

ASSOCIATION OF AMERICAN RAILROADS
OPERATIONS AND MAINTENANCE DEPARTMENT
MECHANICAL DIVISION

SPECIFICATIONS

M-501-41

BEARINGS, JOURNAL, LINED

ADOPTED, 1915; REVISED, 1926, 1934, 1938, 1941

1. **Scope.**—These specifications cover journal bearings for use on locomotive tenders, passenger and freight equipment cars.

2. **Manufacture.**—(a) Before lining, the brass backs shall be bored and thoroughly tinned in accordance with the best standard practice. After lining, the ends of the bearings shall be made smooth by scraping, filing or machining. They must not be ground or rubbed with abrasive materials.

(b) The purchaser reserves the right to inspect the brass backs after boring and previous to tinning and lining.

(c) Unless otherwise specified bearings will be furnished with linings $\frac{1}{4}$ in. thick.

I. CHEMICAL PROPERTIES AND TESTS.

3. **Composition of Back:**

	Per Cent
Copper.....	67 to 70
Tin.....	5 to 7
Lead.....	24 Max.
Zinc.....	3 Max.
Impurities.....	1 Max.

4. **Composition of Lining:**

	Per Cent
Tin	As specified
Antimony, not less than.....	8.0
Tin and antimony.....	10 to 14
Arsenic, maximum	0.2
Copper, maximum	0.5
Sum of tin, antimony, lead and arsenic, min.	99.25
Remainder, maximum	0.75

5. **Analyses.**—The sample for chemical analysis of the back shall consist of a thorough mixture of equal quantities of fine drillings taken at three points on the bearing, surface metal being discarded. The sample for analysis of the lining shall be taken by scraping the lining, after removing surface metal.

II. PHYSICAL PROPERTIES AND TESTS.

6. **Tests.**—The finished casting representing a lot for acceptance shall be broken, either longitudinally or transversely, or both, in order to ascertain the uniformity of the grain of the metal. When this fracture shows separation or imperfect mixing of component parts or dross or dirt spots, the lot shall be rejected.

7. **Number of Tests.**—Bearings shall be divided into lots of 300 or less, and one bearing shall be taken for test and chemical analysis from each lot.

III. PERMISSIBLE VARIATION.

8. **Gaging.**—All bearings shall conform to the latest standards of the Mechanical Division of the Association of American Railroads, with respect to form, dimensions and variations therefrom, as shown on sheets B-21 and D-24 of the Manual of Standard and Recommended Practices.

IV. FINISH.

9. **Finish.**—The castings shall be sound and free from blowholes, dross and mechanical defects. All bearing surfaces, including ends, before and after lining, shall be smooth finished and free from sand.

V. MARKING.

10. **Marking.**—The bearings shall be cast with the marks as shown on Fig. 1. When a serial number is specified it shall be located as shown on Fig. 1. Each lot of 300 or less shall bear the same serial number, which shall commence with 1 with the opening of the year and continue consecutively until the end of the year, at each manufacturer's plant.

VI. INSPECTION AND REJECTION.

11. **Inspection.**—(a) The inspector representing the purchaser shall have free entry, at all times while the work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of charge, all reasonable facilities and necessary assistance to satisfy him that the material is being furnished in accordance with these specifications. Tests and inspection at the place of manufacture shall be made prior to shipment.

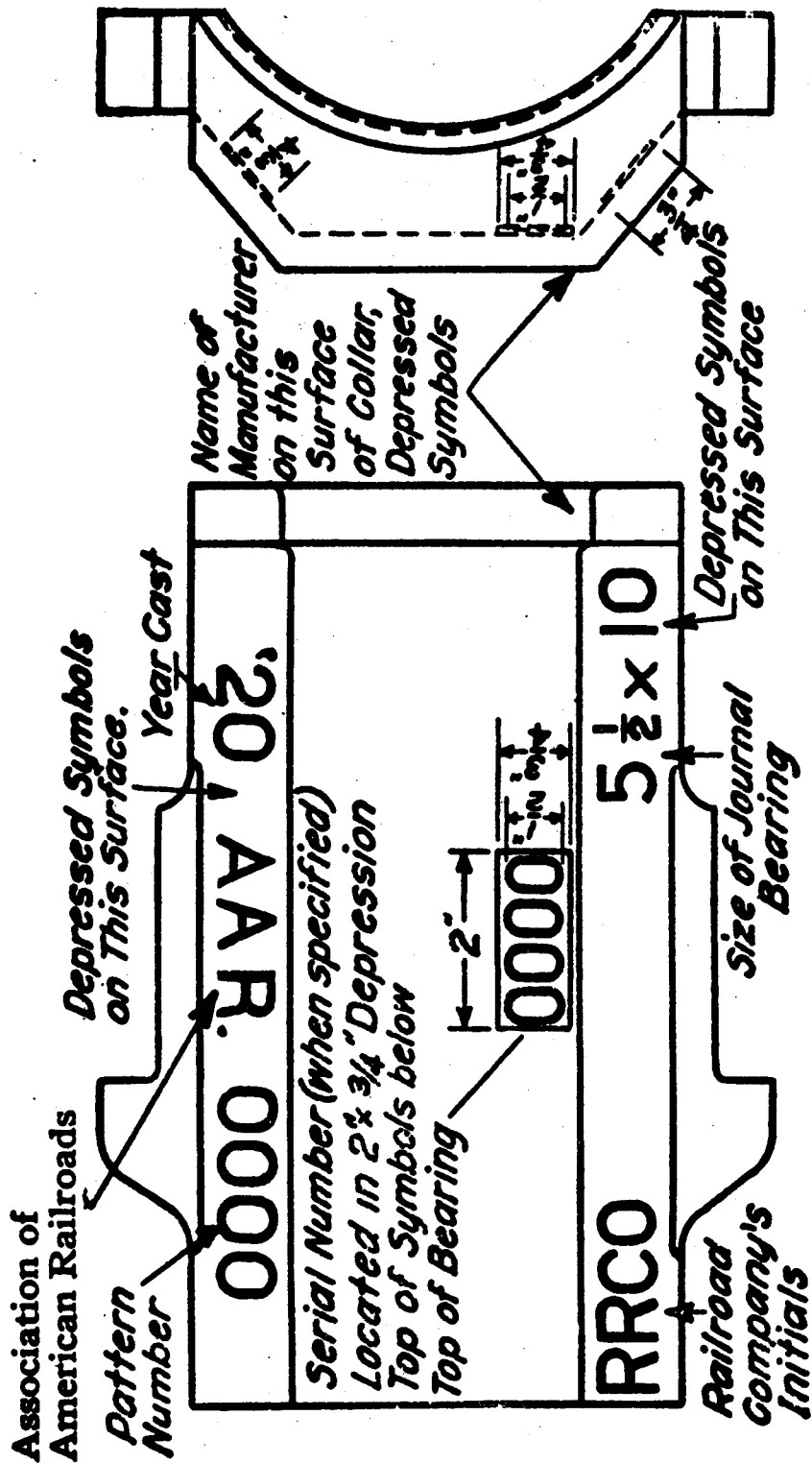


FIG. 1.

(b) The purchaser may make tests to govern the acceptance or rejection of the material in his own laboratory or elsewhere. Such tests shall be made at the expense of the purchaser.

12. **Rejection.**—(a) Material represented by samples which fail to conform to the requirements of these specifications will be rejected.

(b) Material which, subsequent to test and inspection at the factory or elsewhere and its acceptance, shows injurious defects will be rejected and the manufacturer shall be notified.

13. **Rehearing.**—Samples tested in accordance with these specifications, which represent rejected material, shall be held for fourteen (14) days from date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

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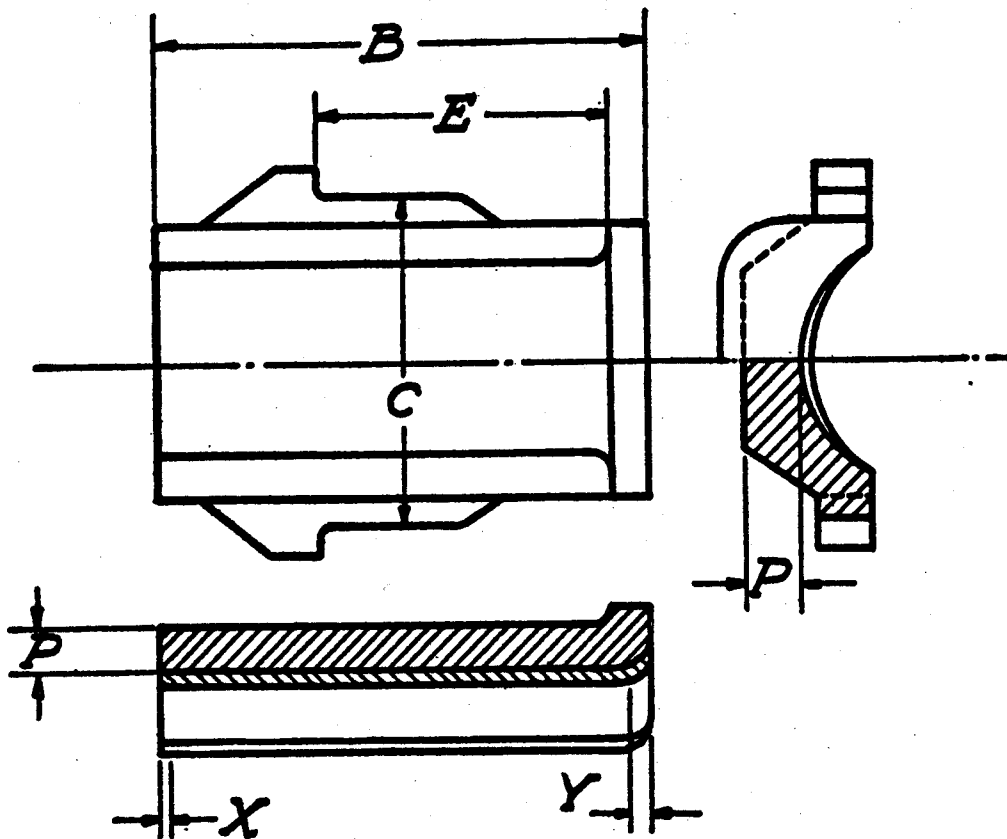
M-502-41

BEARINGS, JOURNAL, RELINED

ADOPTED, 1932; REVISED, 1941

All old lining shall be removed before inspection.

When it is determined that the journal bearing back, after boring and cleaning up for relining, will not finish within the following minimum or maximum limits, such back must not be relined:



	B	C	E	P	X	Y
	Min.	Min.	Max.	Min.	Max.	Max.
	Inches	Inches	Inches	Inches	Inches	Inches
Journal Bearing Backs Worn beyond these limits will not be relined....	For 3 $\frac{3}{4}$ " x 7" Journal	6 $\frac{5}{8}$	4 $\frac{3}{8}$	4 $\frac{1}{4}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$
	For 4 $\frac{1}{4}$ " x 8" Journal	7 $\frac{5}{8}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$
	For 5" x 9" Journal	8 $\frac{5}{8}$	5 $\frac{1}{2}$	5 $\frac{1}{4}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$
	For 5 $\frac{1}{2}$ " x 10" Journal	9 $\frac{5}{8}$	6	5 $\frac{5}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$
	For 6" x 11" Journal	10 $\frac{5}{8}$	7	6 $\frac{7}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$
	For 6 $\frac{1}{2}$ " x 12" Journal	11 $\frac{5}{8}$	7 $\frac{1}{2}$	7 $\frac{3}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$

All backs having any of the following defects, must not be relined:

Non A. A. R.; cracked (as indicated by hammer test); broken; distorted; run hot in service; porosity; cold shot; segregation of material; discolored spots; wedge wear which would interfere with proper lateral movement; or other defect which would prevent the bearing from properly functioning with adjacent parts.

All backs shall be rebored, removing at least 1/32-in. material measured at the center of crown, or more if necessary up to the limit specified in table, removing all oil impregnated metal, leaving a smooth and absolutely clean surface over the entire lining contact area.

The tinning, lining, and inspection shall be in accordance with the specifications for new bearings, with allowance made for worn backs.

The combined thickness of back and lining, measured through the crown, shall be the same as required for a new journal bearing.