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ASSEMBLYING OF ICF BOGIE SECONDARY SUSPENSION BOLSTER HANGER PIN LOCK BY USING HYDRAULIC COMPRESS

M. MUGESH[1], R. MARIAPPAN[2], K. KARTHICK[3], M. THIRUKKUMARAN[4]

[1,2,3]Department of Mechanical and Automation Engineering, PSN College of Engineering and Technology, Tirunelveli
[4]Ass.Professor. Department of Mechanical and Automation Engineering,PSN College of Engineering and Technology, Tirunelveli

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Abstract - Secondary suspension which is a part of ICF Bogie assembly process is getting executed. It is done on two sides. For both the sides weight of 8 tone is moved with the crane from one place to another where the secondary suspension is processed. There may be a affect with this. In order to avoid this we use double acting cylinder and 3 phase motor to compress secondary bolster suspension hydraulic and then we connect lower spring beam and bogie frame with the hanger. We could definitely avoid accidents with this.

Key Words: **ICF bogie frame, secondary suspension, bolster, BSS hanger pin lock , hydraulic compress,**

1. INTRODUCTION

ICF Bogie is a conventional railway bogie used on the majority of Indian Railway main line passenger coaches. The design of the bogie was developed by ICF (Integral Coach Factory), Perambur, India in collaboration with the Swiss Car & Elevator Manufacturing Co., Schlieren, Switzerland in the 1950s. The design is also called the Schlieren design based on the location of the Swiss company

The bogie can be divided into various subsections for easy understanding as follows

A. Bogie Frame
B. Bogie bolster
C. Center pivot pin
D. Wheel set assembly
E. Roller bearing assembly
F. Brake beam assembly
G. Brake levers
H. Brake cylinder
I. Secondary suspension
J. Primary suspension
K. Brake blocks
L. Brake head

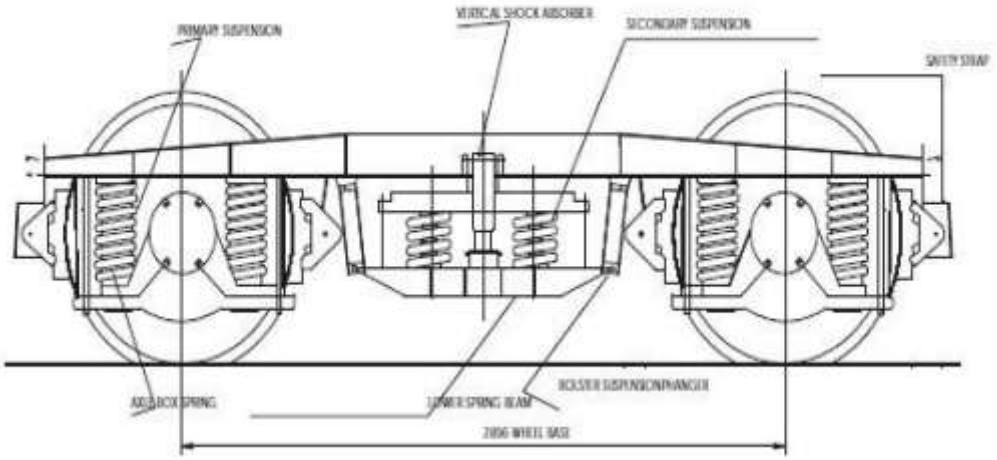


Fig 1.1 ICF BOGIE

The secondary suspension arrangement of the ICF bogies is through bolster springs. The bogie bolster is not bolted or welded anywhere to the bogie frame. It is attached to the bogie frame through the anchor link. The anchor link is a tubular structure with cylindrical housing on both the ends. The cylindrical housings have silent blocks placed in them. The anchor link is fixed to the bogie bolster and the bogie frame with the help of steel brackets welded to the bogie bolster and the bogie frame. Both the ends of the anchor link act as a hinge and allow movement of the bogie bolster when the coach is moving on a curved track.

1.1SECONDARY SUSPENSION PARTS

- Bolster
- spring beam
- Bolster compression springs
- BSS hangers
- BSS block
- BSS pin
- Equalizing stay rod
- Anchor link

Fig 1.2 SECONDARY SUSPENSION

In secondary suspension system, the bolster is supported on helical coiled springs which are placed on lower spring beam. The lower spring beam is suspended from bogie side frame through BSS hangers on BSS hanger blocks. This BSS hanger blocks are supported on BSS hanger pins which are attached in bogie frame.

Fig 1.3 HANGER PIN LOCK

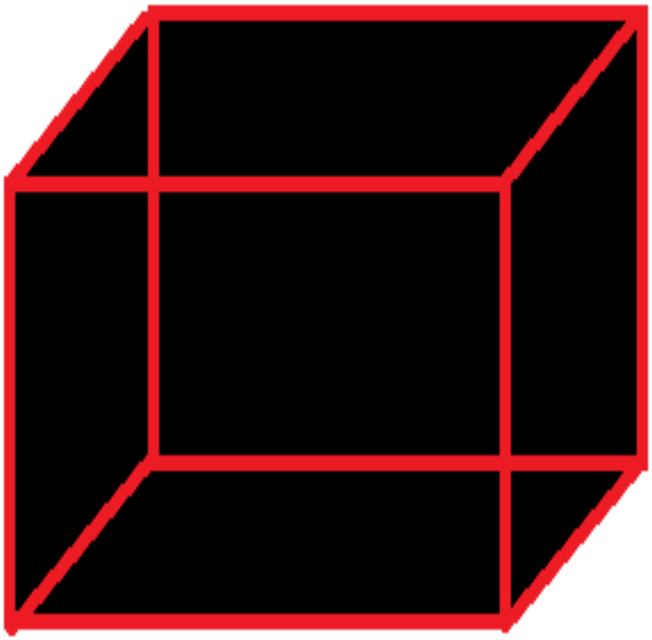
1.2SECONDARY SUSPENSION BOLSTER

The body bolster is a box type fabricated member made up of channels and welded to the body of the coach. It is a free-floating member. The body bolster transfers the dead weight of the coach body to the bogie frame. There are two type of bolsters in an ICF bogie: body bolster and the bogie bolster. The body bolster is welded to the coach body whereas the bogie bolster is a free floating member which takes the entire load of the coach through the body bolster.In body bolster there are 2 side bearers and a center pivot pin are joined by excellent quality welding. These three parts acts as a male part and matches with the female part welded to bogie bolster. These are very vital parts for smooth running of train

Fig 1.4 BOLSTER

1.3THE SECONDARY SUSPENSION LOCKING OF OLD PROCESS IN USE OF NORMAL MASS WEIGHT

The secondary suspension bolster and hanger pin locking system by both side of 8 tone mass weights in used by compress to spring in both side of locking to the hanger pin lock.The mass weight system compress in one place to another place moved by use of crane,the over weight crane lift to cut of chain The cut of chain 8 tone mass weight falling accident of railway workers. The mass weight one place to another place moving systems taking of over time in repair work and production work was delay. Occupying for more then working place.



1.4BOLSTER COMPRESSION SPRINGS

Since it is a ICF all coiled bogie, helical compression springs are used in secondary suspension system. They are made up of chrome vanadium/ chrome molybdenumsteel. The mean diameter of bolster springs are approximately 324mm. Dimensions and safe working load of some bolster springs are given below.

Load deflection testing and grouping of Bolster spring (B.G Main line coaches)

Code	Wire dia	Free height	Test Load	Acceptable height under test load	Groups as per loaded spring height		
					A	B	C
					Yellow	Oxford Blue #	Green
B01	42	385	3300	301-317	301-305	306-311	312-317
B03	42	400	4800	291-308	291-296	297-303	304-308
B04	47	400	6100	286-304	286-291	292-297	298-304
B06	36	416	4200	280-299	280-286	287-292	293-299
B11	47	386	6700	306-322	306-311	312-317	318-322
B13	34						
B15	40	393	6000	256-272	256-261	262-267	268-272
B16	32.5	286					

ICF BOGIE BOLSTER COMPRESS BY USING

2. HYDRAULIC CYLINDER

When diameter of piston rod is almost equal to piston diameter then generally it is called as RAM. But in general all large size of piston rods are called "RAM". Piston rod is a mechanical member, which transmits kinetic energy, which got developed at piston, to the work-piece. It is circular in cross-section in case of double action cylinder, as hydraulic sealing is required between piston rod and guide 50bushIn ram type of single action cylinder, piston rod is also circular in cross action, while in piston type single action cylinder in which sealing is not required between piston rod and guide bush, piston rod may be of any type of cross section. For example in case of lock nut type of single action jack, piston rod has thread on its entire length. Piston-rod is also called as plunger. It could extend from both the end of cylinder, and it could be hollow also. Piston-rod could be attached to other component by means of threading, eye bolt type arrangement, or groove and split coupling arrangement etc

2.1 FRL

It is imperative that a filter, regulator, lubricator (FRL) be employed when running pneumatic tools. The air should be clean, dry, and lubricated to maximize life and performance of the pneumatic tool. Maximum pressure for the FRL is 120 psi.

FRL Operation

Connect the airlines to the FRL. The direction of the air flow is indicated by arrows on the top of the FRL. With the pneumatic tool and in the off position, turn on the supply air to the FRL. Check the level of fluids in the clear bowls on the bottom of the Air Filter and Air Lubricator. If the air filter bowl contains water, drain the bowl by pressing and holding the small button on the bottom of the bowl until the water is completely drained. Observe the maximum water level line on the metal protective shield of the bowl. Water can be drained with either the air supply on or off. The oil level in the air lubricator must be maintained for proper lubrication of the pneumatic tool.The minimum and maximum oil levels are indicated on the metal protective shield of the oiler bowl. To add oil, remove the black oil plug at the top of the oiler with a ¼" hex wrench, add

oil and re-place the plug. USE NONFLUID OIL. Oil can be added with either the air supply on or off. The air pressure is indicated on the dial gauge on the front of the Pressure Regulator. To adjustthe air pressures, pull the large black knob below the gauge down to the unlocked position. When unlocked, an orange band can be observed on the top of the knob Turn the knob clock-wise to increase the pressure. When the desired pressure is reach push the knob up to the locked position. (The orange band is no longer visible.) The amount of lubricant supplied to the pneumatic tool is regulated by the number of drops of oil per minute and is observed through the site window of the oil adjusting valve knob at the top

2.24/3DIRECTIONALVALVE

Valves of type WM are mechanically, manually operated di-rectional spoolvalves, those of types WN, WP and WHD are fluidically operated. They Contro the start, stop and direction oflow. These directional valves basically consist of housing(1), one actuating element (roller plunger, hand lever, rotary knob) or two actuating elements (hydraulic, pneumatic actuator), control spool and one or two return springs In the non-operated condition, control spool is held by re-turn springs – in the case of rotary knob operation by de-tent in the central or initial position (an exception are im-pulse spools with hydraulic or pneumatic actuation)actuating elements shift control spool to the desired position.

2.3 PHASE INDUCTION MOTER

Fig 1.5 3PHASE INDUCTION MOTORS

Induction Both motor and transformer work on the principle of induced voltage

Transformer: voltage applied to the primary windings produce an induced voltage in the secondary windings.

Induction motor; voltage applied to the stator windings produce an N induced voltage in the rotor windings.

The difference is that, in the case of the induction motor, the secondary windings can move.

2.4 SECONDRY SUSPENSION COMPRESS BOLSTER HANGER PIN LOCK OLD PROCESS PROBLEM

- The secondary suspension bolster and hanger pin locking system by both side of 8 tone mass weights in used by compress to spring in both side of locking to the hanger pin lock.
- The mass weight system compress in one place to another place moved by use of grane,the over weight grane lift to cut of chain
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- The mass weight one place to another place moving systems taking of over time in repair work and production work was delay.
- Accupying for more then working place.

3. WORKING PROCESS OF HYDRAULIC COMPRESS

The hydraulic compress working of opening valve oil tube going to the tube line of FRL unit .

- The FRL unit in process of filter in the oil.

- There are the filter of the frl unit oil going to the 3 phase induction motor ,the 3 phase induction motor recived the oil and pump of the oil process and pump oil no for a direct, the oil pump for the open for a 4/3 direct control valve in open for go the oil in tube in inlet line.
- The two inlet tube line down for a hydraulic in compress for a 8 tone weight ,the 8 tone weight in compress of both side of the hydraulic cylinder .
- The process to easy way for a ICF bogie secondary suspension compress of a spring and easy of lock for a bolster and locking for a BSS hanger pin lock.
- The method to save for a time and no problem in process.

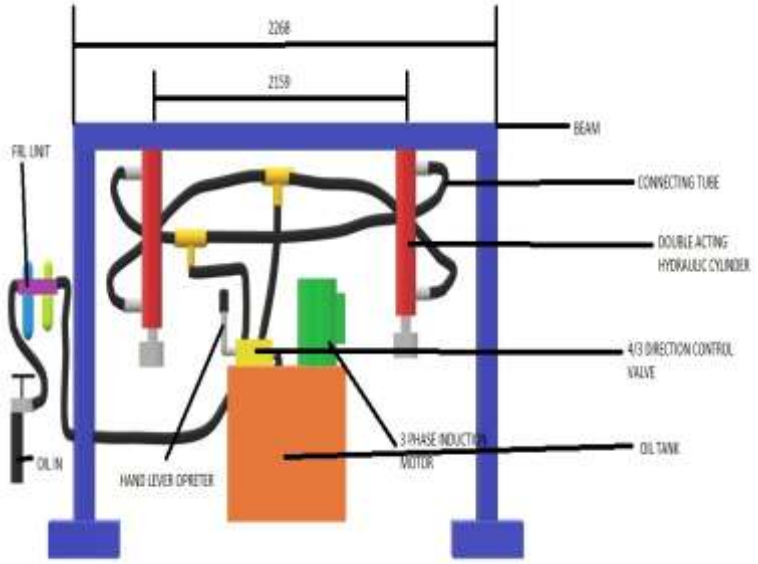

Fig 1.7 HYDRAULIC COMPRESS SETUP

4. CONCLUSION

From the whole discussion in suspension system, I observe that suspension system is like a white blood cell .As white blood cell provides energy to our body to fight against diseases or viruses which try to destroy or try to decrease our life ,in the similar way suspension system provides the energy to a vehicle to protect itself from damaging, increasing life of the vehicle ,increases the handing, increases comfort of passengers and So, according to me if you remove the suspension system, then you feel like in bull- cart in Audi, Mercedes types luxurious cars. The only difference is speed. So, the scope of Suspension System is Too Brigh.

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