

Reasoned Document prepared after receipt of stakeholder's comment on draft Spec. No. AB/RB-41-2016(Rev.1) for Class 'K'(6 1/2"x9") Cartridge Tapered Roller Bearings for freight stocks fitted with light weight low height (LWLH) bogies (narrow Jaw) for 25t axle load application.

DRAFT REVISED STR. No. AB/RB-41-2016(Rev.1)

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RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.	Draft STR No. AB/RB-41-2016(Rev.1)
1.0	<p><b>1. INTRODUCTION</b></p> <p>Cartridge Tapered Roller bearings Class 'E' (6" X11") to RDSO STR No. AB/RB-39-2002 (Rev. 3 with Amendment No. 1, 2 &amp; 3) is being used in freight stock of IR for 20.3/22.9t axle load operation for about three decades. Even though 'E' Class CTRB is designed upto 25t axle load, it may not be suitable for 25t operation in Indian conditions due to difference in maintenance and operation practices of IR and American Railroad like no use of way side hot box detector and acoustic bearing detector in IR to identify bad bearings. In AAR, whenever wheels are re-profiled/changed the bearing must be removed from service which is not so in IR where the bearings are inspected and reconditioned during every POH. Studies reveal that L10 life of E Class bearing operating at 25t axle load will reduce by 52%. A policy decision has therefore been taken to use 'K' Class CTRB in new design 25t axle load wagon to achieve high reliability between two successive POH.</p>

Comments received from stakeholders		
Sr. No.	Name of Firm	Comments
1	M/s SKF India Limited	Nil
2	M/s Schaeffler India Limited	Nil
3	M/s NEI Limited	Nil
4	M/s Timken India Ltd.	Nil

RDSO Remarks	Nil
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<b>Modified Clause, If applicable</b>	Nil
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<b>2.0</b>	<p><b>2. DEFINITIONS</b></p> <table border="1"> <thead> <tr> <th><b>S. No.</b></th> <th><b>Abbreviation</b></th> <th><b>Definition</b></th> </tr> </thead> <tbody> <tr> <td>a)</td> <td>PURCHASER</td> <td>President of the Republic of India</td> </tr> <tr> <td>b)</td> <td>IR</td> <td>Indian Railways</td> </tr> <tr> <td>c)</td> <td>RDSO</td> <td>Research Design and Standards Organisation, Manak Nagar, Lucknow-226011, India.</td> </tr> <tr> <td>d)</td> <td>TENDERER</td> <td>Firm/Company that submits offer for supply as per this specification</td> </tr> <tr> <td>e)</td> <td>CONTRACTOR</td> <td>The firm/company that submits offer for supply of material as per this specification and on whom the contract is placed/will be placed</td> </tr> <tr> <td>f)</td> <td>INSPECTING AUTHORITY</td> <td>The organization or its representative nominated by the purchaser to inspect the supplies on his behalf</td> </tr> <tr> <td>g)</td> <td>SUB-TENDERER</td> <td>Any firm/company from whom the tenderer may obtain an item of supply not manufactured by tenderer himself</td> </tr> <tr> <td>h)</td> <td>AAR</td> <td>Association of American Railroads</td> </tr> <tr> <td>i)</td> <td>IRS</td> <td>Indian Railway Standard</td> </tr> <tr> <td>j)</td> <td>IS</td> <td>Indian Standard</td> </tr> <tr> <td>k)</td> <td>ISO</td> <td>International Organization for Standardization</td> </tr> <tr> <td>l)</td> <td>ROH</td> <td>Routine Overhaul</td> </tr> <tr> <td>m)</td> <td>POH</td> <td>Periodic Overhaul</td> </tr> <tr> <td>n)</td> <td>Kmph or km/h</td> <td>Kilometer per Hour</td> </tr> <tr> <td>o)</td> <td>CTRB</td> <td>Cartridge Tapered Roller Bearings Class 'K' size (61/2" x 9")</td> </tr> <tr> <td>p)</td> <td>LWLH Bogie</td> <td>Three pieces, rigid plank cast steel bogie to RDSO specification No. WD-40-LWLH25 Bogie('K' Class)-2015</td> </tr> <tr> <td>q)</td> <td>t</td> <td>Tones (=1000 Kg)</td> </tr> <tr> <td>r)</td> <td>OEM</td> <td>Original Equipment Manufacturer</td> </tr> <tr> <td>s)</td> <td>STR</td> <td>Schedule of Technical Requirements</td> </tr> </tbody> </table>	<b>S. No.</b>	<b>Abbreviation</b>	<b>Definition</b>	a)	PURCHASER	President of the Republic of India	b)	IR	Indian Railways	c)	RDSO	Research Design and Standards Organisation, Manak Nagar, Lucknow-226011, India.	d)	TENDERER	Firm/Company that submits offer for supply as per this specification	e)	CONTRACTOR	The firm/company that submits offer for supply of material as per this specification and on whom the contract is placed/will be placed	f)	INSPECTING AUTHORITY	The organization or its representative nominated by the purchaser to inspect the supplies on his behalf	g)	SUB-TENDERER	Any firm/company from whom the tenderer may obtain an item of supply not manufactured by tenderer himself	h)	AAR	Association of American Railroads	i)	IRS	Indian Railway Standard	j)	IS	Indian Standard	k)	ISO	International Organization for Standardization	l)	ROH	Routine Overhaul	m)	POH	Periodic Overhaul	n)	Kmph or km/h	Kilometer per Hour	o)	CTRB	Cartridge Tapered Roller Bearings Class 'K' size (61/2" x 9")	p)	LWLH Bogie	Three pieces, rigid plank cast steel bogie to RDSO specification No. WD-40-LWLH25 Bogie('K' Class)-2015	q)	t	Tones (=1000 Kg)	r)	OEM	Original Equipment Manufacturer	s)	STR	Schedule of Technical Requirements
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Sr. No.	Name of Firm	Comments
1	M/s SKF India Limited	Nil
2	M/s Schaeffler India Limited	Nil
3	M/s NEI Limited	Nil
4	M/s Timken India Ltd.	Nil

RDSO Remarks	Nil
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Modified Clause, If applicable	Nil
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RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.	Draft STR No. AB/RB-41-2016(Rev.1)
3.0	<p><b>3. SCOPE</b></p> <p>3.1 This specification covers the technical requirements for manufacture, supply and mounting of AAR approved Cartridge Tapered Roller Bearings complete (Double Cup, Cones, Rollers, Cage, spacer, wear ring/ Bore Clip, Grease seals and Grease) Class 'K' (6 1/2" x 9") for use on freight stock for Indian Railways with following items (to be supplied at the option of the purchaser)</p> <p>(a) Cap Screws (<math>\phi</math> 1 1/8" - 7 UNC - 2A, 2 1/2" threads length to Spec. no. IS: 1367-Part 3 Class P8.8)</p> <p>(b) Locking plate to RDSO Drawing No. WD-06085-S-02 Alt. nil or latest.</p> <p>(c) Narrow Jaw Adapter to RDSO Drawing No. WD- 15020-S-03 Alt.2 or latest.</p> <p>(d) Side frame Key (Item No. 2) &amp; Key bolt, Nut, Spg. Washer and <math>\phi</math> 4 Split pin (Item no 4) to RDSO Drawing No. WD-13012-S-04 Alt. 4 or latest</p> <p>(e) End Cap</p> <p>(f) Backing Ring.</p> <p>The above items are to be procured from firms whose design (or the design owned by their principals) of Class 'K' CTRB is approved by AAR.</p>

This schedule also covers the requirement of manufacture and supply of following spares :

S.N.	Description	Remarks
1.	Double Cup	To be procured from firms whose design (or the design owned by their principals) of Class 'K' CTRB is approved by AAR
2.	Cone Assembly	
3.	Spacer	
4.	Seal wear ring/ Bore Clip Note - In some design of CTRB Class K, Seal wear ring is the integral part of Inner Ring (Cone).In such cases bore clip is provided for fitment with Backing ring	
5.	Backing ring	
6.	End Cap (without cap screws)	
7	Grease Seal	Grease seal from AAR approved grease seal manufacturer through their authorized representative or RDSO/AAR approved bearing manufacturers as per their drawing approved by RDSO
8	Locking plate RDSO Drg. No. WD-06085-S-02 Alt. nil or latest.	To be procured from firms whose design (or the design owned by their principals) of Class 'K' CTRB is approved by AAR till such time their RDSO approved sources are not developed
9	Axle end Cap screws ( $\phi$ 1 1/8" - 7 UNC-2A, 2 1/2" threads length to Spec. no. IS: 1367-Part 3 Class P8.8)	
10	Side frame Key (item No. 2) & Key bolt, Nut, Spg. Washer and $\phi$ 4 Split pin (item no 4) to RDSO Drawing No. WD-13012-S-04 Alt. 4 or latest	
11	Narrow Jaw Adapter to RDSO Drawing No. WD- 15020-S-03 Alt. 2 or latest.	

**Comments received from stakeholders**

Sr. No.	Name of Firm	Comments
1	M/s SKF India Limited	Sr. No. 7 Grease Seal: Grease seal from AAR approved grease seal manufacturer through <del>their authorized representative or</del> RDSO/AAR approved bearing manufacturers as per their
2	M/s Schaeffler India Limited	Nil

3	M/s NEI Limited	Nil
4	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	<p><b>SKF</b>  Sr. No. 7 : Not accepted  Para 3 has been modified because drawing of axle end cap screws has already been prepared and accordingly approved vendors has been already developed by RDSO</p>
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<b>Modified Clause, If applicable</b>	<p><b>3. SCOPE</b></p> <p>3.1 This specification covers the technical requirements for manufacture, supply and mounting of AAR approved Cartridge Tapered Roller Bearings complete (Double Cup, Cones, Rollers, Cage, spacer, wear ring/ Bore Clip, Grease seals and Grease) Class 'K' (6 1/2" x 9") for use on freight stock for Indian Railways with following items (to be supplied at the option of the purchaser)</p> <p>(a) Axle end Cap Screws (ø 1 1/8" - 7 UNC-2A, 2 1/2" threads length) to item No. 2 of RDSO drawing no. WD-18016-S-01 (latest Alt.)</p> <p>(b) Locking plate to RDSO Drawing No. WD-06085-S-02 (latest Alt.)</p> <p>(c) Narrow Jaw Adapter to RDSO Drawing No. WD- 15020-S-03 (latest Alt.)</p> <p>(d) Side frame Key (Item No. 2) &amp; Key bolt, Nut, Spg. Washer and ø 4 Split pin (Item no 4) to RDSO Drawing No. WD-13012-S-04 (latest Alt.)</p> <p>(e) End Cap</p> <p>(f) Backing Ring.</p> <p>This schedule also covers the requirement of manufacture and supply of following spares :</p> <table border="1"> <thead> <tr> <th>S.N.</th> <th>Description</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Double Cup</td> <td rowspan="5">To be procured from firms whose design (or the design owned by their principals) of Class 'K' CTRB is approved by AAR</td> </tr> <tr> <td>2.</td> <td>Cone Assembly</td> </tr> <tr> <td>3.</td> <td>Spacer</td> </tr> <tr> <td>4.</td> <td>Seal wear ring/ Bore Clip Note - In some design of CTRB Class K, Seal wear ring is the integral part of Inner Ring (Cone).In such cases bore clip is provided for fitment with Backing ring</td> </tr> <tr> <td>5.</td> <td>Backing ring</td> </tr> </tbody> </table>	S.N.	Description	Remarks	1.	Double Cup	To be procured from firms whose design (or the design owned by their principals) of Class 'K' CTRB is approved by AAR	2.	Cone Assembly	3.	Spacer	4.	Seal wear ring/ Bore Clip Note - In some design of CTRB Class K, Seal wear ring is the integral part of Inner Ring (Cone).In such cases bore clip is provided for fitment with Backing ring	5.	Backing ring
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5.	Backing ring														

	6.	End Cap (without cap screws)	
	7.	Grease Seal	Grease seal from AAR approved grease seal manufacturer through their authorized representative or RDSO/AAR approved bearing manufacturers as per their drawing approved by RDSO
	8.	Locking plate to RDSO Drg. No. WD-06085-S-02 (latest Alt.)	To be procured from RDSO approved sources
	9.	Axle end Cap Screws ( $\phi$ 1 1/8" - 7 UNC-2A, 2 1/2" threads length) to item No. 2 of RDSO drawing no. WD-18016-S-01 (latest Alt.)	
	10.	Side frame Key (item No. 2) & Key bolt, Nut, Spg. Washer and $\phi$ 4 Split pin (item no 4) to RDSO Drawing No. WD-13012-S-04 (latest Alt.)	
	11.	Narrow Jaw Adapter to RDSO Drawing No. WD- 15020-S-03 (latest Alt.)	

<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>		
<b>4.0</b>	<b>4. LOADING AND OPERATIONAL REQUIREMENTS</b>		
	4.1	Track Gauge (mm)	1676
	4.2	Maximum / Normal Axle Load (t)	25
	4.3	Weight of one wheel set (Kg) 840 mm dia Wheel sets	1200 (Approx)
	4.4	Maximum / Normal speed of the wagon (Kmph)	130/100
	4.5	Average run of the wagon (Km/day)	500 (Approx.)
	4.6	Weight of wagon (tones) Empty condition Loaded (max.)	20 (approx.) 100

	4.7	Type of brake system	Air Brake (Graduated release)
	4.8	Type of wheel Braking	Tread Braking ( one brake block 'K' type per wheel)
	4.9	Maximum braking force per wagon in loaded condition (kg)	18955
	4.10	Wheel Tread Diameter (mm) New Condemning	840 780
	4.11	Dynamic augment Maximum Normal	60% 30%
		Note: For design/ L10 life calculation of CTRB take application factor as 1.6 (60% dynamic augment) for 30% of service period and 1.3 (30% dynamic augment) for balance 70% of service period in Indian Railway condition having axle load 25 t in static condition.	
	4.12	Lateral force Maximum (Prud Homme's limit) Normal	0.85 (1+P/3) 0.15 P where P is the axle load
	4.13	Geographical area	India
	4.14	Atmospheric temperature range (°C) maximum minimum	+ 50 - 10
	4.15	Loaded to empty ratio of wagon operation	80 : 20

Comments received from stakeholders		
Sr.	Name of Firm	Comments

<b>No.</b>		
1	<b>M/s SKF India Limited</b>	Nil
2	<b>M/s Schaeffler India Limited</b>	Para 4.1 to 4.10: Noted Para 4.11: Dynamic augment- As per AAR Manual M-934 chapter 4.2.2- load environment as per Appendix A 4.12 to 4.15- Noted
3	<b>M/s NEI Limited</b>	Nil
4	<b>M/s Timken India Ltd.</b>	Nil

<b>RDSO Remarks</b>	<p>Para 4.5 has been deleted because it varies time to time and other clause renumbered.</p> <p>Para 4.6 has been modified due to wagon directorate is developing BOBSNS wagon which has empty weight 28.5t <b>Schaeffler</b></p> <p>Para 4.11 has been deleted and other Para renumbered</p> <p>Para 4.11 &amp; Para 4.12 has been deleted and other Para renumbered as the 'L10' life calculation requirements of bearings in this STR is as per AAR M-934.</p>
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<b>Modified Clause, If applicable</b>	<p><u>Para 4.6</u></p> <p>Weight of wagon (tones)</p> <p>Empty condition (20 - 30) approx.</p>
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<b>RDSO STR No. AB/RB-41-2016(Rev.1)</b> <b>Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
<b>5.0</b>	<p><b>5. DESIGN DETAILS</b></p> <p>5.1 The roller bearings covered by this Schedule shall be suitable for axle journal to RDSO's drawing number WD-15020-S-02 Alt. nil or latest (journal of this axle is identical to AAR Class 'K' axle journal of M-101 of MSRP Section G).</p> <p>5.2 The rolling elements along with Backing ring, Seal wear rings/Bore Clip, Seals, End cap, Spacer shall conform to AAR Specification for Freight Car Journal Roller Bearings (No. M-934-2012 or latest) and Manual of Standards &amp; Recommend Practices Section H for Class 'K' (6 1/2"x 9") bearing.</p> <p>5.3 The roller bearings shall be fitted on LWLH bogie to RDSO specification No. WD-40-LWLH25 Bogie ('K' Class)-</p>



	2015
5.4	It shall give a minimum L10 life of 16, 00,000 km as per condition specified in AAR Specification for Freight Car Journal Roller Bearings No. M-934-2012 or latest (MSRP Section H).
5.5	Narrow Jaw Adapter (WD-15020-S-03 Alt. 2 or latest) shall be suitable for bogie frame jaw pedestal to RDSO Drawing No. WD-15021-S-03 Alt. 3
5.6	The manufacturer supplying Locking plate, Side frame key and Narrow Jaw Adapter shall have infrastructure, manufacturing & testing facilities and quality control requirement as per Schedule of Technical Requirement No. QMS-19:2009 or latest, QMS-24:2009 or latest and QMS-26:2009 or latest respectively. The manufacturer must comply all the requirements laid down in these schedules in due course of time.

<b>Comments Received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1	M/s SKF India Limited	Nil
2	M/s Schaeffler India Limited	Nil
3	M/s NEI Limited	Nil
4	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Nil
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
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<b>6.0</b>	<b>6. LUBRICATION</b>
	6.1 Grease shall be as per clause 2.1 of RDSO STR No. WD-24-MISC-2003 (Rev.1 with Amendment No.1 of Oct. 2016) or latest.
	6.2 The supplier shall furnish the test results of grease to be used for initial lubrication of these bearings. The test result shall be as per WD-24 -MISC-2003 (Rev. 1 with Amendment No.1 of Oct. 2016) or latest.
	6.3 The supplier should use only the AAR/RDSO approved brands of grease. The supplier should intimate the purchaser and the user the brand and manufacturer's name.
	6.4 The supplier should give specific recommendations for the roller bearing offered regarding: -
	i) Periodicity of change and quantity of grease to be applied. ii) Periodicity of Grease seal change. iii) Period for dismantling and complete bearing examination.

<b>Comments Received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1	<b>M/s SKF India Limited</b>	Para 6: SKF recommends use of only AAR approved grease for required life and re-lubrication interval. In case Indian Railways introduce other brands of greases, grease needs to be certified by AAR.
2	<b>M/s Schaeffler India Limited</b>	Nil
3	<b>M/s NEI Limited</b>	Nil
4	<b>M/s Timken India Ltd.</b>	Nil

<b>RDSO Remarks</b>	<b>SKF</b> Para 6: Not accepted. Grease shall be as per RDSO Specification WD-24-Misc-2003(Rev.1) based on AAR M-942 Specification which provides for both AAR as wells as RDSO approved grease.
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
7.0	<p><b>7. GENERAL REQUIREMENTS</b></p> <p>The Supplier shall meet the following requirements: -</p> <p>7.1 The supplier/principal should have the unconditional current approval of AAR for manufacture of the bearings to be supplied as per this specification.</p> <p>7.2 In addition to the above, further information, regarding his capacity/capability, if required by the purchaser, shall be promptly furnished by the supplier.</p> <p>7.3 In the beginning maximum components of CTRB may be indigenously manufactured However in due course of time the suppliers may indigenously developed 100% of CTRB components as per procedure mentioned in clause 9 of this specification</p>

<b>Comments Received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1	<b>M/s SKF India Limited</b>	<p>Para 7.1 : The supplier/principal should have the unconditional current approval of AAR for manufacture of the bearings to be supplied as per this specification.</p> <p>Para 7.3 : In the beginning maximum components of CTRB may be indigenously manufactured However in due course of time the suppliers may indigenously developed 50% of CTRB components as per procedure mentioned in clause 9 of this specification.</p>
2	<b>M/s Schaeffler India Limited</b>	<p>Para 7.1: The supplier/principal should have the Approval of AAR for manufacture of the bearings to be supplied as per this specification.</p> <p>Para 7.3: In the beginning maximum components of CTRB may be indigenously manufactured. However in due course of time the suppliers may indigenously maximum number of CTRB components as per norms of Indian Railways.</p>
3	<b>M/s NEI Limited</b>	Nil
4	<b>M/s Timken India Ltd.</b>	Nil

<b>RDSO Remarks</b>	<b>SKF</b> Para 7.1: This Para refers to whole design/part of bearings as well as manufacturing plant.
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	<p>Para 7.3: Para has been modified.</p> <p><b>Schaeffler</b></p> <p>Para 7.1: AAR certificate for manufacturing facility and AAR unconditional approval certificate for Class 'K' CTRB is mandatory for safer and reliable running of CTRB in Indian Railways. Para no. 7.2 has been added for manufacturer having conditional approval of CTRB Class "k". Other Para renumbered accordingly.</p> <p>Para 7.3: As above of Para 7.3 of SKF</p>
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<b>Modified Clause, If applicable</b>	<p>Para 7.2 : Indigenous manufacturers not fulfilling the above mentioned eligibility criteria mentioned in Para 7.1 but having conditional approval of AAR for CTRB Class "K" may be considered for placement of 'Developmental Orders' by the Purchaser. However, in this case, tenderer shall furnish a copy of all the test results as per AAR-M-934-2015 or latest and other additional tests carried out on AAR/ AAR approved test rig to validate the CTRB design. Its manufacturing facility shall have valid AAR M-1003 certificate for bearing manufacturing.</p> <p>Para 7.3: In the beginning maximum components of CTRB may be indigenously manufactured. However in due course of time the suppliers may developed indigenously CTRB components as per procedure mentioned in clause 9 of this specification &amp; RDSO's ISO document No. QO-D-8.1-5.</p>
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
<b>8.0</b>	<p><b>8. TECHNICAL PARTICULARS TO BE FURNISHED WITH TENDER</b></p> <p>8.1 A valid photocopy of the final AAR unconditional approval certificate (of the collaborator in the case of an indigenous manufacturer) for the sizes/design and brand of cartridge roller bearings offered.</p> <p>8.2 The supplier shall submit minimum life expectancy of 1600000 Km as per condition specified in AAR Specification for Freight Car Journal Roller Bearings No. M-934-2012 or latest (MSRP Section H).</p> <p>8.3 The maximum thrust (axial) load capacity of the bearing.</p> <p>8.4 A complete set of assembly and detailed drawings of roller bearing along with drawings of adapter, side frame key etc. The drawings shall indicate dimensions, material specifications and weight of each component and shall be in 'Metric' system.</p> <p>8.5 A set of comprehensive technical instructions for mounting/removal and maintenance of roller bearings offered.</p>

	8.6	Supplier shall submit Quality Assurance Program (QAP) of CTRB.
	8.7	The supplier should give specific recommendations for the roller bearing offered regarding Maximum axle load and speed range (rpm/kmph) for optimized performance of bearings in IR condition.
	8.8	The supplier should clearly mention the type of Cage & Grease seal used.
	8.9	Break up of indigenous and imported components to be supplied should be clearly spelt out in the offer.

<b>Comments Received from Stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Para 8.1: A valid photocopy of the final AAR approval certificate (of the collaborator in the case of an indigenous manufacturer) for the sizes/design and brand of cartridge roller bearings offered.
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Para no. 7.2 has been added for manufacturer having conditional approval of CTRB Class "k".
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
9.0	<p><b>9. INDIGENISATION OF BEARING COMPONENTS</b></p> <p>The following procedure would be followed for clearing indigenisation of bearings components. (Cup, Cone, Roller, Cage, Seal wear rings, Grease seal, Spacer etc.)</p>

- |  |   |
|--|---|
|  | <p>9.1 The component manufacturer will obtain drawings/specifications, know-how of manufacturing processes/manufacturing tolerances from bearing manufacturer and set up necessary machinery and plant to undertake manufacture of the component proposed for indigenization. The bearing manufacturer will submit a certificate that the facilities set up are adequate for manufacture of the component to its standard.</p> <p>9.2 The component manufacturer will then manufacture a batch size prescribed by the bearing manufacturer, which shall be sent to the collaborator for testing and approval. Should sampling be necessary from this batch, it shall be done by the RDSO using random sampling procedures.</p> <p>9.3 The bearing manufacturer will arrange to get the component and assembly fitted with such component tested as prescribed in Appendix-C of Specification M-934-2012 or latest of AAR Mechanical Division's Manual of Standards and Recommended Practices Section 'H'. However tests required to be done in AAR Laboratory on their equipment (such as those prescribed in Para 6 of Appendix-C) may be done by the bearing manufacturer on their own machines and in their own laboratories or in any other laboratories equipped to undertake such tests ensuring that the tests are similar to those done by 'AAR' with prior approval of purchaser.</p> <p>9.4 On successful development of the component, the component manufacturer will develop full testing and inspection facilities to test the components as per Specification M-934-2012 or latest for mass production of the component and furnish details thereof to the Railways. Mass production of the component should normally be started after these facilities have been developed. If however, full testing and inspection facilities are not yet developed the manufacturers will advise the Railways the places where testing/inspection will be done.</p> <p>9.5 On being satisfied about adequacy of the testing/inspection procedures as prescribed by the bearing manufacturer, the component manufacturer will be permitted by RDSO to manufacture the component for use on Indian Railways subject to continued certification by the bearing manufacturer as per Para 9.8 below.</p> <p>9.6 The field experience gained with such bearings will be reviewed by RDSO at the time of 1<sup>st</sup> ROH or earlier in case of excessive failures to assess the actual performance of the bearings and the desirability of continuing indigenous manufacture. Should this review involve opening of the bearings the bearing manufacturers will be associated.</p> <p>9.7 To facilitate this review, every time a fresh component is indigenised the bearing lot/lots fitted with such component will be given a distinctive identification marking by the component manufacturer. Details of the marking system would be worked out by the bearing manufacturer in consultation with RDSO and circulated to user Railways.</p> |
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	<p>9.8 The bearing manufacturers will also furnish to the Railways a certificate from their collaborator after every three year that they have the necessary facilities (including subcontractors for component manufacture) to consistently manufacture bearings of desired quality and accuracy under mass production conditions. This should be done before commencement of the indigenisation program.</p> <p>9.9 All intended indigenisation must be completed two years before the expiry of the collaboration agreement so that within the pendency of the collaboration unconditional license to manufacturers can be granted. Should the indigenisation not be completed in this manner, the manufacturer will seek extension of collaboration.</p> <p>9.10 All bearings with indigenously manufactured components will carry either the collaborator's name or the legend 'Manufactured under license by .....'. This legend may be abbreviated to 'LIC....'</p>
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<b>Comments Received from Stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Nil
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
10.0	<p><b>10 INSPECTION</b></p> <p>10.1 The inspection will be carried out generally as per firm's approved drawings, RDSO drawings; firms approved QAP and AAR specification M-934-2012 or latest to the extent applicable to cartridge tapered roller bearings</p>

	<p>and components. Deviations from procedure may be made as agreed between the Purchaser and the Supplier.</p> <p>10.2 The successful bidder will be required to submit their drawings, Quality Control Procedures followed in their works as approved by their Principal and Quality Assurance Programme (QAP) to RDSO for approval. QAP shall consist of critical dimensions/parameters of various components of bearings, physical/ mechanical &amp; chemical properties of it such as Cup, Cone and Rollers etc. QAP should also cover mechanism of quality control on the activities outsourced by the bearing manufacturer with clear cut mention of parameters to be checked along with the periodicity of checks.</p> <p>The said approved QAP and Quality control procedures/drawings may be used for next/consecutive successful bid after intimation the same to Inspecting Authority and Wagon Directorate of RDSO. In this regard, the firm should give a declaration that there is no change in QAP/ Quality control procedure/ drawings during submission of their bid documents at the time of bidding to avoid re-submission of QAP.</p> <p>However, the firm should submit revised QAP and quality control procedure/drawings for approval to RDSO in case there are any changes such as design/material/parameters/approval status/interrupted production/ changes of facilities etc.</p> <p>10.3 Narrow Jaw Adapter will be inspected generally as per RDSO's drawing no. WD-15020/S-3 Alt. 2 or latest in conjunction with AAR Specification M-924-2011 or Latest Revision ('Specifications for journal Roller Bearings Adapters for Freight Cars, MSRP Section-H)</p>
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<b>Comments Received from Stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Para 10.3 has been added and other Para renumbered
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<b>Modified Clause, If applicable</b>	<p>Para 10.3</p> <p>The inspection of material will be carried out at contractor's premises by authorized representatives(s) of RDSO as per manufacturers drawing, physical &amp; chemical properties, various critical dimensions as per Quality Assurance Programme (QAP) as approved by RDSO.</p> <p>Contractor shall provide such additional material or test pieces as may be required for testing and checking compliance with specification, at his cost and in his premises in the presence of representatives(s) of IR. Such tests may include laboratory/bench or any other tests required for validation of design of bearings.</p> <p>Contractor shall provide free of charge labour, material tools, gauge and appliance etc. required by the inspection authority for inspecting at manufacturing location.</p>
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
<b>11.0</b>	<p><b>MOUNTING</b></p> <p>11.1 The correct mounting, locking and initial lubrication of the Roller Bearing shall be done by the supplier. The suppliers shall also arrange to supply necessary equipment and tools for mounting the roller bearings against Railways requirement, if any.</p> <p>11.2 It would be the responsibility of the Roller Bearing Supplier to check and certify the fitness of the axle journal before undertaking the mounting of the bearings and that the tolerances on the journals are adequate for a correct fit.</p> <p>11.3 The supplier should keep proper records for mounting, indicating the details of the following: -</p> <ul style="list-style-type: none"> <li>a) Date of mounting</li> <li>b) Running Serial No. of Wheel sets-Month/Year/SI. No. Wagon Builder Code</li> <li>c) Wheel set Particulars - Contract No.</li> <li>d) Consecutive No. (Cons. No. of wheels)</li> <li>e) Source</li> <li>f) Journal Inspection - Visual: Diameter Fillet Check: By Gauge</li> <li>g) Cartridge Bearing Serial No.</li> <li>h) Source</li> </ul>

	i) Seating Pressure j) Mounted Lateral k) Cap Screw Torque
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Comments received from stakeholders		
Sr. No.	Name of Firm	Comments
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Para 11.1: The correct mounting, locking and initial lubrication of the Roller Bearings shall be done by the supplier. The suppliers shall also arrange to supply necessary equipment and tools for mounting the roller bearings against Railways requirement, if any on chargeable basis.
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	<b>Schaeffler</b> Para 11.1: Changes not accepted
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1)</b> <b>Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
12.0	<b>12. SUPPLY OF 'AS MADE' DRAWINGS</b>  The supplier will be required to supply one set of 'As Made' drawings in digital format on CD and/or on tracing paper showing the overall dimensions, tolerances on the critical dimensions, mounting details, material specifications, weight and manufacturing details necessary for proper inspection and maintenance.

<b>Comments received from stakeholders</b>
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Sr. No.	Name of Firm	Comments
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

RDSO Remarks	Nil
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Modified Clause, If applicable	Nil
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RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.	Draft STR No. AB/RB-41-2016(Rev.1)
13.0	<p><b>13 MAINTENANCE MANUAL</b></p> <p>13.1 The supplier shall supply free of cost at the rate of two copies per thousand bearings with a minimum of 25 copies, along with soft copies, of the detailed maintenance manual for maintenance and overhaul purpose to POH Shop. The adequate number of sample copies should also be mailed to the Director General (Wagon), R.D.S.O., Lucknow-226011. The comprehensive Maintenance Manual should, inter-alia, cover the following: -</p> <p>a) Description of the bearing  b) Procedure for examination of the bearing.  c) Initial and condemning limits of the components.  d) Instructions for periodical maintenance and complete overhauling.  e) Drawings and part number details with current price catalogue.</p> <p>13.2 The supplier shall also supply free of cost copies of pocket manuals/catalogue/specification details at the rate of two copies per thousand bearings supplied with minimum number of 25 copies.</p>

Comments received from stakeholders		
Sr.	Name of Firm	Comments

No.		
1.	<b>M/s SKF India Limited</b>	Para 13(e): Drawings and part number details with current price catalogue.
2.	<b>M/s Schaeffler India Limited</b>	Nil
3.	<b>M/s NEI Limited</b>	Nil
4.	<b>M/s Timken India Ltd.</b>	Nil

<b>RDSO Remarks</b>	<b>SKF</b> Para : Para has been modified
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<b>Modified Clause, If applicable</b>	<b>13 MAINTENANCE MANUAL</b>
	<p>13.1 The supplier shall supply free of cost a minimum of 25 hard copies, along with soft copies, of the detailed maintenance manual for maintenance and overhaul purpose along with supplies. These copies shall be mailed to the Director General (Wagon), R.D.S.O., Lucknow-226011. The comprehensive Maintenance Manual should, inter-alia, cover the following: -</p> <p>f) Description of the bearing g) Procedure for examination of the bearing. h) Initial and condemning limits of the components. i) Instructions for periodical maintenance and complete overhauling. j) Drawings and part number details.</p> <p>13.2 The supplier shall also supply free of cost copies of pocket manuals/catalogue/specification details at the rate of two copies per thousand bearings supplied with minimum number of 10 copies.</p>

<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
<b>14.0</b>	<b>14 RESPONSIBILITY OF THE SUPPLIER</b>
	<p>14.1 The supplier shall assist and advise Indian Railways regarding the process, machinery and plant for the purpose of setting up AAR standard inspection, testing and servicing facilities in three Nominated Workshops</p>

	<p>at no extra cost. The setting up of maintenance facility will be the discretion of the Purchaser.</p> <p>14.2 The supplier shall furnish details of tools and equipment required as per AAR Mandatory Standards &amp; Recommended Practices for:</p> <ul style="list-style-type: none"> <li>- Disassembly of Cartridge Bearings</li> <li>- Cleaning of Components</li> <li>- Inspection of Bearing Components</li> <li>- Greasing</li> <li>- Re-assembly</li> </ul> <p>14.3 The supplier shall agree to train adequate no. of officers and staff in disassembly, cleaning, inspection of bearing components, greasing and assembly of the bearings either at their works or at the railway workshop.</p> <p>14.4 The successful bidder shall agree to supply, free of cost, one cut-model of Cartridge Bearings arrangement to RDSO/Railway for educational purpose.</p>
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<b>Comments received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	<b>M/s SKF India Limited</b>	Para 14.4: The successful bidder shall agree to supply, <del>free of cost</del> , one cut-model of Cartridge Bearings arrangement to RDSO/Railway for educational purpose on chargeable basis.
2.	<b>M/s Schaeffler India Limited</b>	No comments
3.	<b>M/s NEI Limited</b>	Nil
4.	<b>M/s Timken India Ltd.</b>	Nil

<b>RDSO Remarks</b>	<b>SKF</b> : Not accepted, new design of bearing/Class K bearing is required to RDSO/Railway for study purpose.
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1)</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
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<b>Clause No.</b>	
<b>15.0</b>	<p><b>15 Vendor-Changes in Approved status</b></p> <p>All the provisions contained in RDSO's ISO procedures laid down in Document No. QO-D-7.1-11 dated 19.07.2016 (titled "Vendor-Changes in Approved status") and subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor/vendors in the contracts floated by Railways to maintain quality of products supplied to Railways</p>

<b>Comments received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Para has been modified
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<b>Modified Clause, If applicable</b>	<p><b>15. Vendor-changes in Approved status</b></p> <p>All the provisions contained in RDSO's ISO procedures laid down in Document No. QO-D-8.1-11 dated 22.01.2021 (titled "Vendor-Changes in Approved status") and subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor/vendors in the contracts floated by Railways to maintain quality of products supplied to Railways.</p>
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
<b>16.0</b>	<p><b>16 GUARANTEE</b></p> <p>The bearings complete and their components (in case supplied individually) shall be guaranteed for satisfactory performance for a period of 48 months after supply or 36 months after putting into service, whichever is earlier. The guarantee shall cover design, material and workmanship. The Supplier at his own expense shall replace the</p>

	<p>defective lot of cartridge taper roller bearings, adapters and other items supplied against relevant contract.</p> <p>The supplier should have a system for online monitoring of customer complaint for their proper and timely redressal as well as analysis</p>
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<b>Comments received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Para has been modified
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<b>Modified Clause, If applicable</b>	<p>The bearings complete and their components (in case supplied individually) shall be guaranteed for satisfactory performance for a period of 48 months after supply or 36 months after putting into service, whichever is earlier. The guarantee shall cover design, material and workmanship. The Supplier at his own expense shall replace the defective lot of cartridge taper roller bearings, adapters and other items supplied against relevant contract.</p> <p>In case of warranty replacement of the bearing, the period of 36 months would commence when the replaced bearing is commissioned in service. The sole judge in this case would be the purchaser.</p> <p>The supplier should have a system for online monitoring of customer complaint for their proper and timely redressal as well as analysis.</p> <p>The supplier shall actively associate with IR for initial satisfactory fitment of bearings in Railway Workshop/Wagon Builder.</p>
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<b>RDSO STR No. AB/RB-41-</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
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<b>2016(Rev.1) Clause No.</b>	
<b>17.0</b>	<b>17 RECONDITIONING</b> The supplier shall also undertake reconditioning of CTRB as a complete unit. The reconditioned bearing shall perform satisfactory in service and shall meet the requirements laid down in clause 15 above.

<b>Comments received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Nil
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
<b>18.0</b>	<b>18 PACKING</b>  The bearing shall be packed as under: i) Only one bearing shall be packed in a wooden/Carton box. ii) Plastic wedges and plastic straps shall be used to prevent damage during transit. iii) Rust preventive oil shall be used to cover all the surfaces. iv) Bearing shall be suitably wrapped/packed in oil/grease resistant paper /polyethene before being packed in the box.



	<p>v) Bearing shall be finally packed in pallets or wooden cases depending upon mode of transport. These pallets or wooden boxes will be strapped with steel/nylon band and lead seal on wire, by Inspecting Authority before shipment.</p> <p>vi) Supplier has to ensure proper packing of each and every item to protect them against ingress of dust, dirt and moisture before dispatch.</p> <p>The supplier will be responsible for proper packing and shall ensure that these packing methods are adequate for handling at Indian Ports and Inland Rail/Road Transport and in Railway workshops.</p>
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<b>Comments received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	<b>M/s SKF India Limited</b>	<p>Para 18 (i) Each box should contain 6 Nos. of Roller Bearings.</p> <p>Para 18 (ii) Each roller bearing should be wrapped with water proof bubble paper sheet, separated with corrugated paper &amp; 6 bearings completely covered by VCI bag so that it should not rub during transit.</p> <p>Para 18 (iii) This is not applicable as rings are phosphated.</p> <p>Para 18 (iv) Covered in 17.1.2</p>
2.	<b>M/s Schaeffler India Limited</b>	Nil
3.	<b>M/s NEI Limited</b>	Nil
4.	<b>M/s Timken India Ltd.</b>	Nil

<b>RDSO Remarks</b>	<p><b><u>SKF</u></b> Not accepted, Packing methodology is prescribed to avoid damage to bearing during transit &amp; storage .Rust preventive oil is applied to prevent corrosion</p>
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
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<b>19.0</b>	<p><b>19 FIELD PERFORMANC MONITORING</b></p> <p>The supplier shall regularly collect data and samples of previous supply from field to access the actual life obtained nature of defects occurring in the service and should take necessary corrective action to improve quality. Half-yearly report should be submitted to Director General (Wagon) RDSO/ LKO on data, samples collected and corrective action taken. This shall also be a part of Quality Assurance Plan of the supplier.</p>
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<b>Comments received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Nil
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<b>Modified Clause, If applicable</b>	Nil
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
<b>20</b>	<p><b>20 CLARIFICATIONS</b></p> <p>Additional information, if required, may be obtained from the Director General (Wagon), Research Designs and Standards Organisation, Manak Nagar, Lucknow (UP), India - 226011, Fax 91-522-2452494, <a href="mailto:jdwp.rds@gmail.com">jdwp.rds@gmail.com</a>.</p>

<b>Comments received from stakeholders</b>
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Sr. No.	Name of Firm	Comments
1.	M/s SKF India Limited	Nil
2.	M/s Schaeffler India Limited	Nil
3.	M/s NEI Limited	Nil
4.	M/s Timken India Ltd.	Nil

<b>RDSO Remarks</b>	Para has been Modified
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<b>Modified Clause, If applicable</b>	<b>CLARIFICATIONS</b>  Additional information, if required, may be obtained from the Director General (Wagon), Research Designs and Standards Organisation, Manak Nagar, Lucknow (UP), India – 226011
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<b>RDSO STR No. AB/RB-41-2016(Rev.1) Clause No.</b>	<b>Draft STR No. AB/RB-41-2016(Rev.1)</b>
21	<b>21 LIST OF DRAWINGS ENCLOSED</b>  i) Axle to Drawing No. WD-15020-S-02 Alt. nil or latest. ii) Wheel & Axle assembly to Drawing No. WD-15020-S-01 Alt. nil or latest. iii) Adapter (Narrow Jaw) to Drawing No. WD-15020-S-03 Alt. 2 or latest. iv) Locking Plate to Drawing No. WD-06085/S-2 Alt. nil or latest v) Bogie Details to Drawing No. WD-13012-S-04 Alt. 4 or latest. vi) Cast Steel Side Frame to Drawing No. WD-15021-S-03 Alt. 3 or latest.

<b>Comments received from stakeholders</b>		
Sr. No.	Name of Firm	Comments
1.	M/s SKF India	Nil

	<b>Limited</b>	
2.	<b>M/s Schaeffler India Limited</b>	Nil
3.	<b>M/s NEI Limited</b>	Nil
4.	<b>M/s Timken India Ltd.</b>	Nil

<b>RDSO Remarks</b>	Nil
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<b>Modified Clause, If applicable</b>	Nil
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<b>Comments received from stakeholders</b>		
<b>Sr. No.</b>	<b>Name of Firm</b>	<b>Comments</b>
<b>New point to be added in Spec.</b>	<b>M/s SKF India Limited</b>	DISPOSAL OF REJECTED BEARINGS: Bearings which are finally rejected Shall be marked in distinguishable manner and shall be disposed off in such a manner as the Purchaser/RDSO /Inspecting Authority may direct.

<b>RDSO Remarks</b>	<b>SKF:</b> Noted, The practice of proper disposal of bearing already exists in Indian railways.
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<b>Modified Clause, If applicable</b>	Nil
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