

**Association of American Railroads
Manual of Standards and Recommended Practices
Car Construction – Fundamentals and Details**

**SPECIFICATION FOR 286,000 LBS. GROSS RAIL LOAD CARS FOR
FREE/UNRESTRICTED INTERCHANGE SERVICE**

Standard S-286-2002

Adopted November, 2002

Revised September 1, 2005

1.0 SCOPE

This specification applies to all new 4-axle freight cars built after December 31, 2003 that are designed and designated to carry a gross rail load (GRL) greater than 268,000, up to and including 286,000 lbs. Existing freight cars and those rebuilt, newly designated for increased GRL, or modified per Office Manual Rule 88 will be qualified for free unrestricted interchange service provided they meet all requirements of this specification. Unless specifically addressed in this Standard, all appropriate AAR Standards must be met in the design, building and operation of cars in free/unrestricted interchange with a GRL greater than 268,000 lbs. The following specifications outline the requirements for free/unrestricted interchange cars. For purposes of this Standard, any reference to 286,000 lbs. shall include all 4-axle cars with a GRL greater than 268,000-lbs., up to, and including 286,000-lbs. Tank cars have additional requirements; refer to AAR Specification 2.5, MSRP M-1002.

2.0 REQUIREMENTS

2.1 CARBODY

2.1.1 Design Loads

Design of the carbody (including the sides, ends and underframe unless otherwise noted) shall be based on a GRL of 286,000 lbs. Where standard design loads are not specified in M-1001 for 286,000 lbs. GRL, then design loads for 100-ton cars in AAR Specification M-1001 should be used, and those loads should be multiplied by the factor 1.09. When design loads are not specific to car GRL, the existing specifications will govern unchanged. Examples of the latter are the 50,000-lbs. vertical coupler load of Section 4.1.5.3 and impact test coupler force of 1,250,000 lbs. in Section 4.1.10.

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2.1.2 Fatigue Design

A fatigue analysis in accordance with Chapter VII of M-1001 must be performed on all cars built to this specification. When applying fatigue design criteria to a 286,000-lbs. design, 263,000 lbs GRL related REPOS loading multiplied by 1.09 must be used for new car analysis, if 286,000 GRL REPOS are not specified. Cars built prior to the effective date of this specification and increased in gross weight through modification or on the basis of original construction are not required to have a fatigue analysis performed. All cars built for 286,000 lbs GRL after the effective date of this specification must have a minimum computed fatigue life of 1,000,000 miles. High utilization cars must have a minimum computed fatigue life of 3,000,000 miles.

2.2 BRAKE SYSTEM

Brake Systems must meet the braking ratios of S-401 based on GRL.

2.3. BEARINGS

The bearing size of 6-1/2 x 9, 7 x 9 or 7 x 12 to be applied.

2.4 AXLES

The axle size of 6-1/2 x 9, 7 x 9 or 7 x 12 to be applied. Axles are to be ultrasonically tested per AAR Specification M-101.

2.5 WHEELS

Wheels are to be new 36 inch mounted on 6-1/2 x 9 axles and bearings or new 38 inch mounted on 7 x 9 or 7 x 12 axles and bearings. Wheels are to be curved-plate, Class C.

2.6 DRAFT SYSTEM

2.6.1 Draft Components

Couplers, yokes, followers and draft keys must be of Grade E steel.

2.6.2 Draft Gears

Draft gears must have a minimum of 3¼ inch travel and conform to AAR M-901E, M-901G, or M-901H latest revision or cars must be equipped with hydraulic cushioning units in accordance with Office Manual Rule 88.

2.7 SPRINGS

Spring groupings are to be as specified in S-3014 or S-3015. The Equipment Engineering Committee may approve alternative spring arrangements.

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2.8 TRUCKS

2.8.1 Truck Performance and Castings

Trucks shall have Preliminary, Conditional or Full Approval under AAR Truck Performance Specification M-976, latest issue. Proponent may make application for approval to the Equipment Engineering Committee for a specific car and suspension combination if proponent can show that car and suspension performance are equal to or better than the performance outlined in M-976. All the limiting nominal design dimensions for trucks contained in AAR Standard S-302 shall be adhered to. Castings shall meet the requirements of AAR Standards M-202, M-203 and M-210. Where standard design loads are not specified for 286,000 lbs. GRL, then the current test loads provided for axle loading of 6 1/2 x 12 journals x 1.09 shall be used for castings in 286,000 service. Casting manufacturer to certify truck castings are designed to 286,000 lbs. GRL.

2.8.2 Side Bearings

Cars are to be equipped with constant contact side bearings in accordance with AAR Specification M-948 and Office Manual Rule 88.

2.9 STENCILING

Cars meeting the requirements of this specification are to be stenciled with a load limit that equates to GRL minus the lightweight or have a reduced load limit starred in accordance with Interchange Rule 70.