

भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय MINISTRY OF RAILWAYS
रेलवे बोर्ड RAILWAY BOARD

No.2003/M(N)/951/22

New Delhi, dated 16.1.13

The Chief Mechanical Engineers
All Indian Railways

Sub: Report on Must-Change Items in Freight Stock during POH & ROH

As per Item 2.9 of this office letter of even number dt. 11.10.12, a Committee consisting of CRSE/CR (Convenor), CRSE/SCR, CWM/JHSW, CWM/KGPW and Director/Wagon/RDSO (Secretary) was formed to study and recommend the must-change items during POH & ROH.

The Committee has submitted its report which has been accepted by Board (MM). The same is hereby forwarded for necessary appropriate action.

A. Mittal

(Archana Mittal)
Dir. Mech. Engg. (Frt.)

Encl: As above

Copy to: EDS/W/RDSO
ED/CAMTECH

90

REPORT ON MUST CHANGE ITEMS IN FREIGHT STOCK DURING POH AND ROH

1. Terms of reference:

As per Railway Board's letter No. 2003/M(N)/951/22 dated 11-10-2012, a committee consisting of CRSE/CR (Convener), CRSE/SCR, CWM/JHSW, CWM/KGPW and Director RDSO/Wagon (Secretary) is formed to study and recommend the **must-change items during POH & ROH**.

2. Committee Members:

- 1) Shri. P.A. Lamghare, CRSE (Fr), Central Railway.... : Convener
- 2) Shri. M. Amarendra, CRSE, South Central Railway.. : Member
- 3) Shri. S.K. Gupta, CWM, Kharagpur Workshop..... : Member
- 4) Shri. Shivendra Mohan, CWM, Jhansi Workshop..... : Member
- 5) Shri. Roopesh Srivastva, Director (W), RDSO.....: Secretary

3. Background:

There has been a spate of hot axle cases and train parting cases on Indian Railways. Though Zonal Railways are following standard maintenance practices for schedule attention (POH & ROH), there is a wide variation in the consumption pattern of safety and vital items; the consumption is mainly guided by their sanctioned AACs. So, there is a possibility of worn out components remaining in service, thereby increasing the chances of failures.

It is, therefore, imperative to change certain components compulsorily during POH and ROH to improve upon the service reliability of wagons and to minimize on line failures.

4. Methodology:

The committee has visited various workshops (KGPW & JHSW) and ROH depots (NMP & JHS) to observe the existing maintenance practices being followed during POH, ROH, material consumption and failure analysis. The committee has adopted the strategy of considering the experience of workshops, ROH depots, existing material consumption pattern and life cycle of the various components which are subjected to wear and tear as well as failure analysis.

The existing percentage replacement of the safety and vital items in ROH depots and POH workshops have been collected from 16 ROH Depots and 5 Wagon Workshops over IR . The data collected has been compiled as Annexure-A and Annexure-B respectively. The replacement percentage range for the items attributable to Hot Axles, Train Partings and Brake Bindings are given as under:-

Sr. No.	Description	% replacement range	
		ROH	POH
1	Adaptor	0.01-64.20	1.65-69.0
2	Knuckle	3.06-67.65	10.40-94.80
3	Lock for CBC	0.20-18.00	0.68-92.37
4	Rotary Lock Lift Assembly	0.70-50.00	1.00-62.00
5	Bearing Piece	0.20-76.40	0.0-44.0
6	Coupler Rod	2.60-75.90	1.50-57.00
7	Shank Wear Plate	2.80-97.82	12.90-100
8	Striker Casting Wear Plate	6.70-100	19.00-100
9	Dirt Collector Filter	0.00- 62.05	0.00-90.0
10	Yoke Pin Support Plate Liner	7.50-55.20	0.00-7.00
11	BP Air Hose	5.00-76.91	19.00-100

The committee has observed that the wide variation in consumption pattern is on account of big gap in demand and supply of the items. It is gathered that on many occasions, when the stock of material is not available, either the serviceable material or some alternative material manufactured locally in the workshops are being used.

Sick marking analysis of four Zonal Railways (SE, CR, SCR, & WR) for the last three years has been studied and found that majority of failures are on following account.

S. No.	Type of defects	Percentage
1	Brake gear	30.0
2	Wheel	24.2
3	CBC	20.3
4	Air Brake	13.4
5	Side Bearer	11.0
6	Centre Pivot	10.0
7	CTRB failures	8.1

The detailed statement is given at Annexure-C. The items attributable to the above failures need to be changed during scheduled repairs, especially in POH.

The committee has observed that the item like Dirt Collector Filters are not getting replaced during ROH and POH due to the difficulty experienced by the technicians in accessing the location. Some changes are required to be made in design for relocating this item. Similarly, in CASNUB NL type bogies, there is no provision of pedestal liners in original design. So, the worn out surfaces are built up by depositing weld metal in depot and workshop. These surfaces are difficult to be made smooth by grinding. So the movement of the Adaptor is restricted in run and also side surfaces of the Adaptors are getting damaged resulting in rejection of Adaptors. The provision of liners in the original design

will be useful so that the worn out liner can be easily replaced during ROH and POH.

A sample study of various items requiring renewal but allowed in service on account of inadequacy of AAC has been done in Rayanapadu Workshops and this shows that requisite provision of material is not being made in workshops. Certain wear limits are provided on various components like Centre Pivots, Pedestal Jaw, Bolster, Brake Gear Pins etc. but these wear limits should not be applicable during POH for workshops because after having done the POH, wagons are expected to give trouble free service at least up to next ROH. But workshops are taking advantage of tolerance limits and allowing the wagons with worn out components.

The committee had the discussions with CWMs, DY. CMEs of the workshops, Sr. DMEs of the depots and Supervisors on the subject of must change items during POH and ROH, observed the existing trend of material consumption in workshops and ROH depots. Taking the experience of various officials involved in maintenance of wagons and referring various technical pamphlets issued by RDSO & CAMTECH from time to time on the subject of wagon maintenance, committee has made the following recommendations:

RECOMMENDATIONS:

ITEMS TO BE REPLACED DURING ROH

S N	Description of item	Justification for replacement
A	CASNUB BOGIE	
A-1	SF Key nut bolt with washer	During dismantling of wheel from bogie, it is necessary to cut the bolt since it is tack welded with nut. Therefore the committee recommends 100% replacement of this item during POH.
A-2	Split Pin 12 x 110 mm	The split pins of Brake Shoe key are being

		changed 100% in some depots as they are getting distorted / damaged while taking out the brake blocks. Hence 100 % replacement is recommended during ROH.
A-3	CTRB Locking plate	The Locking plates are being changed on 100% basis. While carrying out the UST of Wheel sets, the locking plates are to be removed and while doing so, tabs are getting damaged or broken. Hence 100 % replacement is recommended during ROH.
B	CBC	
B-1	Striker casting Wear Plate	This item is subjected to wear in service as it comes in contact with CBC Shank Wear Plate. Some ROH depots are replacing the item to the extent of 100 %. The worn out component will have serious impact on uncoupling of CBCs and it will also damage CBC shank; it will cause ovality on the top portion of Yoke Pin hole. Therefore the committee recommends 100% replacement of this item during ROH.
C	Air Brake System	
C-1	Dirt Collector Filter	This is basically a non-metallic strainer and of a small value. At present depots are changing on condition basis and there is an apprehension that dirt collectors are not at all opened in depots during ROH. There are many cases of DV malfunctioning and subsequent brake bindings in service and the filter is playing a major role. Therefore the committee recommends 100% replacement of this item during ROH so that it will be compulsory on the part of the depot to open the Dirt Collector.
C-2	Dirt Collector Washer ('O' Ring)	These are the small value rubber items perishable in nature and getting damaged while opening the assemblies. Therefore the
C-3	Rubber gaskets	

C-4	MU washers	committee recommends 100% replacement of this item during ROH.
C-5	AR Drain Plug leather washer	These items are perishable in nature getting damaged while opening the assemblies. Therefore the committee recommends 100% replacement of this item during ROH
C-6	BC Drain Plug leather washer	
D	Tank wagons	
D-1	Filling Pipe Joint Ring (BTPN)	These are the rubber items perishable in nature and getting damaged while opening the assemblies. Therefore the committee recommends 100% replacement of this item during ROH.
D-2	Man Hole Cover Sealing Ring.	

ITEMS TO BE REPLACED DURING POH:

S. No.	Description of item	Justification for replacement
A	CASNUB BOGIE	
A-1	Side Frame	
1.	Pedestal Jaw Liners	These items are subjected to wear in service as they are continuously in contact with adaptor and not expected to last beyond one POH. The liners of suitable thickness are required to be welded. Therefore the committee recommends 100% replacement of these items during POH. Committee also recommends that no weld metal deposit should be done on the pedestal jaw surfaces to maintain the clearances as no machining is done after welding. RDSO may explore the possibility of liners in original design. The smoothness of the surface is primarily important.
2.	SF Key nut bolt with washer	During dismantling of wheel from bogie, it is necessary to cut the bolt since it is tack welded with nut. Therefore the committee recommends 100% replacement of this item during POH.

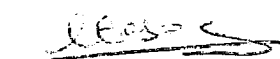
A-2	Bolster	
1	Land surface liner	These items are subjected to wear in service as they are continuously in contact with adaptor and expected to last from POH to POH. The liners of suitable thickness are required to be welded. Therefore the committee recommends 100% replacement of this item during POH.
2	Pocket slope liner	
3	Rotation stop lug liner	
A-3	Bogie Brake Gear	
1	Split Pin 12 x 110 mm	The split pins of Brake Shoe key are being changed 100% in some depots as they are getting distorted / damaged while taking out the brake blocks. Hence 100 % replacement is recommended during POH.
A-4	CTRB Locking plate	The Locking plates are being changed on 100% basis. While carrying out UST of the Wheel sets, the locking plates are to be removed and while doing so, tabs are getting damaged or broken. Hence 100 % replacement is recommended during POH.
A-5	Elastomeric pads	It has been observed that many workshops are replacing this item to the extent of 100%. Being a rubber component, committee recommends 100 % replacement of this item during POH. However, the serviceable EM Pads shall be given to divisions for replacement during the course of train examination.
B	Draw and Buffing Gear Assembly	
B-1	Knuckle	Knuckle is subjected to wear on Nose, Pulling lug area. Some workshops are changing on 100% basis and released serviceable material is given to divisions. Knuckles are playing very important role in coupling gear. In the present spurt of train parting / uncoupling cases Knuckles might be playing a vital role. Upgraded couplers are being developed by RDSO as per WD-70-BD-10. The committee therefore recommends one time replacement of

		indigenous knuckles with the upgraded knuckles as per WD-70-BD-10. However, serviceable knuckles shall be given to divisions for replacement during train examination.
B-2	CBC Lock	Lock is subjected to wear on contact area corresponding to Knuckle pulling lug and curved surface. Committee has observed that majority of the uncoupling cases are on account of worn out Locks. Upgraded couplers are being developed by RDSO as per WD-70-BD-10. The committee therefore recommends one time replacement of indigenous CBC locks with the upgraded CBC locks as per WD-70-BD-10. However, serviceable locks shall be given to divisions for replacement during train examination.
B-3	Rotary Lock Lift Assembly	Mostly, the Anti-Creep Lug of Lock Lifter Assembly is found in worn condition. Moreover, the alignment is disturbed due to riveting became loose in service. Upgraded couplers are being developed by RDSO as per WD-70-BD-10. The committee therefore recommends one time replacement of indigenous lock lift assembly with the upgraded lock lift assembly as per WD-70-BD-10. However, serviceable assemblies shall be given to divisions for replacement during train examination.
B-4	Bearing Piece.	The committee observed that consumption of this item between workshops to workshop varies from 3% to 33%. The item is subjected to wear in service; the slot (17.5 mm x 17.5 mm) of bearing piece becomes worn out in service and not holding the Operating Handle in position. As a result the operating handle along with Rotary Lock Lift Assembly gets displaced from its position thereby causing uncoupling of CBC. The item is not expected to last beyond one

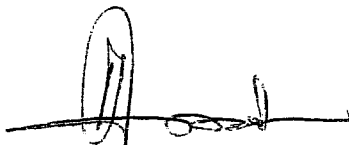
		POH. The committee therefore recommends 100% replacement of this item. However, serviceable bearing pieces shall be given to divisions for replacement during train examination.
B-5	Yoke Pin support plate liner	This item is subjected to wear particularly due to interaction of Yoke Pin's vertical movement. The pin makes a dent mark on the liner which is dangerous which restricts the movement of the yoke pin resulting in the breakage of Support plate rivets. The item is not expected to last beyond one POH cycle. The committee therefore recommends 100% replacement of this item.
B-6	Shank Wear Plate	This item is subjected to wear in service as it comes in contact with CBC Shank Wear Plate. Some workshops are replacing the item to the extent of 70%. The worn out component will have serious impact on uncoupling of CBCs and it will also damage CBC shank. The life of the component is not expected beyond one POH cycle. Therefore the committee recommends 100% replacement of this item during POH.
B-7	Striker Casting Wear Plate	This item is subjected to wear in service as it comes in contact with CBC Shank. Some workshops are already replacing the item to the extent of 100%. The worn out component will have serious impact on uncoupling of CBCs. The life of the component is not expected beyond one POH cycle. Therefore the committee recommends 100% replacement of this item during POH.
C	Air Brake System	
C-1	Dirt Collector Filter	This is basically a non-metallic strainer and of a small value. At present workshops are changing on condition basis. There are many cases of DV malfunctioning in service and the filter is playing a major role. The life of

		the component is not expected beyond one POH cycle. Therefore the committee recommends 100% replacement of this item during POH.
C-2	Dirt Collector Rubber Washer ('O' Ring)	These are the rubber items perishable in nature and getting damaged while opening the assemblies. The life of the items is not expected beyond one POH cycle. Therefore the committee recommends 100% replacement of this item during POH.
C-3	Rubber gaskets	
C-4	Rubber Seals of Cut off Angle Cocks.	
C-5	MU washers	
C-6	Grip seals / Rubber washers	
C-7	AR Drain Plug leather washer	These are items perishable in nature and getting damaged while opening the assemblies. Therefore the committee recommends 100% replacement of this item during POH.
C-8	BC Drain Plug leather washer	
C-9	BP Air Hose	This item is generally tested during POH for leakage and bulging at 10 Kg/cm ² pressure and about 50% rejection is there. Moreover, there are large numbers of service failures. Some workshops are changing 100% Being a Rubber item; it is not expected to last beyond one POH cycle. Therefore the committee recommends 100% replacement of this item during POH. However, serviceable hoses shall be given to divisions for replacement during train examination.
D	Tank wagons	
D-1	Filling Pipe Joint Ring (BTPN)	These are the rubber items perishable in nature and getting damaged while opening the assemblies. Therefore the committee recommends 100% replacement of this item during POH.
D-2	Man Hole Cover Sealing Ring.	

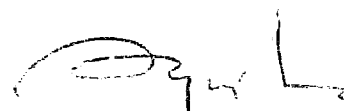
The committee is of the opinion that with the replacement of the items recommended above during ROH and POH, the reliability of freight stock will improve significantly. However, there is a large variation in the consumption pattern of the various items (given in Annexure A & B) during ROH and POH in the Zonal Railways depending on their maintenance practices. Zonal Railways may review the consumption of items and further rationalize the AAC of the items at their end.



(P.A. Lamghare)
Convener



(M. Amarendra)
Member



(S.K. Gupta)
Member



(Shivendra Mohan)
Member



(Roopesh Srivastva)
Secretary

Annexure-A

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTON	BKSC			BSL		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
1	Pedestal Jaw Liners	32%	28%	17%	2.66%	2.4%	2.5%
2	Pedestal Side Liners	32%	28%	17%	1.1%	0.95%	0.9%
3	SF Key nut bolt with washer	90%	80%	90%	56.1%	75.0%	26.3%
4	Land surface liner	32%	28%	17%	2.1%	2.7%	1.9%
5	Outer column gib liner	32%	28%	17%	5.9%	7.5%	5.5%
6	Inner column gib liner	32%	28%	17%	5.5%	5.6%	4.0%
7	Pocket slope liner	32%	28%	17%	14.3%	8.5%	7.6%
8	Rotation stop lug liner	32%	28%	17%	3.1%	2.7%	2.5%
9	Composite Brake Block	95%	95%	100%	100.0%	61.2%	75.1%
10	Brake Shoe Key	58%	56%	59%	57.3%	32.7%	22.0%
11	Split Pin 12 x 110 mm	Nil	Nil	Nil	100.0%	100.0%	100.0%
12	CTRB Locking plate	100%	100%	100%	100.0%	100.0%	95.7%
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads	80%	48%	37%	58.2%	49.7%	33.5%
17	Metal bonded Rubber Pads	45%	45%	40%	46.4%	99.5%	29.0%
18	Polyurethane Rings of Side Bearer	5%	4%	9%	8.2%	3.4%	3.01%
19	Adaptor	2%	3%	3%	6.3%	11.5%	4.1%
20	Knuckle	-	-	-	-	-	-
21	Lock	-	-	-	-	-	-
22	Rotary Lock Lift Assembly	22%	24%	40%	50.0%	39.4%	45.7%
23	Bearing Piece.	6%	9%	19%	24.7%	76.4%	42.9%
24	Operating handle	39%	25%	40%	49.0%	75.9%	26.4%
25	Yoke Pin support plate liner	-	-	-	55.2%	51.1%	7.5%
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	-	-	-	55.2%	51.1%	7.4%
28	Striker Casting Wear Plate	100%	100%	100%	55.2%	51.1%	12.2%
29	Dirt Collector Filter	0.6%	0.5%	0.5%	8.4%	7.6%	0.7%
30	Dirt Collector Rubber Washer ('O' Ring)	16%	23%	20%	34.5%	30.7%	33.2%
31	Rubber gaskets	8%	5%	3%	43.1%	38.4%	41.5%
32	Rubber Seals of Cut off Angle Cocks.	8%	5%	3%	2.3%	3.3%	3.2%
33	MU washers	10%	10%	24%	84.8%	114.8%	67.6%
34	Grip seal washers	Nil	Nil	Nil	1.9%	3.7%	25.2%
35	AR Drain Plug leather washer	Nil	Nil	Nil	18.2%	29.3%	64.9%
36	BC Drain Plug leather washer	Nil	Nil	Nil	18.2%	31.5%	64.9%
37	BP Air Hose	36%	33%	36%	10.4%	35.1%	16.6%
38	Filling Pipe Joint Ring (BTPN)	Nil	Nil	Nil	64.5%	100.0%	100.0%
39	Man Hole Cover Sealing Ring.	Nil	Nil	Nil	64.5%	97.5%	95.3%

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTION	SBI			RDM		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
1	Pedestal Jaw Liners	9.9%	9.1%	8.2%	-	-	-
2	Pedestal Side Liners	9.27%	8.6%	7.9%	-	-	-
3	SF Key nut bolt with washer	63.5%	70.0%	40.6%	25.24%	23.21%	32.51%
4	Land surface liner	8.5%	8.6%	8.0%	-	-	-
5	Outer column gib liner	8.95%	8.4%	7.6%	-	-	-
6	Inner column gib liner	8.54%	8.9%	7.9%	-	-	-
7	Pocket slope liner	20.3%	27.1%	14.1%	5.75%	5.20%	1.45%
8	Rotation stop lug liner	10.17%	8.6%	9.3%			
9	Composite Brake Block	91.90%	99.0%	93.7%	80.21%	98.74%	85.55%
10	Brake Shoe Key	24.57%	28.3%	19.6%	10.14%	10.41%	24.99%
11	Split Pin 12 x 110 mm	89.46%	91.7%	95.5%	9.01%	9.32%	10.74%
12	CTRB Locking plate	98.41%	90.8%	95.5%	2.43%	2.19%	2.73%
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads	34.03%	37.7%	20.8%	100.36%	86.27%	82.89%
17	Metal bonded Rubber Pads	3.34%	11.5%	6.1%	37.76%	15.83%	31.56%
18	Polyurethane Rings of Side Bearer	8.95%	8.62%	9.28%	5.51%	5.36%	5.20%
19	Adaptor	6.65%	6.19%	5.49%	2.25%	2.47%	3.96%
20	Knuckle	-	-	-	19.59%	5.03%	7.14%
21	Lock	-	-	-	11.85%	5.64%	6.22%
22	Rotary Lock Lift Assembly	7.77%	13.1%	12.9%	6.76%	6.05%	11.15%
23	Bearing Piece.	1.82%	3.8%	4.6%	0.00%	0.00%	0.00%
24	Operating handle	23.42%	23.1%	15.1%	6.49%	6.27%	11.59%
25	Yoke Pin support plate liner	-	-	-	-	-	-
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	79.05%	53.4%	32.8%	27.03%	27.79%	41.41%
28	Striker Casting Wear Plate	68.22%	72.62%	50.38%	33.78%	26.03%	43.65%
29	Dirt Collector Filter	62.05%	50.84%	43.67%	-	-	-
30	Dirt Collector Rubber Washer ('O' Ring)	48.80%	80.94%	43.67%	-	-	-
31	Rubber gaskets	35.78%	37.22%	32.75%	-	-	-
32	Rubber Seals of Cut off Angle Cocks.	32.53%	34.50%	32.75%	-	-	-
33	MU washers	15.42%	14.85%	14.03%	45.05%	44.30%	65.76%
34	Grip seal washers	32.53%	33.77%	35.48%	-	-	-
35	AR Drain Plug leather washer	32.53%	47.20%	43.65%	-	-	-
36	BC Drain Plug leather washer	32.53%	49.02%	42.58%	-	-	-
37	BP Air Hose	7.16%	12.71%	15.01%	9.01%	7.81%	17.63%
38	Filling Pipe Joint Ring (BTPN)	-	-	-	-	-	-
39	Man Hole Cover Sealing Ring.	-	-	-	-	-	-

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTON	BZA			KGP		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
1	Pedestal Jaw Liners	-	-	-	-	-	-
2	Pedestal Side Liners	-	-	-	-	-	-
3	SF Key nut bolt with washer	100.00%	100.00%	100.00%	96.70%	86.20%	94.30%
4	Land surface liner	-	-	-	-	-	-
5	Outer column gib liner	-	-	-	-	-	-
6	Inner column gib liner	-	-	-	-	-	-
7	Pocket slope liner	6.39%	9.23%	10.84%	20.00%	22.00%	22.00%
8	Rotation stop lug liner						
9	Composite Brake Block	95.81%	100.00%	100.00%	100.00%	100.00%	100.00%
10	Brake Shoe Key	23.84%	22.50%	20.90%	39.40%	37.00%	40.00%
11	Split Pin 12 x 110 mm	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
12	CTRB Locking plate	79.60%	100.00%	100.00%	94.56%	95.10%	-
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads	64.17%	91.44%	100.00%	80.00%	92.20%	
17	Metal bonded Rubber Pads	90.62%	48.30%	58.33%	-	-	-
18	Polyurethane Rings of Side Bearer	0.00%	6.41%	9.38%	-	-	-
19	Adaptor	0.54%	0.81%	2.35%	3.30%	7.50%	
20	Knuckle	11.76%	16.32%	11.54%	-	-	-
21	Lock	2.87%	6.32%	5.04%	-	-	-
22	Rotary Lock Lift Assembly	4.35%	5.04%	7.04%	9.50%	28.00%	-
23	Bearing Piece.	2.85%	2.56%	3.33%	1.30%	9.42%	-
24	Operating handle	7.49%	10.04%	3.75%	7.80%	23.00%	-
25	Yoke Pin support plate liner	-	-	-	-	-	-
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	56.66%	19.74%	32.25%	20.00%	22.00%	22.00%
28	Striker Casting Wear Plate	42.40%	40.21%	42.42%	59.00%	49.00%	
29	Dirt Collector Filter	-	-	-			
30	Dirt Collector Rubber Washer ('O' Ring)	-	-	-	31.70%	45.60%	45.70%
31	Rubber gaskets	-	-	-	4.60%	2.80%	5.40%
32	Rubber Seals of Cut off Angle Cocks.	-	-	-			
33	MU washers	12.55%	23.59%	51.00%	18.00%	20.60%	212.00%
34	Grip seal washers	-	-	-	-	-	-
35	AR Drain Plug leather washer	-	-	-	-	-	-
36	BC Drain Plug leather washer	-	-	-	-	-	-
37	BP Air Hose	25.93%	15.17%	11.96%	12.20%	15.80%	24.70%
38	Filling Pipe Joint Ring (BTPN)	-	-	-	-	-	-
39	Man Hole Cover Sealing Ring.	-	-	-	-	-	-

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTON	BNDM			UMB		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
1	Pedestal Jaw Liners	28.00%	21.22%	16.33%	33.00%	43.90%	36.10%
2	Pedestal Side Liners	-	-	-	15.70%	21.30%	16.10%
3	SF Key nut bolt with washer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
4	Land surface liner	7.40%	8.14%	16.09%	13.90%	18.80%	20.80%
5	Outer column gib liner	-	-	-	14.60%	17.90%	22.10%
6	Inner column gib liner	-	-	-			
7	Pocket slope liner	14.80%	15.92%	38.99%	11.10%	14.20%	16.70%
8	Rotation stop lug liner				11.70%	12.40%	12.40%
9	Composite Brake Block	100.00%	100.00%	100.00%	91.30%	94.50%	100.00%
10	Brake Shoe Key				43.40%	48.10%	75.40%
11	Split Pin 12 x 110 mm	82.36%	69.89%	91.99%	91.30%	94.50%	100.00%
12	CTRB Locking plate	100%	100%	21%	95.20%	85.20%	75.40%
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads		-	-	100%	100%	100%
17	Metal bonded Rubber Pads	42.85%	-	-	83.50%	59.60%	45.60%
18	Polyurethane Rings of Side Bearer		-	2.62%	1.00%	1.80%	1.20%
19	Adaptor	1.17%	1.15%	2.81%	37.50%	40.70%	64.20%
20	Knuckle	-	-	-	21.90%	23.90%	22.10%
21	Lock	-	-	-	0.20%	0.50%	0.20%
22	Rotary Lock Lift Assembly	6.19%	6.37%	21.87%	0.70%	1.00%	0.70%
23	Bearing Piece.	1.18%	6.31%	11.98%	0.20%	0.30%	0.20%
24	Operating handle				2.60%	5.40%	3.40%
25	Yoke Pin support plate liner	-	-	-	-	-	-
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	21.69%	23.41%	26.98%	59.90%	47.30%	72.80%
28	Striker Casting Wear Plate	100%	100%	100%	43.10%	34.60%	65.30%
29	Dirt Collector Filter	1.70%	3.69%	6.65%	21.10%	24.50%	31.40%
30	Dirt Collector Rubber Washer ('O' Ring)				24.80%	31.80%	60.20%
31	Rubber gaskets	2.63%	2.16%	2.60%	3.70%	4.40%	3.50%
32	Rubber Seals of Cut off Angle Cocks.	2.97%	1.85%	3.78%	36.30%	44.50%	19.50%
33	MU washers	100%	100%	100%	100.00%	100.00%	100.00%
34	Grip seal washers	-	-	-	-	-	-
35	AR Drain Plug leather washer	-	-	-	65.40%	75.70%	87.20%
36	BC Drain Plug leather washer	-	-	-	59.80%	72.20%	79.50%
37	BP Air Hose	14.71%	18.71%	18.09%		-	-
38	Filling Pipe Joint Ring (BTPN)	-	-	-	-	-	-
39	Man Hole Cover Sealing Ring.	-	-	-	-	-	-

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTION	GOOTY			VSKP		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
		-	-	-	0.27%	0.31%	0.38%
1	Pedestal Jaw Liners	-	-	-	-	-	-
2	Pedestal Side Liners	-	-	-	-	-	-
3	SF Key nut bolt with washer	46.95%	43.89%	40.30%	61.81%	78.23%	51.25%
4	Land surface liner	-	-	-	-	-	-
5	Outer column gib liner	-	-	-	-	-	-
6	Inner column gib liner	-	-	-	-	-	-
7	Pocket slope liner	-	-	-	0.27%	0.31%	0.38%
8	Rotation stop lug liner	-	-	-	-	-	-
9	Composite Brake Block	100.22%	99.85%	94.70%	100.00%	100.00%	100.00%
10	Brake Shoe Key	63.27%	21.65%	71.91%	21.03%	26.60%	21.07%
11	Split Pin 12 x 110 mm	-	-	-	-	-	-
12	CTRB Locking plate	82.52%	100.69%	100.36%	100.00%	100.00%	100.00%
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads	86%	77%	100%	28%	36%	23%
17	Metal bonded Rubber Pads	80.28%	41.00%	53.78%	31.80%	17.55%	10.86%
18	Polyurethane Rings of Side Bearer	-	-	3.57%	-	-	-
19	Adaptor	7.78%	0.87%	7.43%	0.78%	0.48%	0.46%
20	Knuckle	30.29%	14.90%	17.83%	7.53%	8.12%	5.04%
21	Lock	16.12%	9.38%	8.20%	7.13%	8.92%	4.41%
22	Rotary Lock Lift Assembly	8.60%	20.89%	12.98%	5.43%	4.31%	4.74%
23	Bearing Piece.	-	-	-	1.52%	2.10%	2.14%
24	Operating handle	22.01%	15.33%	17.15%	9.37%	12.89%	6.53%
25	Yoke Pin support plate liner	-	-	-	-	-	-
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	25.55%	37.84%	48.22%	0.00%	7.93%	6.08%
28	Striker Casting Wear Plate	33.18%	22%	44.58%	31.45%	34.73%	19.27%
29	Dirt Collector Filter	-	-	-	-	-	-
30	Dirt Collector Rubber Washer ('O' Ring)	-	-	-	-	-	-
31	Rubber gaskets	-	-	-	2.23%	3.53%	1.78%
32	Rubber Seals of Cut off Angle Cocks.	-	-	-	0.41%	0.48%	0.07%
33	MU washers	64.24%	54.25%	54.35%	21.79%	30.32%	24.96%
34	Grip seal washers	-	-	-	-	-	-
35	AR Drain Plug leather washer	-	-	-	-	-	-
36	BC Drain Plug leather washer	-	-	-	-	-	-
37	BP Air Hose	59.80%	59.46%	31.85%	16.55%	30.83%	28.06%
38	Filling Pipe Joint Ring (BTPN)	-	-	-	-	-	-
39	Man Hole Cover Sealing Ring.	-	-	-	-	-	-

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTION	VTA			JHS		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
1	Pedestal Jaw Liners	9.38%	9.44%	9.33%	20.00%	25.00%	20.00%
2	Pedestal Side Liners	9.22%	9.44%	9.00%	15.00%	20.00%	25.00%
3	SF Key nut bolt with washer	51.31%	63.99%	77.37%	87.00%	80.00%	100.00%
4	Land surface liner	9.25%	9.47%	9.33%	5.00%	6.00%	5.00%
5	Outer column gib liner	8.99%	9.54%	9.46%	4.00%	5.00%	4.00%
6	Inner column gib liner	9.06%	9.47%	9.59%	3.00%	4.00%	4.50%
7	Pocket slope liner	22.89%	34.10%	22.16%	4.00%	5.00%	3.00%
8	Rotation stop lug liner	9.44%	9.10%	18.79%	2.00%	2.50%	2.00%
9	Composite Brake Block	90.87%	95.96%	93.28%	90.00%	76.00%	86.00%
10	Brake Shoe Key	14.19%	26.71%	11.99%	4.00%	2.00%	6.30%
11	Split Pin 12 x 110 mm	79.14%	94.39%	93.28%	90.00%	76.00%	97.00%
12	CTRB Locking plate	93.75%	94.39%	93.95%	80.00%	94.00%	100.00%
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads	70%	88%	85%	70%	75%	79%
17	Metal bonded Rubber Pads	9.39%	5.54%	3.14%	51.00%	60.00%	40.00%
18	Polyurethane Rings of Side Bearer	9.50%	7.33%	1.53%	29.00%	7.00%	50.00%
19	Adaptor	10.66%	4.45%	4.86%	1.80%	2.30%	3.20%
20	Knuckle	19.00%	11.00%	25.00%	16.00%	9.50%	24.00%
21	Lock	9.00%	12.00%	6.00%	13.00%	6.40%	9.80%
22	Rotary Lock Lift Assembly	6.40%	3.53%	2.40%	1.30%	5.70%	11.00%
23	Bearing Piece.	1.98%	1.30%	2.35%	1.30%	8.60%	18.60%
24	Operating handle	21.68%	22.30%	11.62%	21.00%	22.70%	32.70%
25	Yoke Pin support plate liner	-	-	-	-	-	-
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	54.25%	54.05%	13.11%	75.00%	94.00%	76.00%
28	Striker Casting Wear Plate	60.50%	80.90%	53.30%	37.00%	42.00%	67.00%
29	Dirt Collector Filter	50.00%	53.94%	53.30%	-	-	-
30	Dirt Collector Rubber Washer ('O' Ring)	52.50%	51.24%	47.97%	-	-	-
31	Rubber gaskets	27.50%	25.60%	23.99%	-	-	-
32	Rubber Seals of Cut off Angle Cocks.	25.00%	20.23%	18.66%	-	-	-
33	MU washers	61.75%	67.83%	95.95%	100.00%	100.00%	100.00%
34	Grip seal washers	26.25%	21.04%	19.19%	10.00%	8.00%	8.00%
35	AR Drain Plug leather washer	47.50%	45.85%	47.97%	-	-	-
36	BC Drain Plug leather washer	42.50%	40.45%	47.97%	-	-	-
37	BP Air Hose	55.18%	76.91%	65.03%	6.50%	5.00%	48.00%
38	Filling Pipe Joint Ring (BTPN)	-	-	-	-	-	-
39	Man Hole Cover Sealing Ring.	-	-	-	-	-	-

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTON	MGS			WAT		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
1	Pedestal Jaw Liners	32.80%	108.60%	99.90%	0.03%	0.34%	0.40%
2	Pedestal Side Liners	9.00%	8.10%	13.40%	-	-	-
3	SF Key nut bolt with washer	88.00%	59.00%	81.00%	68.60%	86.90%	56.94%
4	Land surface liner	11.00%	1.10%	17.90%	-	-	-
5	Outer column gib liner	6.90%	6.80%	13.60%	-	-	-
6	Inner column gib liner	0.30%	0.80%	1.00%	-	-	-
7	Pocket slope liner	17.00%	26.00%	26.80%	0.30%	0.34%	0.41%
8	Rotation stop lug liner	1.60%	4.60%	10.00%	-	-	-
9	Composite Brake Block	100.00%	100.00%	100.00%	153.00%	143.00%	95.33%
10	Brake Shoe Key	80.00%	61.60%	71.10%	35.00%	44.32%	35.11%
11	Split Pin 12 x 110 mm						
12	CTRB Locking plate	100.00%	100.00%	69.00%	94.25%	89.30%	77.24%
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads	46%	33%	11%	31.48%	39.57%	25.73%
17	Metal bonded Rubber Pads	12.10%	5.80%	-	35.33%	19.50%	12.60%
18	Polyurethane Rings of Side Bearer	-	5.20%	16.20%			
19	Adaptor	1.70%	1.50%	2.90%	0.86%	0.01%	0.50%
20	Knuckle	11.50%	3.60%	5.10%	12.52%	13.50%	8.40%
21	Lock	2.50%	1.10%	4.80%	11.88%	14.80%	0.50%
22	Rotary Lock Lift Assembly	10.70%	9.00%	7.90%	9.04%	7.18%	7.90%
23	Bearing Piece.	6.90%	5.60%	4.10%	2.52%	3.50%	3.50%
24	Operating handle	16.70%	14.90%	10.90%	15.61%	21.40%	10.80%
25	Yoke Pin support plate liner	-	-	-	-	-	-
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	40.60%	12.30%	2.80%	-	13.20%	10.12%
28	Striker Casting Wear Plate	22.50%	15.00%	6.70%	52.40%	57.80%	32.00%
29	Dirt Collector Filter	-	-	-	-	-	-
30	Dirt Collector Rubber Washer ('O' Ring)	-	-	-	-	-	-
31	Rubber gaskets	-	-	-	2.40%	3.92%	1.90%
32	Rubber Seals of Cut off Angle Cocks.	5.00%	5.00%	6.00%	0.45%	0.01%	25.00%
33	MU washers	35.00%	18.00%	41.00%	36.32%	50.30%	41.51%
34	Grip seal washers	-	-	-	-	-	-
35	AR Drain Plug leather washer	7.00%	3.00%	7.00%	-	-	-
36	BC Drain Plug leather washer	-	-	-	27.56%	51.30%	46.70%
37	BP Air Hose	5.00%	7.50%	6.60%	-	-	-
38	Filling Pipe Joint Ring (BTPN)	-	-	-	-	-	-
39	Man Hole Cover Sealing Ring.	-	-	-	-	-	-

Material Consumption Pattern of ROH Depot

Sr. No.	DESCRIPTION	GMC/NCR			ANDAL		
		2010-11	2011-12	2012-13	2010-11	2011-12	2012-13
1	Pedestal Jaw Liners	-	-	-	-	-	-
2	Pedestal Side Liners	18.23%	21.91%	21.22%	-	-	-
3	SF Key nut bolt with washer	36.66%	18.34%	17.74%	98.00%	89.00%	100.00%
4	Land surface liner	-	-	-	-	-	-
5	Outer column gib liner	-	-	-	-	-	-
6	Inner column gib liner	-	-	-	-	-	-
7	Pocket slope liner	23.84%	24.26%	20.78%	9.00%	6.60%	3.30%
8	Rotation stop lug liner	-	-	-	-	-	-
9	Composite Brake Block	100.00%	100.00%	100.00%	89.00%	58.00%	56.00%
10	Brake Shoe Key	41.34%	46.13%	44.13%	16.00%	19.00%	19.00%
11	Split Pin 12 x 110 mm	98.84%	100.00%	89.28%			
12	CTRB Locking plate	32.91%	32.78%	20.96%	100.00%	100.00%	100.00%
13	Wedge Blocks	-	-	-	-	-	-
14	Center pivot (Bottom)	-	-	-	-	-	-
15	Centre Pivot Top	-	-	-	-	-	-
16	Elastomeric pads	100%	100%	97%	41%	12%	19%
17	Metal bonded Rubber Pads	96.12%	95.02%	79.43%	21.00%	38.00%	9.00%
18	Polyurethane Rings of Side Bearer				25.00%	29.00%	22.00%
19	Adaptor	62.60%	36.50%	26.10%	3.00%	7.00%	4.00%
20	Knuckle	67.65%	28.41%	33.04%	35.00%	40.00%	20.40%
21	Lock	13.20%	17.54%	10.23%	17.00%	18.00%	4.40%
22	Rotary Lock Lift Assembly	7.40%	15.90%	20.42%	4.00%	5.00%	4.00%
23	Bearing Piece.	10.00%	11.08%	18.72%	5.00%	2.30%	2.00%
24	Operating handle	10.17%	9.62%	10.28%	10.00%	6.60%	24.50%
25	Yoke Pin support plate liner	-	-	-	-	-	-
26	Front Stopper and back Stopper plates of CBC	-	-	-	-	-	-
27	Shank Wear Plate	92.59%	97.82%	94.15%	-	-	-
28	Striker Casting Wear Plate	90.74%	92.52%	84.79%	38.00%	21.40%	21.00%
29	Dirt Collector Filter	-	-	-	-	-	-
30	Dirt Collector Rubber Washer ('O' Ring)	-	-	-	-	-	-
31	Rubber gaskets	-	-	-	-	-	-
32	Rubber Seals of Cut off Angle Cocks.	-	-	-	4.00%	4.50%	16.00%
33	MU washers	64.62%	58.87%	93.09%	89.00%	69.00%	100.00%
34	Grip seal washers	-	-		-	-	-
35	AR Drain Plug leather washer	-	-	-	-	-	-
36	BC Drain Plug leather washer	-	-	-	-	-	-
37	BP Air Hose	48.43%	40.66%	31.26%	43.40%	40.00%	44.00%
38	Filling Pipe Joint Ring (BTPN)	-	-	-	-	-	-
39	Man Hole Cover Sealing Ring.	-	-	-	-	-	-

Annexure-B

MATERIAL CONSUMPTION PATTERN OF WORKSHOP (% Replacement)

S No	Description	JMP			KGP			RVPS		
		2010-2011	2011-2012	2012-2013	2011-2012	2011-2012	2012-2013	2010-2011	2011-2012	2012-2013
1	Pedestal Jaw Liners	30	32	33	15.47	17.73	9.72	0	56	60
2	Pedestal Side Liners	5	6	6	---	--	--	0	24	7
3	SF Key nut bolt with washer	100	100	100	100	100	100	79	94	46
4	Land surface liner	25	23	26	---	---	--	6	17	10
5	Outer column gib liner	20	21	22	---	---	--	1	72	23
6	Inner column gib liner	10	8	12	---	---	--	21	19	22
7	Pocket slope liner	42	20	15	6.94	9.30	9.52	38	37	38
8	Rotation stop lug liner	10	9	12	--	--	--	1	17	3
9	Composite Brake Block	100	78	92	100	100	100	100	100	100
10	Brake Shoe Key	14	14	12	23.38	30.23	38.35	15	6	8
11	Split Pin 12 x 110 mm	--	--	--	--	--	--	100	100	1
12	CTRB Locking plate	100	100	100	100	100	100	88	100	100
13	Wedge Blocks	0.4	17	0.2	2.88	3.23	3.76	1	0	2
14	Center pivot (Bottom)	36	21.6	8	12.039	7.49	12.69	58	28	30
15	Centre Pivot Top	53	16	26	25.72	18.67	24.39	41	50	37
16	Elastomeric pads	55	39	53	40.41	29.09	48.61	95	92	81
17	Metal bonded Rubber Pads	51	22	3	89.46	52.39	76.82	100	100	100
18	Polyurethane Rings of Side Bearer	0	16	16	--	--	--	--	--	--
19	Adaptor	2	2	5.6	20.61	39.23	33.43	31	52	61
20	Knuckle	10.4	25	36	86.66	76.58	94.8	67	62	57
21.	Lock	2.4	8	16	82.23	92.37	92.11	19	16	26

S No	Description	JMP			KGP			RVPS		
		2010-2011	2011-2012	2012-2013	2011-2012	2011-2012	2012-2013	2010-2011	2011-2012	2012-2013
22	Rotary Lock Lift Assembly	2.4	2.1	8	38.47	27.86	29.8	13	32	62
23	Bearing Piece.	2.4	1.4	7	1.96	2.27	2.36	40	29	44
24	Operating handle	3	1.5	25	40.45	36.99	25.03	35	57	57
25	Yoke Pin support plate liner	2.5	3	4	--	--	--	7	7	1
26	Front Stopper and back Stopper plates of CBC	0.25	0.25	0.25	2.31	4.27	1.41	1	1	1
27	Shank Wear Plate	100	25	86	12.9	16.55	17	21	82	107
28	Striker Casting Wear Plate	68	19	76	41.95	39.85	69.57	57	93	112
29	Dirt Collector Filter	16	90	19	---	--	--	10	8	22
30	Dirt Collector Rubber Washer ('O' Ring)	100	46	51	2.58	8.85	70.85	10	8	22
31	Rubber gaskets	50	47	60	25.22	35.38	37.78	27	60	56
32	Rubber Seals of Cut off Angle Cocks.	26	19	19	33.93	32.24	39.96	79	77	100
33	MU washers	11	8	19	45.52	32.98	47	5	4	13
34	Grip seal washers	--	--	--	--	--	--	--	--	--
35	AR Drain Plug leather washer	70	65	75	--	--	--	8	4	4
36	BC Drain Plug leather washer	60	60	70	--	--	--	0	0	0
37	BP Air Hose	50	88	82	68.57	82.1	100	100	99	57
38	Filling Pipe Joint Ring (BTPN)	---	--	--	--	6.57	100	7	63	63
39	Man Hole Cover Sealing Ring.	---	--	--	--	19.73	100	44	50	0

MATERIAL CONSUMPTION PATTERN OF WORKSHOP (% Replacement)

S No	Description	JUDW			JHS		
		2010-2011	2011-2012	2012-2013	2011-2012	2011-2012	2012-2013
1	Pedestal Jaw Liners	45	41	46	11.14	9.68	4.3
2	Pedestal Side Liners	--	--	--	0.41	0.22	-
3	SF Key nut bolt with washer	88	46	25	97.6	97.5	62.3
4	Land surface liner	18	16	24	8.33	47.33	8.79
5	Outer column gib liner	20	26	3	0.41	0.11	-
6	Inner column gib liner	--	--	--	--	-	-
7	Pocket slope liner	25	43	4	30	48	34.5
8	Rotation stop lug liner	15	5	4	2.1	1.12	0.42
9	Composite Brake Block	100	71	72	97.6	83.4	79.9
10	Brake Shoe Key	24	9	8	16	15	14
11	Split Pin 12 x 110 mm	100	100	100	-	-	-
12	CTRB Locking plate	100	100	100	100	100	100
13	Wedge Blocks	1	3	4	0.8	0.54	0.63
14	Center pivot (Bottom)	27	24	38	25	24	23
15	Centre Pivot Top	59	26	5	49	39	15.6
16	Elastomeric pads	100	98	100	100	97.7	54.1
17	Metal bonded Rubber Pads	--	--	--	--	-	-
18	Polyurethane Rings of Side Bearer	89	49	59	95.25	100	8.33
19	Adaptor	67	55	69	18	14.5	1.65
20	Knuckle	50	38	75	37.44	23.74	29
21.	Lock	17	16	9	4.67	34.24	0.68
22	Rotary Lock Lift Assembly	18	14	1	19.1	9.59	8.68
23	Bearing Piece.	2	0	0	20	21.87	19.6

S No	Description	JUDW			JHS		
		2010-2011	2011-2012	2012-2013	2011-2012	2011-2012	2012-2013
24	Operating handle	46	45	13	47	43.84	23.75
25	Yoke Pin support plate liner	0	0	0	--	-	-
26	Front Stopper and back Stopper plates of CBC	--	--	---	2	1.76	1.2
27	Shank Wear Plate	100	90	49	47	22.03	35.75
28	Striker Casting Wear Plate	100	76	83	100	100	100
29	Dirt Collector Filter	3	0	0	44	48.2	48.33
30	Dirt Collector Rubber Washer ('O' Ring)	100	100	100	100	100	100
31	Rubber gaskets	100	100	100	44.4	39.4	36.2
32	Rubber Seals of Cut off Angle Cocks.	100	100	100	100	100	100
33	MU washers	100	100	100	26.7	29	35.83
34	Grip seal washers	100	100	100	-		
35	AR Drain Plug leather washer	100	100	100	-		
36	BC Drain Plug leather washer	100	100	100	-		
37	BP Air Hose	19	31	29	49.8	48.22	62
38	Filling Pipe Joint Ring (BTPN)	--	--	--	17		
39	Man Hole Cover Sealing Ring.	--	--	--	100	100	100

Sick Marking Analysis (CR, SER, SCR & WR)

Annexure-C

Year	No. of rakes examined	Total No. of wagons.	No. of wagons marked sick	Defect-wise Breakup														Total excluding body, door & Misc.
				Wheel defect	CBC Compone nets	Hot Box/Warm Box	Centre Pivot Top	Centre Pivot Bottom	Brake Gear defects	Air Brake System	Trolley defects	Suspensio n Spring	Side Bearer	Body damage	Defective door mechanism	Misc.	Total	
2010-11	40360	1929927	106466	6360	5880	1390	2717	97	10727	3816	1115	651	3721	45621	11777	12610	106482	30114
2011-12	39713	1866538	100637	7036	5322	2733	2589	84	6747	3673	1059	746	2688	43208	12139	12541	100565	25641
2012-13	19701	897632	50734	3321	2841	1493	1451	38	3273	1764	567	687	1179	22164	5207	6683	50668	13293
Total	99774	4694097	257837	16717	14043	5616	6757	219	20747	9253	2741	2084	7588	110993	29123	31834	257715	69048
2010-11	Percentage (Total excluding body, door & Misc)			21.1	19.5	4.6	9.0	0.3	35.6	12.7	3.7	2.2	12.4					100.0
2011-12				27.4	20.8	10.7	10.1	0.3	26.3	14.3	4.1	2.9	10.5					100.0
2012-13				25.0	21.4	11.2	10.9	0.3	24.6	13.3	4.3	5.2	8.9					100.0
Avg of 3 yrs.				24.2	20.3	8.1	9.8	0.3	30.0	13.4	4.0	3.0	11.0					100.0