

# WHAT IS TRAIN PARTING?

Train parting is unforeseen division of a train into two or more portions while the train is on run or just about to move.

This is termed as "J" Class Accident



# Types of Train Parting

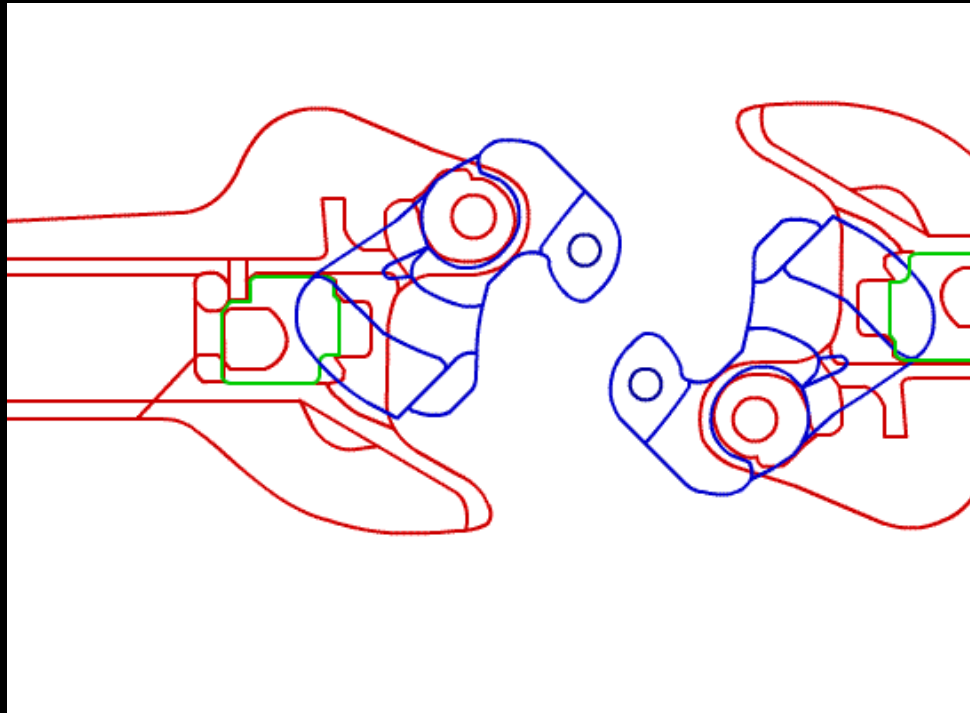
**Train parting is classified under two main heads. 1. Vertical parting**

takes place due to

- excessive CBC height variation. The main reasons for variation in CBC height are;
- Loose/ low rail joints
- Mud pumping under the rail joints. (a common problem to rail bed and is often depicted as the penetrating of fine materials through the ballast) under the rail joints
- CBC drooping– excessive wear and tear of coupler shanks and striker casting/ bearing piece.
- Excessive over loading in the wagons.

**2. Horizontal Parting :-** Horizontal train parting takes place due to following reasons:

- Uncoupling of CBC.
- Breakage/ wear of CBC components due to inherent defects. Failure of draft gear.
- Bad engineman ship



# COUPLER

IS A MECHANICAL DEVICE USED TO  
INTERCONNECT ROLLING STOCK TO FORM A  
TRAIN AND TO TRANSMIT DRAFT AND BUFFING  
FORCES

# TYPES OF COUPLING

## SCREW COUPLING

**IRS SCREW COUPLING** → **FOUR WHEELER TANK ONLY**

**ENHANCED SCREW COUPLING** → **ALL COACHING STOCK**

## CBC COUPLERS

**AAR (NHT)** → **BOX, BCX ( ALL BOGIE WAGONS VACUUM STOCK )**

**AAR (HT)** → **BOXN, BCN ( ALL BOGIE WAGONS AIR BRAKE STOCK )**

## **CBC COUPLERS**

**ALLIANCE II CBC**



**FOUR WHEELER GOODS  
STOCK ( NOW REPLACED  
WITH AAR )**

**ABC COUPLER**



**ALL MG STOCK**

**SCHAKU COUPLER**



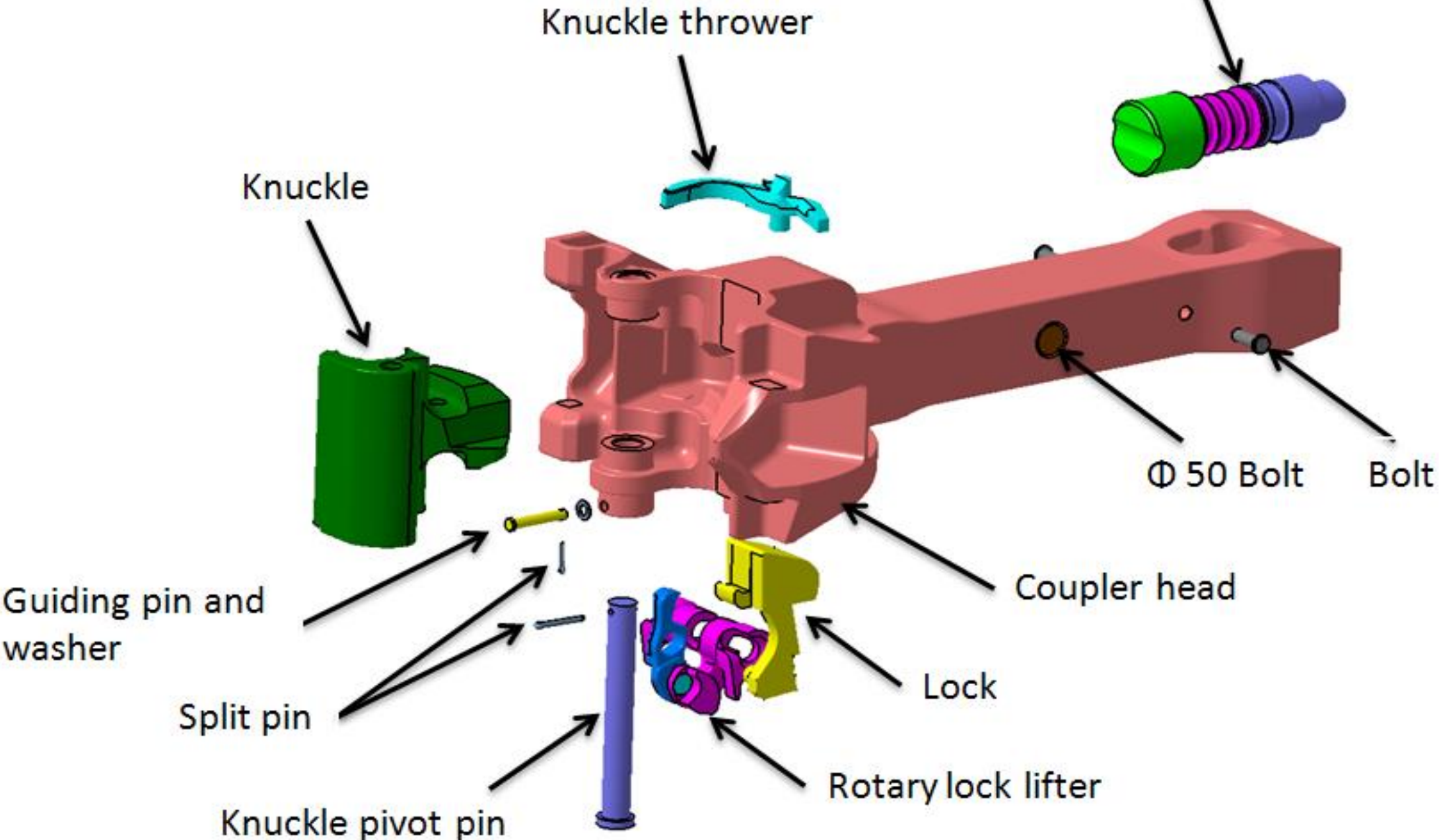
**DEMU**

**AAR MODIFIED  
COUPLER**



**LHB COACHES &  
ICF COACHES**

Backlash compensation device





## Gathering Range

**Horizontal** : +/- 110 m.m.

**Vertical** : +/- 90 m.m.

# Check points to ensure proper coupling

The following points must be checked to insure proper coupling:-

Coupled condition:

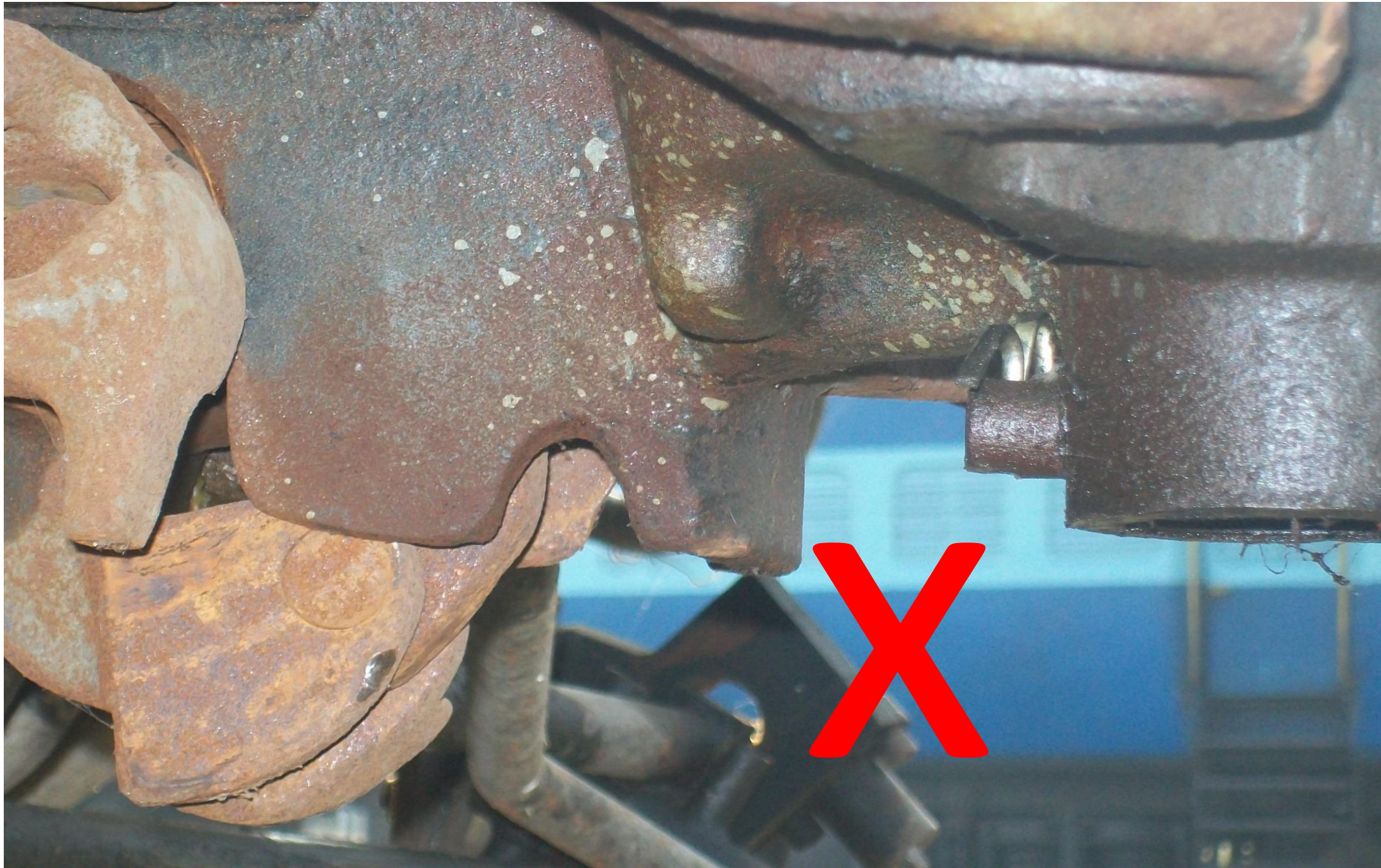
**Check points 1:** telltale slot should be clear of rotary lock lift Lever

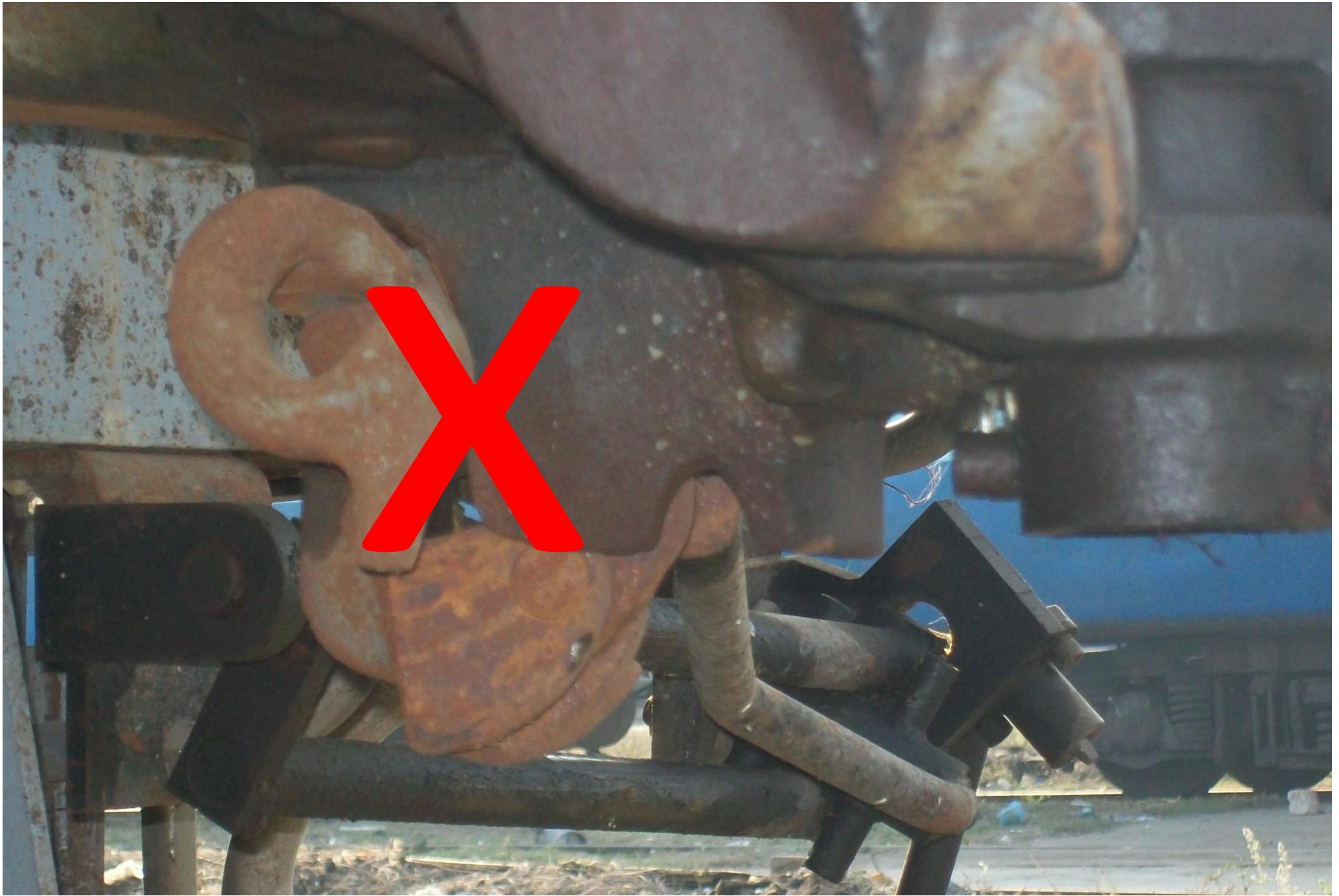
**Check points 2:** Rotary lock Lifter rib should be vertical

**Check points 3:** Locking screw of manual Un Coupling Device should be in locked condition.

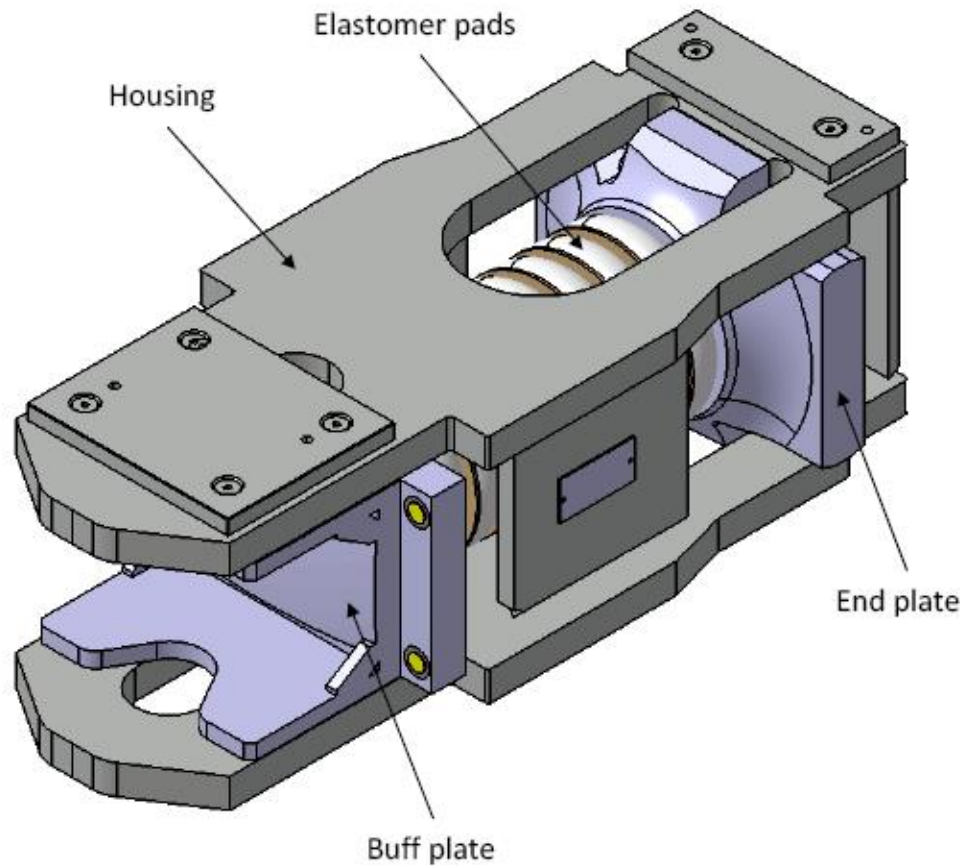




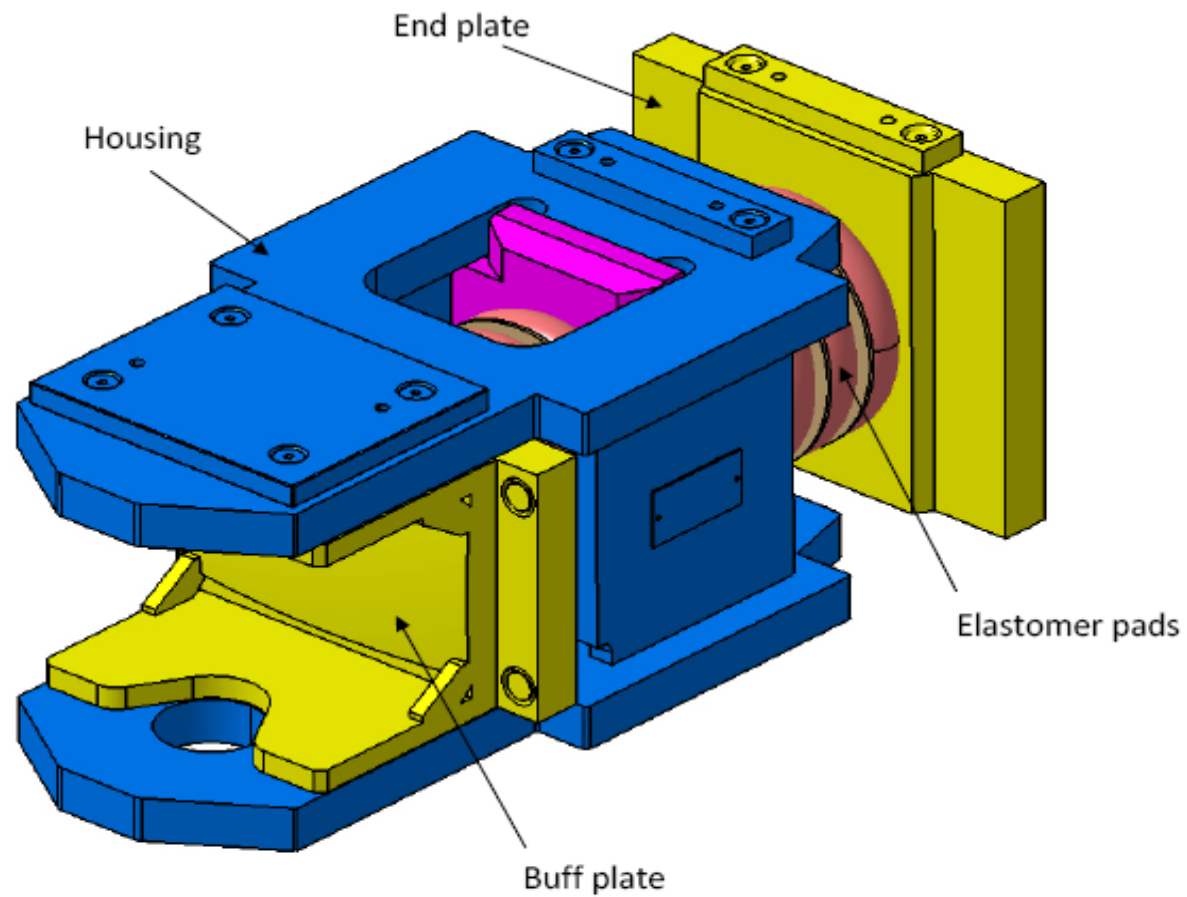




- Make sure, that the handle of manual uncoupling device is locked after coupling.
- After coupling reverse the power to pull (snatch) the vehicles apart.
- This is a typical pull test to reconfirm a positive coupling.



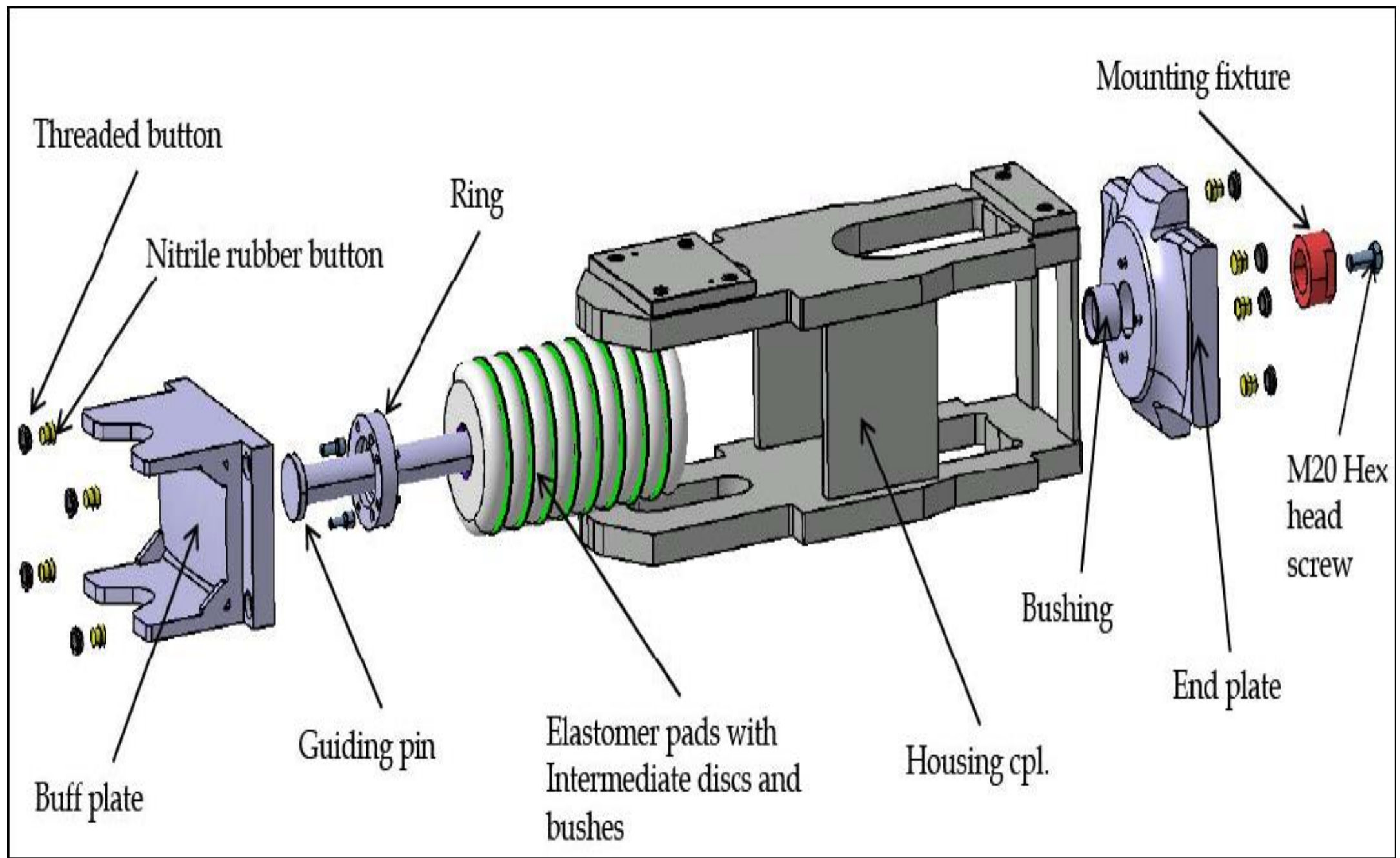
Draft gear, cpl



Draft Gear, cpl. with Floating plate, Type BC 80/45F

# •Single Pack Draft Gear

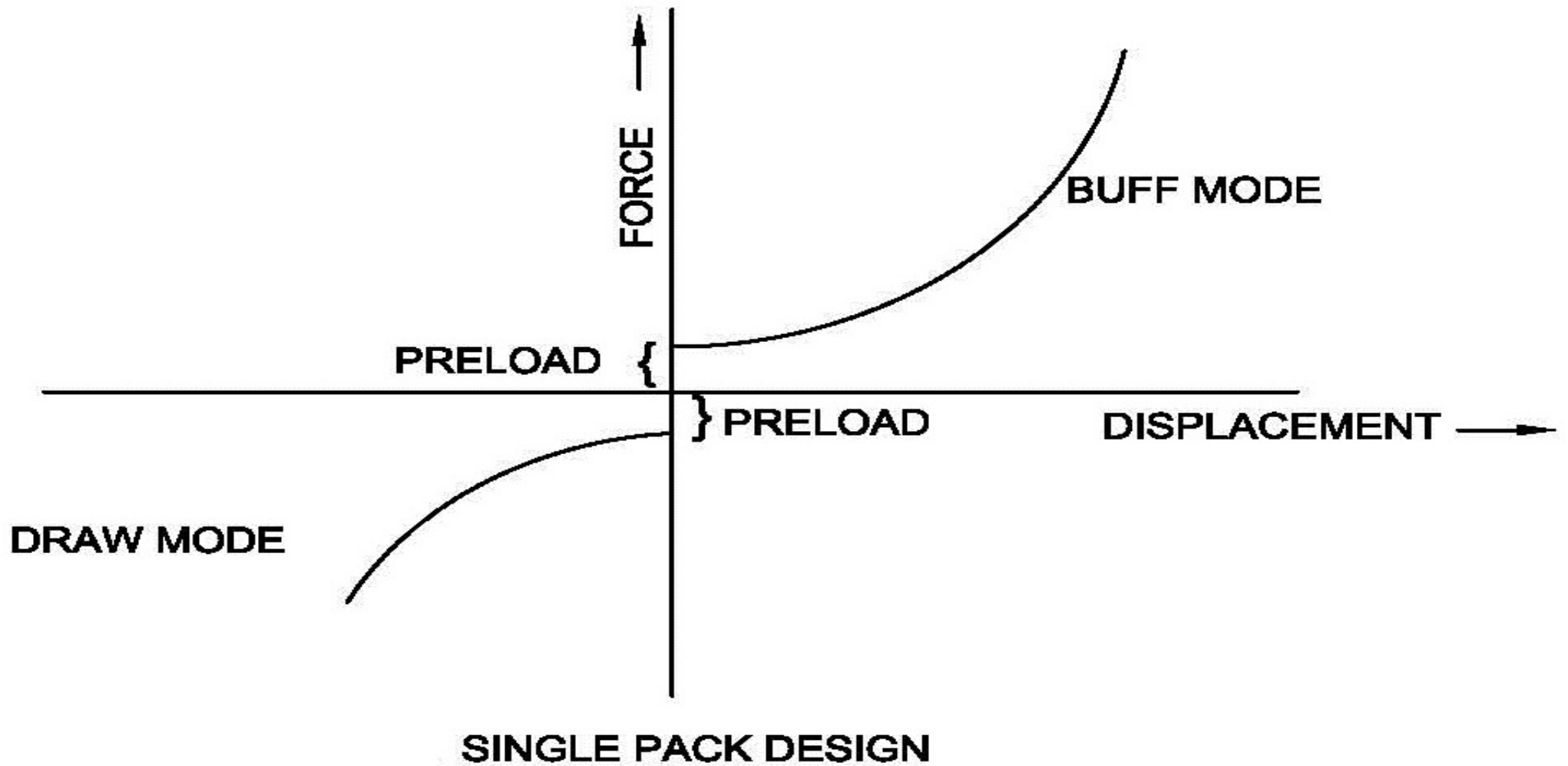
- In this type of draft gear, same set of draft pads is used in buff as well as in draw mode.
- In dynamic condition, the front follower leaves the front stopper during buff and the rear followers leaves the rear stopper during draw modes and hits them on load reversal.



# Preload in Draft Gear

- Space for draft gear is limited
- Draft pack designed for max. tractive/braking forces
- Draft pack load-deflection characteristics are fixed
- Hence pre-load



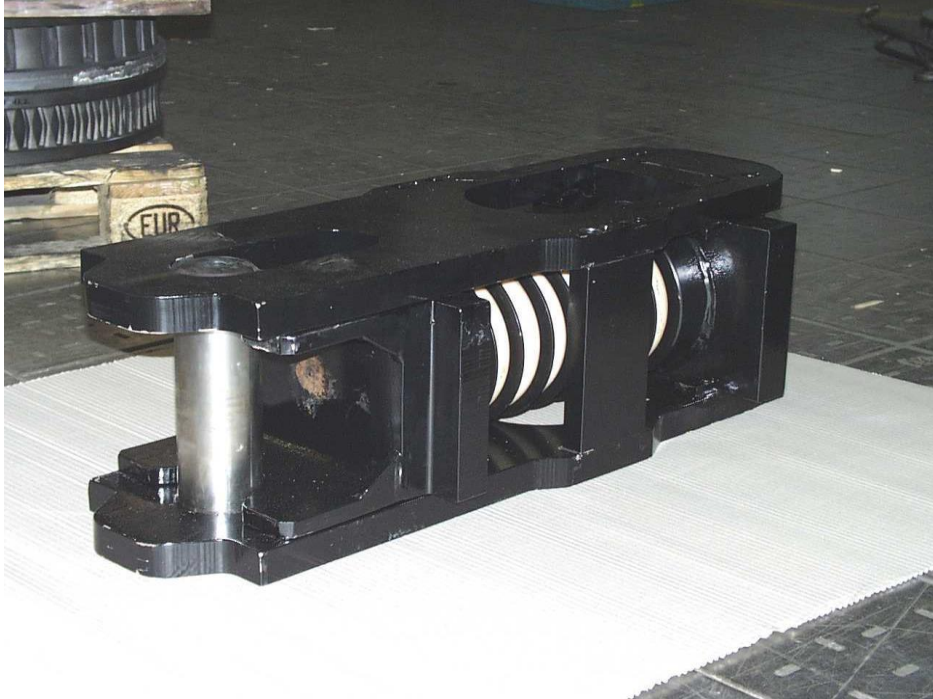
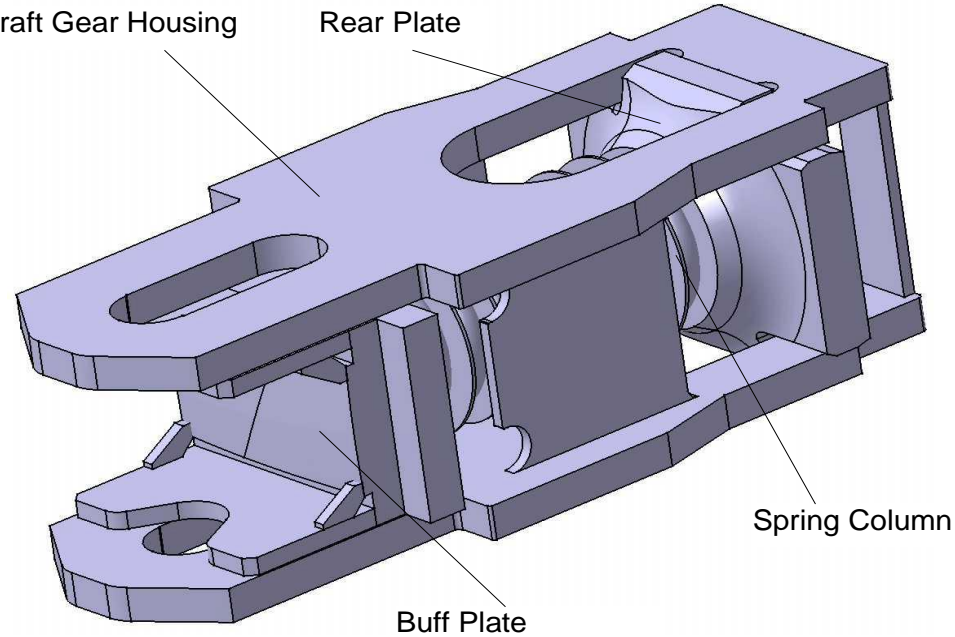


**Travel Characteristics of Single Pack Draft Gear**

# Floating Plate or Twin Pack Draft Gear

- Floating plate or twin pack draft gear has similar cushioning arrangement.
- In floating plate or twin pack draft gear, the problem of rear follower plate striking the rear stopper has been addressed by dividing the draft pads into two parts
- by a floating plate and using this floating plate for the purpose of transmitting force in draw mode.
- In draw mode, only draft pads between floating plates and front follower is compressed where as in buff mode, all the draft pads are used to take buff load.
- It has zero preload in draw mode.

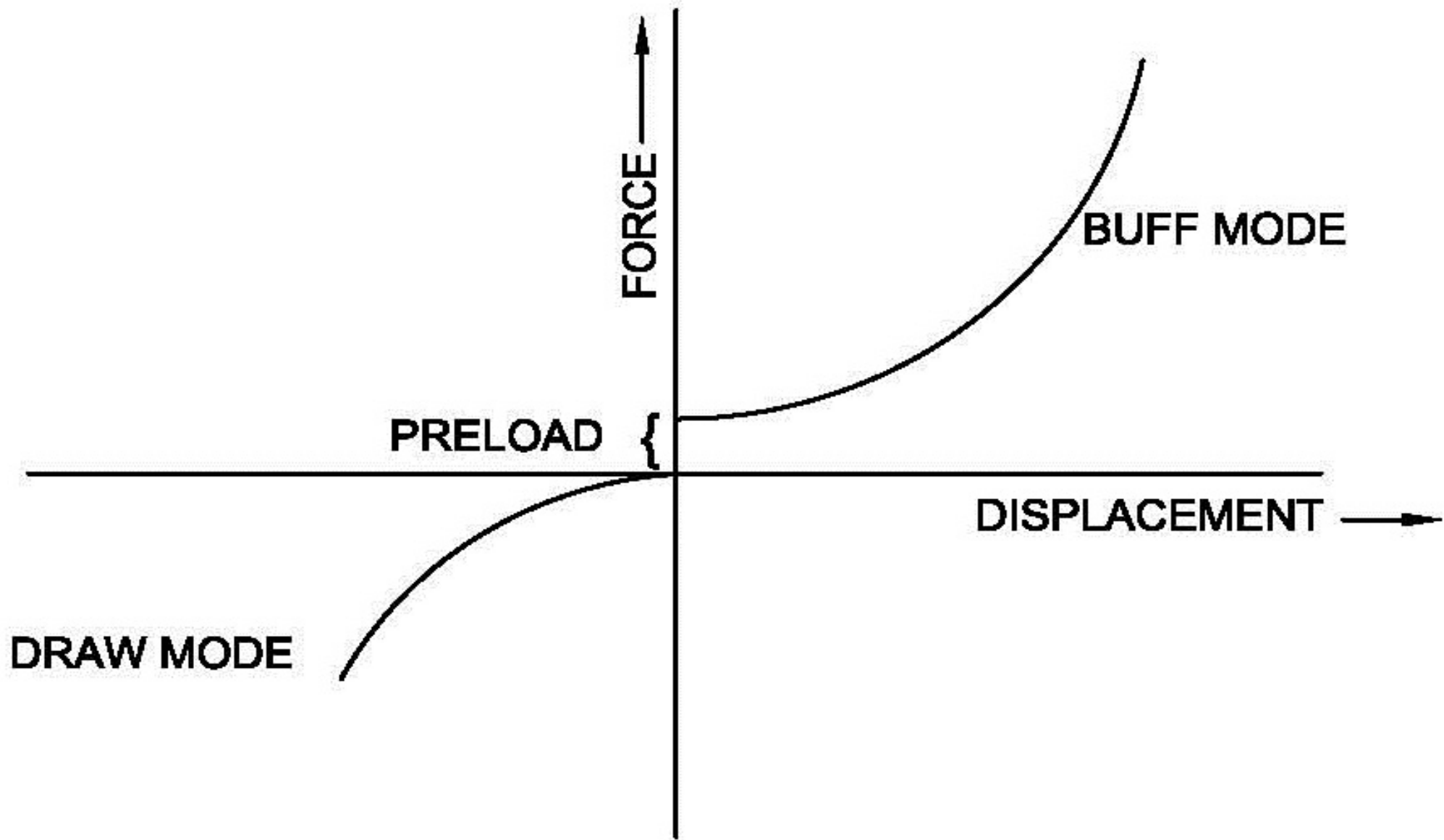
# DRAFT GEAR



Double acting device for energy absorption  
Stroke    Tensile-58m.m.  
            Buff    -80m.m.



- However, in buff mode, this type of draft gear behaves in a way similar to single pack draft gear.
- In dynamic condition, the front follower leaves the front stopper and hits it on load reversal.
- Also, preload in the buff mode adversely affects the longitudinal dynamics of a train.



**TWIN PACK AND FLOATING PLATE TYPE DESIGN**

- The specification of CBC CK-009 (Rev.2) does not specify the type of draft gear. Suppliers are free to supply any type of draft gear such as single pack, twin pack, floating plate or any other design-
- On the basis of a systematic study of design of CBC, a new specification of CBC has been made.
- In the new specification, **balanced type draft gear** has been specified.

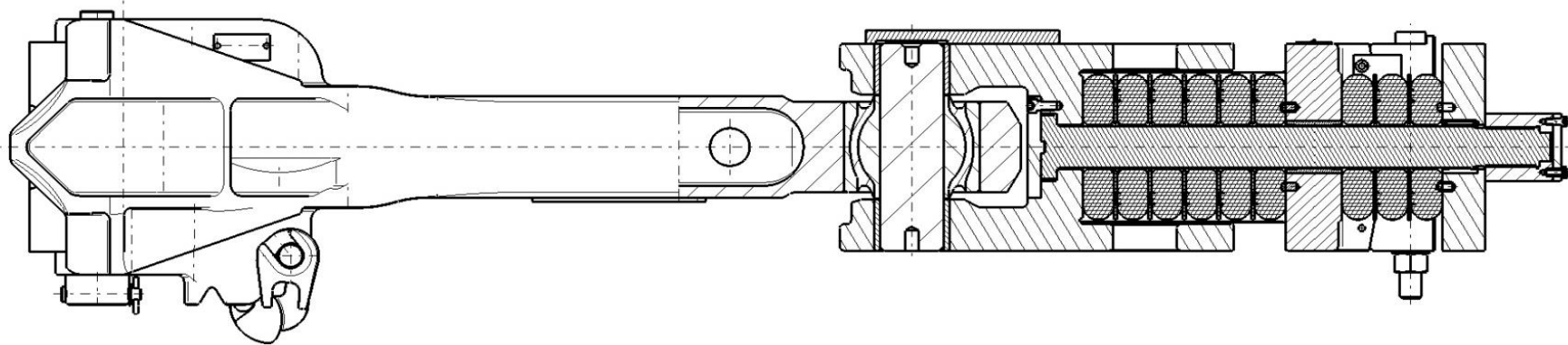
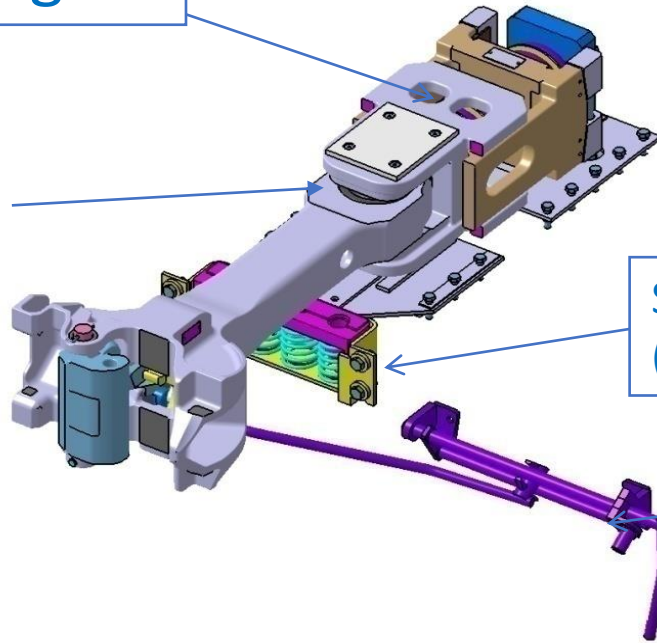
# AAR 'H' type tight lock Coupler with BDG

Balanced draft gear

AAR tight lock 'H' type coupler head having spherolastic bearing at pivot end

Supporting device  
(Existing feature)

Manual uncoupling device  
(Existing feature)



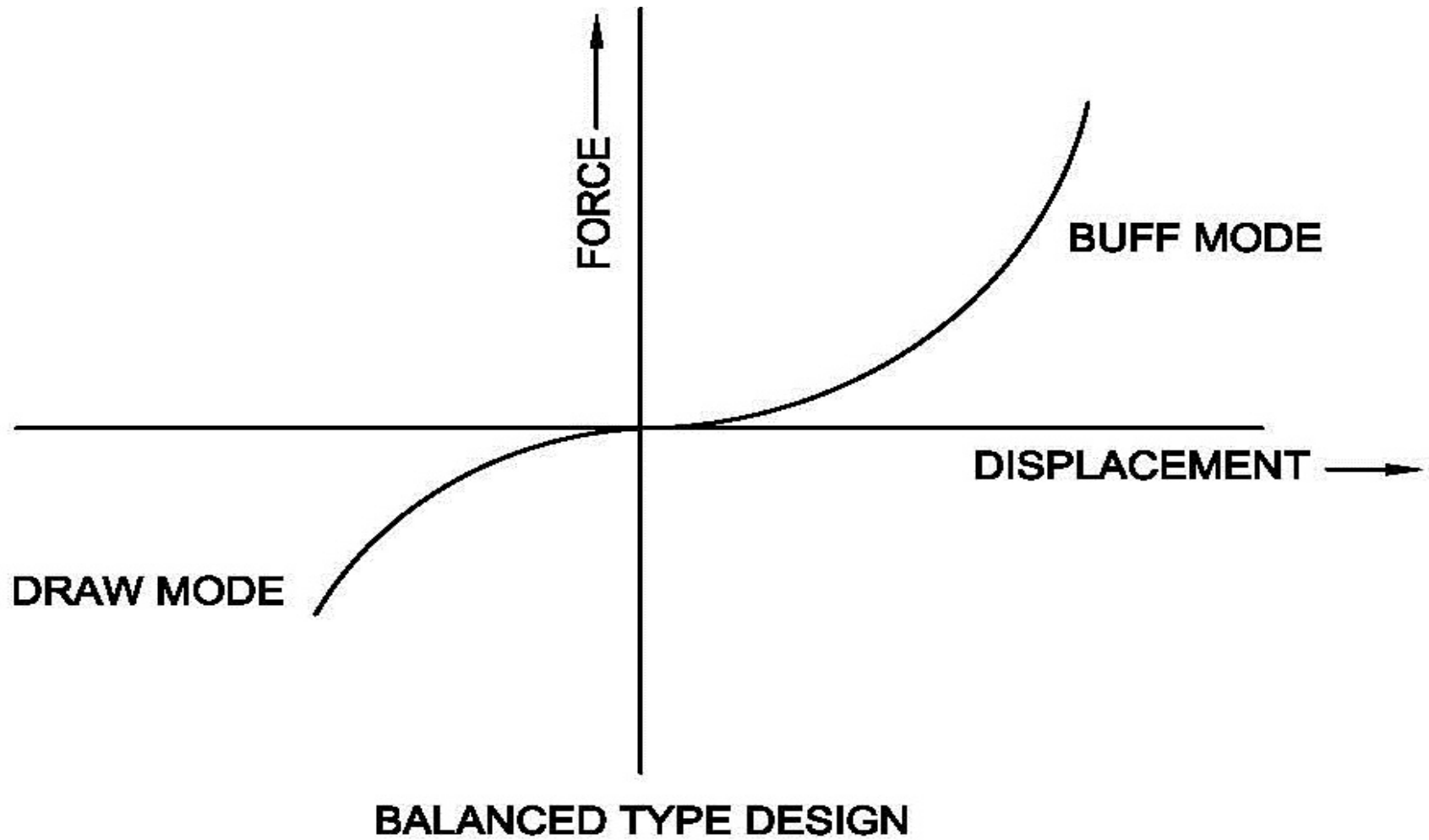
Diagram

# Balanced Type Draft Gear

- Balanced type draft gear overcomes all the problems mentioned in the above sections.
- The draft gear is fixed between the front and rear stopper and no relative movement between the draft gear frames and these stoppers is possible.
- There is no situation of front follower leaving the front stopper and rear follower leaving the rear stopper and hitting them on load reversal.



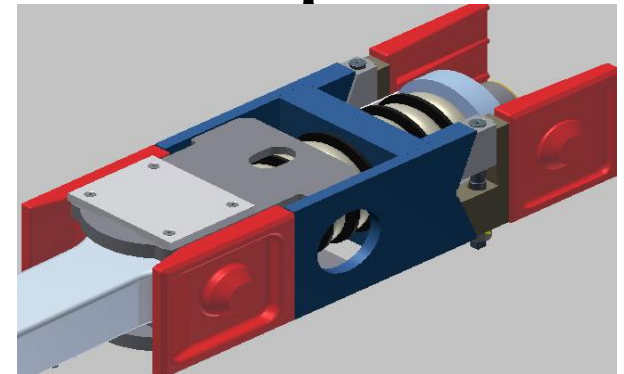
- Apart from this, the following diagram of conceptual draft gear characteristics.
- shows that there is no abrupt change in force on load reversal.
- Force travel curves are regular and they are not vertically separated at neutral position.
- It facilitates smooth load reversal.



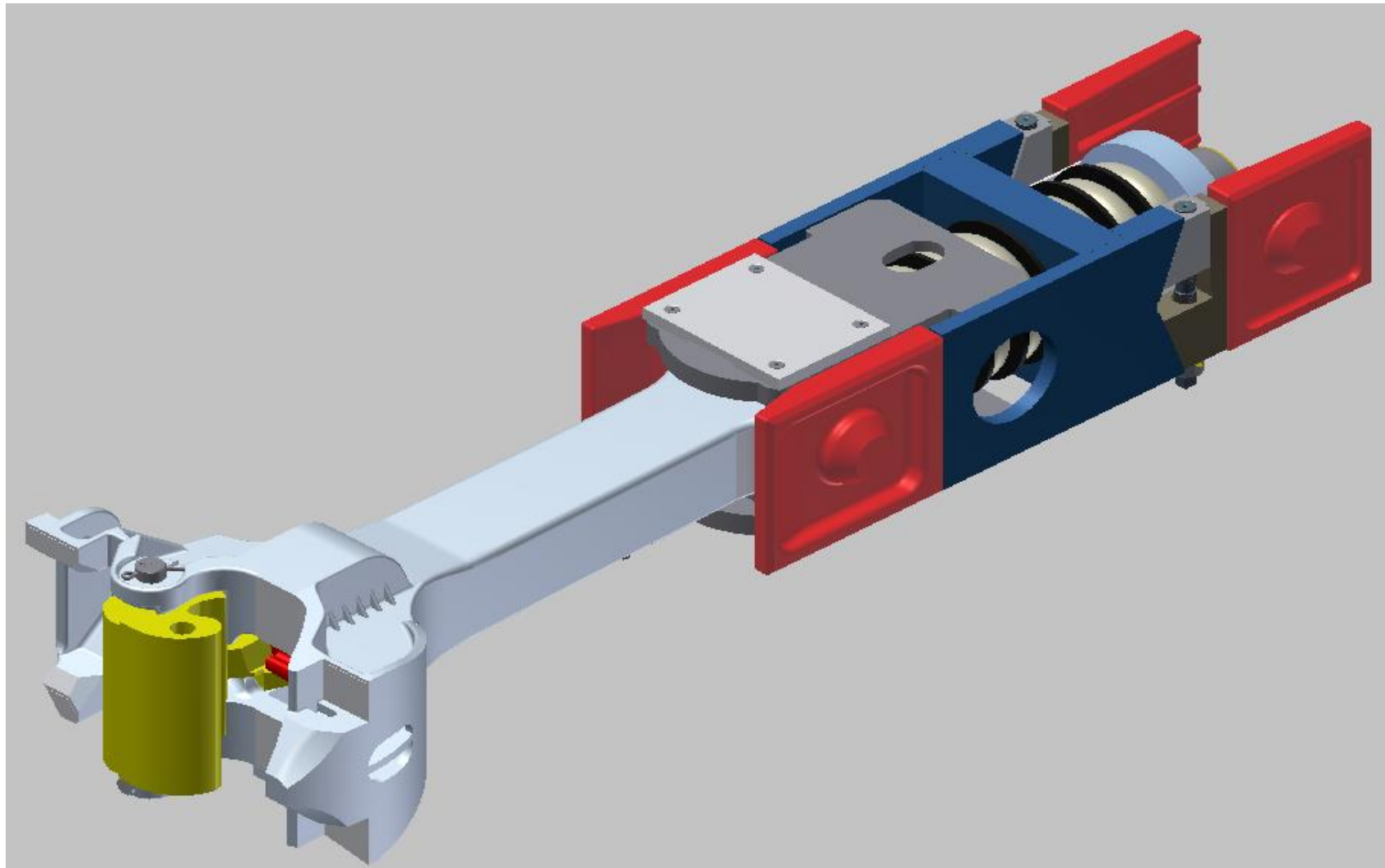
**Travel Characteristics of Balanced Type Draft Gear**

# BDG MAJOR COMPONENTS

- **Stack of Heavy Duty Elastomeric Pads (Imported) - 04 in compression & 03 in tensile mode.**
- **PA-6 bushes for smooth sliding of intermediate plates & pads over Main bolt.**
- **Fabricated Front Fork & H - Housing.**
- **Main bolt - High toughness, forged.**
- **Adjustable wedges to tighten the BDG assembly with coach under frame.**
- **The fixed plate, a part of H Housing (blue color,) which is tight fitted with coach under frame (red color) between front & rear stoppers with the help of special design wedge key.**



# AAR H coupler with BDG

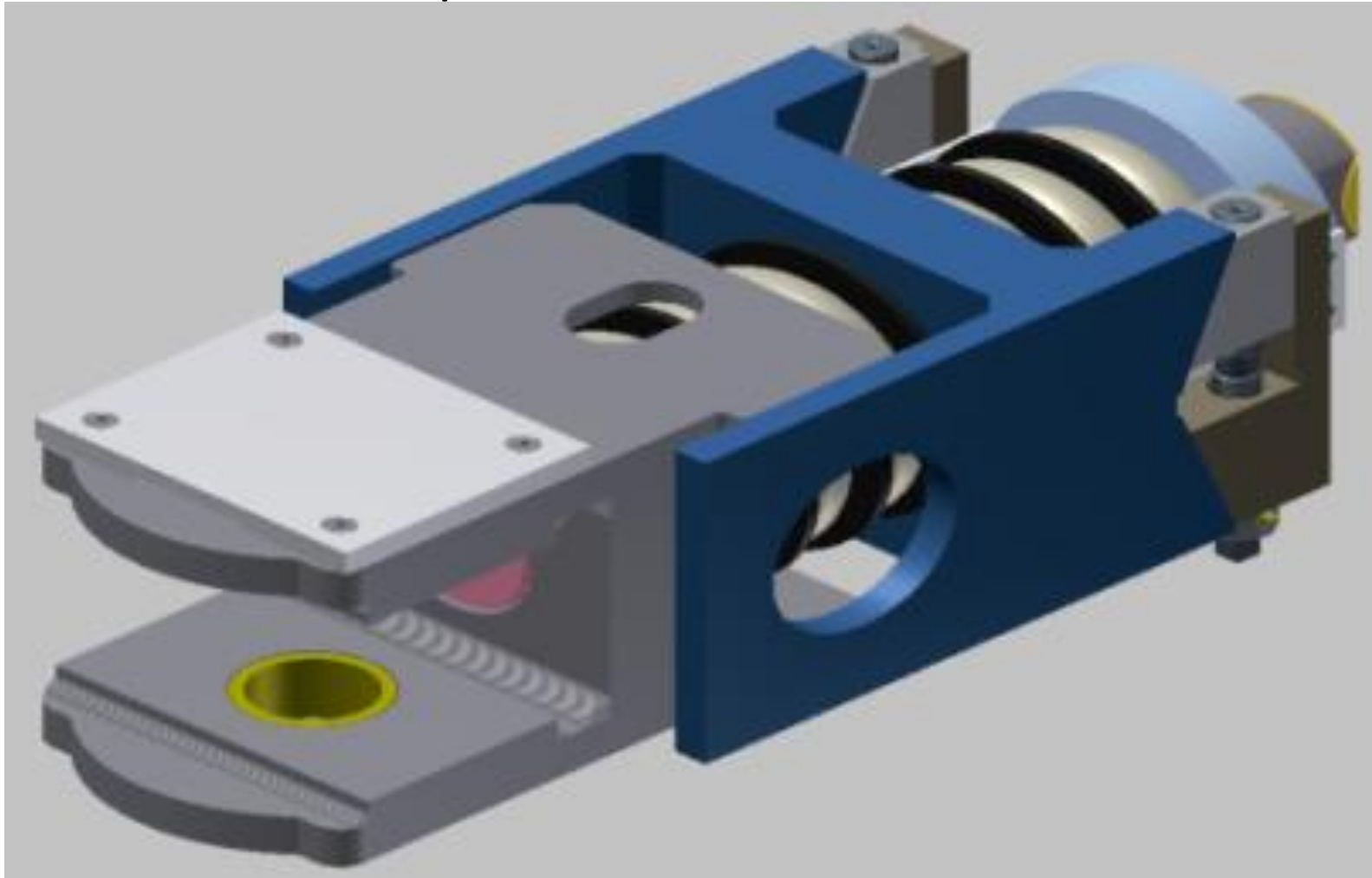


# Balanced type Draft Gear

- Overcomes above problems
- Absorbs energy in draw and buff modes
- Fixed Draft gear – no gap
- Overcomes hitting on load reversal

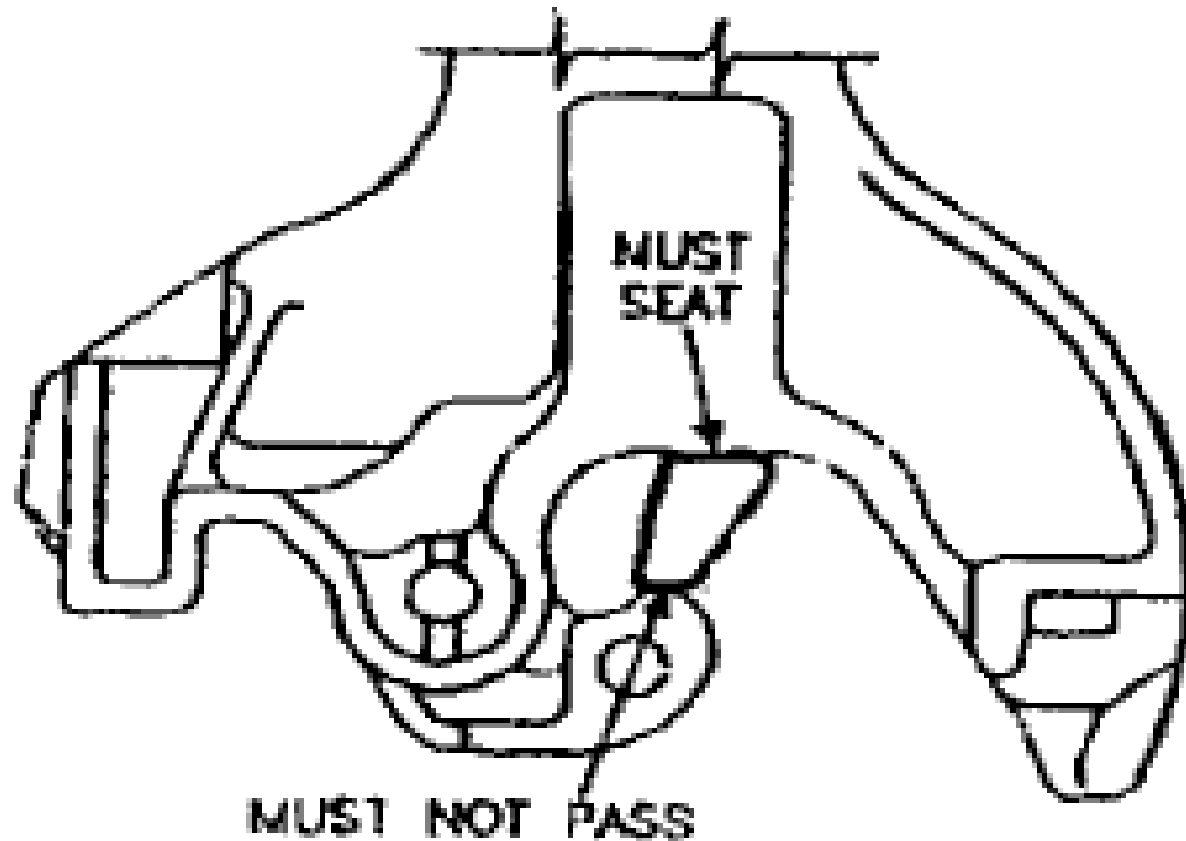
# Balanced Draft Gear

- “H” Housing – elastomeric pads on either side
- Separate Elastomeric pads for draw and buff



## Jaw gap test :

We check the contour of the coupler head assembly using “**Condemning limit gauge**”



## **Knuckle contour (profile) check :**

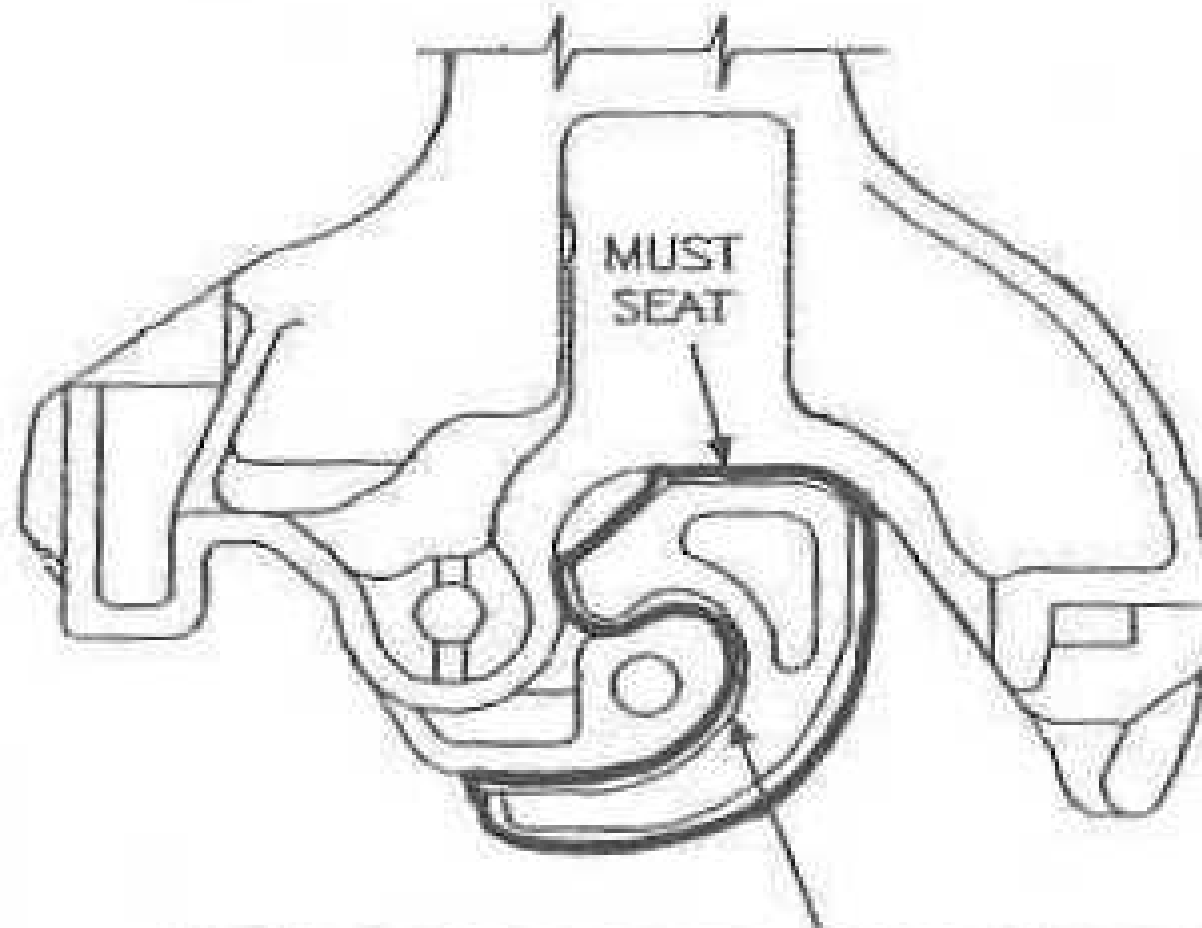
Check the contour of the knuckle using the “ **Contour maintenance Gauge** .

Shake the knuckle while passing the gauge.

This is to ensure that slack in the assembly is included in the profile.

If gauge does not pass, Knuckle and coupler head must be checked and replace it or lock to be modified per APTA standards.(American Public Transportation Association)

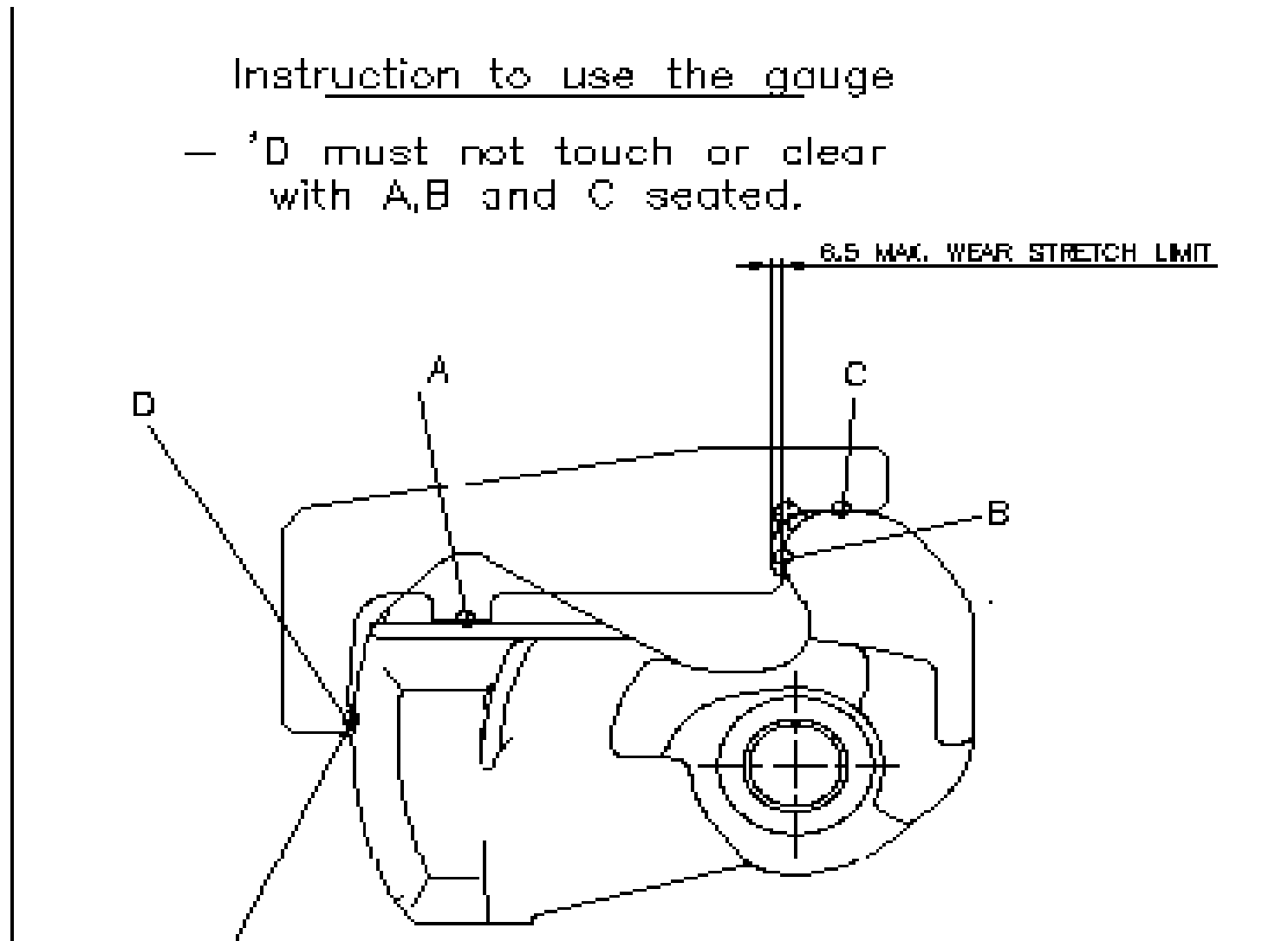




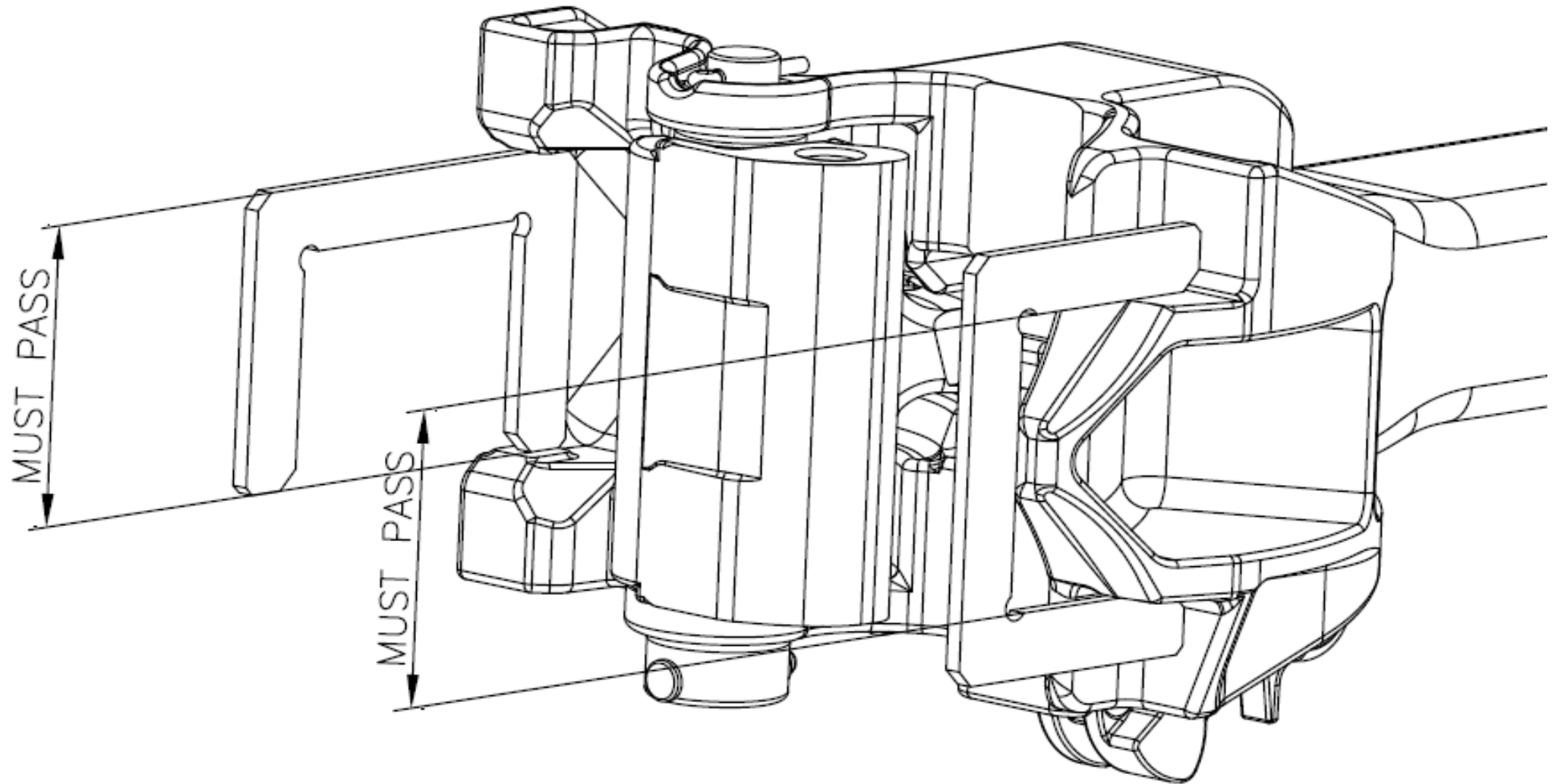
GAGE MUST PASS THROUGH CONTOUR  
WITH KNUCKLE FULLY CLOSED AND  
LOCKED.

# Knuckle nose wear and stretch limit gauge

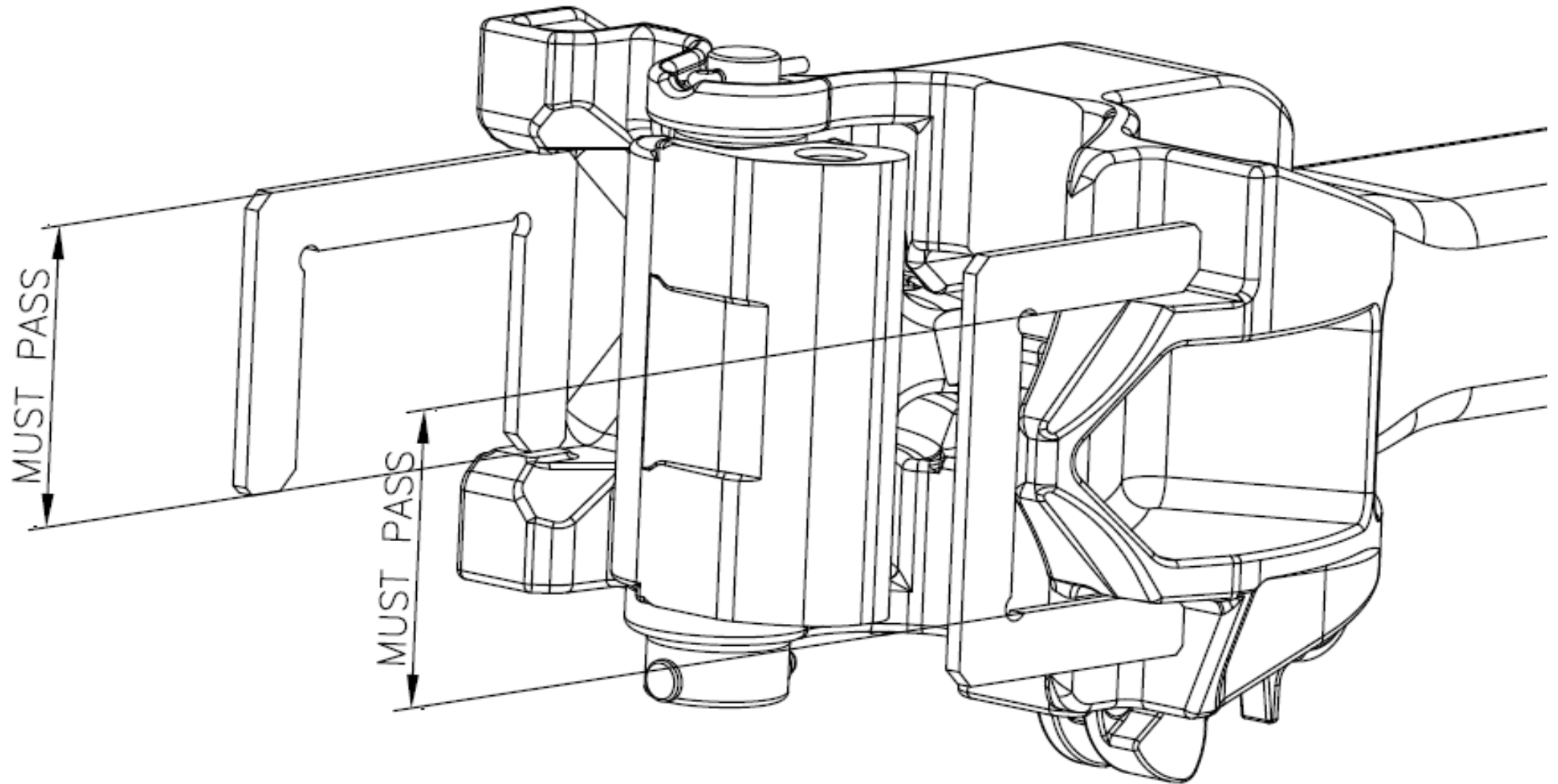
The permitted wear at the nose side is 6.5 mm.



## Vertical height aligning wing pocket and guard arm gauge (GO)



## Vertical height aligning wing pocket and guard arm gauge (GO)



# SCHIAKU COUPLER

## ➤ Introduction

- ‘Schaku Coupler’ is ‘Semi Permanent Coupler’ designed to ensure permanent connection in Rail Cars, which form a unit [used on EMU/DEMU/MEMU Stock].
- Drawbar/ Intermediate Tube are connected by means of Adjustable Muff Coupling/Pair of Cup Sleeve Set. Set can be easily detached allowing quick separation of Cars.
- Drawbar/ Intermediate Tube provided with Centering Hole and Centering Pin which help to align Drawbars.

# Specification – Schaku Coupler

Sl. No.	Description	Specification	Actual (as per Firm)
1.	Coupling Length from Pivot Point	-	1107 mm
2.	Static Strength in Buff Mode	100 Tonne	120 Tonne
3.	Static Strength in Draw Mode	70 Tonne	100 Tonne
4.	Ultimate or Fracture Strength	150 Tonne	150 Tonne
5.	Stroke of the Draft Gear, mm	75 max.	56
6.	Horizontal Swing	-	15
7.	Vertical Swing	-	5-7
8.	Energy Absorption Capacity Dynamic	800 kg-m	900 kg-m
9.	Height From top of the Rail	-	1035 mm
10.	End Fore – Sill load	50,000 kg	500 +10/-5 kN
11.	Coach to Coach Interconnection	-	Through Adjustable Muff Coupling

## ➤ **Parts of Schaku Coupler**

### **1. Semi-Permanent Coupler End-A:**

- Draw Bar/Intermediate Tube
- Pneumatic Coupling
- Draft Gear/Draw and Buff Gear
- Main Bracket/Bearing Bracket with Support
- Adjustable Cup Sleeve/Pair of Cup Sleeve

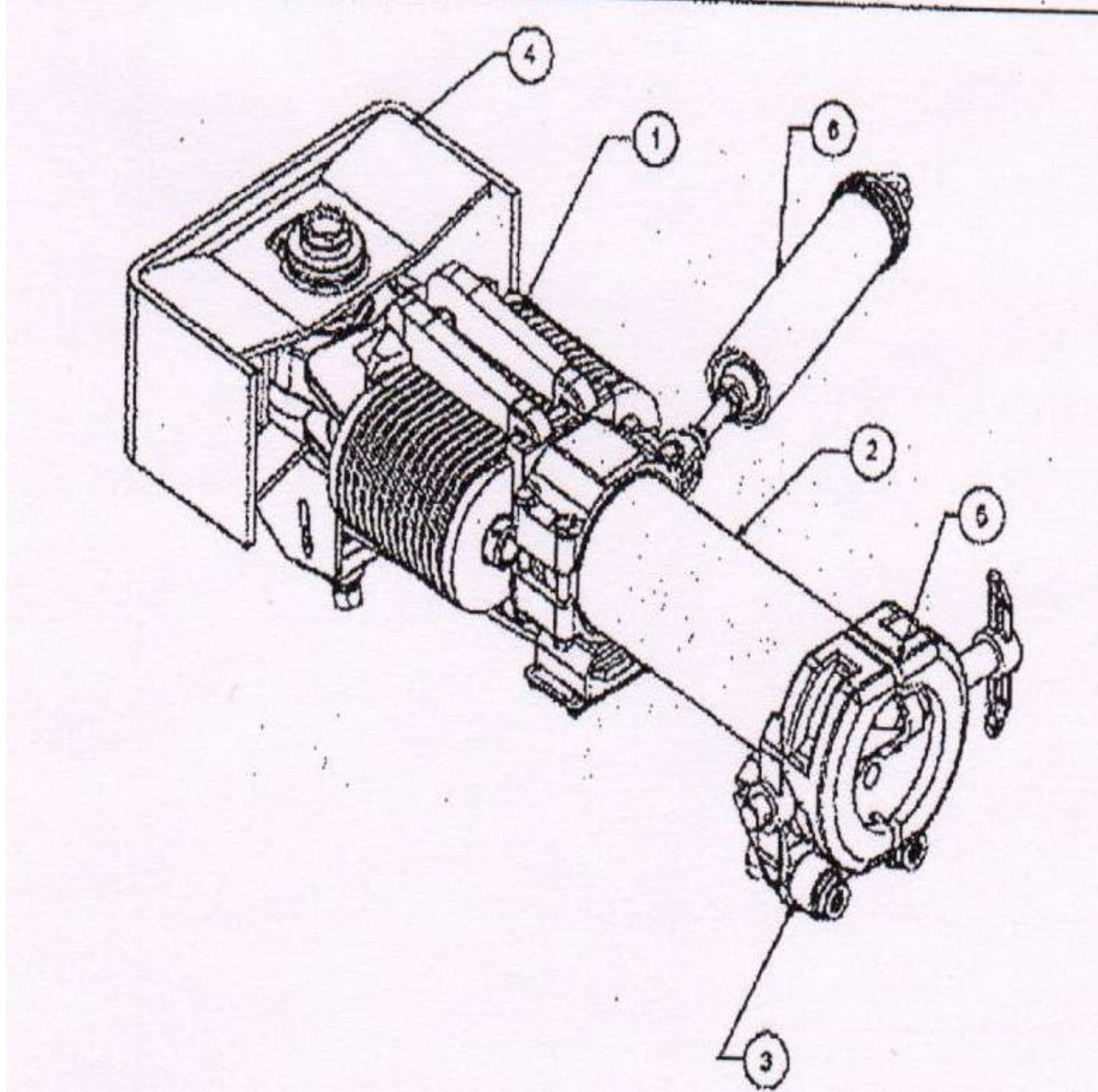


## **2. Semi-Permanent Coupler End-B:**

Difference from Semi-Permanent Coupler End-A is in respect of Centering Carrier and Pneumatic Coupling/Air Pipe Coupling.

## **3. Draw and Buff Gear:**

- Spring Rubber plate of Draw and Buff Gear has energy absorption capacity of 800 to 1400 Kg-m, which protects Coach against impact stresses.
- Pair of Lower/Upper Cup Sleeve connect Draft Gear/Draw and Buff Gear with Draw Bar / Intermediate Tube
- Connection to Main Bracket/Bearing Bracket nuts support on Coach effected by Bearing Bolt, fitted through bore of 'Articulation Bearing' in Fork Eye and secured.

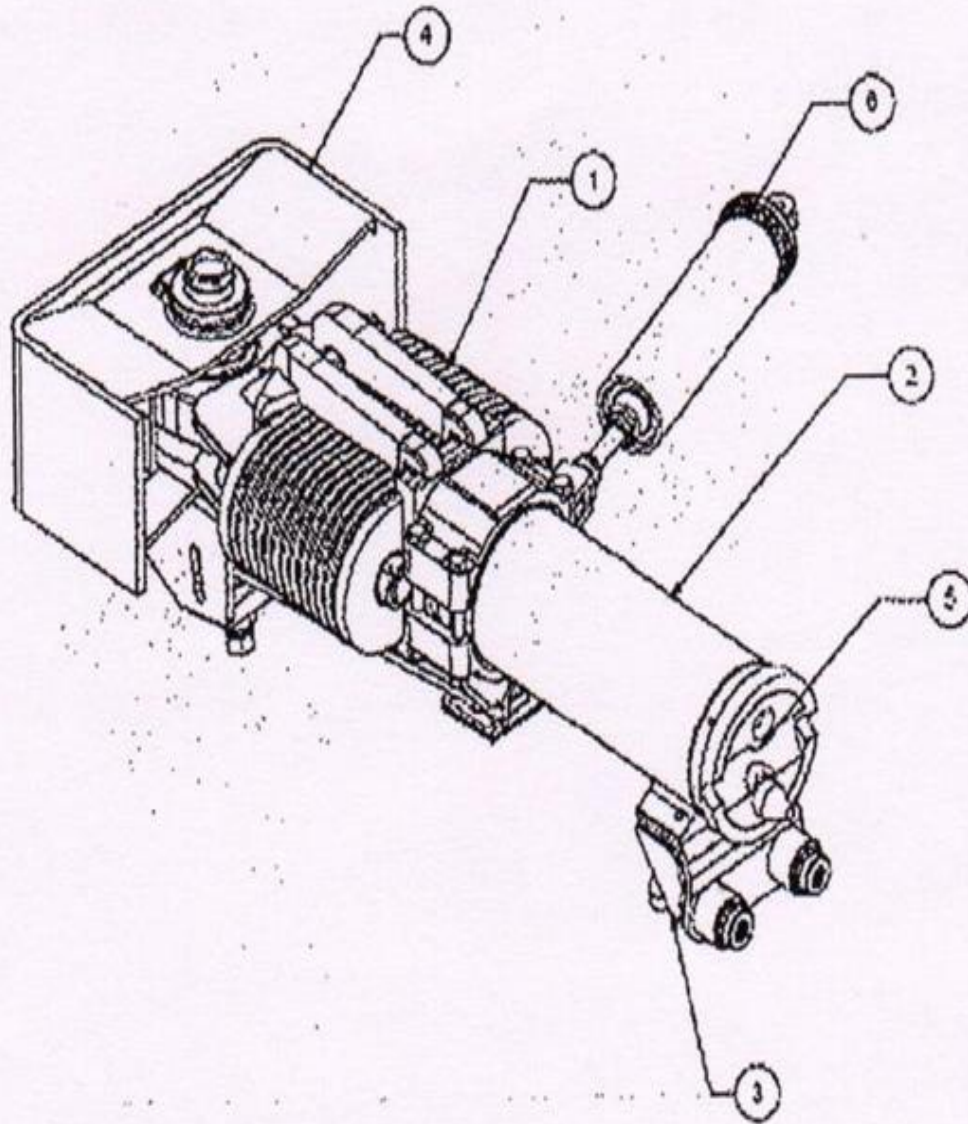


### Legend

1. Draft Gear/Draw and Buff Gear
2. Draw Bar/intermediate Tube
3. Pneumatic Coupling/Air Pipe Coupling
4. Main Bracket/Bearing Bracket with support
5. Adjustable Muff Coupling/Adjustable Cup Sleeve
6. Centering Arrangement/Centering Adjustment Device

## SEMI PERMANENT SCHAKU COUPLER

END 'A'



### Legend

1. Draft Gear/Draw and Buff Gear
2. Draw Bar/intermediate Tube
3. Pneumatic Coupling/Air Pipe Coupling
4. Main Bracket/Bearing Bracket with support
5. Centering Carrier End-B/ Centering Device
6. Centering Arrangement/Centering Adjustment Device

## SEMI PERMANENT SCHAKU COUPLER END 'B'

- Compressive Force is transmitted to Spring Rubber Plates.
- At the end of Compressive Stroke of 56 mm, Rear Plate of Yoke Sub Assembly supports itself upon Fork Eye.
- Tractive Forces transmitted to pair of Lower/Upper Cup Sleeve Joint Yoke Sub Assembly, Rear plate Spring Rubber Plate and two Allen Screws to Fork Eye.
- Articulation Bearing Fitted in Fork Eye permits Lateral/vertical displacement as well as twisting along longitudinal axis of Coupler.

Note:

During Fitment in Coach, Collar of Articulation Bearing in Fork Eye should be located at top side.

- Major Stress Bearing Components of Draw and Buff Gear Sub Assemblies are:
  - Spring Rubber Plates with Steel Plates
  - Pair of Lower/Upper Cup Sleeves
  - Articulation Bearing
  - Yoke Sub-Assembly
  - Fork Eye
  - Allen Bolt/Screw (M 42 x 300)



**DRAFT AND BUFF GEAR – SCHAKU**

**COUPLER**

#### **4. Main Bracket/ Bearing Bracket with Support:**

- Main Bracket/ Bearing Bracket with Support serves function of transmitting Traction and Impact Forces from Coupler to Coach Underframe Structure and to keep Coupler in Horizontal position between Coaches.
- Arranged in 'Tragger Carrier' Sub Assembly in which there is provision of Leaf Spring, which supports the Coupler.

#### **Note:**

Slide Plate protects bearing surface of Leaf Spring from excessive wear.

- ‘Tragger Carrier’ is screwed on Bearing Bolt, which passes through Articulation Bearing in Fork Eye of Draft Gear/ Draw and Buff Gear and is housed in Main Bracket/ Bearing Bracket (which is part of Coach Underframe).
- Major Stress bearing components of Bearing Bracket with support are:
  - Bearing Bolt
  - Main Bracket/Bearing Bracket
  - Upper/Lower Bushes
  - ‘Tragger Carrier’ Sub Assembly
  - Leaf Spring complete Sub-Assembly





Leaf Spring

**TRAGGER CARRIER SUB ASSEMBLY – SCHAKU  
COUPLER**



**TRAGGER CARRIER SUB ASSEMBLY – SCHAKU  
COUPLER**

## **5. Centering Device:**

- Functions to retain Schaku Coupler in position at centre line between Coaches and to retract into central position after side displacement.
- Hinged on Draft Gear/Draw and Buff Gear on one side and fitted to Coach Structure on other side.
- Adjustment of length of centering device possible through Hexagonal Nuts.

- T-Head Bolt guided in Spring pot and Spring Plate establishes connection to Fork Head.
  - Main Components of Centering Device are:
    - Compression Springs (Inner and Outer)
    - Cover Sub-Assembly
    - Spring Pot Sub-Assembly
    - T-Head Bolt

## **6. Draw Bar/Intermediate Tube:**

Draw Bar/Intermediate Tube is connecting Member between ‘Draft Gear/ Draw and Buff Gear’ and Adjustable Cup Sleeve Joint and also serves for fastening Pneumatic Coupling.



**SEMI PERMANENT (SCHAKU) COUPLER END 'A' – CENTERING CARRIER  
(CENTERING DEVICE)**



**SEMI PERMANENT (SCHAKU) COUPLER END 'B' – CENTERING CARRIER  
(CENTERING DEVICE)**

## **7. Pneumatic Coupling / Air Pipe Coupling**

### **8. Adjustable Cup Sleeve:**

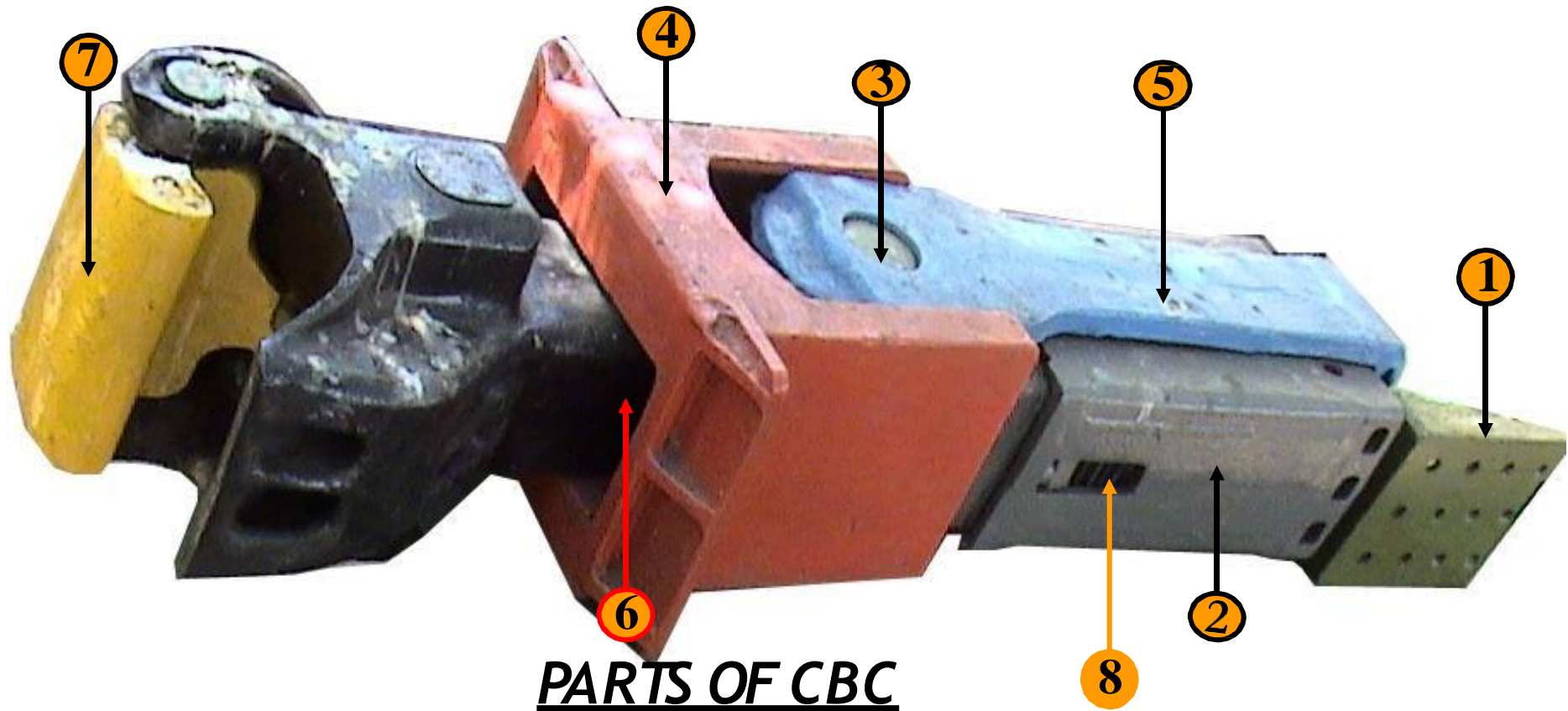
- Functions to transmit Tractive Forces from one Semi Permanent Coupler to the other to facilitate rapid coupling/un-coupling.
- Consists of Pair of Cup Sleeves which can be radially moved over the spindle with the help of handle.
- Centering Carrier serves as abutment for the Spindle and prevents two Couplers from getting twisted.
- Winged Nut secures Spindle against working loose.



# **PARTS & FUNCTIONS OF CBC**



# CBC ASSEMBLY



## PARTS OF CBC

- |                    |                    |
|--------------------|--------------------|
| 1. REAR STOPPER    | 6. COUPLER BODY    |
| 2. DRAFT GEAR      | 7. KNUCKLE         |
| 3. YOKE PIN        | 8. DRAFT GEAR PADS |
| 4. STRIKER CASTING |                    |
| 5. YOKE            |                    |

**CBC  
PARTS**



**COUPLER BODY WITH SHANK**



**KNUCKLE**



**KNUCKLE**

**PIN**



**KNUCKLE THROWER**



**LOCK**



**TOGGLE**



**LOCK LIFT LEVER**





HOO

K



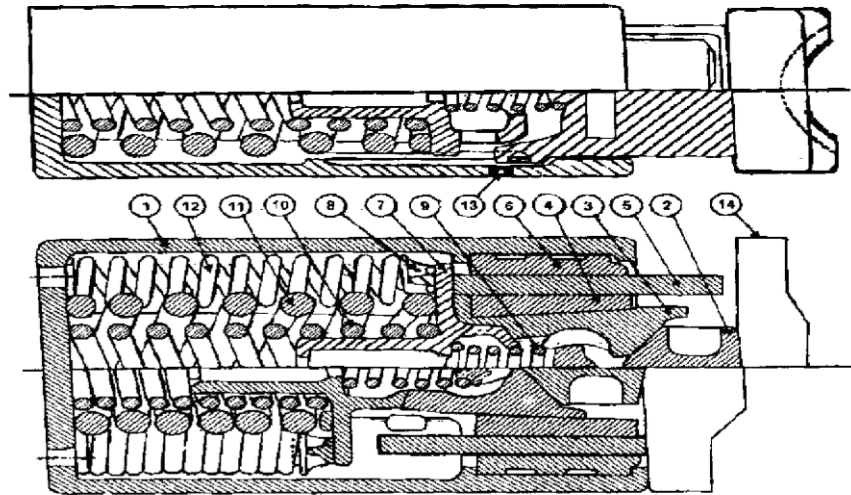
**LOCK LIFTING MECHANISM**



**YOKE PIN**



**YOKE**



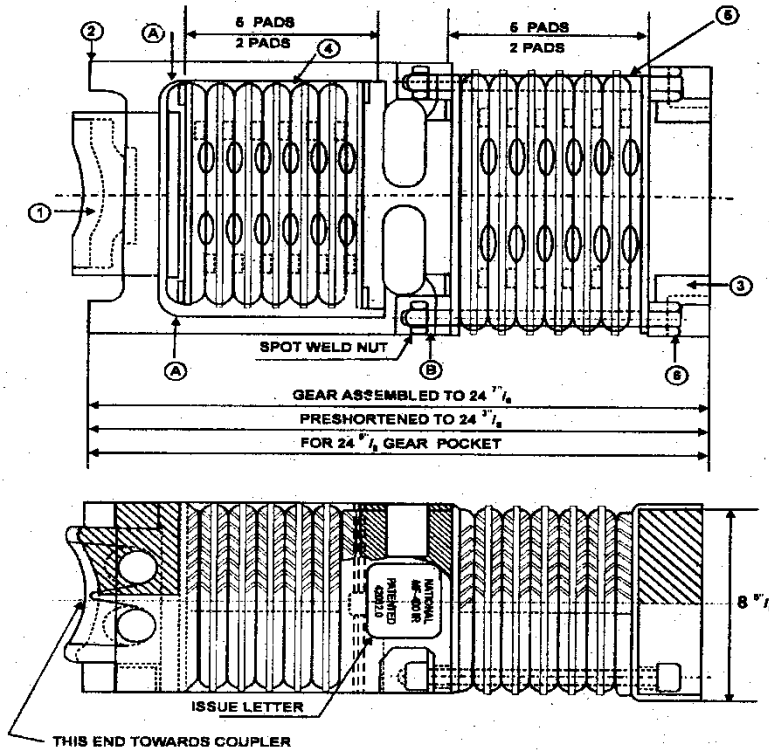
**Fig. 9.7: RELEASED DRAFT GEAR**

- |                             |                        |
|-----------------------------|------------------------|
| 1. HOUSING                  | 8. CORNER SPRING SEAT  |
| 2. CENTRE WEDGE COMPLETE    | 9. RELEASE SPRING      |
| 3. WEDGE SHOE COMPLETE      | 10. INNER COIL SPRING  |
| 4. TAPERED STATIONARY PLATE | 11. OUTER COIL SPRING  |
| 5. MOVABLE PLATE            | 12. CORNER COIL SPRING |
| 6. OUTER STATIONARY PLATE   | 13. SHORTING DEVICE    |
| 7. SPRING SEAT              | 14. FOLLOWER           |

**HIGH CAPACITY DRAFT GEAR**  
**MARK -50**

1. HOUSING
2. CENTER WEDGE COMPLETE
3. WEDGE SHOE COMPLETE
4. TAPERD STATIONARY PLATE
5. MOVABLE PLATE
6. OUTER STATIONARY PLATE
7. SPRING SEAT
8. CORNER SPRING SEAT
9. RELEASE SPRING
10. INNER COIL SPRING
11. OUTER COIL SPRING
12. CORNER COIL SPRING
13. SHORTING DIVICE
14. FOLLWER

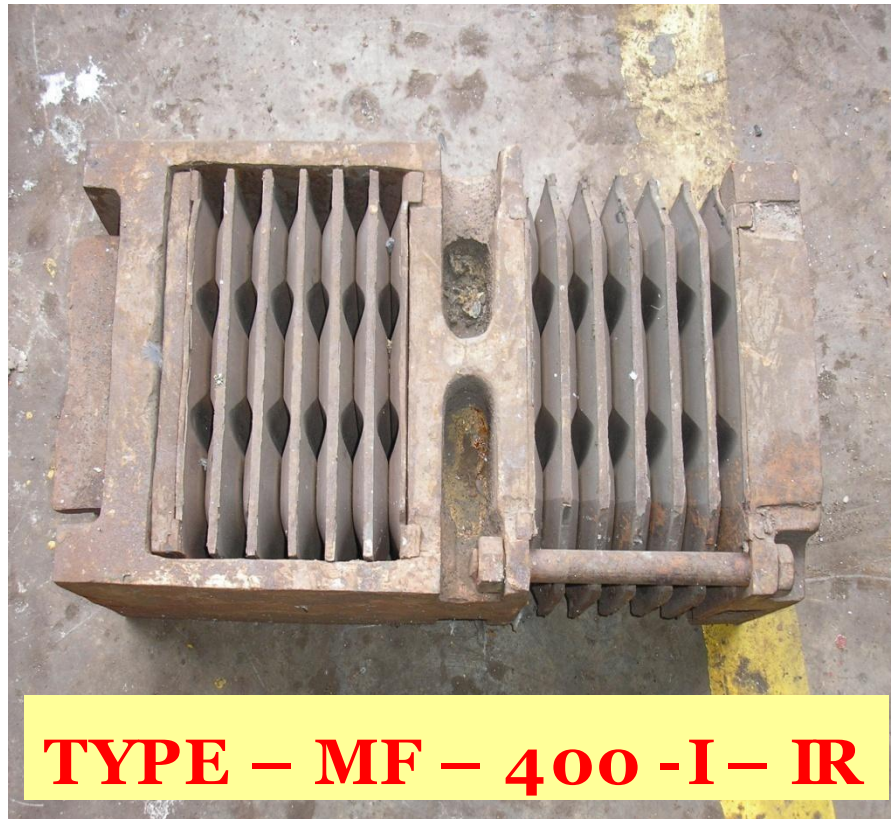
**DRAFT  
GEAR**



- TYPE - MF-400-HR**
1. FRONT FOLLOWER
  2. INTERMEDIATE FOLLOWER
  3. REAR FOLLOWER
  4. FRONT COVER
  5. REAR UNIT
  6. RETAINING BOLTS

# DRAFT

# GEAR



**TYPE - MF - 400 - I - IR**

**DRAFT GEAR**



**TYPE - HR - 40**

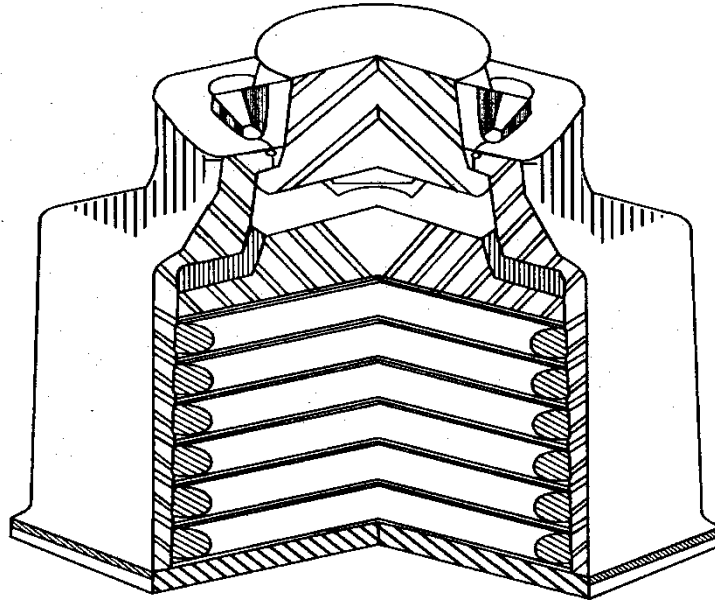
**DRAFT  
GEAR**





**TYPE – RF - 361**

**DRAFT GEAR**



**Fig. 9.6 : RF - 361 DRAFT GEAR**

**HIGH CAPACITY DRAFT GEAR RF-361**

**1.HOUSING**

**2.WEDGE**

**3.SHOES 3 NO'S**

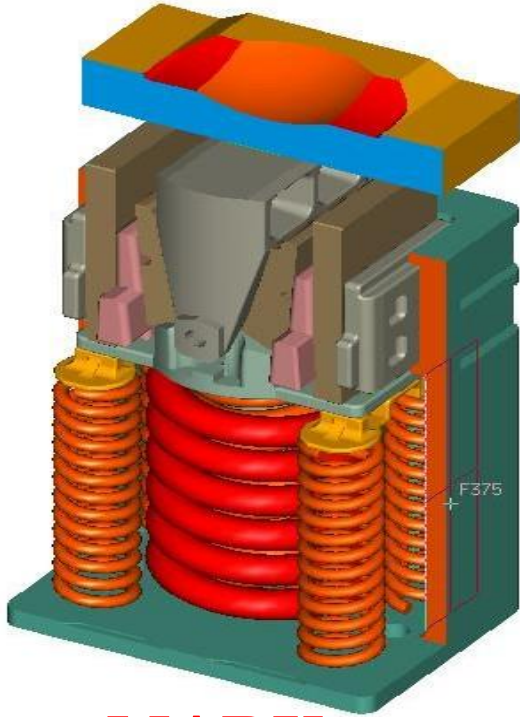
**4.BORE INSERTS**

**5.TOP FOLLOWER**

**6.RUBBER PADS(ELASTOMER UNIT)**

**7.REAR WELL PLATE**

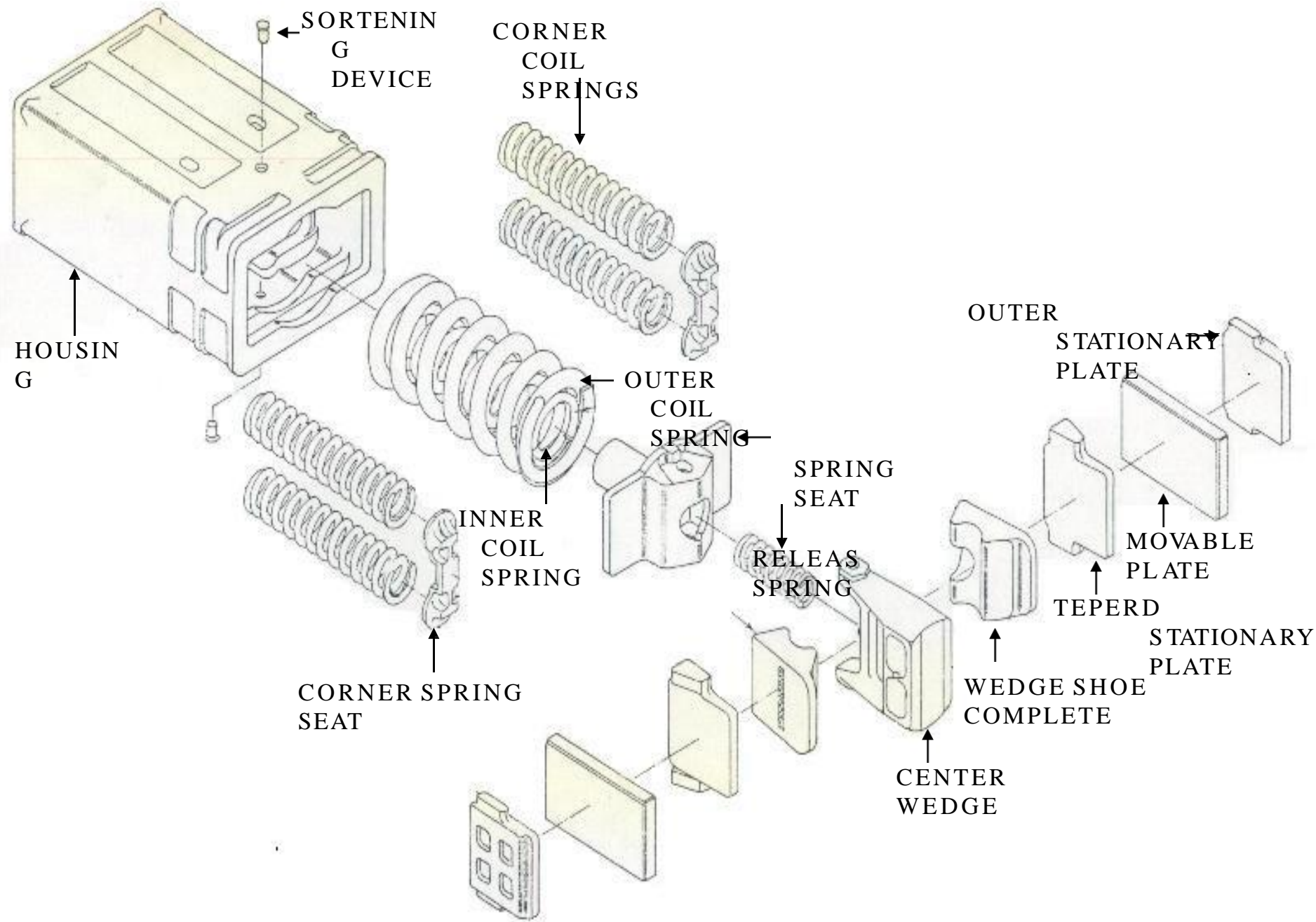
**DRAFT  
GEAR**



MARK -50



DRAFT  
GEAR

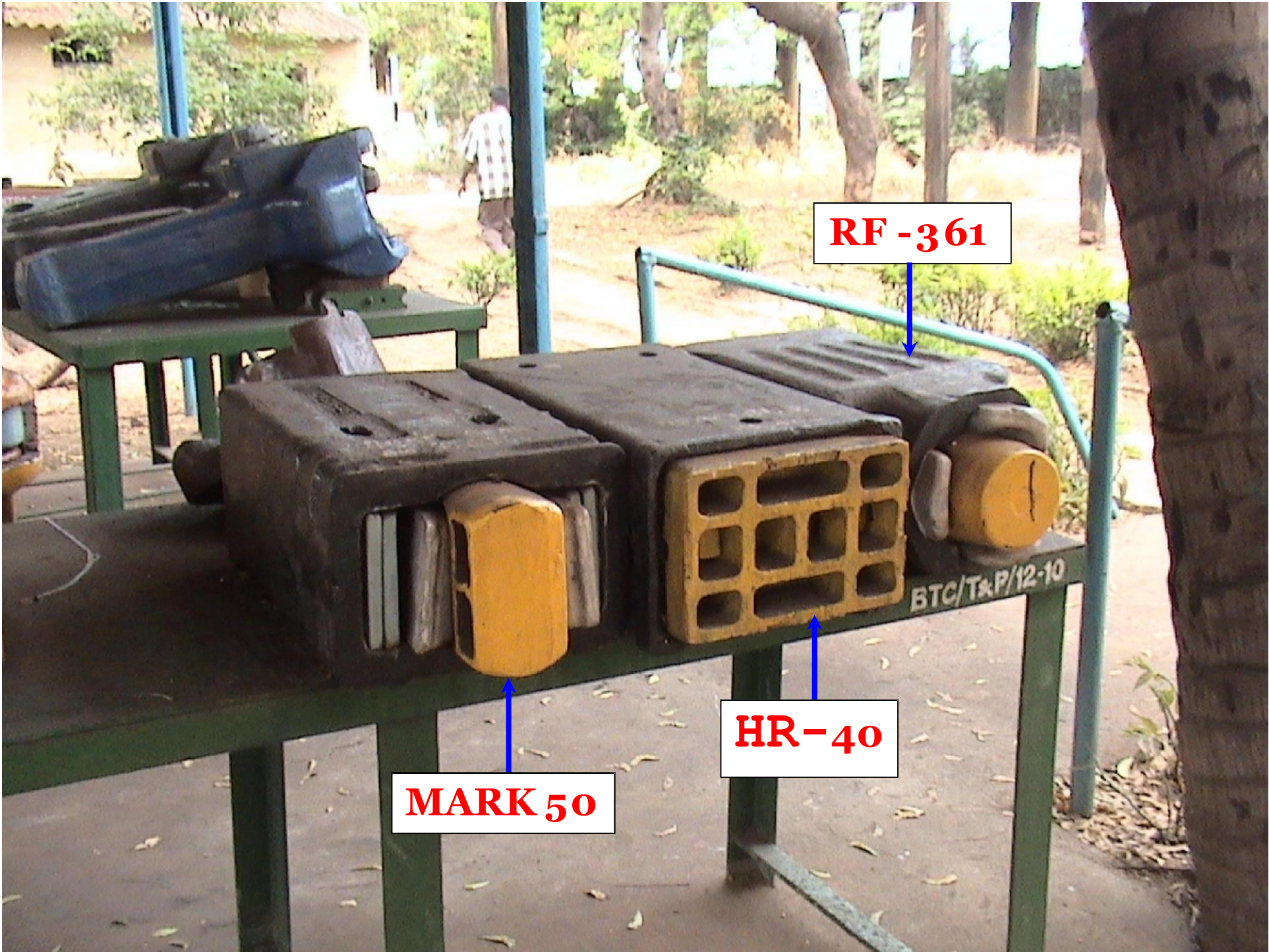


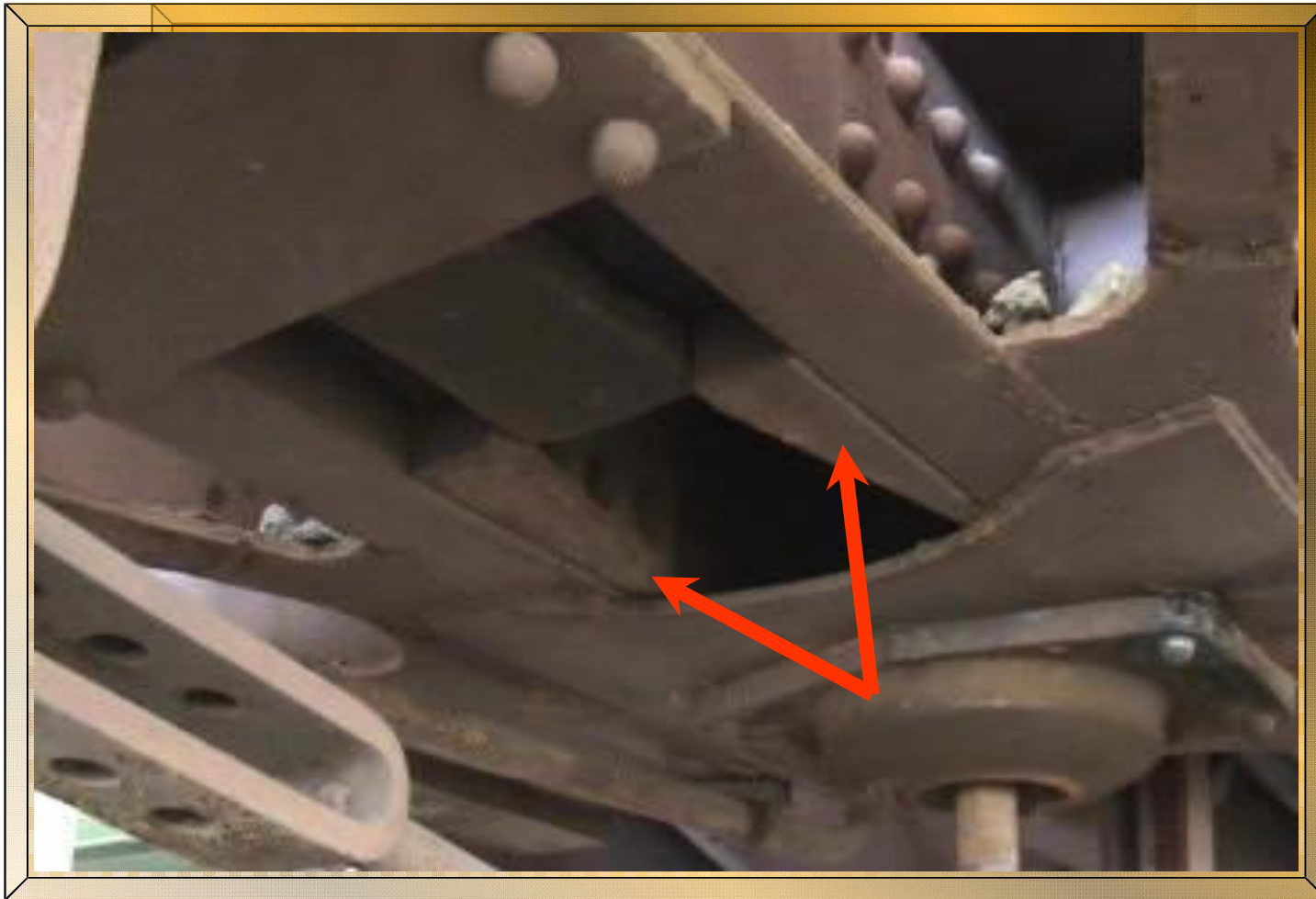
**RF - 361**

BTC/T&P/12-10

**HR-40**

**MARK 50**





**REAR  
STOPPER**

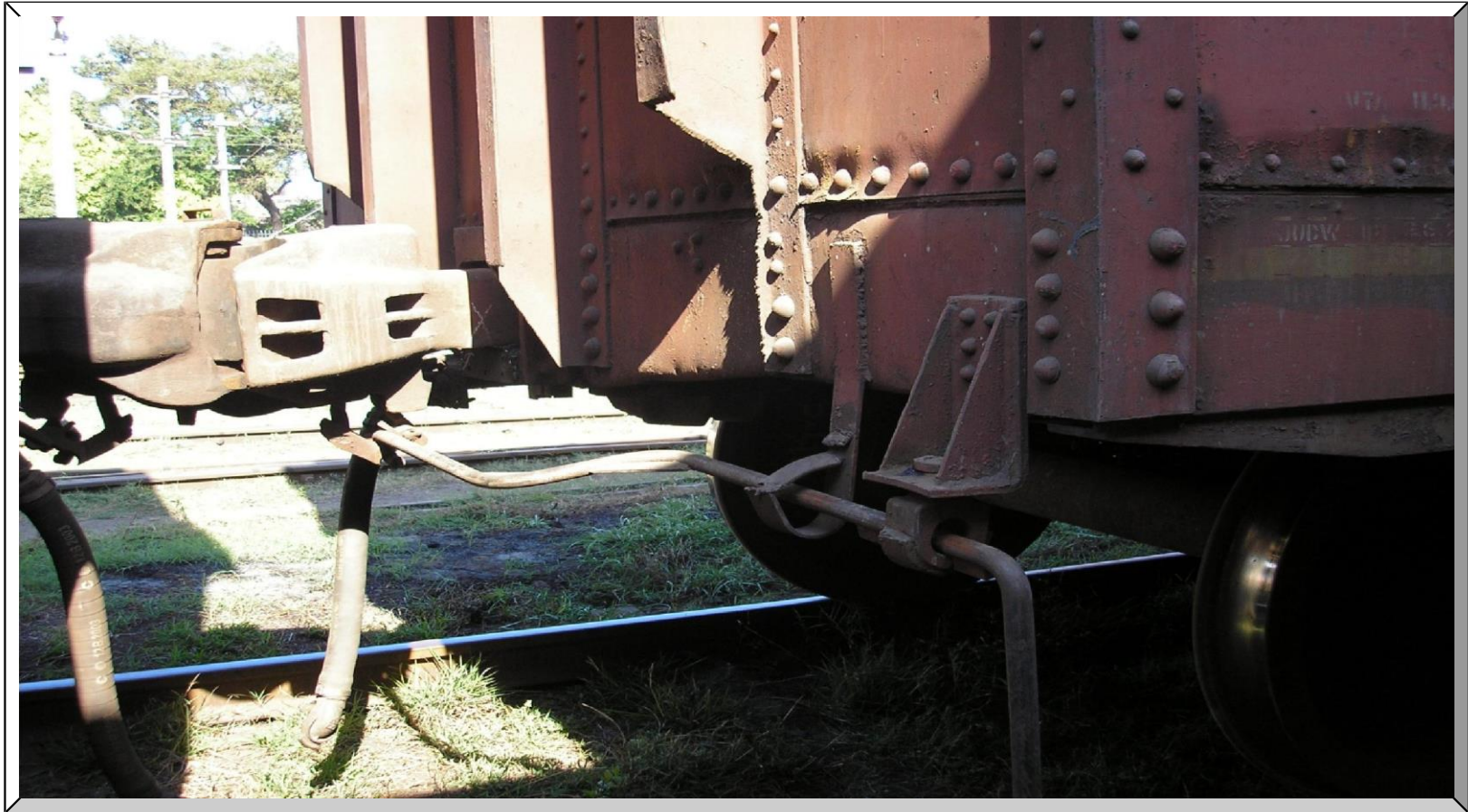


**STRIKER CASTING**

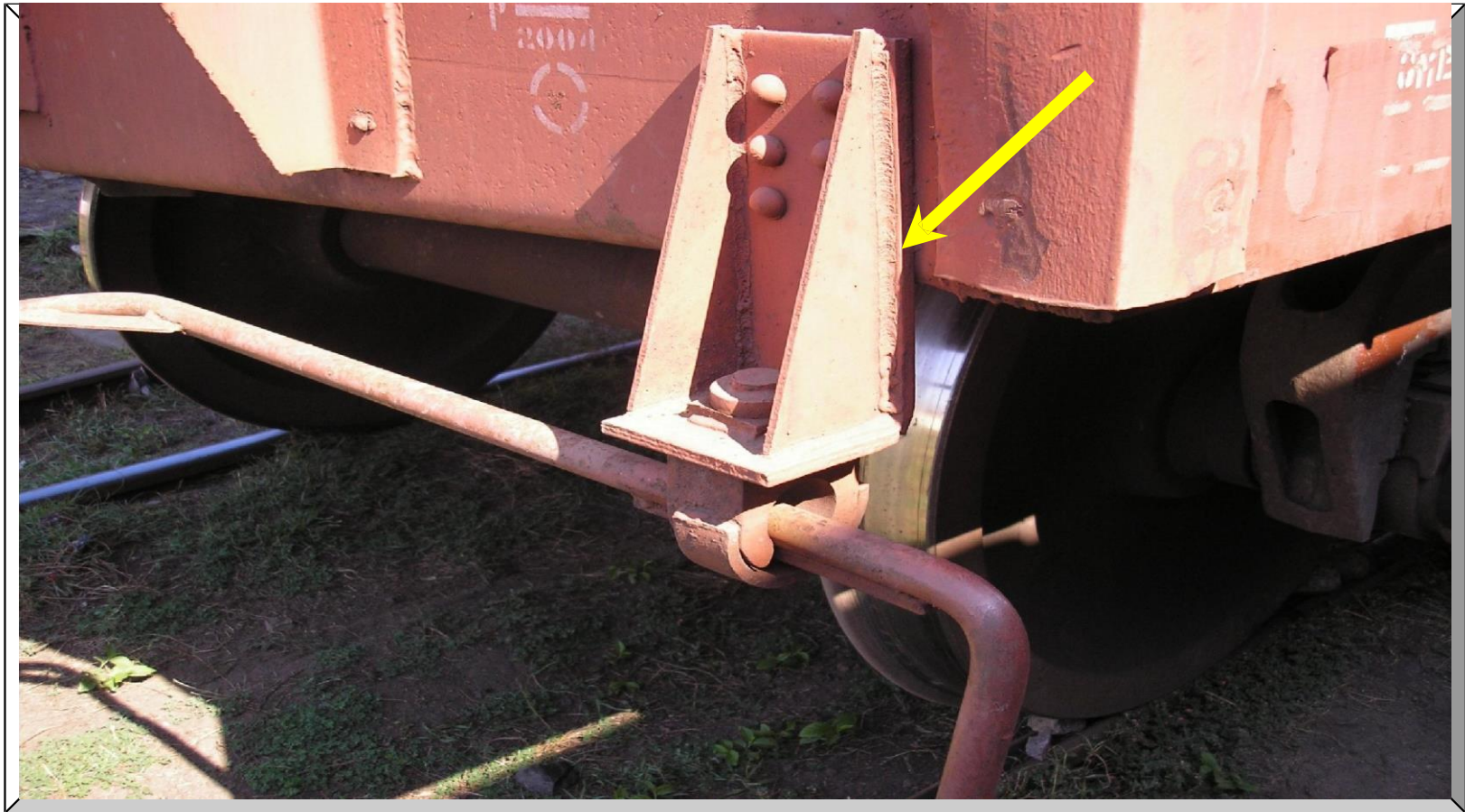


**STRIKER CASTING WEAR PLATE  
&  
SHANK WEAR PLATE**





**OPERATING  
LEVER**



**OPERATING LEVER SUPPORT BRACKET**



**YOKE SUPPORT PLATE**



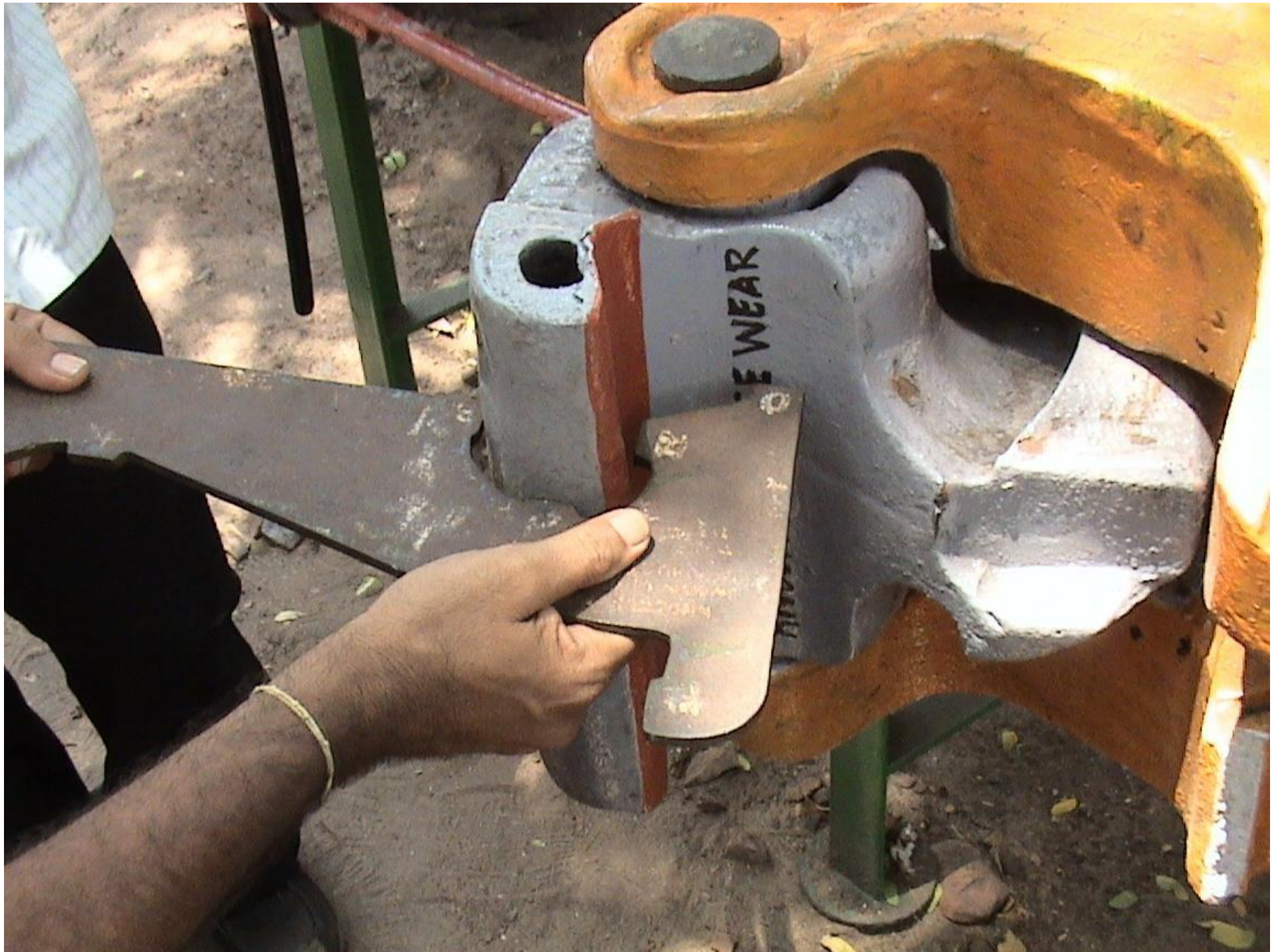
**YOKE PIN SUPPORT PLATE**

# DEFECTS IN CBC

## DEFECTS IN CBC\_

### 1. EXCESSIVE WEAR OF KNUCKLE NOSE

- Constant rubbing of locked knuckles.
- Breakage of knuckle nose on run.
- Check nose wear in sickline and  
Renew knuckle if necessary.







## 2. CRACKS ON COUPLER BODY

- Shunting of wagons with closed knuckles.
- Breakage of coupler body on run.
- Check for cracks and breakage.





Handwritten text on a white tag, possibly identifying the object as a mold or a specific piece of pottery.











### **3. EXPANSION OF GUARD ARM**

- **Shunting of wagons with closed Knuckles.**
- **Disengagement of locked Knuckles on run, mainly on curves.**
- **Check after applying gauge.**







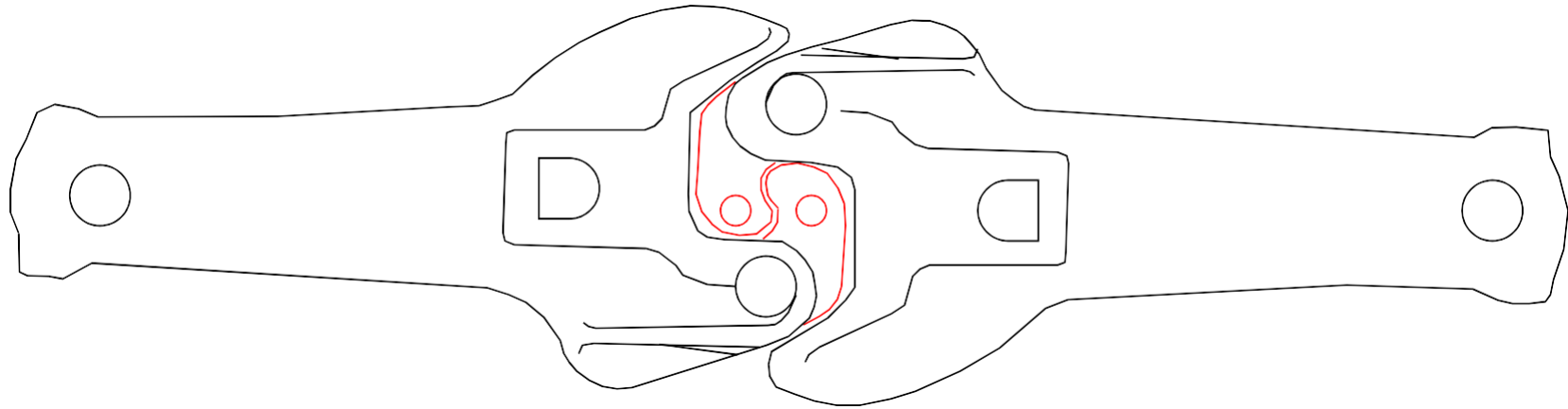




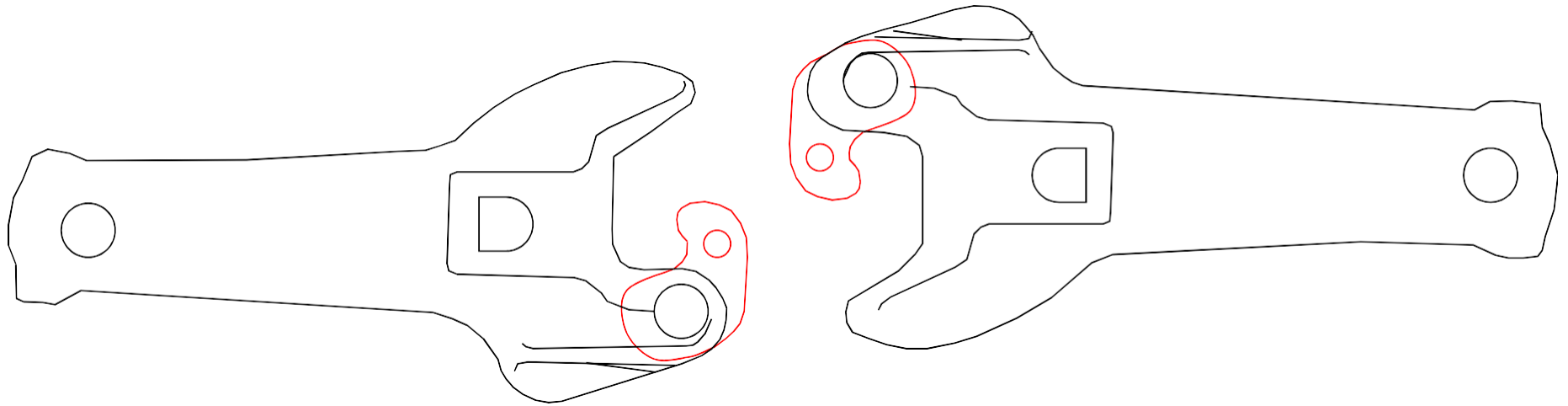
CBC  
GUARD ARM  
EXPANSION

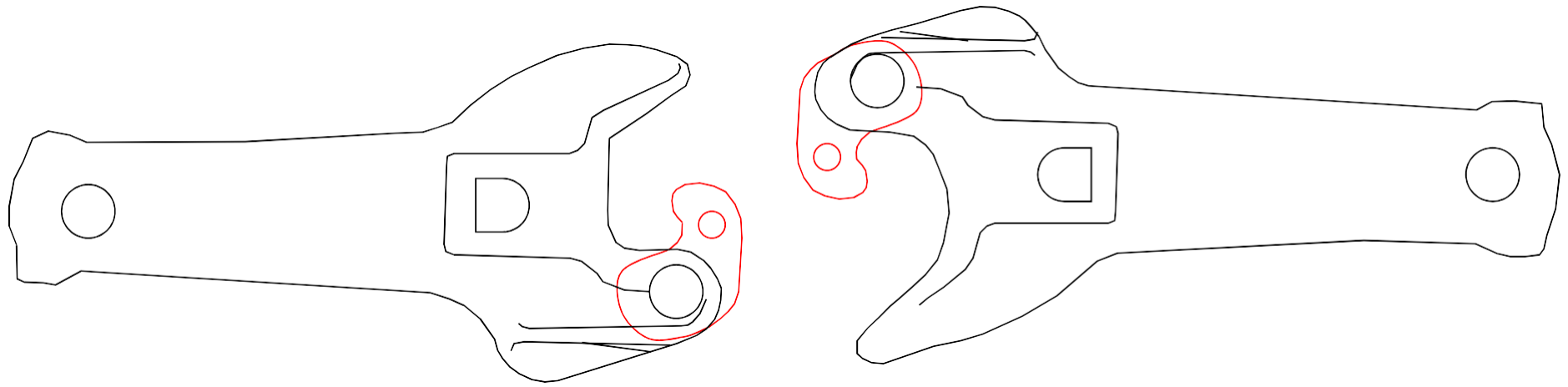


# WHEN GUARD ARM IS IN GOOD CONDITION



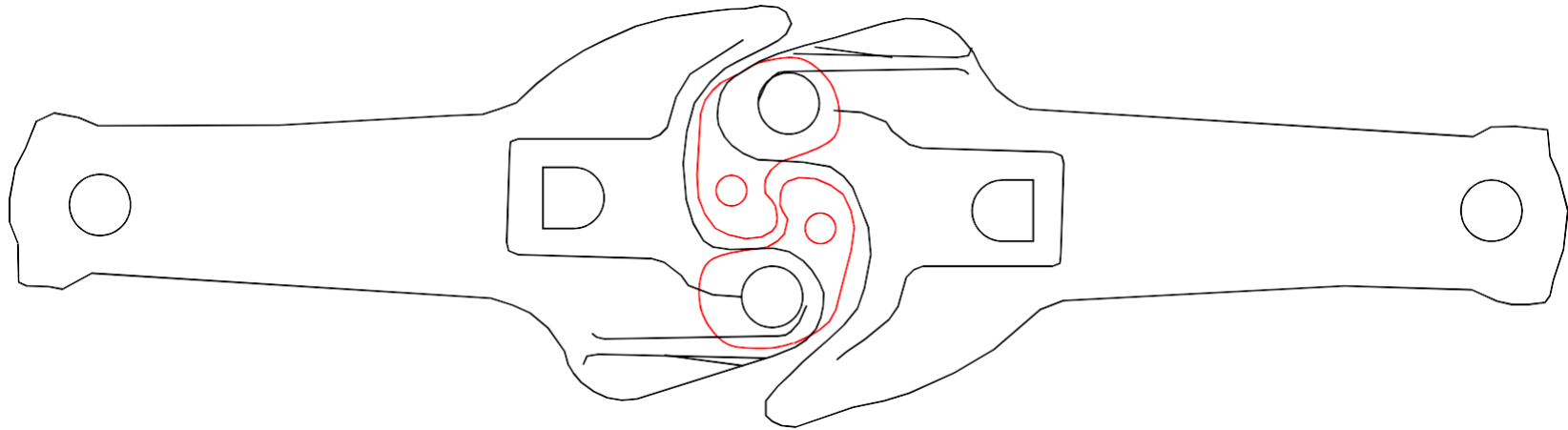
# GUARD ARM EXPANSION



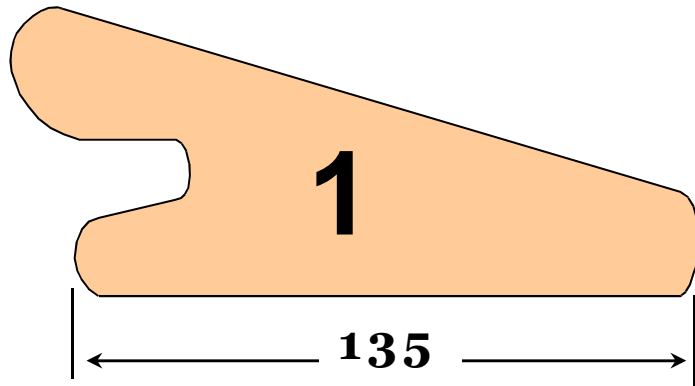


GUARD ARM EXPANDED

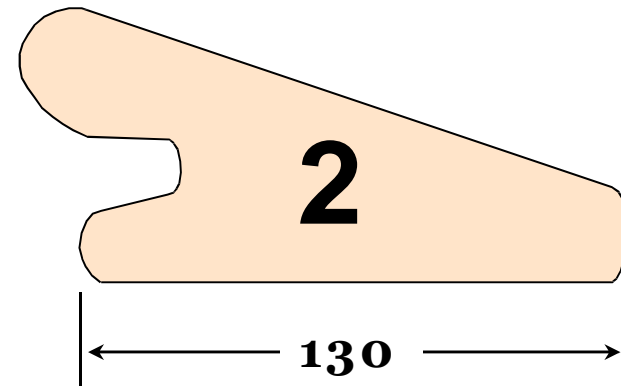
# **DISENGAGEMENT OF LOCKED KNUCKLES**



**GUARD ARM EXPANSION TO BE**  
**CHECKED**                      USING  
CONTOUR WEAR LIMIT  
GAUGE



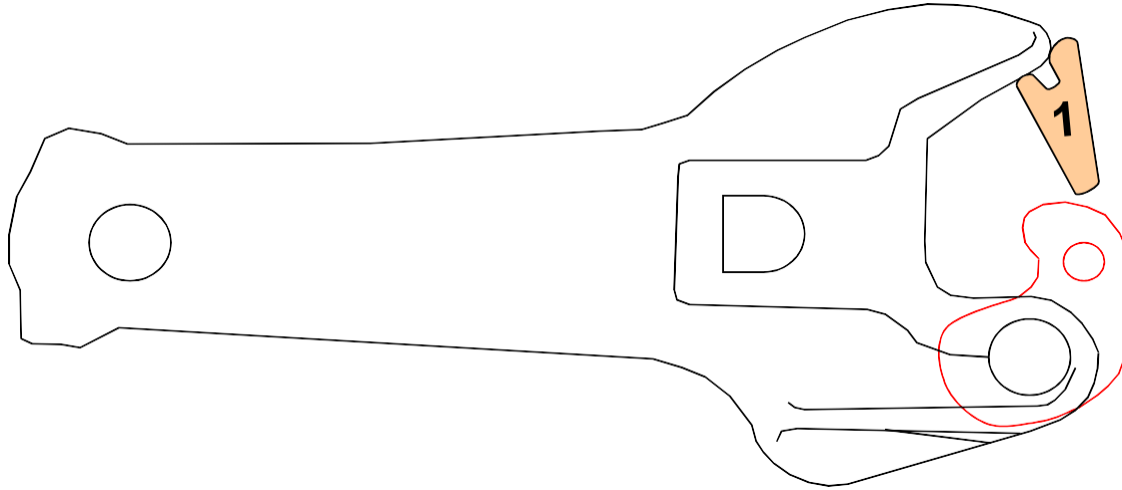
**GAUGE NO 1**



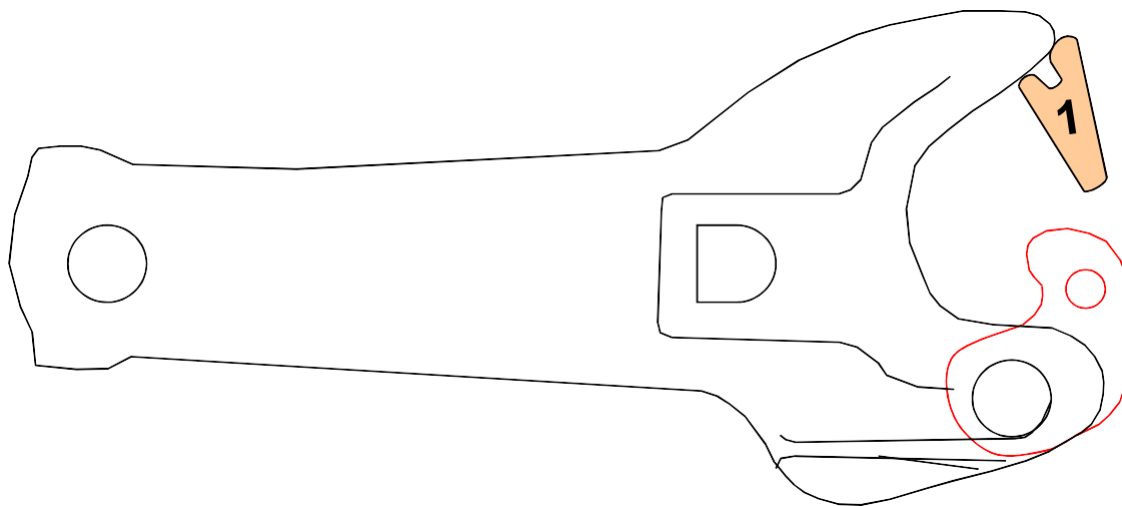
**GAUGE NO 2**



## METHOD OF GAUGE APPLICATION



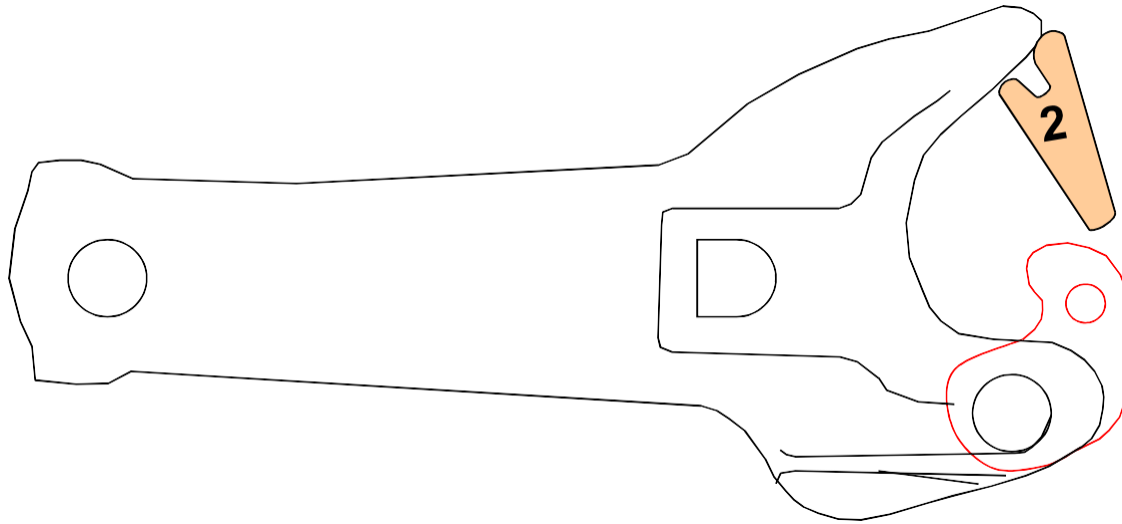
**APPLY GAUGE NO 1**



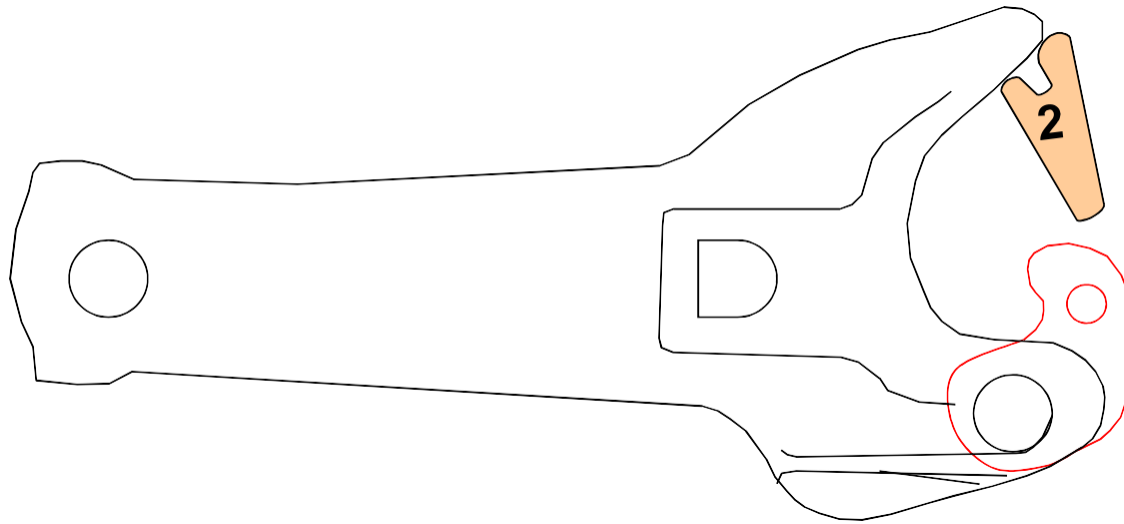
**IF IT PASSES**

**RENEW**

- ✓ **KNUCKLE**
- ✓ **KNUCKLE PIN**
- ✓ **LOCK**



**APPLY GAUGE NO 2**



**IF IT PASSES**

**INDICATES EXPANSION  
OF THE GUARD ARM.  
REPLACE THE CBC**

## 4. IMPROPER

### LOCKING OR

### PARTIAL LOCKING

- Improper coupling
- Defective lock
- Defective lock lifting mechanism
- Twisting of lock

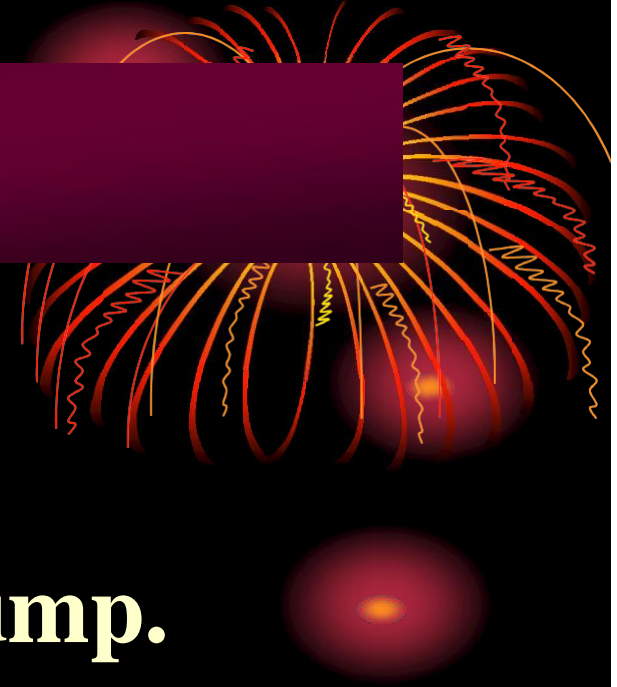
Causes Lifting of lock automatically

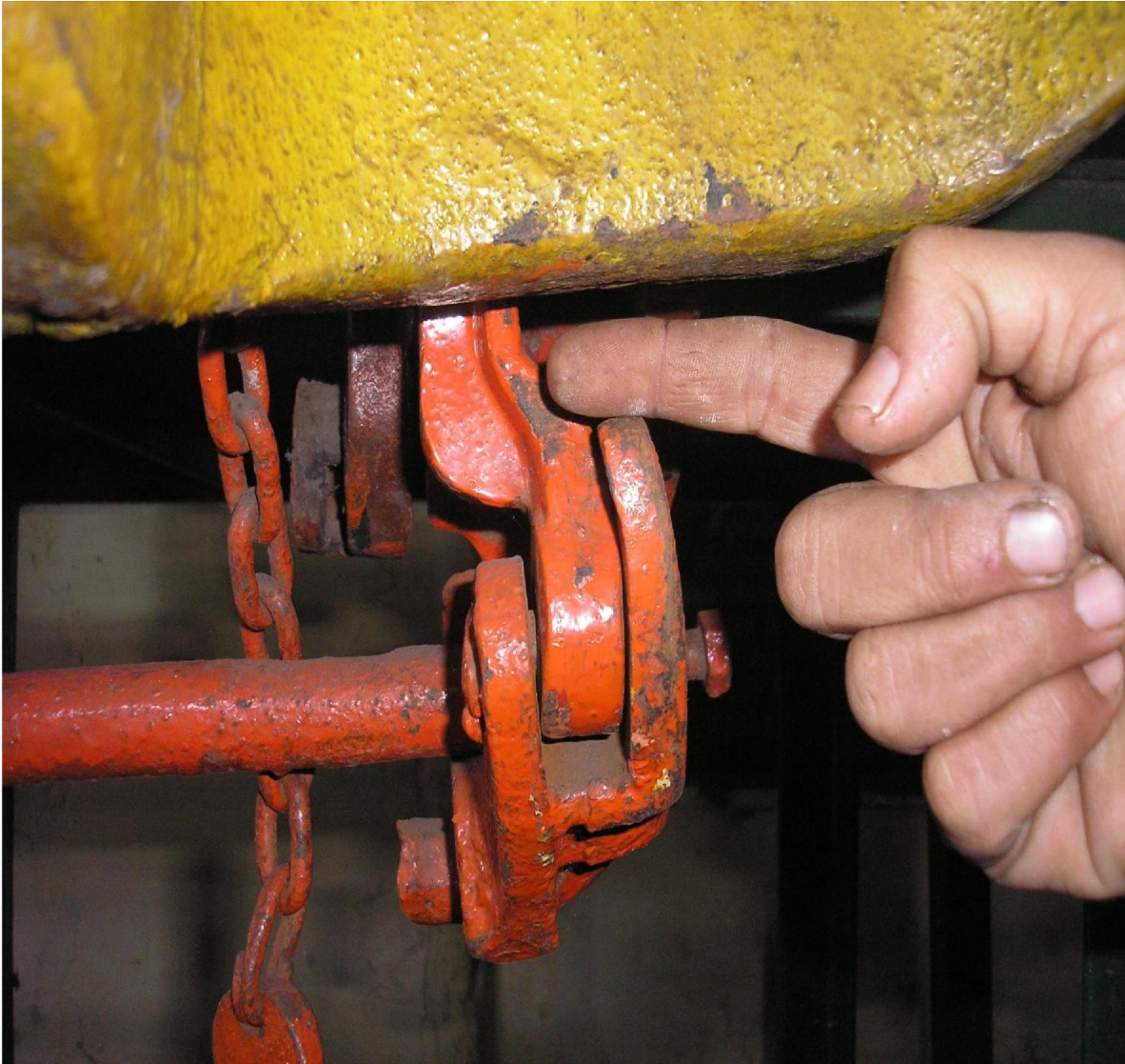
on run.

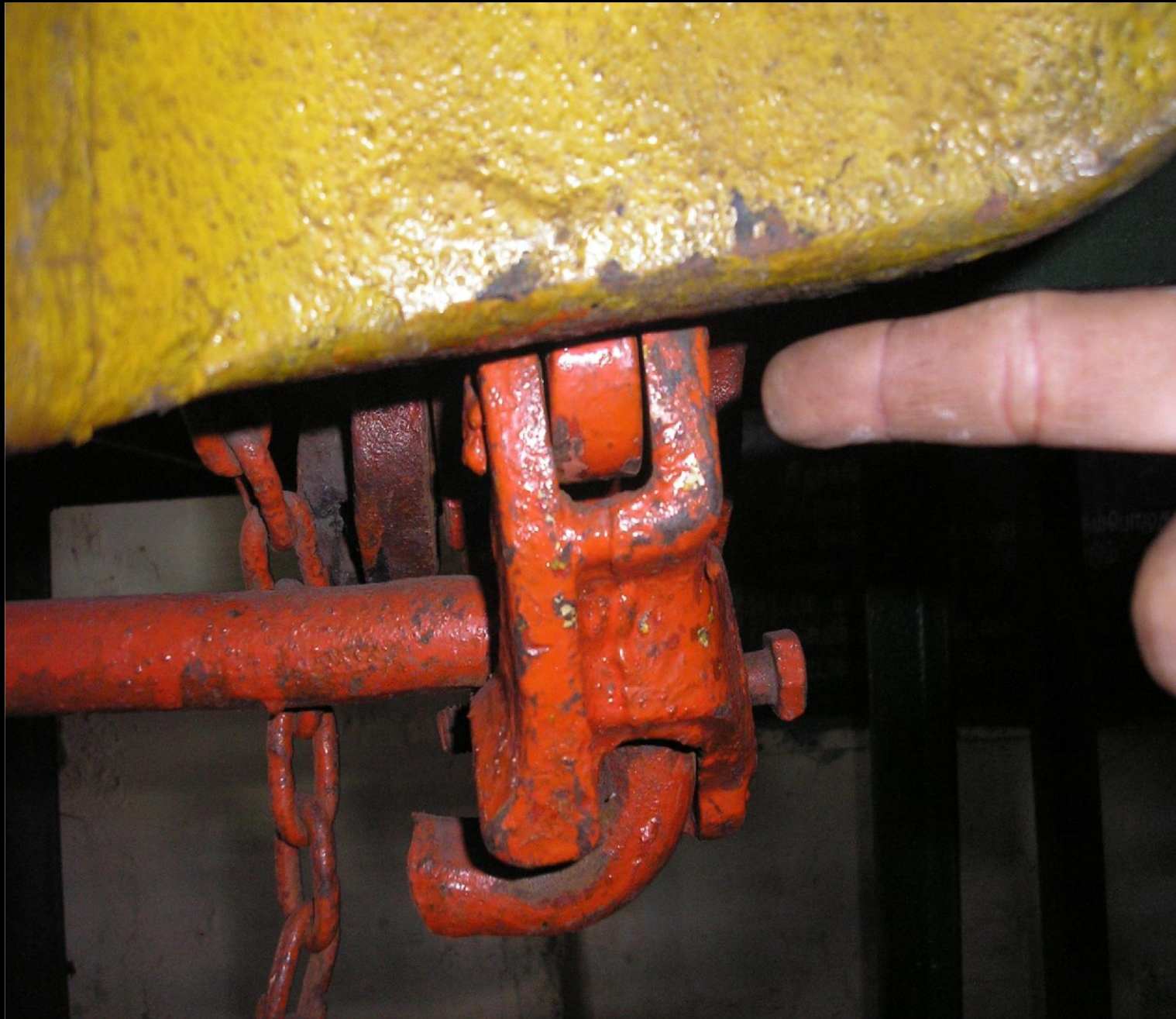
## 4. IMPROPER LOCKING OR

### PARTIAL LOCKING OF KNUCKLES

- Couple wagon with light bump.
- Push back formation for half a wagon Length.
- pull the formation.







## 5. EXCESSIVE BUFFER DROOPING

- Excessive wear on
  - coupler shank
  - Shank wear.
  - Striker casting wear plate
  - plate Yoke pin
  - Yoke pin holes
  - Breakage of striker casting bottom piece.

## 5. EXCESSIVE BUFFER DROOPING

- **Excessive variation in buffer heights mainly between loaded & empty wagon.**
- **Renew the wear plate.**





## **6. EXCESSIVE WEAR OF YOKE PIN SUPPORT PLATE**

- ◆ **Constant rubbing of yoke pin**
- ◆ **Causes dropping of yoke pin through the Worn holes.**



**YOKE PIN SUPPORT  
PLATE**



## **7. DROPPING OF YOKE PIN SUPPORT PLATE**

- **Breakage of rivets.**
- **Working out of nuts.**
- **Dropping of yoke pin on  
run.**
- **Tighten the nuts and tack  
weld**







## **8. BREAKAGE OF REAR STOPPER**

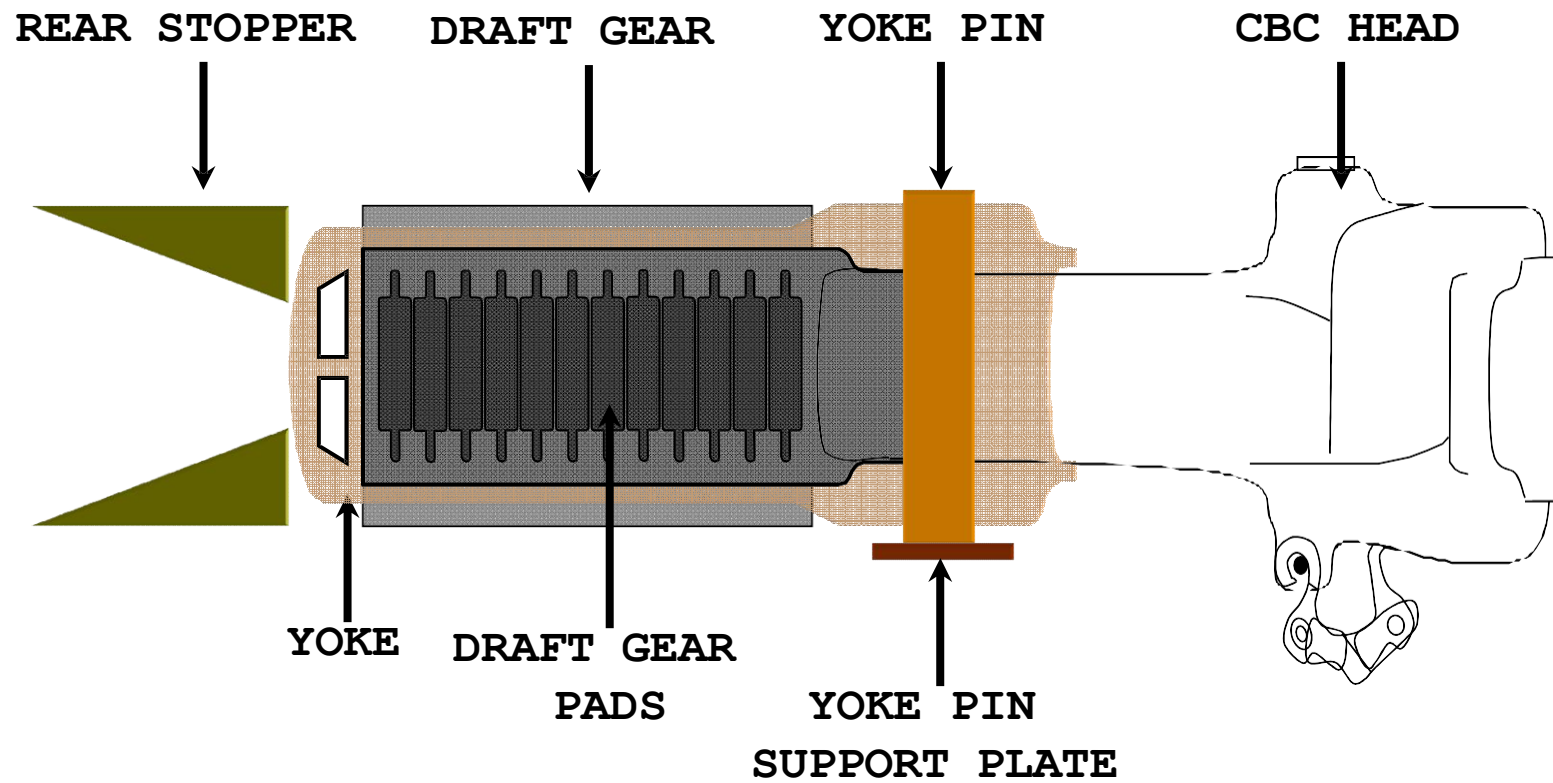
- ▶ **Heavy shunting**
- ▶ **impact Dropping of  
yoke pin  
(yoke pin coming out of support  
plate on run)**



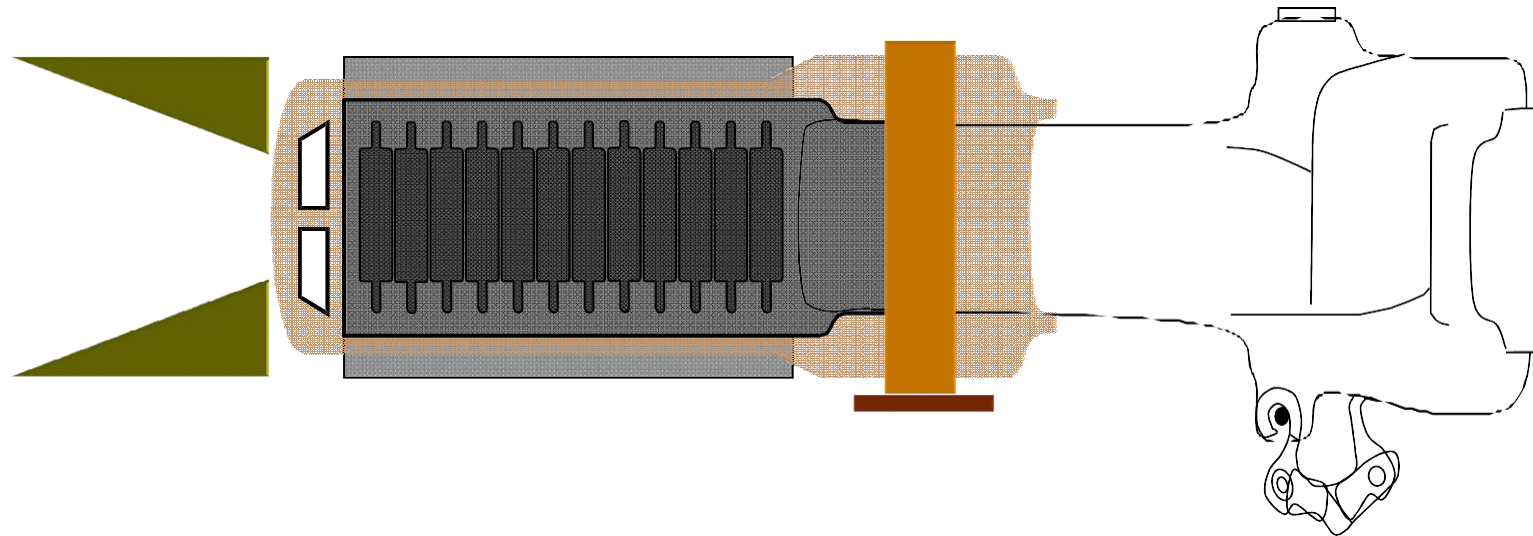
## **8. BREAKAGE OF REAR STOPPER**

### **Check for**

- Damages, missing or broken**
- Renew or replace if necessary check for excessive free slack.**



# REAR STOPPER BREAKAGE





CBC WITH REAR STOPPER



RIVETS SHEARED - OFF & REAR STOPPER MISSING

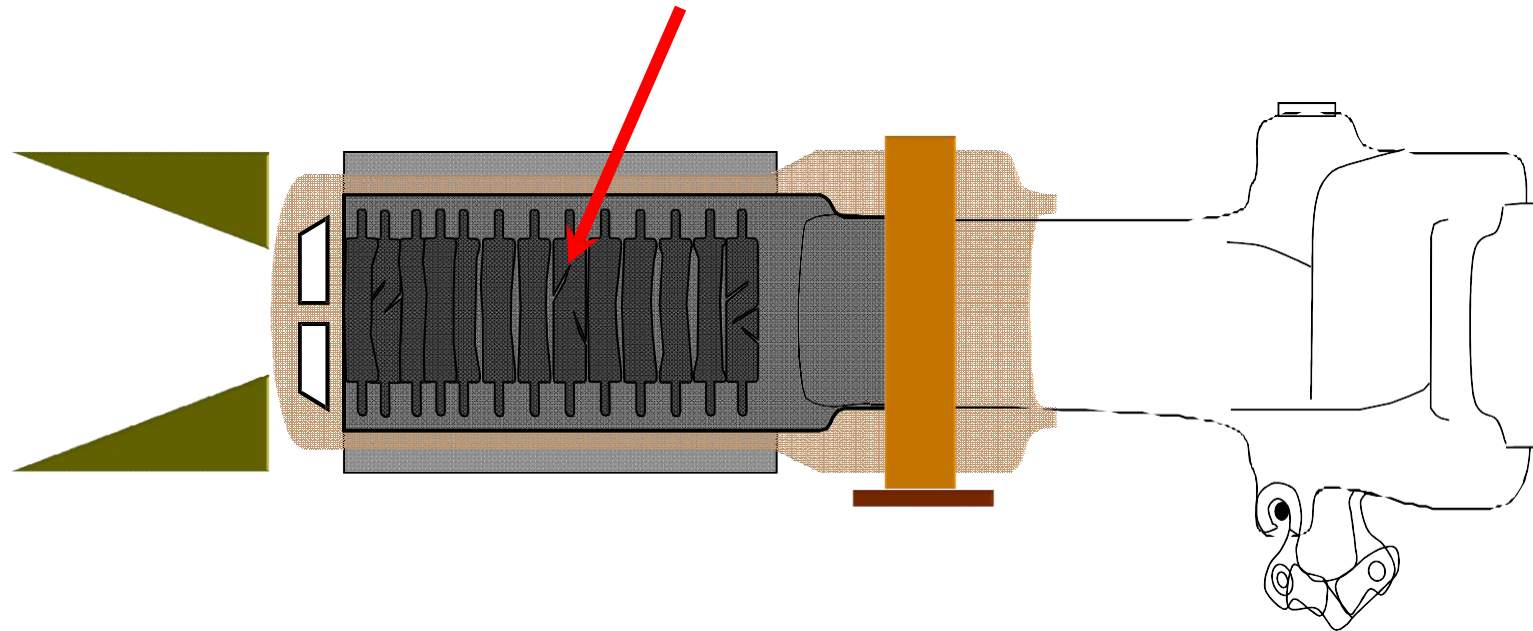
## DRAFT GEAR COMPONENTS

- Heavy shunting impact
- Dropping of yoke pin  
(yoke pin comes out of support plate  
on run)

### Check for

- Damaged pads
- Broken draft gear components

# DRAFT GEAR PADS DAMAGED











**DRAFT  
GEAR BODY  
BROKEN**

## 10. BREAKAGE OF YOKE

- **Excessive wear on yoke.**
- **Heavy draft on pulling**
- **forces. Causes dropping of yoke pin.**

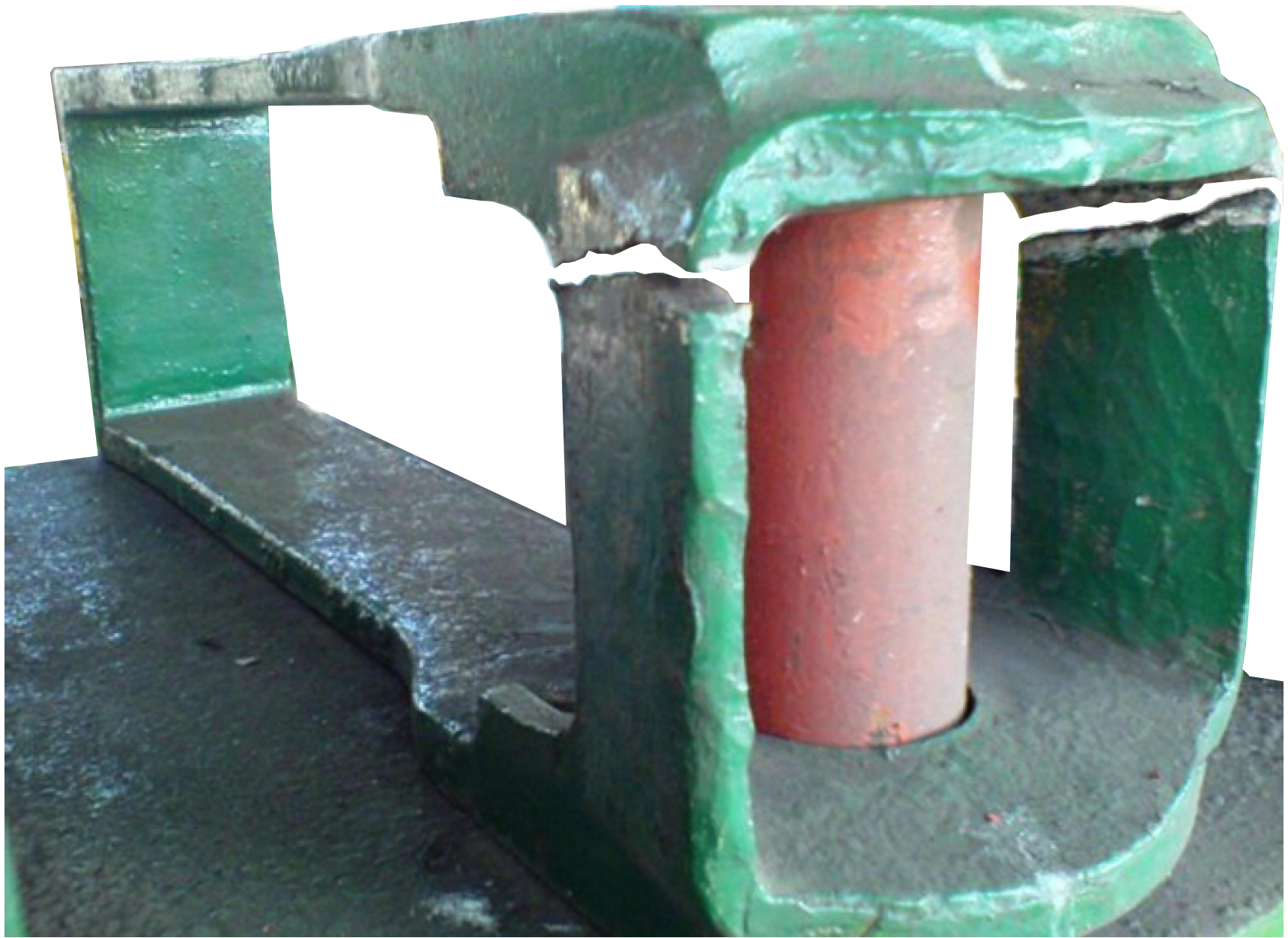
### Check for

- **Cracks or breakage mainly during ROH/POH.**

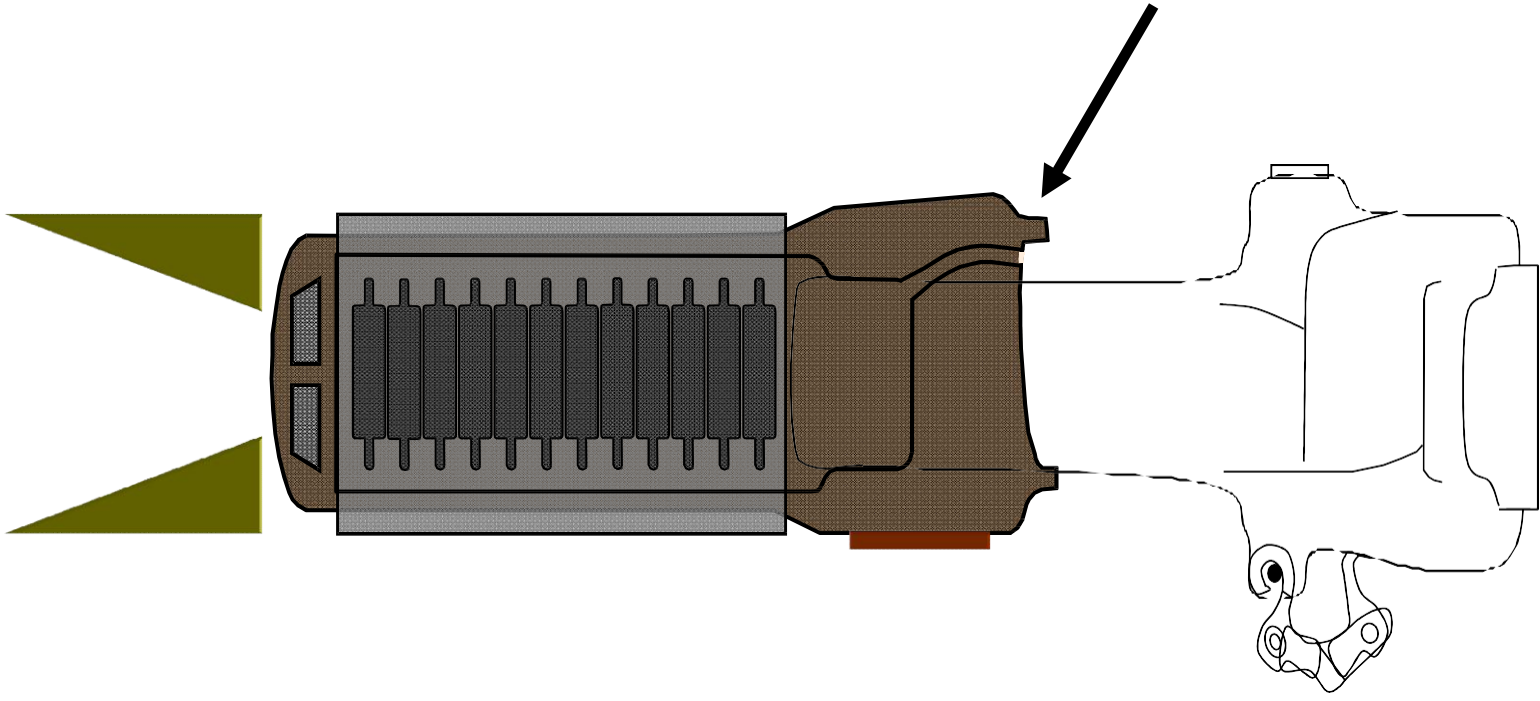
# YOKE BROKEN







# YOKE BROKEN



# 11. DEFICIENCY OF LOCK LIFTING COMPONENTS

- **Breakage of**
- **components. Deliberate**
- **removal.**
- **Lifting of lock on run due**
- **to sudden jerks.**
- **Never allow the wagon with**
- **lock**
- **lifting assembly missing.**



## 12. EXCESSIVE WEAR ON LOCK SIDES OR LOCK FACE OF KNUCKLE



## 12. EXCESSIVE WEAR ON LOCK SIDES OR LOCK FACE OF KNUCKLE

- **Ensure proper checking of lock**
- **Replace knuckle for wear and replace if necessary during ROH/POH.**



## **13. ELONGATION OF KNUCKLE ON NOSE END**

- **Constant draft forces acting on knuckle.**
- **Disengagement of locked knuckles.**
- **Check for elongation of knuckle nose using gauge during ROH.**





HANDLE SKECH GAUGE &  
NOSE WEAR GAUGE

91

10

## **14. ANTI CREEP MECHANISM**

**Even if all the CBC in good condition, due to oscillation the lock along with lifting assembly may get lifted automatically on run.**

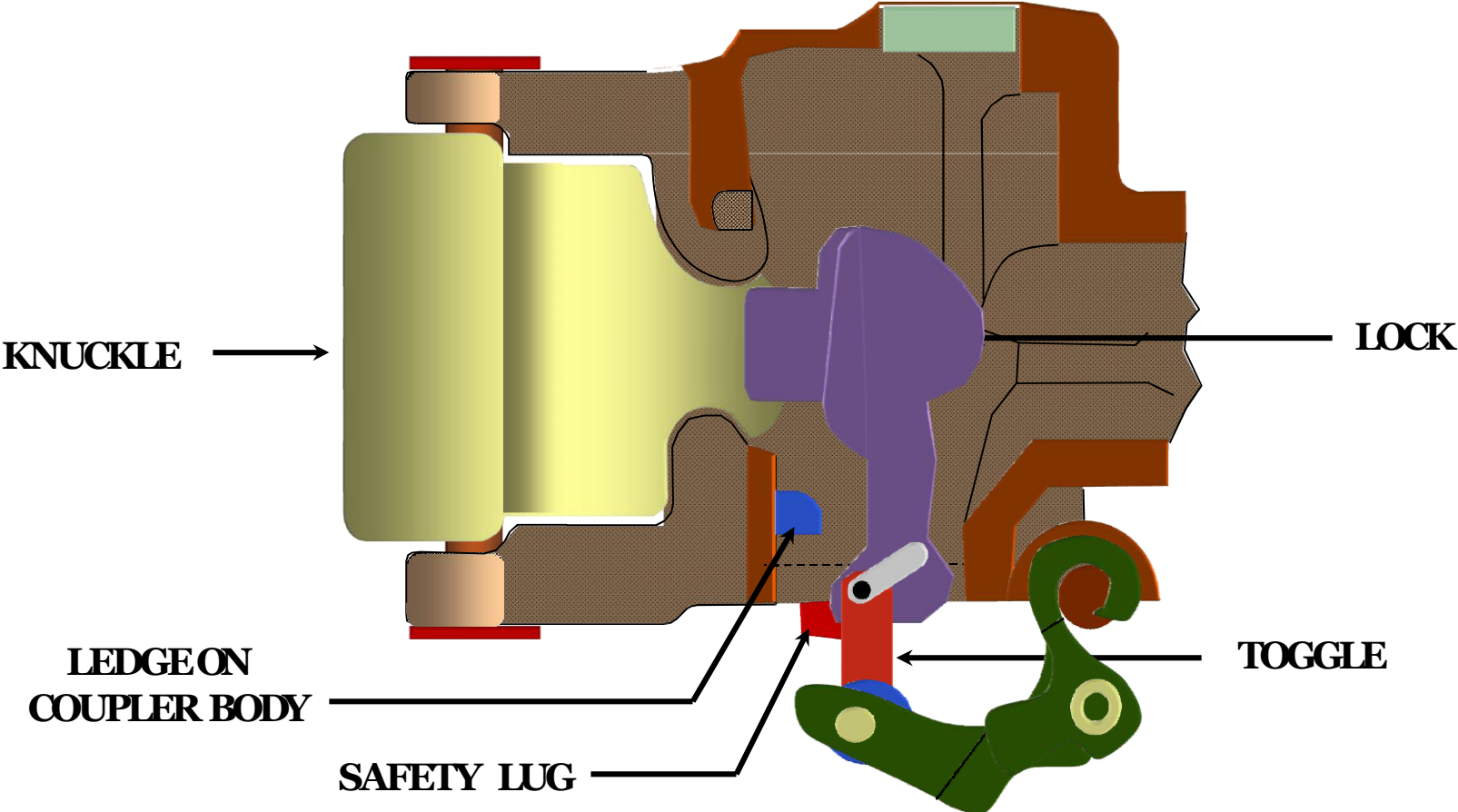
**The anticreep mechanism consists of Anticreep lug in side the coupler head And the toggle.**

## **MAIN REASON FOR IN EFFECTIVE ANTICREEP**

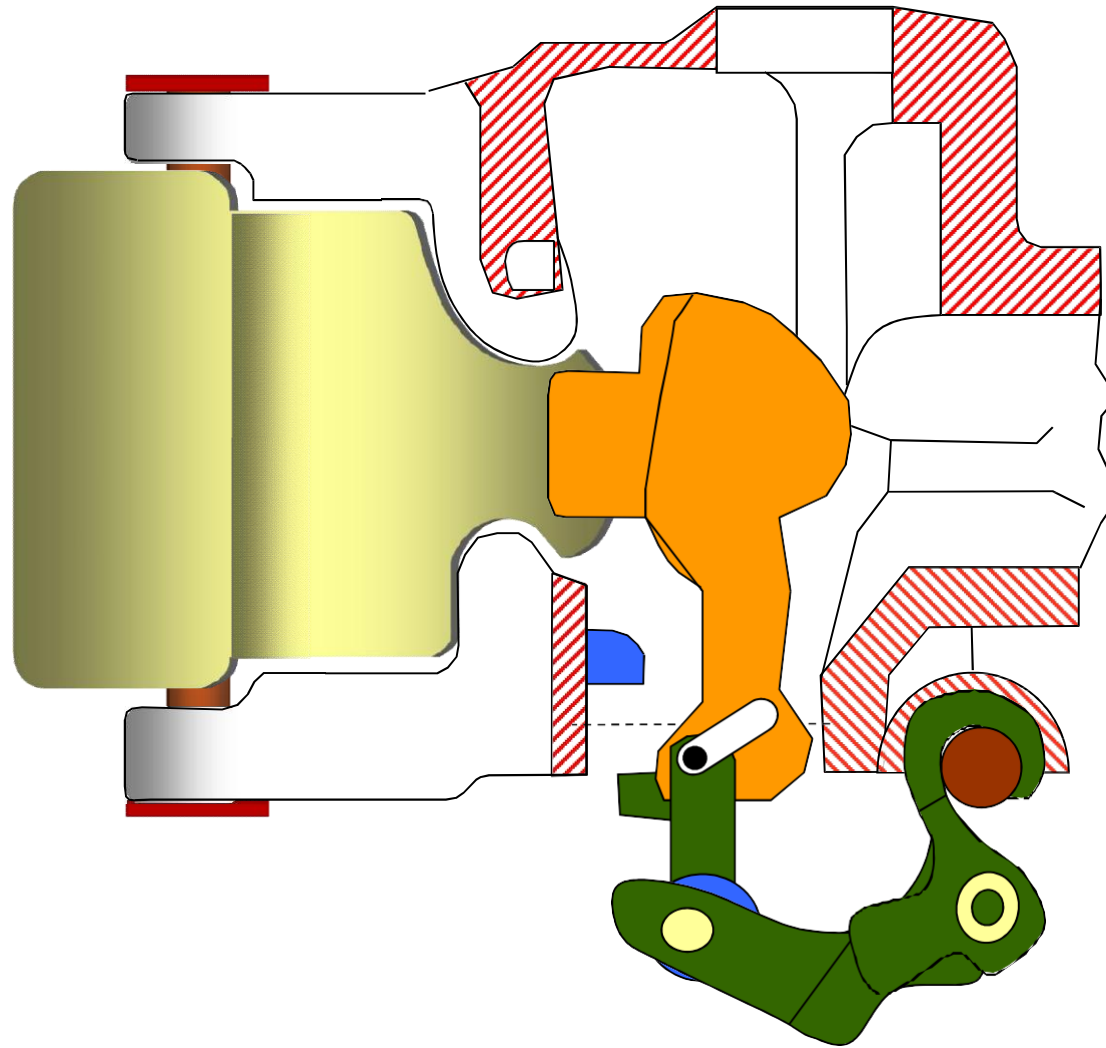
- 1. BROKEN OR WORN OUT ANTICREEP LUG.**
- 2. BROKEN OR WORN OUT SAFETY LUG OF TOGGLE.**



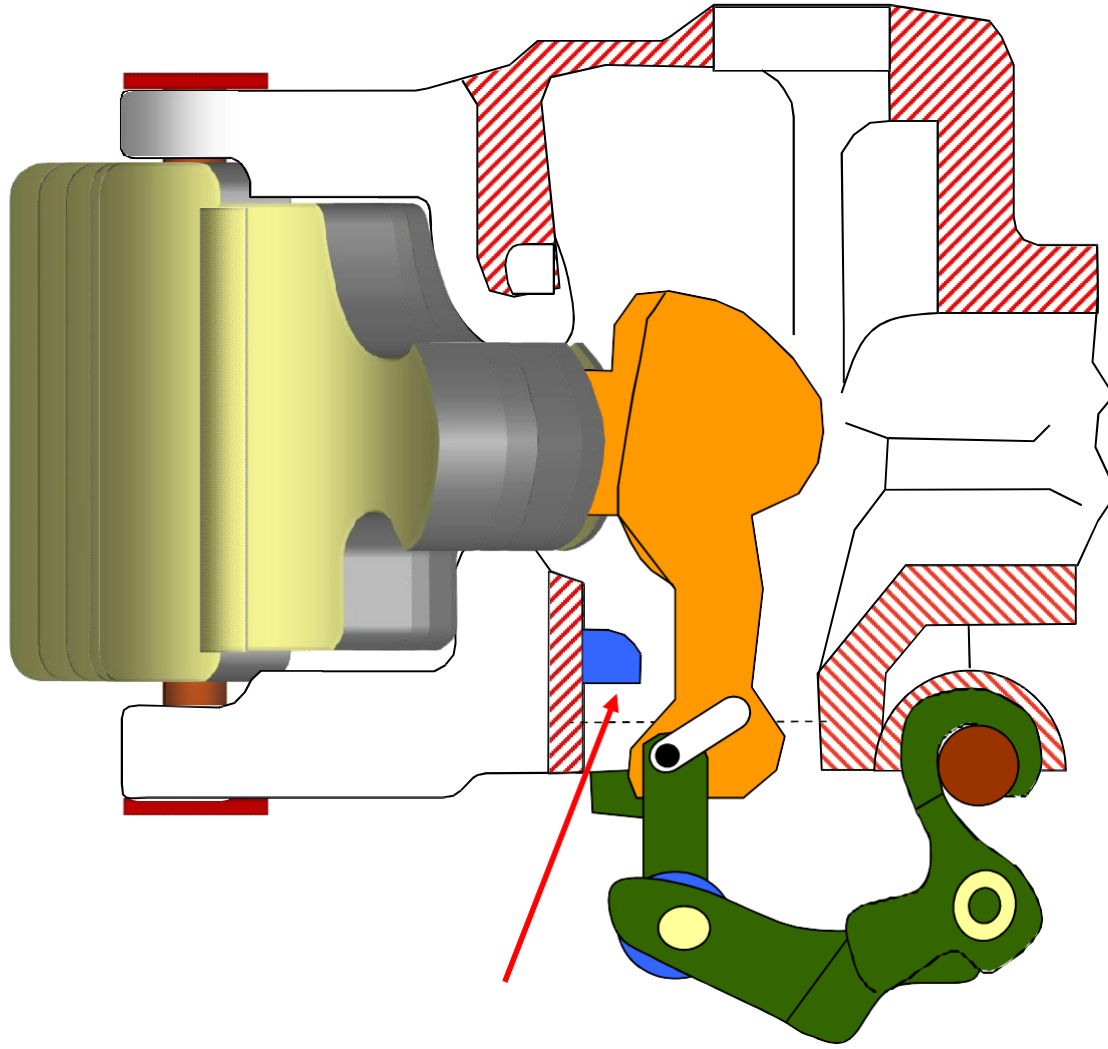
# PARTS OF ANTICREEP MACHANISM



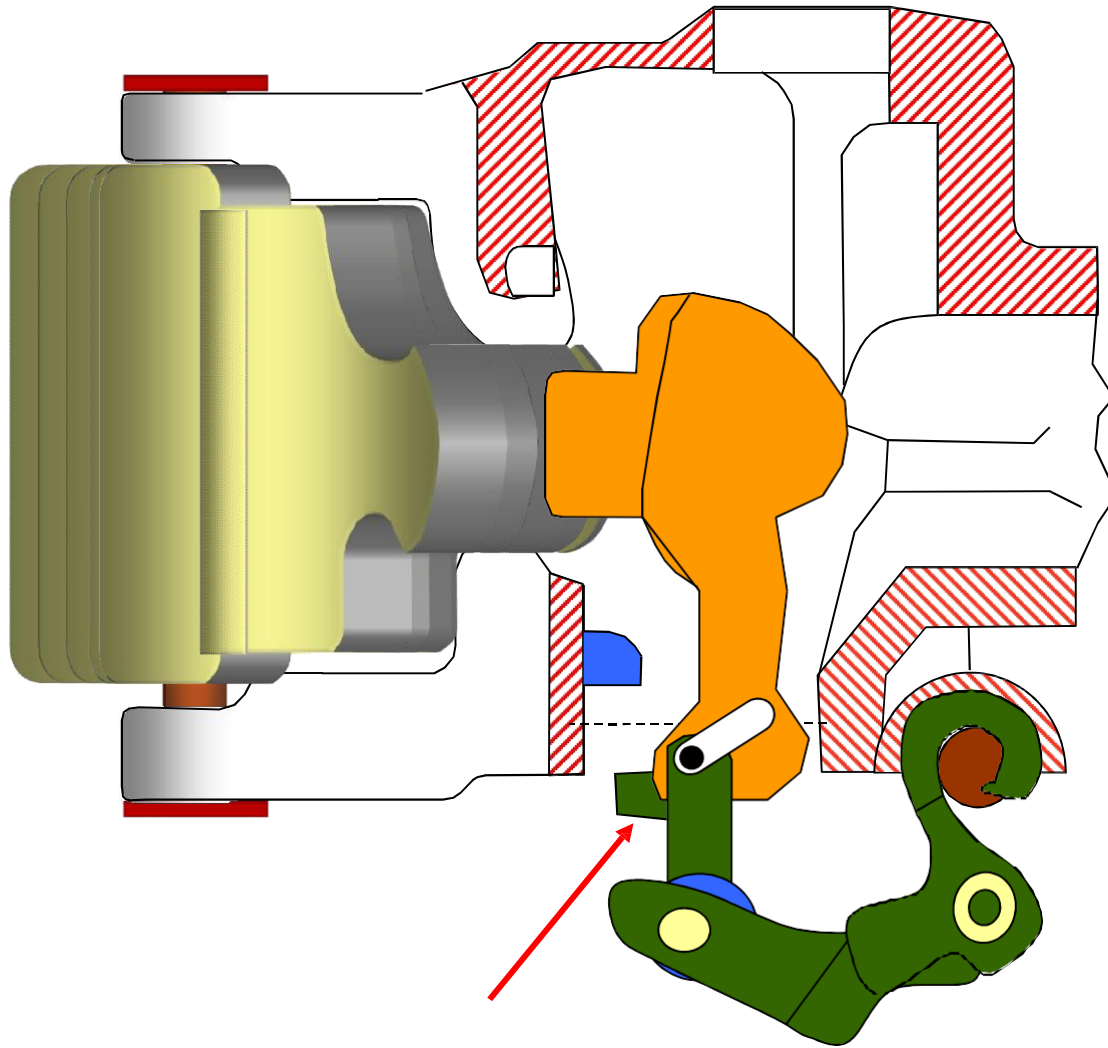
# **FUNCTIONING OF ANTI CREEP MECHANISM**



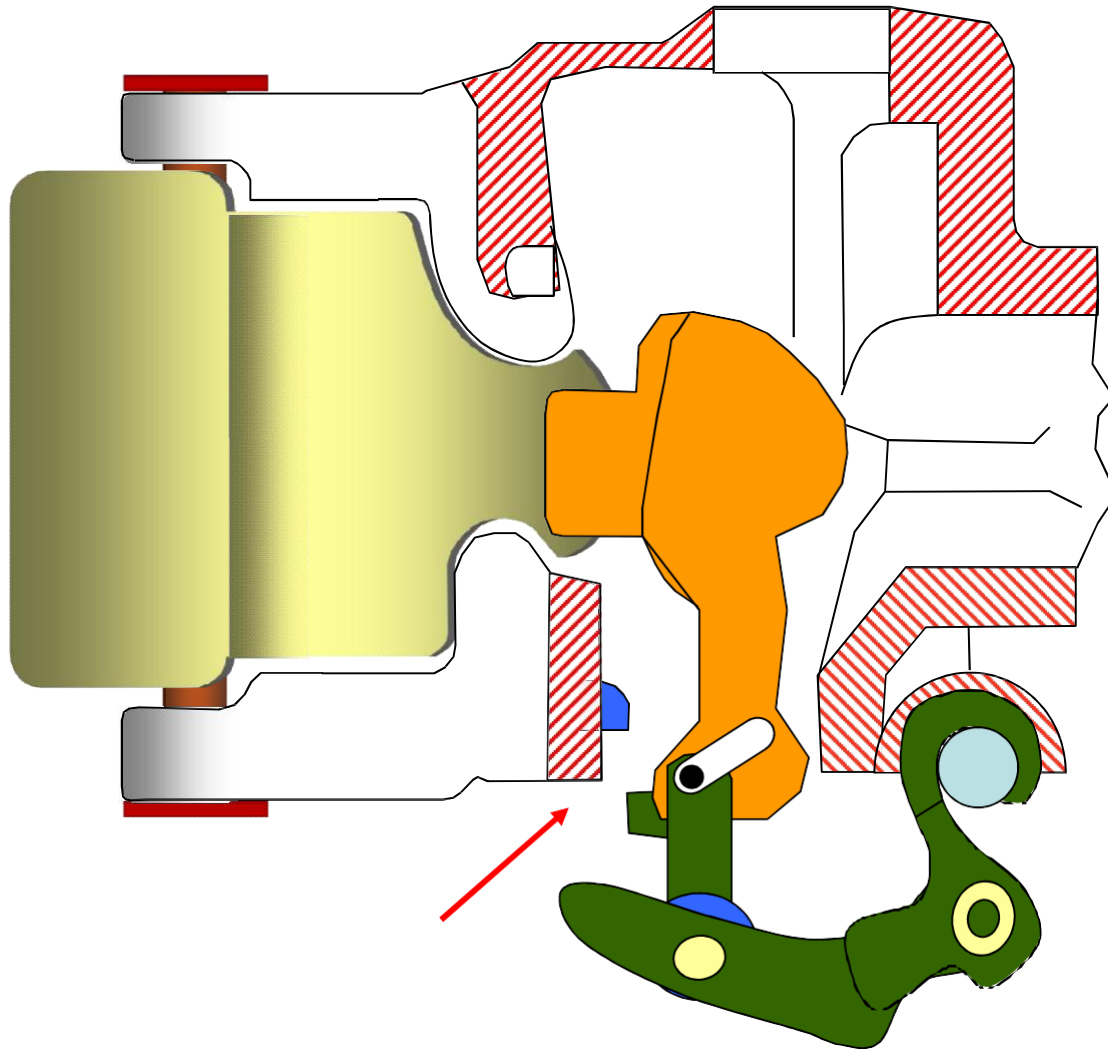
**FAILURE OF ANTI CREEP MECHANISM**  
**(LEGE ON COUPLER BODY)**



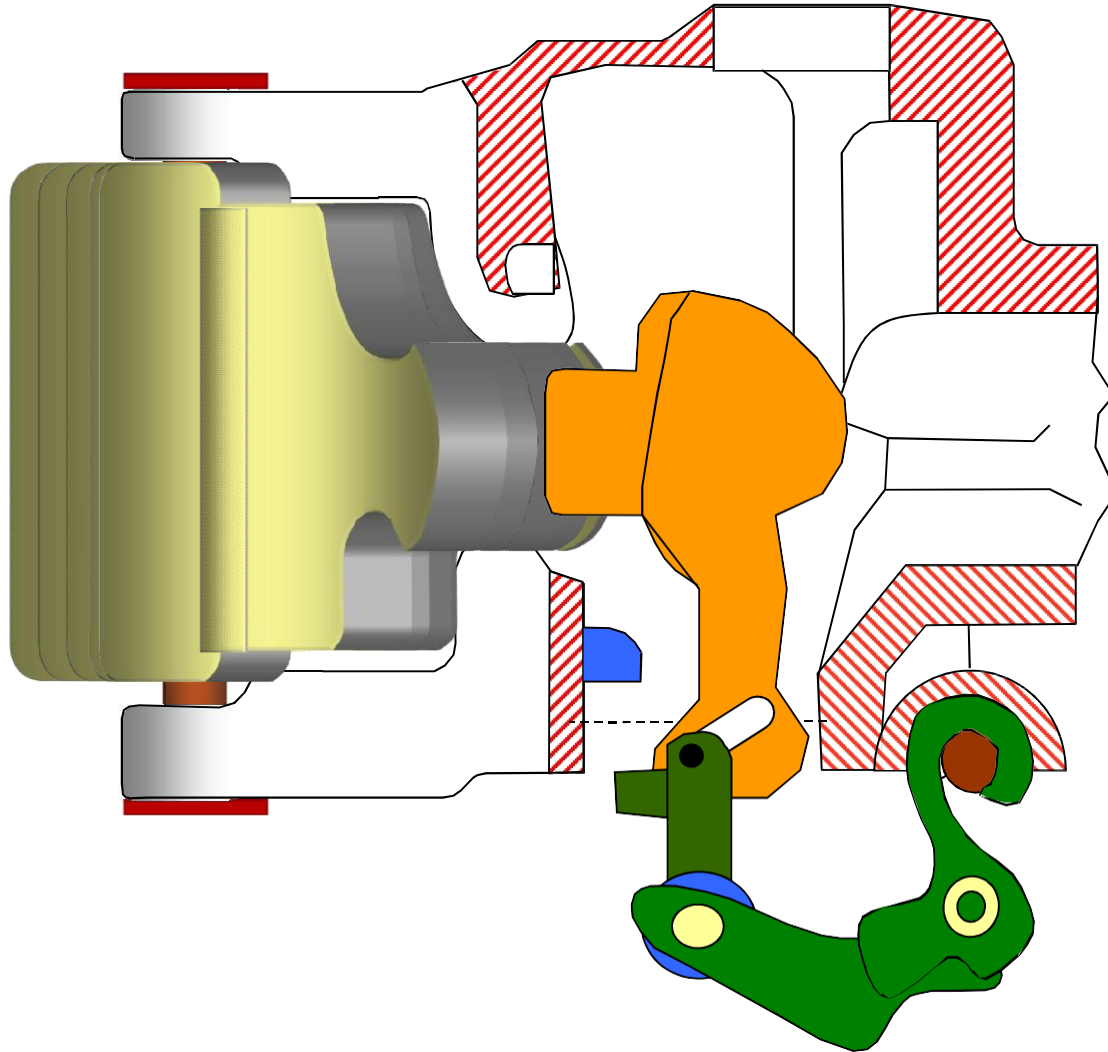
**FAILURE OF ANTI CREEP MECHANISM**  
**( SAFETY LUG ON TOGGLE )**



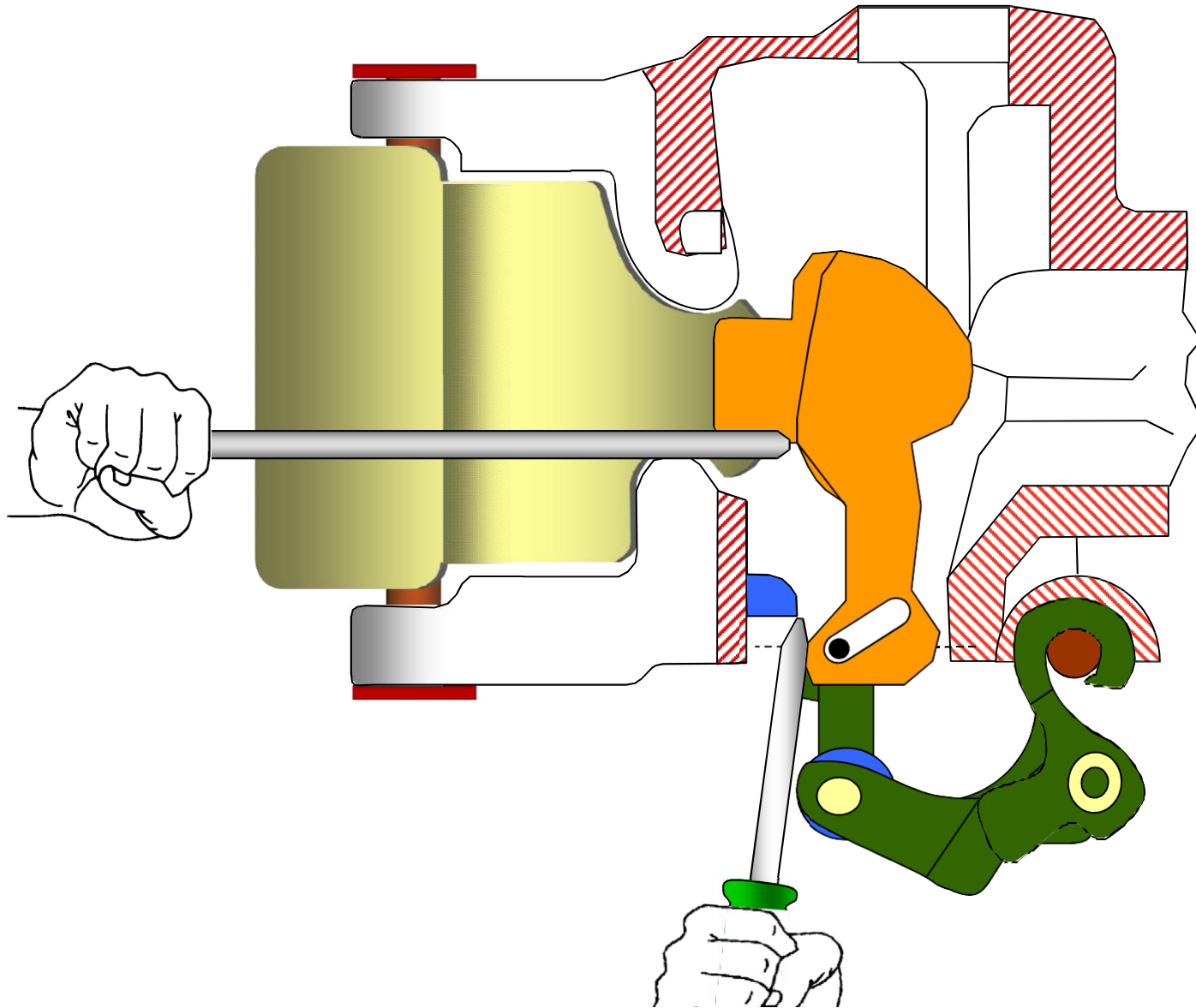
# ADDITIONAL OR AUXILIARY ANTICREEP MECHANISM



**RELEASE OF ANTI CREEP MECHANISM  
WHILE OPERATING LEVER IS MANUALLY  
OPERATED TO OPEN THE CBC**



# CHECKING OF ANTI CREEP MECHANISM



## 15. DROPPING OF OPERATING

### LEVER ON RUN

- **Widening of gap in bearing piece.**
- **Safety strap missing.**
- **Lifting of lock and opening of knuckle.**







## **16. BREAKAGE OF OPERATING LEVER SUPPORT BRACKET**

- **Breakage or corrosion of rivets.**
- **Damage to bracket due to shunting of CBC wagon with IRS wagon.**
- **Bracket with Operating lever falls down on run.**
- **Causing lifting Of lock.**

## 16. BREAKAGE OF OPERATING LEVER SUPPORT BRACKET

### Check for

- **Corrosion of rivets.**
- **Never shunt CBC wagons with IRS wagons.**



## **17. BENT OPERATING LEVER**

- **Mishandling of lever.**
- **Shunting of CBC with IRS**
- **wagons. Causes release of anti-creep mechanism under sudden jerks.**
- **Replace or rectify the bent or damaged operating lever.**



# OTHER CAUSES OF TRAIN PARTING







# **TRAIN PARTING**

**Unforeseen dividing of a train into two or more portions, While the train is on run or just on the move**

# REASONS OF TRAIN PARTING

BREAKAGE OF COPLING  
COMPONENTS

WORKING OUT OF

COUPLIN

# **BREAKAGE OF COUPLING COMPONENTS**

- **Fatigue Failure.**
- **Defective Material.**
- **Shock Loads.**
- **Imoproper Heat Treatment.**
- **Blow Holes Or Air Inclusions In Castings.**
- **Excessive Wear And Tear.**

# WORKING OUT OF COUPLING

- **Dropping of Yoke Pin on Run.**

# UNCOUPLING ON RUN

- Improper locking of knuckles.
- Ineffective anti-creep mechanism.
- Operating lever dropping on run.
- Excessive expansion of the guard arm.
- Vertical displacement of the locked knuckles.

# REPERCUSSIONS OF TRAIN PARTING

- Safety hazard
- Detention to the affected train in the section and at station for clearing and attending or detaching the affected wagon for repairs.

# REPERCUSSIONS OF TRAIN PARTING

- Detention to the other trains, due to blockage of the section.
- Loss of section capacity.
- Detention to wagons for repairs at the stations or for despatching to the nearest sick line for repairs.



# REPERCUSSIONS OF TRAIN PARTING

- Loss of revenue to the railways due to the wagon days lost.
- Loss of power due to out of course stoppage of train.
- Increase in work load for running and maintenance staff.

# REPERCUSSIONS OF TRAIN PARTING

- Additional cost of labour & materials for repairing the affected wagons.
- Inconvenience to the passengers, due to detention and late running of trains.
- Loss of customers on account of delay and non-punctual transit of goods.

# TRAIN PARTING - ATTENTION AT SITE

## UNCOUPLING ON RUN :- CHECK

● BOTH THE KNUCKLES ARE OPEN (or) CLOSED.

● CHECK FOR ANTI - CREEP MECHANISM.

● POSITION OF OPERATING LEVER.

● EXPANSION OF GUARD ARM.

● CHANGE ANY PART REQUIRED.

● COUPLE THE WAGON.

● ENSURE CORRECT LOCKING.

● GIVE MEMO TO SM.

# ~~WORKING OUT OF~~ THE COUPLIN G

- ❖ CHECK YOKE PIN, YOKE PIN SUPPORT PLATE.
- ❖ YOKE AND DRAFT GEAR CONDITION.
- ❖ NOTE THE DEFECTS.
- ❖ DETACH THE WAGON INTO LOOP LINE.
- ❖ ATTACH THE REST OF THE FORMATION.
- ❖ ENSURE PROPER LOCKING.
- ❖ GIVE MEMO TO SM.

# BREAKAGE OF COMPONENTS

- WHICH PART OF CBC IS BROKEN  
FRESH CRACK or OLD CRACK.
- COLLECT THE BROKEN PARTS.
- HAND OVER TO DEPOT.
- IF KNUCKLE, LOCK,  
➤ LOCK LIFTING ASSEMBLY  
IS BROKEN, REPLACE from REAR CBC OF  
BRAKE VAN.

# BREAKAGE OF COMPONENTS

- If other parts are broken. Detach the wagon.  
connect remaining portion of formation.  
Ensure proper locking.
- Check the condition of yoke/draft gear etc.
- Give memo to sm
- contact C&W controller and ask for any Assistance.  
Give all particulars to control.

# **TRAIN PARTING – ATTENTION AT SITE**

## **COLLECT THE FOLLOWING PARTICULARS**

**1. TRAIN NUMBER.**

**2. LOCO NUMBER.**

**3. BPC PARTICULARS.**

➤ **BPC NUMBER**

➤ **ISSUED STATION, DATE, RLY**

**LOAD AS PER BPC, IOC / IOP PARTICULARS.**

**4. LOAD OF THE TRAIN.**



# **TRAIN PARTING – ATTENTION AT SITE**

## **COLLECT THE FOLLOWING PARTICULARS**

### **5. WAGON PARTICULARS.**

- **WAGON NUMBER WITH RLY & TYPE  
PRO PARTICULARS, RETURN DATE  
ROH DETAILS.**

### **6. POSITION OF WAGON FROM LOCO/BV.**

### **7. LOAD PARTICULARS (AS PER SEAL CARD).**

- **STATION FROM, TO  
CONTENTS/ COMMODITY  
NUMBER OF BAGGAGES ETC.**



# **TRAIN PARTING – ATTENTION AT SITE**

## **COLLECT THE FOLLOWING PARTICULARS**

- 8. NAME OF THE DRIVER AND GUARD.**
  
- 9. AVALABILITY OF LC GATE, SIGNAL POST ETC.**
  
- 10. KM WHERE PARTING HAS TAKEN PLACE.**

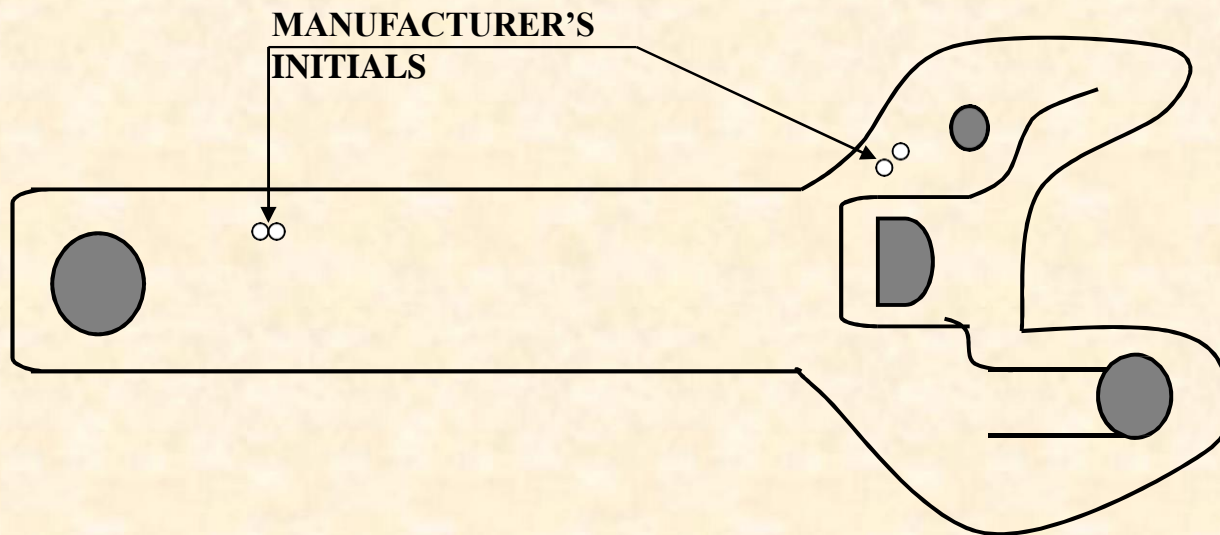
# **TRAIN PARTING – ATTENTION AT SITE**

## **COLLECT THE FOLLOWING PARTICULARS**

**11. WHETHER TRAIN IS ON RUN, STARTING FROM  
HALT OR BRAKING ETC.**

**12. DETAILS OF MANUFACTURER OF FAILED  
COMPONENT AS AVAILABLE IN THE  
COMPONENT.**

# CBC



# YOK E

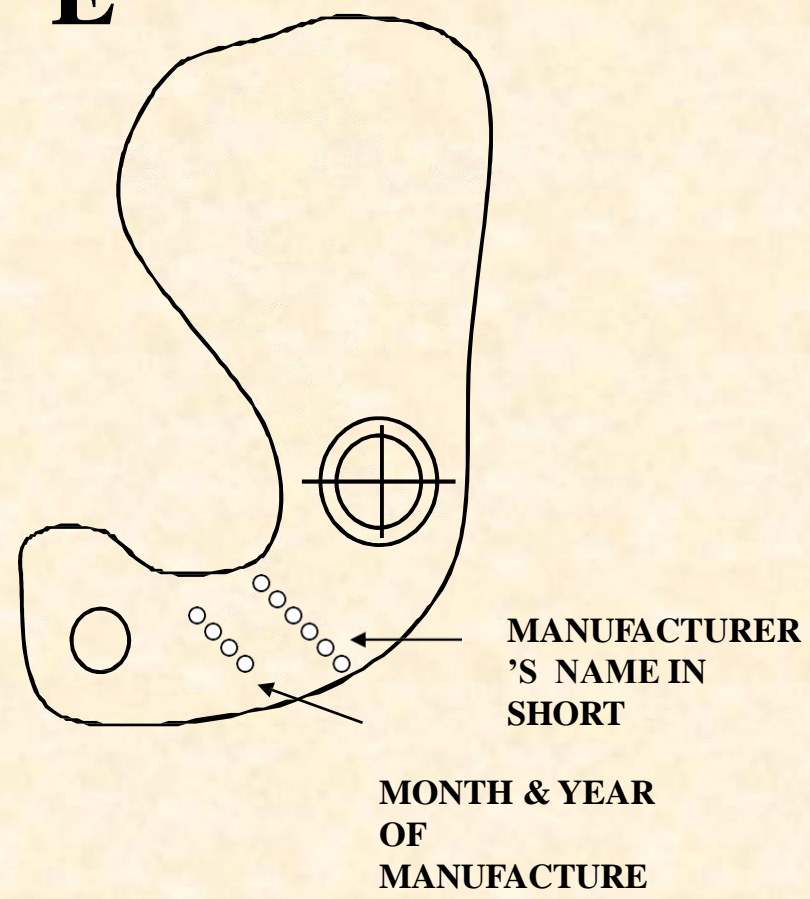
**MANUFACTURER'S INITIALS ON THIS  
SIDE DATE CAST WITH MONTH AND  
YEAR  
LAST TWO DIGITS ON OPPOSITE SIDE**

**MANUFACTURER  
'S INITIALS**

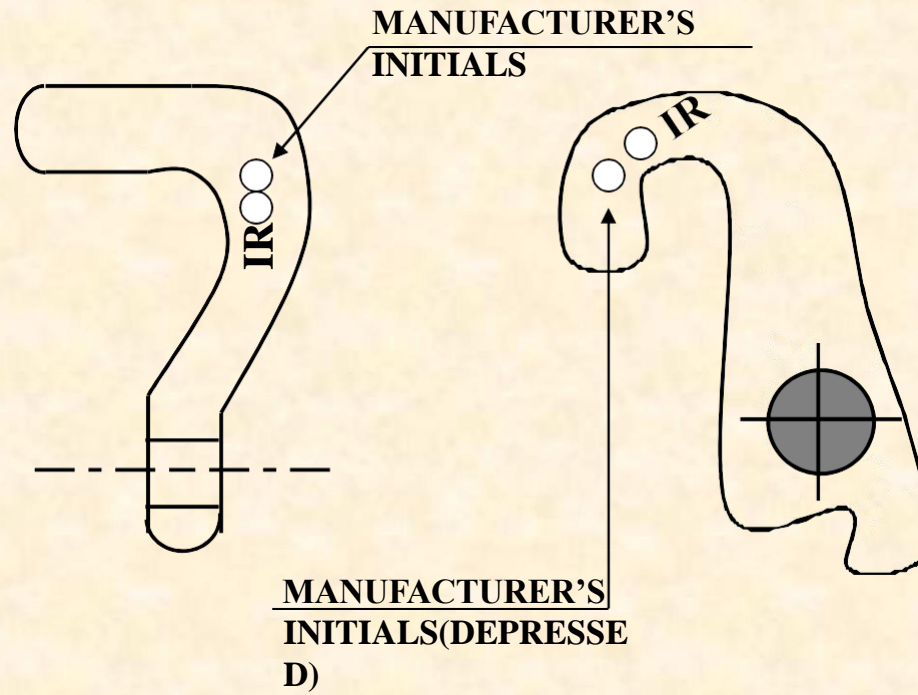


# KNUCKL

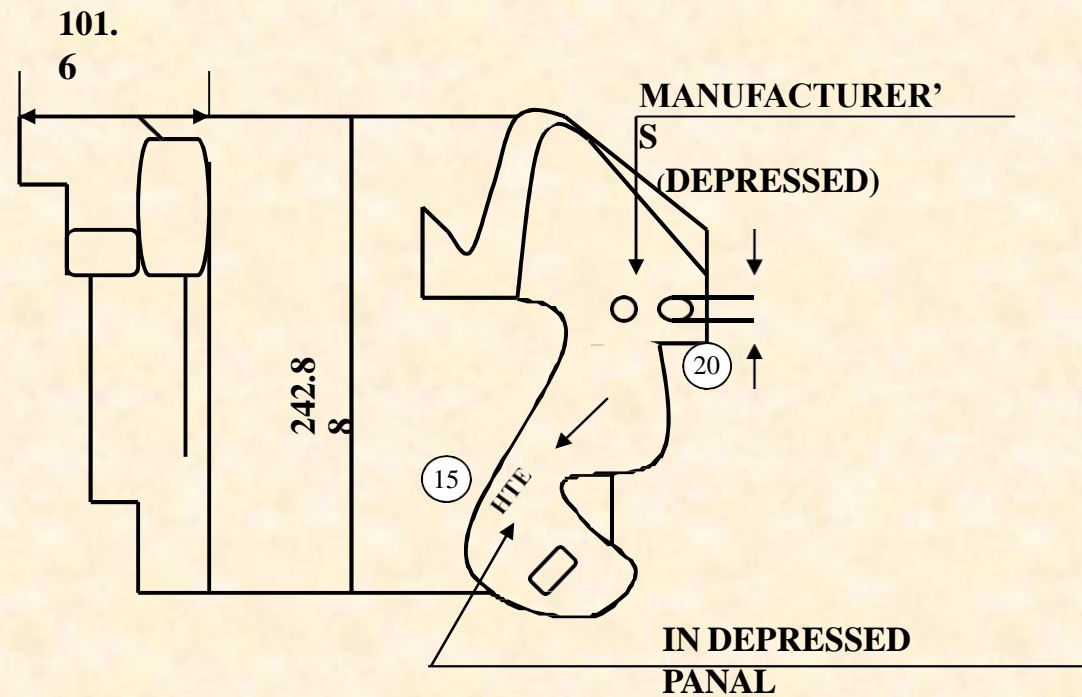
# E



# LOCK LIFTER



# LOCK PIECE



# POINTS TO BE CHECKED IN YARD TO AVOID TRAIN PARTING

Knuckle nose wear  
& guard arm  
expansion



Visually check gap  
between knuckles,  
coupler body & knuckle.  
if more check after  
uncoupling

Cracks in coupler  
body & shank



If found mark sick  
Critical area

Near knuckle pin,  
guard arm  
shank near  
striker casting



# POINTS TO BE CHECKED IN YARD TO AVOID TRAIN PARTING

More gap between  
coupler body &  
Stiriker casting



Check draft gear,  
yoke & yoke pin for  
Wear & breakage

Stiriker casting  
cracked more  
than 25mm



Mark the wagon sick  
for replacing the  
stiriker casting

CBC drooping



Worn out of Shank,  
Shank wear plate,  
Stiriker casting wear  
plate, yoke pin

**Do not permit buffer height difference  
Is more than 63.5mm**

# POINTS TO BE CHECKED IN YARD TO AVOID TRAIN PARTING

Yoke pin support  
plate



Check for  
Correct rivets & wear

Improper locking



Ensure 25 to 30mm gap  
between lock lift  
lever & bottom of CBC.

Wear & tear of  
components



If worn out badly.  
Replace at yard if  
possible,  
Or  
Mark the wagon sick.

# POINTS TO BE CHECKED IN YARD TO AVOID TRAIN PARTING

Lock lift assembly  
missing



Never allow the wagon  
with missing part.  
Replace.

Operating lever  
dropped/missing/  
bend



Check the operating  
lever support bracket.

Never allow bent or  
incorrect operating  
lever.

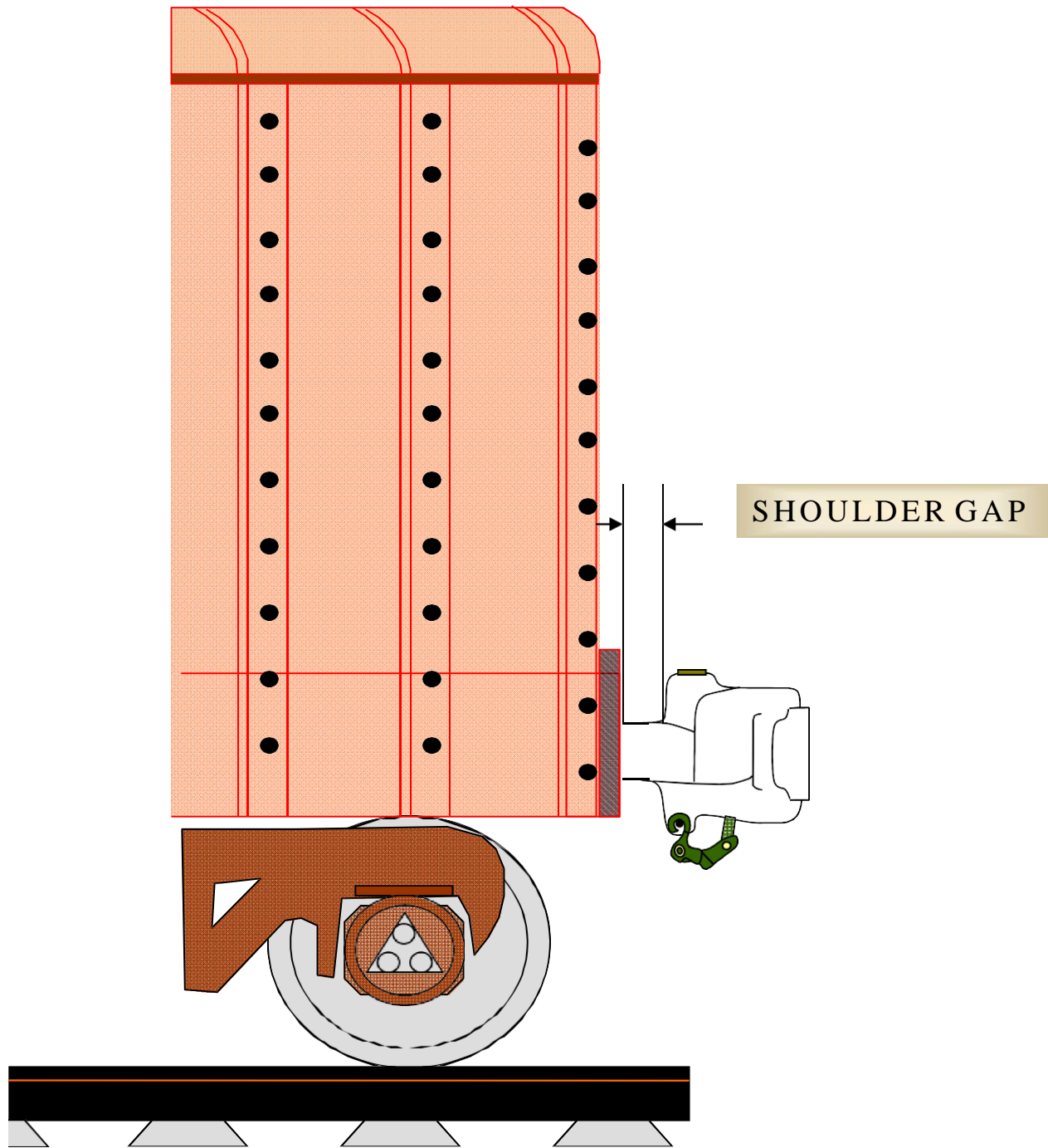
Widening of gap in  
Bearing piece or

Safety strap missing

Corrosion of rivets or

Body.





# FREE SLACK

**THIS IS THE AMOUNT BY WHICH THE CBC  
CAN BE MOVED FORWARD AND BACKWARD  
WITHOUT**

**APPLYING ANY DRAFT AND BUFFING FORCE**

**THE PERMISSIBLE LIMIT OF FREE SLACK IS 25 MM**



## **Reasons For Free**

### **Slack**

- ✓ **Excessive wear on the coupler shank hole.**
- ✓ **Excessive wear on the yoke hole.**
- ✓ **Excessive wear on the yoke pin.**
- ✓ **Weak draft gear.**
- ✓ **Excessive wear on the front and rear stoppers.**



## METHOD OF CHECKING FREE SLACK

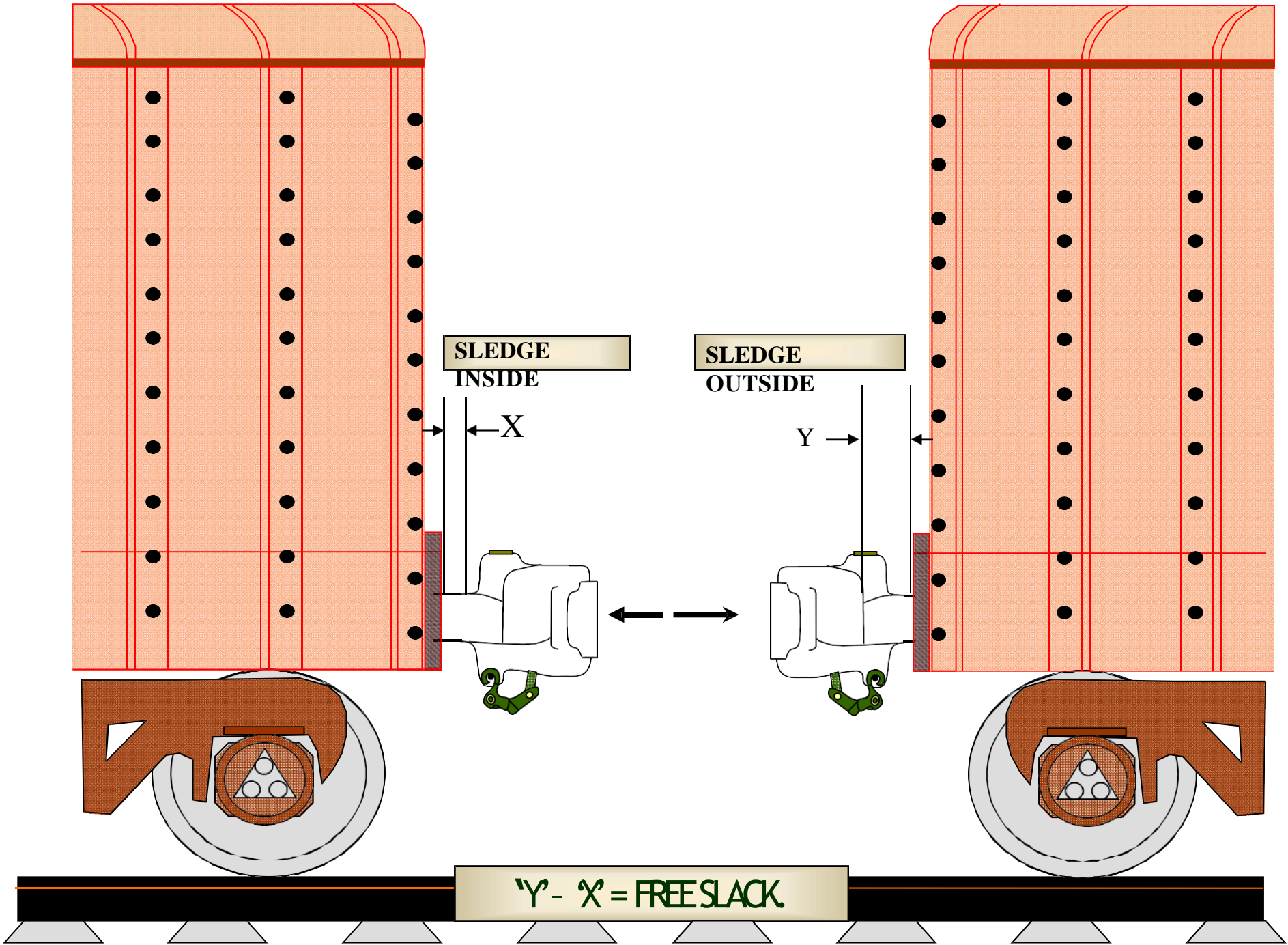
- ⊕ First sledge / push the coupler body towards the striker casting.
- ⊕ Measure the clearance between the coupler horn & the striker casting let the measurement be 'X'.

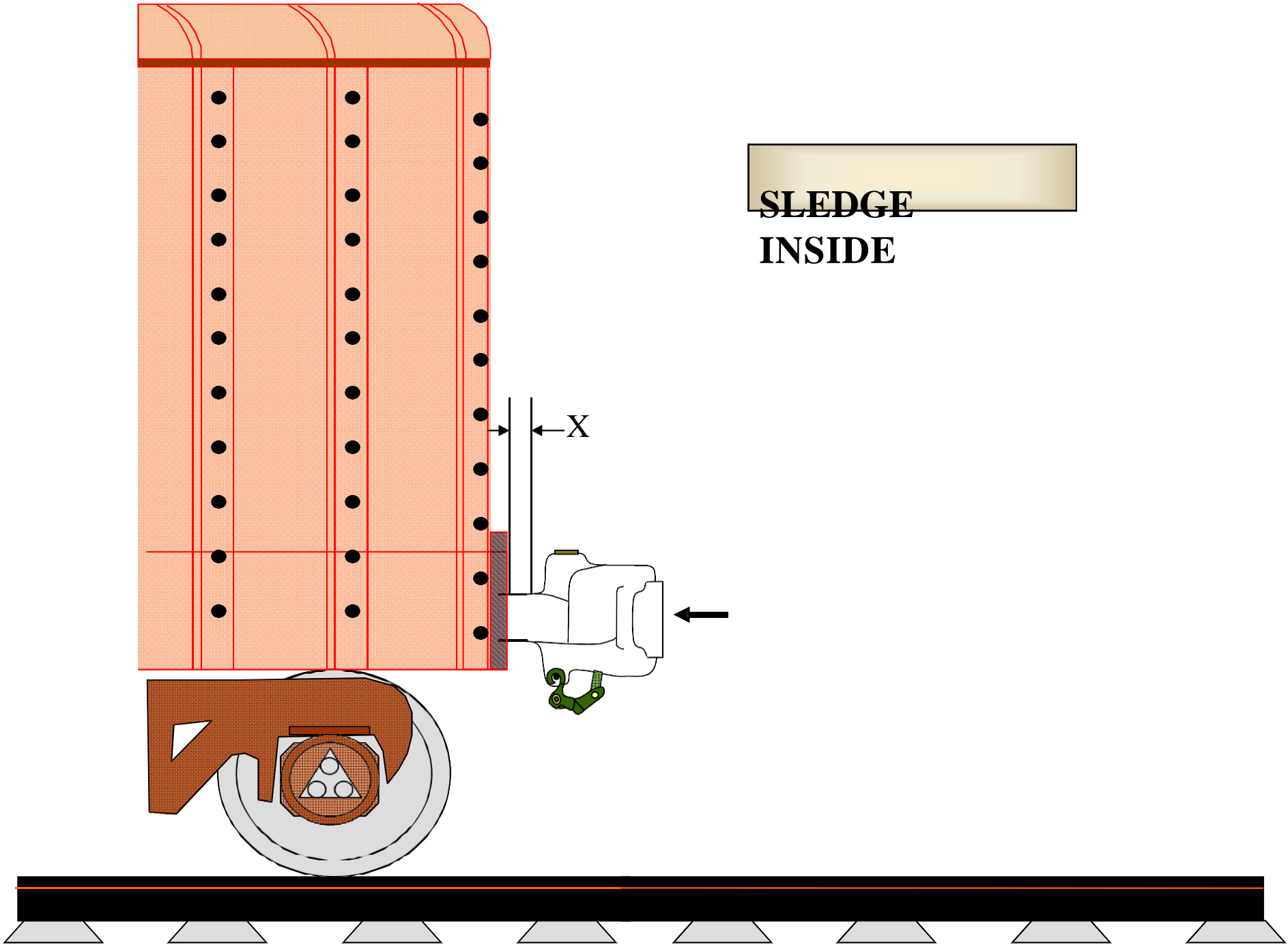




## METHOD OF CHECKING FREE SLACK

- ⊕ Next pull the coupler body away from the striker casting by inserting a long bar between the horn and the striker casting face.
- ⊕ Measure the clearance between coupler horn & the striker casting face. let the measurement be 'Y'.
- ⊕ The difference between these two measurements (Y-X) gives the amount of free slack and it should not be more than **25mm**.



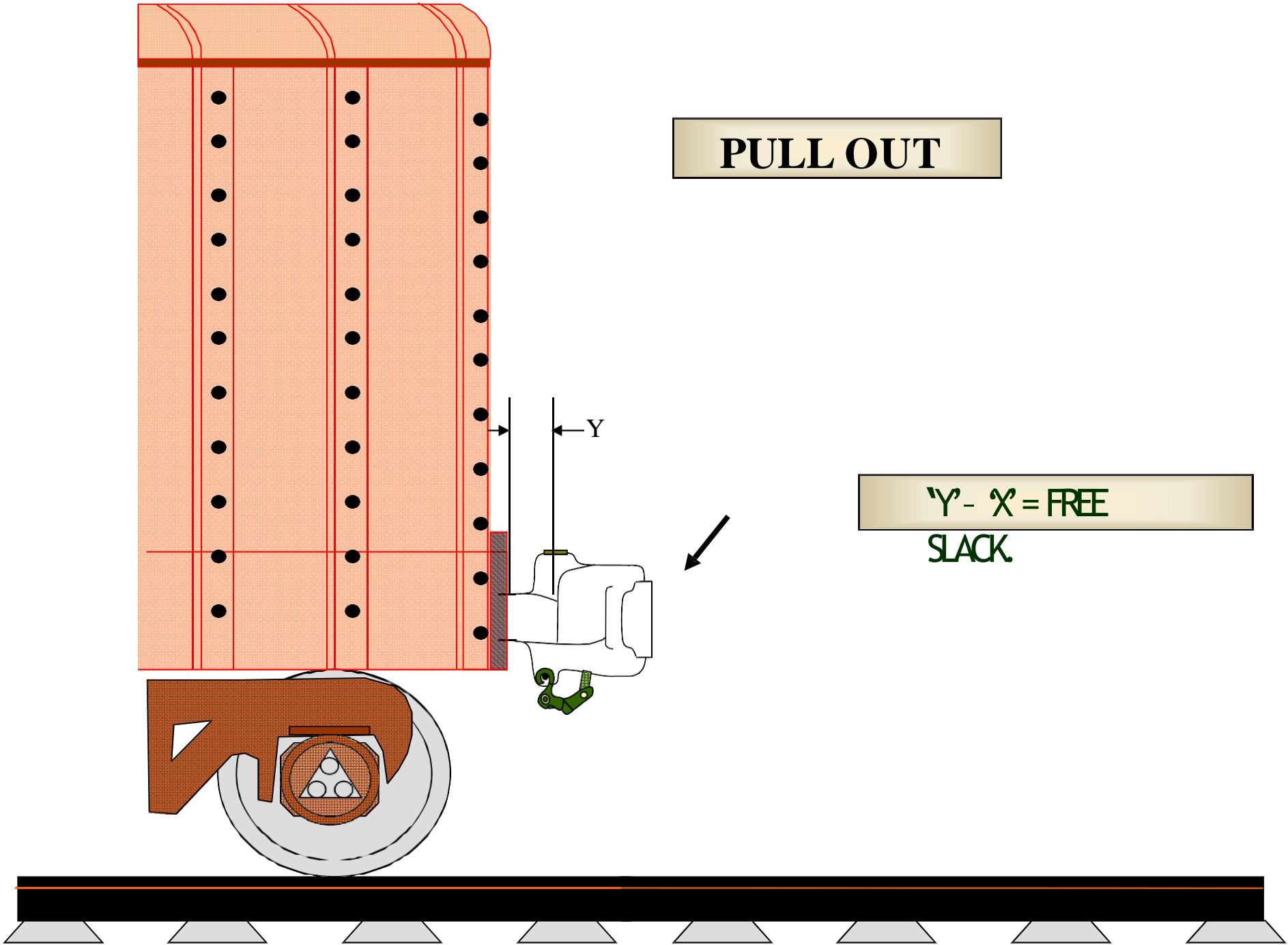


SLEDGE

INSIDE

**PULL OUT**

**Y - X = FREE  
SLACK.**



# **TRAIN EXAMINING STAFF**

- 1. DO NOT ALLOW LOOSE COUPLING ON OUT GOING TRAINS.**
- 2. CORRECT UNEVEN THREADED SCREW OF SCREW COUPLING.**
- 3. ENSURE END WASHER OF SCREW, TRUNNION NUTS & SHACKLE PINS ARE INTACT.**
- 4. DO NOT ALLOW DEAD BUFFERS.**

# **TRAIN EXAMINING STAFF**

- 1. CHECK FOR LOOSE OR BROKEN DRAW BAR SPRINGS OR PERISHED PADS.**
- 2. DO NOT WELD COUPLING HANDLE WITH THE SCREW, CHANGE IT OR RIVET IT TIGHTLY.**
- 6. CHECK FOR SHACKLE EXPANSION IN ICF COUPLING.**
- 7. ENSURE SPARE COUPLINGS ARE PUT ON TO SUSPENSION HOOKS.**

# **TRAIN EXAMINING STAFF**

- 9. NEVER ALLOW JAMMED PISTONS OR BRAKE BINDING ATTEND IT BEFORE DESPATCH.**
- 10. ENSURE THAT HAND BRAKES ARE RELEASED**
- 11. CHECK FOR DRAW BAR SPINDLE NUTS, ENSURE THEY ARE TIGHT.**
- 12. ENSURE DRAFT KEY COTTERS ARE INTACT.**

# **TRAIN EXAMINING STAFF**

- 1. Ensure proper locking of knuckles on cbc.**
- 2. Check for cracks on the coupler body and knuckle.**
- 3. Excess wear of knuckles to be checked.**



# **TRAIN EXAMINING STAFF**

- 4. ENSURE ALL COMPONENTS OF LOCK LIFT ASSEMBLY ARE INTACT.**
- 5. DAMAGE OR BENT OPERATING LEVER SHOULD NOT BE ALLOWED ON WAGONS.**
- 6. CHECK OPERATING LEVER AND ITS BEARING PIECE FOR DAMAGES.**

# **TRAIN EXAMINING STAFF**

- 7. DO NOT ALLOW WAGONS WITH EXCESS BUFFER DROPPING.**
- 8. ENSURE THAT YOKE PIN SUPPORT PLATE ARE INTACT.**
- 9. CHECK FOR EXCESS WEAR OR BREAKAGE OF YOKE PIN SUPPORT PLATE.**

# **TRAIN EXAMINING STAFF**

- 10. NEVER LUBRICATE ANY PART OF CBC COMPONENTS.**
- 12. CHECK FOR DAMAGES OF REAR STOPPER, DRAFT GEAR.**
- 13. BROKEN YOKE PIN TO BE EXAMINED.**

**INSTRUCTION FOR MAINTENANCE  
OF  
CENTER BUFFER COUPLER IN YARD  
DURING INTENSIVE EXAMINATION  
OF GOODS TRAIN**

**1. THE LOCK MUST BE IN LOCKED POSITION. THE LOCK POSITION IS INDICATED BY THE TOGGLE WHICH SHOULD CLEARLY VISIBLE BELOW THE COUPLER HEAD.**

**THIS ASPECT ALSO BE CHECKED BY GUARD AND DRIVER WHILE CLEARING STABLED LOAD FROM ROAD SIDE STATION.**

**2. THE OPERATING ROD SHOULD NOT BE BENT AND ANTI ROTATION LUG OF HANDLE PROPERLY HOUSED IN SLOT OF CENTER BEARING OF SUSPENSION BRACKET OF CBC OPERATING HANDLE TO AVOID ROTATION ON RUN.**

**3. THE SAFETY STRAP OF SUSPENSION BRACKET OF CENTER BEARING SHOULD BE INTACT TO AVOID DROPPING OF HANDLE ON RUN.**

**4. EYE BOLT OF CENTER BEARING CARRIER OF HANDLE SHOULD HAVE PROPER SECURING.**

**5. ADDITIONAL SAFETY BRACKET IS AVAILABLE FOR ADDITIONAL SAFETY TO PREVENT FALLING OF COUPLER ROD DURING RUN.**

**6. THERE SHOULD NOT BE ANY DEFICIENCY OF ANY ITEM IN CBC OPERATING MECHANISM.**

**ie. TOGGLE, ROTARY LEVER , RIVETS CONNECTING THESE ITEM, AND CBC OPERATING HANDLE.**

**7. NO EXCESSIVE DROPPING OF COUPLER BE ALLOWED ON ANY WAGON DURING EXAMINATION TO AVOID VERTICAL “SLIDE OFF “ COUPLERS.**



**8. THE EXCESSIVE WORN OUT KNUCKLE ie. WEAR MORE THAN 9.5<sub>MM</sub> ON NOSE BE REPLACED OR WAGON BE MARKED SICK FOR REPAIR.**

**9. ENSURE THERE SHOULD BE NO PHYSICAL DAMAGE TO ARTICULATED ROTARY LOCK LIFT MECHANISM.**

**10. ON OPEN WAGONS, ROPES OF TARPOLIN COVER  
SHOULD NOT BE ALLOWED TO TIE WITH OPERATING  
HANDLE.**

**11. LENGTH OF THE CBC OPERATING PROJECTION  
DOWNWARDS SHOULD NOT MORE THAN 305 mm**



**THANK YOU**



## 1) Train parting:

A train means a number of rolling stocks with adequate brake power to control the train by Driver from Engine and Guard from Brake Van.

When the train is uncoupled and separated in parts while on run or at the time of starting or at the time of stopping, then the situation is called “ Train Parting “ and this incident is treated as accident.

### Causes of parting:

- i) Sudden jerk and sudden application of brake by Driver / Guard.
- ii) Lack of co-ordination in between two Drivers when two locomotives are working in rising gradient.
- iii) After stopping, Driver starting the train without full release of brakes.
- iv) On rising gradient locomotive wheels slip due to bad weather when the sanders of loco are not working or due to non- availability of sand in sanders. This will cause sudden jerk on the train.
  
- v) Slack or loose coupling.
- vi) Flaw in material.
- vii) Reduction in cross- section of coupler body or any part of screw coupling.
- viii) Manufacturing defects in component like defective material, improper heat Treatment, blow holes or air inclusion in casting.
- ix) Improper securing of screw coupling with Draw bar.
- x) Working out of Transition coupling.
- xi) Improper fitment of CBC lock.
- xii) Working out of CBC head due to droppage of yoke pin.
- xiii) Breakage of yoke pin support plate.
- xiv) Breakage of CBC shank due to excessive wear.
- xv) Dropping down of CBC head.
- xvi) Breakage of knuckle improper locking of the knuckles, in effective anti creep Mechanism.
- xvii) Due to defect in lock and lock assembly of CBC, train parting is classified under two main heads.

**Vertical Parting:** - Vertical parting takes place due to excessive CBC height variation.

The main reasons for variation in CBC height are;

1. Loose/ low rail joints
2. Mud pumping under the rail joints
3. CBC drooping– excessive wear and tear of coupler shanks and striker casting/ Bearing piece.

**Horizontal Parting:-** Horizontal train parting takes place due to following reasons:

- 1 Uncoupling of CBC.
- 2 Breakage/ wear of CBC components due to inherent defects.
- 3 Failure of draft gear.
- 4 Bad engineman ship

xviii) **UNCOUPLING OF CBC:** The most common causes of train parting are, uncoupling of CBC on run (without any breakage of any parts), breakage of knuckle failure of draft gear & working out of CBC. The reasons of uncoupling and preventive measures taken to avoid uncoupling are described as under -

**1) Lock not properly engaged** – In most of the cases, the lock does not drop down to the full locked position inside the coupler head. This may result in slipping up of the lock during run causing uncoupling.

**2) Ineffective anti-creep device** – Lock may slip up due to jerking and jolting during run if the anti-creep feature is not effective.

**3) Operating handles dropping on run** - This is caused by breakage of supporting bracket resulting in operating handle falling down on run and hitting the ballast. This tends to turn the handle leading to lifting of the lock piece and uncoupling.

**4) Excessive play between anti-rotation lug and bearing piece slot:** Due to excessive play between anti-rotation lug and bearing piece slot, operating handle can operate on run due to jerks and can cause uncoupling. Anti-rotation lug is made out of square cross section MS bar with standard dimensions of 16 mm x 16 mm and slot width in bearing piece of 17.5 mm.

**5) Unauthorized tempering with operating handle** – This is believed to be a common incidence by many Railways. Since, uncoupling lever is situated alongside the wagon and is easily accessible, it is easily prone to unauthorized and mischievous manipulation.

**6) Uncoupling due to vertical slipping out of knuckle** - This may occur due to abnormal relative vertical

possibility in the event of combination of number of adverse factors like maximum difference in coupler heights & unevenness on rail joints.

N.B. To avoid incidence of train parting special and meticulous attention should be given to draw gear components at originating station at the time of examination. Driver also should ensure that the sanders or locomotive are in working order with availability sand.

**EFFECTS:**

1. Safety hazard.
2. Detention to the affected train in the section and at station for clearing and attending or detaching the affected coach for repair.
3. Detention to coaches' other trains due to blockage of the section.
4. Loss of section capacity.
5. Detention to coaches for repairs at the station or to send the nearest sick line for repairs.
6. Loss of revenue to the Railway due to the coaches' days lost on account of the above.
7. Loss of power due to stoppage of the train, chunting etc.
8. Increase in the workload for the running and maintenance staff.
9. Additional cost of labour and materials for repairing the affected Coach/Wagon.
10. Inconvenience to the passengers, due to detention and late running of train.
11. Loss of passenger/customers on account of delay or non-punctual trip of goods.

**REMEDIAL MEASURES TO AVOID TRAIN PARTING:**

**DRIVERS:-**

1. Must allow adequate time for creation of vac N pressure and release of brakes before starting. Starting should be smooth and without jerks.
2. Avoid sudden and hares application of brakes except in emergency.
3. Sand gears must be in good working order to avoid engine slipping.

**GUARDS:-**

1. Before starting a train must ensure that all screw couplings are evenly and properly tightened.
2. Brake application from the brake vans should do so carefully not exceeding 1.2 kg/cm<sup>2</sup> drop at a time.

**CONTROLLER AND STATION MASTER:-**

1. Must not stop trains outside stations where there are rising gradients near the outer signal.

**C&W and SICK LINE STAFF:-**

1. Must ensure that draw bars and their components are free from all defects. Special attention should be

2. Sufficient plain washers beyond the spring / pads and inside nut must be provided and tightened sufficiently to clear the cotter slot and correct size of cotter used and properly split to avoid slackening.
3. When the coaches are turned out from sick line, the wear on any section on the draw hook should not exceed 10 m m.
4. Wear on Broad Gauge screw coupling shackle pin, trunion nut pin, shackle link and draw hook hole shall not exceed 3 m m.
5. Buffer projection must not below the minimum length of 600 m m.
6. Projection of draw bar hook shoulder must be within 92mm to 120 m m.
7. Repairs to draw bars, screw coupling and their components should be prohibited in sick line.
8. Screw couplings of coaches passing through sick lines should be oiled and eased.
9. Inspection of CBC coupler whilst/until fitted to coaches should be made to ensure that proper clearance is available to prevent interference.
10. Check correct working operation of knuckle thrower properly.
11. Check that coupler shank is not bent out of alignment with the head.
12. Ensure that clearance between the lock lift lever and the bottom of the CBC casing is not less than 19 mm.
13. Ensure that none of coupler, knuckle, yoke and draft gear components are cracked / broken / deficient.
14. Wearing of shank wear plate should be within 10 m m through and wearing on shank when wear plates not fitted should be within 6.5 mm.
15. Reclamation of knuckles in sick line / ROH depot should not be done.
16. Operating handle bracket should not be welded during ROH / POH; instead it should be secured with ~~six rivets~~ as per design.
17. Bearing piece with gap equal or more than the diameter of the operating handle should be made reject able item during POH / ROH.
18. Proper gauging of all the coupler components is to be ensured during POH & ROH.

### **SHOPS:-**

1. Draw bar of all stock coming to work shops for repair must be in variably examined for wear on the hook neck, shank and screwed portion for the cracks.
2. Screw coupling should be tested to the specified proof load test.
3. Head stock and alied components should be checked for corrosion and to be rectified accordingly.
4. Hot working or welding repair to enhance capacity draw gear and screw coupling should be prohibited.
5. All CBC & draft gear must be removed from wagon and detailed inspection therefore should be ensured with specified gauges.
6. All new screw coupling and draw gear components to be proof load tested prior fitment to coach.



**Yard staff** —

- Don't shunt with loose coupling.
- Don't allow spare coupling to hang loose. Put it on suspension hook.
- Both knuckle to be kept open and in centralized position during hump shunting.
- Don't shunt screw coupling stock over CBC stock or via- versa.
- Don't allow empty wagon in between two loaded wagons.

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