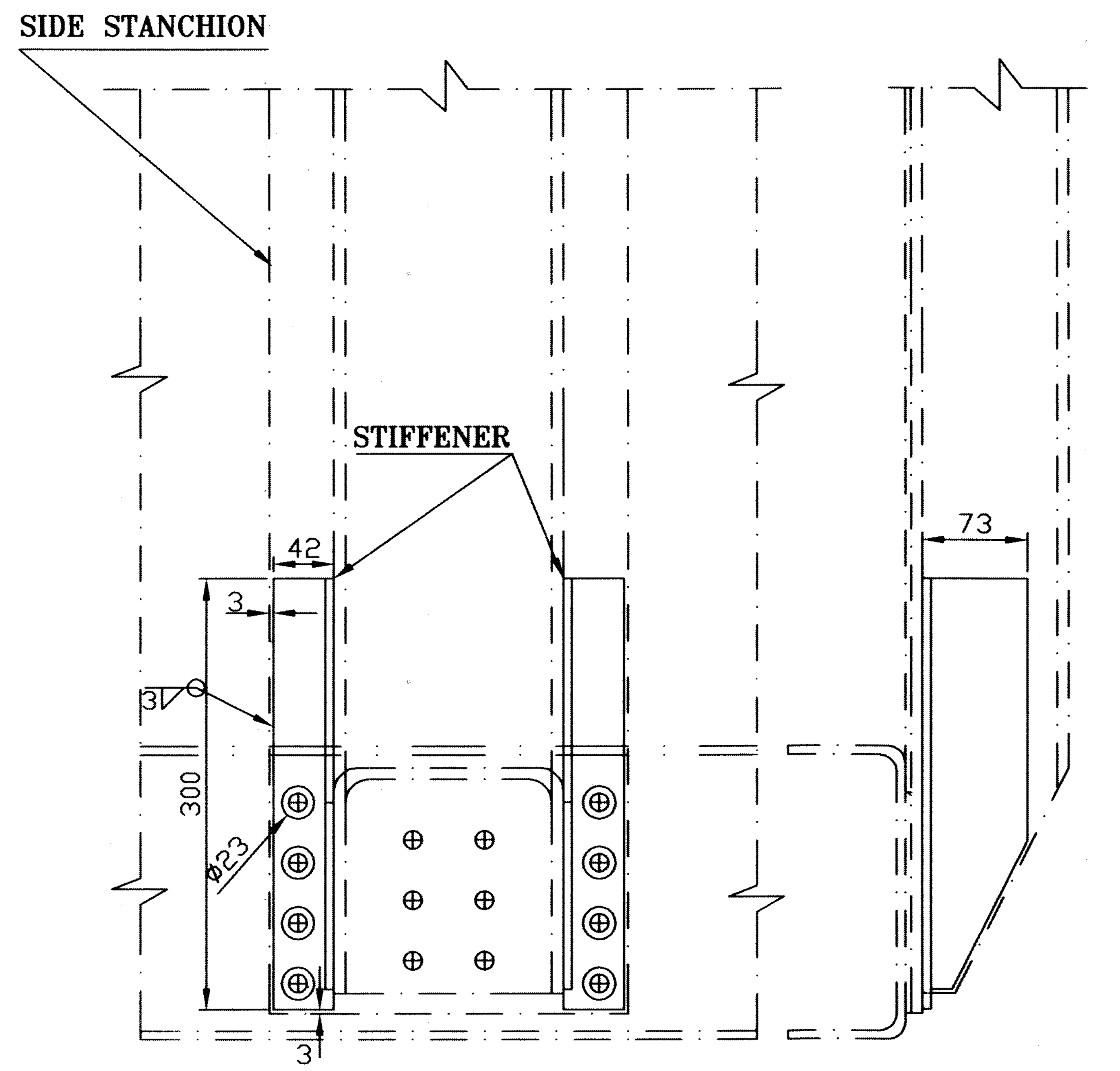
D. A. As Above

E-mail to CME's 30/05/2014

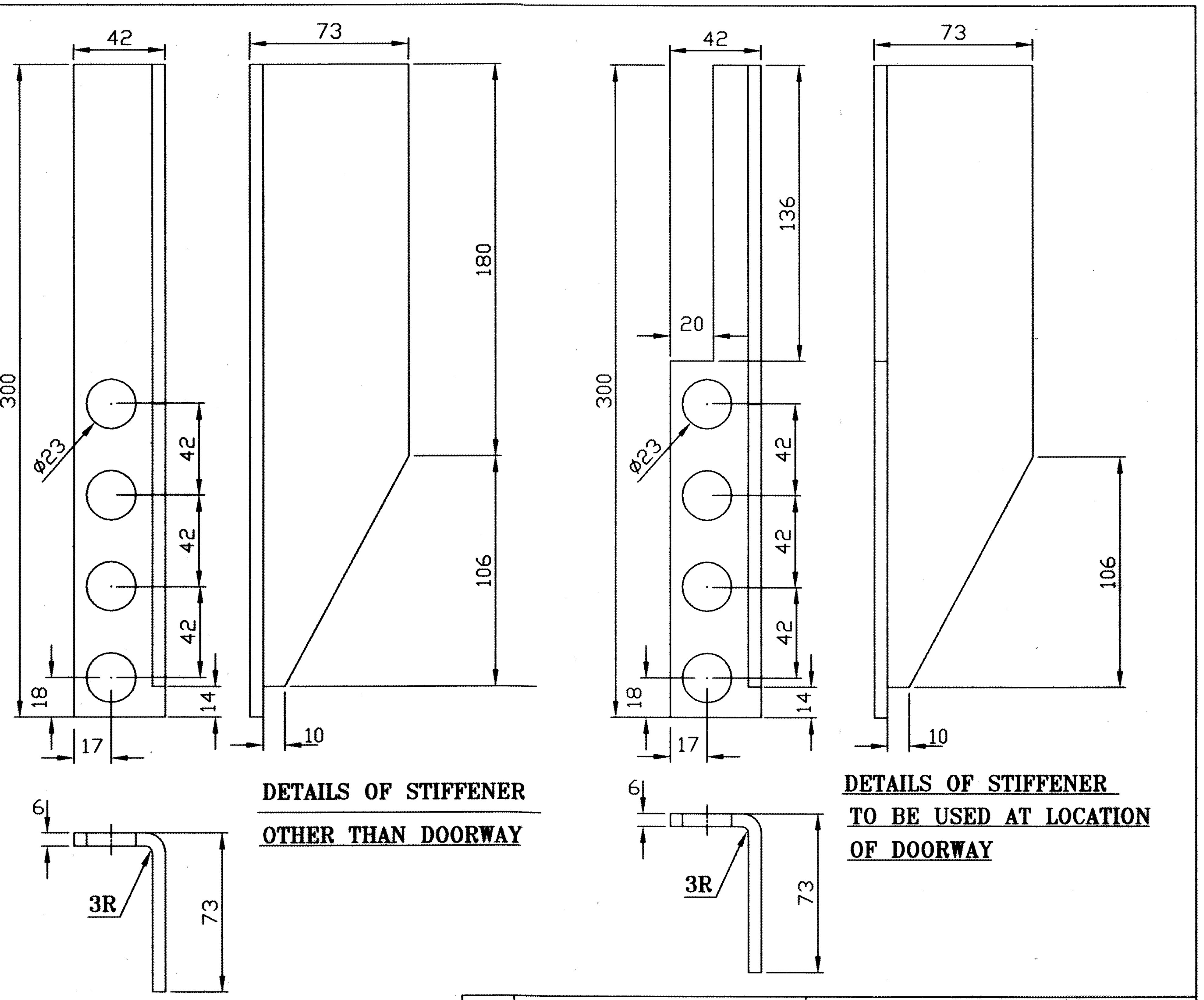
30/5/2014.

(Rupesh Kohli)
Director/Wagon
For Director General/Wagon

2 of 9



SKETCH SHOWING FITMENT OF STIFFENER WITH SIDE STANCHION



DETAILS OF STIFFENER OTHER THAN DOORWAY

DETAILS OF STIFFENER TO BE USED AT LOCATION OF DOORWAY

RECOMMENDED REPAIR PROCEDURE:-

1. Straighten the C-channel of side stanchion
2. Weld the C-channel of side stanchion with back plate of side stanchion after removing weld deposits of broken weld joint
3. Select the correct stiffener based on location of side stanchion
   (i) other than doorway
   (ii) at location of doorway
4. Weld side stanchion stiffener as per above sketch

MATERIAL: IRS: M44

All dimensions in mm

PRELIMINARY SKETCH		ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)	
SUPERSEDED BY		BOGIE OPEN WAGON TYPE BOXNHL	
SUPERSEDES	DATE		
SCALE PASSED	5/14	SKETCH SHOWING RECOMMENDED REPAIRS FOR CASES OF WELD FAILURE IN SIDE STANCHION OF BOXNHL WAGON	
CHECKED	5/14		
DRAWN L.MOHAN	05/14		
TRACED			
COMPARED			
J.S.NO. WD-14013			
B.G.	R.D.S.O. [W]	GROUP	WD-14013-S-01

ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.

A3

SL-1750

फैक्स / Fax : 91-0522-2452494
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK' Lucknow
टेलीफोन / Tele: 2451200 (PBX)
0522-2465773

सत्यमेव जयते

भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011

No. MW/BOXNHL.

Dated: 23.06.2014

Chief Workshop Manager
Wagon Repair Workshops

Sub: Recommended Repairs in reported failure in Bottom Bolster Gusset Plate of BOXNHL wagons, during POH.

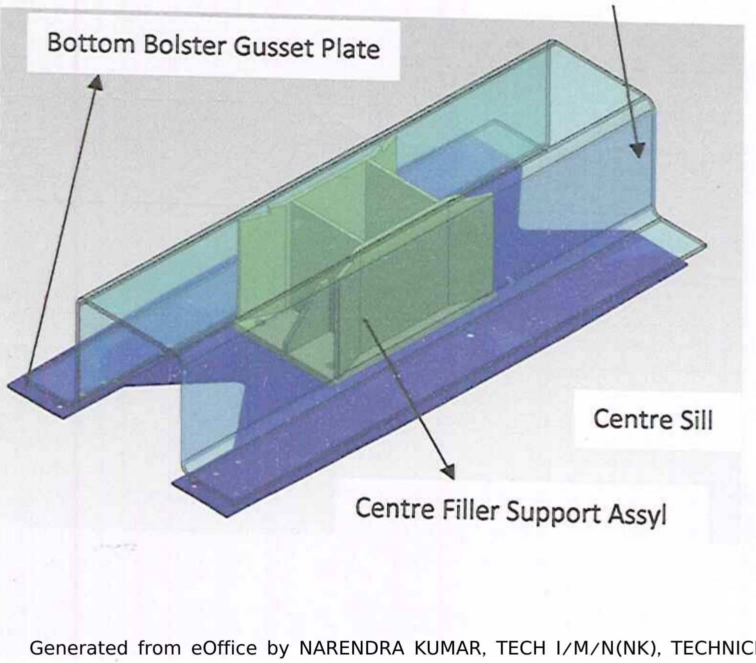
Ref: (i) CWM/JHSW letter No. RS.120/BOXN/Instructin-IV dated 01/06/2015.
(ii) Dy.CME/Jagadhari/NR letter No. 109-W/BCN/BOXN dated 22/06/2015.
(iii) Visit of RDSO personnel to JHSW & Perumbur W'shop.

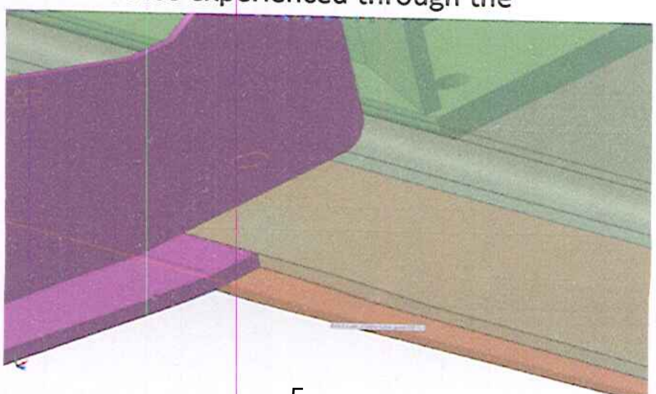
References above, JHSW/ NCR, Jagadhari w'shop/ NR, RWS/SECR, Perumbur w'shop, SR have reported failures in Bolster Bottom gusset plate (BBGP) of BOXNHL wagons. The reported failures have been inspected & studied by RDSO. Following the same, this letter details both- (a the reasons for the reported failure & (b) the recommended repair for the same.

(A) **Brief account of the Reason for BBGP failures**:

The reported failures pertain to the centre-pivot area of the BOXNHL wagon. The details of the same are enumerated in RDSO drg Nos. WD-05086-S-4 Alt 6, WD-05086-S-14 Alt 10, WD-05086-S-15 Alt 8. Depicted alongside is a modelled view of the centre pivot arrangement & the assembly therein.

As is evident therein, the Centre sill is provided with a centre filler support arrangement, to enable load distribution/ transmission of the vertical forces from the CP Top assembly. The fabricated assembly of the centre sill-filler support arrangement- bottom bolster gusset plate, provides for the structure that distributes, the vertical force experienced through the





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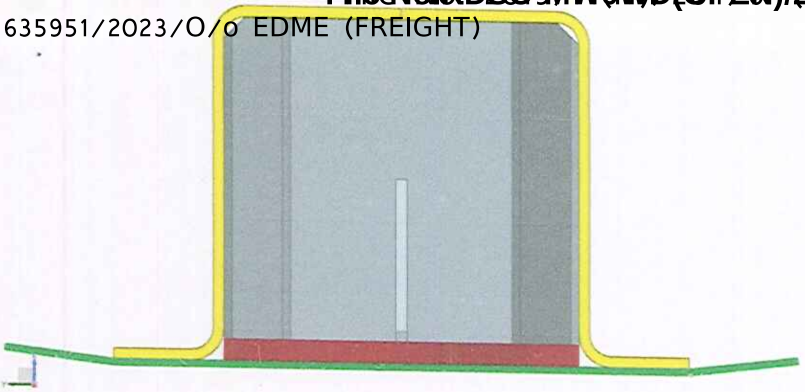
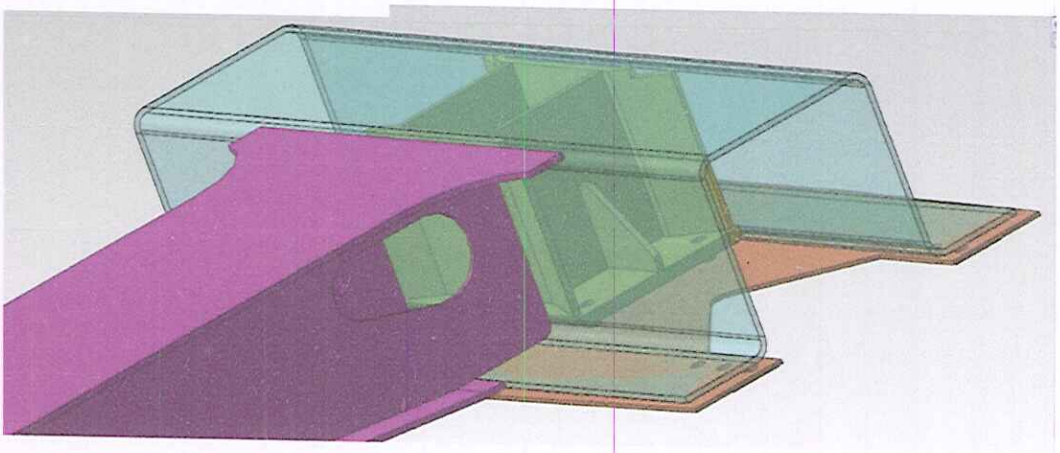
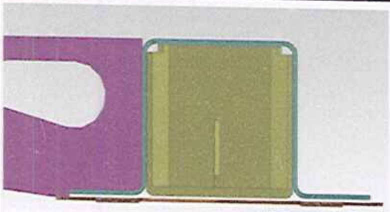


CP top & bottom assembly. The correct fabrication of the centre sill-filler support arrangement- bottom bolster gusset plate is hence an imperative requirement.

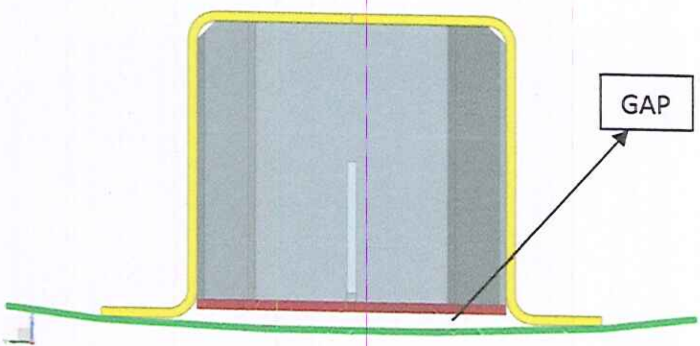
Further, as per the arrangement shown in the drg, the bolster bottom plate should be butted flush with the centre sill flange. The bottom



gusset plate should then be welded on the face of this joint. In case, the bolster bottom plate is not flush, but protrudes inwards wrt the centre sill flange, the bottom gusset plate would get welded with a gap between the gusset plate & the bolster bottom plate. With repeated hitting of the CP top, the gusset plate is liable to first plastically deform & then subsequently crack.

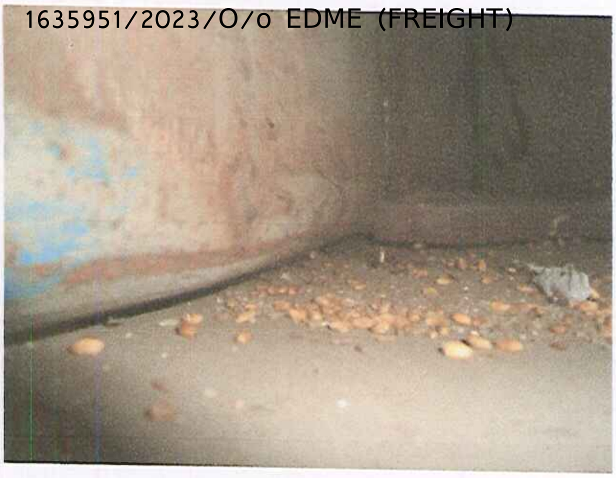


Actual Fitment of Bolster Base Plate



Identified Causes of Failure:

Depicted, below, is the actual arrangement, as observed in the wagons, reported with the subject failure. The arrangement, as physically inspected, in the damaged wagons, shows (1) Improper butting of the Bolster Bottom plate with the Centre sill flange AND/OR (2) A gap (when none should exist) between the bottom plate of the centre filler & the BBGP. The noticed defects are also illustrated in the below pasted photographs.



Gap inspected between the BBGP & centre filler arrgmt in failed wagons.

The following, regarding the above details are notable:

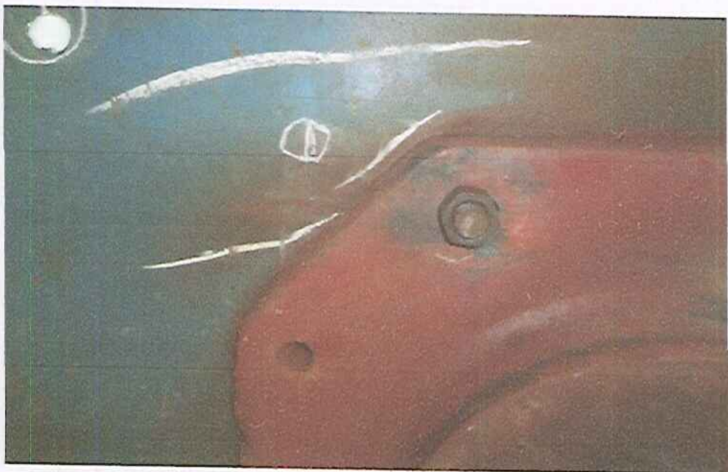
(a) In all cases, the reported failure is of the bottom bolster gusset plate(BBGP).

(b) The BBGP has been mostly observed to show crack near the mating area/ overlap portion with the bolster bottom plate.

(c) In all failure cases, a significant gap (as much as 15mm) has been observed between the BBGP & the centre filler base plate.

(d) Gaps/ incorrect butt joint between the bolster bottom plate & the centre sill flange has been observed in all wagons with BBGP failures.

Identified Cause & Progression of Reported Failure:



The observed gap, between the BBGP & the centre filler support arrangement, renders the centre filler support arrangement, ineffectual. It also results into a gap between the centre filler support & the BBGP, thus permitting BBGP to get deformed/ distorted in the vertical direction. The vertical forces, from the CP, directly deform the BBGP, owing to the gap available between the two assemblies. This deformation,

would ultimately result into a failure(crack) of the BBGP & in case the gap is not addressed, the continuous pounding of the BBGP & the lack of support from the centre filler (owing to the gap because of incorrect fabrication) could result into direct load transfer to the centre sill flange area, ultimately resulting in a longitudinal crack along the centre sill flange (in BOXNHL wagons available in JHSW, so far, no centre sill crack has been reported).

The above, cause & progression of the reported failure is corroborated by (i) the recorded gap between the BBGP & centre sill filler support (ii) cracks in all BBGP in wagons where CS cracks are reported (iii) deformation in BBGP, in all wagons with noticed gaps between the filler support & BBGP.

(B) Recommended Repair:

The following two alternates are recommended for undertaking repairs in BOXNHL wagons, observed with cracks in BBGP:

Alternate-I: This is the preferred alternate. It involves removal of the existing (& cracked) BBGP. Although the alternate is expected to be time intensive, adopting it would ensure comprehensive redressal of the reported failure.

The following steps are recommended:

1. Carefully cut & remove the existing BBGP from the wagon. Utmost care is to be exercised to ensure that during cutting, no damage is done to the other existing structural members.
2. After removal of BBGP, carefully grind & clean the surfaces to remove any remnants/ portions left consequent to the cutting of the BBGP.
3. Check the alignment of the bottom filler base plate vis-à-vis the centre sill flange in the longitudinal plane. In case of observing any gap between the centre filler base plate & the centre sill flange, the same be filled-up using shims/ packing plate of the required thickness to ensure complete packing of the centre filler.
4. Check the alignment of the Bolster bottom plate with either of the centre sill flanges. In case of gap between the bolster bottom plate & the centre sill flange, the same be filled-up using shims/ packing plate of the required thickness (in case of varying thickness/ uneven gap, shims of multiple thicknesses should be provided) to ensure complete packing of the bolster bottom plate & the centre sill flange. In case shims/ packing sheet of required thicknesses are not available in IRSM:44, shims/ sheet of IS:2062 E 250 or above could also be used.
5. Take a new BBGP & inspect for correctness of dims (incl thk) & bending as per RDSO Drg No. WD-05086-S-15 Alt 8 (Item No. 8).
6. Weld the new, inspected/ checked BBGP, duly ensuring flatness of the mating surfaces- centre sill flange, centre filler bottom plate & the bolster bottom plate surface. Ensure proper, adequate weld penetration all round the welding on the BBGP.

7. Apply the CP Top on the newly fitted Bolster Gusset Plate & tighten (hand tight) two diagonally opposite mounting bolts of adequate size & length to secure the CP Top. Check using a feeler gauge of 1 mm whether any gap exists between the CP top surface & the BBGP. In case of a gap, a suitable shim be provided so that no gap exists between the CP top surface & the BBGP.
8. Apply lock bolts as per recommended practice of diagonal application & then remove the temporarily fitted mounting bolts & apply other lock bolts to fix the CP top. It be ensured that the lock bolts are of the correct dims & make. Correct swaging of the lockbolts may be also necessarily ensured.
9. Ensure that the stipulated distance of 9.5 (+0.0/ -0.5) mm as detailed in RDSO Drg No. WD-05086-S-08 between the top of the CP Top Base Plate & the Side Bearer, by providing adequate number of shims underneath the Side bearer is maintained.

Alternate-II: This is the less-preferred alternate & should be adopted only if the prerequisite of Alternate-I, i.e. removal of the existing BBGP is considered impractical/ not feasible. This alternate involves in-situ repair of the broken BBGP.

The following steps are recommended:

1. Measure the CBC height of the Wagon (at either CBC's). It be ensured that the CBC height measurement is done on a level track. Estimate the corrected CBC height, with POHed Bogie wheel dias. If the CBC height, expected after lowering on POHed Bogies, is less than 1095 mm, move to Step 2. In case the CBC height, expected after lowering on POHed Bogies, is more than 1095 mm, mark & record that the wagon is to be fitted with Bogies with wheels less than 990 mm dia & then move to Step 2.
2. The portion of crack in the BBGP, be exposed & opened-up using gouging. Care should be taken to avoid consequent damage to other components or of further damaging the BBGP.
3. Try & drill (it would be difficult owing to vertical drilling & HS Ferritic Stainless steel material) a arrest-hole at the end of the crack to prevent, further crack propagation.
4. Weld deposit in the exposed crack area of the BBGP, completely filling up the crack portion.
5. Grind the welded surface & ensure a smooth flat surface of the BBGP, so that the CP top can evenly sit on the surface.
6. Apply the CP Top on the repaired Bolster Gusset Plate & tighten (hand tight) two diagonally opposite mounting bolts of adequate size & length to secure the CP Top. Check using a feeler gauge of 1 mm whether any gap exists between the CP top surface & the BBGP. In case of a gap, remove the CP top & grind any high spots/ weld deposit material leading to the gap. It should be ensured that no gap exists between the CP top surface & the BBGP.
7. Remove the temporarily fitted mounting bolts & remove the CP top.
8. Apply a packing plate of 8mm thk, as per details enumerated in the enclosed sketch(Annexure-I) over the repaired BBGP, by welding all along the edge of the

packing plate. Ensure proper, adequate weld penetration all round the welding along the edge of the packing plate.

9. Check the flatness of the packing plate, after welding & if found OK, apply the CP Top. CP Top be secured using the recommended lockbolts. It be ensured that the lock bolts are of the correct dims & make. Correct swaging of the lockbolts may be also necessarily ensured.
10. Attempt to fill the gap (expected to be available) between the filler support base plate & the BBGP or the BBGP & the centre sill flange by application of shims/ sheets (of adequate size) to cover the gap. Trials may also be carried out by filling this gap using specialized metal-epoxy gap sealants/ rebuilding compounds, based on past experiences of w'shops if any. Kindly note that availability of the above gaps, is the prime cause of the subject failures/ cracks. It is hence imperative that every effort is made to plug the available gaps, in order to prevent a recurrence of the subject failure.
11. Ensure that the stipulated distance of 9.5 (+0.0/ -0.5) mm as detailed in RDSO Drg No. WD-05086-S-08 between the top of the CP Top Base Plate & the Side Bearer, by providing adequate number of shims underneath the Side bearer is maintained.
12. While lowering the wagon, the wheel dia in the bogies, used be as recorded in Step 1 above.

It is requested that the above, be kindly perused & although a trial of both the above alternatives has been done at JHSW, the above recommended repairs be again tried-out in BOXNHL wagons, being noticed with crack in BBGP. A feedback, following the trials be kindly forwarded to RDSO. Any other issue in the above proposed repair scheme, if noticed, may also be communicated to RDSO. In case, association of RDSO, during the above repair related trials is felt necessary, the same be communicated so that RDSO personnel can be deputed to the respective w'shops. Also, in case any other repair methodology/ scheme has been adopted/ tried-out by w'shops/ ZR, the same be communicated to RDSO. RDSO shall look forward to all inputs/ feedbacks/ suggestions towards the repair of the subject defects.

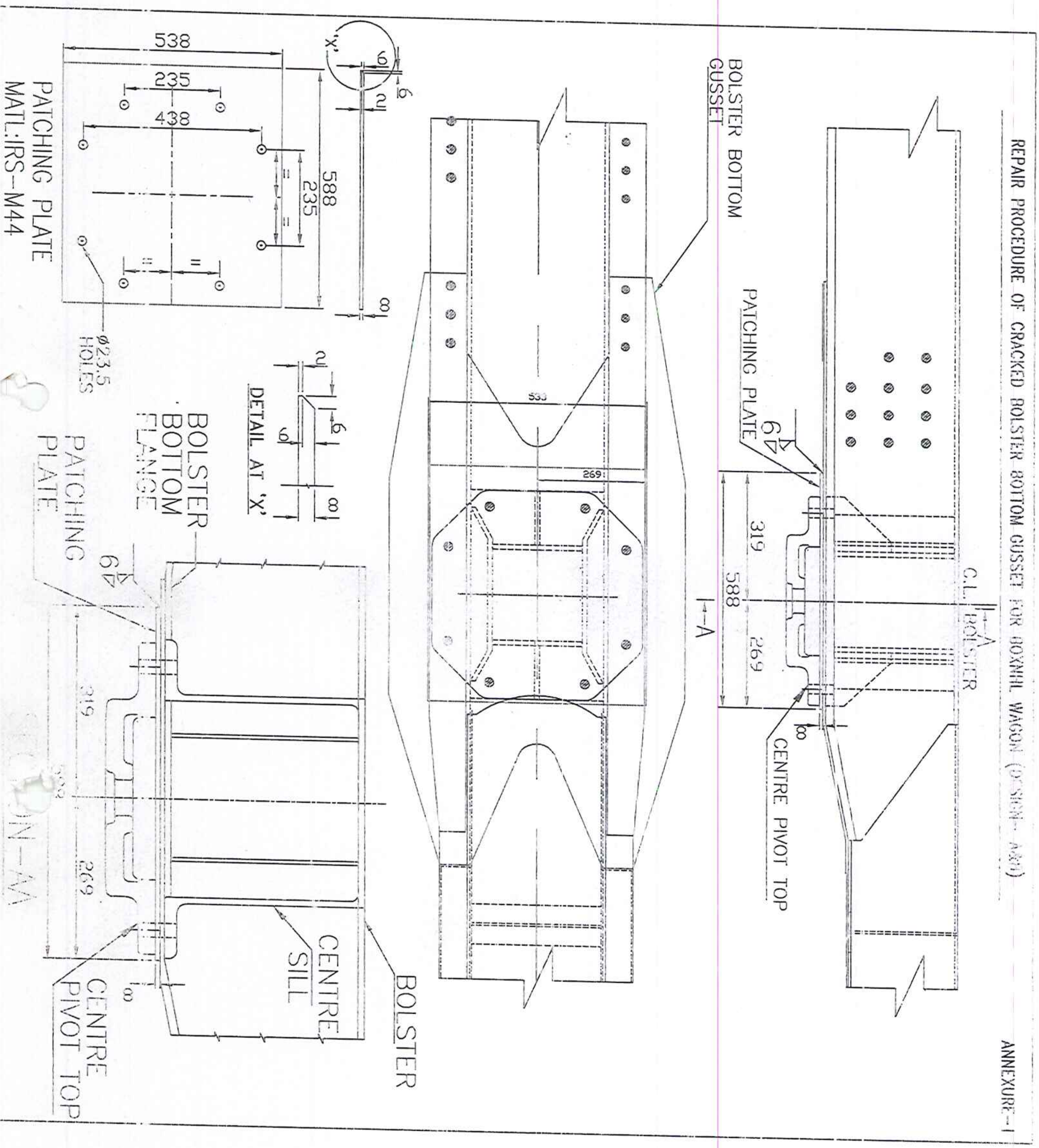
24/06/2015.

(Rupesh Kohli)
Director/Wagon
For Director General/Wagon

<u>*Copy for kind information*</u>:

- CME: NCR, WCR, SECR, NR.
- CWE: NCR, WCR, SECR, NR
- EDME/Frt/ Rly Bd
- DME/Frt/ Rly Bd: In Ref to your letter No. 2005/M(N)/204/1 Vol III dated 12/06/2015.

524



525

फैक्स / Fax : 91-0522-2452494
टेलीफोन / Tele: 2465773 (DOT)

सत्यमेव जयते

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

MW/BOXNHL

08.01.16

मुख्य कारखाना प्रबंधक

1. उत्तर मध्य रेलवे कारखाना, झाँसी – 248003
2. पश्चिम मध्य रेलवे कारखाना, कोटा – 324002
3. दक्षिण मध्य रेलवे, कारखाना, रायनापाडू –
4. उत्तर रेलवे कारखाना, जगाधरी – 135002
5. पूर्व रेलवे कारखाना, लिलुहा – 711204
6. दक्षिण पूर्व रेलवे कारखाना, खड़गपुर –721301
7. दक्षिण रेलवे कारखाना, पैराम्बूर – 600023
8. दक्षिण पूर्व मध्य रेलवे कारखाना, रायपुर. फैक्स: 0771–2522638
9. पश्चिम रेलवे कारखाना, प्रतापनगर – 390004
10. पूर्व मध्य रेलवे कारखाना, जमालपुर – 811214 (फैक्स–06344–243214)
11. उत्तर पश्चिम रेलवे कारखाना, अजमेर –305001
12. उत्तर पूर्व फ्रन्टियर रेलवे कारखाना, न्यू बोगई गांव –
13. उत्तर रेलवे कारखाना, अमृतसर – 143001 (फैक्स–0183–2224216)
14. गोल्डन रॉक केन्द्रीय कारखाना–दक्षिण रेलवे त्रिची – 620004 (फैक्स–0431–2490220 / 2491113)

Sub: Procedure for Repair of Centre sill of BOXNHL (Design A & B) wagon.

Zonal Railways have reported Cracks in Centre sill of BOXNHL (Design-A & B) wagon having three piece Centre sill. The issue has been examined and a detailed repair procedure to RDSO Drg no WD-16002-S-01 for repair of the center sill of BOXNHL wagon (Design-A & B) has been prepared and enclosed with this letter.

Encl: Drawing No WD-16002-S-01

8/1/2016
(A.K. Mishra)
Joint director/wagon
For Director General/Wagon

Copy to:

1. मुख्य यांत्रिक अभियन्ता :
   1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई– 400 001.
   2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001.
   3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली – 110 001.

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4. दक्षिण रेलवे, पार्क टाउन, चेन्नई – 600 003.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्दराबाद – 500 071.
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता – 700 043.
7. पूर्वोत्तर रेलवे, गोरखपुर – 273 012.
8. पूर्वोत्तर सीमान्त रेलवे, मालीगॉव, गुवाहाटी – 781 011.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई – 400 020.
10. पूर्व मध्य रेलवे, हाजीपुर – 844 101.
11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर,–751 016.
12. उत्तर मध्य रेलवे, हास्टिंग रोड ,इलाहाबाद – 211 001.
13. उत्तर पश्चिम रेलवे, जयपुर – 302 006.
14. दक्षिण पश्चिम रेलवे, हुबली – 580 023.
15. पश्चिम मध्य रेलवे, जबलपुर – 482 001.
16. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्पलेक्स, बिलासपुर – 495 004.

329

2193

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Fax : 91-0522-2452494
Tele/Fax: 0522- 2465773

Government of India - Ministry of Railways
Research Designs & Standards
Organisation
Lucknow – 226011
DID (0522)2450115
DID(0522)2465310

No. MW/BOXNHL

Date 21.11.2017

मुख्य कारखाना प्रबंधक :

1. उत्तर मध्य रेलवे कारखाना, झाँसी – 248003
2. पश्चिम मध्य रेलवे कारखाना, कोटा – 324002
3. दक्षिण मध्य रेलवे, कारखाना, रायनापाडू – 521241
4. उत्तर रेलवे कारखाना, जगाधरी – 135002
5. पूर्व रेलवे कारखाना, लिलुहा – 711204
6. दक्षिण पूर्व रेलवे कारखाना, खड़गपुर –721301
7. दक्षिण रेलवे कारखाना, पैराम्बूर – 600023
8. दक्षिण पूर्व मध्य रेलवे कारखाना, रायपुर.
9. पश्चिम रेलवे कारखाना, प्रतापनगर – 390004
10. पूर्व मध्य रेलवे कारखाना, जमालपुर – 811214
11. उत्तर पश्चिम रेलवे कारखाना, अजमेर –305001
12. उत्तर पूर्व फ्रन्टियर रेलवे कारखाना, न्यू बोगई गांव –783381
13. उत्तर रेलवे कारखाना, अमृतसर – 143001
14. गोल्डन रॉक केन्द्रीय कारखाना–दक्षिण रेलवे त्रिची – 620004
15. मुख्य कारखाना प्रबंधक, पूर्व मध्य रेलवे कारखाना, समस्तीपुर

Sub- Procedure for repair of centre sill of BOXNHL (Design A & B) wagon.
Ref- (I) This office letter of even no. dated 08.01.2016.
(ii) Eastern Railway, Jamalpur letter No. F/Dy(W)/OFF/RB/49 dated 16.08.2017

Vide this office letter under ref (i) above, repair procedure (RDSO drawing No. WD-16002-S-01 Alt. NIL) for repairing of cracks in Centre Sill of BOXNHL wagons (Design A & B) having three piece centre sill was issued.

Recently, few cases have been reported by Zonal Railways wherein the crack has been propagated upto the top of centre sill web and further extended towards longitudinal direction. Accordingly, the repair procedure has been revised to repair these type of cracks also. Further, it is advised that these wagons should be marked with remark "CENTRE SILL REPAIRD" and special instruction to be issued for special attention on these wagons during examination at each examination point and status report of these wagons to be sent to RDSO.

The revised repair procedure is enclosed with this letter.

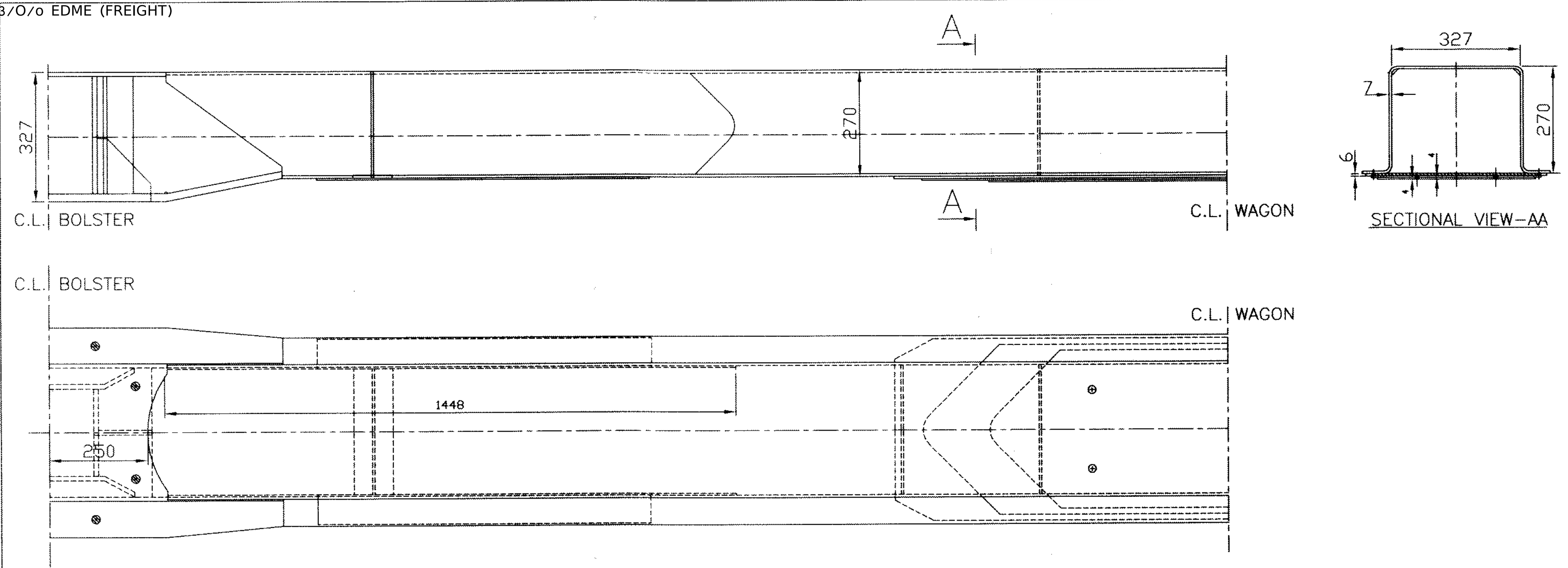
संलग्नक : Drg. No. WD-16002-S-01 Alt-1

21.11.17
(पी0के0 पाण्डेय)
निदेशक/माल डिब्बा
कृते महा निदेशक

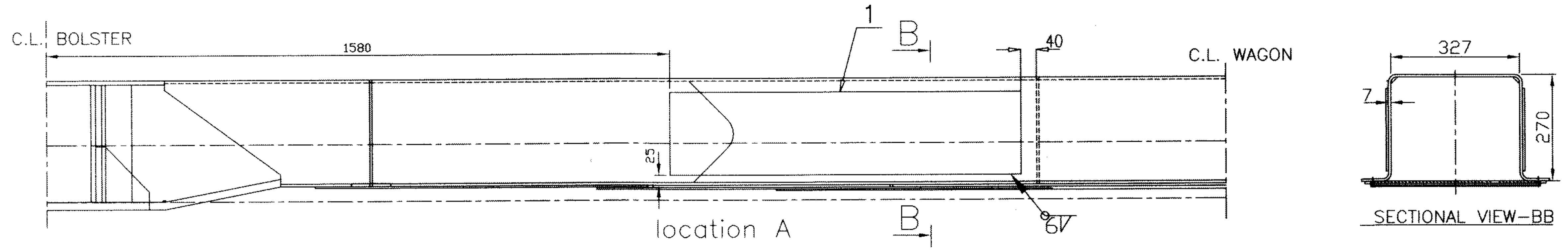
प्रतिलिपिः–

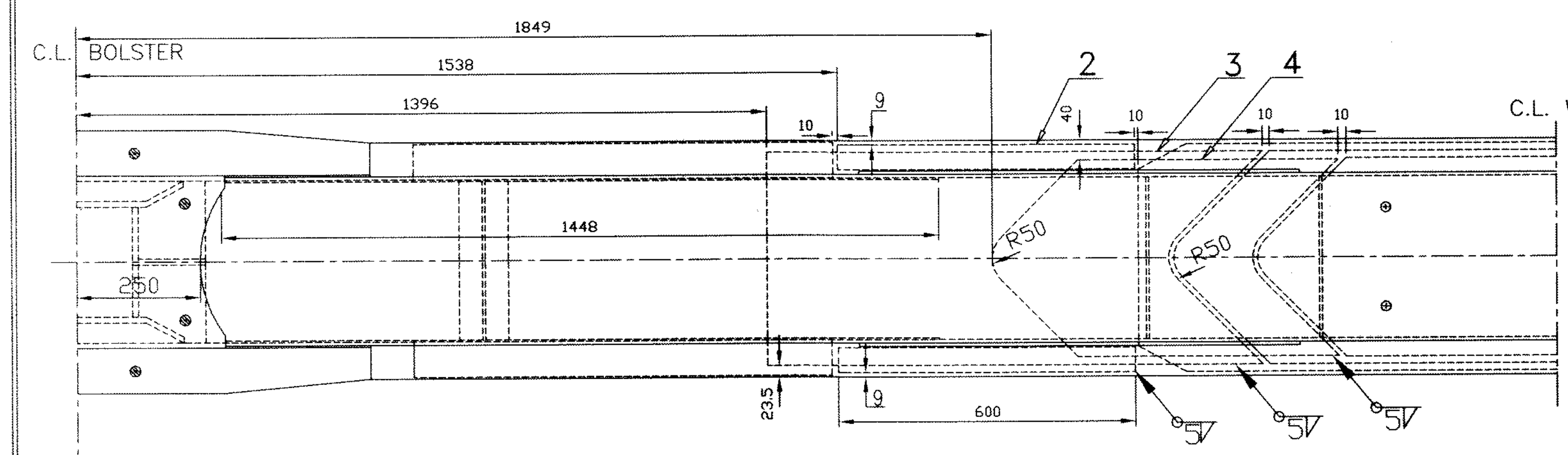
मुख्य यात्रिक अभियन्ताः–
1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई– 400 001.
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001.
3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली – 110 001.

4. दक्षिण रेलवे, पार्क टाउन, चेन्नई – 600 003.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्दराबाद – 500 071.
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता – 700 043.
7. पूर्वोत्तर रेलवे, गोरखपुर – 273 012.
8. पूर्वोत्तर सीमान्त रेलवे, मालीगॉव, गुवाहाटी – 781 011.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई – 400 020.
10. पूर्व मध्य रेलवे, हाजीपुर – 844 101.
11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर,–751 016.
12. उत्तर मध्य रेलवे, हास्टिंग रोड ,इलाहाबाद – 211 001.
13. उत्तर पश्चिम रेलवे, जयपुर – 302 006.
14. दक्षिण पश्चिम रेलवे, हुबली – 580 023.
15. पश्चिम मध्य रेलवे, जबलपुर – 482 001.
16. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्पलेक्स, बिलासपुर – 495 004

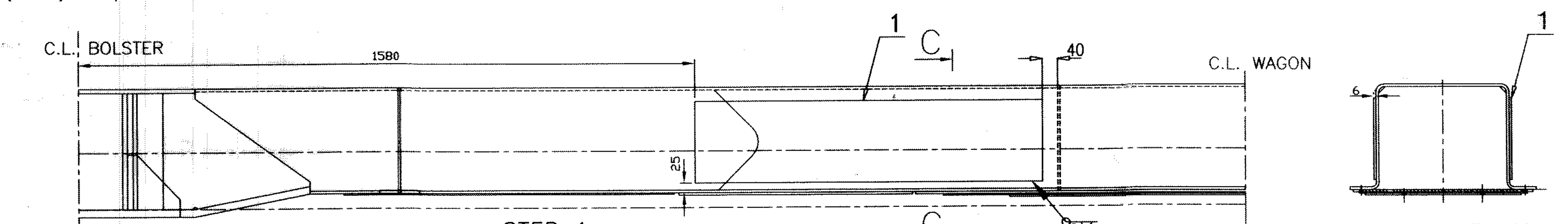


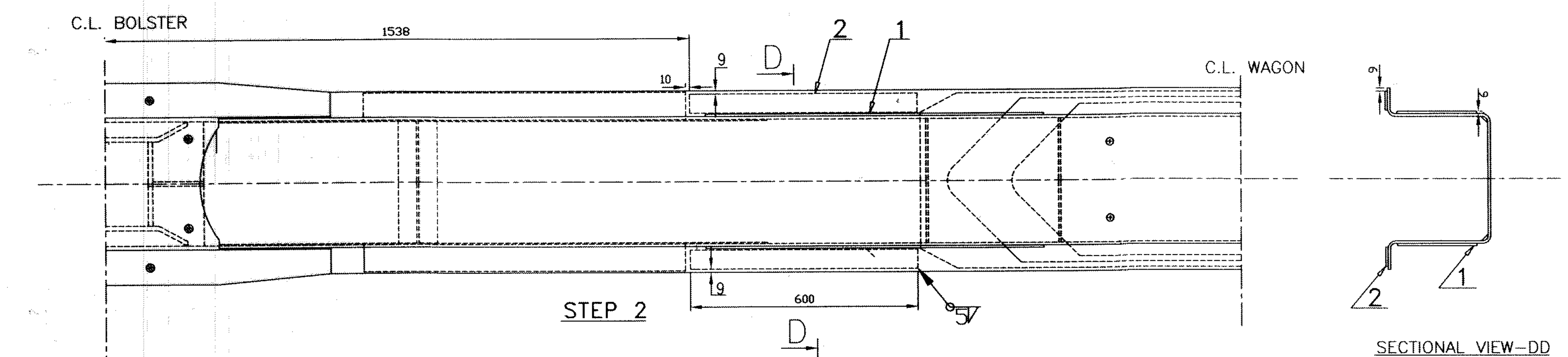
EXISTING CENTRE SILL ARRANGEMENT

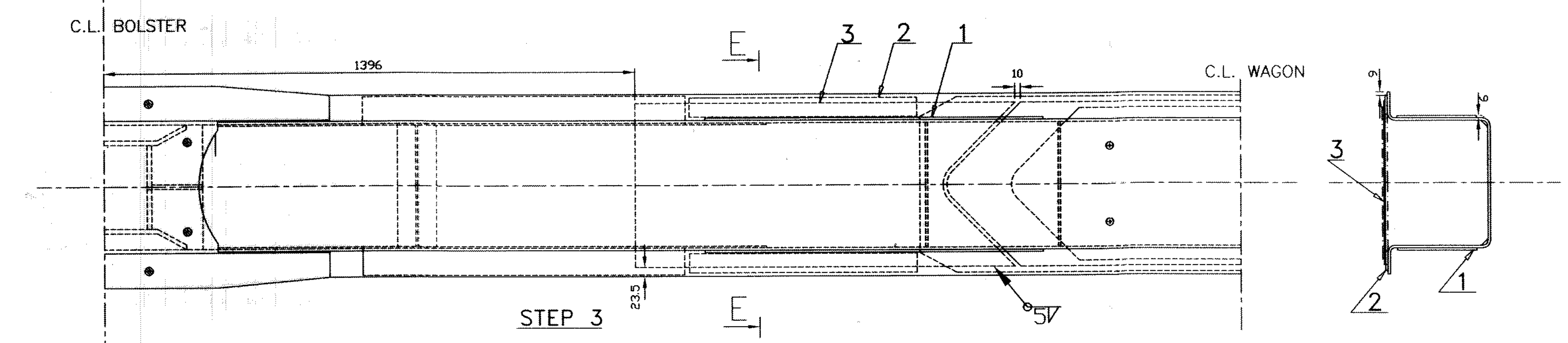


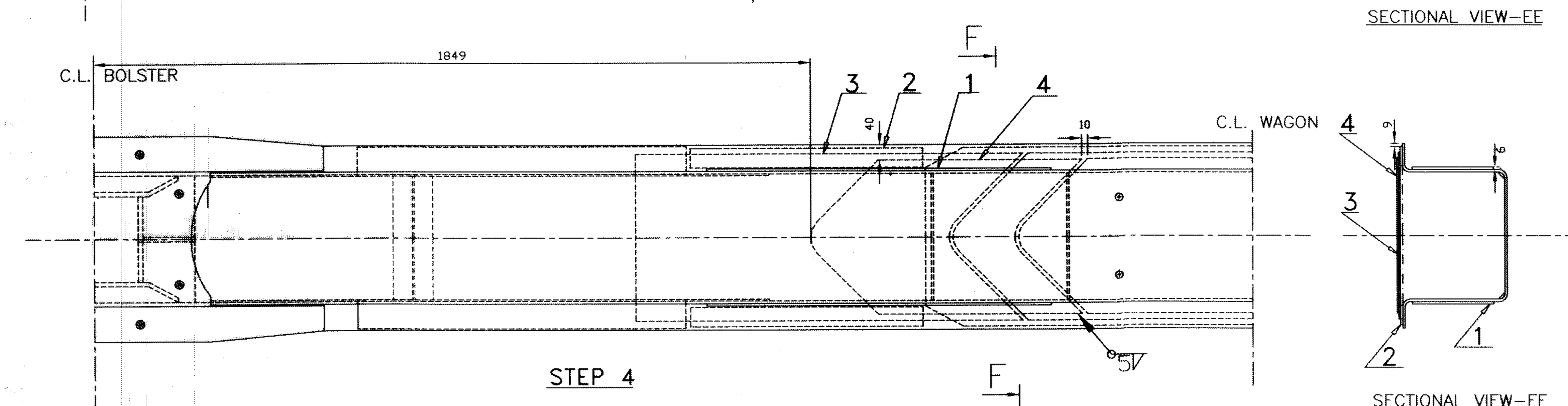


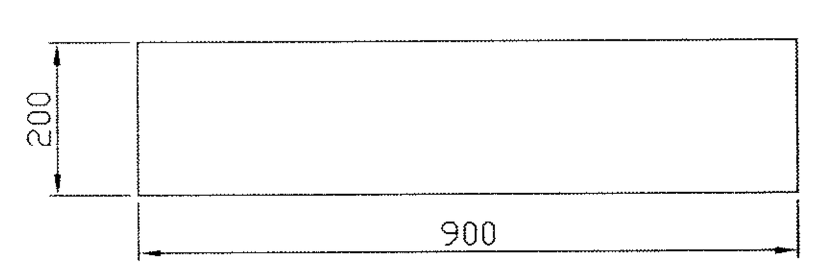
FINAL ASSEMBLED CENTRE SILL STRUCTURE WITH ALL PATCH PLATES



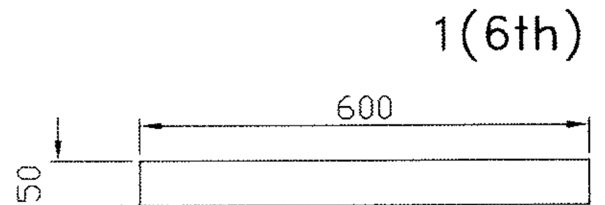




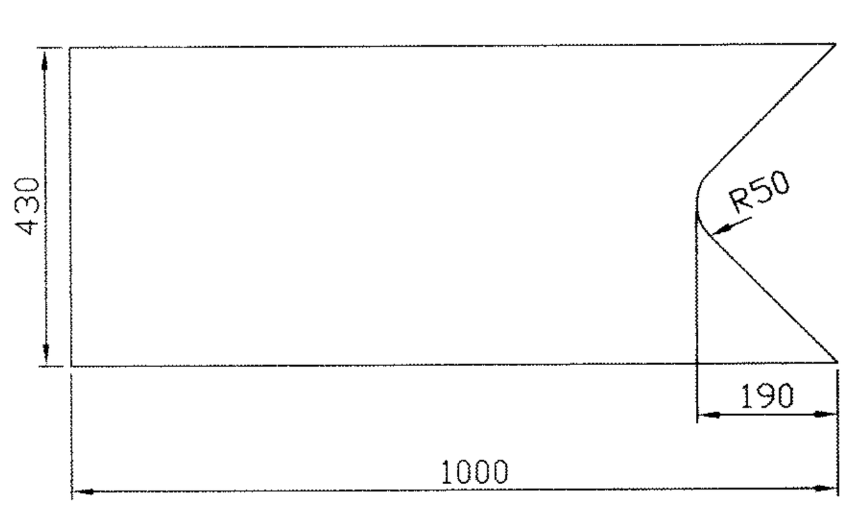




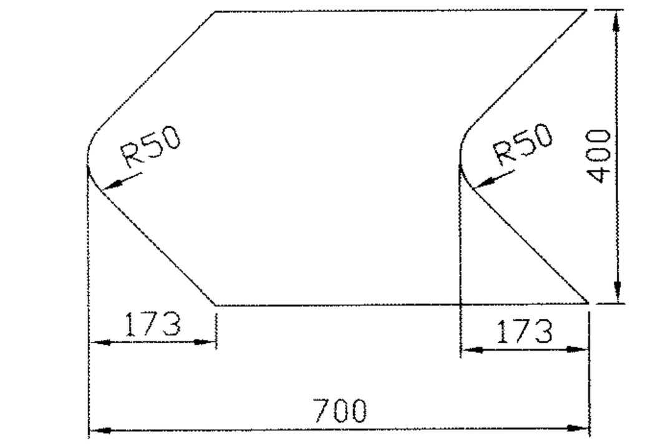
1(6th)



2(6th)



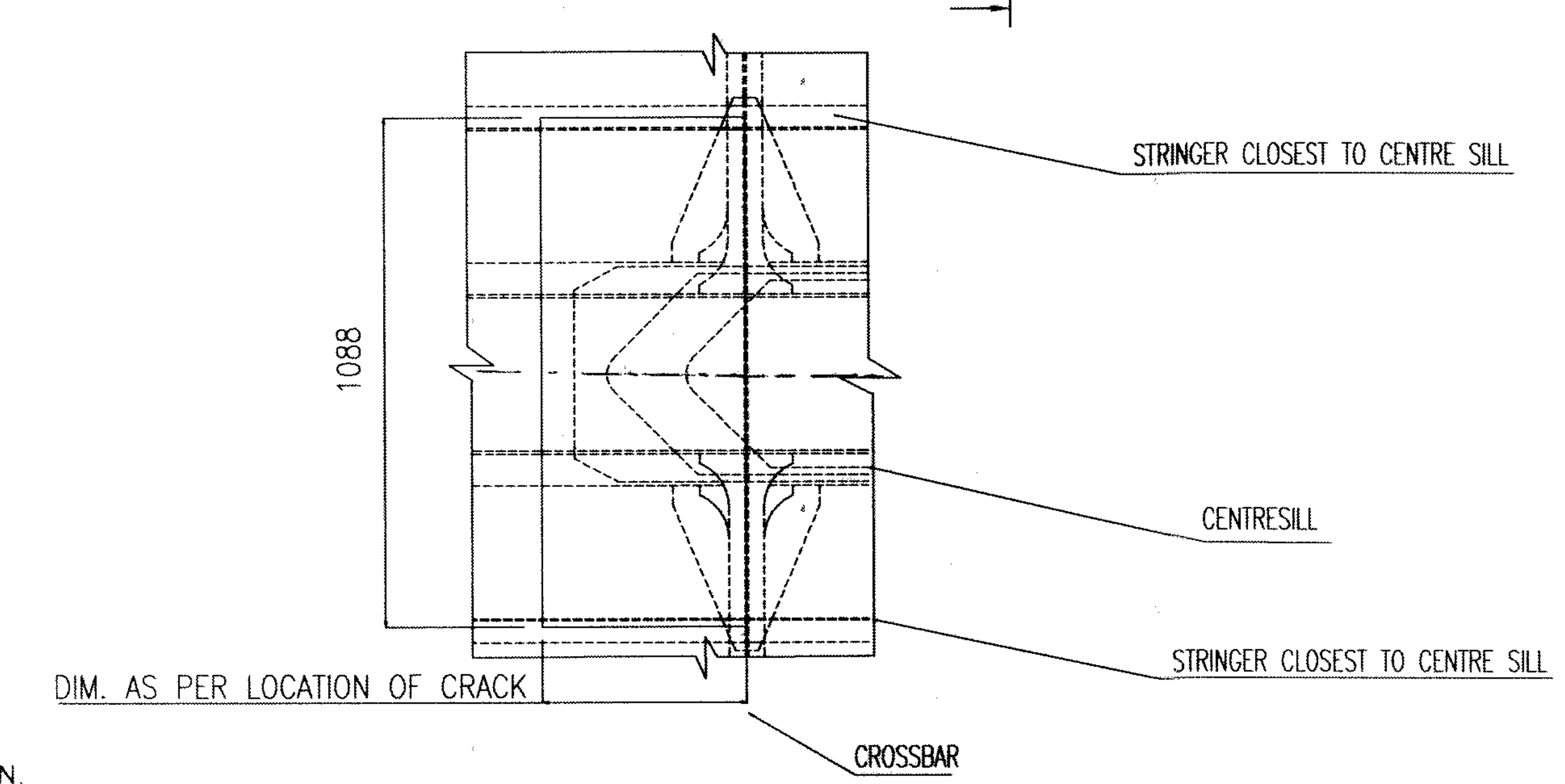
3(4th)



4(4th)

PROCEDURE FOR REPAIRING CENTRE SILL BETWEEN BOLSTERS:-

1. FOR REPAIR OF CRACKS IN THREE PIECE CENTRE SILL BETWEEN BOLSTERS FOLLOWING REPAIR PROCEDURE SHALL BE ADOPTED:
2. MAXIMUM OCCURENCERS OF CRACK HAVE BEEN REPORTED AT LOCATION A.
3. FOR ANY OTHER LOCATIONS EXTENT OF CRACK TO BE DETERMINED USING DYE PENETRATION TEST.
4. FOR CRACKS AT LOCATION A FOLLOWING PROCEDURE TO BE ADOPTED
   4(i) PROCEDURE FOR CENTRE SILL WEB REPAIR
   (a) FOR CRACKS AT LOCATION OF WEB WHERE CRACK HAS NOT PROPOGATED TO ITS END ARREST HOLES TO BE MADE TO PREVENT FURTHER CRACK PROPOGATION.
   (b) NEXT GOUGE THE CRACKS AND FILL WITH WELD FOLLOWED BY GRINDING . A PACKING PLATE (ITEM-1) BE PROVIDED AT OUTER SIDE OF CENTRE SILL WEB AS SHOWN IN STEP 1.
   (c) FOR CRACKS AT LOCATION OF WEB WHERE CRACK HAS PROPOGATED TO ITS END, GOUGE THE CRACKS AND FILL WITH WELD FOLLWED BY GRINDING. A PACKING PLATE(ITEM-1) BE PROVIDED AT OUTER SIDE OF CENTRE SILL WEB AS SHOWN IN STEP 1.
   4(ii) PROCEDURE FOR CENTRE SILL FLANGE REPAIR
   (a) FOR REPAIR OF CENTRE SILL FLANGE GOUGE THE CRACKS AND FILL WITH WELD FOLLOWED BY GRINDING.
   (b) PROVIDE STIFFENING PLATE (ITEM-2) AT BOTTOM OF CENTRE SILL FLANGE AS SHOWN IN STEP 2.
   (c) PROVIDE STIFFENING PLATE (ITEM-3) AT BOTTOM OF CENTRE SILL FLANGE AS SHOWN IN STEP 3.
   (d) PROVIDE STIFFENING PLATE (ITEM-4) AT BOTTOM OF CENTRE SILL FLANGE AS SHOWN IN STEP 4.
5. FOR CRACK REACHING UPTO TOP OF THE WEB AND PROPAGATING TOWARDS LONGITUDINAL DIRECTION
   (i) REMOVE FLOOR PLATE ABOVE CRACK BETWEEN LONGITUDINAL STRINGER NEAREST TO CENTRE SILL.
   (ii) FOLLOW PROCEDURE AT 4 (i) AND 4(ii)
   (iii) NEW PEICE OF FLOOR PLATE TO BE WELDED WITH STRINGERS
   (iiii) DPT TO BE DONE BEFORE GOUSING AND AFTER FILLING CRACK WITH WELD
6. CARE SHOULD BE TAKEN FOR GOOD QUALITY OF WORKMANSHIP.
7. ALL CENTRESILL REPAIRED WAGON SHOULD BE MARKED WITH REMARK "CENTRESILL REPAIRED" AT SIDE WALL ON BOTH SIDE WITH LETTER SIZE OF 175mm.
8. ALL THESE WAGONS SHOULD BE CHECKED AT EVERY EXAMINATION POINT & FITNESS REPORT TO BE SEND TO RDSO DURING ROH & POH.



① DETAIL 5(i)

ITEM	DESCRIPTION	NO OF.	REF. DRG.	WT OF ONE (Kg.)	MATL&SPEC	REMARKS
4	PATCH PLATE	2	———	—	IRS:M-44	
3	PATCH PLATE	2	———	—	IRS:M-44	
2	PATCH PLATE 600x50x6TH	4	———	—	IRS:M-44	
1	PATCH PLATE 900x200x6TH	4	———	—	IRS:M-44	

PRELIMINARY SKETCH — ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)

SUPERSEDED BY			
SUPERSEDES		DATE	
SCALE	PASSED	A.K.MISHRA	01/16
	CHECKED	K.PAL	01/16
	DRAWN	L.MOHAN	01/16
	TRACED		
	COMPARED		
	J.S.NO.	WD-16002	01/16

PROCEDURE FOR REPAIR OF CENTER SILL OF BOXNHL

ALT	ITEM.	AUTHY	DESCRIPTION		DATE	ASSY. DRGS.
①		WD-17070	NOTE 5,6 & 7 ADDED		11/17	

B.G. | R.D.S.O. [W] | GROUP | WD-16002-S-01

A1

भारत सरकार --रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Fax : 91-0522-2452494
Tele/Fax: 0522- 2465773

Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011
DID (0522)2450115
DID(0522)2465310

No. MW/BOXNHL

Date: 02.07.2018

मुख्य यांत्रिक अभियन्ता :

1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई– 400 001.
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001.
3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली – 110 001.
4. दक्षिण रेलवे, पार्क टाउन, चेन्नई – 600 003.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्दराबाद – 500 071.
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता – 700 043.
7. पूर्वोत्तर रेलवे, गोरखपुर – 273 012.
8. पूर्वोत्तर सीमान्त रेलवे, मालीगॉव, गुवाहाटी – 781 011.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई – 400 020.
10. पूर्व मध्य रेलवे, हाजीपुर – 844 101.
11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर,–751 016.
12. उत्तर मध्य रेलवे, हास्टिंग रोड ,इलाहाबाद – 211 001.
13. उत्तर पश्चिम रेलवे, जयपुर – 302 006.
14. दक्षिण पश्चिम रेलवे, हुबली – 580 023.
15. पश्चिम मध्य रेलवे, जबलपुर – 482 001.
16. दक्षिण पूर्व मध्य रेलवे, आर0ई0 काम्पलेक्स, बिलासपुर–495004

Sub: Strengthen of centre sill during ROH/POH of BOXNHL wagons.
Ref: This office letter of even no. dtd. 08.01.2016.

RDSO vide letter referred above, has issued the procedure for repair of centre sill of BOXNHL wagon provided with three piece centre sill. RDSO drawing no. WD- 16002-S-01, details the procedure to be followed for repair of centre sill.

There are BOXNHL wagons manufactured with three piece centre sill in which centre sill are not found with any crack during ROH/POH examination. Since, these wagons are prone to develop crack at centre sill location. A strengthening procedure to RDSO Drg. no. WD-18051-S-01, for strengthen the centre sill has been prepared as a preventive measure.

A copy of repair procedure is attached herewith and you are advised to strengthen BOXNHL wagon (manufactured with three piece) during ROH/POH.

D. A. WD-18051-S -01

(Sanjay Kumar)
Exe. Director Std./Wagon

Copy to:
EDME (Freight), Railway Board, New Delhi-110 001- for kind information.

अअमासं RDSO
रेल अग्रदूत Transforming Railways
फैक्स / Fax : 91-0522-2452494
टेलीफोन / Tele: 0522- 2462638
arvindirsme10@gmail.com

सत्यमेव जयते

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011

No. MW/BOXNHL Date: 20.05.2022

Principal Chief Mechanical Engineers

1. Northern Railway, Baroda House, New Delhi-110 001
2. Central Railway, CST, Mumbai-400 001
3. Eastern Railway, Fairlie Place, Kolkata-700 001
4. Western Railway, Churchgate, Mumbai-400 020
5. Southern Railway, Park Town, Chennai-600 003
6. South Central Railway, Secunderabad-500 071
7. South Eastern Railway, Garden Reach, Kolkata-700 043
8. North Eastern Railway, Gorakhpur-273 001
9. Northeast Frontier Railway, Maligaon, Guwahati-781 011
10. East Central Railway, Hajipur, Bihar 844 101
11. North Western Railway, Jaipur-302 006
12. North Central Railway, Allahabad.-211 001
13. South Western Railway, Hubli – 580 023
14. East Coast Railway, Bhubaneswar, Orissa-751 023
15. West Central Railway, Jabalpur-482 001
16. South East Central Railway, R.E. Complex, Bilaspur – 495 004

Sub: Strengthen of Centre-Sill during ROH/POH of BOXNHL wagons.
Ref: This office letter no even dated 02.07.2018.

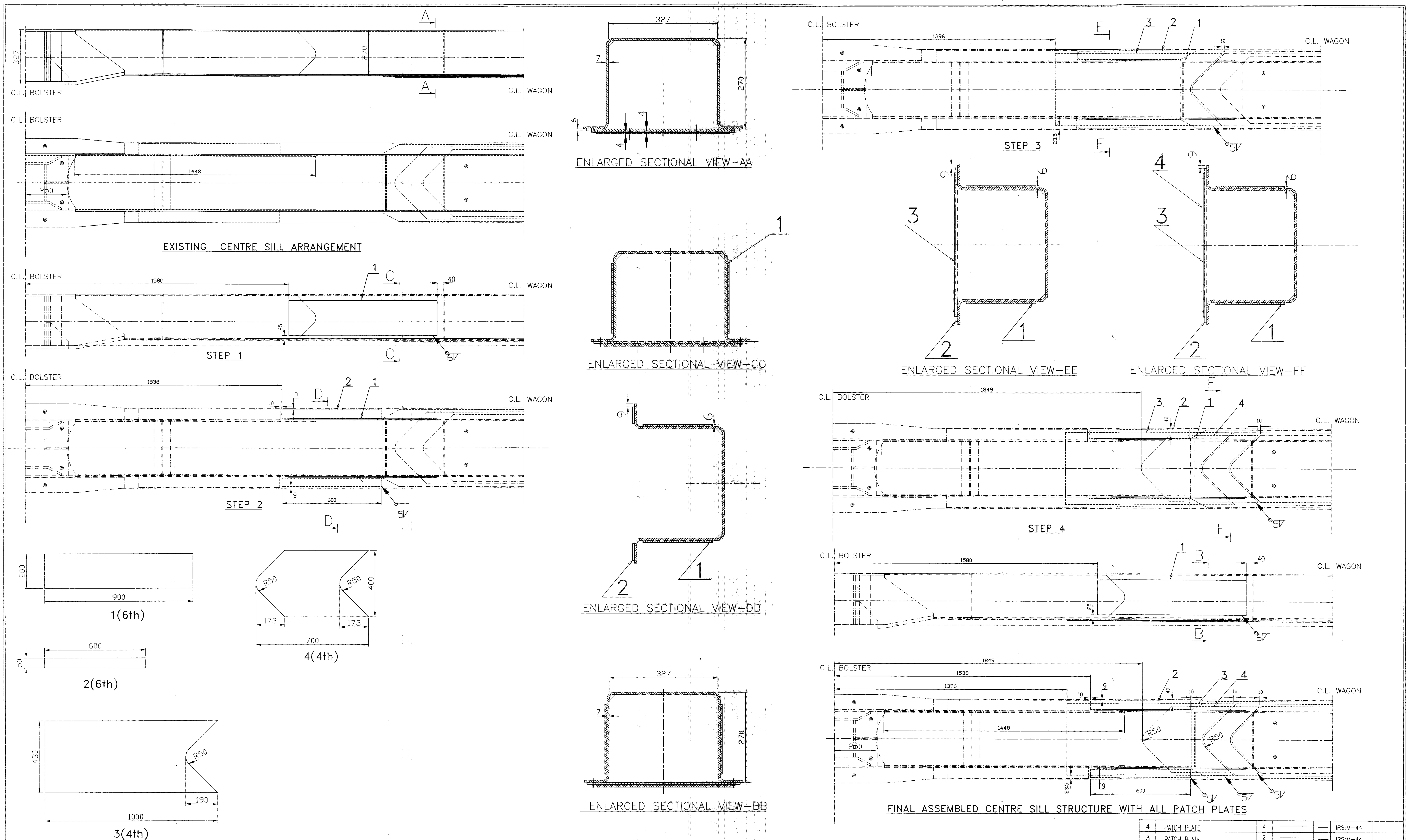
Vide letter under reference above, the strengthening procedure no WD-18051-S-01 for three piece centre sill of BOXNHL wagon has been issued to PCMEs of all Zonal Railway.

It is advised to please ensure to strengthen the three piece centre sill of BOXNHL wagon following the procedure no WD-18051-S-01 during ROH/POH.

20/05/22

D.A.: As above

(Arvind Kumar)
Jt. Director/WD-II
For Director General/RDSO



PROCEDURE FOR STRENGHTENING THREE PIECE CENTRE SILL BETWEEN BOLSTERS:-

1 FOR CENTRE SILL WEB STRENGHTENING
   (a) TWO PACKING PLATE (ITEM-1) BE PROVIDED AT OUTER SIDE OF CENTRE SILL WEB (BOTH WEB) AS SHOWN IN STEP 1.

2 FOR CENTRE SILL FLANGE STRENGHTENING
   (a) FIRST PROVIDE STIFFENING PLATE (ITEM-2) AT BOTTOM OF CENTRE SILL FLANGE AS SHOWN IN STEP 2.
   (b) NEXT PROVIDE STIFFENING PLATE (ITEM-3) AT BOTTOM OF CENTRE SILL FLANGE AS SHOWN IN STEP 3.
   (c) FINALLY PROVIDE STIFFENING PLATE (ITEM-4) AT BOTTOM OF CENTRE SILL FLANGE AS SHOWN IN STEP 4.

3. CARE SHOULD BE TAKEN FOR GOOD QUALITY OF WORKMANSHIP.

4. ALL CENTRE SILL WAGON THUS MODIFIED SHOULD BE MARKED WITH REMARK "CENTRE SILL STRENGHTENED" AT SIDE WALL ON BOTH SIDE WITH LETTER SIZE OF 175mm.

5. ALL THESE WAGONS SHOULD BE CHECKED AT EVERY EXAMINATION POINT & FITNESS REPORT TO BE SEND TO RDSO DURING ROH & POH.

ITEM	DESCRIPTION	NO OF.	REF. DRG.	WT OF ONE (Kg.)	MATL&SPEC	REMARKS
4	PATCH PLATE	2	———	—	IRS:M-44	
3	PATCH PLATE	2	———	—	IRS:M-44	
2	PATCH PLATE 600x50x6TH	4	———	—	IRS:M-44	
1	PATCH PLATE 900x200x6TH	4	———	—	IRS:M-44	

PRELIMINARY SKETCH

ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)

SUPERSEDED BY		
SUPERSEDES		DATE
SCALE PASSED		06/18
CHECKED		06/18
DRAWN	L.MOHAN	06/18
TRACED		
COMPARED		
J.S.NO.	WD-18051	06/18

PROCEDURE FOR STRENGHTENING CENTER SILL OF BOXNHL

ALT	ITEM	AUTHY	DESCRIPTION	DATE	ASSY. DRGS.

B.G. | R.D.S.O. [W] | GROUP | WD-18051-S-01

फैक्स/थंग रू 91.0522.2452494
टेलीफोन@Tele: 2465773 (DOT)
42921 (Rly.)

सत्यमेव जयते

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ & 226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

No. MW/BOXNHL

Date: 15.06.22

General Manager (Mechanical)

1. Central Railway, CST, Mumbai-400 001
2. Eastern Railway, Fairlie Place, Kolkata-700 001
3. East Central Railway, Hajipur- 844 101
4. East Coast Railway, Railway Complex, Bhubaneswar-751 023
5. Northern Railway, Baroda House, New Delhi-110 001
6. North Central Railway, Allahabad.-211 001
7. North Western Railway, Jaipur-302 006
8. North Eastern Railway, Gorakhpur-273 001
9. Southern Railway, Park Town, Chennai-600 003
10. South Central Railway, Secunderabad-500 071
11. South Eastern Railway, Garden Reach, Kolkata-700 043
12. South East Central Railway, R.E. Complex, Bilaspur – 495 004
13. South Western Railway, Hubli – 580 023
14. Northeast Frontier Railway, Maligaon, Guwahati-781 011
15. Western Railway, Churchgate, Mumbai-400 020
16. West Central Railway, Jabalpur-482 001

Sub: Procedure for repair of Defects/cracks in centre sill.

Ref: 1. RDSO letter no MW/BOXNHL dt 08.01.2016
2. RDSO letter no MW/BOXNHL dt 21.11.2017

In reference to letters above, instructions for repair of three-piece centre sill in BOXNHL wagon have already been issued to all railways for cases of damages between bolsters vide Drg no WD-16002-S-01 Alt 1(or latest).

In case of single piece centre sill of BOXNHL wagons, cases of damages to backstop portion have been reported from various workshops. To address the damages as reported, two drawings have been prepared and circulated. The drg no's are, WD-20035-S-01 Alt nil (or latest) &WD-20035-S-02 Alt nil (or latest).

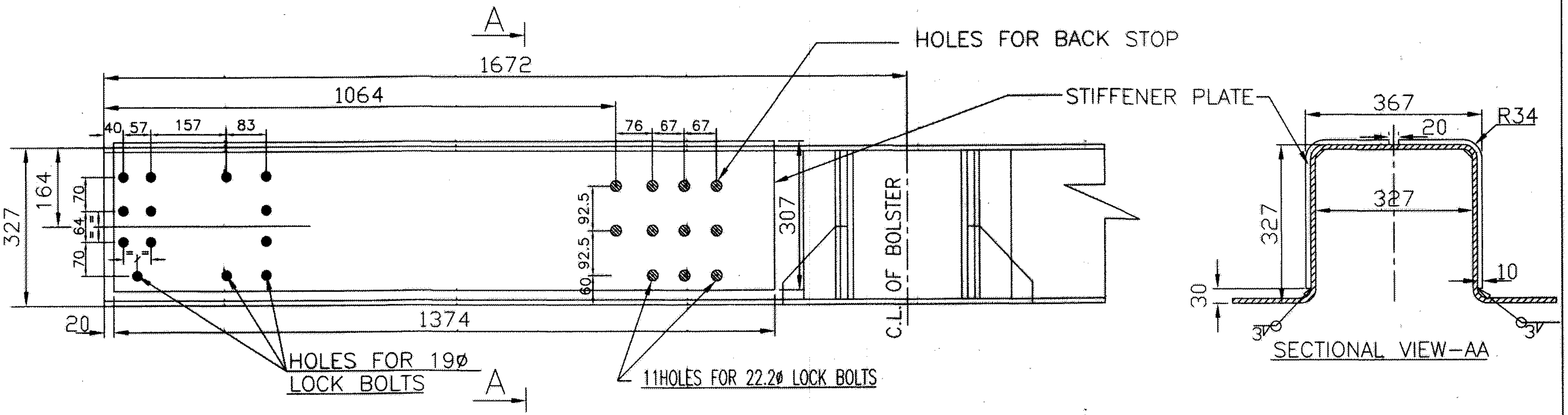
In addition to the damages/defects reported already at backstop location in case of single piece centre sill, Ajmer workshop reported one case of new type of crack generation at back stop location. The issue was examined and a new drg WD-22045-S-01 Alt nil has been prepared for this and the wagon has been repaired successfully. In future similar nature of cracks can be repaired by the above mentioned drg.

The drawing Nos WD-20035-S-01, WD-20035-S-02 & WD-22045-S-01 made for repair of backstop location defects may be referred to for further ref and repair as and when such type of defects arise.

15.06.2022

(Arvind Kumar)
Jt. Director/WD-II
For Director General/RDSO

Copy: EDME (Frt.)/ Railway Board



REPAIR PROCEDURE:-

1. REMOVE FLOOR PLATE ABOVE CRACK LOCATION .
2. REMOVE COUPLER BODY AND DRAFT GEAR ASSEMBLY.
3. CHECK CENTRE SILL SIDE WALL/TOP FLANGE AT BACK STOP/DRAFT GEAR LOCATION COMPLETELY FOR ANY CRACKS THEREAFTER CHECK THE DEPTH UPTO WHICH CRACK HAS PROPOGATED AND EXTENT OF DAMAGES CAUSED TO FLANGE.
4. REMOVE LOCK BOLTS OF BACK STOP AND STRIKER CASTING AS SHOWN IN DRAWING.
5. AN ARREST HOLE TO BE MADE AT END OF THE CRACK TO PREVENT FURTHER CRACK PROPOGATION.
6. NEXT GAUGE THE CRACKS AND FILL WITH WELD FOLLOWED BY GRINDING.
7. STIFFENER CHANNEL TO BE FABRICATED AS PER DETAILS SHOWN IN DRAWING.
8. STIFFENER CHANNEL TO BE MATCHED WITH PROFILE OF CENTRE SILL AND TO BE PLACED OVER THE CENTRE SILL.
9. AFTER CHECKING FITMENT HOLES TO BE DRILLED AT MATCHING LOCATIONS OF HUCK BOLTS AS PER DIMENSIONS GIVEN IN DRAWING.
10. NOW HUCK BOLTING OPERATION TO REINSERT ALL REMOVED BOLTS TO BE TAKEN UP.
11. NEXT STIFFENER CHANNEL TO BE TACK WELDED FIRST AORUND THE CENTRE SILL
12. NOW ALL ROUND WELDING OF STIFFENER PLATE WITH CENTRE SILL TO BE DONE.
13. NEXT REASSAMBLE THE COUPLER BODY .
14. NEXT FLOOR PLATE TO BE WELDED AND TO BE CUT TO SUIT PATCH AS SHOWN.
15. CARE SHOULD BE TAKEN FOR GOOD QUALITY OF WORKMANSHIP.
16. CENTRE SILL THUS REPAIRED TO BE MARKED ON SOLEBAR PROMINENTLY AS "CENTRE SILL REPAIRED" FOR PROPER MOMITORING PURPOSE.
17. IN CASE TOP FLANGE OF CENTRE SILL AT THIS LOCATION HAS CRACKED ACROSS ITS WIDTH, THEN WAGON IS NOT TO BE REPAIRED.

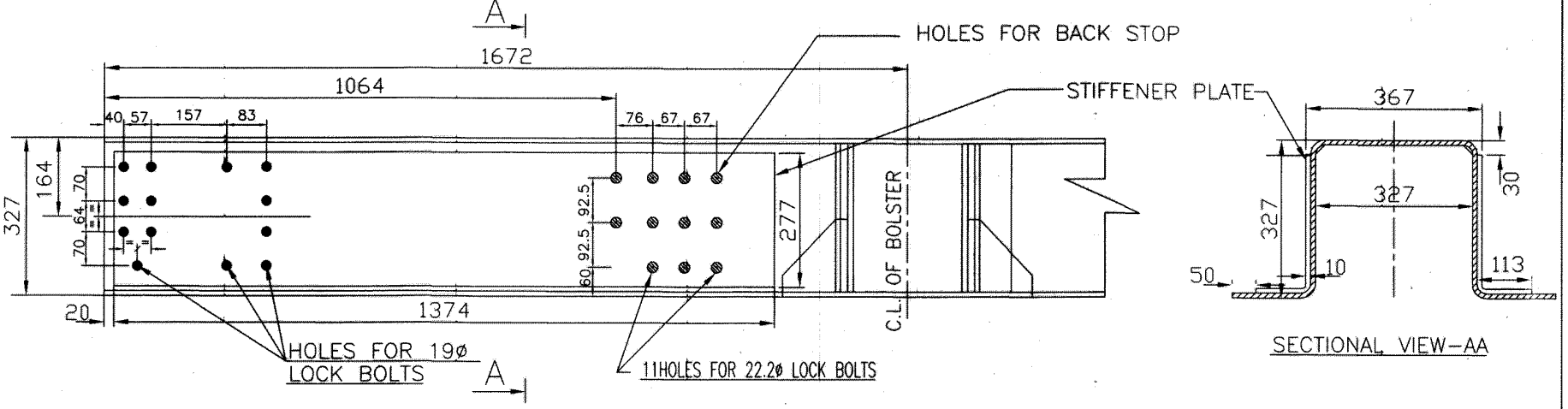
ITEM	DESCRIPTION	NO. OF.	REF. DRG.	WT. OF (Kg.)	MTL & SPEC	REMARKS
1	STIFFENER PLATE	-	-	-	IS:2062 E 250	

PRELIMINARY SKETCH — ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)

			DATE
SUPERSEDED BY			
SUPERSEDES			
SCALE 1:5	PASSED	[signature]	09/2020
	CHECKED	[signature]	09/2020
	DRAWN	L.MOHAN	09/2020
	TRACED		
	COMPARED		
	J.S.NO.	WD-20035	09/2020

REPAIR PROCEDURE FOR DAMAGE TO CENTRE SILL AT DRAFT GEAR /BACK STOP LOCATION FOR BOXNHL WAGON

B.G. | R.D.S.O. [W] | GROUP | WD-20035-S-01



REPAIR PROCEDURE:-

1. REMOVE FLOOR PLATE ABOVE CRACK LOCATION .
2. REMOVE COUPLER BODY AND DRAFT GEAR ASSEMBLY.
3. CHECK CENTRE SILL SIDE WALL/TOP FLANGE AT BACK STOP/DRAFT GEAR LOCATION COMPLETELY FOR ANY CRACKS THEREAFTER CHECK THE DEPTH UPTO WHICH CRACK HAS PROPOGATED AND EXTENT OF DAMAGES CAUSED TO FLANGE.
4. REMOVE LOCK BOLTS OF BACK STOP AND STRIKER CASTING AS SHOWN IN DRAWING.
5. AN ARREST HOLE TO BE MADE AT END OF THE CRACK TO PREVENT FURTHER CRACK PROPOGATION.
6. NEXT GAUGE THE CRACK'S AND FILL WITH WELD FOLLOWED BY GRINDING.
7. STIFFENER CHANNEL TO BE FABRICATED AS PER DETAILS SHOWN IN DRAWING.
8. AFTER CHECKING FITMENT HOLES TO BE DRILLED AT MATCHING LOCATIONS OF HUCK BOLTS AS PER DIMENSIONS GIVEN IN DRAWING.
9. NOW HUCK BOLTING OPERATION TO REINSERT ALL REMOVED BOLTS TO BE TAKEN UP.
10. NEXT STIFFENER CHANNEL TO BE TACK WELDED FIRST AORUND THE CENTRE SILL
11. NOW ALL ROUND WELDING OF STIFFENER PLATE WITH CENTRE SILL TO BE DONE.
12. NEXT REASSAMBLE THE COUPLER BODY .
13. CARE SHOULD BE TAKEN FOR GOOD QUALITY OF WORKMANSHIP.
14. CENTRE SILL THUS REPAIRED TO BE MARKED ON SOLEBAR PROMINENTLY AS "CENTRE SILL REPAIRED" FOR PROPER MOMITORING PURPOSE.

ITEM	DESCRIPTION	NO. OF.	REF. DRG.	WT. OF (Kg.)	MTL & SPEC	REMARKS
1	STIFFENER PLATE	–	–	–	IS:2062 E 250	

PRELIMINARY SKETCH

ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)

SUPERSEDED BY

SUPERSEDES

DATE

SCALE			
1:5	PASSED		09/2020
	CHECKED	L.MOHAN	09/2020
	DRAWN	L.MOHAN	09/2020
	TRACED		
	COMPARED		
	J.S.NO.	WD-20035	09/2020

REPAIR PROCEDURE FOR DAMAGE TO CENTRE SILL AT DRAFT GEAR /BACK STOP LOCATION FOR BOXNHL WAGON

B.G.	R.D.S.O. [W]	GROUP	WD-20035-S-02

भारतसरकार–रेलमंत्रालय
अनुसंधानअभिकल्पऔरमानकसंगठन
लखनऊ– 226011
Fax : 91-0522-2452494
Tele/Fax: 0522- 2456165

Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011
DID (0522)2450115
DID(0522)2465310

No. MW/BOXNHL Dated: 17.06.2022

To,
All PCME'S

1. Northern Railway, Baroda House, New Delhi-110 001
2. Central Railway, CST, Mumbai-400 001
3. Eastern Railway, Fairlie Place, Kolkata-700 001
4. Western Railway, Churchgate, Mumbai-400 020
5. Southern Railway, Park Town, Chennai-600 003
6. South Central Railway, Secunderabad-500 071
7. South Eastern Railway, Garden Reach, Kolkata-700 043
8. North Eastern Railway, Gorakhpur-273 001
9. Northeast Frontier Railway, Maligaon, Guwahati-781 011
10. East Central Railway, Hajipur, Bihar 844 101
11. North Western Railway, Jaipur-302 006
12. North Central Railway, Allahabad.-211 001
13. South Western Railway, Hubli – 580 023
14. East Coast Railway, Bhubaneswar, Orissa-751 023
15. West Central Railway, Jabalpur-482 001
16. South East Central Railway, R.E. Complex, Bilaspur – 495 004

Sub: **Regarding repair of damages of BOXNHL wagons**

Ref (i) Railway board letter No. 2015/M(N)/951/63 dt 06.04.2022
(ii) Chairman & CEO, Railway Board letter DO No 2015/M(N)/951/63 dt 28.04.2022
(iii) Railway board letter No. 2019/M(N)/60/7 pt. dt 22.02.2022
(iv) CRSE/WCR/Jabalpur letter no WCR.M.G.01.251 III dt 31.12.2021
(v) CRSE/SECR/Bilaspur letter no CME/HQRS/003/005/RSP/Wagon/BOXNHL /311 dt 02.03.2022.
(vi) CWM/SER/Garden Reach letter no M6/1246/Drawing/16 dt 07.04.2022
(vii) Railway Board letter No. 2019/M(N)/60/7 dt 30.05.22
(viii) CWE/ER letter no MRW/BOXNHL Rehabilitation dt 09.06.2022

a) BOXNHL wagons are made of IRSM-44 (SS) material, which by virtue of its mechanical properties is corrosion resistant and is ideally suited for the transport of coal on mass scale. Being so, the utilization of BOXNHL wagon for transportation of coal and other commodities is very high. To meet the transportation requirement particularly to ensure the ever increasing demands of coal from power plants it is necessary that BOXNHL wagon should be maintained in good condition.

BOXNHL wagon damages cases are being reported continuously from all over Zonal Railways. The majority of the damages incurred are due to mishandling of the wagon during loading and unloading. Due to heavy damages incurred in the wagon, work load of wagon workshops has increased considerably.

b) Railway Board has also highlighted the issues of wagon damages and unavailability of wagons for operational use on this account. In order to prevent such incidences from occurring repeatedly several measures have been taken/suggested by Railway Board vide letter under reference at (i).

c) Vide letter under reference (ii) above, Chairman & CEO Railway Board emphasized that Zonal Railways are to take concerted efforts to "Minimize damage to wagon during loading/unloading". Wagon damages result in running of embedded empties, thereby adversely impacting wagon availability resulting in increased wagon maintenance cost and other safety concerns.

   Railway Board has issued instructions to Zonal Railways from time to time for taking steps to prevent damages to wagons which include monitoring of Loading/unloading points, levy of penalty and recovery of the same.

d) Vide Railway Board letter under reference (iii) above, RSP work has been allotted to Zonal Railways for repair of damages of BOXNHL wagon–PB item no. 1286/2022-23.

e) Vide CRSE/WCR letter under reference (iv) above, issue of non-availability of STR to undertake detailed repair work for damages incurred in these wagons has been raised. Further WCR has highlighted following areas of attention for repair of damages in BOXNHL wagon:
   1. Replacement of side panel (body side arrangement).
   2. Replacement of full body & side stanchion pillar with huck bolting as per requirement.
   3. Cutting & replacement of damaged patches in body and floor and fitment (Approx. 2 patches in body & floor each).
   4. Repair of body bulging by changing side top coping.
   5. Replacement of door way crosses bar stiffener and doors.

f) Vide CRSE/SECR and CWM/SCR/GOC letters under reference (v) & (vi) respectively, the issue of non-availability of STR to undertake detailed repair work for damages incurred in these wagons has been raised.

g) Vide CWE/ER letter under reference (viii) above, once again issue of non-availability of STR to undertake detailed repair work for damages incurred in BOXNHL wagons has been raised. Further CWE/ER has highlighted following areas of attention for repair of damages in BOXNHL wagon:
   1. Replacement of side walls complete along with related work(e.g. stripping, fitting & welding, lock bolting)
   2. Replacement of end walls complete along with related work (e.g. stripping, fitting & welding, lock bolting)
   3. Replacement of all doors complete along with related work (e.g. stripping, fitting & welding, lock bolting)
   4. Complete flooring of all wagons. (e.g. stripping, fitting & welding)
   5. Minor repair based on actual condition.

h) As stated earlier during operational use of wagons, large-scale damages to superstructure and wagon parts have been reported. The damage/defects and component repair can be broadly undertaken as under.

1. **Damages and repairs in body side:**
   - These include damages of side middle copings, door way stiffening cross bars, body side stanchions (hat section), side top coping and other components.
   - The above damages/defects are being repaired by the Zonal Railways on condition basis with adoption of RDSO issued document on repair of superstructure No GL/Repair/BOXNHL: 2022. This document has already been issued to all workshops of Indian Railways and same may be referred to for repair.
   - In case of heavily damaged/accidental case of body side where patching/repair is not possible, complete replacement of body side along with related works(e.g. stripping, fitting, welding, lock bolting) may be done as per requirement.
2. **Door related issues:**
   - RDSO has already been issued letter to railways regarding change in door material from SS to MS The drawings details are given in the RDSO door drawing Nos WD-09034-S-07 (for SS) and WD-22006-S-01 (for MS) of BOXNHL wagon.
   - Heavily damaged door which cannot be repaired shall be replaced by following RDSO door drawing Nos WD-22006-S-01.
3. **Body side stanchion repair:**
   - Cases of body side stanchion having welding failure with solebar were occurring. The drawing was suitably modified to prevent welding failure in future.
   - Damaged side stanchions shall be repaired following RDSO drawing no WD-14013-S-01 and guidelines GL/Repair/BOXNHL: 2022.

4. **Body bulge repair:**
   - These have been reported in large no of wagons. Investigation of these cases shows claw marks caused by JCB hitting on inside of body sheet during unloading of wagons. The body side sheet also get torn from inside.
   - For such cases localized replacement in form of puncture patches is allowed. Repair of body bulging of BOXNHL wagon is done as need arises.
   - The repair body bulging shall be done following guidelines as issued in GL/Repair/BOXNHL: 2022.

5. **Oblong hole in sole bar repair:**
   - Zonal Railways also reported cases of oblong holes being formed in sole bar of BOXNHL wagon. These are caused due to wrong practices (use of oxy acetylene cutting in place of plasma cutting) followed in ROH/POH during repairs made to side stanchion.
   - This results in side stanchion holes getting distorted from their original locations and shape. The above defect is being repaired by workshops concerned by following in house developed repair procedure.

6. **Body end damages and repair:**
   - These include damages in end top coping, top corner joint and other relevant components.

- In majority of cases damages to body end are limited to small area mostly in form of deformation in end top coping due to gripping by jaws of tippler during unloading operation. These damages are being attended to by Zonal Railways/Workshops on condition basis.
- The repair of body end damage shall be done following RDSO guidelines No GL/Repair/BOXNHL: 2022.
- In case of heavily damaged/accidental case of body end where patching/repair is not possible complete replacement of end walls along with related works(e.g. stripping, fitting, welding, lock bolting) may be done as per requirement.

7. **Floor plate damage and repair:**
   - These damages include tearing out of floor plate panels, distortion of plates, depression in the plates etc.
   - The main reasons of floor plate damages are due to use of mechanized unloading with JCB and crane.
   - The damage portions are being repaired by the zonal railways on condition basis. There is no fixed interval for repair/replacement of the damaged floor plates.
   - Complete flooring of wagons (including related works (e.g. stripping, fitting, and welding) may be done if condition warrants.

8. **Underframe members damages and repairs other than centre sill:**
   - Here damages occur in load supporting members like sole bar, headstock cross bars, stringers which tend to get distorted/broken due to buckling of floor plate. For such cases the repair work is done by workshops/depots on condition basis, and replacement is done as and when required.
   - The repair of these damages shall be done following RDSO guidelines No GL/Repair/BOXNHL: 2022.

9. **Centre sill damage and repair:**
   - Excessive sagging of centre sill and development of cracks in centre sill has been reported. These occur due to mishandling of wagon during loading/unloading.
   - For cases of centre sill sagging a separate document "Centre sill sagging repair of BOXNHL wagon" has been prepared. The stepwise instructions for sagging repair have been provided in this document.
   - For repair of damage centre sill letter has already been issued to all Zonal railways vide RDSO letter No MW/BOXNHL dated 21.11.2017.
   - A Separate RDSO drawing has been also issued to all Zonal Railways for repair of damage centre sill for specific cases of damages to back stopper portion of BOXNHL wagons vide drg Nos:
     a) WD-20035-S-01
     b) WD-20035-S02
     c) WD-22045-S01
   - RDSO has also issued a strengthening procedure of centre sill of BOXNHL wagon during ROH/POH as a preventive measure vide letter No MW/BOXNHL dated 02.07.2018 and same letter has been reiterated on 20.05.22. All Zonal Railways are requested to ensure the strengthening of centre sill as per RDSO issued procedure.

All the above issued guidelines, repair procedures or STR, repair drawings, strengthening procedures etc., are once again being sent to all Zonal Railways. All Zonal Railways are requested to follow the issued repair procedures for repair of damaged BOXNHL wagons.

The need for issuing a separate rehab procedure is not required, as all defects that make the wagon unfit for traffic use are already covered in the above mentioned repair procedures and issued drawings for the wagon repair. The aforesaid mentioned from para 1 to 9 may be used for doing the necessary repair on condition basis.

This is for your information and necessary action please.

ARVIND KUMAR

Digitally signed by ARVIND KUMAR
DN: cn=ARVIND KUMAR, c=IN, st=Uttar Pradesh, o=INDIAN RAILWAYS, serialNumber=f10e98f39668a2db6570bfb1b5426e8c921ab13e8179dbae7c49e1256932d6cf
Date: 2022.06.17 17:32:51 +05'30'

DA: as above

(Arvind Kumar)
Jt. Director/Wagon
For Director General/wagon

Copy: EDME (Frt.)/ Railway Board, New Delhi-110001.

INDIAN RAILWAYS

Guidelines For Repair of Damaged BOXNHL Wagon

S.NO.	Month/year of issue	Amendment No.	Revision No
01	June -2022	Nil	Nil

ISSUED BY

RESEARCH DESIGN AND STANDARDS ORGANISATION

MINISTRY OF RAILWAYS

MANAK NAGAR, LUCKNOW -226 011

Contents

E	Letter no MW/BOXNHL dt 08.01.2016 &21.11.2017 regarding cracks/damages in three-piece centre sill	
F	Letter no MW/BOXNHL dt 02.05.2018 & 20.05.2022 regarding strengthening of three-piece centre sill	
G	Letter no MW/BOXNHL dt 15.06.2022 regarding cracks/damages in single-piece centre sill	
H	Letter no MW/BOXNHL dt 10.03.21 regarding sagging repair procedure to be followed in centre sill	

1. General Note:

1. These Repair guidelines are meant to be an enabling guide for repair workshops to undertake repair of SS BOXNHL wagons. Experience of noticed damages in BOXNHL wagons has shown that predominantly the noticed damages are on account of wrong loading/ unloading practices/ accidents & hence, greatly differ from wagon-to-wagon. This also underlines the fact that no single document detailing all kinds of possible damages/ repair-of-those-damages can be compiled. This document, hence, aims to define broadly the requirements/ expectations from repair practices on BOXNHL wagons covering all aspects to the extent possible.
2. Although efforts have been made to cover recommendations for structural repair in all major assemblies, it is expected that workshops, based on experience gained while undertaking repair of BOXNHL wagons, would suitably add/ enrich this document.
3. BOXNHL wagon structure uses high strength Ferritic Stainless steel. The material is corrosion resistant & owing to higher strength, is also less prone to distortions. At the same time, once distorted, it also needs considerable rework/ replacement for repair. Workshops are advised to refer to RDSO’s document No. GL/SS/General for general instructions on SS handling, storage & working.
4. This document is expected to be read in conjunction with relevant & latest revision of drgs of BOXNHL & other RDSO standards/ Specs such as G-72, G-93, G-81. It is expected that consumables such as welding electrodes/ paints as specified in relevant specs/ standards/ drgs shall be used during repair. This document also does not over-rule/ replace any maintenance instructions in Wagon maintenance manual/ Rly Bd’s circulars/ RDSO’s instructions/ Maintenance standards but only supplements the same. Workshops are advised to refer back to RDSO, in case of any conflicting instructions/ guidelines concerning repair of BOXNHL is noticed.
5. BOXNHL uses CRF (Cold Roll Formed) sections in some structural members. In cases of damages to the CRF sections, these need to be repaired/ replaced. In order to improve availability & provide flexibility & also since smaller lengths (instead of full lengths) could be needed during repair, these sections could be manufactured in-house by workshops, if possible, using press-forming. Care should however be taken to ensure sectional dimensions & material of construction, as detailed in relevant drgs, are maintained.
6. All repair/ replacement work on BOXNHL should be undertaken on-condition basis. No assemblies, in this document are recommended for mandatory/ compulsory replacement.
7. The wagon assemblies repaired/ replaced are recommended to be painted, before despatch. Necessary process as detailed in relevant specifications, mentioned in respective marking diagrams of BOXNHL should be followed.

2.**0 Wagon Body**:

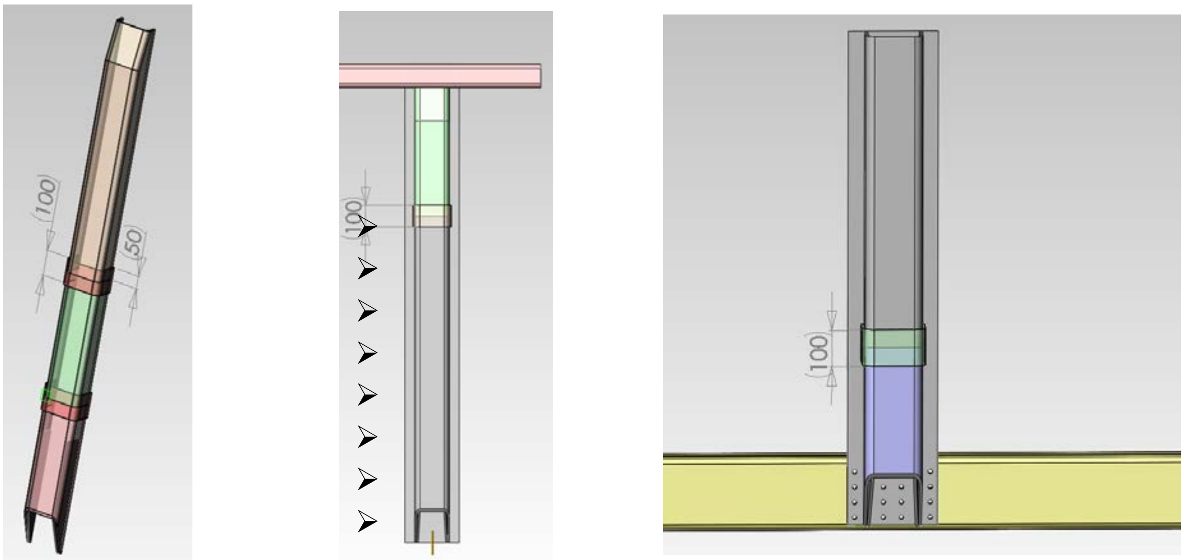
2.1. Damages to side & end stanchions like cracks/ twist/ bent/ broken/ punctured / welding gaps.:

The damaged portion is recommended to be cut and replaced with appropriate section of requisite length. Since material used is IRS:M44 (Stainless steel), for cutting sheet cold cutting method that is plasma cutting should be followed. Cutting by any other means particularly oxy acetylene will lead to distortion and change in material properties and is not allowed. It should be ensured that :

(a) Butt welding between the existing & the replaced section is correctly done ensuring weld penetration & alignment

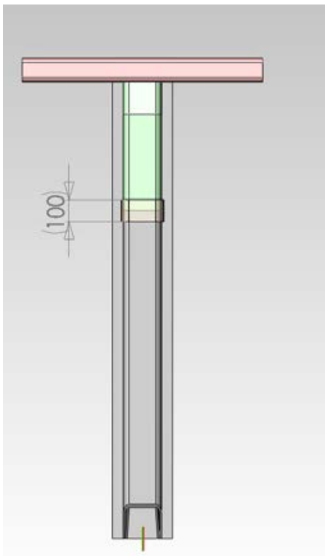
(b) To strengthen the butt weld, a lap joint of at least 100mm width be further provided between the older & the replaced section.

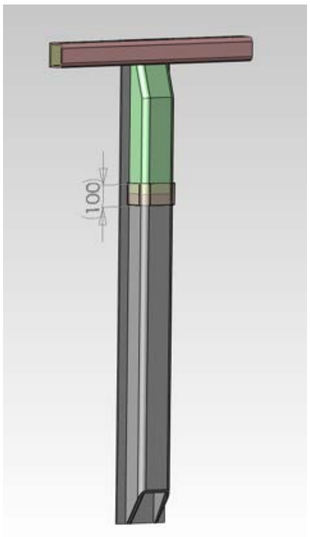
Illustrative sketches showing the repair are shown below for reference:



2.2. Repair to joints of Side Stanchion with the Top Coping:

The recommended repair is the same as above & is illustrated below:

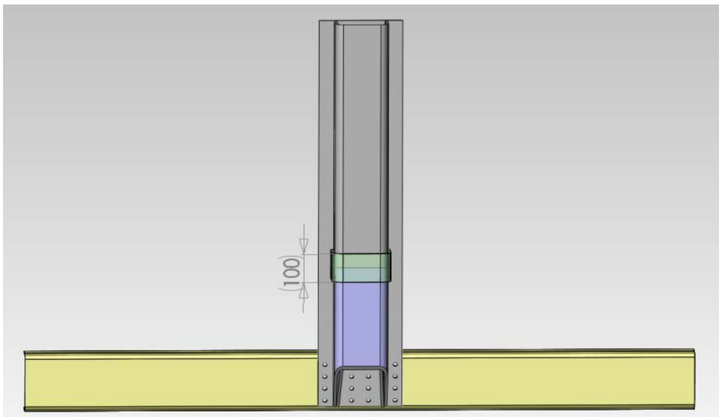


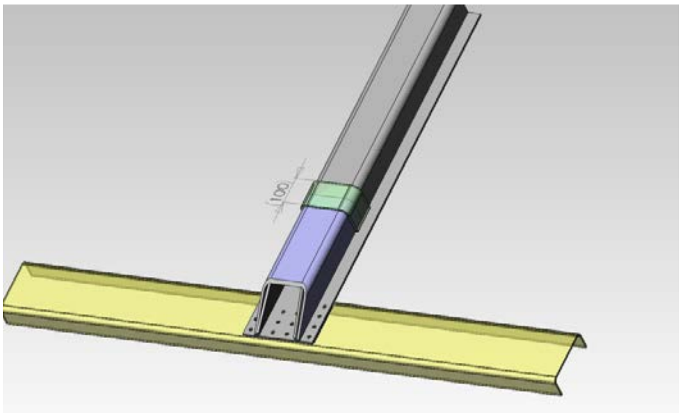


2.3. Repair of Side Stanchion when damage noticed at the joint/ near the joint of the side stanchion with Sole bar or joint of the stanchion with the top coping:

In such damages, it is recommended to repair/ replace the stanchion section of at least 450mm above the sole bar/ below the top coping, to ensure adequate strength at the bottom part which is the most critical area of the side stanchion. The repair procedure of Butt & lap joint, is recommended to be the same as above. The lockbolts, between the stanchion back plate & solebar may need to removed/ cut, for these repair. Before assembly of the new stanchion, it needs to be ensured that the back plate in the new/ replaced section of stanchion & the solebar have aligned holes of correct sizes to ensure proper lock bolting after repair of the stanchion.

Illustrative sketches for these repairs are as below:





Kindly note that the above repair, by using joints in the side stanchion, is being recommended to optimize repair cost & also with the inherent assumption that the joint repair, would be sound with good weld penetration & correct dimensional control. Since stanchions, provide lateral strength to the wagon sides, it is recommended that in case a side stanchion warrants more than two repair joints, as recommended above, the side stanchion be replaced.

Cases of body side stanchion weld failures with sole bar have been reported by railways. The section of body stanchion has not been damaged /deformed in any way and only welding with solebar has opened. In such cases a sketch showing repair procedure to be followed has been made. Drg no WD-14013-S-01 has been issued for this purpose and the same may be referred to for repair. In this context a letter MW/BOXNHL dated 29.05.2014 has been issued to all concerned CWM's

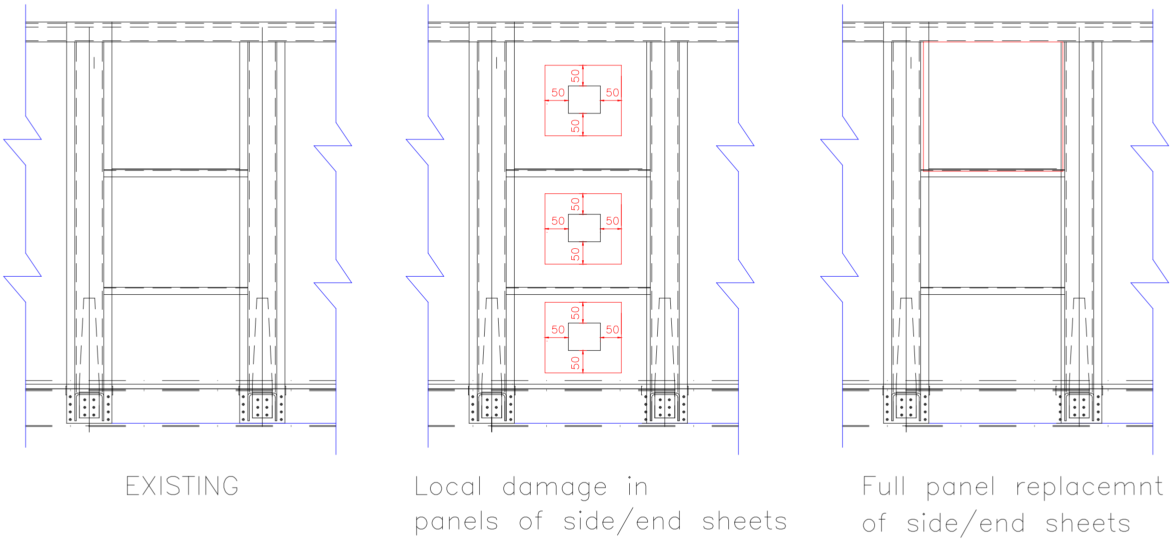
2.4. Damages to Side/ End Body Sheet:

In cases of damages to body side sheet/ end side sheet, it is recommended that sheet patches of adequate sizes be used & welded by overlapping with the existing side sheet to repair the damaged/ torn sheet. The size of the sheet, being used for repair, should be so chosen so as to ensure at least a 50mm overlap, all round the repair patch. The sheet overlap is being permitted, to safeguard support members (such as crib angles) that could get damaged, if an entire panel of side sheet is recommended to be replaced.

An illustrative sketch is shown. The sheet overlap could be provided both from the outside or the inside, with welding being done both from the inside & the outside to ensure patch strength. In case of the side sheet being damaged/ torn/ damaged at multiple locations, warranting a large number of patches, it is recommended that a decision for replacement of the entire side sheet panel, between two consecutive side stanchions be taken. In case it is felt necessary, to ensure strength of the replaced section, the side sheet could overlap on the existing side sheet/ inside face of the side stanchions.

For cases of body /end sheet bulging straightening is to be done by heating affected area and hammering it . Since IRS M44 has spring back action after cooling care to taken to ensure proper straightening is done. It should be ensured that heating is done only to the extent required. Since this is stainless steel heating to "red hot" condition is not permitted in any case.

A illustrative sketch detailing repair procedure is shown below for reference.

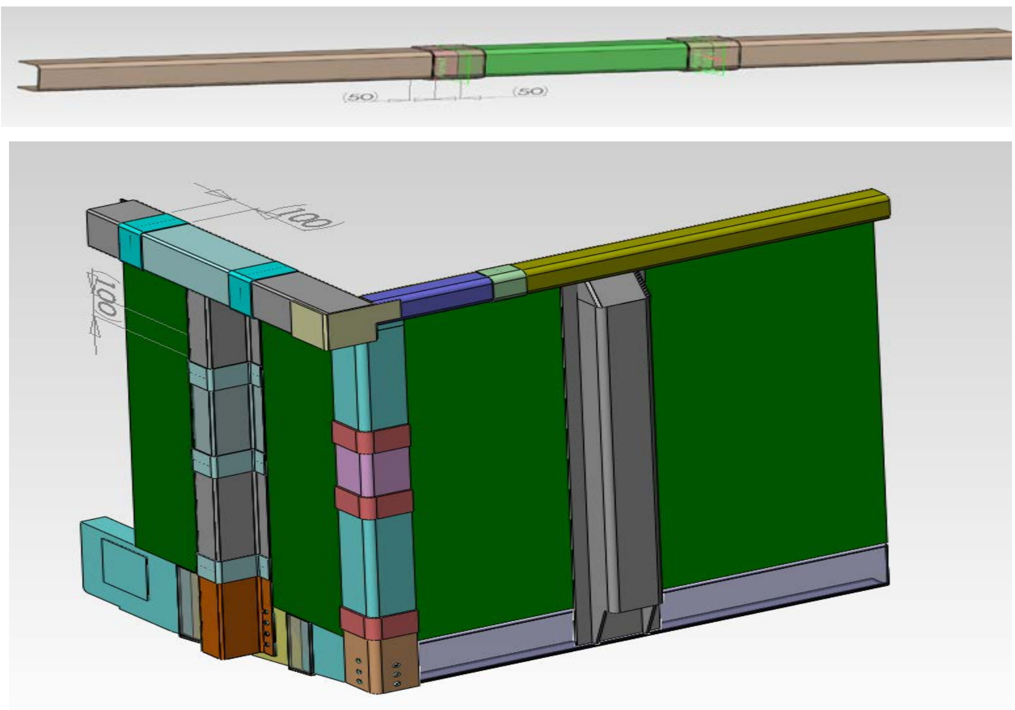


2.5. Damages to side top coping, end top coping &/ or corner joint:

The damaged portions of the Top copings are recommended to be cut and replaced with similar sections, as recommended for stanchions. The similar repair process of Butt joint, reinforced with a lap joint, as recommended for side stanchions, be followed.

In case of a damage to a corner joint, it is recommended that since such a damage would necessarily entail damages to portions of side & end top coping, the corner joint, as an assembly be replaced. This is also recommended owing to the critical role of the corner joint in overall structural strength of the open wagon.

An illustration of the repair of the end top/ side top coping, corner stanchion & corner joint is shown below:

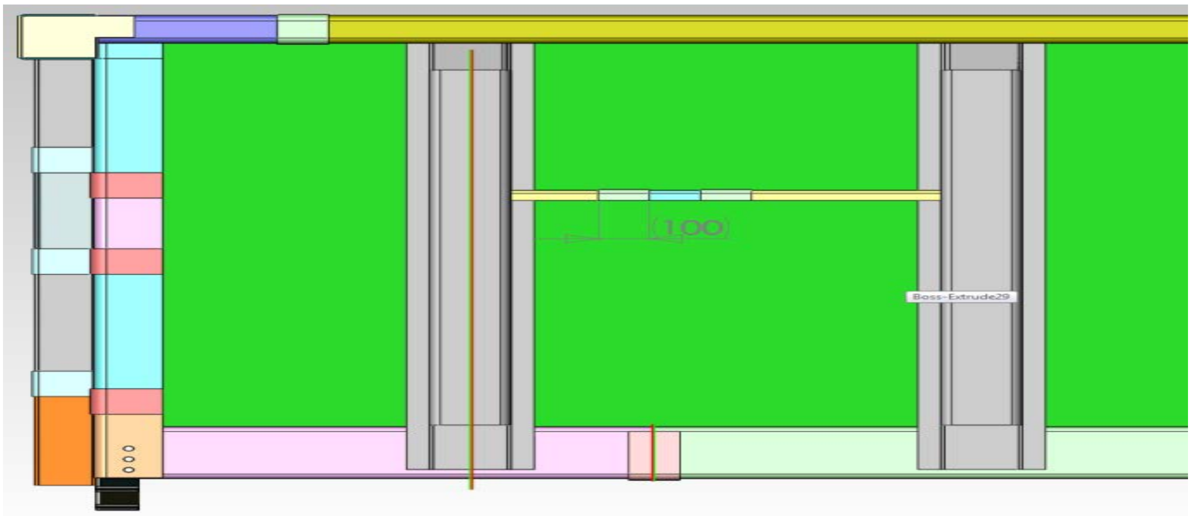


2.6. Damages to side middle copings, other structural support members & door assembly:

Side Middle Copings & other support members are recommended to be repaired, as in case of coping/ side stanchions. An illustrative sketch is indicated alongside.

In cases of damages to door way stiffening crossbar, damaged portion to be similarly attended/ replaced in case of heavy damages.

Damaged components of door assembly to be replaced on condition basis. In case of bulging of door sheet, the door may need to be un-assembled & straightened using suitable fixtures/ tools. In case of heavy damage/ bulging that cannot be rectified, the full door assembly may need to be replaced. If required door to MS material as per drg. no WD-22006-S-01 can be used as replacement.



2.7. Repair for Body Side Bulging:

Body Side bulging of BOXNHL wagons varies from case-to-case .As such a general repair procedure for cases of bulging is not feasible. In general, the conventional body bulging repair practices, such as heating the side sheet &pulling together the wagon sides, through tie/ clamp rods, may not be very effective on the Ferritic SS of BOXNHL. The following recommendations could be evaluated to address body bulging:

- In case of side sheet bulge, the sheet section needs to be freed from one end & rewelded/ patched with overlap after necessary straightening. The replacement of the complete side sheet panel may also be evaluated.
- To undertake body sheet bulging, in case the side sheet is intact & the side stanchions are also not bent/ damaged, the side sheet may need to be heated & straightened. Care should be taken not to heat the Side sheet beyond 150 degrees Celsius. Also, if the side sheet panel can be freed from the coping, the sheet could be straightened more easily & could be welded back with the coping, after straightening, after tying the necessary tie-rods between the opposite top copings. Similarly, if the bottom panels are observed to

be bulged, these may need to be cut from the crib angle & replaced/ repaired after separate straightening.

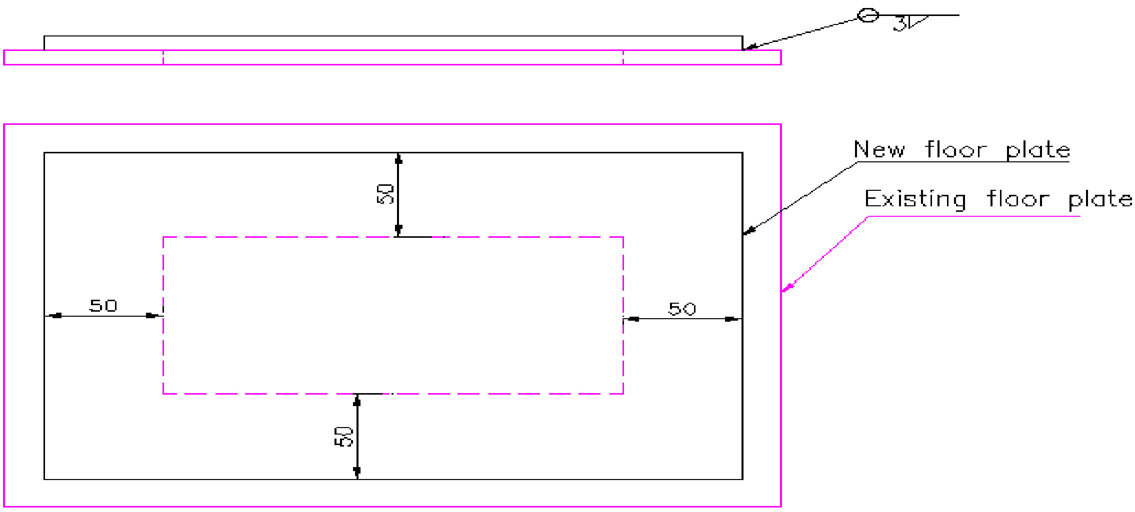
- In case of heavily bulged sections, some sections/ portions of the side wall could need to be removed after cutting from the crib angle and/or the top coping, straightened on a fixture/ using hydraulic means & then welded back in place after straightening.

3. Underframe:

The following repair recommendations are made for underframe assemblies/ components:

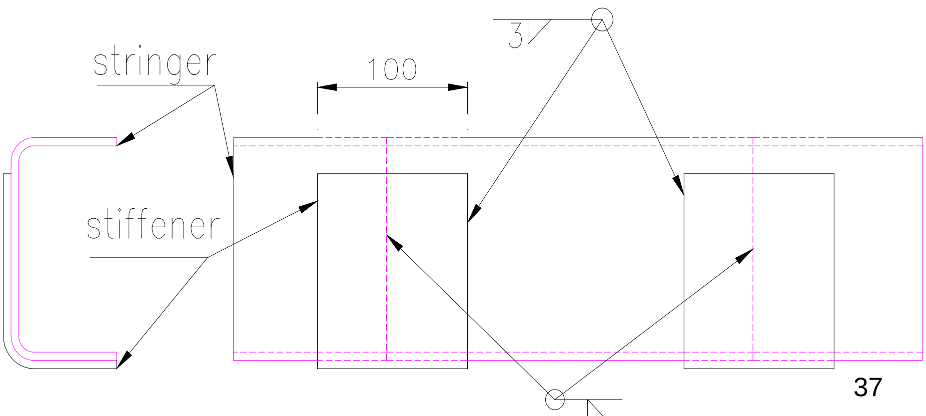
3.1 Floor Plate:

Damaged/ punctured/ distorted floor plates are recommended to be repaired by cutting out damaged portion and replacing it using floor plate sheet of appropriate size ensuring minimum all-round overlap of 50mm. In case of damage to floor plate near crib & end angles, damaged portion of the floor plate be cut close to the crib/ end angle & be replaced with overlap, if needed at crib & end angles.



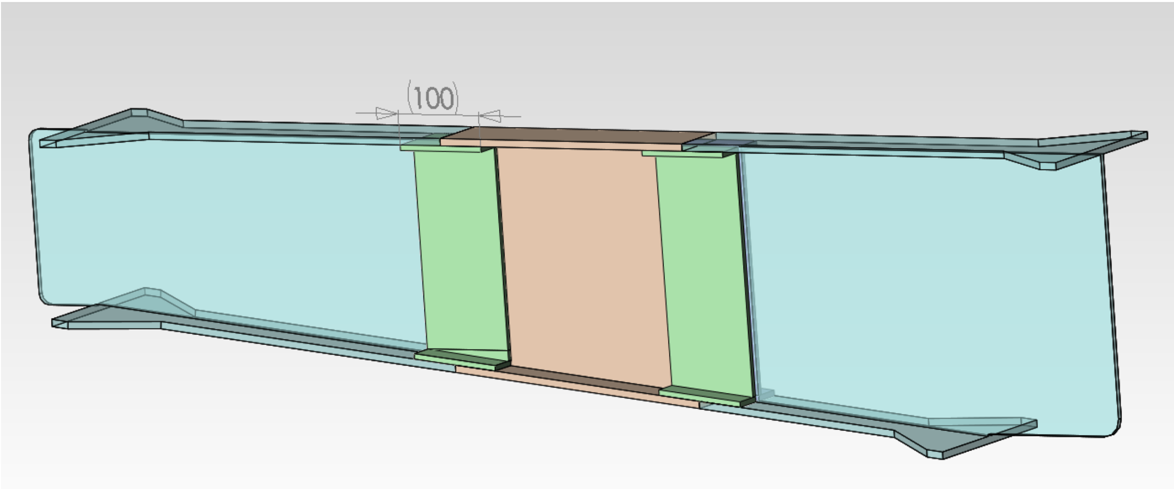
3.2 Repair of Stringers:

For stringers supporting the underframe, it is recommended that in case of damage/ bent stringers of smaller length, replacement with a new stringer of the damaged portion be done. In case of heavy or beyond repair case the stringer is to be replaced with a new section & its condition in assembly to be evaluated. For other stringers condition-based repair is recommended to be done. In order to strengthen the joint, stiffening plates be added as and where required. An illustrative sketch is shown below:



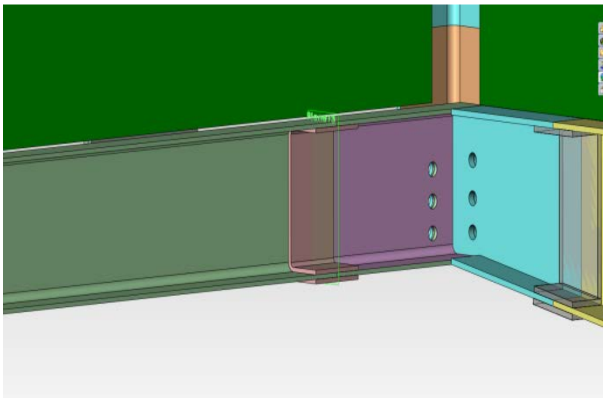
3.3. Repair of Cross Bars:

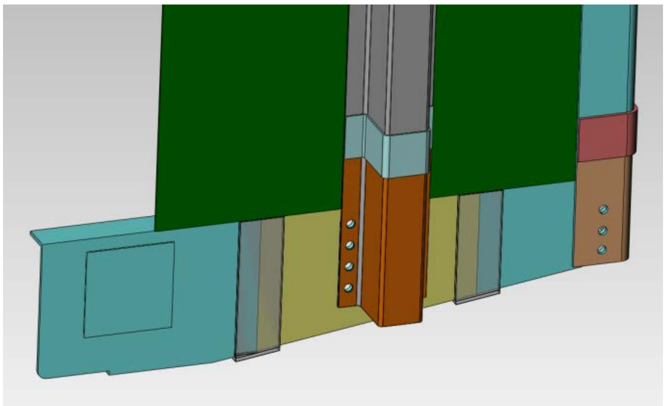
In the case of damaged crossbars supporting the underframe, damaged portion to be attended & depending on condition, be replaced in case of heavy damages. Supporting plates & overlap is recommended to ensure additional strengthening of the repair joint.



3.4. Repair of Damaged Headstock/ Headstock Sole-Bar assembly:

In cases of damaged headstock, it is recommended that damaged portion be cut and replaced by appropriate section, ensuring adequate overlap of the lap welded cover plate. Stiffening plate, both on the inside & outside, is recommended to be provided for strengthening the repaired joint.





3.5 Repair of Sole bar:

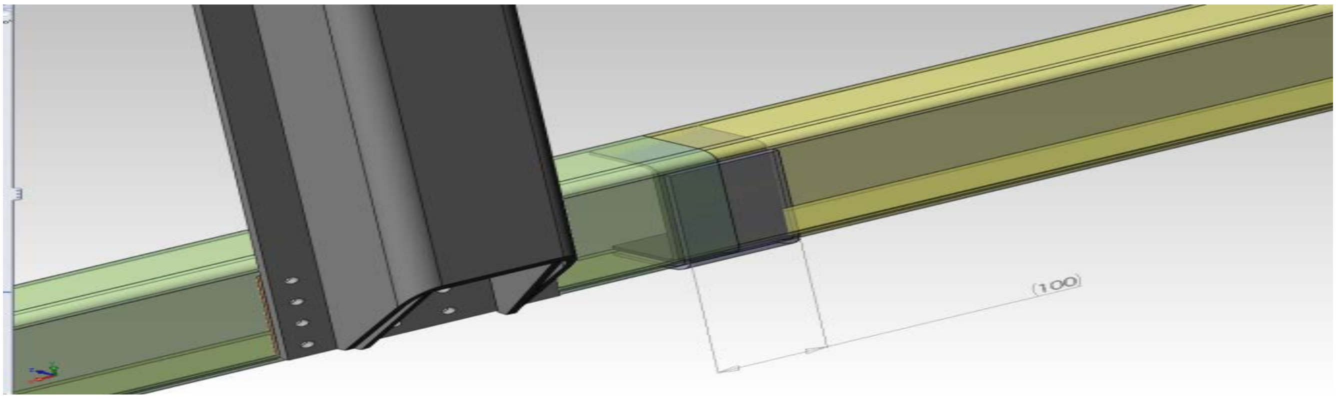
For repair of damaged portions of solebar, it is recommended that the damaged portions be cut and replaced by a repair piece of similar section & of adequate length. Apart from the butt weld, it is also recommended that an overlap joint be ensured between the but welded repair piece & the originally available sole bar.

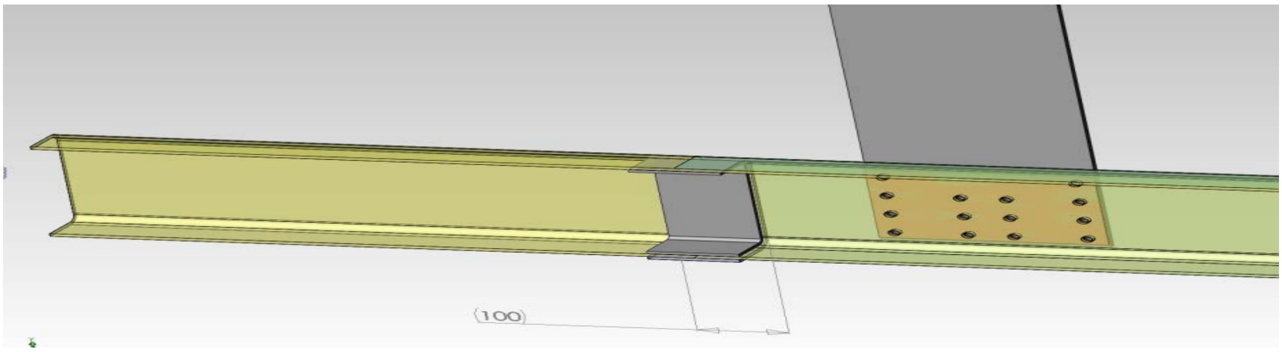
A min overlap of 100 mm width be ensured for additional strength of the repaired solebar. For additional strength & based on the location of the repair, the joint be also supported by a backing plate. In case, sole bar repair is undertaken, close to the side stanchion mating area, appropriate holes may need to be drilled in the backing plate.

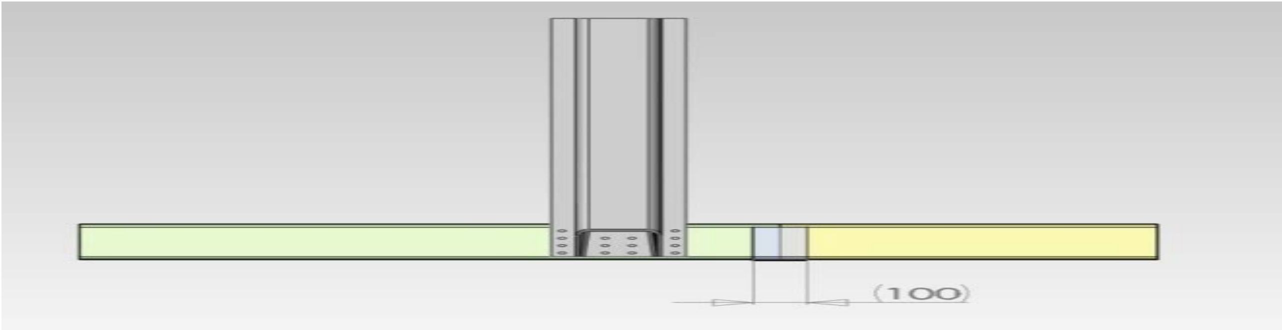
It is further recommended that in cases of repair of sole bar close to the side stanchion mating area, the sole bar repair be undertaken to ensure that the weld joint in the sole bar is at least 200mm away from the location of the lockbolts on either side of the side stanchion.

There has been a rise in no of cases being reported where oblong holes are being formed in solebar. These are caused due to wrong practices followed in ROH/POH when repairs to side stanchion are done. In order to remove lock bolts due procedure of cutting as prescribed by plasma cutting is not followed in most places and instead oxy acetylene cutting as is followed for mild steel wagons is restored to. This results in side stanchion holes getting distorted from their original locations and shape, leading tom such cases.

The procedure to be followed by workshops to repair such cases is to place plate inside the solebar, to match with its profile and to drill holes to match position of holes with that of body side stanchion. If however workshops can find a alternative method to attend to such cases the same may be applied by them keeping the overall structural integrity I view.





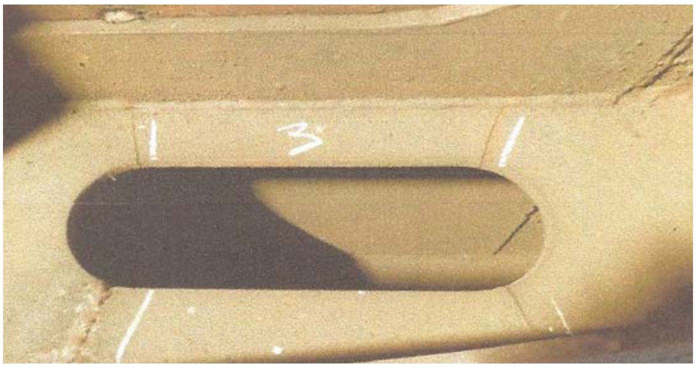


3.6 Damages to support/ locating brackets located in underframe:

In case of damages to support/ locating brackets used at various locations in underframe, it is recommended that repair/ replacement be undertaken on condition basis. Strengthening of the repair weld joints/ providing additional support/ overlap/ backing plates be ensured during such repairs.

3.7. Cracks in corners of slot of body bolster web plates:

Cracks developed at the corners of slots of body bolster web plates near sole bar. The reason of development of cracks due low section modulus and stress concentration. The issue has addressed by modification in drawing and for damages repair a repair procedure has been issued to CWM Jhansi vide letter no MW/BOXNHL dated 23.01.2015.



3.8 Damage in bolster bottom gusset plate:

Workshops reported cracks in bolster bottom gusset plate near the joint of centre filler base plate. The cause of cracks in bolster bottom gusset is gap between the bolster bottom gusset plate & the centre filler support arrangement. In order to address this issue detailed guidelines were prepared and circulated to all Zonal Railways vide letter no MW/BOXNHL dated 23.06.2014.

3.9 Damages to Centre sill :

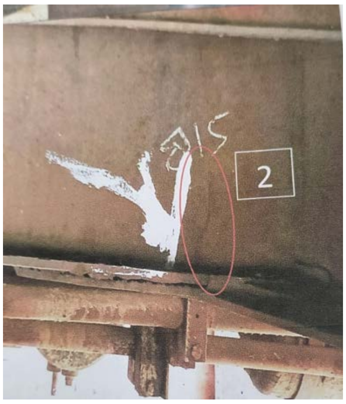
In BOXNHL wagon there are two types of centre sills used . These centre sills are Three piece centre sill and Single piece CRF section. Their defects and repair procedures are given below.

3.9.1 Three piece Centre sill:

Railways/Workshops/ROH depots have reported cracks in centre-sill of BOXNHL wagons. The cracks in centre sill are categorized as under:

- Between bolsters at the location where stiffening plates end
- Near the joining portion of End & middle Centre-sills
- Just after the bolster near end of bolster bottom gusset.





3.9.1.1 Repair procedure of Three piece Centre sill:

The repair procedure no WD-16002-S-01 (latest alt.) for cracks in three-piece centre sill has been prepared and circulated to all Zonal Railways vide letter no MW/BOXNHL dated 21.11.2017.

3.9.1.2 Strengthening procedure of three piece Centre sill:

Those cases of three-piece centre sill where no cracks have been observed during ROH/POH examination, a strengthening procedure no WD-18051-S-01 has been prepared and circulated to all Zonal Railways vide letter no MW/BOXNHL dated 02.07.2018 and 20.05.2022.

3.9.2 Single piece CRF section Centre sill:

Cracks in Single piece centre sill are categorized as under:

- Between bolster and headstock near back stop lock bolt location.
- Some cases reported between bolsters at the location where stiffening plate end


3.9.2.1 Repair procedure of Single piece CRF section Centre sill:

Repair procedure nos WD-20035-S-01, WD-20035-S-02 & WD-22045-S-01 (latest alt.) of Single piece CRF section centre sill has been issued to all Zonal Railways vide letter no MW/BOXNHL dated 15.06.22

3.9.3 Sagging of Centre sill (Both Three piece & Single piece CRF section): -

It has been observed that, various cases of centre sill localized sagging have been reported and for such cases no specific guidelines have been issued.

Shown below is case of centre sill having sagged.

Now to cope up with such sagging cases of centre sill, a general repair procedure has been developed for centre sill sagging repair of BOXNHL wagon and same has been issued to Kota workshop vide MW/ BOXNHL letter dated 10.03.21.

To repair the sagging of centre sill of BOXNHL wagon, the following steps are recommended:

- First of all, remove the floor plate on affected portion of centre sill to access condition of wagon for repair to be under taken.
- The affected surface to be cleaned, so that inspection for defects can be carried out easily.
- The surface of centre sill if having any dent mark or uneven surface that can be corrected to even surface by heating (max.300˚C) followed by hammering.
- Check the centre sill, if any crack is observed in web/flange by using dye penetration test or any other suitable means. If crack is found, it is to be repaired by the repair guidelines already issued as mentioned in para-2 above.
- In order to maintain level, suitable thickness/sizes of patch plates are to be welded on sag portion of centre sill to achieve uniform level on top of centre sill.
- After achieving the required level, the floor plate shall be welded. It is to be ensured that patch plates should be completely welded with floor plate bottom.

The photograph of repaired centre sill with sagging as per the repair procedure described is shown below for reference.

ANNEXURE

SL-1603

फैक्स / Fax : 91-0522-2452494
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK'Lucknow
टेलीफोन / Tele: 2465773 (DOT)
42921 (Rly.)

सत्यमेव जयते

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ –226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

No. MW/BOXNHL

May 29, 2014

मुख्य यांत्रिक अभियंता (यांत्रिक),

1. मध्य रेलवे, सी.एस.टी., मुम्बई–400 001
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता–700 001
3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली–110 001
4. दक्षिण रेलवे, पार्क टाउन, एस.सी.ओ– चेन्नई.600 003
5. दक्षिण मध्य रेलवे, सिकन्दराबाद,–500 371
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता.700 043
7. उत्तर पूर्व रेलवे, गोरखपुर–281 001
8. उत्तर पूर्व फ्रन्टियर रेलवे, मालीगॉव, गुवाहाटी.781 001
9. पश्चिम रेलवे, चर्चगेट, मुम्बई–400 020
10. पूर्व मध्य रेलवे, हाजीपुर, बिहार–844 101
11. उत्तर मध्य रेलवे, इलाहाबाद–211001
12. उत्तर पश्चिम रेलवे, जयपुर–302 006
13. दक्षिण पश्चिम रेलवे, बंगलौर–560 023
14. पश्चिम मध्य रेलवे, जबलपुर–482 2201
15. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्पलेक्स, बिलासपुर – 495004
16. ईस्ट कोस्ट रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर, उड़ीसा–016

Sub: Recommended repair in weld failures reported in side stanchion of BOXNHL wagons

Ref: (i) Reported subject failures vide ECR letter o. ECR/MEC/WAG/456 dtd 25.04.14
(ii) Subject failures highlighted by Sr. DME/MGS & Sr. DME/ECR during Wagon Builders meeting at RDSO on 11.12.2013.
(iii) Subject failures reported by SECR.
(iv) Dir, I&L, Kolkata letter No. Wagon. General dated 31.01.2014
(v) This office letter of even no. dated 31.01.2014.
(vi) Deliberations on the subject in the 7th WMG.
(vii) Trial fitment of recommended repair at MGS, ROH Depot on 22/23.04.2014

References above, Zonal Railways have been reporting weld failures in side stanchions used in BOXNHL wagons.

The subject issue has been studied/ inspected by RDSO. The reported failures are essentially weld joint failures of side stanchions C channel with the back plate. The failures are owing to manufacturing shortcomings – poor/no welding penetration or poor/no welding of C channel with back plate.

Despite the reported failures being the result of incorrect manufacturing, in order to totally eliminate the reported failures, the side stanchion design has been altered to eliminate the failing weld joint and the modified drawings communicated to all Wagon Builders. It is expected that all new BOXNHL wagons would be manufactured with the modified side stanchion design, thus eliminating the possibility of the reported weld failures.

For existing wagons, kindly find enclosed a sketch detailing the recommended repair that needs to be carried out by Zonal Railways on side stanchions wherein the reported weld failures are observed. Kindly note that a trial repair/fitment has been done by ECR(reference (vii) above) and the enclosed sketch has been finalized, based on the feedback gathered during the above trial repair.

Kindly note that the enclosed sketch is by no means the only suitable repair method and in case Zonal Railways can suggest a simpler/more effective/more practical repair procedure, the same be kindly communicated to RDSO. RDSO shall look forward to and evaluate all such suggestions. Kindly also note that the side stanchion with reported weld failures should be necessarily attended to, in order to avoid further, more serious failures or possible obstructions/ infringements to IR-SOD by bulging/broken/distorted side stanchion in BOXNHL wagons.

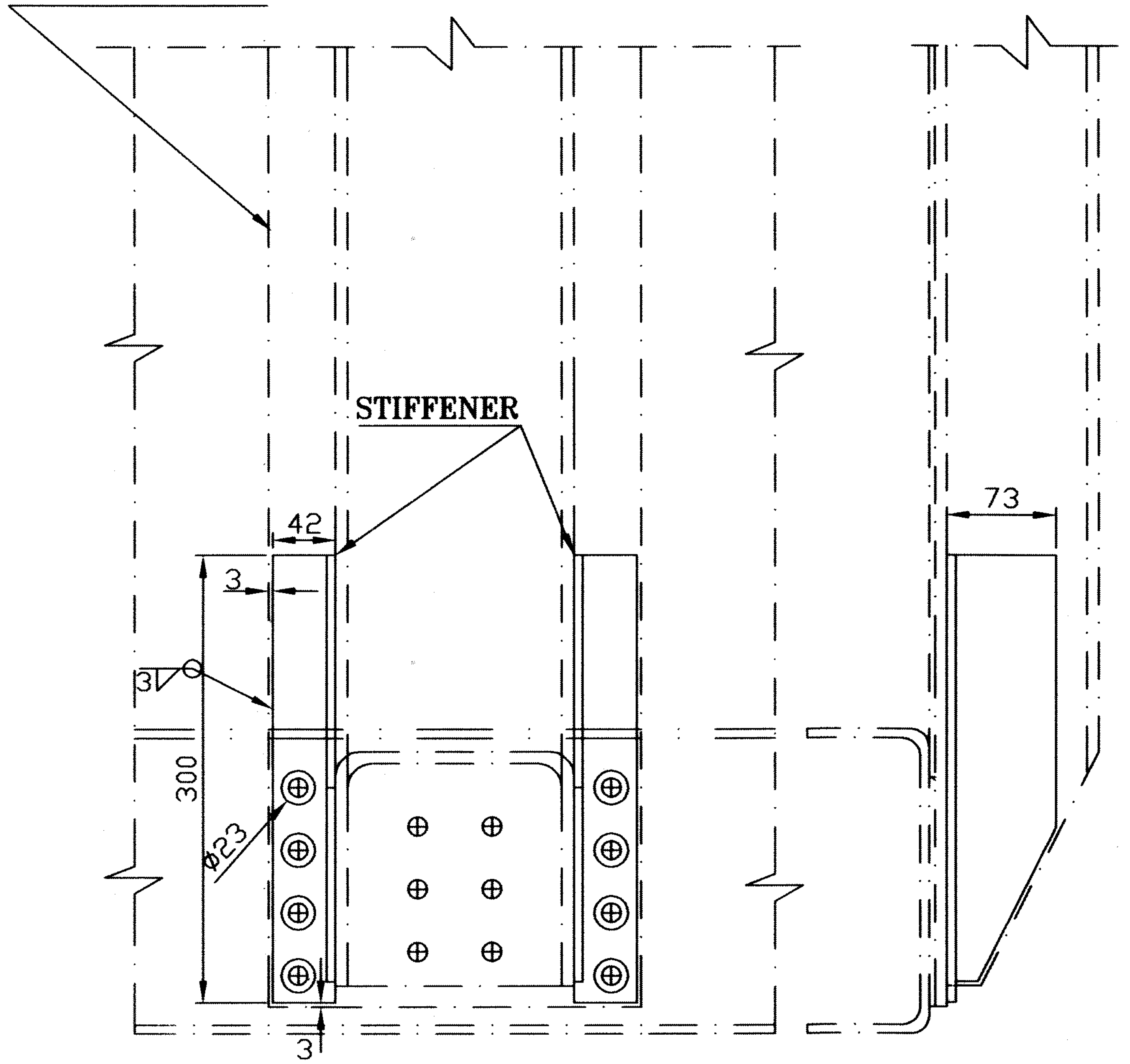
D. A. As Above

E-mail to CME's 30/05/2014

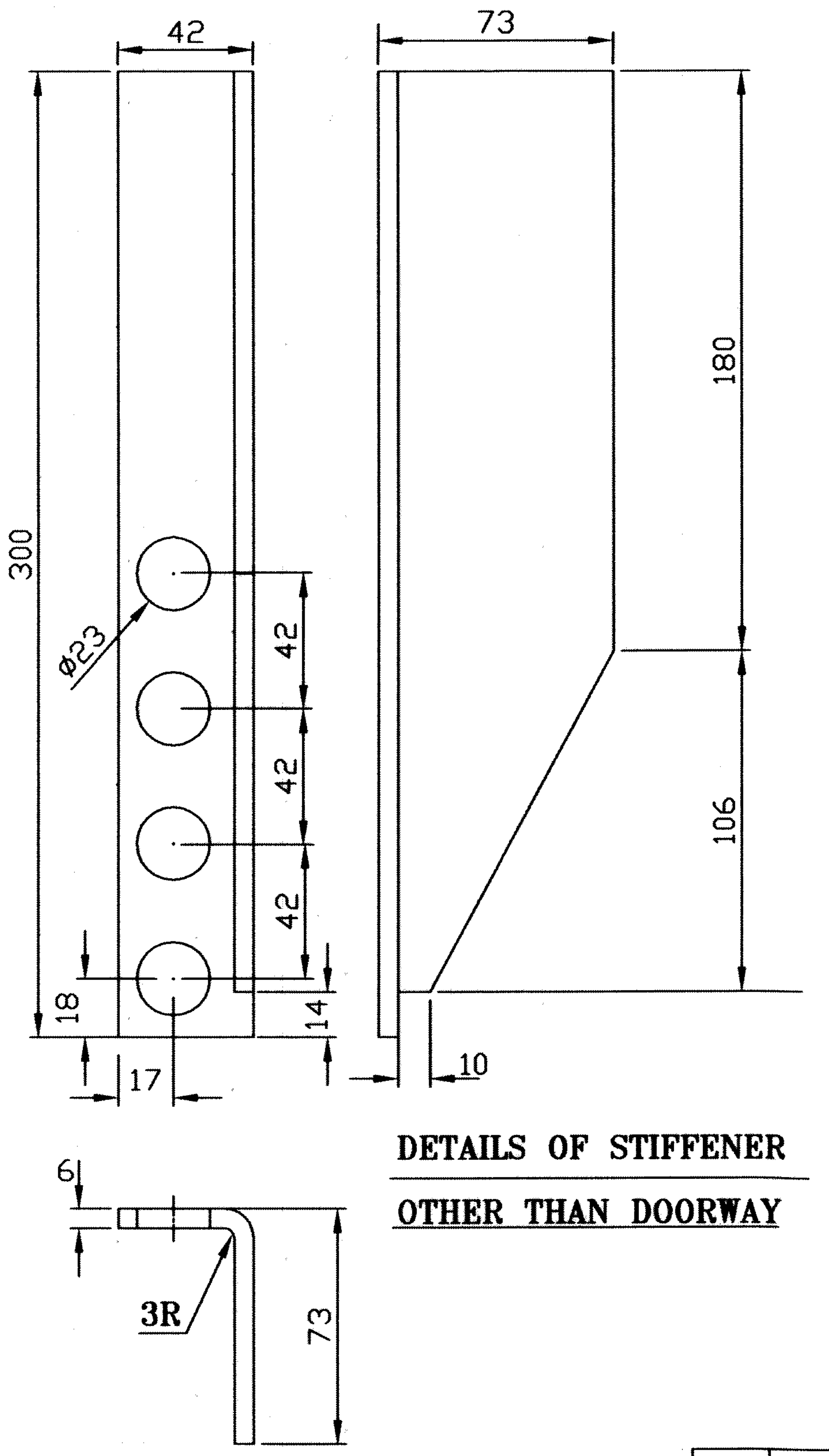
30/5/2014.

(Rupesh Kohli)
Director/Wagon
For Director General/Wagon

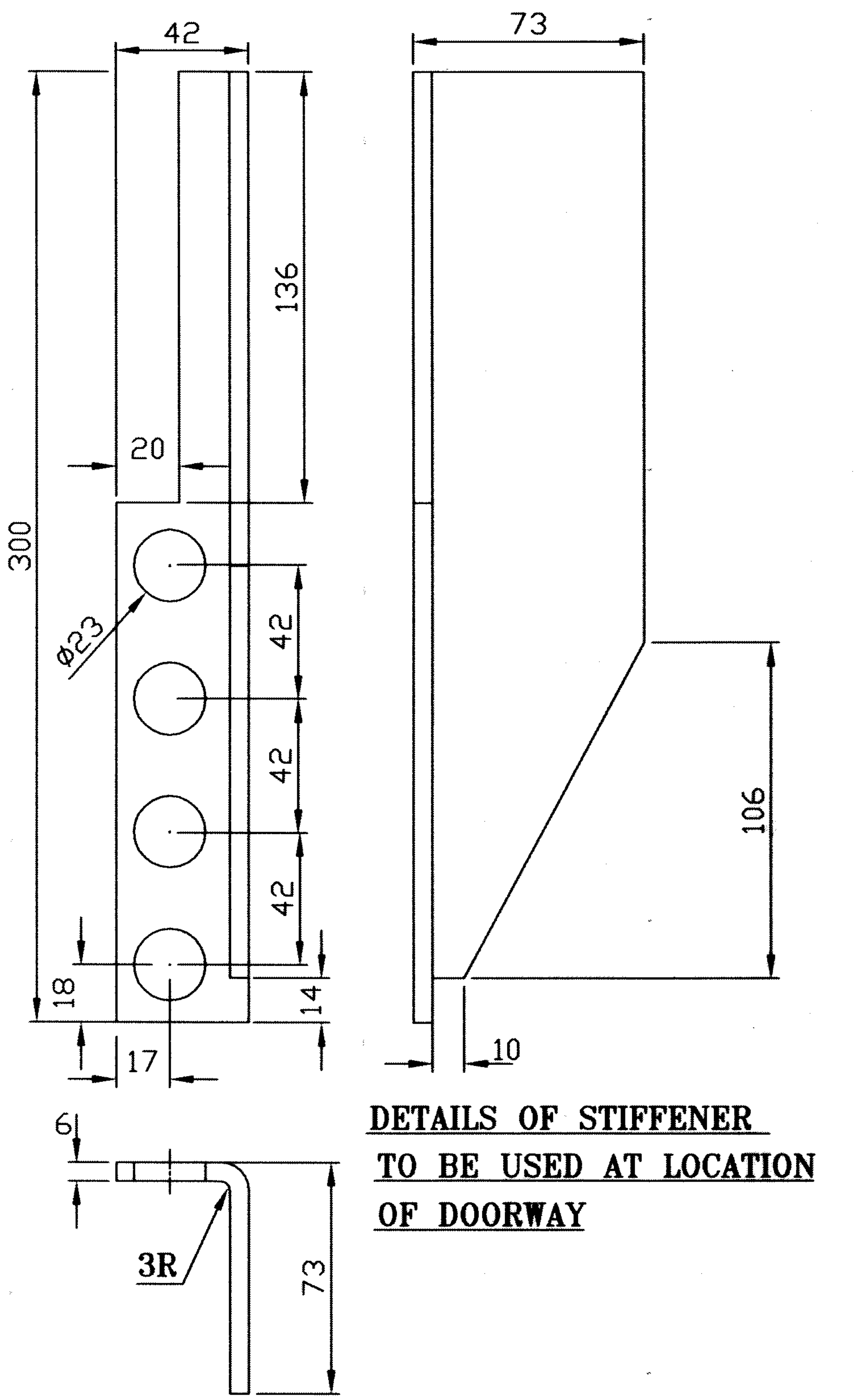
219



SKETCH SHOWING FITMENT OF STIFFENER WITH SIDE STANCHION



DETAILS OF STIFFENER OTHER THAN DOORWAY



DETAILS OF STIFFENER TO BE USED AT LOCATION OF DOORWAY

RECOMMENDED REPAIR PROCEDURE:-

1. Straighten the C-channel of side stanchion
2. Weld the C-channel of side stanchion with back plate of side stanchion after removing weld deposits of broken weld joint
3. Select the correct stiffener based on location of side stanchion
   (i) other than doorway
   (ii) at location of doorway
4. Weld side stanchion stiffener as per above sketch

MATERIAL: IRS:M44

All dimensions in mm

ALT.	ITEM	AUTHY.	DESCRIPTION	DATE	ASSLY. DRGS.

PRELIMINARY SKETCH

ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)

SUPERSEDED BY
SUPERSEDES

BOGIE OPEN WAGON TYPE BOXNHL

SCALE			DATE
	PASSED	[signature]	5/14
	CHECKED	[signature]	5/14
	DRAWN	L.MOHAN	05/14
	TRACED		
	COMPARED		
	J.S.NO.	WD-14013	

SKETCH SHOWING RECOMMENDED REPAIRS FOR CASES OF WELD FAILURE IN SIDE STANCHION OF BOXNHL WAGON

B.G. | R.D.S.O. [W] | GROUP | WD-14013-S-01

A3

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

Fax : 91-0522-2452494
Telephone : 91-0522-2456165

सत्यमेव जयते

No. MW/BOXNHL Date: 13.01.2022

All PCME

1. Central Railway, CST, Mumbai-400001
2. Eastern railway,Fairlie Place, Kolkata-700001
3. East Central Railway, Hajipur, Bihar-844101
4. East Cost Railway, Railway Complex, Bhubaneswar,Orissa-751023
5. Northern Railway, Baroda House, New Delhi-110001
6. North Central Railway, Allahabad-211001
7. North Western Railway, Jaipur-302006
8. North Eastern Railway, Gorakhpur-273012
9. Southern Railway, Park Town, Chennai-600003
10. South Central Railway, Secunderabad-500071
11. South Eastern Railway, Garden Reach, Kolkata-700043
12. South East Central Railway, R.E. Complex, Bilaspur – 495004
13. South Western Railway, Bubli-580023
14. Northeast Frontier Railway, Maligaon, Guwahati-781011
15. Western Railway, Churchgate, Mumbai-400020
16. West Central Railway, Jabalpur-482001

Sub: Use of MS door in BOXNHL/BOXNLW/BOXNR wagons.

The issue of damages in doors of BOXNHL/BOXNLW/BOXNR wagons has been highlighted in recent presentation circulated through Board. It has been indicated that the door defects were 16.33% in 2019-20 and 17.53% in 2020-2021.

The BOXNHL/BOXNLW/BOXNR wagons use stainless steel doors. As per discussion with various Zonal Railways it has been informed that the repairs of these doors are difficult. Further the cost of stainless steel doors is high and there are repeated cases of repairs/replacement of these doors.

It is advised that, whenever condition warrants for defective stainless steel doors of BOXNHL/BOXNLW/BOXNR to be completely replaced, doors to drawing no. WD-90007-S-1 & WD-22006-S-01 may be used for doors having outer dimensions of 1480mm x 775 mm & 1460mm x 775 mm respectively. These drawings use Mild Steel in place of Stainless Steel and reduce the recurring expenditure.

This may be implemented.

DA: (i) RDSO Letter no MW/BOXNHL dt. 19.07.2019.
(ii) WD-22006-S-01

(Arvind Kumar)
Jt Director/Wagon
for Director/General

Copy to: EDME (Freight), Railway Board, New Delhi.

फैक्स / Fax : 91-0522-2452494
टेलीफोन / Tele: 0522- 2462638

भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011

No. MW/BOXNHL Date:19.07.2019

Chief Mechanical Engineer,

1. Northern Railway, Baroda House, New Delhi-110 001
2. Central Railway, CST, Mumbai-400 001
3. Eastern Railway, Fairlie Place, Kolkata-700 001
4. Western Railway, Churchgate, Mumbai-400 020
5. Southern Railway, Park Town, Chennai-600 003
6. South Central Railway, Secunderabad-500 371
7. South Eastern Railway, Garden Reach, Kolkata-700 043
8. North Eastern Railway, Gorakhpur-281001
9. Northeast Frontier Railway, Maligaon, Guwahati-781 001
10. East Central Railway, Hajipur, Bihar 844 101
11. North Western Railway, Jaipur-302 006
12. North Central Railway, Allahabad.-211 033
13. South Western Railway, Hubli – 560 023
14. East Coast Railway, Bhubaneswar, Orissa-751 016
15. West Central Railway, Jabalpur-482 001
16. South East Central Railway, R.E. Complex, Bilaspur – 495 004

Sub: Standardization of flap door of open wagon type BOXN, BOST, BOXNLW, BOXNHL & BOXNR wagons.

Ref: (i) This office letter of even no. dated 08.04.2016.
(ii) CWM/Kota/WCR letter no. M 116/3 BOXNHL dated 19.03.2019.
(iii) EDME/Fr./ Railway Board letter no. 2019/M (N) 204/6 dated 03.04.2019

RDSO had standardized the doors of stainless steel (IRS M:44) open wagons i.e. BOXNR, BOXNHL and BOXNLW, the same was communicated to all concerns vide this office letter under reference (i) above.

Now, RDSO undertook a comprehensive review of doors fitted in all open wagons including Mild Steel Open Wagon i.e. BOXN and BOST wagons and after review. following three types of doors are finalized.

Type of wagon	BOXN	BOST (Design A,B,C & D)	BOXNLW	BOXNHL (Design A & B)	BOXNR (OLD)*	BOXNHL (Design-C)	BOXNHL (Design-D)	BOXNR
Material	M.S.	M.S.	IRS M:44	IRS M:44	IRS M:44	IRS M:44	IRS M:44	IRS M:44
Door opening	1460 X 750	1460 X 750	1460 X 750	1460 X 750	1460 X 750	1440 X 750	1414 X 750	1440 X 752
Door Size	1480 X 777	1480 X 777	1480 X 775	1480 X 775	1480 X 775	1460 X 775	1460 X 775	1460 X 775
Drawing No.	WD-90007-S-1 Alt-16 (Latest)		WD-88088-S-07 Alt-13 (Latest)			WD-09034-S-07 Alt-08 (Latest)		

*Manufactured before 08.04.2016.

-2-

In view of above, now only three type of doors are required for all open wagon like BOXN, BOST, BOXNLW, BOXNHL & BOXNR wagons as detailed in above table.

This is for your information and necessary action.

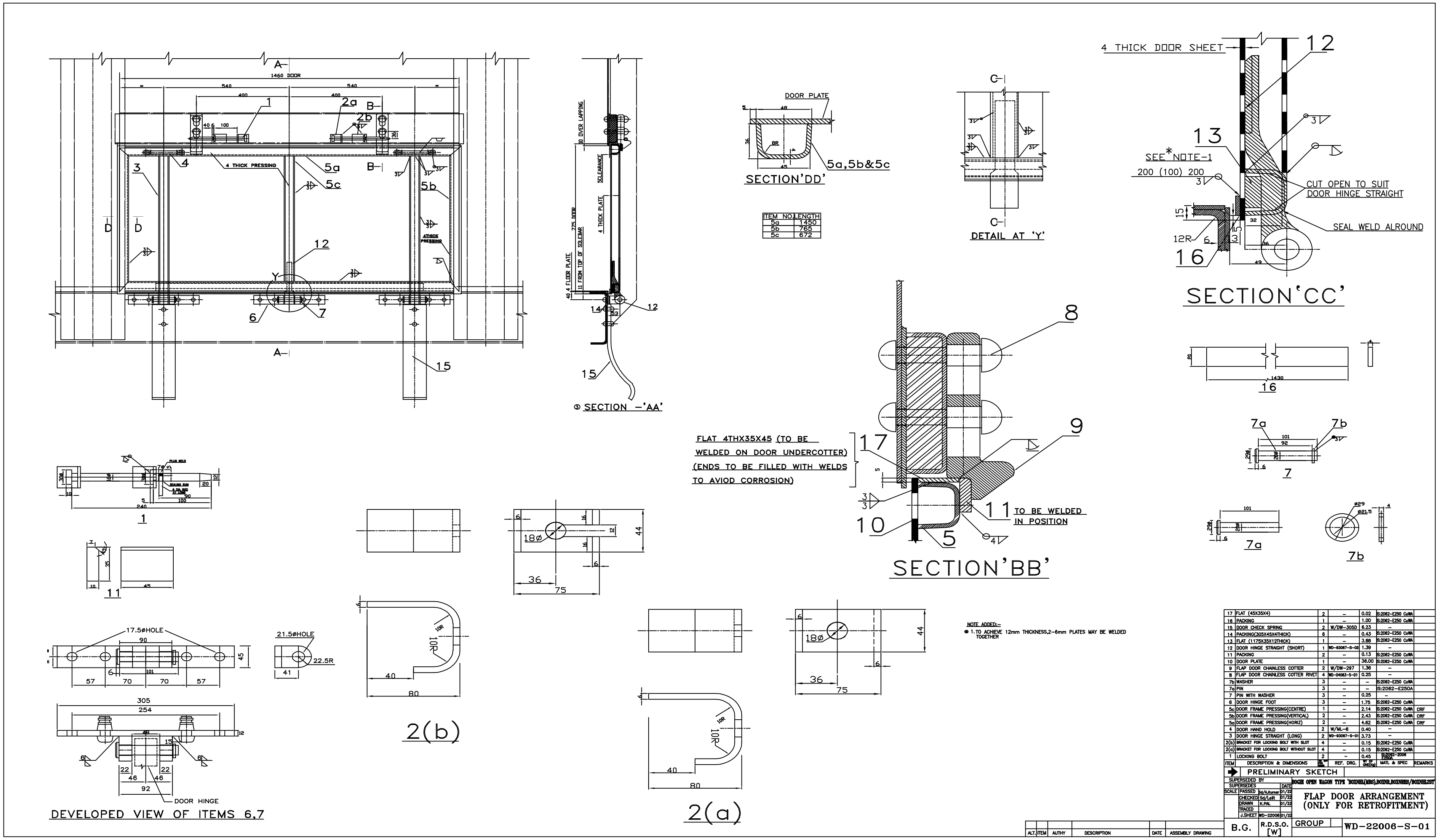
D. A. Nil

(P.K. Pandey)
Director/wagon
for Director General

Copy to:

EDME (Freight), Railway Board, New Delhi-110 001- for information

File No. RDSO-MW0(WD)(OPEN)/2/2020-O/o PED/SW/RDSO



ITEM	DESCRIPTION & DIMENSIONS	No. OFF PER DOOR	REF. DRG.	WT OF ONE(Kg)	MATL & SPEC	REMARKS
17	FLAT (45X35X4)	2	–	0.02	IS:2062-E250 CuWA	
16	PACKING	1	–	1.00	IS:2062-E250 CuWA	
15	DOOR CHECK SPRING	2	W/DW-305D	6.23	–	
14	PACKING(305X45X4THICK)	6	–	0.43	IS:2062-E250 CuWA	
13	FLAT (1175X35X12THICK)	1	–	3.88	IS:2062-E250 CuWA	
12	DOOR HINGE STRAIGHT (SHORT)	1	WD-93067-S-02	1.39	–	
11	PACKING	2	–	0.13	IS:2062-E250 CuWA	
10	DOOR PLATE	1	–	36.00	IS:2062-E250 CuWA	
9	FLAP DOOR CHAINLESS COTTER	2	W/DW-297	1.36	–	
8	FLAP DOOR CHAINLESS COTTER RIVET	4	WD-04063-S-01	0.25	–	
7b	WASHER	3	–	–	IS:2062-E250 CuWA	
7a	PIN	3	–	–	IS:2062-E250A	
7	PIN WITH WASHER	3	–	0.25	–	
6	DOOR HINGE FOOT	3	–	1.75	IS:2062-E250 CuWA	
5c	DOOR FRAME PRESSING(CENTRE)	1	–	2.14	IS:2062-E250 CuWA	CRF
5b	DOOR FRAME PRESSING(VERTICAL)	2	–	2.43	IS:2062-E250 CuWA	CRF
5a	DOOR FRAME PRESSING(HORIZ)	2	–	4.62	IS:2062-E250 CuWA	CRF
4	DOOR HAND HOLD	2	W/ML-6	0.40	–	
3	DOOR HINGE STRAIGHT (LONG)	2	WD-93067-S-01	3.73	–	
2(b)	BRACKET FOR LOCKING BOLT WITH SLOT	4	–	0.15	IS:2062-E250 CuWA	
2(a)	BRACKET FOR LOCKING BOLT WITHOUT SLOT	4	–	0.15	IS:2062-E250 CuWA	
1	LOCKING BOLT	2	–	0.45	IS:2062-2006 E250A	

PRELIMINARY SKETCH

SUPERSEDED BY			BOGIE OPEN WAGON TYPE 'BOXNHL(MBS),BOXNR,BOXNRHS/BOXNHL25T'
SUPERSEDES		DATE	
PASSED	Sd/A.Kumar	01/22	FLAP DOOR ARRANGEMENT (ONLY FOR RETROFITMENT)
CHECKED	Sd/Lalit	01/22	
DRAWN	K.PAL	01/22	
TRACED			
J.SHEET	WD-22006	01/22	

B.G. | R.D.S.O. [W] | GROUP | WD-22006-S-01

1718

फैक्स / Fax : 91-0522-2452494
टेलीफोन / Tele: 2465773 (DOT)
42921 (Rly.)
pm1rdso@gmail.com

सत्यमेवजयते

भारतसरकार–रेलमंत्रालय
अनुसंधानअभिकल्पऔरमानकसंगठन
लखनऊ–226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

No. MW/BOXNHL

Jan'23, 2015

Chief Works Manager
Jhansi Workshop, NCR

Sub: Recommendations for repair of reported Wagon defects.

Ref: (1) (1) Dy.CME/JHSW letter No. RS-120/BOXNHL dated 19/12/2014.
(2) Dy.CME/JHSW letter No. RS-120/BOXN/Inst III dated 22/12/2014.
(3) Dy.CME/JHSW letter No. RS-120/BOXNHL/BCNHL dated 26/12/2014.
(4) CWE/NCR letter No. Mech/610/Ws/3 dated 26/12/2014.
(5) Visit of RDSO officials to JHSW on 30/12/2014.

References above, the reported defects in wagons have been inspected/ studied. Based on the observed failures & as discussed with JHSW officials during visit of RDSO officials, the following recommendations for repair of noticed failures are forwarded:

S.no.	Reported Failure/ Defect	Possible/ Most Likely Cause	Recommendations for repair/ Further action
	BOXNHL Wagons:		
1	Cracks developed at the corners of slots of Body bolster web plates near solebar.	Could have been caused owing to low section modulus, because of lesser height. The provision of slot on web plate, would further reduce, the strength. Above further aggravated, owing to undressed flame-cut slots, with notches acting as stress concentration points that may cause initiation of cracks at corners of slots and further propagation, with service.	Recommended repair detailed in Annexure-I. Necessary Drg modifications being undertaken. Inspection agencies also being notified, about manufacturing related shortcomings.
2	Crack developed in the bolster bottom gusset around the center pivot top.	Due to incorrect manufacturing/improper fitment of bolster bottom flange and center sill flange a gap gets created between top of bolster bottom gusset and	Recommended repair detailed in Annexure-I. Inspection agencies also being notified, about manufacturing related shortcomings.

		bottom of centre sill. The above is evident (pls refer Annex-I) from the upward material flow observed in the bolster bottom gusset, to fill the created gap. This plastic flow/ continuous hitting of CP Top resulted in the crack being generated in bolster bottom gusset plate around the center pivot top.	
	BOSTHS Wagon:		
3	Some BOSTHS wagons, recd by JHS workshop for their Ist POH, were reported to be fitted with CASNUB22HS bogies instead of the specified CASNUB22HS MOD-I bogies.	Perusal of past records show that owing to non-availability of the specified CASNUB22HS MOD-I bogies (with bogies being a free supply item), CASNUB 22HS bogies were permitted to be fitted.	Owing to modifications in CP type, Bogie Bolster, Suspension Springs, Friction Wedge, the Bogies cannot be modified. Thus the only available option, is to change the nomenclature of such wagons, from the marked BOSTHS to BOST wagon. It is recommended that a separate record of such wagons be maintained.
	BOXNR Ties:		
4	NCR has reported that BOXNR wagons recd for POH are found to be with cross-ties of underframe missing.	The only reasons for the reported missing tie-bars could be either they were not fitted by the w'shop/ unit which undertook the BOXNR conversion or incorrect/ improper welding, leading to dropping of cross-ties.	Owing to significant costs of BOXN to BOXNR conversion, the underframe of the converted wagons need to be suitably strengthened. The PCC of BOXNR wagons is also higher than BOXN wagons, hence underframe strengthening is necessarily needed.

Any further clarification/ assistance be kindly sought from RDSO.

Forwarded for kind further necessary action.

23/01/2015

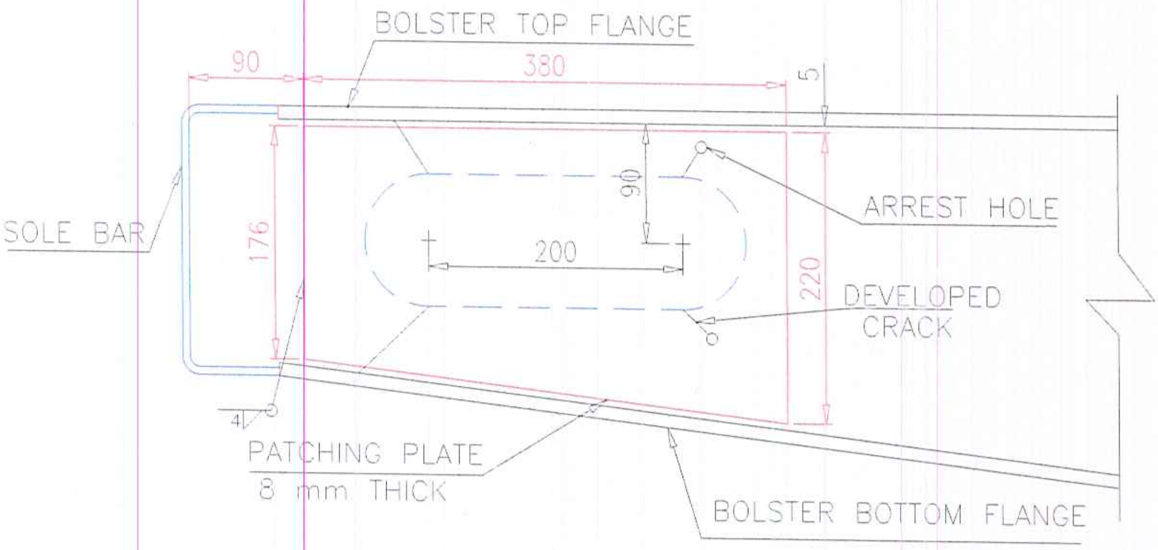
(Rupesh Kohli)
DSW/WD/II

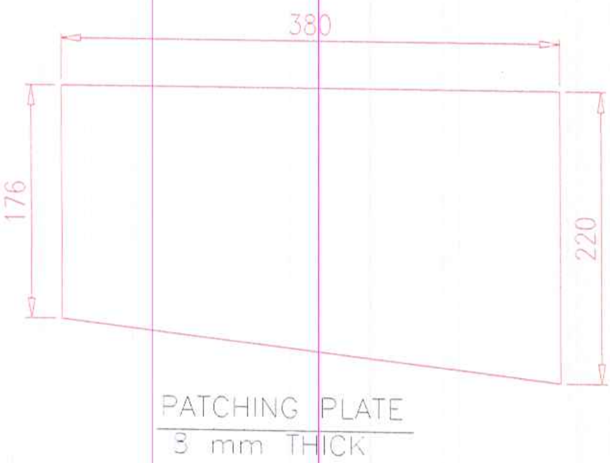
Copy for kind info:

- CME, NCR
- CWE, NCR

ANNEXURE-I

1. Repair procedure for Noticed Cracks in Bolster Web Plate of BOXNHL:





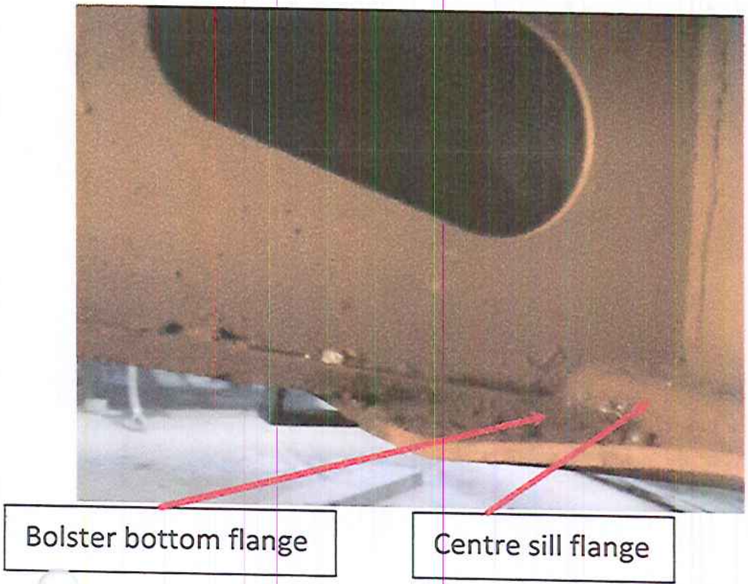
Recommended Procedure for repair

i. Cut the above detailed patching plate.
ii. Goug the cracks portion& fill with weld, then perform grind flush.
iii. Make the arrest hole at edge of crack if it has not reached the flange.
iv. Arrest hole may not be made, if crack has reached up to flange.
v. Put the patch plate over the cut hole covering the crack as shown in the above sketch and weld all-around properly.
vi. Please ensure good quality welding.

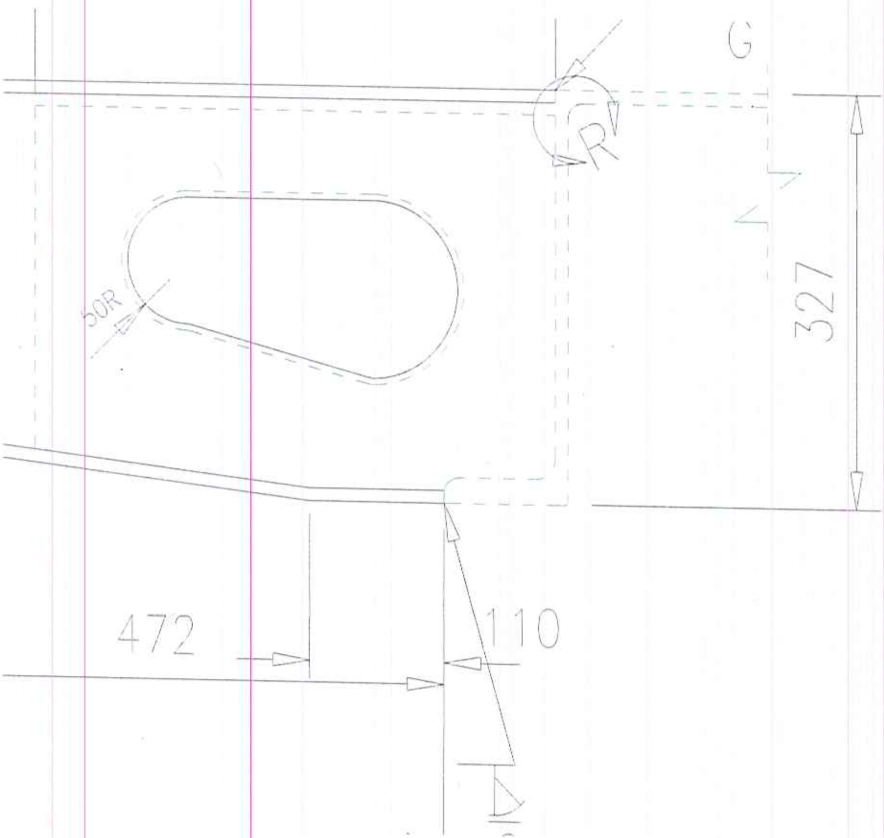
Caution:

Repair similar to the above recommendation, has been initiated by JHSW by using a gas cut piece of similar material. The photo below shows repair of the same. It is evident that using such poorly cut patch plates, is bound to further worsen the failure. It is hence requested that proper care be taken to avoid stress concentration points.

2. Repair procedure for Noticed Cracks in Bolster Gusset Plate of BOXNHL:



As per drg. WD-05086-S-15 (sheet-2) correct fitment of bolster bottom plate with center sill flange is appended below:



Recommended Procedure for repair:

(i) Remove the bolster bottom gusset

(ii) Maintain level at the bottom of center sill by welding a suitable thickness plate as filler and weld it to make the surface levelled.

(iii) Weld the bolster bottom gusset as per std drawing of BOXNHL wagon.

SL-1750

फैक्स / Fax : 91-0522-2452494
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK' Lucknow
टेलीफोन / Tele: 2451200 (PBX)
0522-2465773

सत्यमेव जयते

भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011

No. MW/BOXNHL.

Dated: 23.06.2014

Chief Workshop Manager
Wagon Repair Workshops

Sub: Recommended Repairs in reported failure in Bottom Bolster Gusset Plate of BOXNHL wagons, during POH.

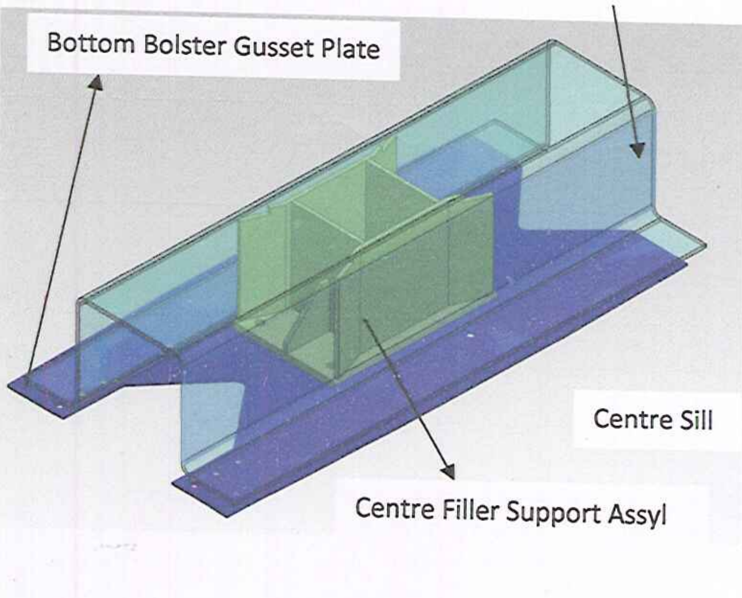
Ref: (i) CWM/JHSW letter No. RS.120/BOXN/Instructin-IV dated 01/06/2015.
(ii) Dy.CME/Jagadhari/NR letter No. 109-W/BCN/BOXN dated 22/06/2015.
(iii) Visit of RDSO personnel to JHSW & Perumbur W'shop.

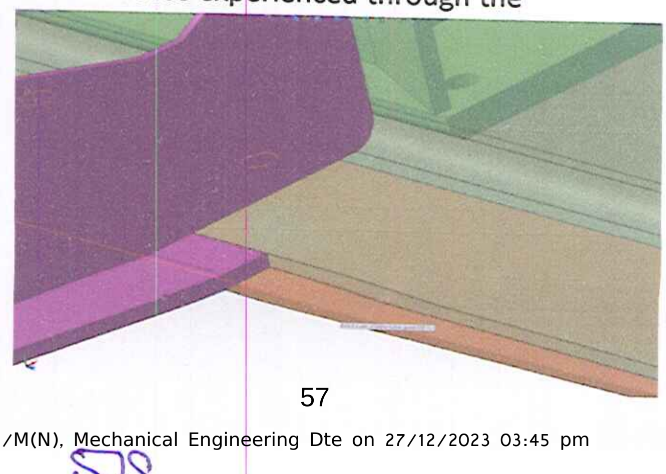
References above, JHSW/ NCR, Jagadhari w'shop/ NR, RWS/SECR, Perumbur w'shop, SR have reported failures in Bolster Bottom gusset plate (BBGP) of BOXNHL wagons. The reported failures have been inspected & studied by RDSO. Following the same, this letter details both- (a the reasons for the reported failure & (b) the recommended repair for the same.

(A) **<u>Brief account of the Reason for BBGP failures</u>**:

The reported failures pertain to the centre-pivot area of the BOXNHL wagon. The details of the same are enumerated in RDSO drg Nos. WD-05086-S-4 Alt 6, WD-05086-S-14 Alt 10, WD-05086-S-15 Alt 8. Depicted alongside is a modelled view of the centre pivot arrangement & the assembly therein.

As is evident therein, the Centre sill is provided with a centre filler support arrangement, to enable load distribution/ transmission of the vertical forces from the CP Top assembly. The fabricated assembly of the centre sill-filler support arrangement- bottom bolster gusset plate, provides for the structure that distributes, the vertical force experienced through the





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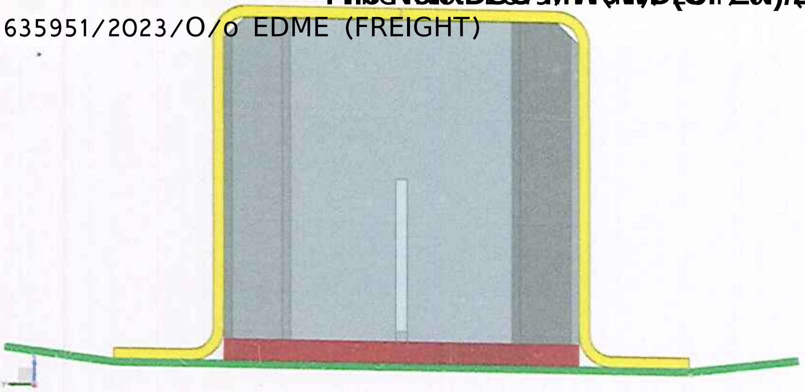
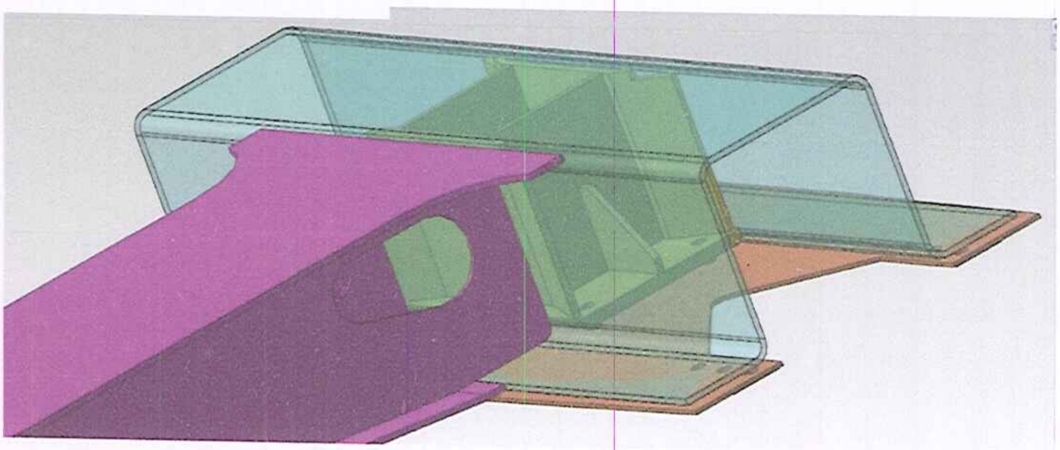
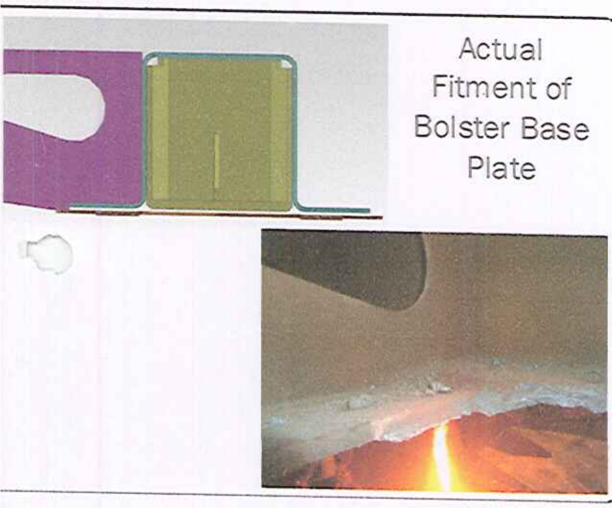


CP top & bottom assembly. The correct fabrication of the centre sill-filler support arrangement- bottom bolster gusset plate is hence an imperative requirement.

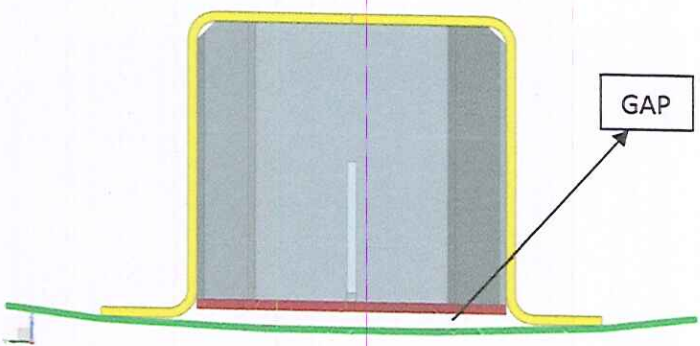
Further, as per the arrangement shown in the drg, the bolster bottom plate should be butted flush with the centre sill flange. The bottom



gusset plate should then be welded on the face of this joint. In case, the bolster bottom plate is not flush, but protrudes inwards wrt the centre sill flange, the bottom gusset plate would get welded with a gap between the gusset plate & the bolster bottom plate. With repeated hitting of the CP top, the gusset plate is liable to first plastically deform & then subsequently crack.

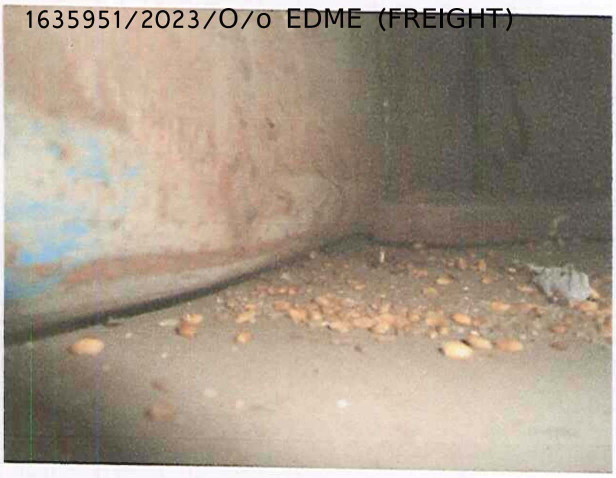


Actual Fitment of Bolster Base Plate



Identified Causes of Failure:

Depicted, below, is the actual arrangement, as observed in the wagons, reported with the subject failure. The arrangement, as physically inspected, in the damaged wagons, shows (1) Improper butting of the Bolster Bottom plate with the Centre sill flange AND/OR (2) A gap (when none should exist) between the bottom plate of the centre filler & the BBGP. The noticed defects are also illustrated in the below pasted photographs.



Gap inspected between the BBGP & centre filler arrgmt in failed wagons.

The following, regarding the above details are notable:

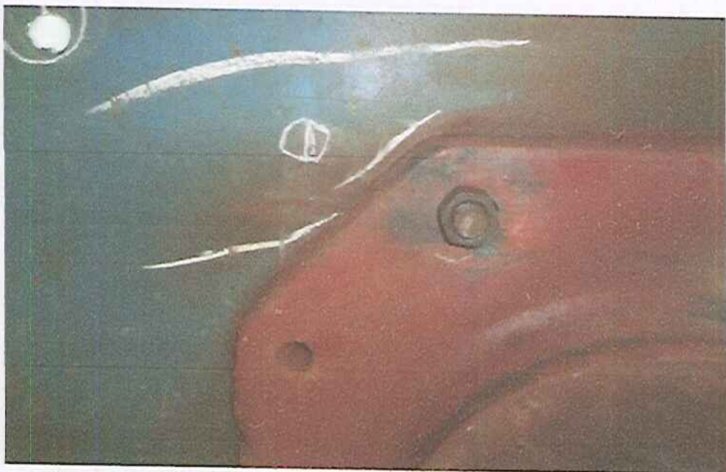
(a) In all cases, the reported failure is of the bottom bolster gusset plate(BBGP).

(b) The BBGP has been mostly observed to show crack near the mating area/ overlap portion with the bolster bottom plate.

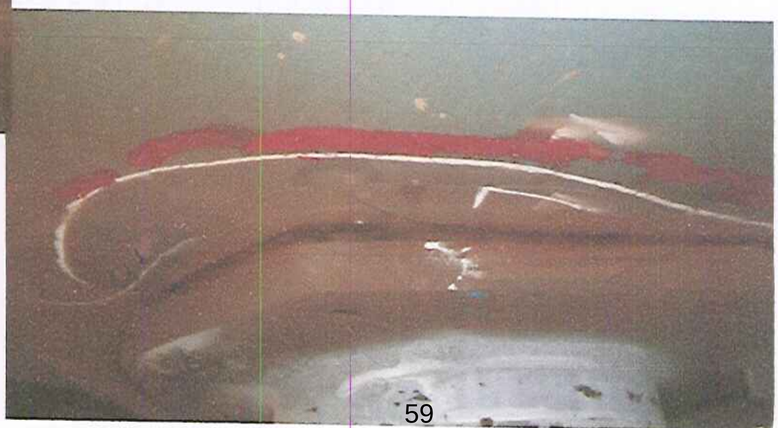
(c) In all failure cases, a significant gap (as much as 15mm) has been observed between the BBGP & the centre filler base plate.

(d) Gaps/ incorrect butt joint between the bolster bottom plate & the centre sill flange has been observed in all wagons with BBGP failures.

Identified Cause & Progression of Reported Failure:



The observed gap, between the BBGP & the centre filler support arrangement, renders the centre filler support arrangement, ineffectual. It also results into a gap between the centre filler support & the BBGP, thus permitting BBGP to get deformed/ distorted in the vertical direction. The vertical forces, from the CP, directly deform the BBGP, owing to the gap available between the two assemblies. This deformation,



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would ultimately result into a failure(crack) of the BBGP & in case the gap is not addressed, the continuous pounding of the BBGP & the lack of support from the centre filler (owing to the gap because of incorrect fabrication) could result into direct load transfer to the centre sill flange area, ultimately resulting in a longitudinal crack along the centre sill flange (in BOXNHL wagons available in JHSW, so far, no centre sill crack has been reported).

The above, cause & progression of the reported failure is corroborated by (i) the recorded gap between the BBGP & centre sill filler support (ii) cracks in all BBGP in wagons where CS cracks are reported (iii) deformation in BBGP, in all wagons with noticed gaps between the filler support & BBGP.

(B) <u>Recommended Repair:</u>

The following two alternates are recommended for undertaking repairs in BOXNHL wagons, observed with cracks in BBGP:

<u>Alternate-I:</u> This is the preferred alternate. It involves removal of the existing (& cracked) BBGP. Although the alternate is expected to be time intensive, adopting it would ensure comprehensive redressal of the reported failure.

The following steps are recommended:

1. Carefully cut & remove the existing BBGP from the wagon. Utmost care is to be exercised to ensure that during cutting, no damage is done to the other existing structural members.
2. After removal of BBGP, carefully grind & clean the surfaces to remove any remnants/ portions left consequent to the cutting of the BBGP.
3. Check the alignment of the bottom filler base plate vis-à-vis the centre sill flange in the longitudinal plane. In case of observing any gap between the centre filler base plate & the centre sill flange, the same be filled-up using shims/ packing plate of the required thickness to ensure complete packing of the centre filler.
4. Check the alignment of the Bolster bottom plate with either of the centre sill flanges. In case of gap between the bolster bottom plate & the centre sill flange, the same be filled-up using shims/ packing plate of the required thickness (in case of varying thickness/ uneven gap, shims of multiple thicknesses should be provided) to ensure complete packing of the bolster bottom plate & the centre sill flange. In case shims/ packing sheet of required thicknesses are not available in IRSM:44, shims/ sheet of IS:2062 E 250 or above could also be used.
5. Take a new BBGP & inspect for correctness of dims (incl thk) & bending as per RDSO Drg No. WD-05086-S-15 Alt 8 (Item No. 8).
6. Weld the new, inspected/ checked BBGP, duly ensuring flatness of the mating surfaces- centre sill flange, centre filler bottom plate & the bolster bottom plate surface. Ensure proper, adequate weld penetration all round the welding on the BBGP.

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7. Apply the CP Top on the newly fitted Bolster Gusset Plate & tighten (hand tight) two diagonally opposite mounting bolts of adequate size & length to secure the CP Top. Check using a feeler gauge of 1 mm whether any gap exists between the CP top surface & the BBGP. In case of a gap, a suitable shim be provided so that no gap exists between the CP top surface & the BBGP.
8. Apply lock bolts as per recommended practice of diagonal application & then remove the temporarily fitted mounting bolts & apply other lock bolts to fix the CP top. It be ensured that the lock bolts are of the correct dims & make. Correct swaging of the lockbolts may be also necessarily ensured.
9. Ensure that the stipulated distance of 9.5 (+0.0/ -0.5) mm as detailed in RDSO Drg No. WD-05086-S-08 between the top of the CP Top Base Plate & the Side Bearer, by providing adequate number of shims underneath the Side bearer is maintained.

Alternate-II: This is the less-preferred alternate & should be adopted only if the prerequisite of Alternate-I, i.e. removal of the existing BBGP is considered impractical/ not feasible. This alternate involves in-situ repair of the broken BBGP.

The following steps are recommended:

1. Measure the CBC height of the Wagon (at either CBC's). It be ensured that the CBC height measurement is done on a level track. Estimate the corrected CBC height, with POHed Bogie wheel dias. If the CBC height, expected after lowering on POHed Bogies, is less than 1095 mm, move to Step 2. In case the CBC height, expected after lowering on POHed Bogies, is more than 1095 mm, mark & record that the wagon is to be fitted with Bogies with wheels less than 990 mm dia & then move to Step 2.
2. The portion of crack in the BBGP, be exposed & opened-up using gouging. Care should be taken to avoid consequent damage to other components or of further damaging the BBGP.
3. Try & drill (it would be difficult owing to vertical drilling & HS Ferritic Stainless steel material) a arrest-hole at the end of the crack to prevent, further crack propagation.
4. Weld deposit in the exposed crack area of the BBGP, completely filling up the crack portion.
5. Grind the welded surface & ensure a smooth flat surface of the BBGP, so that the CP top can evenly sit on the surface.
6. Apply the CP Top on the repaired Bolster Gusset Plate & tighten (hand tight) two diagonally opposite mounting bolts of adequate size & length to secure the CP Top. Check using a feeler gauge of 1 mm whether any gap exists between the CP top surface & the BBGP. In case of a gap, remove the CP top & grind any high spots/ weld deposit material leading to the gap. It should be ensured that no gap exists between the CP top surface & the BBGP.
7. Remove the temporarily fitted mounting bolts & remove the CP top.
8. Apply a packing plate of 8mm thk, as per details enumerated in the enclosed sketch(Annexure-I) over the repaired BBGP, by welding all along the edge of the

packing plate. Ensure proper, adequate weld penetration all round the welding along the edge of the packing plate.

9. Check the flatness of the packing plate, after welding & if found OK, apply the CP Top. CP Top be secured using the recommended lockbolts. It be ensured that the lock bolts are of the correct dims & make. Correct swaging of the lockbolts may be also necessarily ensured.
10. Attempt to fill the gap (expected to be available) between the filler support base plate & the BBGP or the BBGP & the centre sill flange by application of shims/ sheets (of adequate size) to cover the gap. Trials may also be carried out by filling this gap using specialized metal-epoxy gap sealants/ rebuilding compounds, based on past experiences of w'shops if any. Kindly note that availability of the above gaps, is the prime cause of the subject failures/ cracks. It is hence imperative that every effort is made to plug the available gaps, in order to prevent a recurrence of the subject failure.
11. Ensure that the stipulated distance of 9.5 (+0.0/ -0.5) mm as detailed in RDSO Drg No. WD-05086-S-08 between the top of the CP Top Base Plate & the Side Bearer, by providing adequate number of shims underneath the Side bearer is maintained.
12. While lowering the wagon, the wheel dia in the bogies, used be as recorded in Step 1 above.

It is requested that the above, be kindly perused & although a trial of both the above alternatives has been done at JHSW, the above recommended repairs be again tried-out in BOXNHL wagons, being noticed with crack in BBGP. A feedback, following the trials be kindly forwarded to RDSO. Any other issue in the above proposed repair scheme, if noticed, may also be communicated to RDSO. In case, association of RDSO, during the above repair related trials is felt necessary, the same be communicated so that RDSO personnel can be deputed to the respective w'shops. Also, in case any other repair methodology/ scheme has been adopted/ tried-out by w'shops/ ZR, the same be communicated to RDSO. RDSO shall look forward to all inputs/ feedbacks/ suggestions towards the repair of the subject defects.

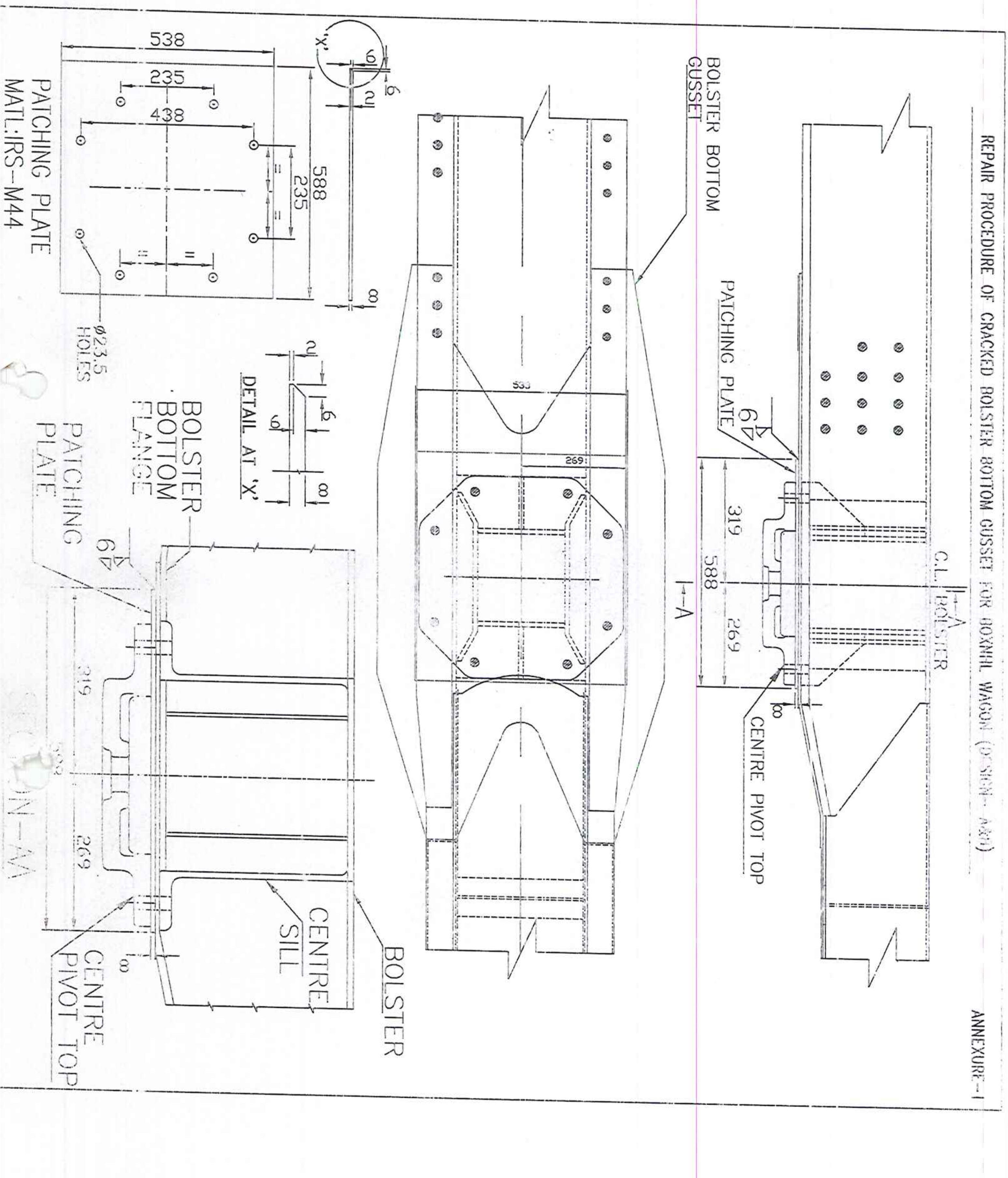
24/06/2015.

(Rupesh Kohli)
Director/Wagon
For Director General/Wagon

Copy for kind information:

- CME: NCR, WCR, SECR, NR.
- CWE: NCR, WCR, SECR, NR
- EDME/Frt/ Rly Bd
- DME/Frt/ Rly Bd: In Ref to your letter No. 2005/M(N)/204/1 Vol III dated 12/06/2015.

§24



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फैक्स / Fax : 91-0522-2452494
टेलीफोन / Tele: 2465773 (DOT)

सत्यमेव जयते

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

MW/BOXNHL

08.01.16

मुख्य कारखाना प्रबंधक

1. उत्तर मध्य रेलवे कारखाना, झाँसी – 248003
2. पश्चिम मध्य रेलवे कारखाना, कोटा – 324002
3. दक्षिण मध्य रेलवे, कारखाना, रायनापाडू –
4. उत्तर रेलवे कारखाना, जगाधरी – 135002
5. पूर्व रेलवे कारखाना, लिलुहा – 711204
6. दक्षिण पूर्व रेलवे कारखाना, खड़गपुर –721301
7. दक्षिण रेलवे कारखाना, पैराम्बूर – 600023
8. दक्षिण पूर्व मध्य रेलवे कारखाना, रायपुर. फैक्स: 0771–2522638
9. पश्चिम रेलवे कारखाना, प्रतापनगर – 390004
10. पूर्व मध्य रेलवे कारखाना, जमालपुर – 811214 (फैक्स–06344–243214)
11. उत्तर पश्चिम रेलवे कारखाना, अजमेर –305001
12. उत्तर पूर्व फ्रन्टियर रेलवे कारखाना, न्यू बोगई गांव –
13. उत्तर रेलवे कारखाना, अमृतसर – 143001 (फैक्स–0183–2224216)
14. गोल्डन रॉक केन्द्रीय कारखाना–दक्षिण रेलवे त्रिची – 620004 (फैक्स–0431–2490220 / 2491113)

Sub: Procedure for Repair of Centre sill of BOXNHL (Design A & B) wagon.

Zonal Railways have reported Cracks in Centre sill of BOXNHL (Design-A & B) wagon having three piece Centre sill. The issue has been examined and a detailed repair procedure to RDSO Drg no WD-16002-S-01 for repair of the center sill of BOXNHL wagon (Design-A & B) has been prepared and enclosed with this letter.

Encl: Drawing No WD-16002-S-01

8/1/2016
(A.K. Mishra)
Joint director/wagon
For Director General/Wagon

Copy to:

1. मुख्य यांत्रिक अभियन्ता :
   1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई– 400 001.
   2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001.
   3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली – 110 001.

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4. दक्षिण रेलवे, पार्क टाउन, चेन्नई – 600 003.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्दराबाद – 500 071.
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता – 700 043.
7. पूर्वोत्तर रेलवे, गोरखपुर – 273 012.
8. पूर्वोत्तर सीमान्त रेलवे, मालीगॉव, गुवाहाटी – 781 011.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई – 400 020.
10. पूर्व मध्य रेलवे, हाजीपुर – 844 101.
11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर,–751 016.
12. उत्तर मध्य रेलवे, हास्टिंग रोड ,इलाहाबाद – 211 001.
13. उत्तर पश्चिम रेलवे, जयपुर – 302 006.
14. दक्षिण पश्चिम रेलवे, हुबली – 580 023.
15. पश्चिम मध्य रेलवे, जबलपुर – 482 001.
16. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्पलेक्स, बिलासपुर – 495 004.

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भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Fax : 91-0522-2452494
Tele/Fax: 0522- 2465773

Government of India - Ministry of Railways
Research Designs & Standards
Organisation
Lucknow – 226011
DID (0522)2450115
DID(0522)2465310

No. MW/BOXNHL

Date 21.11.2017

मुख्य कारखाना प्रबंधक :

1. उत्तर मध्य रेलवे कारखाना, झॉसी – 248003
2. पश्चिम मध्य रेलवे कारखाना, कोटा – 324002
3. दक्षिण मध्य रेलवे, कारखाना, रायनापाडू – 521241
4. उत्तर रेलवे कारखाना, जगाधरी – 135002
5. पूर्व रेलवे कारखाना, लिलुहा – 711204
6. दक्षिण पूर्व रेलवे कारखाना, खड़गपुर –721301
7. दक्षिण रेलवे कारखाना, पैराम्बूर – 600023
8. दक्षिण पूर्व मध्य रेलवे कारखाना, रायपुर.
9. पश्चिम रेलवे कारखाना, प्रतापनगर – 390004
10. पूर्व मध्य रेलवे कारखाना, जमालपुर – 811214
11. उत्तर पश्चिम रेलवे कारखाना, अजमेर –305001
12. उत्तर पूर्व फ्रन्टियर रेलवे कारखाना, न्यू बोगई गांव –783381
13. उत्तर रेलवे कारखाना, अमृतसर – 143001
14. गोल्डन रॉक केन्द्रीय कारखाना–दक्षिण रेलवे त्रिची – 620004
15. मुख्य कारखाना प्रबंधक, पूर्व मध्य रेलवे कारखाना, समस्तीपुर

Sub- Procedure for repair of centre sill of BOXNHL (Design A & B) wagon.
Ref- (I) This office letter of even no. dated 08.01.2016.
(ii) Eastern Railway, Jamalpur letter No. F/Dy(W)/OFF/RB/49 dated 16.08.2017

Vide this office letter under ref (i) above, repair procedure (RDSO drawing No. WD-16002-S-01 Alt. NIL) for repairing of cracks in Centre Sill of BOXNHL wagons (Design A & B) having three piece centre sill was issued.

Recently, few cases have been reported by Zonal Railways wherein the crack has been propagated upto the top of centre sill web and further extended towards longitudinal direction. Accordingly, the repair procedure has been revised to repair these type of cracks also. Further, it is advised that these wagons should be marked with remark "CENTRE SILL REPAIRD" and special instruction to be issued for special attention on these wagons during examination at each examination point and status report of these wagons to be sent to RDSO.

The revised repair procedure is enclosed with this letter.

संलग्नक : Drg. No. WD-16002-S-01 Alt-1

(पी0के0 पाण्डेय)
निदेशक / माल डिब्बा
कृते महा निदेशक

प्रतिलिपि:–

मुख्य यान्त्रिक अभियन्ता:–

1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई– 400 001.
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001.
3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली – 110 001.

4. दक्षिण रेलवे, पार्क टाउन, चेन्नई – 600 003.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्दराबाद – 500 071.
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता – 700 043.
7. पूर्वोत्तर रेलवे, गोरखपुर – 273 012.
8. पूर्वोत्तर सीमान्त रेलवे, मालीगॉव, गुवाहाटी – 781 011.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई – 400 020.
10. पूर्व मध्य रेलवे, हाजीपुर – 844 101.
11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर,–751 016.
12. उत्तर मध्य रेलवे, हास्टिंग रोड ,इलाहाबाद – 211 001.
13. उत्तर पश्चिम रेलवे, जयपुर – 302 006.
14. दक्षिण पश्चिम रेलवे, हुबली – 580 023.
15. पश्चिम मध्य रेलवे, जबलपुर – 482 001.
16. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्पलेक्स, बिलासपुर – 495 004

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Fax : 91-0522-2452494
Tele/Fax: 0522- 2465773

Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011
DID (0522)2450115
DID(0522)2465310

No. MW/BOXNHL

Date: 02.07.2018

मुख्य यांत्रिक अभियन्ता :

1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई– 400 001.
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001.
3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली – 110 001.
4. दक्षिण रेलवे, पार्क टाउन, चेन्नई – 600 003.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्दराबाद – 500 071.
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता – 700 043.
7. पूर्वोत्तर रेलवे, गोरखपुर – 273 012.
8. पूर्वोत्तर सीमान्त रेलवे, मालीगॉव, गुवाहाटी – 781 011.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई – 400 020.
10. पूर्व मध्य रेलवे, हाजीपुर – 844 101.
11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखरपुरा, भुवनेश्वर,–751 016.
12. उत्तर मध्य रेलवे, हास्टिंग रोड ,इलाहाबाद – 211 001.
13. उत्तर पश्चिम रेलवे, जयपुर – 302 006.
14. दक्षिण पश्चिम रेलवे, हुबली – 580 023.
15. पश्चिम मध्य रेलवे, जबलपुर – 482 001.
16. दक्षिण पूर्व मध्य रेलवे, आर0ई0 काम्पलेक्स, बिलासपुर–495004

Sub: Strengthen of centre sill during ROH/POH of BOXNHL wagons.

Ref: This office letter of even no. dtd. 08.01.2016.

RDSO vide letter referred above, has issued the procedure for repair of centre sill of BOXNHL wagon provided with three piece centre sill. RDSO drawing no. WD- 16002-S-01, details the procedure to be followed for repair of centre sill.

There are BOXNHL wagons manufactured with three piece centre sill in which centre sill are not found with any crack during ROH/POH examination. Since, these wagons are prone to develop crack at centre sill location. A strengthening procedure to RDSO Drg. no. WD-18051-S-01, for strengthen the centre sill has been prepared as a preventive measure.

A copy of repair procedure is attached herewith and you are advised to strengthen BOXNHL wagon (manufactured with three piece) during ROH/POH.

D. A. WD-18051-S -01

(Sanjay Kumar)
Exe. Director Std./Wagon

Copy to:
EDME (Freight), Railway Board, New Delhi-110 001- for kind information.

अ अ मा सं RDSO
रेल अग्रदूत Transforming Railways

फैक्स / Fax : 91-0522-2452494
टेलीफोन / Tele: 0522- 2462638
arvindirsme10@gmail.com

भारत सरकार –रेल मंत्रालय
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लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow – 226011

No. MW/BOXNHL   Date: 20.05.2022

Principal Chief Mechanical Engineers

1. Northern Railway, Baroda House, New Delhi-110 001
2. Central Railway, CST, Mumbai-400 001
3. Eastern Railway, Fairlie Place, Kolkata-700 001
4. Western Railway, Churchgate, Mumbai-400 020
5. Southern Railway, Park Town, Chennai-600 003
6. South Central Railway, Secunderabad-500 071
7. South Eastern Railway, Garden Reach, Kolkata-700 043
8. North Eastern Railway, Gorakhpur-273 001
9. Northeast Frontier Railway, Maligaon, Guwahati-781 011
10. East Central Railway, Hajipur, Bihar 844 101
11. North Western Railway, Jaipur-302 006
12. North Central Railway, Allahabad.-211 001
13. South Western Railway, Hubli – 580 023
14. East Coast Railway, Bhubaneswar, Orissa-751 023
15. West Central Railway, Jabalpur-482 001
16. South East Central Railway, R.E. Complex, Bilaspur – 495 004

Sub: Strengthen of Centre-Sill during ROH/POH of BOXNHL wagons.
Ref: This office letter no even dated 02.07.2018.

Vide letter under reference above, the strengthening procedure no WD-18051-S-01 for three piece centre sill of BOXNHL wagon has been issued to PCMEs of all Zonal Railway.

It is advised to please ensure to strengthen the three piece centre sill of BOXNHL wagon following the procedure no WD-18051-S-01 during ROH/POH.

20/05/22

D.A.: As above

(Arvind Kumar)
Jt. Director/WD-II
For Director General/RDSO

Copy to:-
EDME/Frt., Railway Board, New Delhi [illegible]

फैक्स/थ्रं रू 91.0522.2452494
टेलीफोन@Tele: 2465773 (DOT)
42921 (Rly.)

सत्यमेव जयते

भारत सरकार --रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ & 226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

No. MW/BOXNHL

Date: 15.06.22

General Manager (Mechanical)

1. Central Railway, CST, Mumbai-400 001
2. Eastern Railway, Fairlie Place, Kolkata-700 001
3. East Central Railway, Hajipur- 844 101
4. East Coast Railway, Railway Complex, Bhubaneswar-751 023
5. Northern Railway, Baroda House, New Delhi-110 001
6. North Central Railway, Allahabad.-211 001
7. North Western Railway, Jaipur-302 006
8. North Eastern Railway, Gorakhpur-273 001
9. Southern Railway, Park Town, Chennai-600 003
10. South Central Railway, Secunderabad-500 071
11. South Eastern Railway, Garden Reach, Kolkata-700 043
12. South East Central Railway, R.E. Complex, Bilaspur – 495 004
13. South Western Railway, Hubli – 580 023
14. Northeast Frontier Railway, Maligaon, Guwahati-781 011
15. Western Railway, Churchgate, Mumbai-400 020
16. West Central Railway, Jabalpur-482 001

Sub: Procedure for repair of Defects/cracks in centre sill.

Ref: 1. RDSO letter no MW/BOXNHL dt 08.01.2016
2. RDSO letter no MW/BOXNHL dt 21.11.2017

In reference to letters above, instructions for repair of three-piece centre sill in BOXNHL wagon have already been issued to all railways for cases of damages between bolsters vide Drg no WD-16002-S-01 Alt 1(or latest).

In case of single piece centre sill of BOXNHL wagons, cases of damages to backstop portion have been reported from various workshops. To address the damages as reported, two drawings have been prepared and circulated. The drg no's are, WD-20035-S-01 Alt nil (or latest) &WD-20035-S-02 Alt nil (or latest).

In addition to the damages/defects reported already at backstop location in case of single piece centre sill, Ajmer workshop reported one case of new type of crack generation at back stop location. The issue was examined and a new drg WD-22045-S-01 Alt nil has been prepared for this and the wagon has been repaired successfully. In future similar nature of cracks can be repaired by the above mentioned drg.

The drawing Nos WD-20035-S-01, WD-20035-S-02 & WD-22045-S-01 made for repair of backstop location defects may be referred to for further ref and repair as and when such type of defects arise.

15.06.2022

(Arvind Kumar)
Jt. Director/WD-II
For Director General/RDSO

Copy: EDME (Frt.)/ Railway Board

फैक्स/Fax : 91-0522-2452494
टेलीफोन/Tele: 2465773 (DOT)

सत्यमेव जयते

भारत सरकार–रेलमंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ–226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

MW/BOXNHL March 10, 2021

Chief Workshop Manager,
Wagon Repair shop,
West central Railway,
Kota- 324 002

Sub: Premature condemnation of wagons.

Ref.: (i) Your letter No. M 116/3/BOXNHL dated 11.2 2021
(ii) This office letter of even No. dated 08.02.2021
(iii) Rly. Board`s letter No.2019/M (N)/60/6 dated 16.12.2020

Reference above, your proposal for premature condemnation of one BOXNHL wagon bearing No. 22161169235 (2011) & one BVZI wagon bearing No. 86100955754 (2009) has been inspected by RDSO on 5th march 2021.

1. Owing to reported damaged condition of center sill of BOXNHL wagon, a repair procedure has been prepared (copy enclosed) to rectify center sill.

2. BVZI wagon is manufactured with mild steel and having no load, as such correction in hogged camber can be under taken, a procedure has been prepared by RDSO and the same has already been tried out at GOC, Chennai to correct number of BVZI wagons (copy enclosed).

Based on the above, the proposal for premature condemnation of BOXNHL & BVZI wagon is technically differed.

10/3/21

D. A.: As above

(Arvind Kumar)
Jt. Director/ Wagon
For Director General / RDSO

फैक्स / ध्ं रू 91.0522.2452494
टेलीफोन@Tele: 2465773 (DOT)
42921 (Rly.)

सत्यमेव जयते

भारत सरकार –रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ & 226011
Government of India - Ministry of Railways
Research Designs & Standards Organization
Lucknow – 226011

No. MW/BOXNHL

Date: 15.06.22

General Manager (Mechanical)

1. Central Railway, CST, Mumbai-400 001
2. Eastern Railway, Fairlie Place, Kolkata-700 001
3. East Central Railway, Hajipur- 844 101
4. East Coast Railway, Railway Complex, Bhubaneswar-751 023
5. Northern Railway, Baroda House, New Delhi-110 001
6. North Central Railway, Allahabad.-211 001
7. North Western Railway, Jaipur-302 006
8. North Eastern Railway, Gorakhpur-273 001
9. Southern Railway, Park Town, Chennai-600 003
10. South Central Railway, Secunderabad-500 071
11. South Eastern Railway, Garden Reach, Kolkata-700 043
12. South East Central Railway, R.E. Complex, Bilaspur – 495 004
13. South Western Railway, Hubli – 580 023
14. Northeast Frontier Railway, Maligaon, Guwahati-781 011
15. Western Railway, Churchgate, Mumbai-400 020
16. West Central Railway, Jabalpur-482 001

Sub: Procedure for repair of Defects/cracks in centre sill.

Ref: 1. RDSO letter no MW/BOXNHL dt 08.01.2016
2. RDSO letter no MW/BOXNHL dt 21.11.2017

In reference to letters above, instructions for repair of three-piece centre sill in BOXNHL wagon have already been issued to all railways for cases of damages between bolsters vide Drg no WD-16002-S-01 Alt 1(or latest).

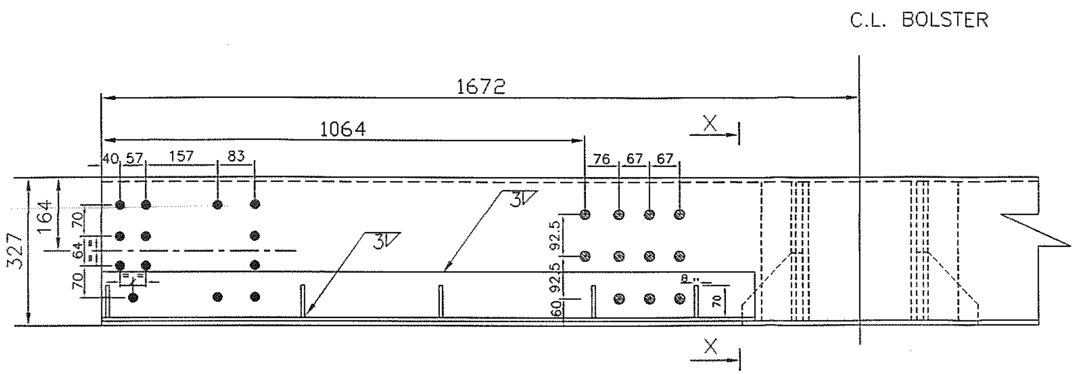
In case of single piece centre sill of BOXNHL wagons, cases of damages to backstop portion have been reported from various workshops. To address the damages as reported, two drawings have been prepared and circulated. The drg no's are, WD-20035-S-01 Alt nil (or latest) &WD-20035-S-02 Alt nil (or latest).

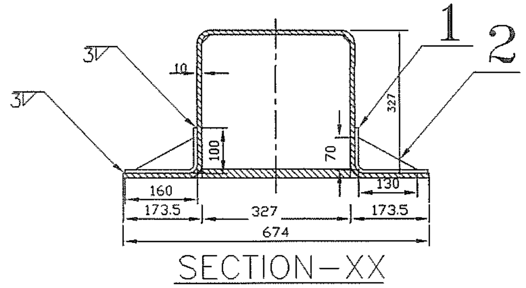
In addition to the damages/defects reported already at backstop location in case of single piece centre sill, Ajmer workshop reported one case of new type of crack generation at back stop location. The issue was examined and a new drg WD-22045-S-01 Alt nil has been prepared for this and the wagon has been repaired successfully. In future similar nature of cracks can be repaired by the above mentioned drg.

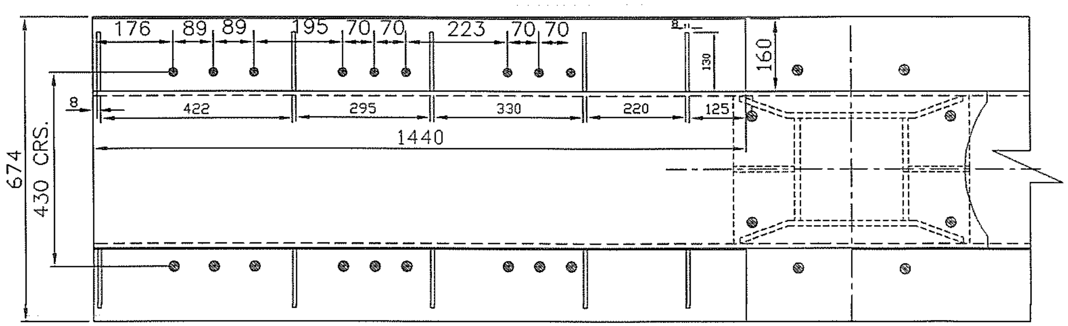
The drawing Nos WD-20035-S-01, WD-20035-S-02 & WD-22045-S-01 made for repair of backstop location defects may be referred to for further ref and repair as and when such type of defects arise.

15.06.2022
(Arvind Kumar)
Jt. Director/WD-II
For Director General/RDSO

Copy: EDME (Frt.)/ Railway Board







REPAIR PROCEDURE:-

1. REMOVE FLOOR PLATE ABOVE CRACK LOCATION .
2. REMOVE COUPLER BODY AND DRAFT GEAR ASSEMBLY.
3. CHECK CENTRE SILL WEB/TOP FLANGE AT BACK STOP/DRAFT GEAR LOCATION COMPLETELY FOR ANY CRACKS THEREAFTER CHECK THE DEPTH UPTO WHICH CRACK HAS PROPOGATED.
4. REMOVE LOCK BOLTS OF BACK STOP AND STRIKER CASTING AS SHOWN IN DRAWING.
5. ARREST HOLES TO BE MADE AT END OF THE CRACKS TO PREVENT FURTHER CRACK PROPOGATION.
6. NEXT GAUGE THE CRACKS AND FILL WITH WELD FOLLOWED BY GRINDING.
7. ANGLE TO BE FABRICATED AS PER DETAILS SHOWN IN DRAWING.
8. TO WELD RIBS WITH ANGLE AS PER SPECIFIED DISTANCES GIVEN IN DRAWING.
9. ANGLE TO BE MATCHED WITH PROFILE OF CENTRE SILL AND TO BE PLACED OVER THE CENTRE SILL.
10. AFTER CHECKING FITMENT HOLES TO BE DRILLED AT MATCHING LOCATIONS OF HUCK BOLTS AS PER DIMENSIONS GIVEN IN DRAWING.
11. NEXT ANGLE TO BE TACK WELDED FIRST AORUND THE CENTRE SILL
12. NOW WELDING OF ANGLE WITH CENTRE SILL TO BE DONE AS PER DRG.
13. NOW HUCK BOLTING OPERATION TO REINSERT ALL REMOVED BOLTS TO BE TAKEN UP.
14. NEXT REASSAMBLE THE COUPLER BODY .
15. NEXT FLOOR PLATE TO BE WELDED AND TO BE CUT TO SUIT PATCH AS SHOWN.
16. CARE SHOULD BE TAKEN FOR GOOD QUALITY OF WORKMANSHIP.
17. CENTRE SILL THUS REPAIRED TO BE MARKED ON SOLEBAR PROMINENTLY AS "CENTRE SILL REPAIRED" FOR PROPER MOMITORING PURPOSE.
18. IN CASE TOP FLANGE OF CENTRE SILL AT THIS LOCATION HAS CRACKED ACROSS ITS WIDTH, THEN WAGON IS NOT TO BE REPAIRED.

ITEM	DESCRIPTION	NO.	REF. DRG.	WT.	MTL. & SPEC	REMARKS
2	RIBS 8th	5	——	0.1	IS:2062:2006 -E250 A	
1	ANGLE 160X100X8 Th. LENGTH-1440	2	——	22	IS:2062:2006 -E250 A	

PRELIMINARY SKETCH — ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)

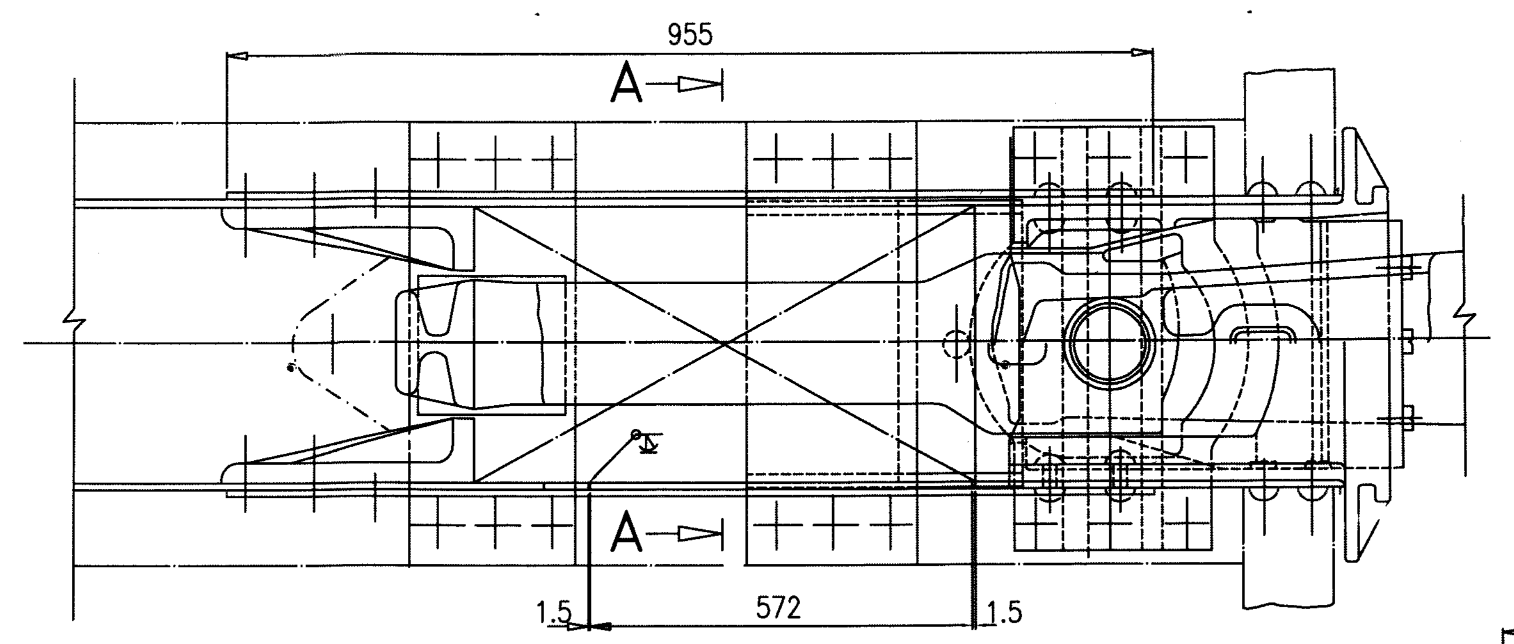
BOGIE OPEN WAGON TYPE 'BOXNHL(MBS)/BOXNHL-25T'

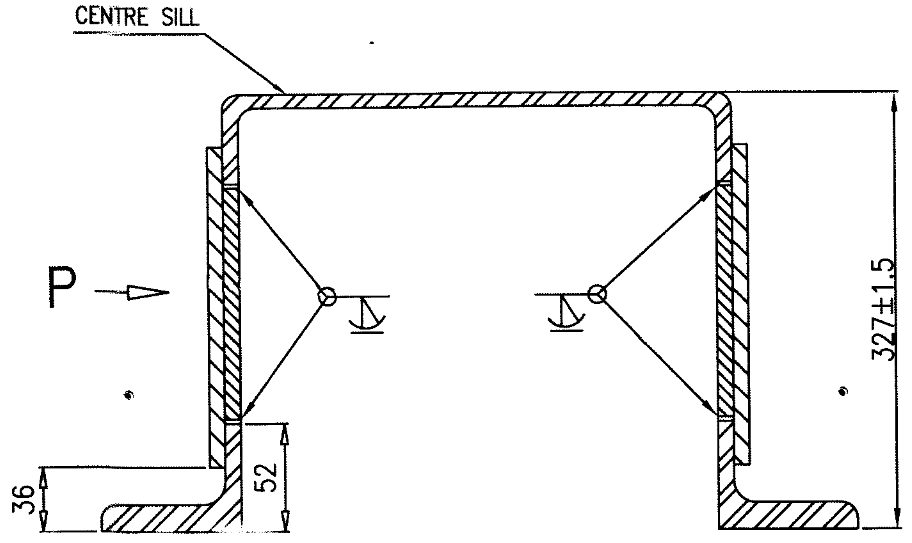
SCALE 1:20, 1:10 — DRAWN L.MOHAN 05/22 — J.S.NO. WD-22045 05/22

CENTRE SILL REPAIR
(FOR LOGITUDINAL CRACK AT BACKSTOP LOCATION)

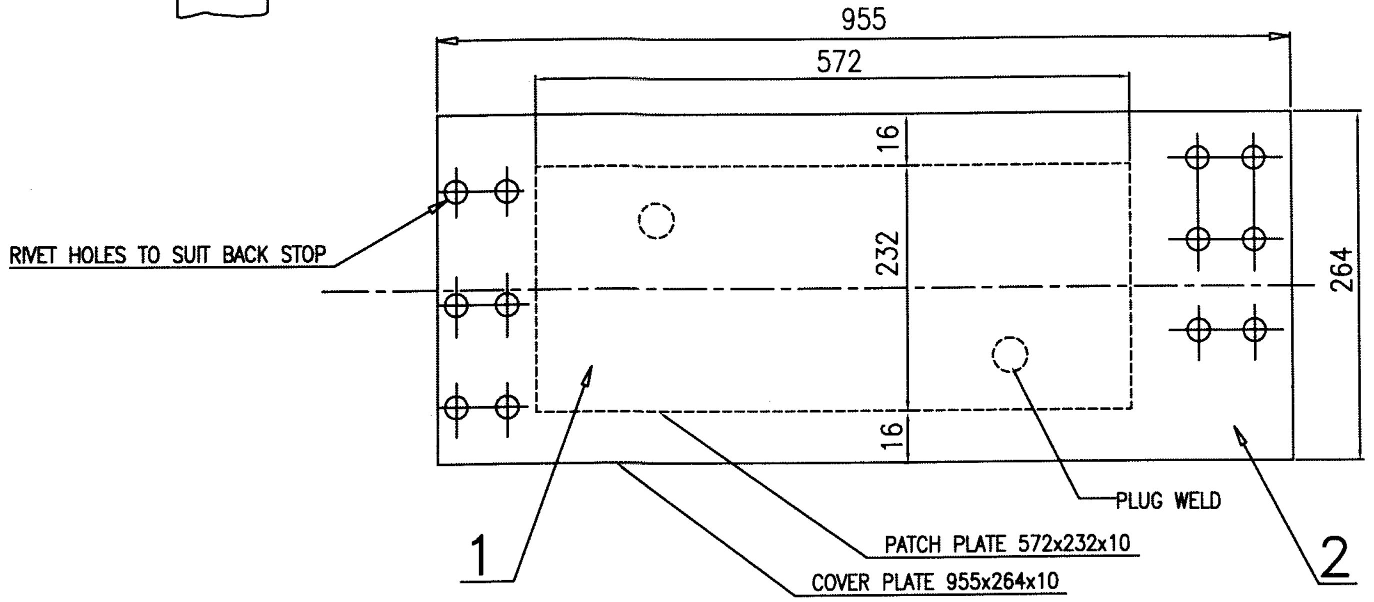
B.G. R.D.S.O. [W] GROUP WD-22045-S-01

A3
13/06/22





SECTION–AA



VIEW FROM 'P'

REPAIRE PROCEDURE:–

1. REMOVE COUPLER BODY AND DRAFT GEAR ASSEMBLY.
2. CHECK CENTRE SILL SIDE WALL AT DRAFT GEAR LOCATION COMPLETELY FOR ANY DAMAGE/BULGING IF FOUND SUCH DEFECT . STANDARD PATCHING REPAIR IS REQUIRED.
3. CUT RIVETS OF TWO COLUMN OF BACK STOP AND STRIKER CASTING AS SHOWN IN DRAWING.
4. CUT A WINDOW ON SIDE WALL OF CENTRE SILL OF 575X235 COVERING EFFECTED / DAMAGED SIDE WALL OF CENTRE SILL AND REMOVED IT CAMPLETELY.
5. INSERT A PATCH PLATE OF SIZE 572X232X10 IN THE SLOT AND AFTER ALIGNING WITH CENTRE SILL WALL FROM INSIDE. WELD IS COPLETELY AS PER PROCEDURE DETAILED IN IS:9595.
6. TAKE A COVER PLATE OF SIZE 955X264X10 AND COVERING AT LEAST TWO COLUMN OF RIVETS FROM BACK STOP AS WELL AS STRIKER CASTING AND DRILL IT AT SITE. IN ADDITION TO THIS TWO DIAGONAL DRILL HOLES ARE MADE TO PLUG WELD WITH PATCH PLATE.
7. PUT THIS COVER PLATE FROM OUT SIDE OF CENTRE SILL WALL AND RIVET BACK STOP AND STRIKER CASTING WITH COVER PLATE.
8. PLUG WELD ON PREVIOUSLY DRILLED COVER PLATE (DIAGONAL HOLES) WITH PATCH PLATE.
9. MAKE COMPLETE ASSEMBLY OF THE COUPLER.
10. CARE SHOULD BE TAKEN FOR GOOD QUALITY OF WORKMANSHIP.

ITEM	DESCRIPTION	NO. OF.	REF. DRG.	WT. OF (Kg.)	MTL & SPEC	REMARKS
2	COVER PLATE	–	–	20	IS:2062 Fe 410 CuWA	
1	PATCH PLATE	–	–	10.4	IS:2062 Fe 410 CuWA	

PRELIMINARY SKETCH

ONLY FOR PROTOTYPE APPLICATION UNDER GUIDANCE OF R.D.S.O. (WAGON)

SUPERSEDED BY			
SUPERSEDES			DATE
SCALE	PASSED	[signature]	03/14
1:5	CHECKED	L.MOHAN	03/14
	DRAWN	D.KUMAR	8/05
	TRACED		
	COMPARED		
	J.S.NO.	WD–05066	8/05

REPAIR PROCEDURE OF BULGE HAT SECTION AT DRAFT GEAR LOCATION

B.G.	R.D.S.O. [W]	GROUP	WD–05066–S–01

A3