25 T BOGIE

STC/SPJ

25 T BOGIE

CASNUB Bogie as freight truck is introduced in Indian Railways in the year 1981 under BOXN wagon. Since then CASNUB type bogies are used as freight truck in Indian Railways. For enhancement of speed, improvement in pay to tare ratio and low maintenance, RDSO thought for track friendly bogie.

In 2006 RDSO prepared specification no.WD-45-MISC-06 for track friendly bogie with the requirements of Indian Railways and floated tender in the year 2007 globally through Railway Board. The offer of M/s ASF KEYSTONE Inc. USA has been considered.

25 T BOGIE

A contract between M/s ASF KEYSTONE Inc. USA and Indian Railways has been made to supply 4000 no's of track friendly bogie with Transfer of Technology. This is a two axle three-piece cast steel bogie. The bogie is designed in such a manner that pivoting at two place to provide Swing Motion feature. The side frame, bolster and transom are designed for 32.5t axle load. They will supply 25t axle load bogies. Its capacity can be elevated to 32.5t axle load by changing its spring nest of suspension.

SALIENT FEATURE OF BOGIE

- Two axle three-piece cast steel bogie
- Swing motion feature.
- Maximum swing of bolster 32 mm in two stages.
- Speed 110 kmph.
- Pivoted surface between the pedestal and adopter.
- Pivoted surface between the spring seat and rocker assembly.
- Bogie mounted brake system.

SALIENT FEATURE OF BOGIE

- Spring loaded constant contact side bearers.
- Wheel base 1880 mm.
- Journal centers 2248 mm.
- Diameter of wheel 965 mm.
- Bottom of center pivot height from rail level 635.7 mm.
- Height of side bearer from rail level 774.3 mm.
- Bogie stiffness 715.16 kg/mm.

AXLE AND BEARING

- Type of bearing : AAR Std. Class ‘M’ 7˝X9˝
- Axle : AAR – M101 Grade F
- Journal size : 165.2 mm Dia.
- Journal centre : 2248 mm
- Adopter type : Class M

WHEEL

- Diameter of wheel : 965 mm
- Condemning diameter : 920 mm
- Wheel profile : WWP
- Rim thickness : 127 mm
- Flange thickness : 28.5 mm
- Condemning flange thickness : 23.8 mm

SWING MOTION MECHANISM

- Swing motion bogie design has two stage lateral suspensions
  - pivoting surface between the pedestal and the adopter
  - pivoting surface between the spring seat and the rocker assembly
- In this arrangement the wheel gets decoupled from the mass of the wagon and when flange hits the rail, the mass behind the contact is the mass of the wheel and not the mass of whole wagon.

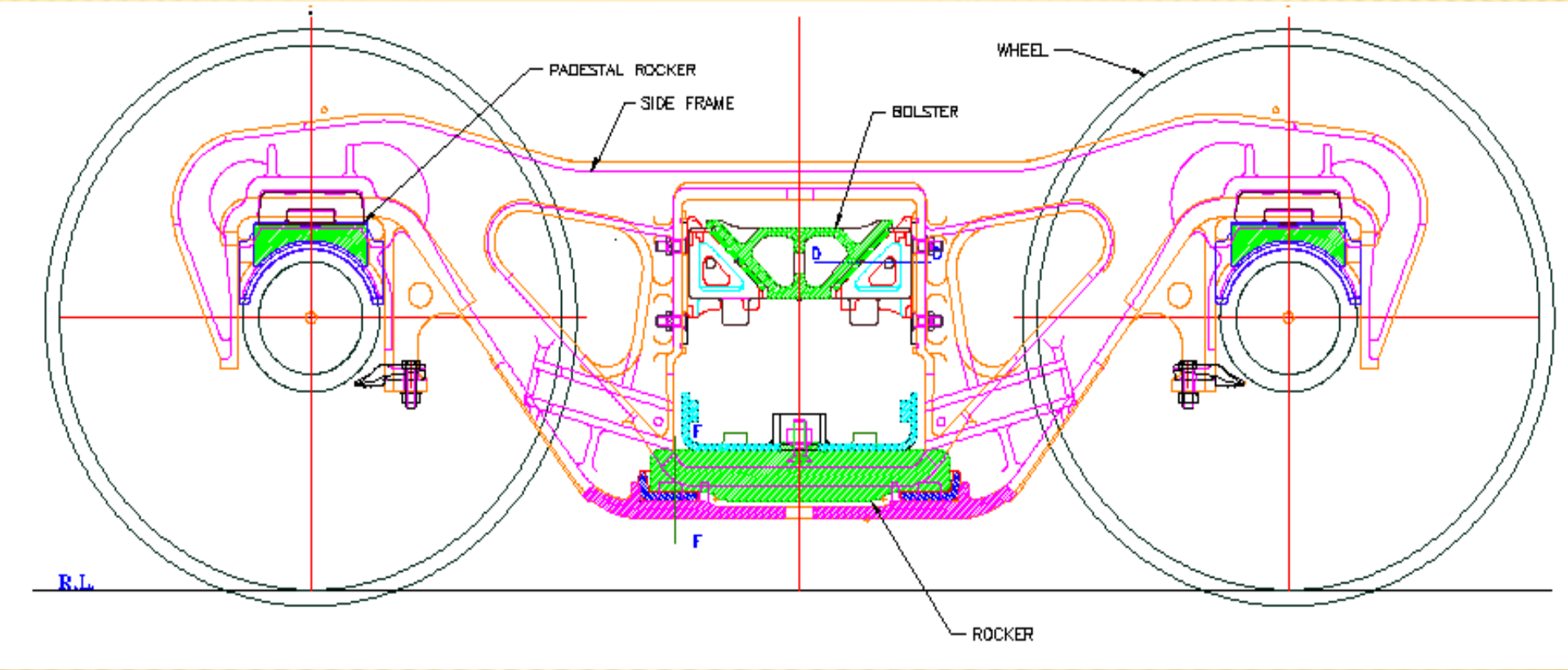
SWING MOTION MECHANISM

- Lateral forces between wheel & rail and also wheel & rail wear get reduced considerably.
- Point of application of lateral forces is lowered from the height of conventional bolster gibs to the height of spring seat, reducing the wheel unloading considerably.

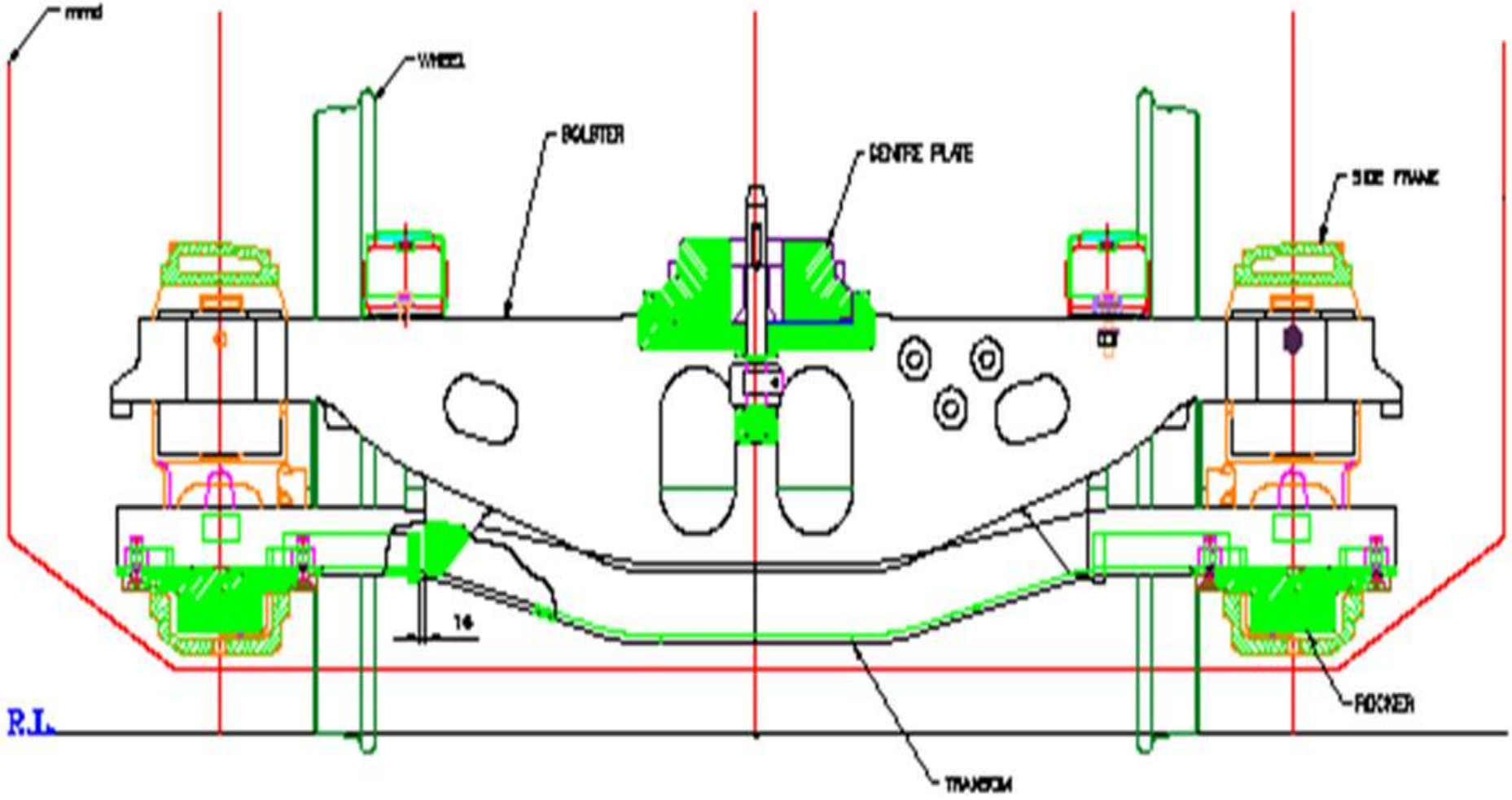
ADVANTAGES OF SWING MOTION BOGIE

- Improves curving performance
- Improves ride quality
- High speed stability and axle-to-rail alignment
- Reduces rolling resistance.
- It provides a longer bogie and rail life
- Excellent wheel load equalizing ability
- Increase velocity
- Reduce wheel wear
- Prevent hunting
- Reduce track wear
- Reduce component wear

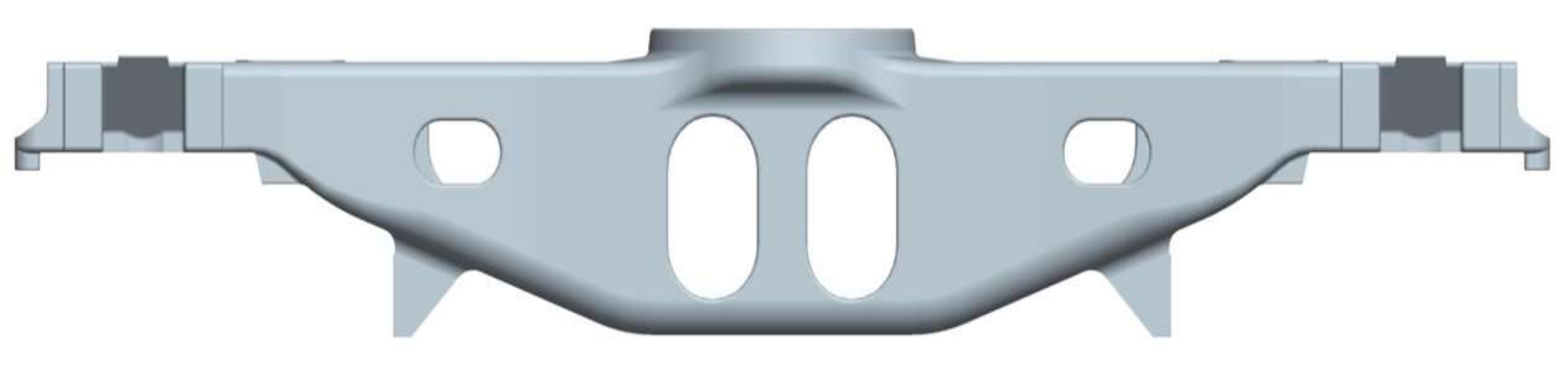
ARRANGEMENT OF TRACK FRIENDLY BOGIE



FREE BOGIE ARRANGEMENT



BOLSTER



Particulars	ASF	Casnub
Weight of Bolster	720 kg	565 kg
Centre pivot bottom	Integrated	Riveted
Material	M-201 Grade B+	Annexure-VIII of WD-17-Casnub-22HS-Bogie
UTS	552 Mpa	500 Mpa
Yield Stress	345 Mpa	300 MPa

UTS- ultimate tensile strength

Mpa- megapascals (Mpa= N/mm2)

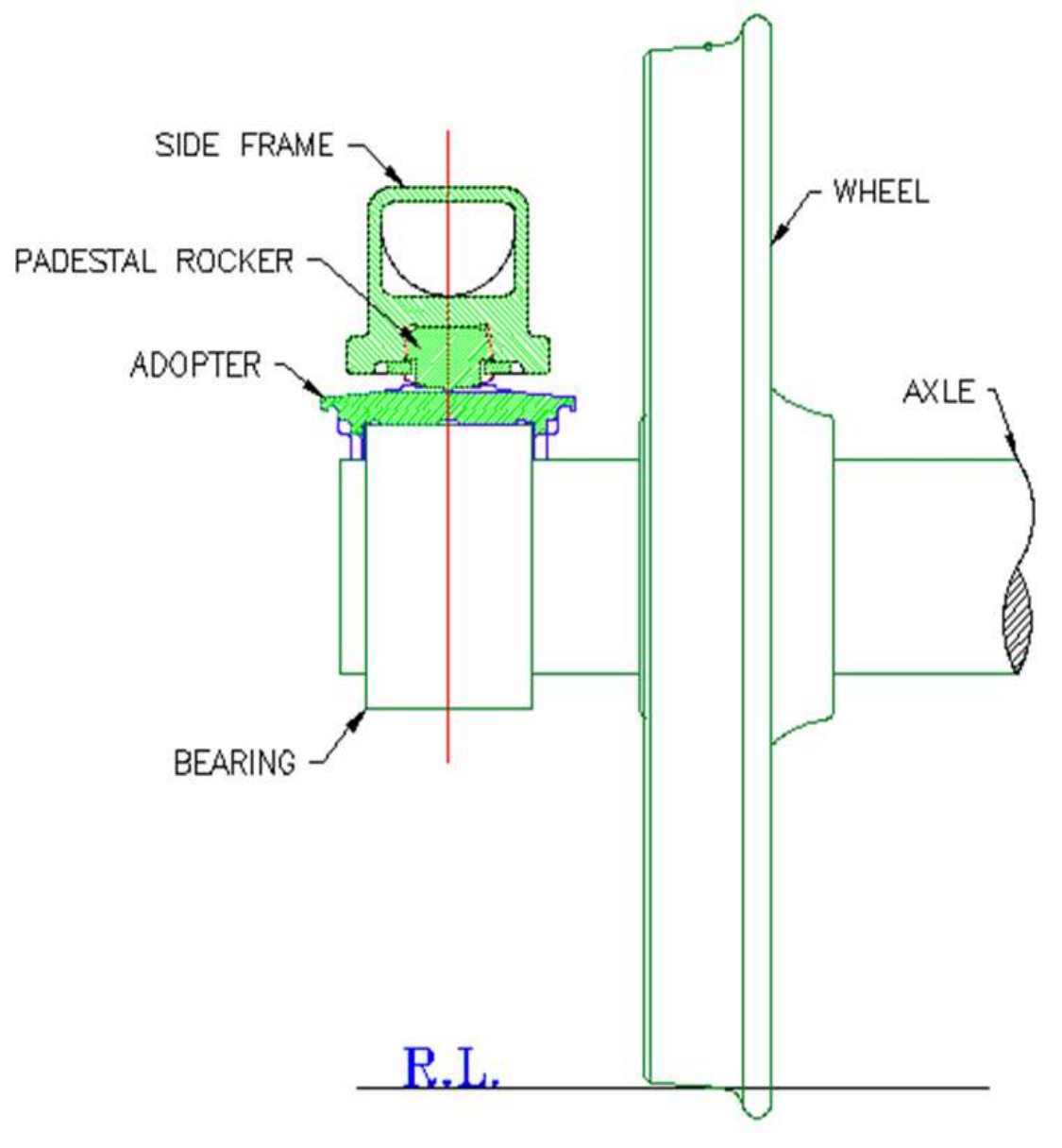
SIDE FRAME

Particulars	ASF	Casnub
Weight of each frame	420	430
Jaw	M Class	E Class
Material	M-201 Grade B+	Annexure-VIII of WD-17-Casnub-22HS-Bogie
UTS	552 Mpa	500 Mpa
Yield Stress	345 Mpa	300 MPa

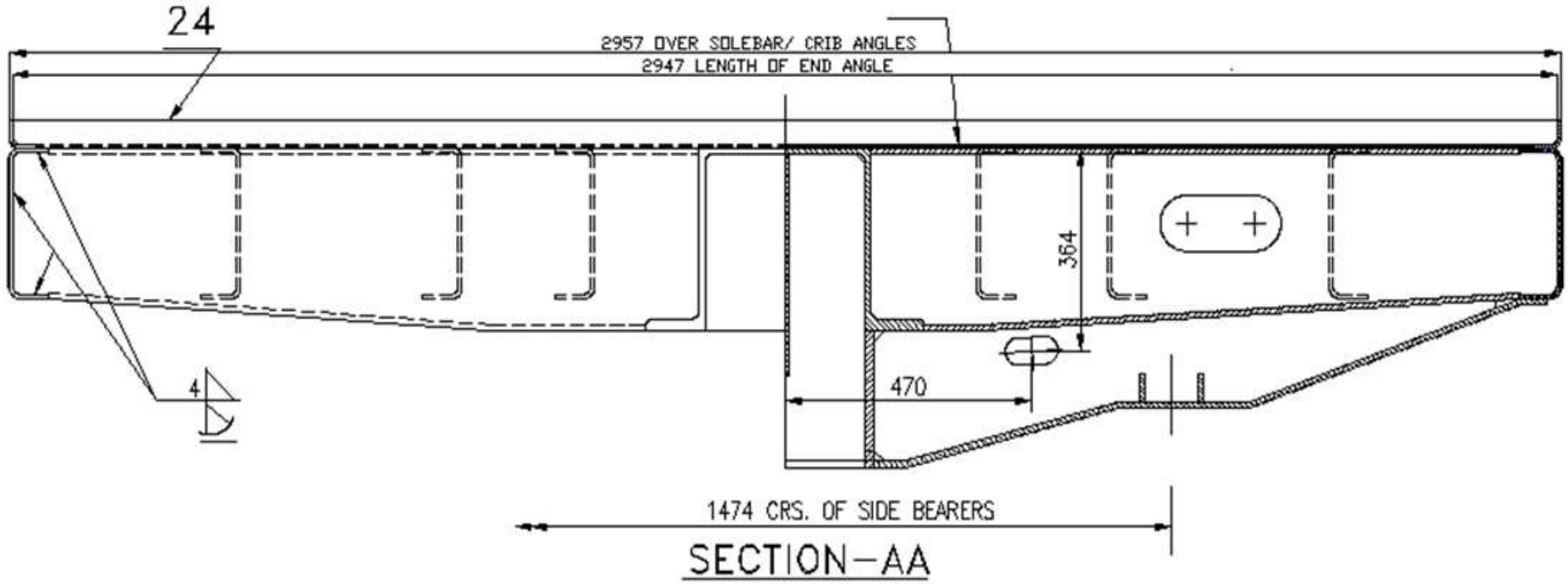
UTS- ultimate tensile strength

Mpa- megapascals (Mpa= N/mm2)

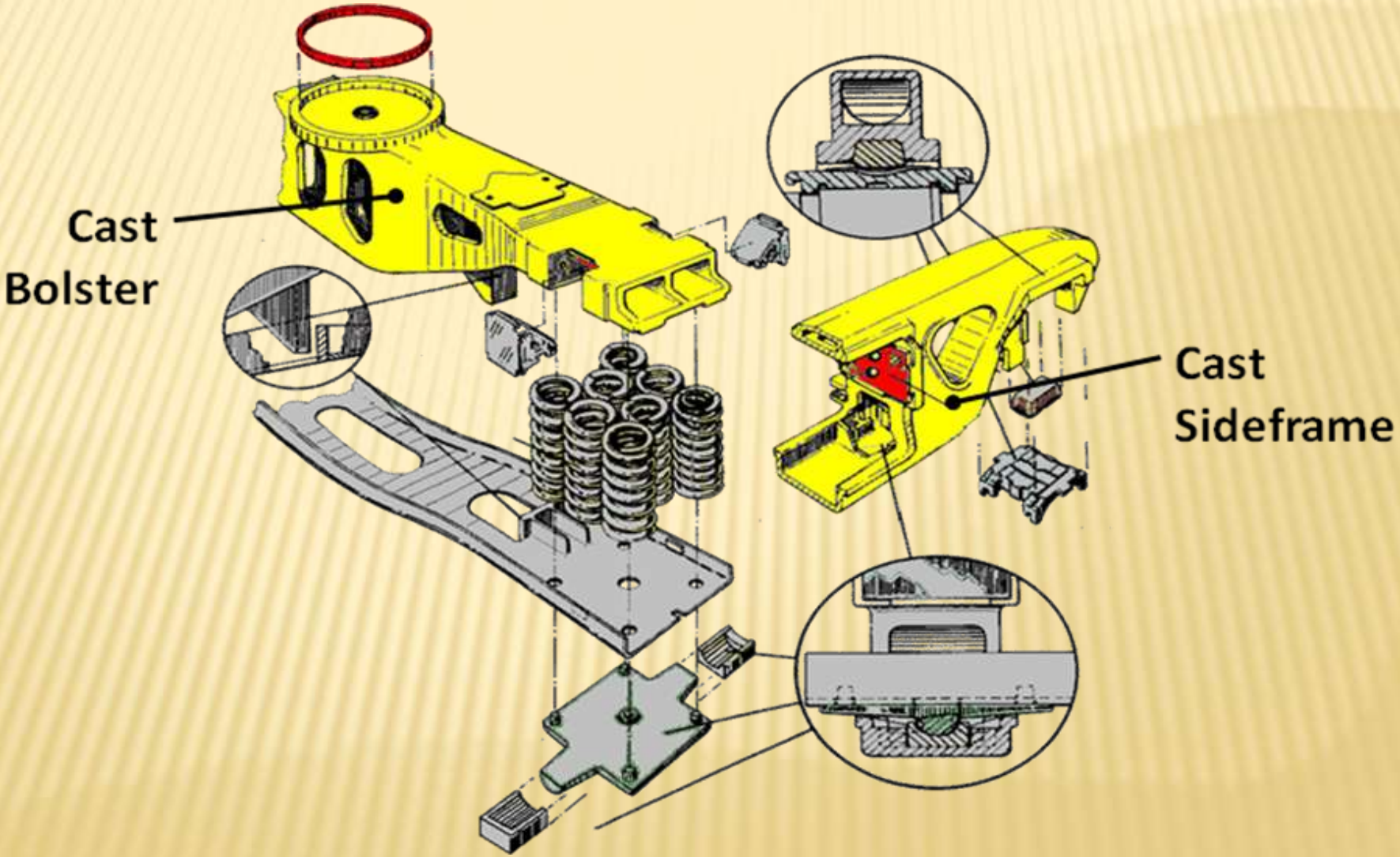
ARRANGEMENT OF PADESTAL ROCKER



CROSS SECTION OF BOXN25M UNDER FRAME BOLSTER WITH ADOPTER



EXPLODED VIEW OF BOGIE



TRANSOM

Particulars	ASF	Casnub
Weight of Transom	153 kg	157 kg
Material	ASTM A656 type 7 Grade 80	IS:5986-92 Grade Fe360

CONCLUSION:

Ultimately, these features of 25 t A/L Bogie lowered lateral force on wheel. Thus reduced wheel to rail wear, maintenance and provide high speed. Low height of this bogie leaves more space to accommodate more volume of consignment. Expected POH of this bogie is 8 years or assuming 200,000 km per year. This bogie in freight operation expected to be earning additional 4.5 cores (approx.) per wagon per year.