Webinar on Centre Buffer Coupler (Freight)

Functions

- Inter connection of rolling stock
- Transmits both draft & buffing load between vehicles and to/from under-frame
- Shock absorbing

Advantages of CBC

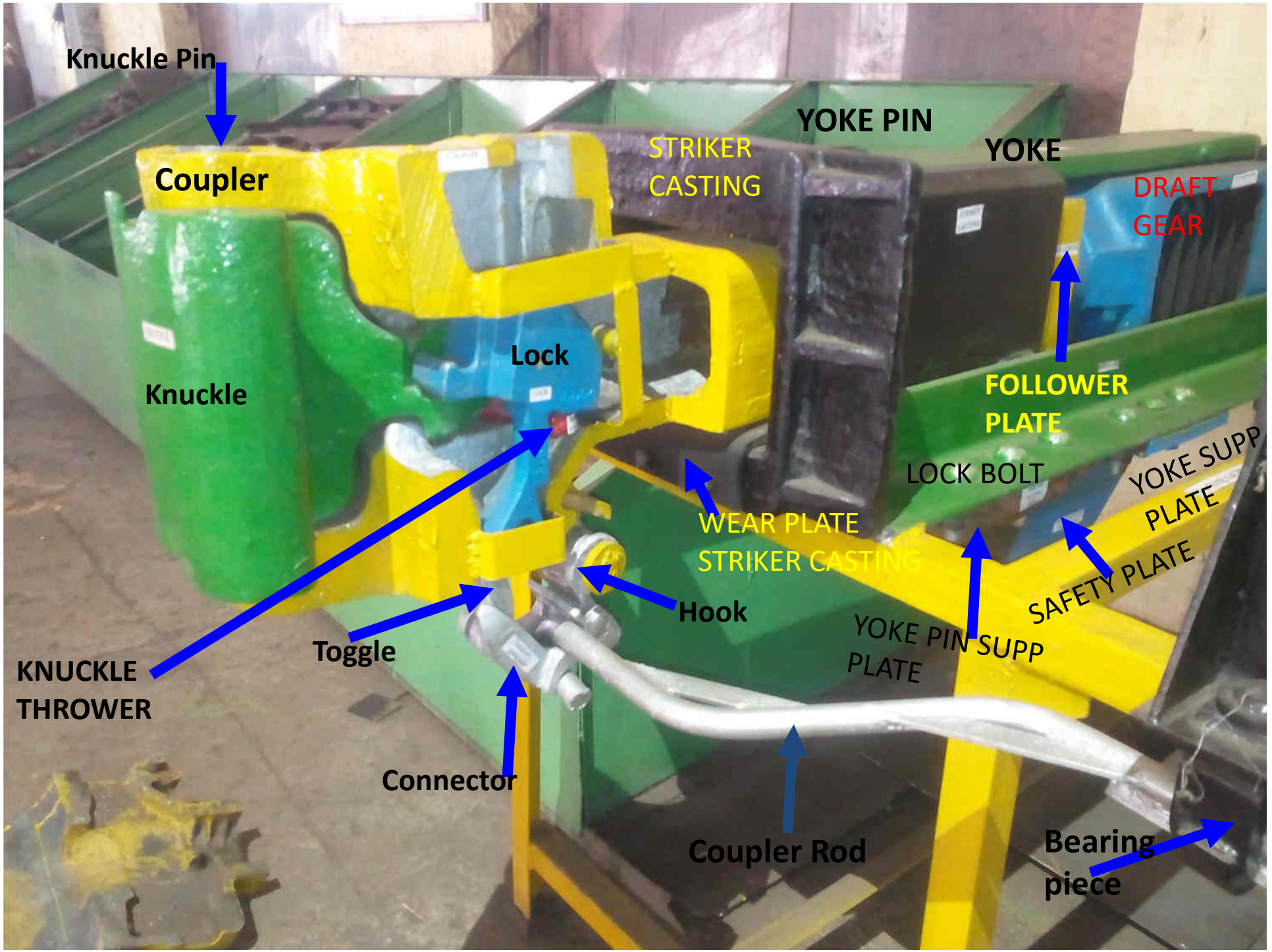
- Safe for shunting staff & reduces time required.
  - –Automatic coupling type
  - –Quick detachment possible
- Less staff for uncoupling.
- Prevention of un- coupling in the event of derailment/ accident.

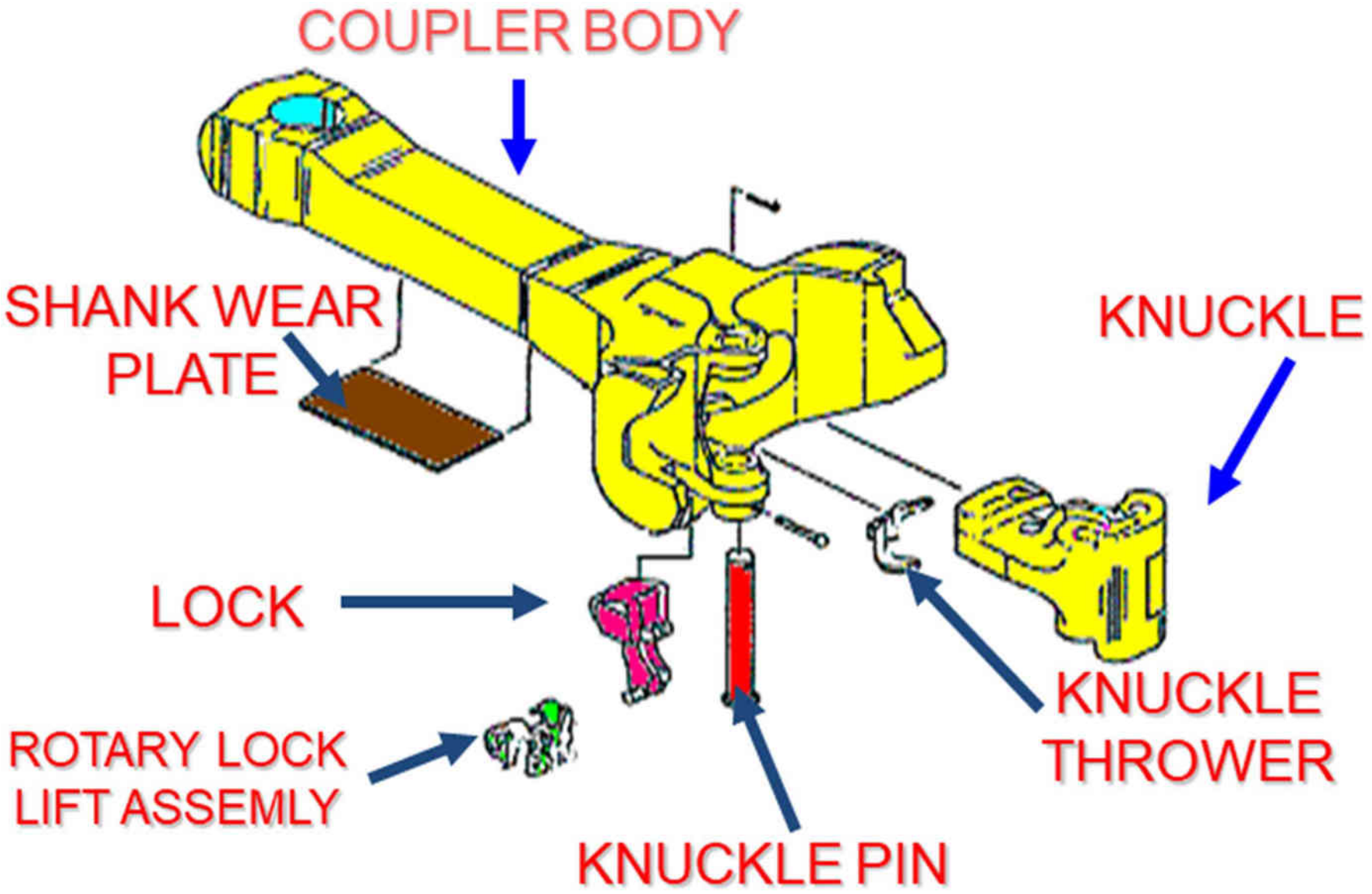
CBC Used In Freight Stock

- AAR E/F type used in wagon.
- HT Draft Gears are used- MK-50 & RF-361.
- Draft gear fitted with yoke.

Main Components of CBC

- Coupler body, Knuckle, Lock.
- Knuckle thrower.
- Lock lifter assembly.
- Yoke, Yoke pin, Yoke pin support.
- Striker casting
- Draft Gear.
- Operating handle

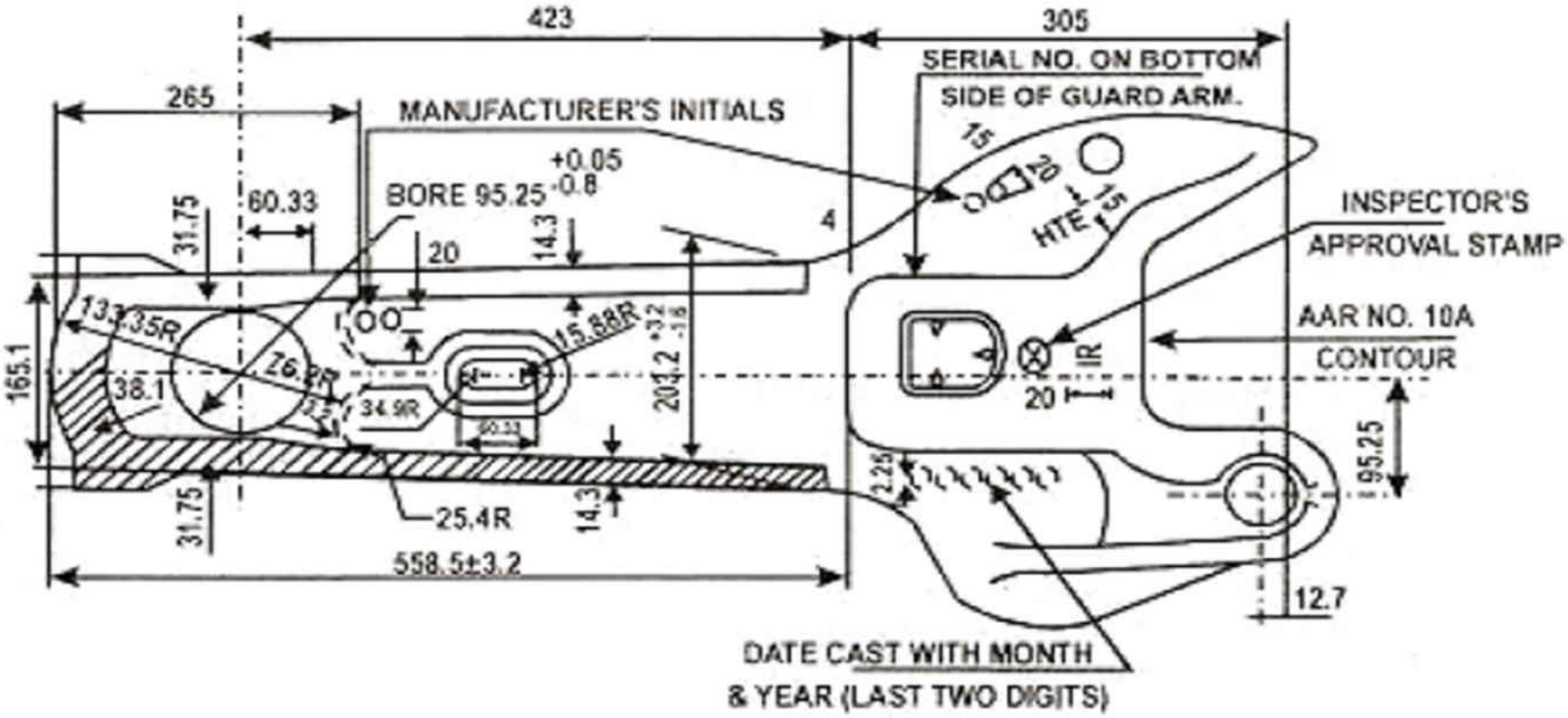

Knuckle Pin
Coupler
STRIKER CASTING
YOKE PIN
YOKE
DRAFT GEAR
Lock
Knuckle
FOLLOWER PLATE
LOCK BOLT
YOKE SUPP PLATE
WEAR PLATE
STRIKER CASTING
SAFETY PLATE
Hook
YOKE PIN SUPP PLATE
KNUCKLE THROWER
Toggle
Connector
Coupler Rod
Bearing piece


COUPLER BODY
SHANK WEAR PLATE
KNUCKLE
LOCK
KNUCKLE THROWER
ROTARY LOCK LIFT ASSEMLY
KNUCKLE PIN

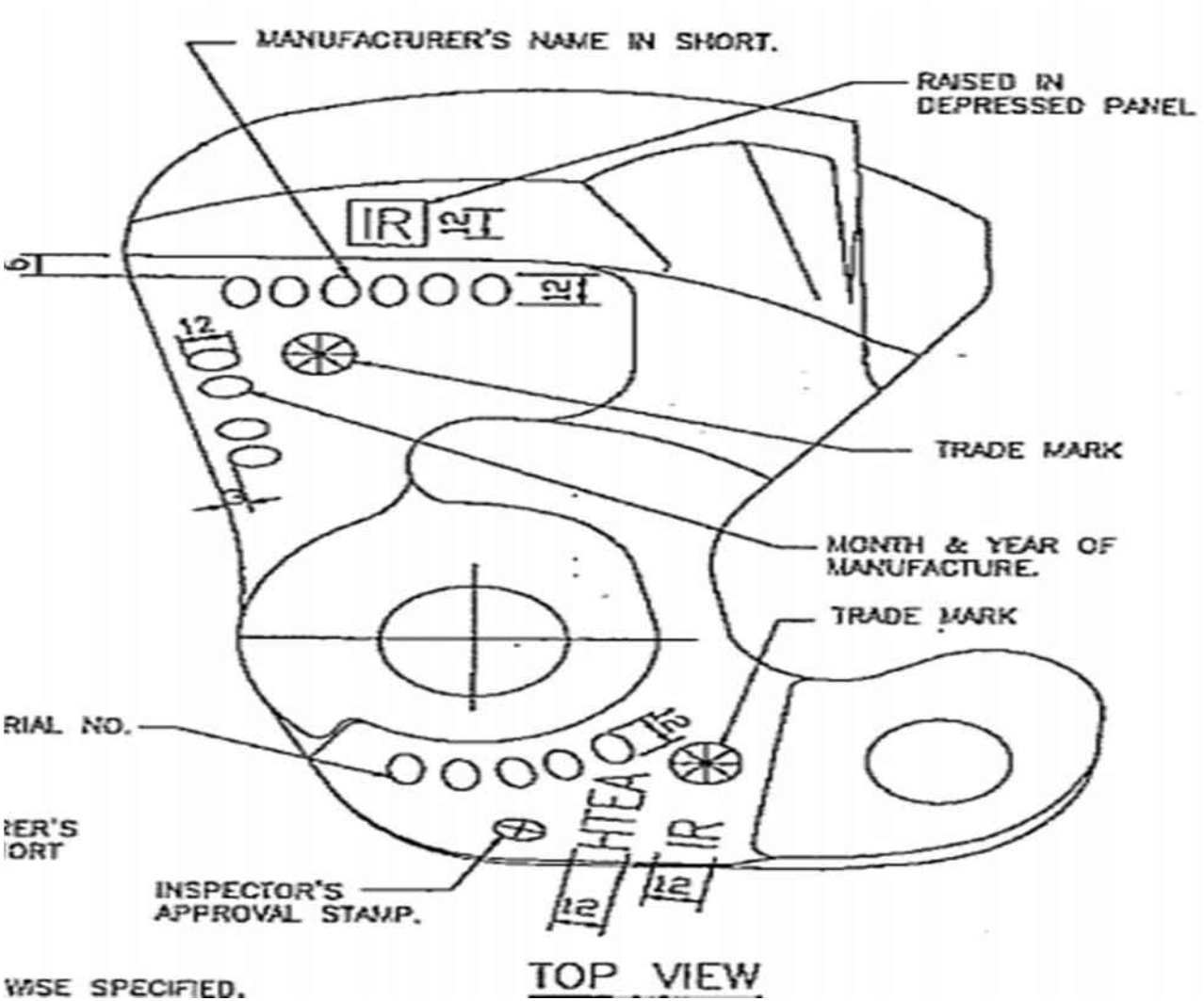
RDSO Guidelines For Markings On CBC Components - Strict Implementation

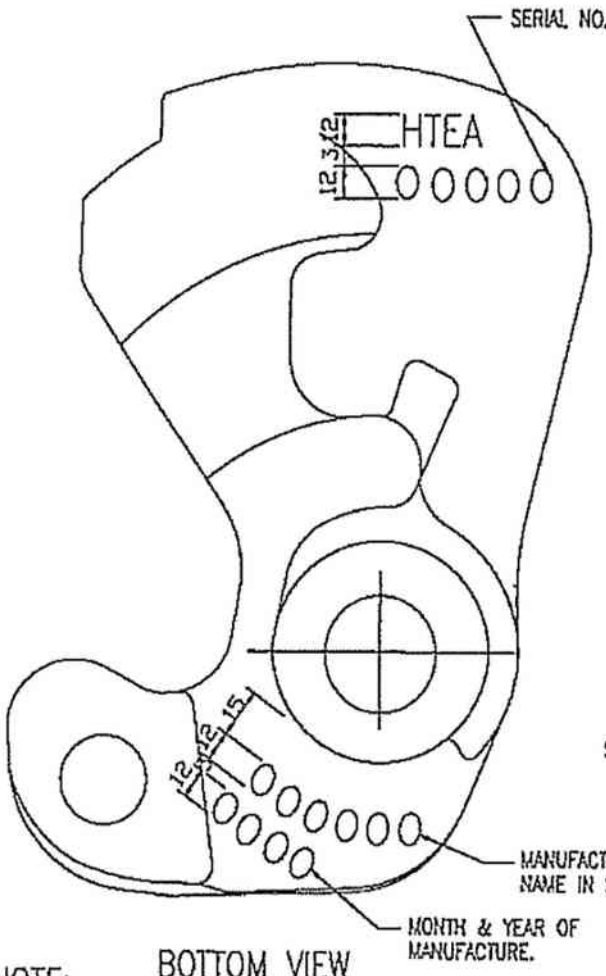
- Must have prescribed markings (Raised/Depressed)
- As per latest drawings
- Manufacturer's code, date, Serial no. etc as specified- clearly visible
- All markings are Raised unless otherwise specified
- Reject if non-availability of markings (w.e.f 01/03/18) and report to RDSO
- Marking on CBC components 6.3.18.pdf
- Latest drawing. SK-62724 alt 28.PDF

Coupler Body

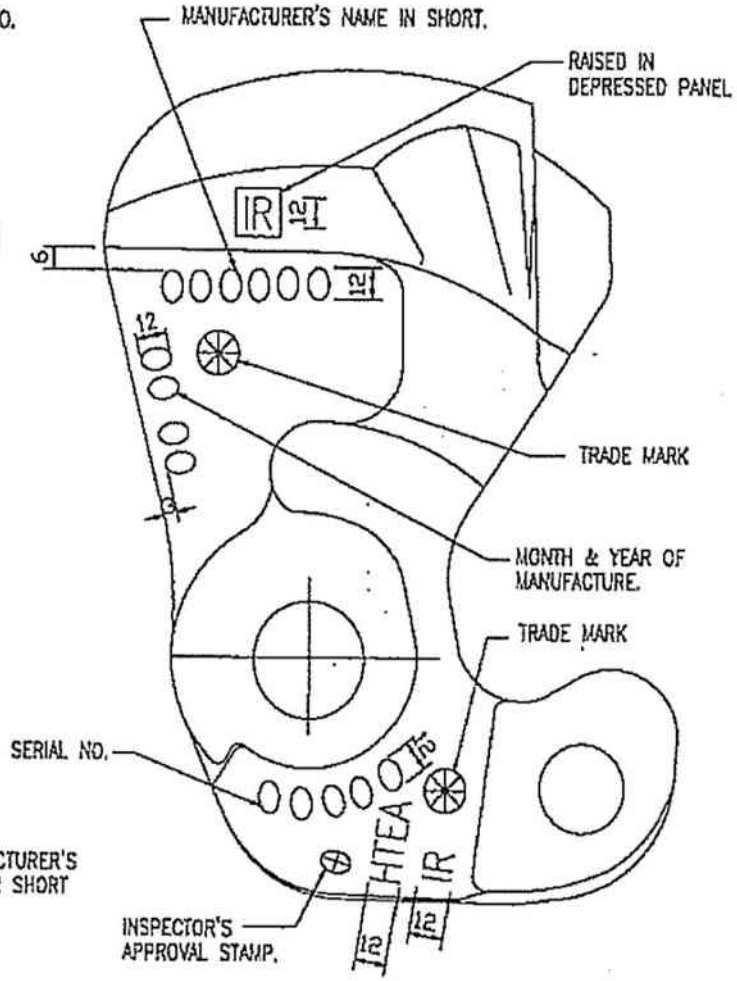


KNUCKLE


MANUFACTURER'S NAME IN SHORT.
RAISED IN DEPRESSED PANEL
TRADE MARK
MONTH & YEAR OF MANUFACTURE.
TRADE MARK
INSPECTOR'S APPROVAL STAMP.
TOP VIEW



BOTTOM VIEW



TOP VIEW

S.NO.	MANUFACTURER'S NAME	IN SHORT
1	BURN STANDARD COMPANY LTD.	BS
2	BESCO LTD.	BESCO
3	BHILAI ENGINEERING CORPORATION LTD.	BECO
4	HINDUSTAN ENGINEERING INDUSTRIES.	HEI
5	ORIENT STEEL INDUSTRIES LTD.	OSIL
6	TITAGARH INDUSTRIES LTD.	TITA
7	TEXMACO LTD.	TEX
8	DATRE CORPORATION LTD.	DATRE
9	RANEKA INDUSTRIES LTD.	RIL
10	BRAITHWAITE & CO. LTD.	BWT
11	FRONTIER ALLOY STEEL LTD.	FAS
12	TITAGARH WAGON LTD.	TWL
13	JUPITER ALLOYS & STEEL (INDIA) LTD	JASIL
14	SIENA ENGINEERING PVT. LTD.	SN
15	RINE ENGINEERING PVT. LTD.	RN
16	ATUL ENGINEERING UDYOG.	ATUL
17	AD ELECTRO STEEL CO. PVT. LTD.	ADE

NOTE:-

1. ALL MARKING LETTERS SHALL BE 2 MM RAISED, UNLESS OTHERWISE SPECIFIED.
2. ALL INDICATED MARKING SIZES ARE MINIMUM.
3. WHEN ANY OF THE MARKING ARE ILLEGIBLE MANUFACTURER MUST APPLY ELECTRIC ARC WELDING FOR DISTINCT MARKINGS AS SPECIFIED.
4. LOCATION OF MARKINGS MAY BE VARIED WITHIN INDICATED AREAS TO SUIT MANUFACTURERS PRACTICE.

SUPERSEDED BY			
SUPERSEDES		DATE	
SCALE	PASSED		
	CHKD.		
	DRAWN	G.HUSAIN	7/98
	TRACED		
	U.SHEET		

C.B.C: FOR BOGIE-WAGONS

MARKINGS ON KNUCKLE

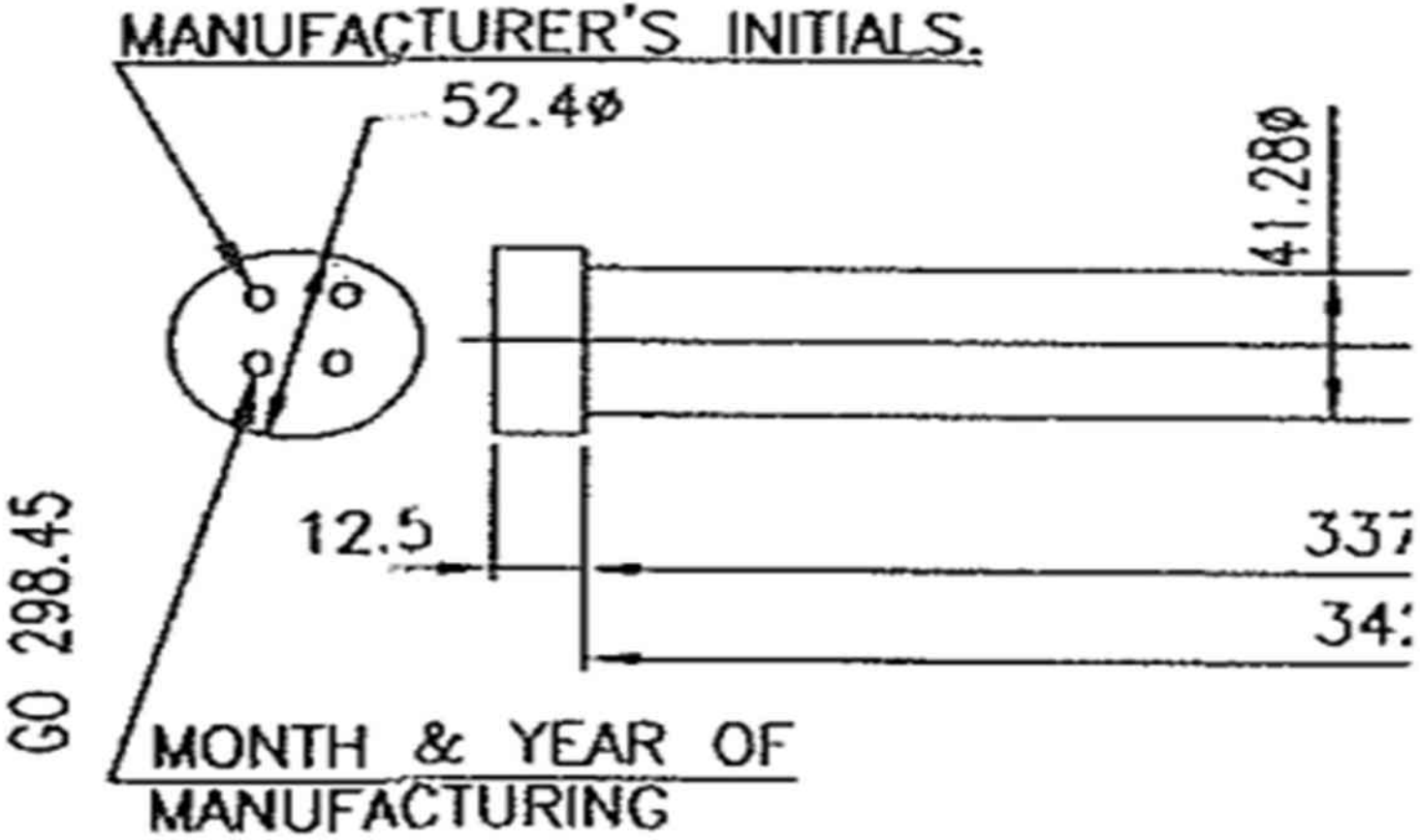
A3

ALT.	ITEM	AUTHORITY	DESCRIPTION	DATE	ASSLY. DRG.
⑧	-	WD-07051	REVISED	08/07	

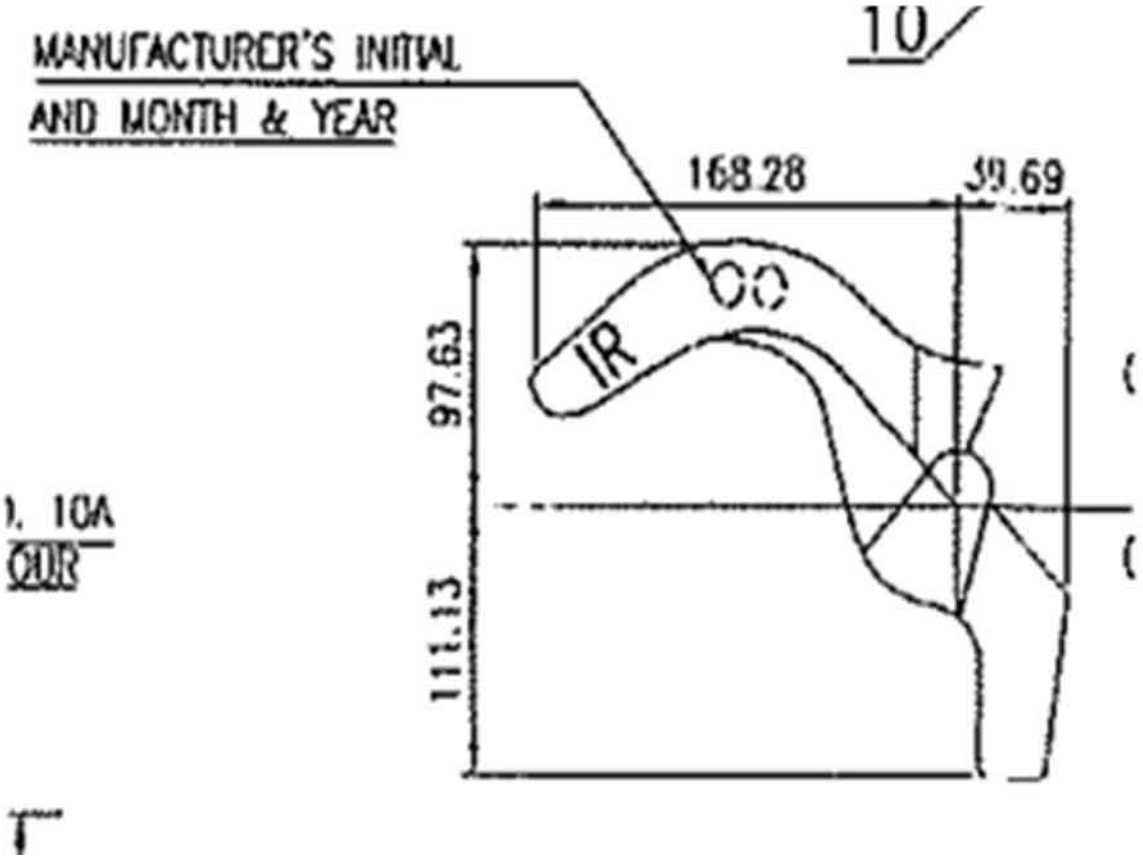
B.G. | RDSO [W] | GROUP | WD-87004-S-1


JM&S

KNUCKLE PIN

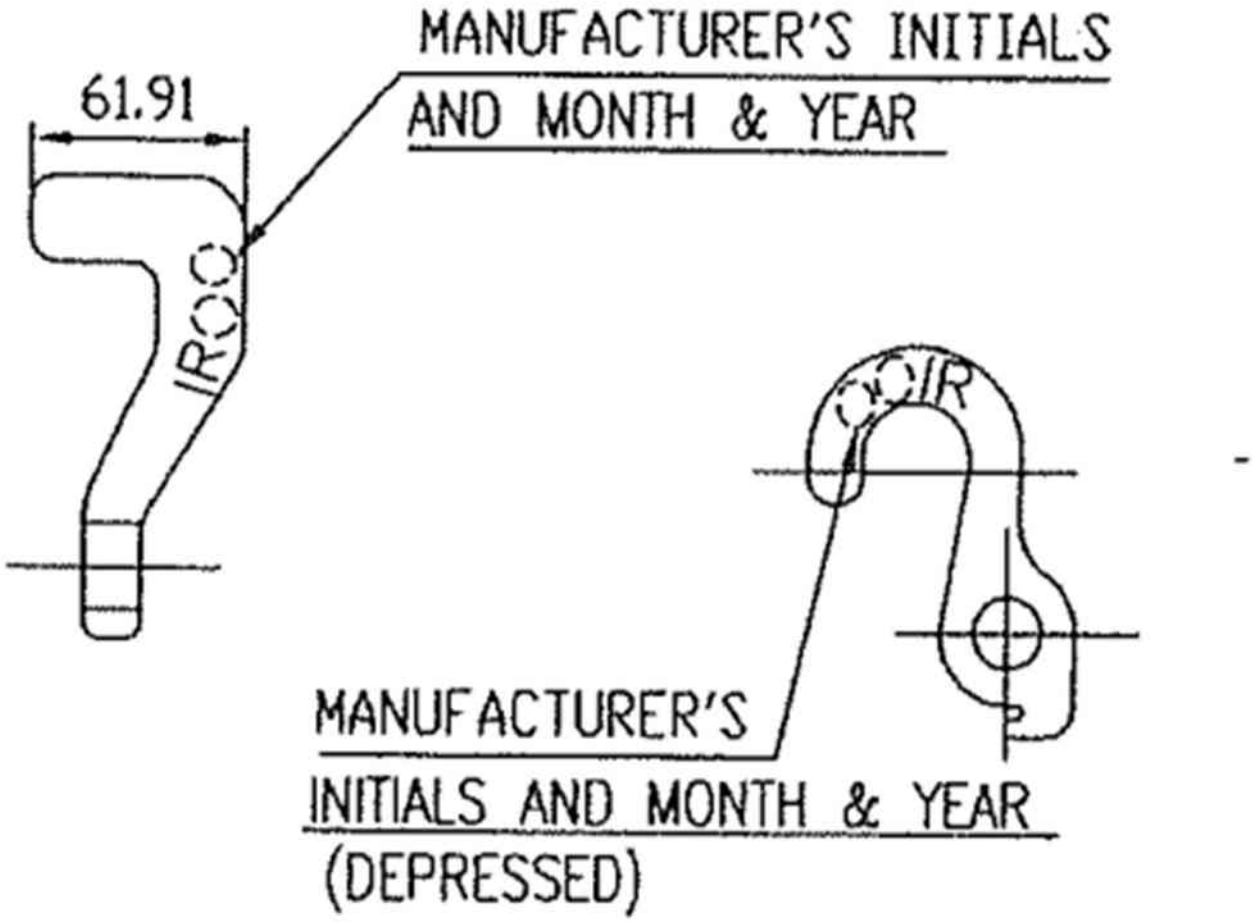

MANUFACTURER'S INITIALS.
52.4ø
41.28ø
GO 298.45
12.5
337
34:
MONTH & YEAR OF
MANUFACTURING

KNUCKLE THROWER

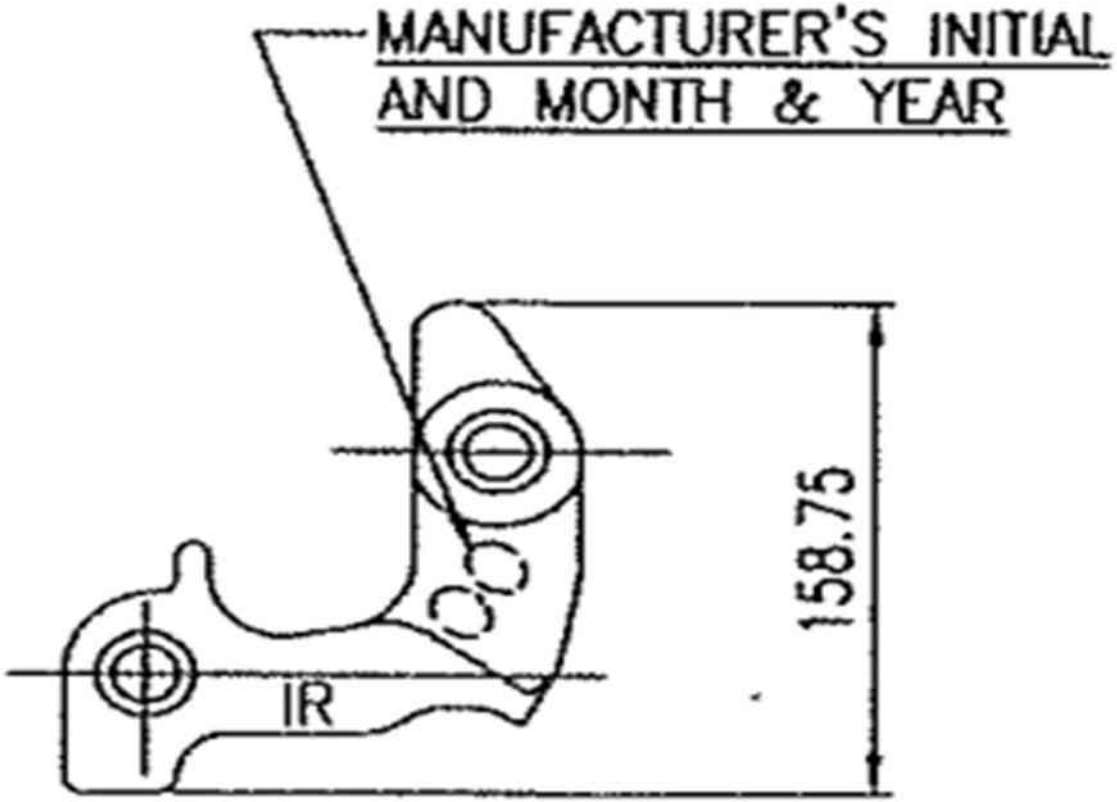



IRSN
UHT
10/18

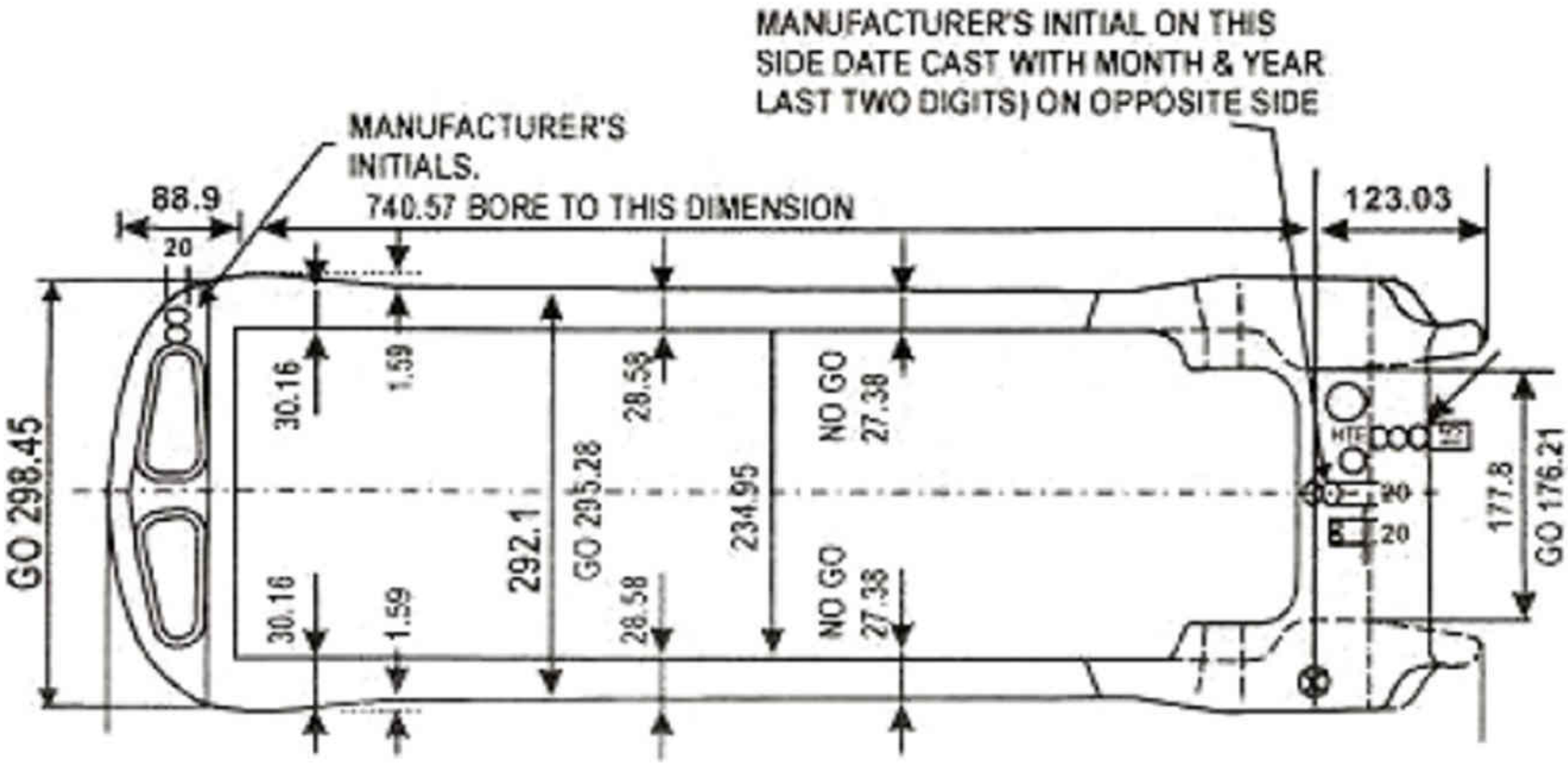
LOCK AND HOOK



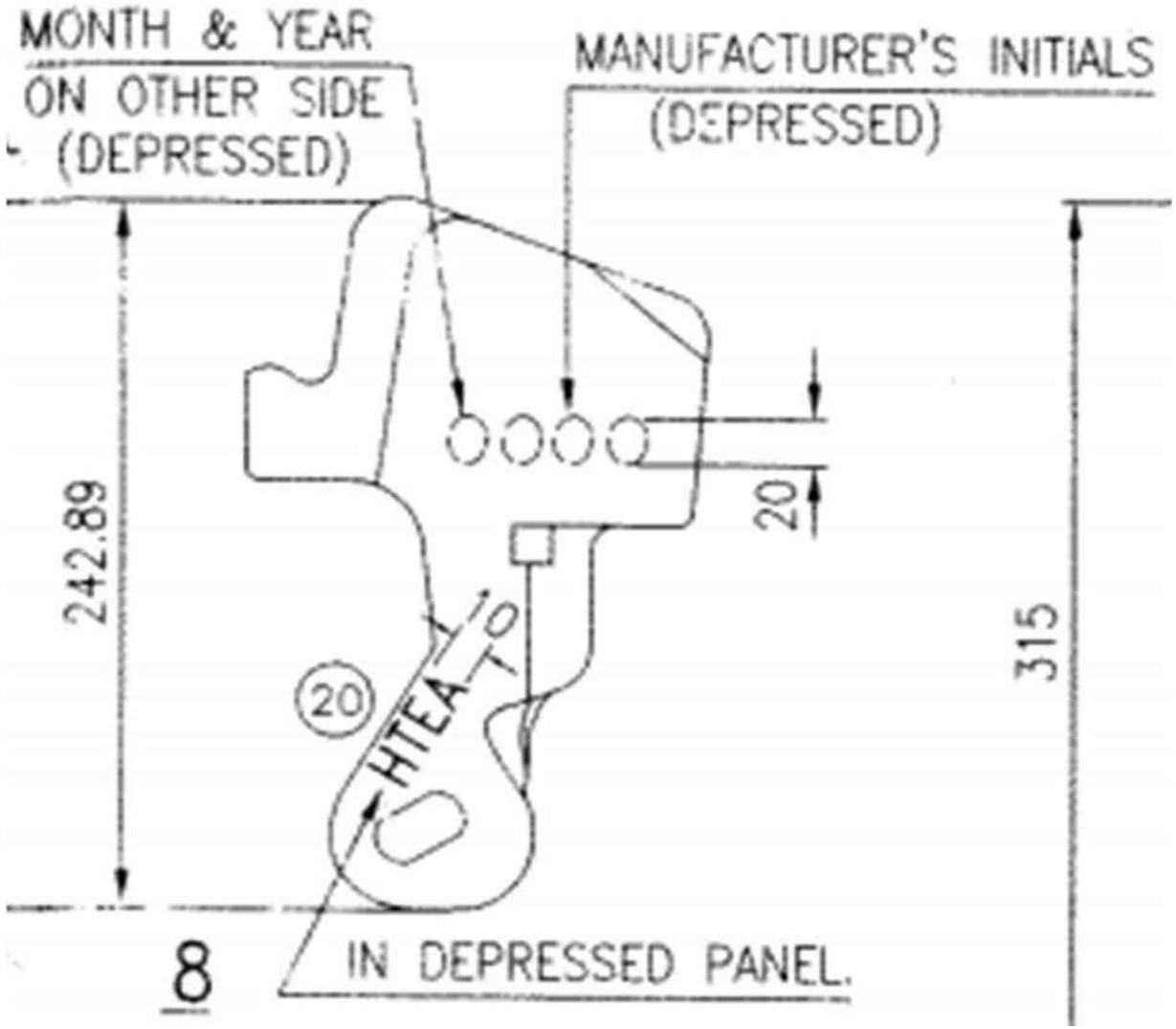
CONNECTOR



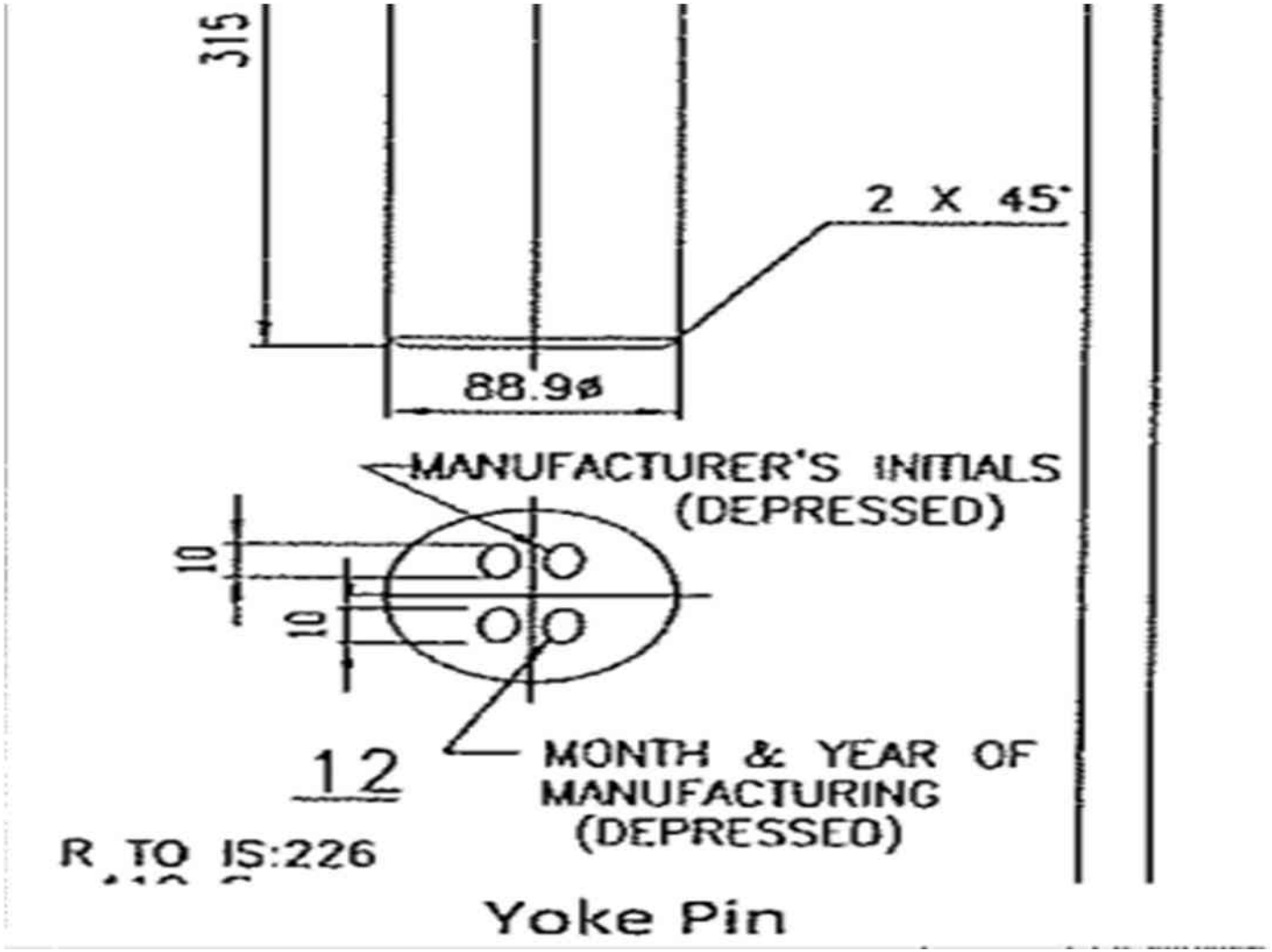
YOKE


MANUFACTURER'S INITIAL ON THIS SIDE DATE CAST WITH MONTH & YEAR LAST TWO DIGITS) ON OPPOSITE SIDE
MANUFACTURER'S INITIALS.
740.57 BORE TO THIS DIMENSION
88.9
20
123.03
GO 298.45
30.16
1.59
28.58
NO GO
27.38
292.1
GO 295.28
234.95
30.16
1.59
28.58
NO GO
27.33
177.8
GO 176.21
20
20

CBC LOCK


MONTH & YEAR
ON OTHER SIDE
(DEPRESSED)
MANUFACTURER'S INITIALS
(DEPRESSED)
242.89
20
315
20
HITEA TO
8
IN DEPRESSED PANEL.

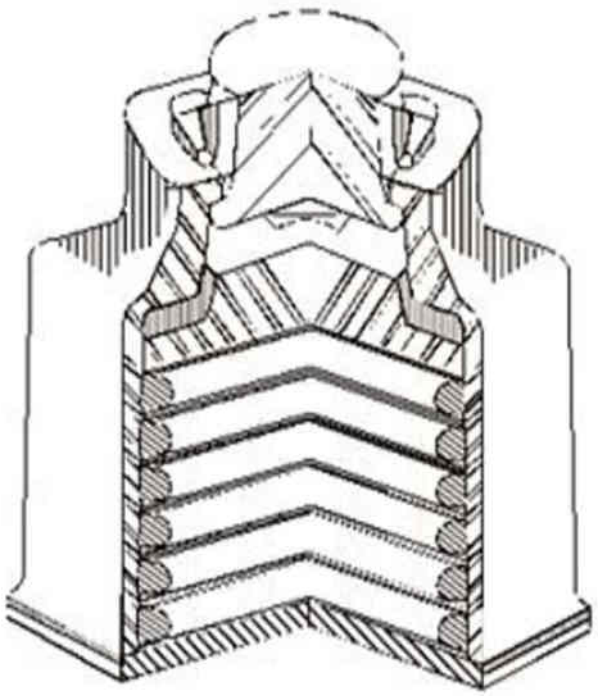
YOKE PIN



Yoke Pin

DRAFT GEAR

- MOST COMMONLY USED DRAFT GEAR OF CBC ARE:



- MK-50
- RF-361

Knuckle

- Fitted with coupler head.
- Used to couple two coupler heads of two wagons.
- NO repair work.
- Always replace by NEW one.
- Weakest link
- DPT during ROH

Lock

- Fitted with coupler head

- After assembly of two coaches, it locks the both coupler heads

Lock Lifter Assembly

- Fitted with coupler head
- Used to lift the lock during uncoupling
- Toggle, Lock lift lever connector, Lock lift, lever hook

Striker Casting

Defects Which Leads To Train Parting

- Lock not properly engaged
- Excessive wear on knuckle nose & Stretched knuckle
- Excessive play between anti–rotation lug and bearing piece slot
- Breakage of operating handle lever support bracket
- Uncoupling due to vertical slipping out of knuckle

Train Parting Analysis (NWR)

Component involved	2017-18	2018-19	2019-20
CBC body	2	-	1
Knuckle	6	5	1
Yoke	1	-	-
Uncoupling	1	1	3
Operating Handle	-	1	-
Head Stock work out	-	1	-
Total	**10**	**8**	**5**

A report on analysis of train parting by Railway Board highlighted that approx. 62% cases of train parting were due to uncoupling and approx. 38% due to breakages of components.

Manuals to be used

- Wagon maintenance manual
- G-80, for workshop
- G-76, for open line staff

Coupler Examination In Yard (G 76)

- Operating rod- not bent and set in bearing piece Operating handle, Bearing Piece slot
- Coupler operating mechanism- must work properly
- Locking of coupler- lock should drop when the knuckle is closed
- Buffer height. (refer IRCA 2.13.1)

Empty	Loaded
Max- 1105 mm Min – 1090 mm	1030 mm

Items To Be Checked For Cracks/ Parts Broken Off/ Missing

- Coupler body
- Striker Casting
- Knuckle pin
- Yoke pin support

Items To Be Checked For Excessive Wear

- Knuckle
- Shank wear plate – limit 1 mm thick
- Striker casting wear plate – limit 2 mm thick

Examination During ROH

- Anti-creep Check
- CBC contour condition

CBC Contour Gauge no. 1

CBC Contour Gauge no. 2

- Knuckle stretch & nose wear-Knuckle Profile- Gauge 3
- Shank wear plate- Replace when worn >5 mm
- Striker casting wear plate- Must Change item
- Slack in draft gear- Max slack 25 mm
- Articulated locklift assembly
- Coupler operating mechanism
- DPT Test of knuckles during ROH

Limits Of Wear/Replacement Of CBC Components

S N	Description	Limits for Replacement
1	Knuckle nose wear limit gauge	9.5 mm max
2	Shank wear plate (when new 6 mm thick)	1 mm
3	Knuckle Pin	38 mm
4	Clevis Pin	36 mm
5	Striker casting wear plate	2 mm

Examination During POH

- G 80 to be followed
- Dismantle all parts except locklift assembly
- Part must be clean i.e. free from dirt, rust, paint
- Part must be visually inspected for cracks, fractures, sections broken out, worn surfaces, distortion

Must Change Items (IRCA III)

- **During ROH**
  - Striker casting wear plate
- **During POH**
  - Knuckle
  - CBC lock
  - Rotary Lock lift assembly
  - Bearing Piece
  - Yoke Pin support plate liner
  - Shank wear plate.
  - Striker casting wear plate

Things To Remember While Inspection, Maintenance & Operation

- When operated, it opens knuckle fully.
- Lock drops freely while knuckle is slowly closed
- Only dry lubricant shall be used
- Ensure proper coupling any position
- Check correct operation
  - full knuckle throw,
  - lock set
  - anti-creep
  - locking is obtained
- Shank should not be bent out of alignment with the head.
- Variation between the CBC heights of adjacent wagons should be within the permissible limit **of 75 mm**

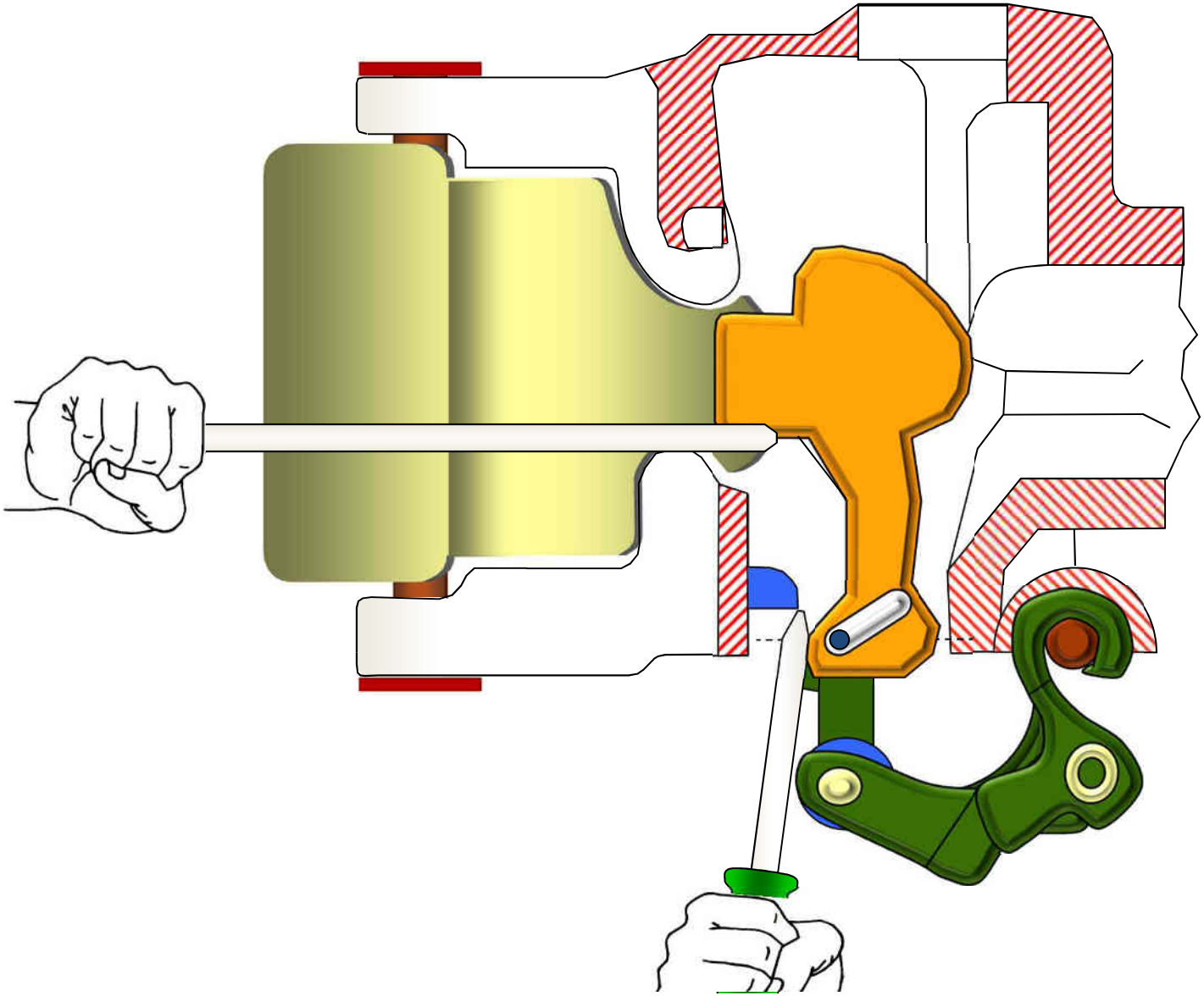
Instructions By Railway Board For Strict Implementation

- Procure as per latest drawings
- Specifications must indicate the latest STR/Drawing with alteration no
- Only RDSO inspection allowed for procurement
- NTXR rejections on marking details, w.e.f. 01/03/18

Instructions By Railway Board For Strict Implementation

- Zonal Railways can not procure any new CBC parts of WD-48-BD-08
- WD-48-BD-08 specification was withdrawn in May 2008. All such CBC components are to be withdrawn
- Use hydraulic tool for dropping Draft gear

Anti-creep Check



- Close the knuckle.
- Insert a bar between the lock and the knuckle tail shelf and lift the lock upwards and at the same time push the lug rearward by inserting a screw driver between the coupler body and the front of the lock hole.
- If the lock can be raised enough to permit the opening of the knuckle, the anti-creep mechanism is defective
- Replace the lock lift assembly. (Toggle, Lock lift lever and Lock lift lever hook)
- Check again
- Even after replacing the above, if the lock can be raised, the Anti-creep mechanism is found defective due to excessive wear on the lug of the coupler body
- In such a case, replace the coupler body.

Coupler Body

Location of Crack in Coupler

Bearing Piece Slot

Standard slot width

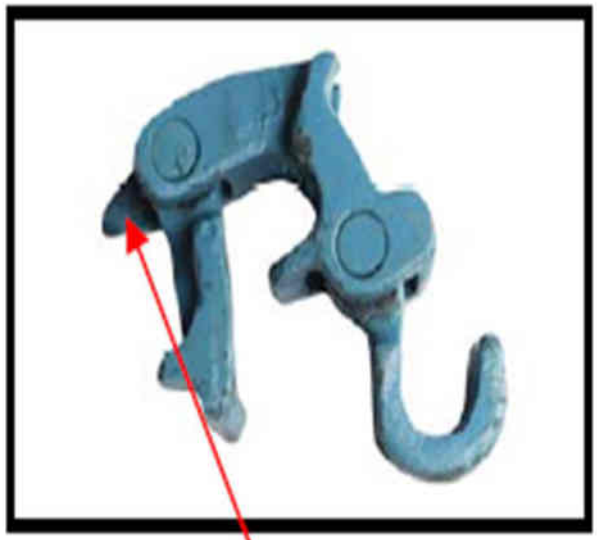
Standard width
17.5 mm

Worn out slot width

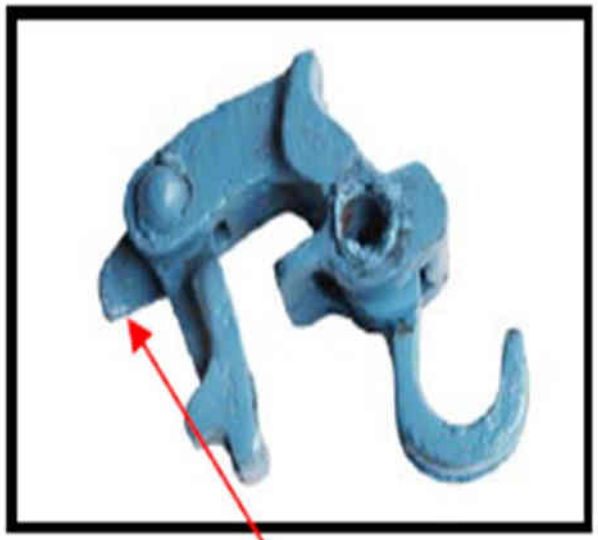
Worn out slot width

(ii) Ensure that anti creep lug of the lever connector is not excessively worn out. There is no gauge specified for measuring the wear. However it should be checked with worn sample which can serve as a comparator.

Auxiliary anti creep lug

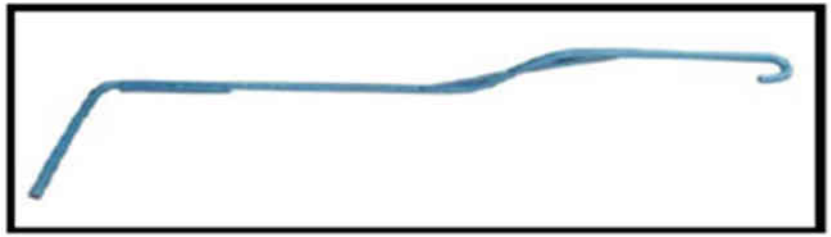


Worn out sample of anti creep



Operating Handle

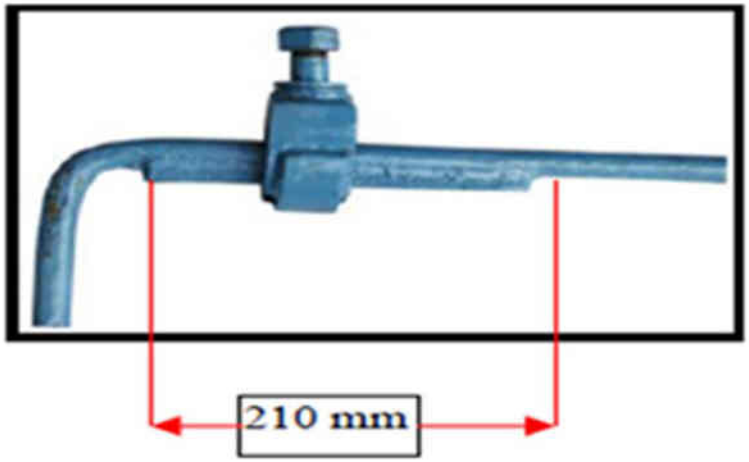
ऑपरेटिंग हैंडिल की स्थिति



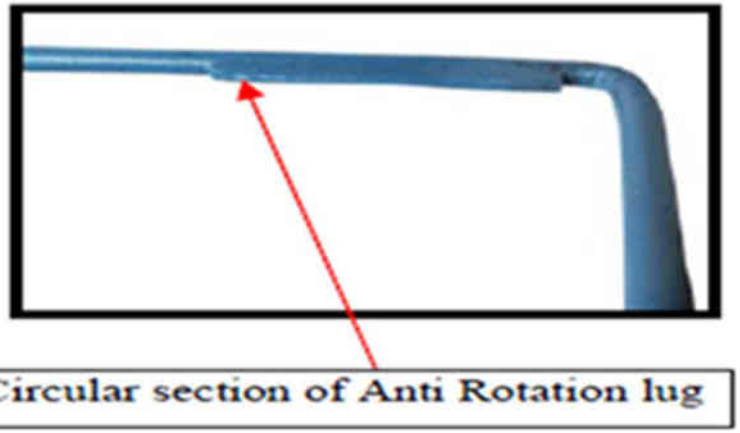
Standard operating handle

Bent operating handle

Photograph of new rotation lug

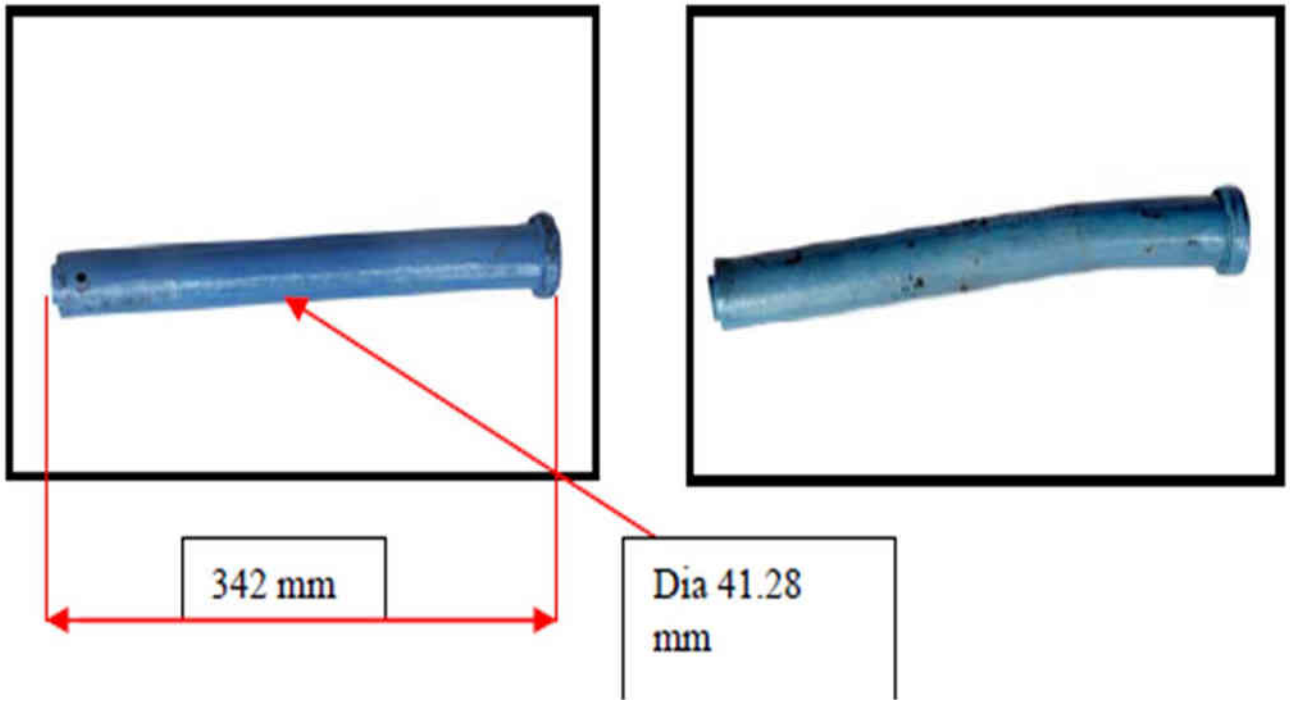


Photograph of circular section of rotation lug

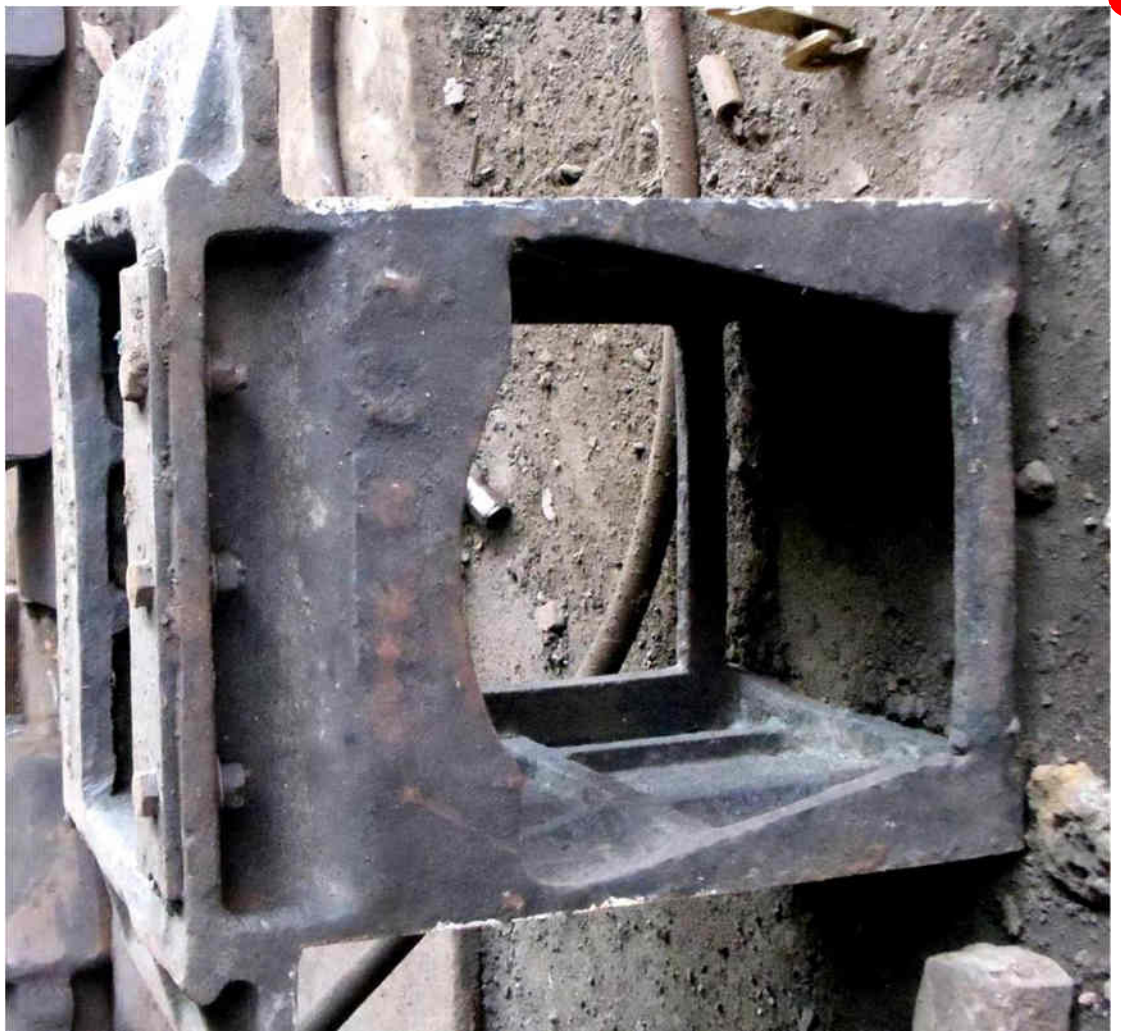


Knuckle Pin

Knuckle pin should be standard and straight. *Non-standard and bent knuckle pin*



Striker Casting



CBC Contour Gauge no. 1

उद्देश्य:- इनकमिंग वैगन के कपलर कन्टूर की वियर लिमिट को चेक करना ।

कार्यविधि :- 1. नो गो गेज नं. G-1 से इनकमिंग वैगन के कपलर कन्टूर की वियर लिमिट को चेक करें। इस गेज के पार जाने की दशा में नकल, नकल पिन व लॉक को रद्द करे।

(सन्दर्भ:-सी.बी.सी. मैनुअल G-80.)

CBC Contour Gauge no. 2

उद्देश्य:- फाइनल वैगन के कपलर कन्टूर की वियर लिमिट को चेक करना ।

कार्यविधि :- 1. नो गो गेज नं. G-2 से फाइनल वैगन के कपलर कन्टूर की वियर लिमिट को चेक करें। इस गेज के पार जाने की दशा में कपलर को रद्द करे |

(सन्दर्भ:-सी.बी.सी. मैनुअल G-80.)

Knuckle Profile- Gauge 3

उद्देश्य:- नकल के प्रोफाइल को चेक करना।

कार्यविधि :- 1. गेज नं. G-3 से नकल के प्रोफाइल का निरीक्षण करें। नक़ल स्ट्रेच होने की दशा में गेज का D पॉइंट बॉडी पर टच करे या G पॉइंट नोज पर टच करे तो नक़ल को रद्द करें।

(सन्दर्भ:-सी.बी.सी. मैनुअल G-80.)