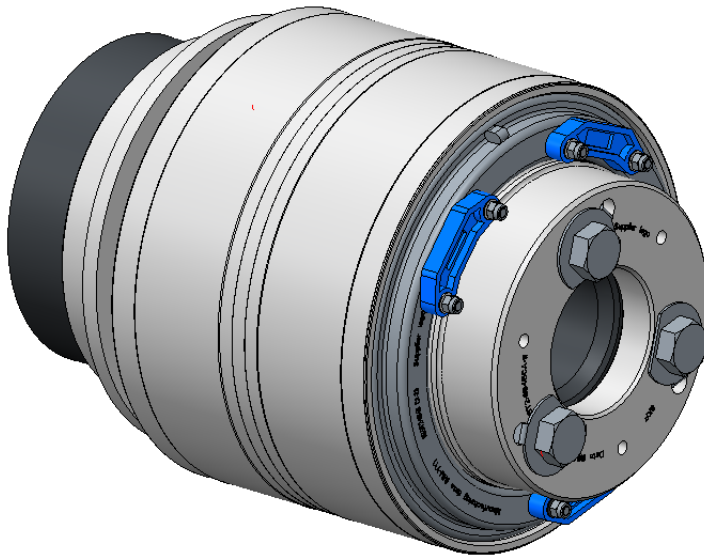


MEDHA TBU- BT2 8555 CA TBU MAINTENANCE PLAN

TRAIN-18 44TS





RAILWAYS PRODUCTS

SKF TBU Mounting Instructions

Date

2022-09-01

Location

India




Tapered roller bearings are high precision products. Bad handling, mounting and dismounting can affect bearing life, leading to early failures. This manual is intended as a guide for inspection of SKF tapered roller bearing units in service. For convenience, only the term TBU is used in this document since all the instructions given in this manual are valid for both TBU and CTBU (see “*Terms and Definitions*” section).

Project: Medha Train 18

Product: BT2-8555 CA

Customer: Medha Servo

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	Department	Date	Name	Signature
Prepared by:	SKF – RBU -AE	01-09-2022	Deepak M	
Checked by:	SKF – RBU -AE	06-09-2022	Sangeet Jain	
Approved by:	SKF – RBU -AE	06-09-2022	Sangeet Jain	

We thank you for your interest in SKF products.

MAINTENANCE PLAN OF TBU

TBU/CTBU maintenance is a delicate operation which, if not correctly performed, can lead to failures in service, resulting in damages to people or goods and liability issues. For these reasons, it should be always performed by SKF or in certified refurbishment centres. Responsibility of maintenance process lies with the Customer whenever he decides to perform this operation autonomously in a workshop not certified by SKF. The maintenance plan for this application as defined for train level is:

Schedule	Periodicity
Daily	Every day
Trip	Every 3 days or 5000km(whichever comes first)
Monthly	30 Days \pm 2 days
Quarterly	90 Days \pm 3 days
Nine Monthly	270 Days \pm 3 days
Shop Schedule-1 (SS-1)	18 Months \pm 5 days
Shop Schedule-2 (SS-2)	36 Months \pm 5 days
Shop Schedule-3 (SS-3)	72 Months \pm 5 days

Maintenance interval
<i>Dismounting & Inspection of 20 bearings from the fleet at 1.2 Millions of Km</i>
<i>Refurbishment of all bearings in the fleet at 1.4 Millions of Km or 3 years whichever comes first.</i>
<i>(All Shop Schedules)</i>



SKF bearings have to be completely overhauled every time they are dismantled from the axle for any reason (i.e. change brake disk, etc.) even if they have not reached the maintenance interval. It is always necessary to replace both the TBUs on an axle when one of these TBU is dismantled before having reached its maintenance interval. The warranty on the TBU will expire when it is dismantled from the axle. The polymer cage must be replaced every 12 years for high-speed bearings and every 16 years for bearings in other applications. Contact SKF for further details.

The Service Life for this application is:

Service Life
<i>4.2 Millions of Km or 9 years whichever comes first.</i>



SKF bearings must be scrapped when the service life is reached.

The maintenance plan for this project is the following:

Schedule	Inspection to be done
Daily	Visual inspection of axlebox
Trip, Monthly, Quarterly, 9 Monthly	Additionally observe for any signs of grease leakage, abnormal noise & temperature during rolling in & rolling out
SS1, SS2, SS3	Additionally conduct the visual inspection of axlebox bearing, check for abnormal noise, mounted end play, condition of axle end components & torque. Check the mounting date of bearing and send to OEM for refurbishment if due as per the defined intervals given below

Maintenance Plan

Type of Operation	Frequency
Inspection Step –Dismounting, Visual and Grease Analysis- 20 bearings	1.2 Million Km
1 st Overhaul (SS2) – All bearings	1.4 Million Km or 3 years
Inspection Step –Dismounting, Visual and Grease Analysis- 20 bearings	2.6 Million Km
2 nd Overhaul (SS3) – All bearings	2.8 Million Km or 6 years
Scrap of the bearings	4.2 Million Km or 9 years

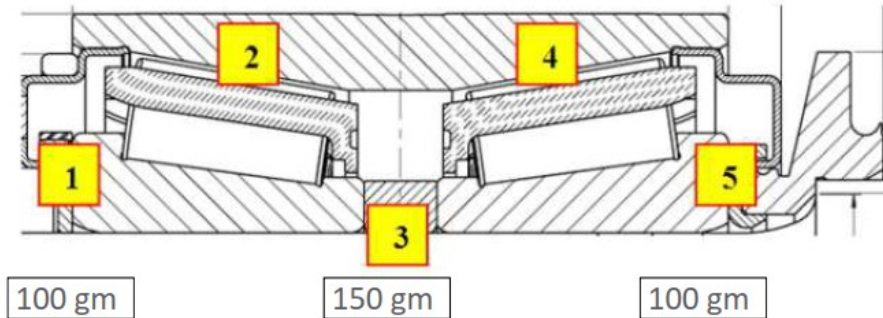
Inspection to be followed during the train level inspection schedules are detailed below.

- Visual inspection for general condition – Observe the visible parts for any physical damage / abnormalities
- Check for any signs of overheating or detection of hot bearing -Temperature should not exceed 80°C & bearing should be removed from service if temperature has reached 100°C. Temperature trend to be made with the help of thermal sticker / thermal scanners / non-contact type temperature gun.
- Difference between 2 bearings on same axle must not be exceed by more than 20°C, if noticed the bearing with increased temperature should be monitored strictly.
- During rolling in and out examination, try to listen for any unusual noise.
- Noise observed during manual rotation of the bearing by hand which is **uniform in nature** is considered normal. This kind of noise is due to clearance within the bearing.
- Noise observed which is cyclic in nature with certain frequency and can be isolated to specific points on bearing is considered as abnormal and should be informed to SKF.
- SKF to be contacted in case of doubt.
- Check bearings for Grease oozing – Detailed in the next section.
- During schedules which involves removal of wheelset from the bogie, the mounted end play should be checked & ensured that the axle end fittings are tightened with the required torque.

Grease Oozing

Grease is a thickener full with oil, mixed with anti-oxidants, rust inhibitors, EP and anti-wear additives etc.

Grease distribution in a TBU during initial filling is in the locations marked as given below.



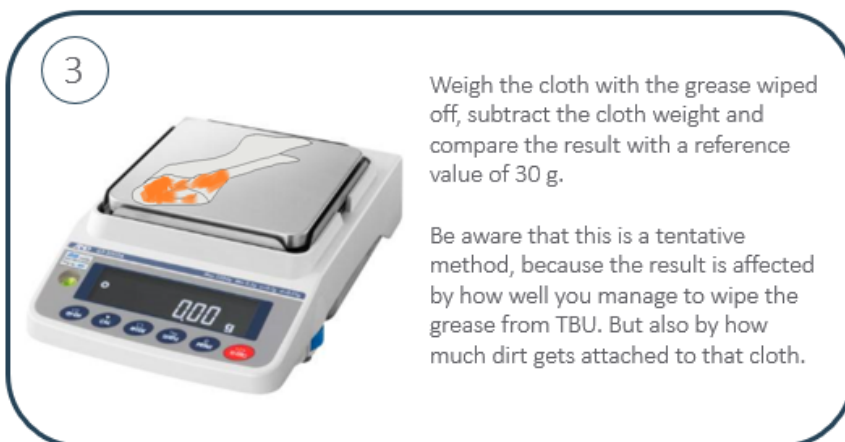
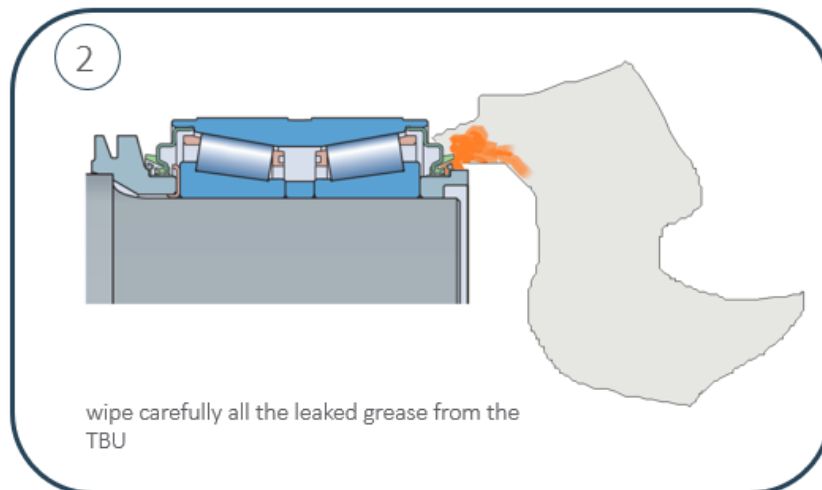
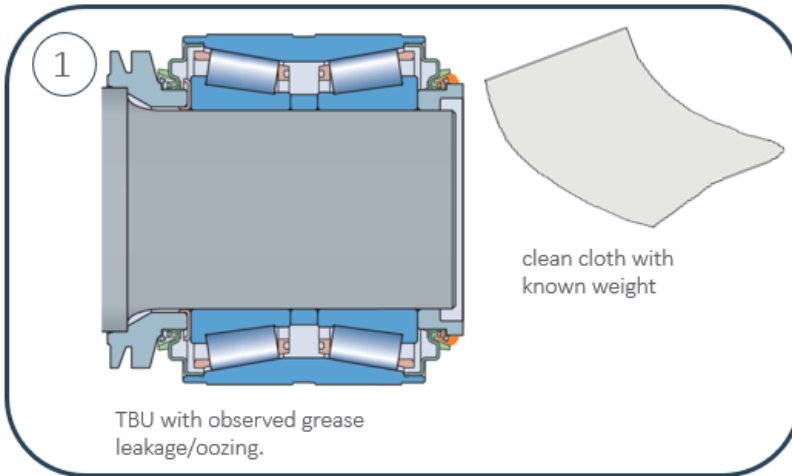
During operation of the TBU, grease normally settles on places like the cage pockets corners, central spacer, seal, raceways etc due to the centrifugal action created during rotation. During the course of normal operation, the temperature inside the bearing increases and this creates an internal pressure which tries to escape through the seals. Due to the presence of grease in this area, this pushes out a small amount of grease through the seal lips. This is a normal phenomenon in TBU and is well documented.

This slight oozing of the grease is acceptable. The grease thus visible should not be cleaned away as the grease forms an additional barrier to prevent further oozing. If the other operating parameters like temperature is normal, then the bearing should be allowed to continue in service.

If the oozed out grease does not settle & the quantity of the grease observed is more than 30gms, then the bearing should be removed from service & sent for refurbishment. The grease seal should be examined in detail to identify any mechanical damage. The visualization of grease quantity on the bearing is as show below.



The weight of the grease leaked out can be determined using the below steps.





The grease is minimal in quantity & is settled, dry.



The grease is fluctuating around the allowable limit & seems fresh. Contact SKF



Oil separation has happened from grease and is not serviceable. Contact SKF

Contacts



Internet:

www.skf.com

www.skf.com/group/industry-solutions/railways

For any other issue contact your local SKF Sales Unit:

SKF India Limited

611-617, 6th Floor, Bestech Chambers

B-Block, Sushant Lok, Phase-I

Gurgaon-122002, India