

Association of American Railroads

**OPERATIONS AND MAINTENANCE DEPARTMENT
MECHANICAL DIVISION**

MANUAL OF STANDARDS AND RECOMMENDED PRACTICES SECTION A, PART III

PASSENGER CAR REQUIREMENTS

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PASSENGER CAR MAINTENANCE REQUIREMENTS

Standard

S-045

Adopted 1983

Effective January 1, 1984

1.0 STANDARDS FOR THE CARE AND MAINTENANCE OF PASSENGER EQUIPMENT CARS

1.0.1

These standard maintenance practices and operating requirements must be used for load carrying or passenger carrying passenger equipment cars operating on the railroads of the United States and Canada. These standards are to be used in conjunction with agreements between car owners and the operating railroad.

1.1

For the purpose of this standard the definition of passenger train cars is shown as RP-900 included in Section L of the AAR Manual of Standards and Recommended Practices. Recommended practice RP-900 shall determine whether or not cars are of passenger car construction.

1.2

In the application of this standard passenger cars shall be treated as belonging to the companies or individuals whose reporting marks the cars bear.

1.3

The provisions of this standard apply to cars on which work is performed under an operating agreement between the passenger car owner and one or more systems of railroads, from originating point of the operating line to destination terminal of the line.

1.4

Inspections required by this standard and the maintenance practices required by this standard must be performed as specified and repairs performed in accordance with agreements between the passenger car owner and the operating railroads.

1.5

Passenger cars which are privately owned must be inspected, maintained, and/or repaired prior to movement, as a minimum, in accordance with this standard or agreements between the private car owner and the operating railroads.

1.6

Copies of these standards, Mechanical Division Circular Letters, Mechanical Division Interchange Rules, Letter Ballots and Results of Letter Ballots and Annual Reports of the Committees of the Mechanical Division and the Manual of Standards and Recommended Practices are available upon application to the Secretary of the Mechanical Division, Association of American Railroads, 1920 L Street, N.W., Washington, D.C. 20036.

2.0 BRAKE EQUIPMENT

This section outlines maintenance requirements and instructions for all types of brake equipment used on passenger car equipment.

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2.1 Air Brakes

Maintenance, inspection, testing and repairs of air brakes includes the following requirements

2.1.1

Periodic maintenance of air brakes is considered as C.O.T.&S. which is clean, oil, test, and stencil.

2.1.2

Air brakes must have COT&S performed in accordance with the following table. The time limits referred to are defined as the date of month stenciled on the car. The standard stencil location and type of stencil is identified elsewhere in this standard.

Passenger Car Brake Type	U Type	D-22 Type	26-C Type	PS-68 Type	All Other Types
Months as Stenciled	15	24	36	48	12

2.1.2.1

Any railroad passenger car which is overdue for COT&S may be moved to another location for rebuilding, reconditioning, repairs, or scrapping providing the car has passed a single car test. As shown in Standard S-044, (Instruction Pamphlet 5039-4, Sup. 3) of Section A Part III of the Manual of Standards and Recommended Practices.

2.1.3

Passenger cars may not be placed in service beyond COT&S date stencilled on car. In addition, COT&S must be performed for the following reasons.

2.1.3.1 Stenciling Missing

2.1.3.2 Stenciling Incorrect

2.1.3.3 Stenciling Indistinct

2.1.3.4

Evidence of brake valvular equipment having been submerged whether found operative or inoperative after submerging.

2.1.4

Periodic maintenance on passenger cars equipped with freight type brake valvular equipment must be performed in accordance with requirements of the Field Manual of AAR Interchange Rules, current edition.

2.1.5

Air brake components requiring maintenance other than at the periodic attention cycle shall be performed as required.

2.1.6

In the repair of brakes on passenger type equipment, components must only be replaced in kind.

2.1.7

Maintenance, inspection, testing, reconditioning and repairs of all air brake equipment including brake cylinders and slack adjusters must be performed in compliance with the following instruction pamphlets, leaflets, AAR standards or government regulations as applicable. The pamphlets and leaflets shown below are published by the air brake valve equipment manufacturers.

2.1.7.1

Instructions on the Use of Condemning Gages for U-12-BD, U-12-BC, and U-12-B Universal Valves. Pamphlet 2356-2, 1-1960 or latest revision.

2.1.7.2

Use of Condemning Gages or D-22 Type Control Valves. Pamphlet 2356-4, 6-1956 or latest revision.

2.1.7.3

Test Code for Car Air Signal Testing Device. Pamphlet 2377-2, 7-1942 or latest revision.

2.1.7.4

B-1 Hose Clamping Machine and B-1 Hose Clamp Removal Machine. Pamphlet 2416-1, 8-1967 revised 1-1980 (AAR Standard S-487).

2.1.7.5

Code of Tests, U-12 Type Universal Valves. The 3-USB Test Rack. Pamphlet 5039-2, 7-1953 or latest revision.

2.1.7.6

Single Car Testing Device. Code of Tests for Passenger Equipment Pamphlet 5039-4, Sup. 3, 1-1983 (AAR Standard S-044) or latest revision.

2.1.7.7

Code of Tests, D-22 Type Control Valves. The "AB" Test Rack. Pamphlet 5039-21, 2-1962 or latest revision.

2.1.7.8

Shop Maintenance for D-22 Type Passenger Car Brake Equipment Devices. Pamphlet 2089, latest revision.

2.1.7.9

Composite Instruction Pamphlet, 26-C Brake Equipment for Passenger Car. Pamphlet 5071-8, 12-1960 or latest revision.

2.1.7.10

Passenger Car Brake Equipment Type 26-C with Rear End Control. Pamphlet 5071-10, latest revision.

2.1.7.11

Brake equipment test racks must be in accordance with applicable standards published in Section E Part II of the Manual of Standards and Recommended Practices.

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2.1.7.12

All truck mounted brake equipment must be maintained in accordance with passenger car owners instructions.

2.1.7.13

The Power Brake Law of 1958, Publication Safety Appliance and Power Brakes dated 1-1973 revised 9-1977 and amended 10-1-1982 or equivalent rules.

2.2 Brake Parts - Air and Foundation**2.2.1**

Renewal of brake parts shall be performed when the following is found.

2.2.1.1

Parts which are found inoperative, bent, broken, out of gauge, or missing.

2.2.1.2

Air brake hose of the approved AAR non-armored type must be renewed with new approved AAR Specification M-601 latest revision hose when defective as defined in AAR Field Manual Interchange Rules, Rule 5 dated 1983 or latest edition. This includes brake pipe, signal pipe, main reservoir and brake cylinder hoses.

2.2.1.2.1

Armored air hose is prohibited.

2.2.1.3

Brake shoes of the cast iron type must be replaced with new approved AAR Specification M-401-56 latest revision brake shoes when defective or when worn to the extent of $\frac{3}{4}$ " or less thickness.

2.2.1.4

Brake shoes of the composition type must be replaced with new approved types when defective or worn to the extent of $\frac{1}{2}$ " or less thickness including the lining and the backing plate.

2.2.1.4.1

Brake shoes used on Amtrak equipment must be Amtrak approved type.

2.2.1.5

Brake pad lining on disc brakes must be replaced with new approved AAR Specification M-926-72 latest revision brake shoes when defective or when worn to the extent of $\frac{1}{4}$ " or less thickness.

2.2.1.6

Universal control brake valve equalizing or quick action portions must be replaced in kind when defective.

2.2.1.7 Cast Iron Reservoirs

2.2.1.7.1

No welding is permitted on body portion of cast iron reservoirs, however, holes in mounting lugs when worn may be built up by welding. Mounting lugs fractured or broken off (separated) within ½" or more distance from the body portion of the cast iron reservoir maybe welded by using bronze welding procedures to replace lug.

2.2.1.7.2

Welding shall be in accordance with the requirements of the AAR Field Manual of Interchange Rules, Rule 82, 1983 Edition or latest revision.

2.2.2

In the renewal or replacement of brake parts as shown in Paragraph 2.2.1, any deviation from that shown will be considered wrong repairs and must be corrected when found.

2.3

Cars built new on or after January 1, 1968 must be equipped with brake piping as follows:

2.3.1

Brake pipe size shall be 1¼ inch schedule 80 type.

2.3.2

Brake pipe material shall be either of the following:

2.3.2.1

Extra heavy wrought iron per Specification ASTM A-72 latest revision.

2.3.2.2

Alloy steel pipe per Specification ASTM A-53 latest revision.

2.3.3

Brake pipe branch pipe size shall be 1 inch Schedule 80 pipe.

2.3.4

Brake pipe branch pipe materials shall be either of the following:

2.3.4.1

Extra heavy wrought iron per Specification ASTM A-72 latest revision.

2.3.4.2

Alloy steel pipe per Specification ASTM A-53 latest revision.

2.3.5

Brake pipe nipples when used in brake pipe at end of car must be 1¼" in size either Schedule 40 or Schedule 80 pipe.

2.4 Handbrakes

2.4.1

At time of COT&S maintenance, handbrakes must be inspected, lubricated and tested, including all connections to insure safe and effective operation.

2.5 Air Brake Stencil

2.5.1

Old stencilling must be removed and the area painted over with quick drying paint.

2.5.2

Show place, month, day, and year of COT&S per chart, Paragraph 2.1.2 of this standard.

2.5.2.1

Stencil shall include railroad or private owner reporting marks, initial of shop or station performing maintenance.

2.5.3

Stencil must be applied in a suitable location for visual inspection; truck frame is the preferred location.

2.5.4

Stencil must not be changed until all work has been performed.

2.5.5

Any deviation from these standards must be corrected when found.

3.0 COUPLER AND COUPLER PARTS

3.1

This section outlines maintenance requirements and instructions for all types of couplers and coupler parts used on passenger car equipment. The maintenance requirements for couplers designed exclusively for passenger equipment are covered in this standard.

3.2

The maintenance requirements for AAR Type F couplers used in both freight and passenger car equipment will be found in Rules 17 and 18 of the 1983 Edition of the AAR Field Manual of Interchange Rules.

3.3

Passenger car couplers of the Type H tightlock design and controlled slack design must be maintained in accordance with instructions of this standard. These couplers and their design details will be found in AAR Specification M-206-80 and M-206-80 of Section A Part III of the Manual of Standards and Recommended Practices.

3.4

Any coupler having the standard MCB 1904 contour, other than those referred to in the foregoing paragraphs, with distance between point of knuckle and guard arm exceeding $5\frac{1}{8}$ ", (a side of gage) measured perpendicular to the guard arm with Gage Number 25623-1 as shown in Figure 1, must have defective part or parts renewed to bring the coupler within the proper gage limits.

3.5

Passenger equipment cars equipped with AAR Type E coupler and associated parts will be operated only under special agreement between the operating railroad and the passenger car owner.

3.6

Inspection, testing, reconditioning and repairs of all passenger car couplers and associated coupler parts must be performed in accordance with these standards or applicable requirements in the Field Manual of AAR Interchange Rules, 1983 Edition or latest revision for AAR Type E or F couplers.

3.7

All couplers when replaced account defective must only be replaced in kind, or in accordance with written request by owner.

3.8

Any deviation from these standards must be corrected when found.

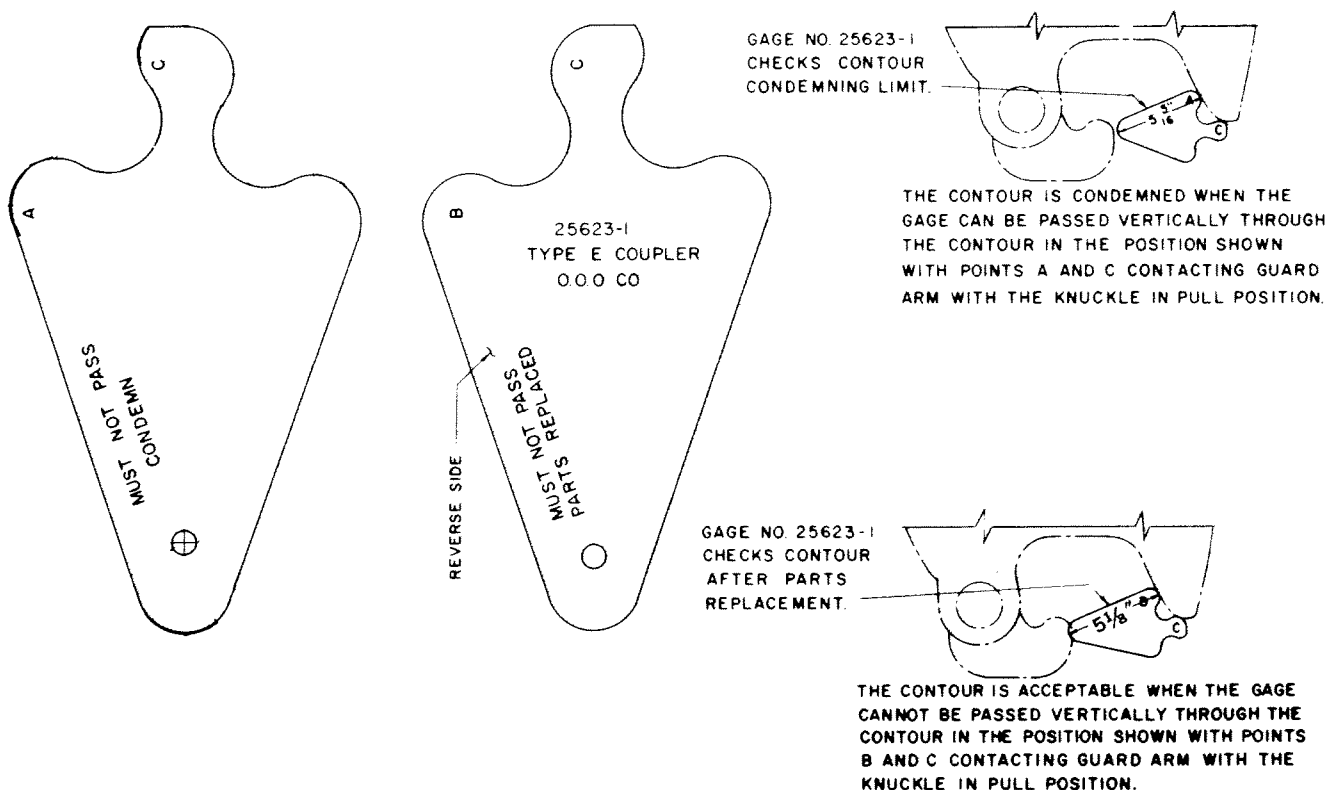


FIGURE 1

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3.9 Welding Requirements

3.9.1

For the repair or reconditioning of AAR Type H tightlock couplers or controlled slack couplers welding must be performed in accordance with the requirements as shown in AAR Specifications M-206-80 and M-206-80 of Section A Part III of the Manual of Standards and Recommended Practices.

3.9.2

For the repair or reconditioning of AAR Type E or Type F couplers welding will be performed in accordance with the requirements of the latest edition of the Field Manual of AAR Interchange Rules and appropriate specifications in Section B of the Manual of Standards and Recommended Practices.

3.10 Wear Plate

3.10.1

For Type F couplers shank wear plates may be applied if coupler is removed from the car and work is performed in accordance with AAR Specification M-212 of Section B Manual of Standards and Recommended Practices.

3.10.2

AAR Type H tightlock couplers or control slack couplers must have wear plates applied in accordance with appropriate specifications in Section A Part III of the Manual of Standards and Recommended Practices.

3.10.3

Coupler with shank dimensions less than the AAR Standard or AAR alternate standard as shown in Section A, Part III of the Manual of Standards and Recommended Practices are prohibited in passenger car equipment service.

3.10.4

Couplers and coupler parts listed in Freight Car Rule 90 of the AAR Field Manual of Interchange Rules are prohibited in passenger car equipment service.

3.11 Coupler Contour Gaging

3.11.1

For Type F coupler which is comprised of a new coupler body and second hand or reconditioned parts, the complete unit must meet all requirements of Coupler Contour Gage Number 47120-2 shown in the appropriate rule of the AAR Field Manual of Interchange Rules 1983 or later edition.

3.12 Coupler Replacement

3.12.1

In the replacement of couplers in any passenger car equipment any modification of sill construction which might include cutting or burning slots or holes must not be performed without prior approval of the operating railroad car engineering department.

3.13 Coupler Height Requirements

3.13.1

For passenger carrying passenger cars coupler heights requirement is as follows

- (1) Minimum - 34 inches
- (2) Preferred - 34½ inches
- (3) Maximum - 35 inches

3.13.2

Non-passenger carrying passenger car equipment coupler height shall be as follows:

3.13.2.1

Empty cars same as for passenger carrying cars in Paragraph 3.13.1.

3.13.2.2

Loaded cars as shown as follows:

- (1) Minimum - 32 inches
- (2) Preferred - 32½ inches
- (3) Maximum - 33 inches

3.13.3

The measurements for coupler height as shown in Paragraph 3.13 must be made from the top rail to center of face of coupler knuckle.

3.13.4

In the adjustment of coupler height where possible, the adjustments should be made when the car is empty.

4.0 JOURNAL ROLLER BEARING - PERIODIC LUBRICATION

4.1

This section outlines lubrication and maintenance requirements for all types of roller bearings used on passenger cars.

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4.2

Journal roller bearings must have lubrication applied in the amount of frequency shown in the following chart:

Type	Size	Frequency	Amt. of Lubricant
Oil Lubricated	Any Size	30 Days	Restore Oil to Maximum Level
Grease Lubricated-Bearings with Housing Covers	Any Size	90 Days	1 Pound
Grease Lubricated - Bearings with Housing Covers and Rotating End Cap on same Car	Any Size	90 Days	Add Amount Specified for Type of Bearing
Grease Lubricated - Bearings with End Caps (either Inboard or Outboard Application)	D-(5½x10)	12 Mos	6 Oz.
	E-(6 x 11)	12 Mos	6 Oz.
	F-(6½x12)	12 Mos	8 Oz.
	G-(6½)	12 Mos	8 Oz.
	EE-(5½)	12 Mos	8 Oz.
	EE-(6)	12 Mos	8 Oz.

4.2.1

Other size bearings not listed in 4.2 are to be lubricated per manufacturers recommendations.

4.2.2

Passenger cars must not operate beyond lubrication date stencilled on car.

4.2.3

Roller bearings must have filling plugs properly replaced after lubrication of oil lubricated roller bearings.

4.2.4

A pressure gun properly calibrated in ounces by weight must be used in the grease lubrication of grease type journal roller bearings.

4.2.5

Pipe plugs must be properly replaced with AAR approved type grease fittings when plugs are found on grease lubricated bearings except NFL type roller bearings which do not require grease fittings.

4.2.5.1

Roller bearings designated NFL (no field lubrication) shall not be lubricated except when bearing is being reconditioned.

4.3

It is recommended that all roller bearings on a car be of the same type.

4.4

When necessary to replace one or both wheels off the axle, roller bearings must be replaced with new or reconditioned bearings.

4.5 Lubrication Stencil

4.5.1

When stencil is missing, incorrect or indistinct car must be lubricated in accordance with Paragraph 4.2.

4.5.2

Old stencilling must be removed and the area painted over with quick drying paint.

4.5.3

New stencilling should show month-day-year—railroad station or private car shop reporting initial and “lub” for lubrication.

Example: “Lub” chg—10-20-83 ABC

4.5.3.1

Use same railroad station or private car shop reporting initial as used for air brake stencil.

4.5.3.2

Apply stencil at one of the following locations on the car, using not less than one inch figures and letters.

4.5.3.2.1

On one side of each truck at diagonal corners of car or on side of car body at platform end sill or step side, on diagonal corners of car.

4.5.3.3

New stencilling must not be applied until all lubrication work has been performed in accordance with this standard.

4.6

Reconditioning and maintenance procedures for roller bearings will be followed as shown in Section H and Section H Part II of the AAR Manual of Standards and Recommended Practices.

4.7

The grade of oil used in oil lubricated journal roller bearings must conform with AAR Specification M-963—All Year Journal Box Lubricating Oil, as shown in Section H of the Manual of Standards and Recommended Practices.

4.8

Grade A grease to AAR Specification M-917 must be used in the lubrication of passenger car type trucks having Hyatt roller bearings equipped with thrust blocks. Approved greases are as follows.

4.8.1

Southwest Grease and Oil Company Code 11810.

4.8.2

Texaco Incorporated RB Grease No. 2301.

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4.8.3

Atlantic Richfield L-340 Lithium RB Grease.

4.9

Grease lubricated roller bearings other than those shown in Paragraph 4.2 must be lubricated with an approved grease shown in AAR Field Manual Rule 26 1984 Edition or latest revision.

4.9.1

Roller bearings on Amtrak cars should be lubricated with Amtrak approved EP grease, if not available, AAR approved M942 grease may be substituted.

4.10

Passenger car owner is responsible for periodic lubrication of roller bearings after expiration of time limits regardless of circumstances or in accordance with contractual agreement between owner and operating railroad.

4.10.1

Failure of roller bearings is the owners responsibility.

5.0 WHEELS**5.1**

This section outlines maintenance requirements and instructions for all types of wheels used on passenger car equipment. The maintenance requirements for wheels designed exclusively for passenger equipment and included in this standard are to be used in conjunction with the requirements specified in Section G and Section G, Part II, of the Manual of Standards and Recommended Practices and are included in order to supplement the requirements of those sections.

5.2

The requirements for wear limits, gaging, and cause for renewal of defective passenger car wheels are covered in this standard.

5.2.1 Prohibited Wheels**5.2.1.1**

Steel tired wheels are prohibited in passenger car service and are to be removed on sight when found.

5.2.1.2

Cast iron wheels are prohibited in passenger car service.

5.2.1.3

Class C steel wheels for use with on-tread brakes are prohibited in passenger car service.

5.2.2 Wheel Defects

5.2.2.1

Method of gaging and illustrations outlined in Freight Car Rule 41 of the AAR Field Manual of Interchange Rules are to be used on passenger equipment cars with the exception that the thin rim condemning limit for passenger equipment cars is 1 inch or less and shall be measured as shown in Freight Car Rule 41.

5.2.2.2

Slid flat wheels having the slid flat area over 1 inch in length must be replaced. Also the mate wheel is to be replaced. The slid flat defect must be measured as shown in Freight Car Rule 41 of the AAR Field Manual of Interchange Rules.

5.2.2.3

Wheels which have been overheated as a result of being in fire must be replaced.

5.2.2.4

Wheels removed from service must be replaced in kind.

5.2.2.4.1

When untreated wheels are substituted for heat treated wheels, the passenger car owner must be advised within 30 days after date of substitution and reason given for the substitution.

5.2.2.4.2

Wheels must not be painted with any opaque material.

5.2.2.5

Wheels applied must have at least 1¼ inch minimum rim thickness and standard full narrow flange thickness.

5.2.2.6

For cars having wheels not on the list of Paragraph 5.4.1 owner must be contacted for types of wheels to be applied.

5.2.2.7

Machining and mounting of wheels for passenger equipment cars must be in accordance with the AAR Wheel and Axle Manual Section G, Part II of the Manual of Standards and Recommended Practices. The shop performing the wheel change is responsible for scrapping dismounted wheels found with oversize axle bore or found with insufficient wheel hub wall thickness.

5.3 Wheel Identification

5.3.1

Wheels of various classes including Classes A, B, C, or L are commonly used in passenger car equipment service. These may be identified as shown in the illustrations in Figures 2 and 3. Material specifications for various classes of passenger car equipment wheels must be in accordance with the specifications found in Section G and Section G, Part II of the Manual of Standards and Recommended Practices.

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5.3.2

Wheel heat treatment relates to the service for which the various classes of wheels are generally intended as follows:

5.3.2.1

Class U—general service where an untreated wheel is satisfactory.

5.3.2.2

Class L—high speed service with more severe braking conditions than other classes and light wheel loads.

5.3.2.3

Class A—high speed service with severe braking conditions, but with moderate wheel loads.

5.3.2.4

Class B—high speed service with severe braking conditions and heavier wheel loads.

5.3.2.5

Class C service with heavier braking conditions where off tread brakes are employed.

5.3.3

Class markings of wheels are identified by stamping on either the back face of the rim of the wheel or on the hub of the wheel as shown in Figures 2 and 3 of Paragraph 5.3.1.

5.3.4

Class C wheels must not be applied to any passenger equipment cars which are equipped with on-tread brakes.

MARKING OF STEEL WHEELS RIM STAMPING

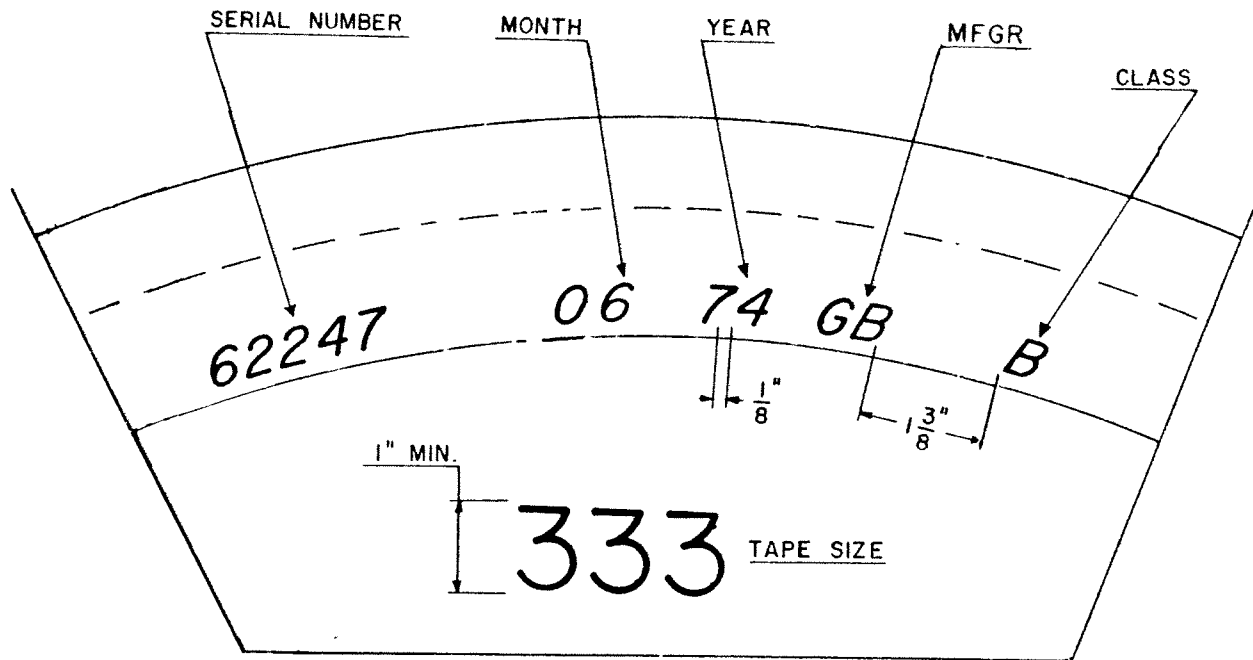


FIGURE 2

NOTE 1. Stamping to consist of manufacturer's serial number, date of manufacture, manufacturer's identification and class of heat treatment. Stamping is limited to 14 characters and the design designation shall be stencilled on the back plate with paint using characters at least one inch in height.

NOTE 2. Stamping to be spaced a minimum of $\frac{1}{8}$ inch between characters and $1\frac{3}{8}$ inches between groups. The stamping shall be located not less than $\frac{1}{4}$ inch from the inner edge of the rim.

NOTE 3. Manufacturer's identification is limited to two initials are to be as follows:

*A-ARMCO; *BW-Bethlehem; *CW-U.S. Steel (Pittsburgh Plant); EW-Edgewater; *G-U.S. Steel (Gary Plant); JW-Sumitomo Metal Industries; SW-Standard Steel; ZW-Canadian Steel Wheel.

NOTE 4. Dies used to produce characters shall be not less than $\frac{3}{8}$ inch in nominal height at crest and hot stamping shall be nominally $\frac{3}{64}$ inch in depth. Italicized characters (sloped upward to right) shall be used.

NOTE 5. All wheels will be marked for class using letters U, L, A, B or C, as appropriate.

* No longer in production

MARKING OF CARBON STEEL WHEELS HUB STAMPING

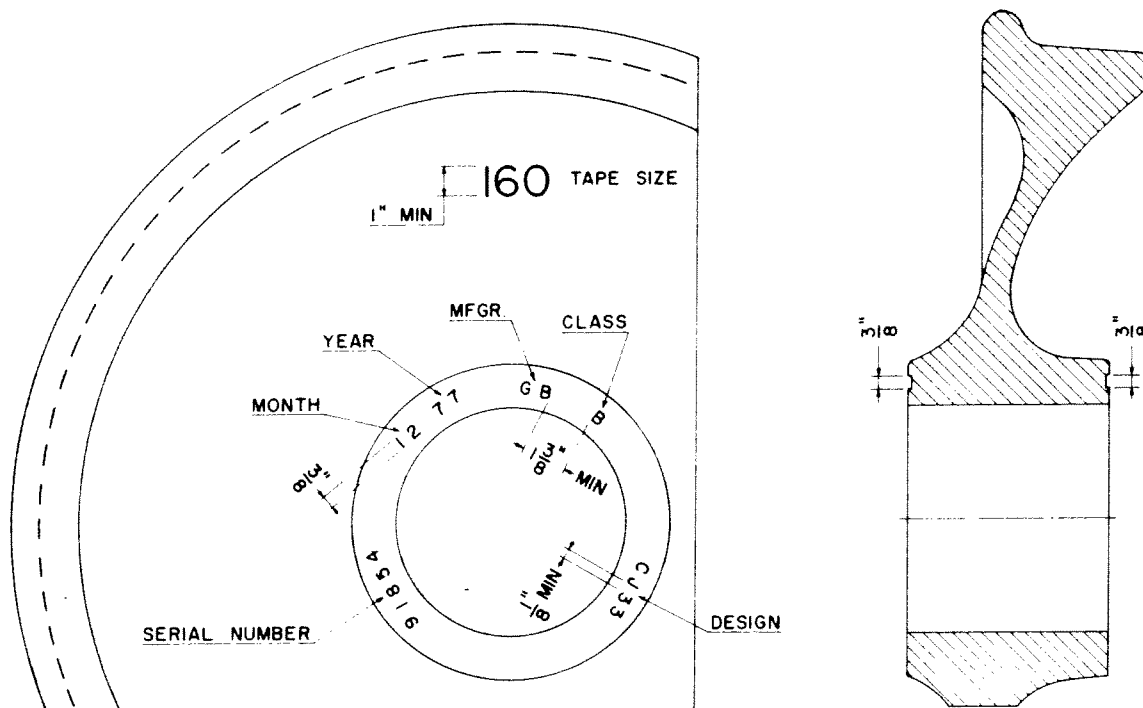


FIGURE 3

NOTE 1. When ordered, wheels may be stamped on front or back (as specified by purchaser) hub face.

NOTE 2. Stamping to consist of manufacturer's serial number, date of manufacture, identification of manufacturer, class and design designation. The hub stamping of locomotive wheels may be applied by the purchaser after final machining of the hub. Wheels that are to be marked by the purchaser should be furnished with all marking stencilled on the front plate with paint using characters at least 1 inch in height.

NOTE 3. Manufacturer's identification is limited to two initials which are to be as follows:

*A-ARMCO; *BW-Bethlehem; *CW-U.S. Steel (Pittsburgh Plant); EW-Edgewater; *G-U.S. Steel (Gary Plant); JW-Sumitomo Metal Industries; SW-Standard Steel; ZW-Canadian Steel Wheel.

NOTE 4. Stamping to be spaced a minimum of $\frac{1}{8}$ inches between characters and a minimum of $1\frac{3}{8}$ inches between groups and located approximately central of the hub face.

NOTE 5. Stamps used to produce characters shall not be less than $\frac{3}{8}$ inch in height and shall not have sharp edges. Italicized characters (sloped upward to right) shall be used.

NOTE 6. All wheels will be marked for class using letters U, L, A, B or C, as appropriate.

NOTE 7. The three groups (1) design, (2) serial number and (3) date of manufacture, manufacturer and class will be spaced approximately equidistant around the hub face.

* No longer in production.

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5.4

Wheel types commonly used on passenger equipment cars.

5.4.1

Table I is a list of wheels commonly used on passenger equipment cars

TABLE I

AAR Wheel Type	Date Std	Intended Max Axle Size	Max Finish Bore	Notes	Companies Requiring
A-32	1972		6 $\frac{1}{8}$ "		AMTRAK, CR
CA-32	1972		6 $\frac{1}{8}$ "		AMTRAK, CR
C-33	1946	5 $\frac{1}{2}$ x 10	7 $\frac{3}{4}$ "	22,125 lbs Max. Rating	AMTRAK, BN
CC-33	1968	5 $\frac{1}{2}$ x 10	7 $\frac{3}{4}$ "		AMTRAK, BN
A-34	1955	6 $\frac{1}{2}$ x 12	9 $\frac{1}{4}$ "	Diesel Rail Car Also	AMTRAK, CR, CP
CA-34	1968	6 $\frac{1}{2}$ x 12	9 $\frac{1}{4}$ "		AMTRAK
A-36	1950		7 $\frac{3}{4}$ "		SOU, ONT, DRGW, CHESSIE, CR, CP, MP, WP
CA-36	1968		7 $\frac{3}{4}$ "		WP
B-36	1946		8 $\frac{1}{2}$ "		AMTRAK, ONT, MKT, ICG, DRGW, SCL, CR, BN, CP, NW, AL, MP, CHESSIE, GTW
CB-36	1968		8 $\frac{1}{2}$ "		AMTRAK, NW, AC, GTW
D-36	1946		8 $\frac{1}{2}$ "		CR, BN, SP, UP, MILW, AM- TRAK, ATSF
CD-36	1968		8 $\frac{1}{2}$ "		BN, UP, SP, MILW, AMTRAK
E-36			10 $\frac{1}{4}$ "	For Disc Brake Axles	CR, BN, CP, SP, NW, UP, AL, ICG, AC, GTW, SCL, MILW, AM- TRAK, ONT, ATSF, MP, DRGW
CE-36			10 $\frac{1}{4}$ "		BN, NW, UP, SP, MILW, AM- TRAK, GTW
M-36	1980			AMTRAK Inboard Bearing	BN, AMTRAK
CM-36	1980				BN, AMTRAK

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6.0 AXLES

6.1

This section outlines maintenance requirements and instructions for roller bearing type axles used on passenger car equipment. The maintenance requirements of this standard are to be used in conjunction with the standards, specifications and recommended practices contained in Section G and Section G, Part II of the Manual of Standards and Recommended Practices and are meant to supplement the requirements of these sections.

6.2

Axles used on passenger equipment cars must be of the raised wheel seat (RWS) roller bearing type identified and specified in Section G and Section G, Part II of the Manual of Standards and Recommended Practices.

6.2.1

Hollow axles must not be used in intercity passenger car service unless approved by operating railroad.

6.3

Axles must be replaced when the limits of wear have been reached as shown in the following table.

Journal Size Standard To Car	Wheel Seat Limit Location I	Axle Center Limit Location K
5" x 9"	When less than 6 $\frac{3}{4}$ "	When less than 5 $\frac{1}{4}$ "
5 $\frac{1}{2}$ " x 10"	When less than 7 $\frac{5}{16}$ "	When less than 5 $\frac{3}{4}$ "
6" x 11"	When less than 8"	When less than 6 $\frac{5}{16}$ "
6 $\frac{1}{2}$ " x 12"	When less than 8 $\frac{1}{2}$ "	When less than 6 $\frac{3}{4}$ "

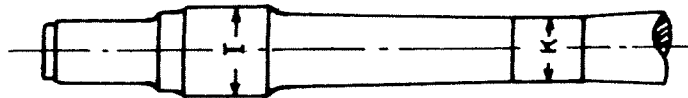


FIGURE 4

6.3.1

Axles must be replaced when the following conditions are found:

6.3.1.1

Broken.

6.3.1.2

Damage due to overheating.

6.3.1.3

Damage between wheel seats of a depth of $\frac{1}{8}$ " or deeper.

6.3.1.4

Journal found rusted or pitted.

6.3.1.5

Axle bent when determined at wheel shop.

6.3.1.6

Axle damaged as a result of being in fire.

6.3.2

Plain bearing axles must not be substituted for roller bearing axles. Plain bearing axles are prohibited in passenger service.

6.3.3

Raised wheel seat (RWS) roller bearing axles must be replaced in kind in order to maintain size standard to the car.

6.3.3.1

Second-hand axles when used must meet the dimensions shown in the following table:

Journal Size	Wheel Seat Diameter Location I	Axle Center Diameter Location K
5 x 9	$6\frac{3}{4}$ " or more	$5\frac{1}{4}$ " or more
$5\frac{1}{2}$ x 10	$7\frac{5}{16}$ " or more	$5\frac{3}{4}$ " or more
6 x 11	8" or more	$6\frac{5}{16}$ " or more
$6\frac{1}{2}$ x 12	$8\frac{1}{2}$ " or more	$6\frac{3}{4}$ " or more

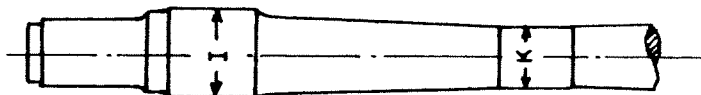


FIGURE 5

6.3.3.2

Axles when reclaimed must in accordance with the AAR Wheel and Axle Manual Section G, Part II of the Manual of Standards and Recommended Practices.

6.3.4

Axles removed from service account overheated must not be reconditioned and must be immediately stencilled in 1 inch letters overheated scrap and journal mutilated to prevent reuse.

7.0 CARS AND CAR BODY

7.1

Cars must meet the requirements of the operating railroad as to type of construction, safety and clearances to be acceptable in passenger service.

7.2

All cars must be equipped with safety appliances conforming to US DOT-FRA Regulation Title 49CFR231.

7.3

All exterior and underneath equipment on passenger cars must be securely attached and supported in a safe manner for cars to be acceptable in passenger service.

7.4

Cars must be equipped with an approved air brake and signal system in order to be considered acceptable in passenger service.

7.5

All cars with underneath exposed wood parts must be equipped with a brake shoe spark shield over each wheel. These spark shields must be made of sheet steel or galvanized iron approximately $\frac{1}{16}$ " thick in an area 36" wide by 48" long.

7.6

Cars equipped with electric heat furnished from head end power shall use 3 phase, 480 volt service for train line power.

7.7

Cars must be equipped with all steel or aluminum underframes and draft sills. These underframes must be of such design and condition to adequately support underneath equipment of the car.

7.8 Cars Prohibited in Passenger Service

7.8.1

Cars having defects that are in violation of the United States Safety Appliance Act are not acceptable in passenger service.

7.8.2

Cars having all wood or combination wood and steel superstructure with wood sheathing are not acceptable in passenger service.

7.8.3

Cars which have structural and/or mechanical deficiencies are not acceptable for passenger car service.