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

International Year of Cooperatives 2025
Cooperatives Build a Better World

No. 2018/M(N)/172/1 (E-3323008) **Dated: 09.06.2025**

Principal Chief Mechanical Engineers
All Zonal Railways.

Sub: Application of Gauges during routine maintenance of CBC Knuckle.
Ref.: RDSO letter no MW/CPL/BG/HT dated 13.05.2025. (Copy enclosed)

Vide letter under reference RDSO has issued guidelines for application of Gauges during routine maintenance of CBC Knuckle. Application of following CBC gauge was practically demonstrated in presence of representatives of Zonal Railways.

A. Knuckle nose wear and stretch limit gauge (RDSO Gauge No.3 to G-80/G-76 maintenance manual)
B. Knuckle hub height gauge (AAR Gauge No. 49363)
C. Knuckle pin hole wear limits (AAR Gauge No. 49364-B)

The above-mentioned gauges should be available during ROH, Sick line & Yard attention of CBC components in all the Zonal Railways.

Zonal railways are requested to ensure sufficient availability of above CBC gauges at ROH depot, Sick line & Examination yard.

Abhay Kumar

Digitally signed by Abhay Kumar
DN: cn=Abhay Kumar, c=IN, st=Delhi, o=MINISTRY OF RAILWAYS, ou=RAILWAY BOARD, serialNumber=d712810a1b80c8abfe835abbec49b7b66a1dc3eb1ae2659f8a5a81559a17ac38
Date: 2025.06.09 15:54:23 +05'30'

(Abhay Kumar)
Director ME (Freight)
Railway Board
Email: dmef@rb.railnet.gov.in

Copy to:
EDSW/RDSO: for kind information please.

भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
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Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2450115
DID (0522) 2465310

MW/CPL/BG/HT Dated: 13.05.2025

EDME (Freight)
Railway Board
Rail Bhawan, New Delhi

Sub: Application of Gauges during routine maintenance of CBC Knuckle.

Ref: (i) This office letter of even no. dated 04.03.2025.
(ii) Railway Board letter no. 2018/M(N)/172/1 (E-3323008), dated 17.03.2025.
(iii) CWM /JUDW/NR letter no. 793-W/7/Pt-III/RDSO, dated 25.03.2025.
(iv) Dy. CME/JUDW NR note dated 25.04.2025

1. Knuckle is one of the most critical components of CBC system used in freight stock of Indian Railways. Online failure of Knuckle or associated CBC components or opening of knuckle on run due to certain defects lead to parting of trains, thus proper maintenance of knuckle is essential.

2. A Large number of warranty failures of Knuckle have been reported to RDSO by Zonal Railways. Reported warranty failures of CBC components have been analyzed by RDSO and it was observed that majority of knuckle warranty cases are due to Knuckle nose wear, Knuckle pin hole enlargement, wear on Knuckle hub height etc.

3. For optimum performance of Knuckle during service, manufacturing process, maintenance practices, gauging etc. have been reviewed by RDSO.

4. For improved reliability of knuckle during service, vide RDSO letter No.MW/CPL/BG/HT, dated 20.05.2010, reconditioning of CBC knuckle has been prohibited. Accordingly, gauge No. 9, 10, 11 & 12 mentioned in G-80 & G-76 maintenance manual, related to reconditioning of knuckle have become obsolete and these gauges are no more relevant for maintenance of CBC.

5. To align the gauging practices of Knuckle with AAR, RDSO has proposed introduction of 02(two) new maintenance gauges in line with AAR recommended practices along with use of existing gauge i.e. Knuckle nose wear and stretch limit gauge (RDSO Gauge No.3, G-80 & G 76). Based on the recommendation on CBC Knuckle gauging sent vide ref.(i) above, Railway Board through the letter at ref. (ii) has directed for knuckle gauging demonstration at JUDW/Northern Railway.

6. Accordingly, application of following gauges on CBC Knuckle has been practically demonstrated in presence of representatives of Zonal Railways (Attendance sheet attached as **Annexure-A**), JUDW/NR, RDSO/Lucknow and Coupler manufacturer from 24.04.25 to 25.04.25 at JUDW/NR.

A. Knuckle nose wear and stretch limit gauge (RDSO Gauge No.3 to G-80/ G-76 maintenance manual)
B. Knuckle hub height gauge (AAR Gauge No. 49363)
C. Knuckle pin hole wear limits (AAR Gauge No. 49364-B)

7. Manual applications of above gauges on Knuckle have been carried out by representatives of Zonal Railways and a power point presentation was made on correct use of maintenance gauges on Knuckle during service, minimum acceptance criteria of casting surface finish using SCRATA, requirement of MPI inspection etc. Copy of Power Point Presentation is attached as **Annexure-B** for ready reference.

8. A group discussion session was also organized among representatives of Zonal Railways, JUDW/NR, RDSO/Lucknow and Coupler manufacturer. During group discussion, various issues related to CBC maintenance were discussed such as implementation of MPI on coupler components, requirement of Die penetration test, maintenance issues, warranty rejection of coupler components etc.

9. The gauges mentioned in the para 6 above should be available with the all the Zonal Railways for gauging of CBC Knuckles during ROH and for the Sick line & Yard attention of CBC components.

10. Vide Railway Board letter no. 2018/M(N)/172/1(E-3323008) dt.22.10.2024, knuckle is a must change item during POH. However, serviceable knuckle released during POH should be gauged using gauges mentioned in para-6 above before issue to open line for use.

11. Railway Board may kindly issue suitable directives to all Zonal Railways for implementation of above three gauges as summarized in para-9 & 10 above.

DA: As above

Digitally Signed by Arvind Kumar
Date: 13-05-2025 17:54:57
Reason: Approved

(Arvind Kumar)
Director/WD-II
Executive Director/ Std./Wagon/RDSO

Annexure-A

Attendance Sheet of the participants (First session)

JAGADHRI WORKSHOP

Attendance sheet — DATE

Sr. No.	Name	Designation	Contact No.	Place Railway / Shop Name	Name of Depot	Railway Zone	Signature
1	Sunil Kumar	TECH-I	8128972811	CWM PRTN	M.	WR	
2	PRIYANEESH MODI	JE	9039311275	ROH	SGT(SBC)	SWR	Pmodi
3	VAIBHAV MAHALGAMATYA	JE	7879164174	ET ROH(BPL)	ET ROH BPL	WCR	
4	RAJKUMAR	SSE	7457003425	NE Railway IZN(works)	IZNS(workshop)	NER	
5	RAHUL GUPTA	SSE	9593197893	New Bongaigaon workshop	New Bongaigaon Workshop NFR	NFR	
6	V.K. meena	SSE	9794837812	KRJ/PRYJ/NCR	KRJ/PRYJ/NCR	NCR	
7	RAHUL YADAV	JE	8059885928	DER/PRYJ/NCR	ICD-DER	NCR	
8	B Sasidhara Rao	SSE	9701271428	SNF/SC/SCR	Sanathnagar	SCR	
9	PRADIP KUMAR	SSE	9123102132	JMP/ER	SSE(mech)NCSI	ER(JMP Workshop)	
10	DILIP KUMAR	SSE	9031062941	BRND/DHN/ECR	SSE(C&W) BRWD	ECR(DHN)	Dilip Kumar
11	NAWEEN KUMAR	Tech II	9955517844	RDM/SC/SCR	SSE(C&W)RDM	SCR	Naween Kumar
12	RAJESH KUMAR	JE	8860409662	Sick line GZB	TE(S/L)GZB	N/R	
13	Deepak Kumar	Tech I	8285809162	Sickline GZB	Tech I GZB	N/R	
14	MRITYUNJAY MAYANK	JE	9002028440	sickline/ROH	USL/UDL	ER	M. Mayank
15	SOURAV MAHADANI	JE	9002028426	ROH Depot	UDL (BOXN)	ER	Sourav Mahadani
16	A.K. SHAIKH (AASIMODDIN)	SSE	9503011416	ROH Depot	BSL	CR	
17	Girish Nandanwar	SSE	7219387653	ROH Depot	Bhusawal	CR	
18	Gulshan Kumar	MCM	9255204844	CBW/PNP	CDO/PNP	NR	
19	R. Nagaraju	JE	8886880850	SSE/C&W/GY	BOXN/ROH/Depot	SCR	
20	Sudeep Pal	Tec-I	9800708373	ER/NH/SDAH	NH C&W (ROH)	ER	
21	Shyam Sunder Saha	JE	7439677904	NH/SDAH	NH/C&W/ROH	ER	
22	Bablu Kumar	Tech-II	9504649877	JMP/ER	Tech-II (Mech)/C&W	ER(JMP Workshop)	Bablu Kumar
23	PRABHAT TIWARI	SSE ROH JHS	6307811768	NCR	ROH JHS	NCR	Prabhat Tiwari
24	KRISHNA MURARI	Tech-	9648037827	NCR	ROH JHS	NCR	
25	Shiv Kumar Pal	SSE-PRTN WS	9724091792	WRly.	PRTN Work Shop	WRly.	

JAGADHRI WORKSHOP

Attendance sheet — DATE

Sr. No.	Name	Designation	Contact No.	Shop Name	Name of Depot	Railway Zone	Signature
26	SANTOSH KUMAR	SR. TECH.	9097744335	ROH/BOKARO.	ROH Depo/BKSC.	SER	Santosh Kr
27	AVINASH KUMAR GOND	SR. TECH.	8960724131	WCC/DDU/ROH	WCC/C&W/DDU	ECR	Avinash Kr Gond
28	CHINMOY KUMAR NAG	SSE/C&W/BKSC	7781011531	ROH/BKSC	ROH depot/BKSC	SER	
29	ASIF SAHZAD	Tech III	6362786202		SGT (SBC)	SWR	Asif Sahzad
30	AKHILESH YADAV	JE/JHSW	9151062754	Inspection	JHSW	NCR	Akhilesh Yadav
31	MD. Mukimuddin Ahmed	SSE/C&W/NGC	9954705659	Wagon maintenance Depot NGC/NFR	NGC	NFR	Ahmed
32	Pawan Kumar Mishra	Sr.S.Engr.	9771429457	C&W/GMX	Garhara	ECR/SEE	
33	DEVENDRA KUSHWAHA	SSE	7318004053	CBC	CMLR/JHS	NCR	
34	MUKESH KUMAR MEENA	SSE	8058808051	ROH/FL/NWR	ROH/FL	NWR	Mukesh
35	KARMBIR CHANDRA	SSE	7604083139	ROH/NTP	ROH/NTP.	N.F. Railway	Chandra
36	JAIDEV SINGH	Tech II	9983341600	SSE C&W/JU NWR		NWR/JU DIV	
37	Birendra	SSE C&W	9001198415	SSE/C&W/JU NWR	JU	NWR/JU DIV	
38	Jagdish kumar	Sr. Tech C&W	6350613274	SSE/C&W/BME NWR	BME	NWR/JU DIV	
39	prabhu Ram	Sr. Tech C&W	6350613290	SSE/C&W/BME NWR	BME	NWR/JU/DIV	
40	Manoj Kumar bairwa	JE C&W	7217084019	TANK wagon depot Agra MCR		NCR/Agra/DIV	
41	Rahul Ojha	Q.C. engg.	9575084757	CBC	Siemens engg. pvt. Ltd.	Indore	
42	Zakir Khan	Q.C. Engg.	9753365464	CBC.	Roncka ind Ltd	Indore (M.P.)	
43	Hetram meena	S.R.Tech.	9828682398	CBC	SSE/C&W/LDH	NR	
44	Abhishek Kumar	Sr. Instructor/SI	7874797543	COW	STI/AII	NWR	
45	ATUL YADAV	SSE	7014785879	CBC Inspection	ADLW	NWR	
46	Chandrashekhar Lahri	Tech-I	9770519666	C&W PPYARD	SSE ROH PPYARD	SECR Raipur	
47	Dangar Singh Rathore	Tech-I	8504806325	ROH/FL	ROH FL/JPDIV	NWR	
48	Rajesh saini	Tech-I	9636044451	SSE/C&W/FL	SSE/C&W/FL/JP DIV	NWR	
49	NAVEEN KUMAR	JE	9304595891	JE/CBC	WRS/R	SECR	Naveen Kumar
50	BHUPESH KU. VERMA	JE	9752877684	PP Yard/R/SECR	PP Yard/BFA	SECR	

JAGADHRI WORKSHOP

Attendance sheet

DATE

Sr. No.	Name	Designation	Contact No.	Shop Name	Name of Depot	Railway Zone	Signature
51	Ningaraj B	Tech-III CAW/NVU	7795184894	SSE/CAW/NVU	NVU/UBL	SWR	[illegible]
52	Stephen S. Arokiyswami	Tech-I	9379230159	ROH Depot	NVU UBL/SWR	SWR	[illegible]
53	R. VIJAYA RAJ	SSE/C&W/HPT	7022029736	ROH/HPT	HPT/UBL/SWR	SWR	[illegible]
54	T.S.MADHAVARAO	SSE/HPT	7022029725	ROH/IC/HPT	HPT/UBL/SWR	UBL/SWR	[illegible]
55	ANANDJEET KUMAR VERMA	JE/ADTP	8797776733	ROH/DEPOT	ADTP/CKP/SER	SER	[illegible]
56	RAJEEV KUMAR	JE/BNDM/CKP	7488921839	ROH/BNDM	BNDM/CKP/SER	SER	[illegible]
57	Ashish Ranjan	Tech I/BNDM/CKP	8709002923	ROH/BNDM	BNDM/CKP/SER	SER	[illegible]
58	Jugal Kishor Naik	SSE/BIA	9752877469	Ex yd/BIA	Ex yd/Bhilai	BSP	[illegible]
59	Madan lal sharma	Tech/JP	9116686054	Sick line/JP	CCC/JP	NWR	[illegible]
60	Pradeep Kumar Besra	SSE/C&W/BMY	9752877431	Sick line/WRC/BMY	WRC/BMY	BSP.	[illegible]
61	Rakesh Sharma	JE/CAW/RE	9729595620	CAW/REWARI	RE/JP	NWR	[illegible]
62	Sunil Kumar	MCM/C&W/RE	9680363223	C&W/RE/JP	RE/JP	NWR	Sunil Kumar
63	Rakesh Kumar	Tech-I	7488173940	C&W DBG	DBG/HJP	ECR	Rakesh Kumar
64	Devisingh Jatav	Tech-I	8827224652	WRS Kota	WRS Kota	WCR	[illegible]
65	Prem Chand Meena	S.S.E	9256121443	WRS KOTA	KOTA	WCR	[illegible]
66	Kishor Kr Kshatri	Tech-III	8210289109	NFR SSE C&W NJP	ROH/NJP	NFR	[illegible]
67	Lasen Besra	Asst w/s	7670461617	NWS/KGP	CBC/KGP	S.E.R	Besra
68	MANIK MUNIAN	SSE	9836274316	NWS/KGP/SER	CBC/KGPW	SER	Manik Munian
69	SETHI NAND NETY	J.E	8975585004	C&W/KRBA/BSP	Ex fuel/KRBA	SECR	[illegible]
70	Hemant Kumar Sahu	JE	7879113136	C&W/BCN/BSP	BCN/BSP/SECR	SECR	[illegible]
71	ASHISAN SANGA	Tech-II	7978755937	ROH/PRDP/KUR	ROH/PRDP	ECoR	[illegible]
72	BALKAR PURI	Quality Head	8607320152	RINE ENG BADDI	-		[illegible]
73	NITESH SHARMA	ACS. Manager	8988284569	RINE ENGG. BADDI.			[illegible]
74	RAJESH LENKA	SSE	9776542790	ROH DEPOT	PARADEEP	ECoR	[illegible]
75	Gurpreet Singh	Tech-1	7275475077	ROH Depot	GMC	NCR	[illegible]

JAGADHRI WORKSHOP

Attendance sheet

DATE

Sr. No.	Name	Designation	Contact No.	Shop Name	Name of Depot	Railway Zone	Signature
76	Vaibhav Shakya	SSE/C&W	7525001555	SSE/C&W	GMC	NCR	[illegible]
77	A. Mahabir	JE/C&W/PSA	8118094953 8249798320		SSE/C&W/Palasa	E.Co.Rly/KUR	[illegible]
78	D.J. Barshya	Tech.	7099622177	NAC	NAC/LMG div	NFR	[illegible]
79	[illegible]	Marketing Manager	9873040843	[illegible]			[illegible]
80	Kishor Kr. Sharma	G. Manager	9816694001	Rine Engg. Baddi	Prod./QA.	Baddi HP	[illegible]
81	vinod mishra	Gauging incharge	8219225092	FASL P.(H.P)	Gauging	Paonta sahib (H.P)	[illegible]
82	Parveen Kumar	Q.C. Engg.	9805634701	FASL Paonta sahib	Q.C. deptt.		[illegible]
83	S. Chandra Das	QC Engg.	8960128500	FASL	FASL Kanpur	—	S.D.
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<u>Attendance Sheet of the participants</u> (Second session)

JAGADHRI WORKSHOP

Attendance sheet — DATE

Sr. No.	Name	Designation	Contact No.	Shop Name	Name of Depot	Railway Zone	Signature
1	Prakash Chand Guleria	SSE/C&W/TKD	9717633483	TKD SICKLINE	C&W/TKD	NR	[signature]
2	Ram Niwas	SSE/C&W/PNP	9729531445	PNP	C&W/PNP	NR	[signature]
3	AJEET KUMAR	JE/C&W/TNPM	9361800790	ROH TNPM	TNPM/MAS/SR	SR	Ajeet
4	LAXMAN SINGH	SSE/C&W/KOTA	9785560207	ROH KOTA	C&W KOTA	WCR	[signature]
5	SAURABH KUMAR CHATURVEDI	Sr. Tech/C&W/KOTA	~~8824313430~~ 9785783194	ROH KOTA	C&W KOTA ROH	WCR	Saurabh
6	ARSHAD HUSSAIN	Sr.Tech/C&W/KJGY	9837406950	—	ROH Depot	NR	[signature]
7	Dharmender Kumar	SSE/C&W/KJGY	8954049247	~~ROH Depot~~	ROH Depot	NR	[signature]
8	Amar Pal	SSE/C&W/UMB	7496903069	—	ROH Depot	NR	[signature]
9	Nasib Kr.	Sen.Tech/UMB	8930780220	Scaffom	ROH Depot	NR.	[signature]
10	BIJAY KUMAR	Tech-II	9162548858	ROH AJNI	ROH Depot AQ	CR	[signature]
11	AASHISH KR BHATT	TECH II	9939313122	ROH DAUND	ROH DAUND(PA)	CR (PA DIV)	[signature]
12	Arvind Kumar	JE/C&W/NTSK	7018143058	ROH NTSK	ROH NTSK	NFR	[signature]
13	Jaiyant Kumar	Tech.I/C&W/NTSK	6201282854	ROH/NTSK	ROH/NTSK	NFR	Jaiyant Kumar
14	TEETU Ram.	Sr. Tech.	7500051491	—	ROH Depot	NR	[signature]
15	SONU KUMAR	Tech-III/C&W	8755334505	—	ROH Depot RJGY	NR	Sonu Kumar
16	Dharmpal Singh	Tech I	9254978223	—	SSE/C&W/KJGY	N.R	[signature]
17	B.M. SRINIVASAN	JE/CW/PER	9840871064	WR PER/CW	CW/PER	S.R	B.M. Srinivasan
18	Kamlesh Prasad meena	Sr.Tech.	7993457374	SSE/C&W/NZB	SSE/C&W/NZB/OPAVL	SCR	[signature]
19	Devendra Kumar Prajapati	TECH-I	9826293240	TECH/C&W/STA	TECH/C&W/STA	WCR	D Prajapati
20	Pankaj Kumar	SSE/C&W/STA	9752410420	ROH/STA(BCN)	BCN ROH Depot STA	WCR	Pankaj
21	ALOK KUMAR	SSE/C&W/NKJ	7024141795	ROH/NKJ/JBP	ROH depot NKJ	WCR	[signature]
22	Haripal Singh	Quality incharge	0171518601	—	Quality	A.E.U Agra	[signature]
23	Shailendra Bhaduriya	Marketing Manager	9097359945	—	—	"	[signature]
24	Deepak Kumar	Tech I	8285809162	G2D Sick Line	ROH depot	NR	Deepak Kumar
25	K Somachalam	SR TECH	7799367570	ROH CSL	ROH CSL/VSKP	ECoR	K. Seedam

JAGADHRI WORKSHOP

Attendance sheet — DATE

Sr. No.	Name	Designation	Contact No.	Shop Name	Name of Depot	Railway Zone	Signature
26	B. NAGA	SSE/C&W/BZA	7993457525	ROH depot/Body shop	ROH depot/BZA	SCR	[signature]
27	SHAIK. MUKHTHAR AHMED	JE/Workshop/RYPS	7670807040	Wagon workshop/BZA	WWS/BZA/RYPS	SCR	[signature]
28	J. SUNIL KUMAR	Tech-I/WWS/RYPS	8985484532	Wagon work shop/BZA	WWS/BZA/RYPS	SCR	[signature]
29	KULDEEP KUMAR	SSE C&W Gonda	9794842462	ROH SHED NER/Gd	ROH Depot Gonda	NER	[signature]
30	RAM ASHISH PANDEY	Tech-II/C&W/Gonda	6388514550	ROH SHED NER/GD	ROH DEPOT GONDA	NER	RA Pandey
31	Amanpreet Singh	SSE/C&W/LDH	9915418991	Wagon Care Centre	Sick Line/LDH	NR	[signature]
32	Anil Kumar Singh	SSE/ASR W/S	8288030724	BSS	Mech. W/S ASR	NR	Anil
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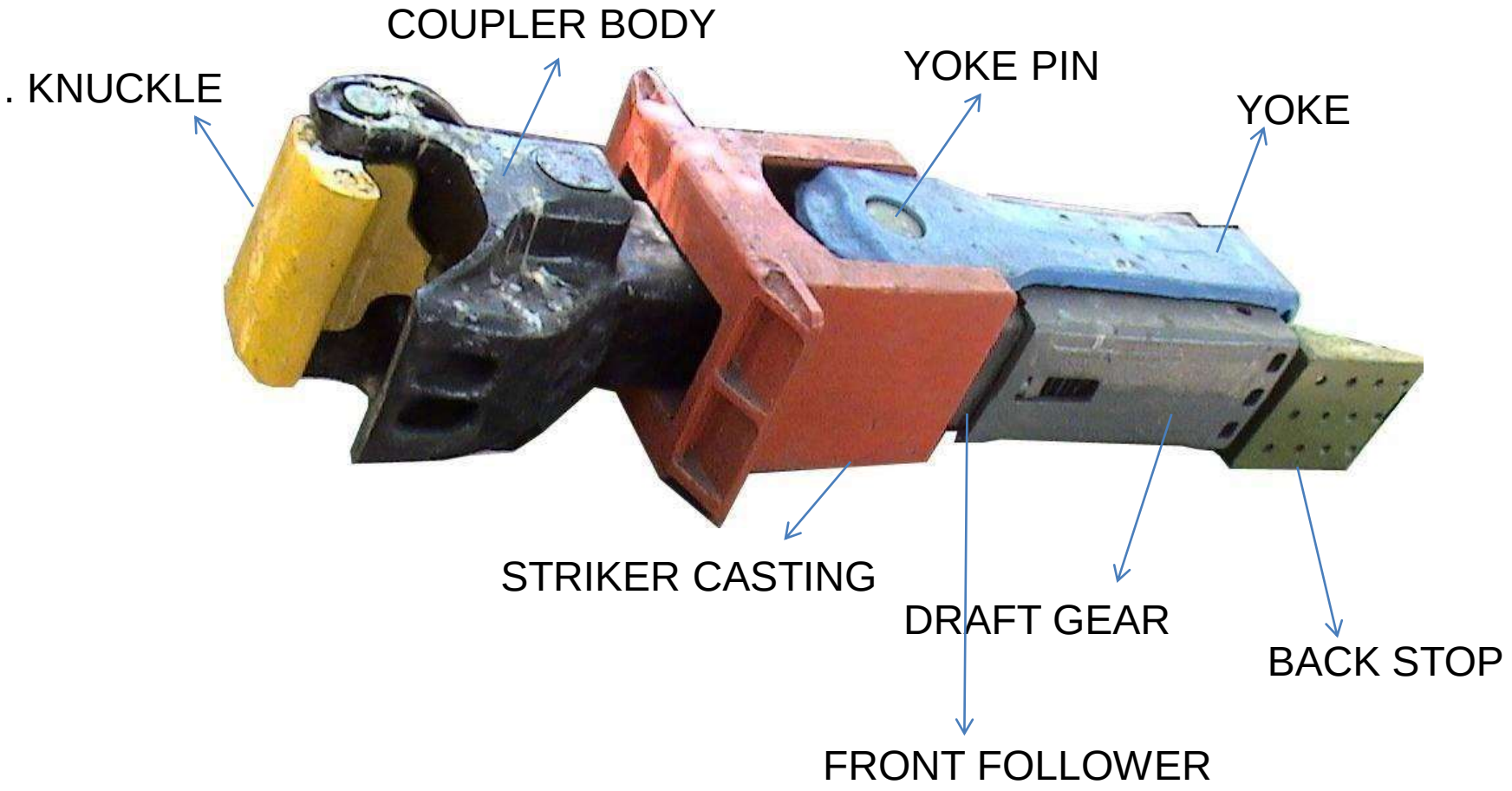
WASH ROOM

सत्यमेव जयते

Application of Gauges during routine maintenance of CBC Knuckle on 24th April, 2025 by RDSO

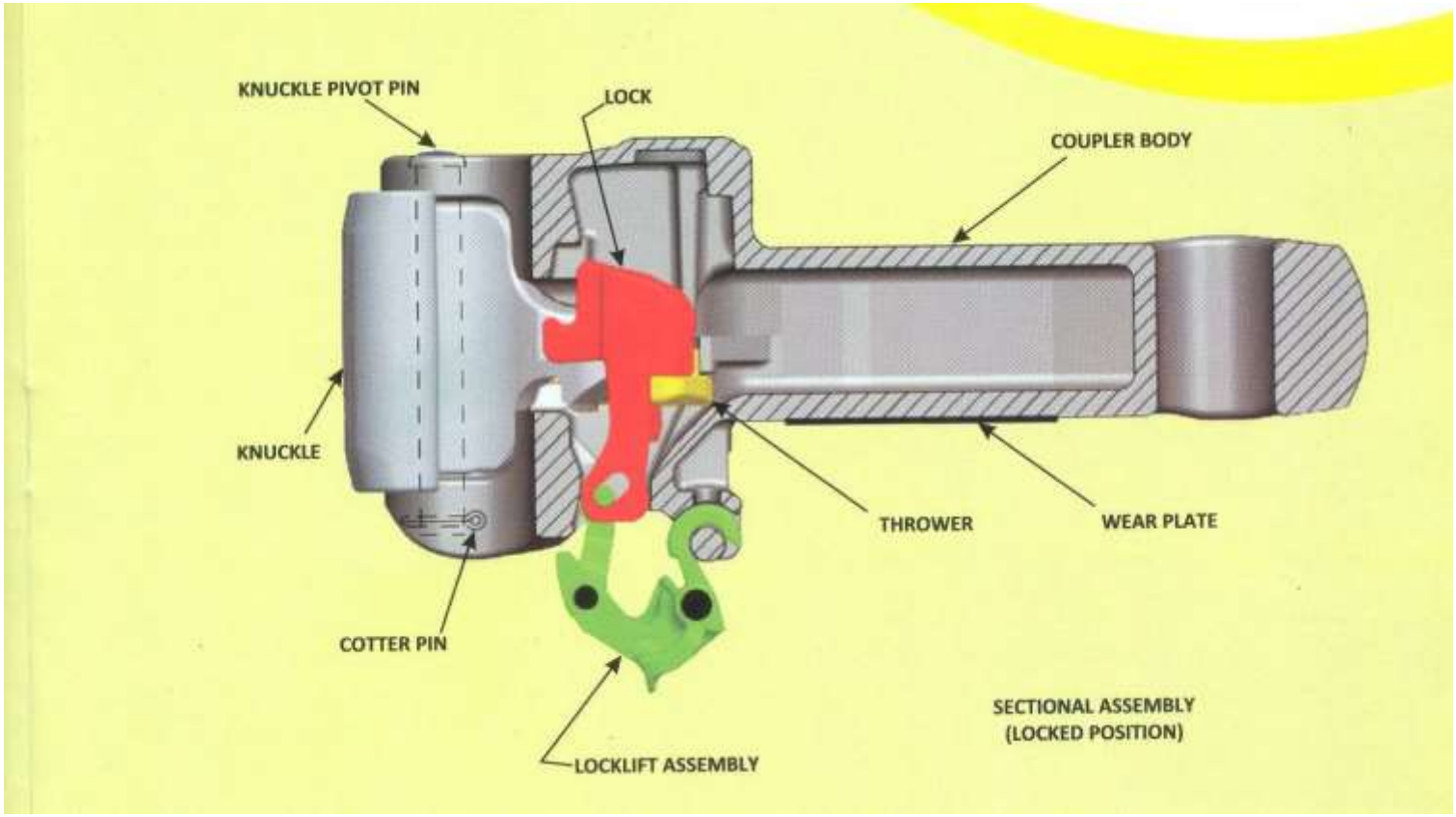
INTRODUCTION

- A **CBC coupler** (Center Buffer Coupler) is a type of railway coupling system widely used in freight. It is designed to provide a strong and secure connection between railway vehicles while allowing limited flexibility for smooth train operations. The Coupling system transmits both draft & buffing load to under-frame and absorb high frequency forces during impact. Also Dissipates low frequency forces to protect the vehicle from damage.
- Eli H. Janney invented the **knuckle coupler**, which automatically locked when two railcars came together.
- The **CBC coupler** was developed based on the Janney design but with modifications for increased strength and compatibility.


. KNUCKLE
COUPLER BODY
YOKE PIN
YOKE
STRIKER CASTING
DRAFT GEAR
BACK STOP
FRONT FOLLOWER

CENTRE BUFFER COUPLER WITH ITS ASSEMBLY ARRANGEMENTS

Fitment of Assembly in the E-type Centre Buffer Coupler



WORKING PRINCIPLE

Coupling –

- The CBC coupler consists of a **coupling mechanism** (knuckle) and a **center buffer** that is positioned in the middle of the coupler**.**

- When two trains are brought together, the **knuckle** is pushed open position by a operating handle. When **knuckle** is pushed open position by a operating handle mechanism, Lock goes upward direction on Lock chamber of coupler body**.**

- As the cars move closer, the **knuckle engages automatically** by sitting of Lock on Knuckle face while operating handle in release condition **.** Once fully connected, the knuckle **locks into place**, securing the two cars together.

MAINTENANCE REVIEW OF KNUCKLE

- Knuckle is one of the most critical components of CBC system used in freight stock of Indian Railways. Online failure of Knuckle or associated CBC components or opening on run due to certain defects can cause parting of trains, thus proper maintenance of knuckle during service is essential.
- Reported warranty failures of CBC components have been analyzed and it is observed that many knuckle warranty cases are on accounts, such as Knuckle Nose wear, Knuckle pin hole enlargement, wear on Knuckle hub height etc.
- For optimum performance of Knuckle during service; manufacturing process, maintenance practices, gauging etc. have been reviewed by RDSO.

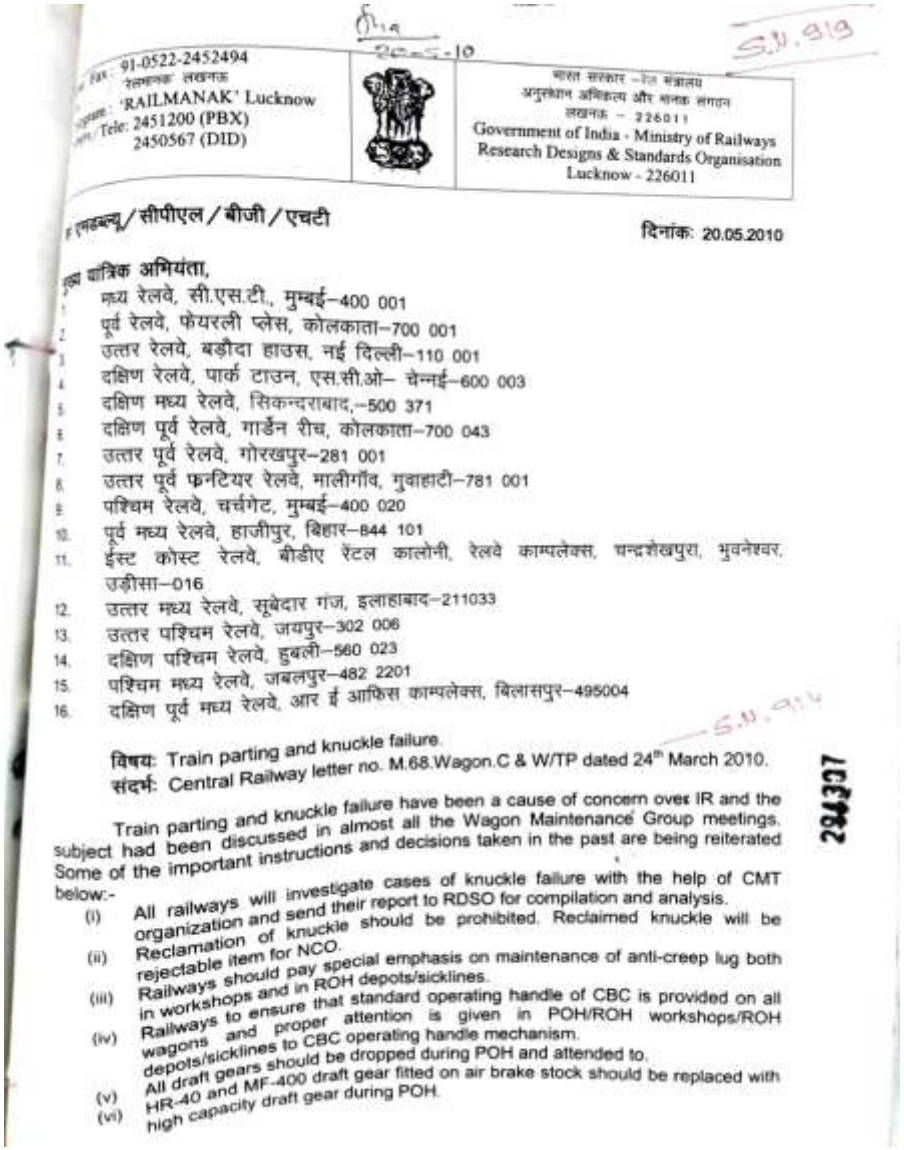
MAINTENANCE REVIEW OF KNUCKLE

- For improved reliability of knuckle during service, vide RDSO letter No.MW/CPL/BG/HT, dated 20.05.2010 (copy attached as Annexure-I), reconditioning of CBC knuckle has been prohibited.

- Accordingly, gauge No. 9, 10, 11 & 12 mentioned in G-80, related to reconditioning of knuckle have become obsolete and no more relevant for checking of knuckle during routine maintenance by Zonal Railways. To study and streamline, current gauging practices of CBC components being followed over Zonal Railways, joint inspections have been carried out at JHS work shop/NCR and PTRN work shop/WR.

- The joint inspection reports have been analyzed and following gauges and its application procedure for checking of Knuckle are recommended in line with AAR standard;

ANNEXURE -1



Fax: 91-0522-2452494
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'RAILMANAK' Lucknow
Tele: 2451200 (PBX)
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भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226011

F (वैगन्स)/सीपीएल/बीजी/एचटी

दिनांक: 20.05.2010

मुख्य यान्त्रिक अभियंता,

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, गार्डन रीच, कोलकाता–700 043
7. उत्तर पूर्व रेलवे, गोरखपुर–281 001
8. उत्तर पूर्व फ्रन्टियर रेलवे, मालीगाँव, गुवाहाटी–781 001
9. पश्चिम रेलवे, चर्चगेट, मुम्बई–400 020
10. पूर्व मध्य रेलवे, हाजीपुर, बिहार–844 101
11. ईस्ट कोस्ट रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्पलेक्स, चन्द्रशेखपुरा, भुवनेश्वर, उड़ीसा–016
12. उत्तर मध्य रेलवे, सूबेदार गंज, इलाहाबाद–211033
13. उत्तर पश्चिम रेलवे, जयपुर–302 006
14. दक्षिण पश्चिम रेलवे, हुबली–560 023
15. पश्चिम मध्य रेलवे, जबलपुर–482 2201
16. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्पलेक्स, बिलासपुर–495004

S.N. 913

S.N. 914

विषय: Train parting and knuckle failure.
संदर्भ: Central Railway letter no. M.68.Wagon.C & W/TP dated 24th March 2010.

294337

Train parting and knuckle failure have been a cause of concern oves IR and the subject had been discussed in almost all the Wagon Maintenance Group meetings. Some of the important instructions and decisions taken in the past are being reiterated below:-

(i) All railways will investigate cases of knuckle failure with the help of CMT organization and send their report to RDSO for compilation and analysis.
(ii) Reclamation of knuckle should be prohibited. Reclaimed knuckle will be rejectable item for NCO.
(iii) Railways should pay special emphasis on maintenance of anti-creep lug both in workshops and in ROH depots/sicklines.
(iv) Railways to ensure that standard operating handle of CBC is provided on all wagons and proper attention is given in POH/ROH workshops/ROH depots/sicklines to CBC operating handle mechanism.
(v) All draft gears should be dropped during POH and attended to.
(vi) HR-40 and MF-400 draft gear fitted on air brake stock should be replaced with high capacity draft gear during POH.
(vii) HR-40 and MF-400 draft gear should be deleted from the list of excluded items.
(viii) Grade C coupler should be deleted from the list of excluded items.
(ix) Railway should ensure that both ends of wagon should have same type of draft gear and coupler.
(x) Grade-C couplers should be replaced by Grade-E couplers on all air brake stock during POH.
(xi) Workshops to ensure correct colour coding on off POH wagons to indicate type of draft gear and couplers as per the scheme issued by RDSO.
(xii) Workshops should ensure that at the time of assembly of MK-50 and RF-361 draft gears. Bore inserts and pre-shorteners as specified by draft gear manufacturers are used to get reliable service from draft gear.
(xiii) Draft gear should be reconditioned as per manufacturers maintenance manual.
(xiv) Railways should stop reclamation of knuckle nose wear plate in sick line/ROH depot.
(xv) Railways should follow proper repair and maintenance practices for maintenance of coupler and draft gear as prescribed in RDSO's manual G-76 for open line and G-80 for workshops.
(xvi) Railways should carry out survey of marking and manufacturer's identification as advised by RDSO vide their letter no. MW/CPL/BG/D dated 27/28.8.2001 so that specific manufacturers can be identified for improvement in marking scheme.
(xvii) Proper attention to draft gear should be given during POH. The draft gear should be attended, if the slack exceeds more than 25mm, to avoid excessive slack on coupler and draft gear components. During ROH, if the slack beyond 25mm is noticed, the draft gear should be replaced. The draft gear assembly taken out should be sent to the nominated workshop for proper attention.
(xviii) Railways should ensure that coupler height should be maintained as specified in IRCA Part-III, Rule NO.2.13.7 as excessive difference in two adjacent couplers would cause excessive wear and stress on knuckle. In this context, instructions contained in Para 5.12 of G-95 for Air Brake Stock and Para 7 of G-16 for UIC stock should be followed.
(xix) Workshops must ensure 100% dropping of couplers, their gauging and repairs as laid down in RDSO's Manual G-80.
(xx) The chemical composition of Coupler body, Knuckle, Yoke & Lock had been revised for improving the quality. In this regard marking has been changed from "HTE" to "HTEA". It should be noted that all the couplers manufactured after July 2009 must have "HTEA" marking.

294338

(रुपेश श्रीवास्तव) 20/5
कृते महानिदेशक/माल डिब्बा

प्रतिलिपि: EDME/Freight.

MAINTENANCE GAUGES OF CBC KNUCKLE

Following gauges shall be used for checking of in-service knuckle:

- Knuckle nose wear and stretch limit gauge (RDSO Gauge No.3, G-80 & G 76)
- Knuckle hub height gauge (Newly induced, AAR Gauge No. 49363)
- Knuckle pin hole wear limits (Newly induced, AAR Gauge No. 49364-B).

MAINTENANCE OF GAUGES

- The POH/ROH/Sick Lines should maintain at least three (03) sets of above gauges, out of which one set of master gauge shall be kept for recalibration of other two sets of gauges.

- The accuracy of gauges should be checked with the master gauge for in-house recalibration on quarterly basis. Any gauge out of calibration should not be used.

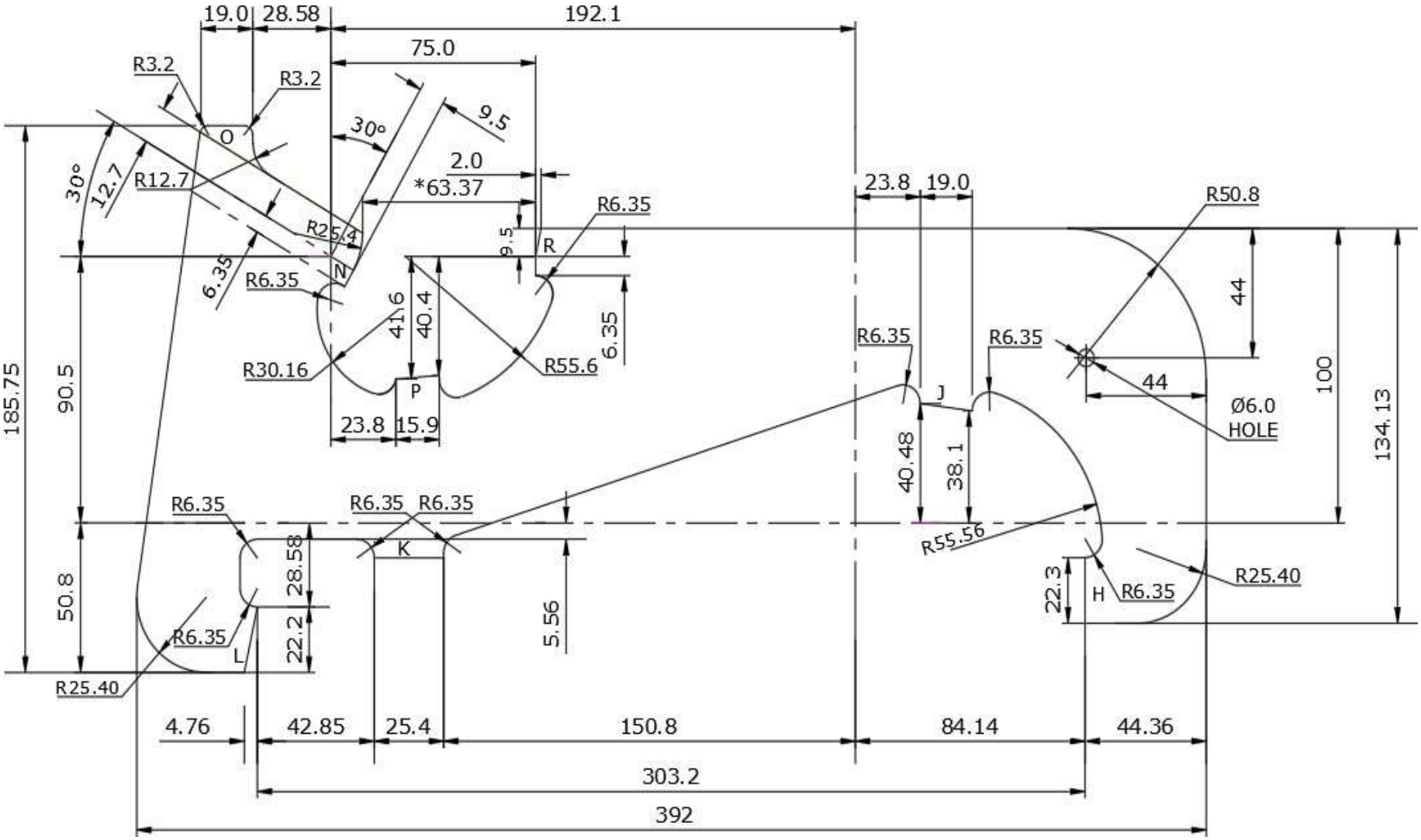
- Master gauge shall be got recalibrated from Gauge manufacturer or any authorized agency for calibration of gauges. Periodicity of recalibration of master gauge shall be one year.

APPLICATIONS OF GAUGES

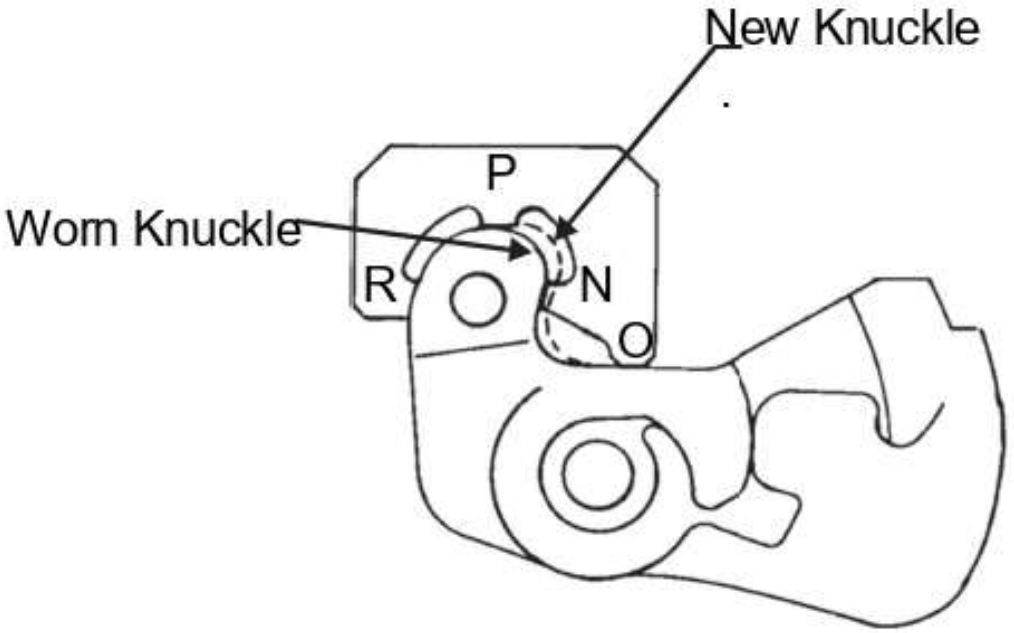
Inspection for Knuckle Nose Wear

- Maintenance Gauge no.3 shall be used for checking of Knuckle Nose Wear (Fig-1).
- The gauge should be applied vertically on Knuckle (As per Fig 2 & 3).
- For checking of nose wear, with point no. O, P & R in contact, point N should not pass vertically for more than half of knuckle nose height.
- The knuckle must be rejected/replaced when point “N” can pass for more than half of knuckle nose height with points “O,” “P,” and R” continuously in contact with knuckle
- Knuckle nose wear limit is 9.5 mm

DRAWING OF GAUGE NO.3, FIG NO.1



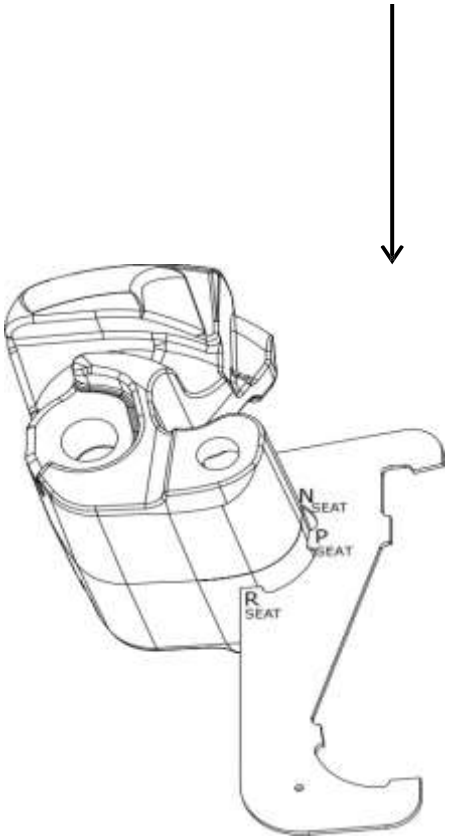
APPLICATION OF GAUGE NO.3, FIG NO.2



The Knuckle must be replaced when Point 'N' can be passed one half or more of knuckle nose height with point 'O', 'P' and 'R' continuously in contact with knuckle surface

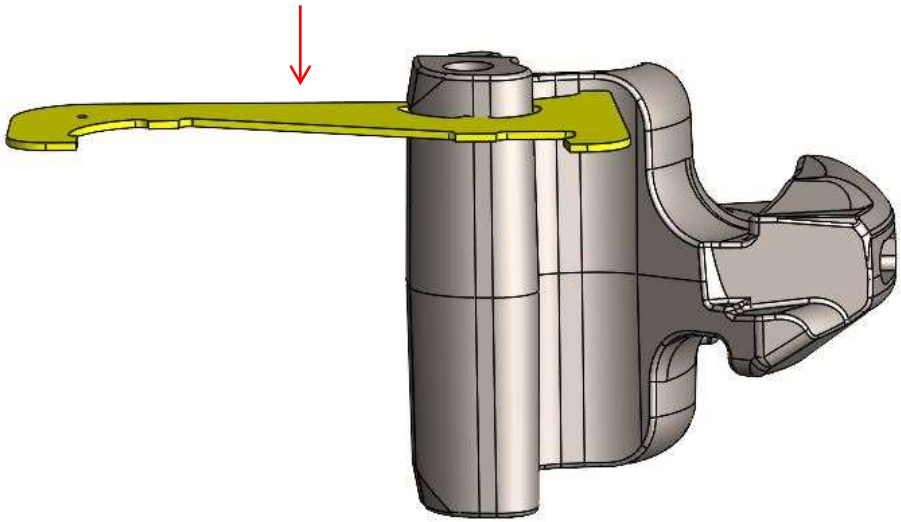
APPLICATION OF GAUGE NO.3, FIG NO.3

Gauge shall Be Applied From Vertical Direction Either Top side or Bottom Side.

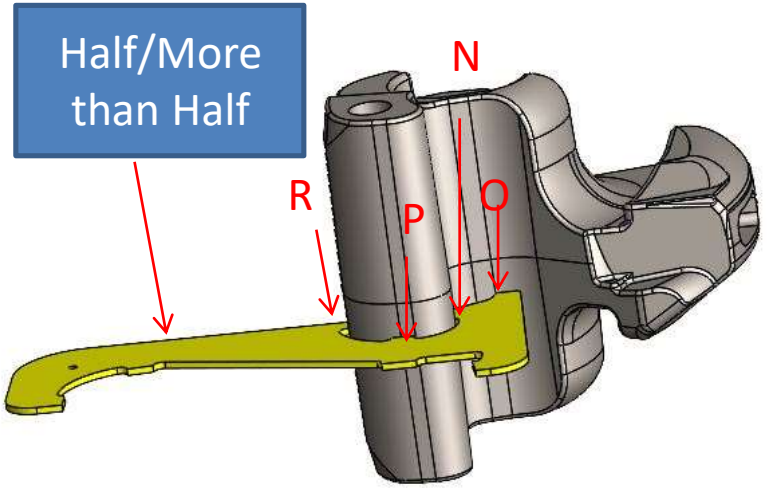


APPLICATION OF GAUGE NO.3, FIG NO.3

Knuckle NOSE WEAR (Gauge No.3)



(Not Reject)



(Reject/Replace)

APPLICATIONS OF GAUGES

Procedure to check Knuckle stretch limit by Stretch Limit Gauge (Gauge No. 3)

- Maintenance Gauge No. 3 shall be used for checking of Knuckle Stretch.
- The Gauge should be applied through figure No. 02.
- Knuckle Stretch Limit Point ‘H’ must pass with point J , K & L in contact.
- The Knuckle must be rejected/replaced when point ‘H’ cannot pass for full length of Knuckle with points L, K & ‘J’ continuously contact with Knuckle.

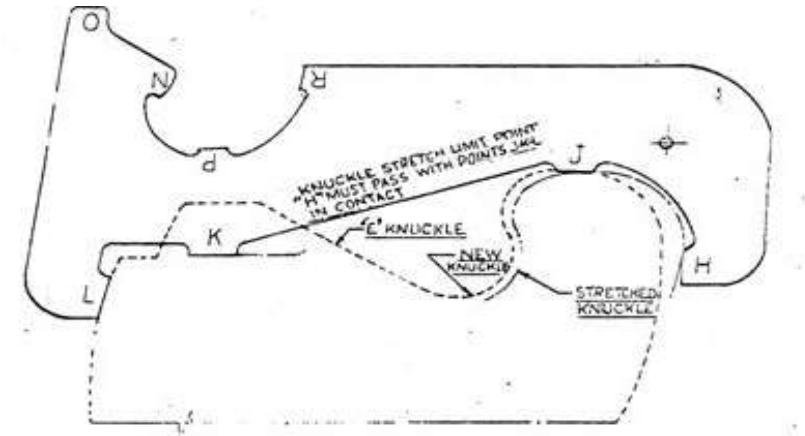


Fig. No 01
(Application Area in Gauge No. 3)

Fig. 02
(Gauge Application)

APPLICATIONS OF GAUGES

Inspection for Knuckle hub height (AAR Gauge No. 49363)

Gauge Application –

This Gauge has been introduced to check Knuckle Hub Height by Knuckle Hub Height gauge (AAR Gauge No 49363) during maintenance of the Knuckle.

- The Gauge should be applied as shown in fig. below
- Gauge must not pass through.
- If the Gauge pass through the hub then reject/replace the Knuckle (as shown in Fig. No. 02)

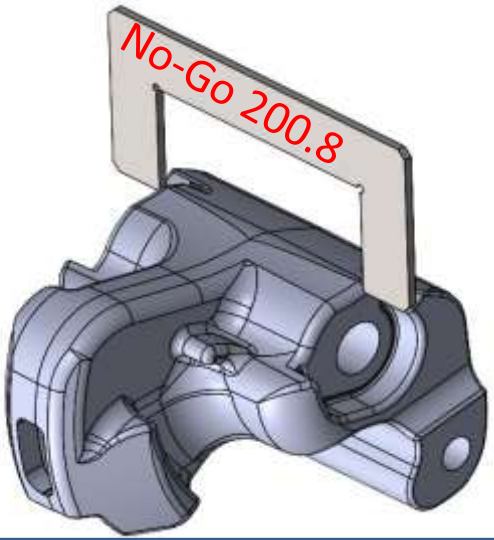


Fig. No. 01 (Not Pass)

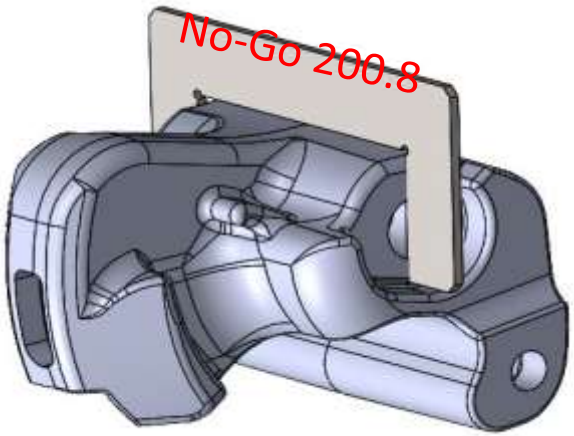
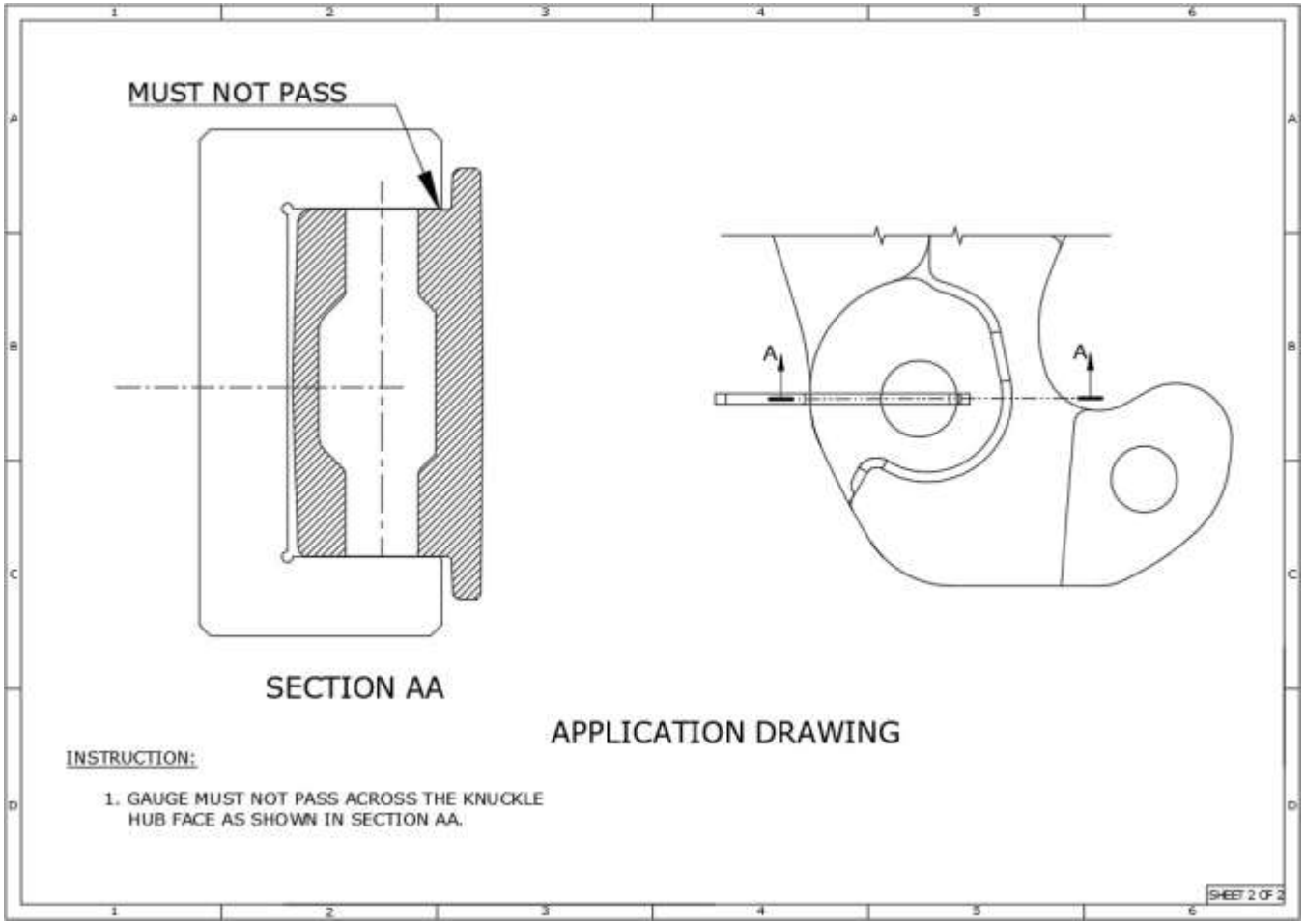


Fig. No. 02
(Reject/Replace the Knuckle)

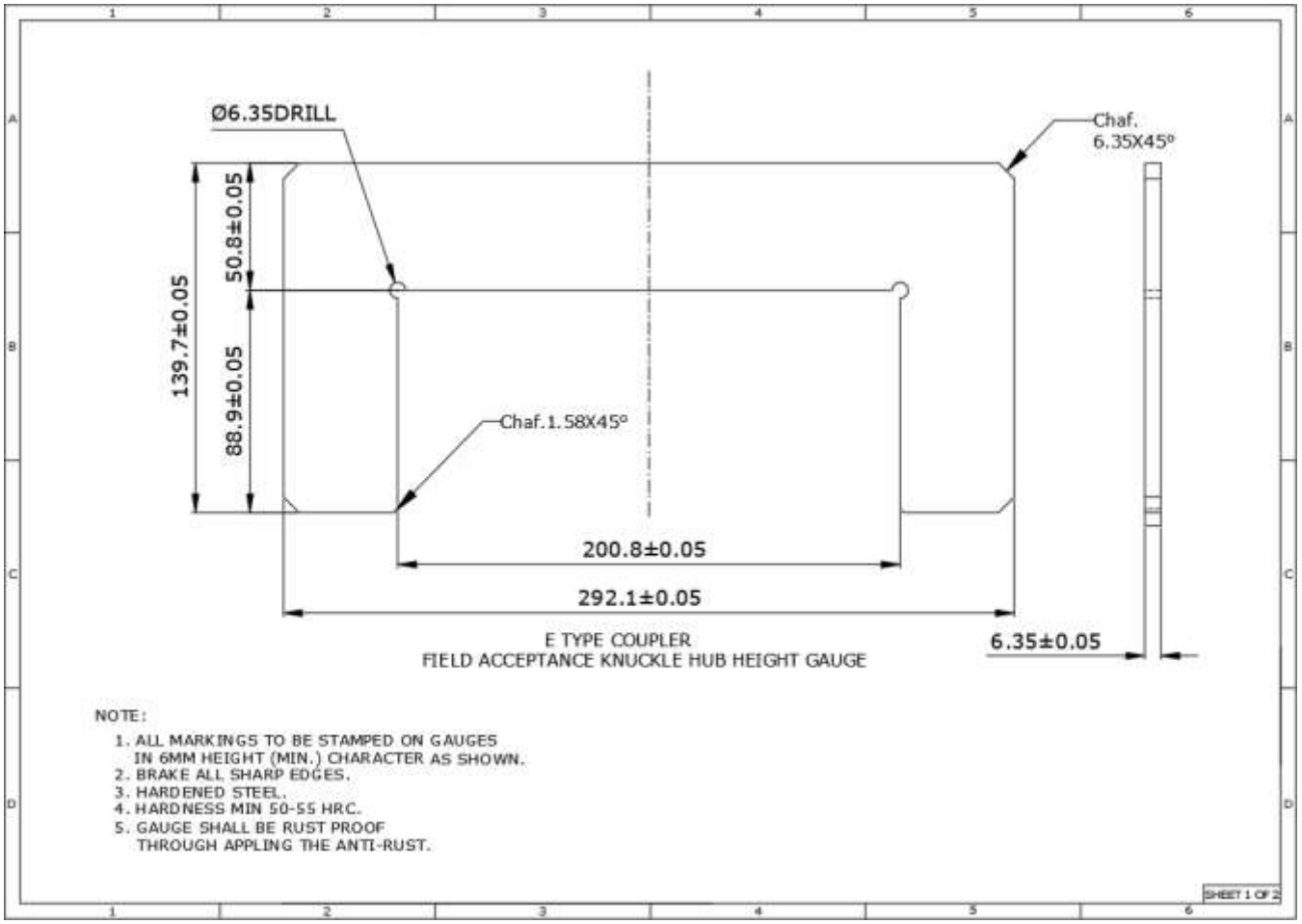
APPLICATIONS OF GAUGES

Application of Knuckle hub height gauge (AAR Gauge no. 49363



APPLICATIONS OF GAUGES

Drawing of Knuckle hub height gauge (AAR Gauge no. 49363)



APPLICATIONS OF GAUGES

Inspection of Knuckle pin hole wear limits

- **Gauge Application**: This Gauge has been introduced for checking Pin Hole Enlargement of Knuckle. Knuckle Pin Hole Wear Limit Gauge (AAR Gauge No 49364) shall be used for this purpose.
- The gauge should be applied on Knuckle as under

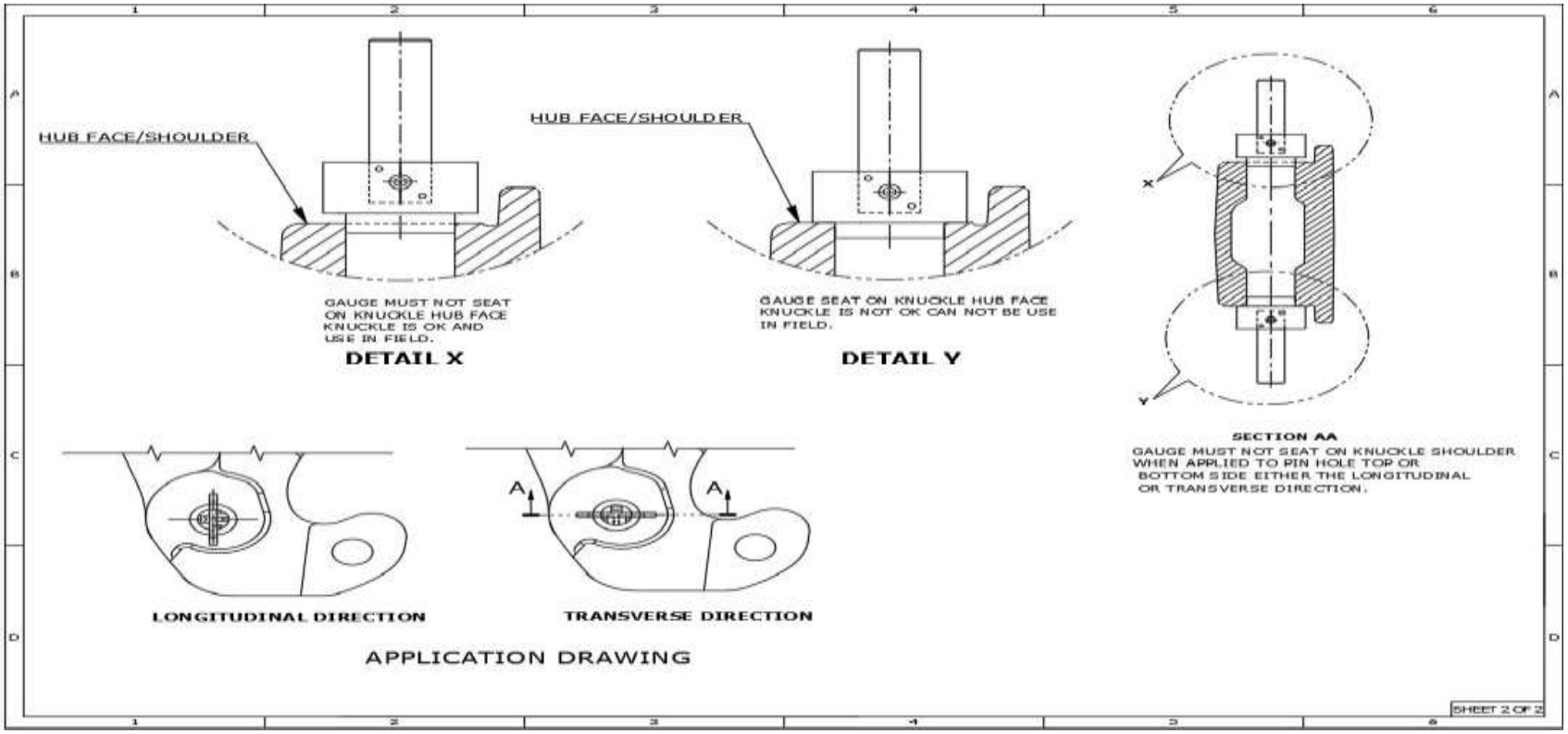


Fig. No. 01

APPLICATIONS OF GAUGES

- Gauge must not seat on the shoulder/Knuckle Hub Face when applied to pin hole top or bottom in either longitudinal or transverse direction. (as shown in Fig No. 02, Detail X).
- Gauge seat on the Knuckle Hub Face it should be rejected. (as shown in Fig No. 02, Detail Y).

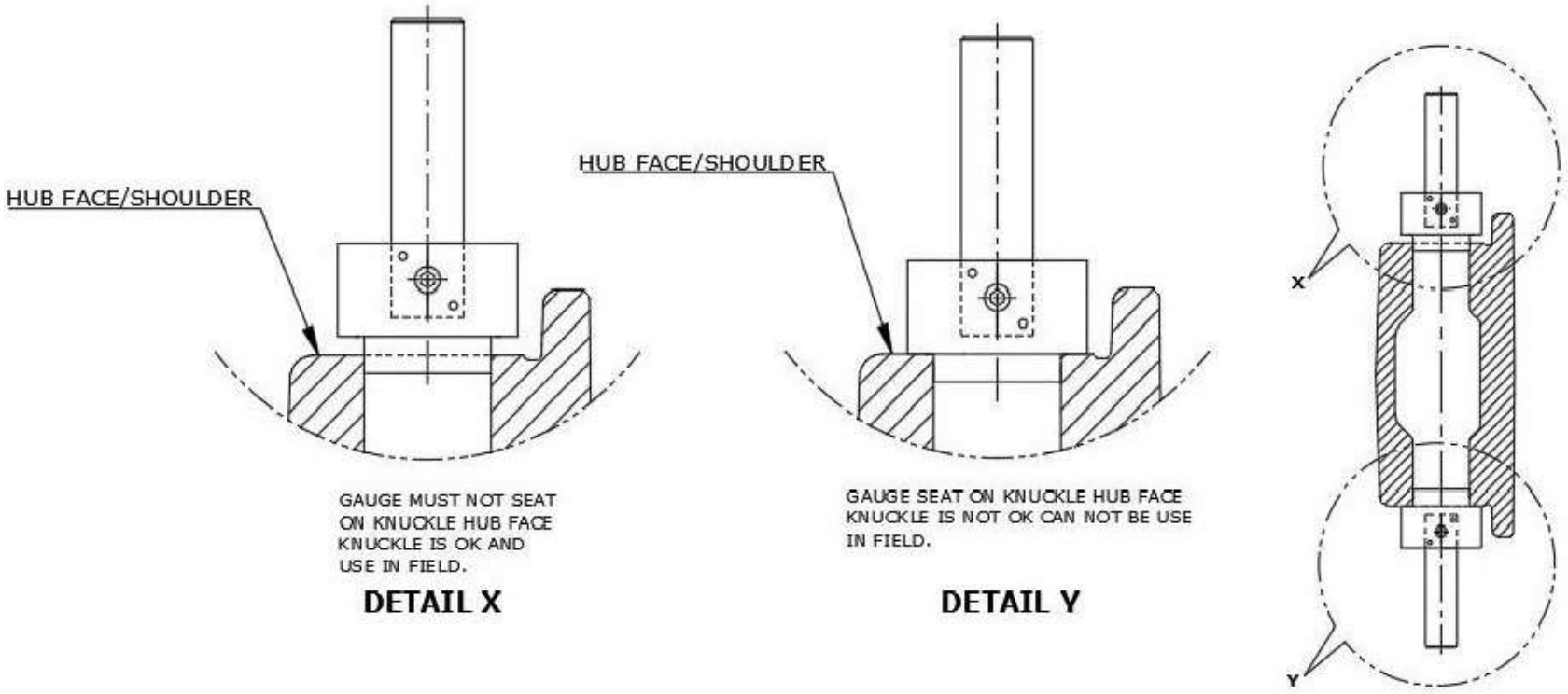
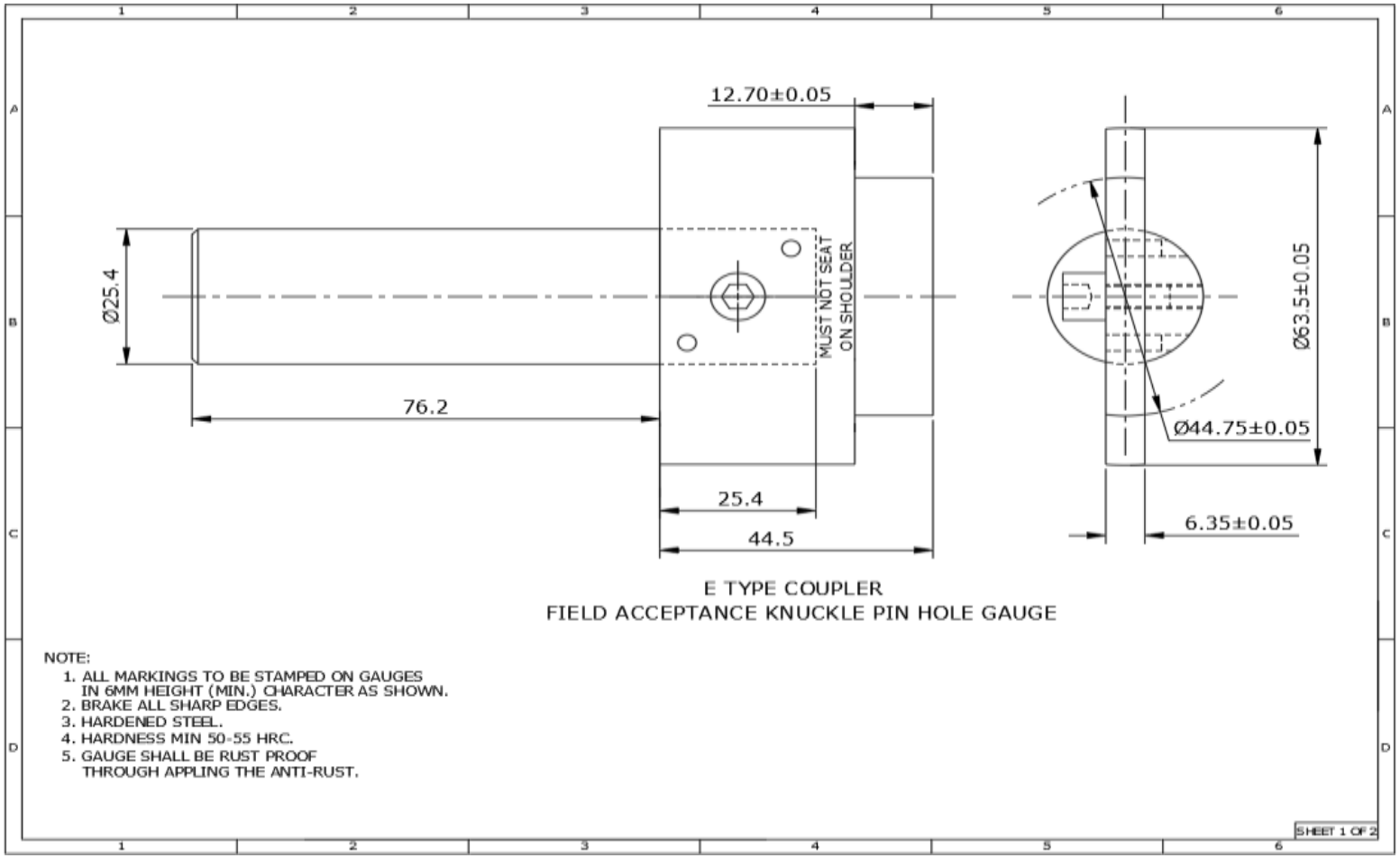


Fig. 02 (For Detail X & Y)

APPLICATIONS OF GAUGES

Drawing of Knuckle pin hole wear limits gauge (AAR Gauge no. 49364-B)



APPLICATIONS OF GAUGES

Drawing of Knuckle pin hole wear limits Gauge (AAR Gauge no. 49364-B)

Gauge should be used in either longitudinal or transverse direction.

Gauge application

OTHER ISSUES REGARDING KNUCKLE WARRANTY CASES

- Some of the Railways has reported warranty failures of CBC Knuckles on account of surface defects and Magnetic Particle Testing. Maintenance practices, gauging etc. have been reviewed by RDSO.

- **Surface defects examination** is not the scope of routine maintenance. Whenever, it is required , refer the RDSO specification No. WD-70-BD-10 (Rev4) which described the minimum acceptable surface conditions for the defects described below shall govern.

- Acceptable surfaces shall be defined utilizing Steel Castings Research and Trade Association (SCRATA) Comparators for the Definition of Surface Quality of Steel Castings (1981). The listed defect classification does not apply to inaccessible areas. Surface defects described herein do not preclude the requirements of proper gauge application as defined elsewhere in specification.

ACCEPTANCE LEVEL

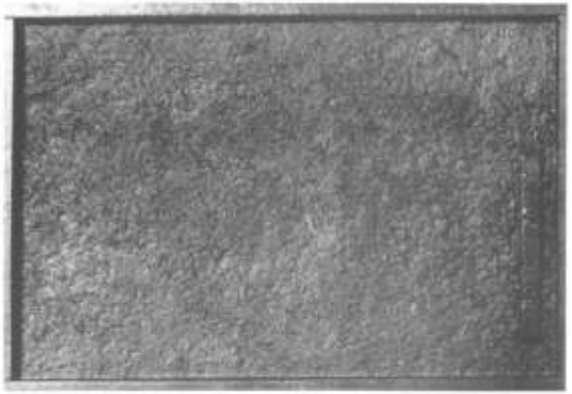
- Surface conditions evaluated with SCRATA comparators

		CRITICAL AREA	NON-CRITICAL AREA
A	SURFACE ROUGHNESS	A3	A3
B	SURFACE INCLUSION	B2	B4
C	GAS POROSITY	C2	C3
D	LAPS	D1	D4
E	SCABS	E2	E2
F	CHAPLETS	F2	F4
G	THERMAL DRESSING	G2	G3
H	MECHANICAL DRESSING	H3	H4
J	WELDS	J2	J3

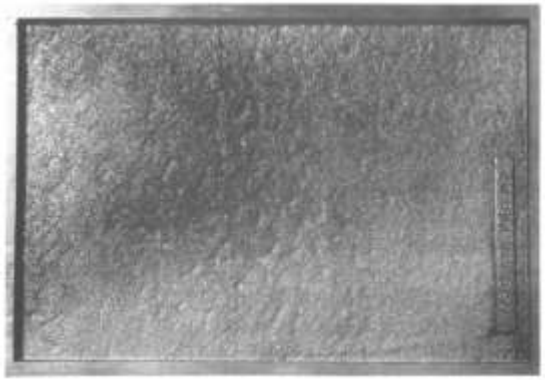
SURFACE ROUGHNESS

- This is denoted as ‘A’.

A1



A3



A2

A4

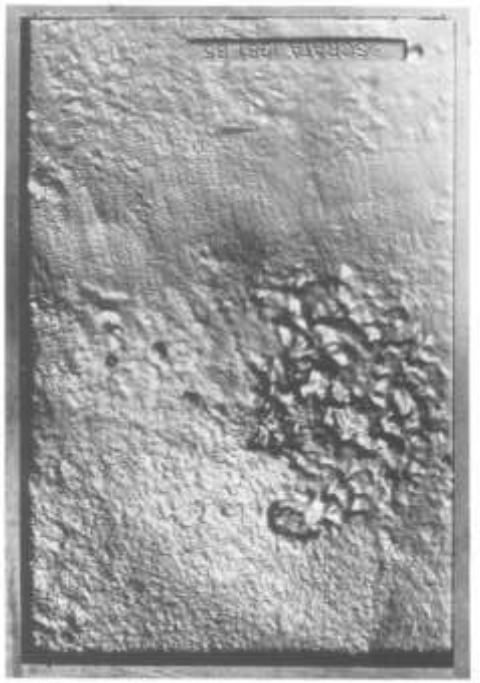
A5

SURFACE INCLUSION

- This is denoted as ‘B’

B1

B2



B5

B3

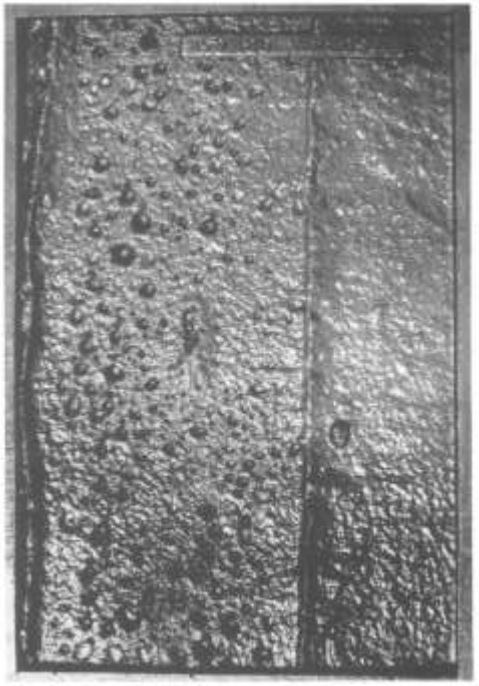
B4

GAS POROSITY

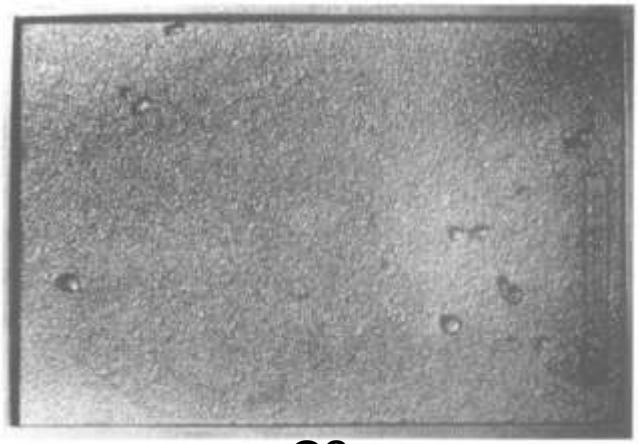
- This is denoted as ‘C’

C1

C2



C5



C3

C4

LAPS

- This is denoted as ‘D’

D1

D2

D5

D3

D4

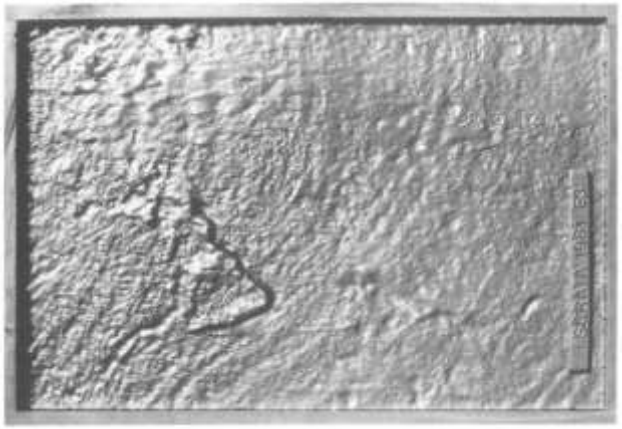
SCABS

- This is denoted as ‘E’

E1

E2

E5

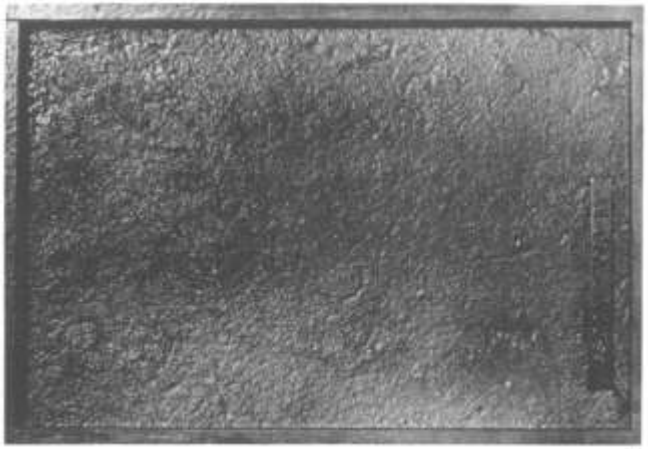


E3

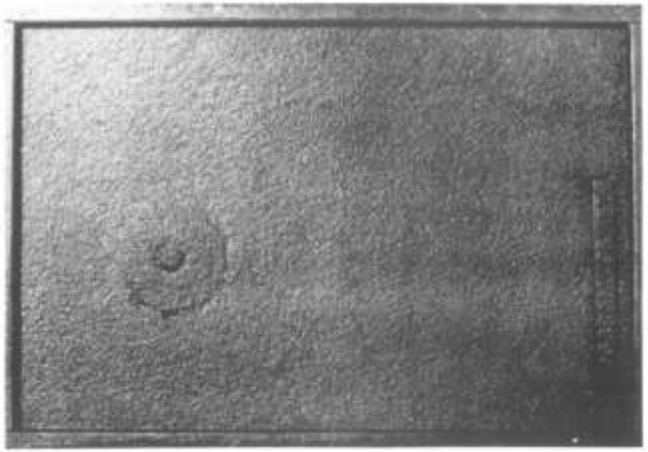
E4

CHAPLETS

- This is denoted as ‘F’



F1



F2

F5

F3

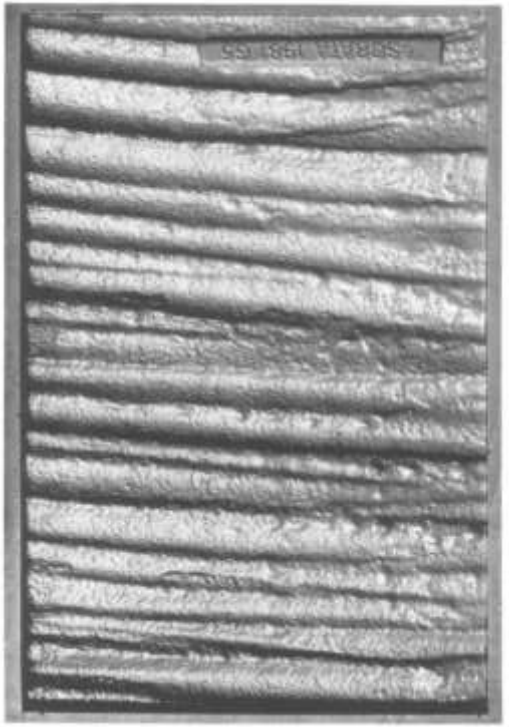
F4

THERMAL DRESSING

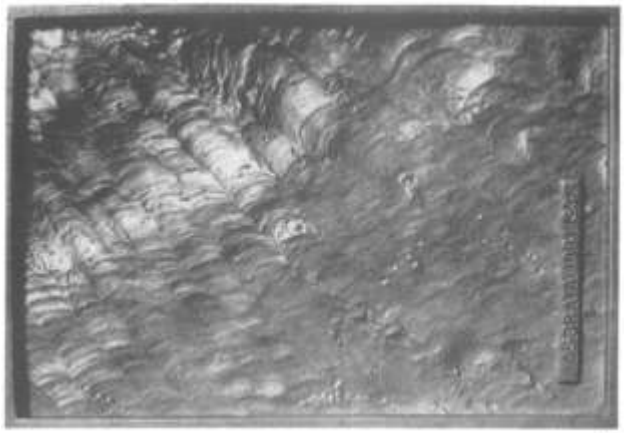
- This is denoted as ‘G’

G1

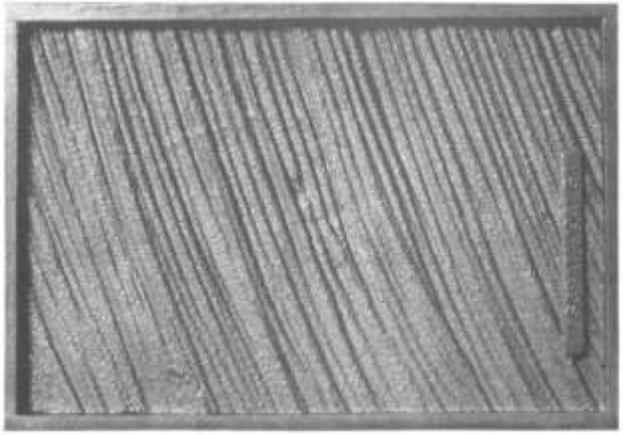
G2



G5



G3



G4

MECHANICAL DRESSING

- This is denoted as ‘H’

H1

H2

H5

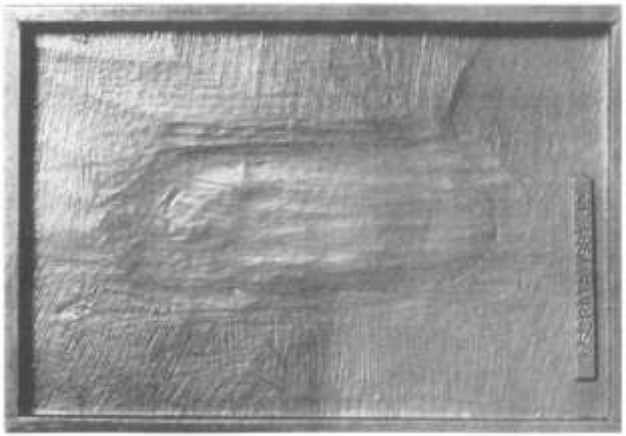
H3

H4

WELDS

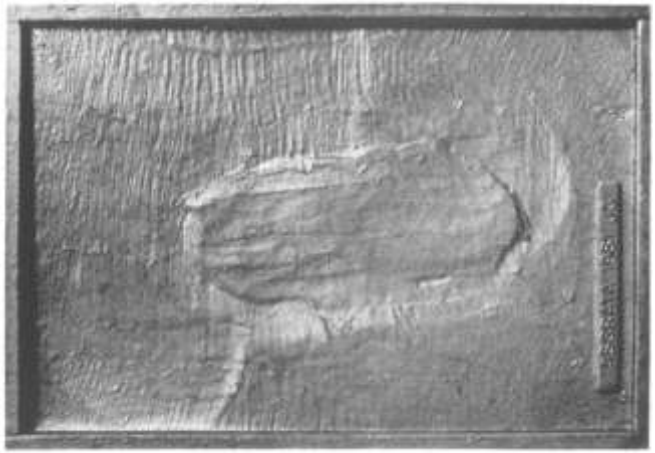
- This is denoted as ‘J’

J1

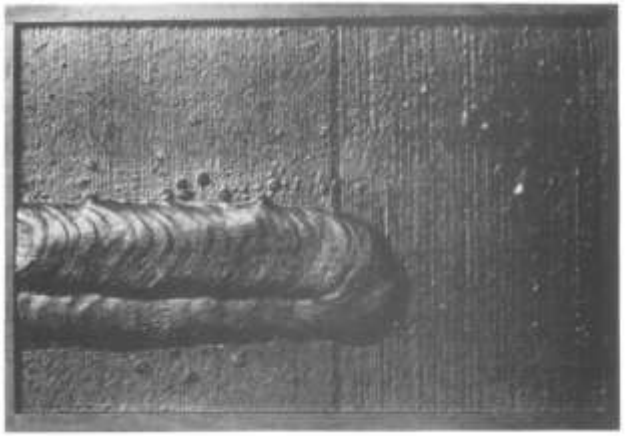


J2

J5



J3

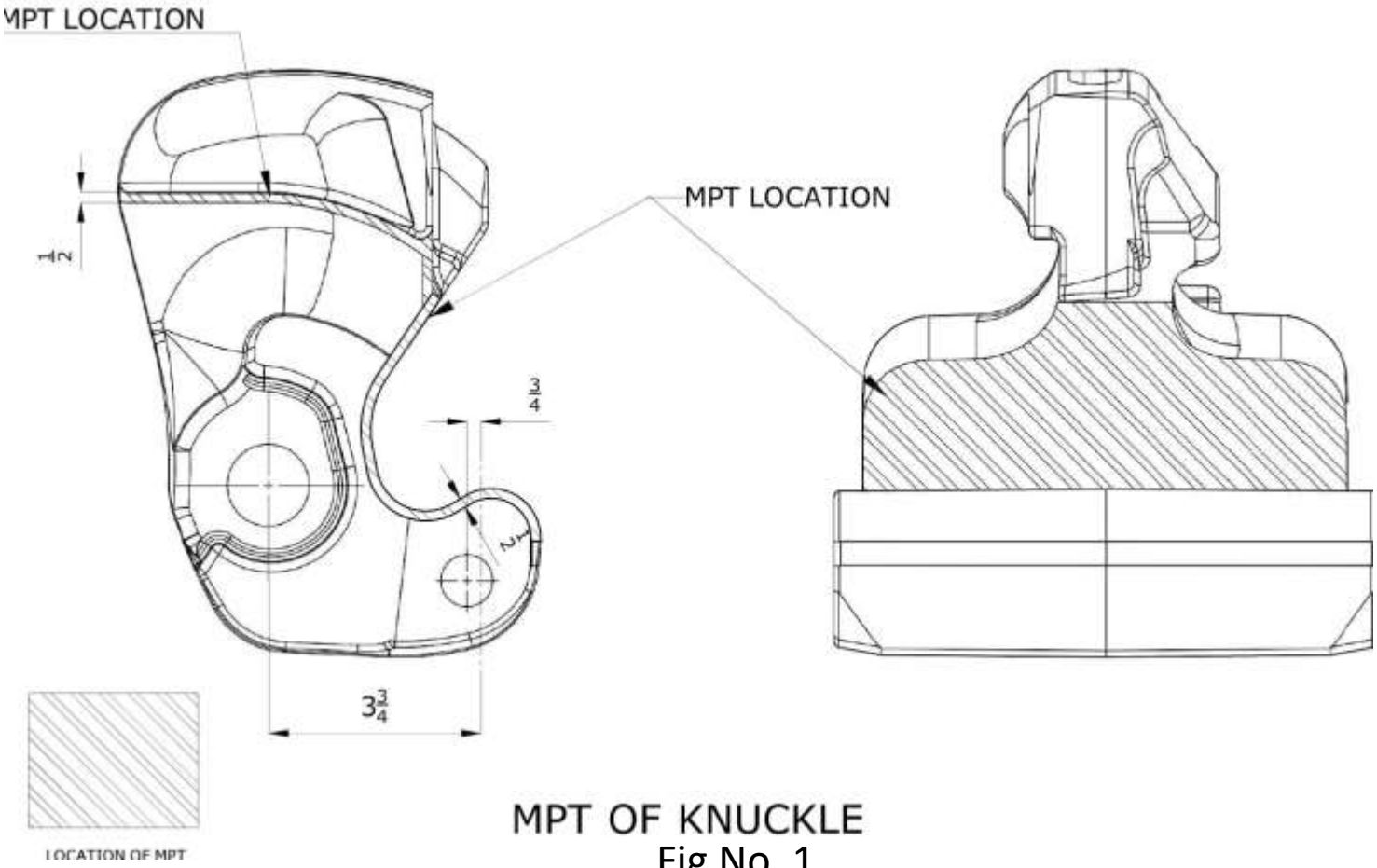


J4

MAGNETIC PARTICLE TEST

- Railway Board has accepted report of the committee constituted for review of must change items of CBC and its components during ROH and POH of wagons vide letter no. Railway Board Letter No. 2018/M/(N)/171/1 (E-3323008), dated 22.10.2024.
- Accepted recommendations of the Committee also includes MPT (Magnetic Particle Testing) on Coupler body, Knuckle and Yoke at critical areas during POH of the wagons and MPT at critical areas of Knuckle during ROH of the wagons.
- In this regard, a Guideline for Magnetic particle testing and Inspection has been issued vide RDSO letter No. MW/CPL/BG/HT, dated 27.11.2024 for conducting MPT (Magnetic Particle Testing) on Coupler body, Knuckle and Yoke at critical areas.

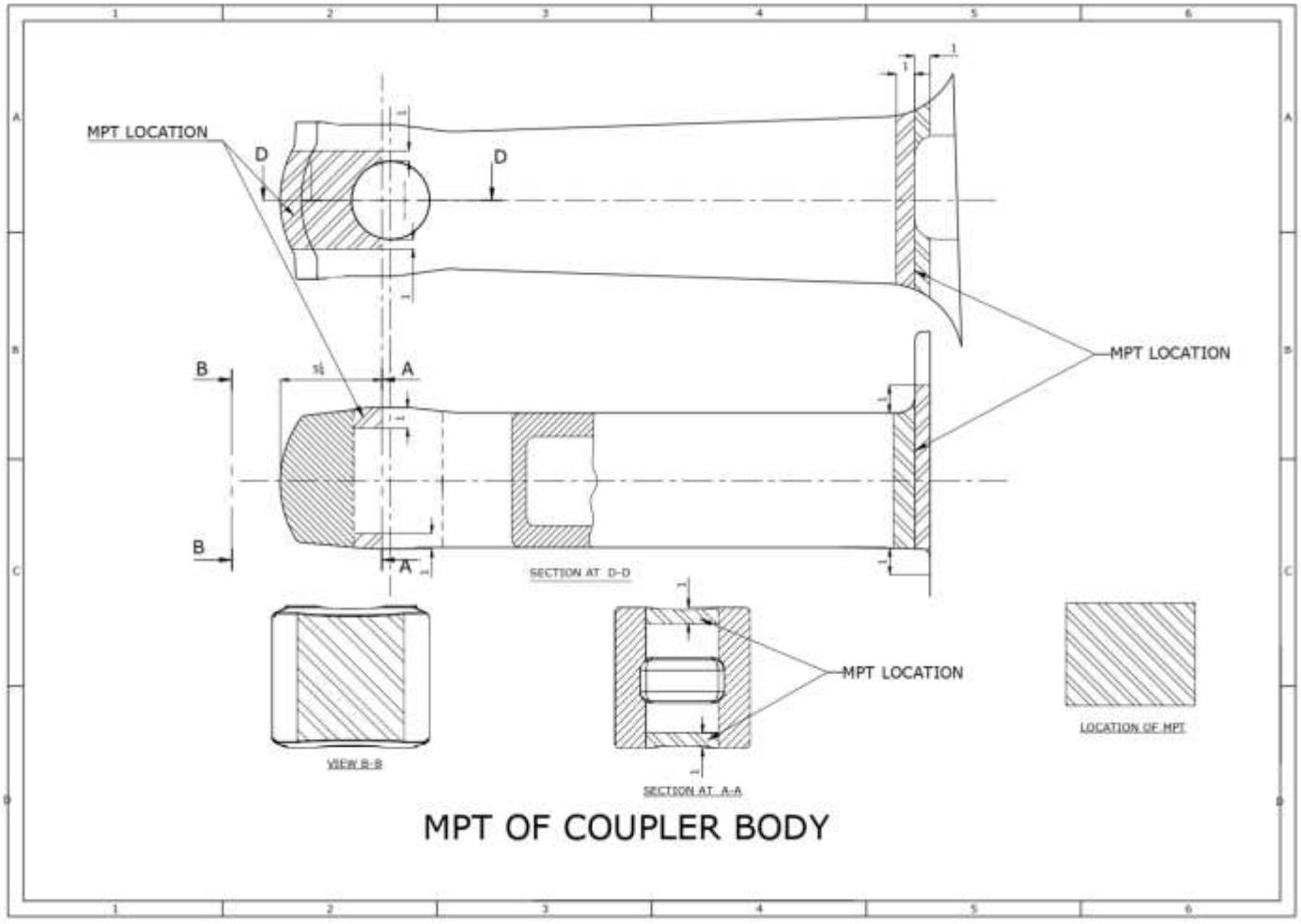
MPT Location For Knuckle



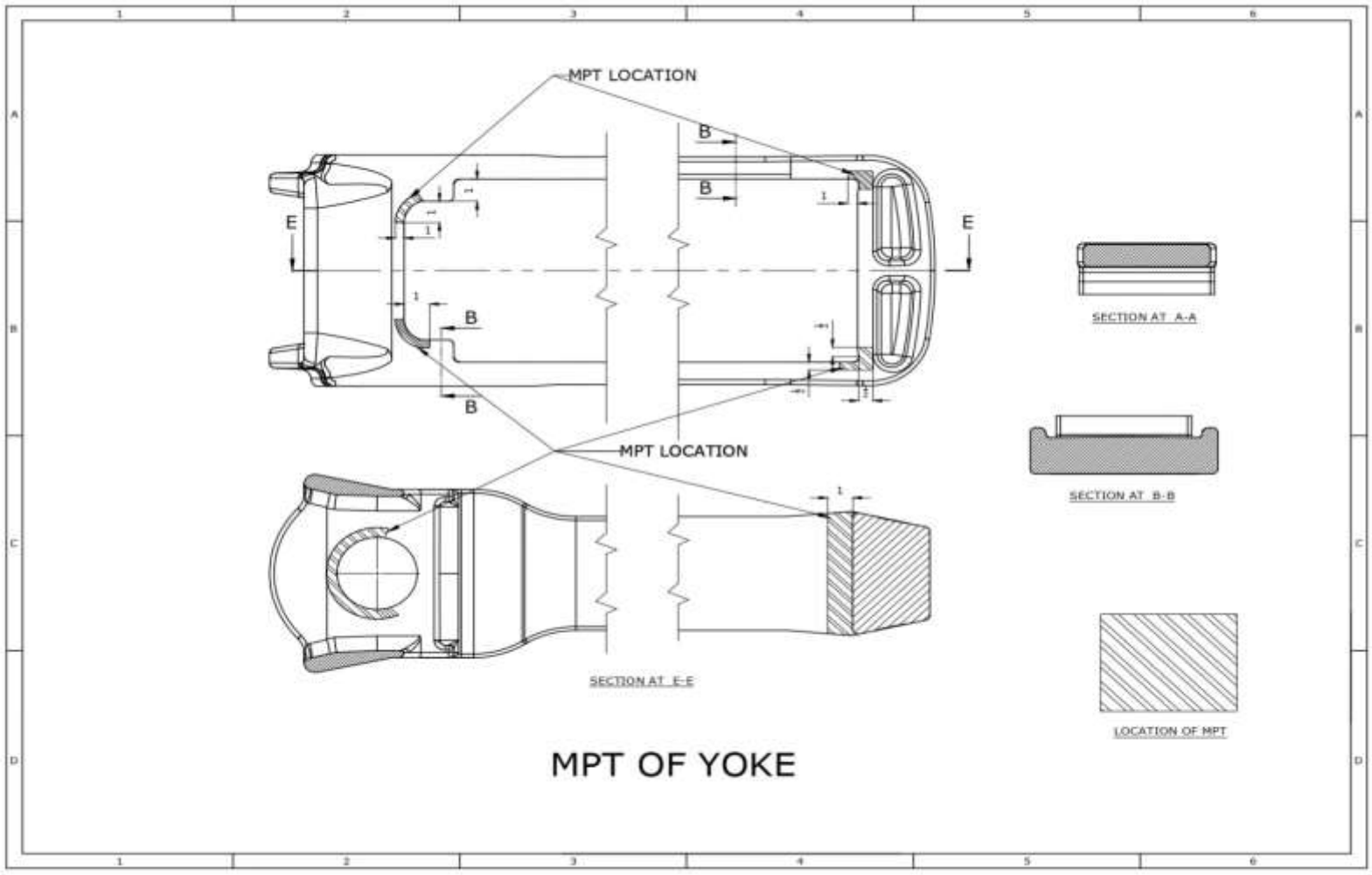
MPT OF KNUCKLE

Fig No. 1

MPT Location for Coupler Body



MPT Location for Yoke



MPT LOCATION FOR KNUCKLE

- Magnetic particle testing shall be done in both directions as vertical and horizontal position of knuckle.

Top Pulling Lug

Inner Profile of Knuckle

Bottom Pulling Lug

MPT Location Photographs for Coupler Body

MPT location Photographs for Yoke






THANK YOU