

S. N. 33

Government of India
Ministry of Railways

Research, Designs & Standards Organisation

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SPECIAL MAINTENANCE INSTRUCTIONS
No. RDSO/EL RS/SMI/16

- 1 Title
Fits and limits on bearings of auxiliary motors used on electric locomotives.
- 2 Application to class of locomotive
Auxiliary motors of all electric locomotives.
- 3 Object of special maintenance instructions
 - 3.1 It is necessary to ensure that the fits between bearing races and shafts/housings are correctly made in order to prevent bearing failures. Excessive interference leads to reduced clearance and eventual failure of bearing. Inadequate clearances lead to revolution of races, overheating and again to bearing failures.
 - 3.2 Loco Sheds and Car Sheds have sometimes experienced difficulties in the matter of deciding the tolerances on dimensions of bearings, shafts, housings, etc. This document gives the required limits.
- 4 Instructions
 - 4.1 The limits for rotor shaft and bearing housing diameters should be adopted as per Tables below. For ready reference the limits for the bores of inner races and outer dias of outer races are also given in the following Tables. These should be checked during inspection of bearings.

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(A) TOLERANCES ON SHAFTS & BEARING INNER RACES

1 Micron = 0.001 mm.			
S. No.	Nominal shaft dia. range mm.	Shaft tolerances K5 microns.	Inner race bore tolerances h B Microns.
1	10 to 18	+ 9 + 1	- 8 0
2	18 to 30	+ 11 + 2	-10 0
3	30 to 50	+ 13 + 2	-12 0
4	50 to 80	+ 15 + 2	-15 0
5	80 to 120	+ 18 + 3	-20 0

(B) TOLERANCES ON HOUSING BORES & BEARING OUTER RACE

S. No.	Nominal Housing dia. range mm	Housing dia. tolerances J6 Microns)	Outer race tolerances h B Microns.
1	18 to 30	- 5 + 8	0 - 9
2	30 to 50	- 6 + 10	0 - 11
3	50 to 80	- 6 + 18	0 - 28
4	80 to 120	- 6 + 16	0 - 15
5	120 to 150	- 7 + 18	0 - 18
6	150 to 180	- 7 + 18	0 - 25
7	180 to 200	- 7 + 22	0 -30

- 4.2 The limits for bearing clearances for new bearings are given below. These should also be checked during inspection of bearings.

RADIAL INTERNAL CLEARANCE OF DEEP GROOVE BALL BEARINGS

1 Micron = 0.001 mm.

S. No.	Nominal bore dia range (d) mm	C3 type clearance (Greater than normal)	
		Minimum microns.	Maximum microns
1	10 to 18	11	25
2	18 to 24	13	28
3	24 to 30	13	28
4	30 to 40	15	33
5	40 to 50	18	36
6	50 to 65	23	43
7	65 to 80	25	61
8	80 to 100	30	58

4.3 References

- i) SKF General Catalogue No. 3000 E/GB 666, Nov 1975
for k5 see page 87
for J6 see page 91
for J6 C3 see page 66 -
clearance for deep groove ball bearing.
- ii) Guide for selection of fits -
Indian Standards Institution Specification
No. IS: 2709 - 1964.

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5 Agency for implementation

- a) All Electric Locomotive Sheds
- b) POH shops of the Railways
- c) Rewinding shops of the Railways.

6 Distribution 2 copies

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