

DRAW & BUFFING GEAR

ENHANCED SCREW COUPLINGS

i) Description

Enhanced draw gear and screw coupling components were earlier manufactured from Stc. 60.61 VSM10661 steel. The draw gear & screw couplings are designed for a proof load of **60t** (both) and a breaking load of **108t & 112t** respectively.

In 1998, the material for the draw gear and screw coupling components has been upgraded to IS:5517-93 Grade 35 Mn6M03 to enhance the proof load to 75t (both) and a breaking load of 130 t (both). Specifications C -9509 and C -9505 apply to these draw gear and screw coupling respectively. The dimensions of these draw gear & screw couplings are the same as earlier.

Location of wear	Wear limit	Suggested no go gauge
Root of hook near point of contact with bent link	13 mm	Profile gauge with 15 mm adjustable projection
62 mm dia pin hole	3 mm	65 mm flat
Bottom side of shank 56 mm height	15 mm	41 mm snap
Draft key slot(159 mm)	13 mm	173 mm flat
38 mm width	2 mm	40 mm flat
Hook opening 48 mm	5 mm	46 mm go 53 mm no go plug

Draw Bar:

Location of wear	Wear limit	Suggested no go gauge
155mm draft key slot	9 mm	164 mm snap
39 mm shank body	3 mm	36 mm snap
Slot width 38 mm	2 mm	40 mm flat
Threads M39x3	1 mm	Thread profile

Draft Key

Location of wear	Wear limit	Suggested no go gauge
Draw bar seating 139 mm	4 mm	Profile gauge with 5 mm adjustable projection
Draw hook seating 139 mm	4 mm	Profile gauge with 5 mm adjustable projection
Thickness 36 mm	4 mm	32 mm snap
Cotter hole 14 mm dia	2 mm	16 mm plug

Rubber draft pads

- The rubber pads should invariably be changed as a set every alternate POH. The sets should not be formed from supplies from different suppliers. Furthermore, the pads should be checked every POH for bulging, perishing or having got set to a length below **186 mm**. Replace the pads (as a set) if found defective.

Draft Yoke

Component	Wear location	Wear limit	Suggested no go gauges
Draft yoke	45 mm dia hole	3mm	48 mm flat
Bush	32mm dia hole	1mm	33 mm flat

Draw gear pin

- Replace pins, found damaged, bent or worn more than 1 mm anywhere on the nominal diameter (**31 mm**).

Draw hook beam

Wear location	Wear limit	Suggested no go gauge
Wearing piece	6 mm	snap gauge 12 mm thick
Locating pins 25 mm dia	6 mm	19 mm snap

Component	Wear location	Wear limit	Suggested no go gauge
Straight link	61 mm dia hole	2 mm	63 mm flat
Straight link	47 mm dia hole	2 mm	49 mm flat
Bent link	42 mm dia stem	3mm	39 mm snap

Component	Wear location	Wear limit	Suggested no go gauge
Bent link	47 mm dia hole	2 mm	49 mm flat
Bent link	78 mm 'U' gap	3 mm on each arm	77 mm to go 85 mm no go gauge
Pin on draw hook	60 mm dia	2mm	58 mm flat

Screw	55 x 6.35 mm k/thread	1 mm	K thread profile gauge
Trunnion LH/RH Knuckle	Thread 55.635x6.35 K/thread	1 mm	K thread profile gauge
-do-	76 mm thickness	4 mm	72 mm snap
-do-	46 mm dia pin	2 mm	44 mm snap

ICF TYPE BUFFER OF BG MAINLINE COACHES

Description

Presently enhanced capacity (**1030 kg.m**) buffer conforming to specification No. IRS-M 10 are fitted in all BG mainline coaches .

Earlier buffer had a plunger with curved face. During reclamation a wear plate with centre hole as per SK-81142 is fitted and plug is welded at centre to prevent rotation of buffer spindle. To avoid welding of centre plug, an integral face plate is to be provided and the new buffer assembly should be to SK 98145

Rubber buffer pads are to be procured and used as a pack from RDSO approved sources.

Buffer casing of earlier design are to IRS drawing no W/BD 392 & 393. In order to reduce the stress level on fixing bolts and prevent cracks in underframe headstock, the size of base of casing and location of fixing holes were increased and design of casing to RDSO SK 94043 and SK 94044 has been advised to PU's and Railways in 1994. Railways may use both existing and revised design of casings depending on the location of holes available in the underframe head stock.

Buffer casing

- Examine the buffer casing for cracks, damage, deformation & wear. The casing worn more than the wear limit and found cracked should be discarded. The elongated holes can be filled with weld metal and re drilled to **26 mm dia**. The location of 4 holes are **60.3 +/- 0.2 mm** from centre of casing along width & **174.5 ± 0.2 mm** along length in buffer casing to IRS W/BD – 392 / 393 . The respective dimensions in casing to SK 94043/94044 are **85 ± 0.2 mm** & **174.5 ± 0.2 mm**. These dimensions should be checked and restored ,if found different.

Wear location	Wear limit	Suggested gauge
Buffer casing body wall thickness 11.5 mm	5.5 mm in wall thickness	Inside micrometer
Fixing hole in the base 26 mm dia	2 mm on dia	28mm flat

Buffer plunger

Examine the plunger for wear, cracks & deformation. The plunger worn more than the wear limit on body and cracked should be discarded. Worn out face plates shall be replaced.

- The wear limits are as follows :

Wear location	Wear limit	Suggested gauge
Buffer plunger tube wall thickness 9 mm	4mm	Micrometer
Plunger face/face plate 19 mm	11mm	1905 mm curvature gauge with depth measurement.

- Place buffer spindle in the plunger and rivet cast steel face plate to Sk 94254 with 6 Nos. of **16 mm dia** flat CSK rivets on buffer plunger from face plate side. No gap should exist. Circumferential welding of face plate with plunger is prohibited

Rubber buffer pads

- Rubber buffer pads should invariably be changed as a set at every alternate POH. The set should not be formed from different supplies. Further more, the pads should be checked every POH for perishing or permanent set to a length below **424 mm**.

Buffer spindle

- Inspect the spindle for straightness, wear on body and threads. Straighten the spindle, if required.

Wear location	Wear permitted	Suggested no go gauge
Buffer spindle body 40 mm dia	5 mm	35 mm snap
Threads M 39	0.5 mm	thread profile gauge

Destruction Tube

- Check the destruction tube for bulging, corrosion. Replace the damaged/corroded destruction tube.

BUFFER HEIGHT

Buffer height in B.G. stock shall be within limits given below on level track:

Empty

1105 mm (maximum.)

Loaded

1030 mm (minimum.)

BUFFER PROJECTION

Buffer projection from the headstock on broad gauge wagons should be within limits shown below:

	For Long Case	For Short Case
Maximum	635 mm	456 mm
Minimum	584 mm	406 mm

After POH, the projection shall **not be less than 625 mm** and 445 mm for **long case** and short case buffers respectively.

CENTRE BUFFER COUPLER(CBC)

GENERAL

There are two main arrangements of draft and buffing gear in use on Broad Gauge. The older arrangement, which is found on few wagons, consists of a screw coupling with side buffers. In this design the *draft load is transmitted through the screw coupling, draw hook and draw hook springs* while the *buffing force is borne by the side buffers*. The conventional screw coupling (WA/BD-125) has a working load of 22.5t. The restrictions of size and weight limit the extent to which the draft capacity of this coupling can be improved. Recognizing this fact, the other arrangement on BG wagons is that of a **Centre Buffer Coupler (CBC)** which **transmits both draft and buffing loads**. The knuckle type centre buffer coupler was adopted for BOX, BOXN and other new design of wagons. Later on, a smaller knuckle type coupler, known as the **Alliance-II coupler**, was introduced for **four wheeler wagons**. The **working strength of CBC is 120 tonnes**. CBC also has a transition version called “Transition Coupler” which incorporates a screw coupling and a pair of side buffers to permit attachment with wagons fitted with screw coupling.

CENTRE BUFFER COUPLER & DRAFT GEAR

Indian Railway uses **AAR type centre buffer couplers** having **E-type head** and **F-type shank** for freight stock on Broad Gauge system.

- A) The draft capacity of the AAR coupler depends on the strength of knuckle, which is weakest link in the assembly. The yield strength of knuckle Grade 'C' & Grade 'E' is 132t and 180t respectively.
- B) ADVANTAGES OF AAR CENTRE BUFFER COUPLER**
- Coupler and buffing gear are both located together at the centre of the wagon.
 - Centre buffer coupler is identical at either end of the wagon and hence wagon direction is immaterial.
 - Coupling action between wagons is automatic.
 - With transition arrangement, coupling with screw coupling is possible.

PARTS OF CENTRE BUFFER COUPLER ASSEMBLY

The main parts of Centre Buffer Coupler are as under:-

- i) Coupler body
- ii) Knuckle
- iii) Knuckle pivot pin with washer
- iv) Lock

- v) Knuckle thrower
- vi) Toggle
- vii) Universal lock lift lever connector
- viii) Lock lift lever hook
- ix) Lock lift rivet
- x) Lock lift lever rivet
- xi) Top lifter hole cap
- xii) Yoke pin
- xiii) Yoke
- xiv) Yoke pin support.
- xv) Striker casting
- xvi) Striker casting wear plate
- xvii) Shank wear plate
- xviii) Yoke support plate
- xix) Draft Gear arrangement with front follower
- xx) Safety bracket with anchor plate
- xxi) Uncoupling gear arrangement
- xxii) Back stop
- xxiii) Clevis for Transition type coupler only
- xxiv) Screw coupling for Transition type coupler only
- xxv) Clevis pin for transition type coupler only