

## Marine Engineering Exam Resource – Review of Bearings

1. A solid bearing with no cap is called?  
Dolly box. (Babbitt bearing) page 100 - 101
2. What would be the best Babbitt bearing to use in a heavily loaded drive where the bearing sits on a horizontal base and the pull is slightly above horizontal?  
Angle style bearing (Babbitt bearing with cap) page 101
3. What is the best means of checking a Babbitt bearing for 75% contact with a shaft?  
Mechanic blue. Shaft coated with mechanic blue and rotate inside Babbitt Bearing. Scratch marks indicate high spots, which are to be removed. Page 110
4. What is the usual method for reducing the clearance in a split Babbitt bearing?  
Remove some of the shims between cap and base. Page 102, 110, and 111 Bearing material is softer than shaft and can withstand the temperature. Babbitt is made of copper, tin, lead, and antimony.
5. Where would you place a level when leveling off the bottom half of a large bearing housing?  
Put the level on the bottom of the housing, if the shaft is in place put level on shaft.
6. Babbitt melts at approximately what temperature?  
445 degrees to 550 degrees f it melts. Temperature for pouring is 650 to 700 Degrees. Page 103
7. How are Babbitt liners held in place?  
By keys formed when Babbitt forms into slot or holes drilled in housing. Page 104
8. What is the shaft called, used to form the Babbitt liner?  
Mandrel. Page 104
9. Why is a shaft collar used in conjunction with some Babbitt bearings?  
To protect bearings from thrusts load and prevent endplay. Page 115
10. What safety rules should be applied when pouring Babbitt bearings?  
Wear protective clothing. Make sure parts are clean and dry. Do not pour Where water can drip on parts as it causes expansion and a rough finish. Vent Babbitt pot and bearing. Make sure area is well ventilated. Page 106
11. Babbitt should be poured at what speed?  
At a steady rate and in one pouring or you will get fracture marks. Pour generously and allow some to overflow. Page 106
12. How are Babbitt bearings fitted?  
Hand scrapped. Sometimes turned on a lathe. Final fitting is hand scrapped.
13. Why are the top edges of a Babbitt bearing chamfered?  
So the lubricant can be tunneled to the shaft. Page 109, 105, 107 air vent made to let air out.
14. How far are the edges of a Babbitt bearing chamfered? Why?

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Almost to the corner but not complete bearing length because of lubrication leakage.

15. How is the clearance in a Babbitt bearing checked?  
Feeler gauges. Dial indicators. Lead wire or plastic gauge. Page 112
16. When babbitting a bearing, the housing must be?  
Completely clean and dry. Should be preheated. Page 106
17. Where should an oil groove be located in a plain bearing?  
On the low-pressure side. On top or cap end of bearing. Page 110 Mandrel would be coated with white lead or acetate? Cut to stop from sticking to the shaft. Page 111. Scraping, grooving. Page 119
18. What are the advantages in a plain bearing? Name five.  
Quieter in operation, better resistance to unexpected overload and shock conditions. Less radial space required. Low cost, old Babbitt can be reused. Less likely to be damaged by contaminants.
19. What are the most common causes of plain journal bearing failure?  
Lack of lubrication. Clearance is about .001 per inch of shaft.
20. What are the basic bearings styles that the rolling elements are classified?  
Ball bearings. Roller bearings, spherical, cylindrical, tapered. Needle Bearings. Page 112 checking bearing clearances. Page 115 thrust control.
21. What are the types of loads that bearings can experience?  
Radial, right angle to shaft. Thrust, parallel to shaft. Combination, both radial and thrust loads.
22. What types of bearings can be used with the various loads?  
Radial load, single row ball, cylindrical, double row ball. Thrust load, ball thrust, roller thrust, needle thrust. Combination, tapered roller, angular, contact, spherical roller.
23. What are ball bearings generally suited for?  
High speed applications. Low to medium capacity loads. Roller bearings are suited for low speeds. Low to high load applications. Page 119
24. What is another name for a Conrad bearing?  
Single row deep groove ball bearing. Page 117 parts of a bearing
25. What do the c numbers on a bearing refer to?  
Represent degree of clearance between rolling element and raceway.
26. What is a needle bearing?  
Cylindrical bearing where the length is more than twice the diameter. Designed as pure radial or for thrust. Page 118.
27. What is bearing creep?  
Area of rolling element changes. Inner race slowly creeps around shaft. Page 122

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28. What are the three types of rollers that can be used in a roller bearing?  
Spherical. Cylindrical tapered. Page 118
29. What is the taper of a standard tapered bore bearing?  
1" inch in 12". K means tapered bore. Page 119
30. If the bearing housing had only enough room for a single row radial bearing, what type of bearing would you use to carry higher radial load?  
Maximum capacity. More balls in the bearing than a single row ball bearing. (Conrad) page 120
31. How many bearings should be fixed on a shaft with 3 split anti friction pillow block types?  
One fixed. Usually the drive end and the rest floating. Page 128
32. When pressing a taper roller bearing from a shaft, the pressure should be against?  
The inner race. Press on tight fitting race. Usually inner but can be outer.
33. Which bearing retains its load carrying capacity even when misaligned?  
Spherical roller.
34. What types of bearings should not be used for thrust loading?  
Radial needle bearing. Single row ball bearings. Page 137.
35. What very important factor must be considered when installing anti-friction bearings?  
Cleanliness. Area and tool must be clean to stop any contamination. Page 138.
36. What would be the probable cause of a bearing that overheats, even though the bearing was carefully and properly installed. Too much lubricant in bearing housing.
37. What is the temperature range a large bearing should be heated in oil for a shrink fit?  
Not above 248 degrees to 250 degrees f.
38. What would you use along with a hammer to remove a bearing?  
Mild steel punch. Key stock. Cold rolled. Page 134.
39. Final dressing of a shaft before installing a bearing should be done with?  
Fine emery cloth. Check shaft for roundness and nicks. Page 123.
40. What cautions should be taken when welding on shafts mounted on bearings?  
Make sure the current does not have to take a path through the bearing. To prevent arc in bearing.
41. Where would you check for radial fit when mounting an axial bearing?  
Between top rolling member and outer race. (Diameter clearance) reduce end play on taper bearings.
42. When mounting spherical roller bearings with sleeve adapters, clearance should be checked where?

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Between top roller and outer race with feeler gauges. Page 130.

43. What three pieces of information does a bearing code give?

Number on bearing, skf 6208-k-c4

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|--------------------------------|----------------|
| i. 6 - type of rolling element | service weight |
| ii. 2 - service weight         | 1) extra light |
| iii. 08 - bore size - mm x 5   | 2) light       |
| iv. k - taper                  | 3) medium      |
| v. c4 - clearance              | 4) heavy       |

44. What should be checked on the shaft before bearing installation?

Shaft diameter. Over, under size. Check for burrs and nicks. Corner radius correct. Retaining ring grooves are clear.

45. How is an angular contact ball bearing designed to withstand the thrust and radial loads?

Large shoulder on one side. Page 130. Rule of thumb when no table is available, reduce clearance by 50%.