

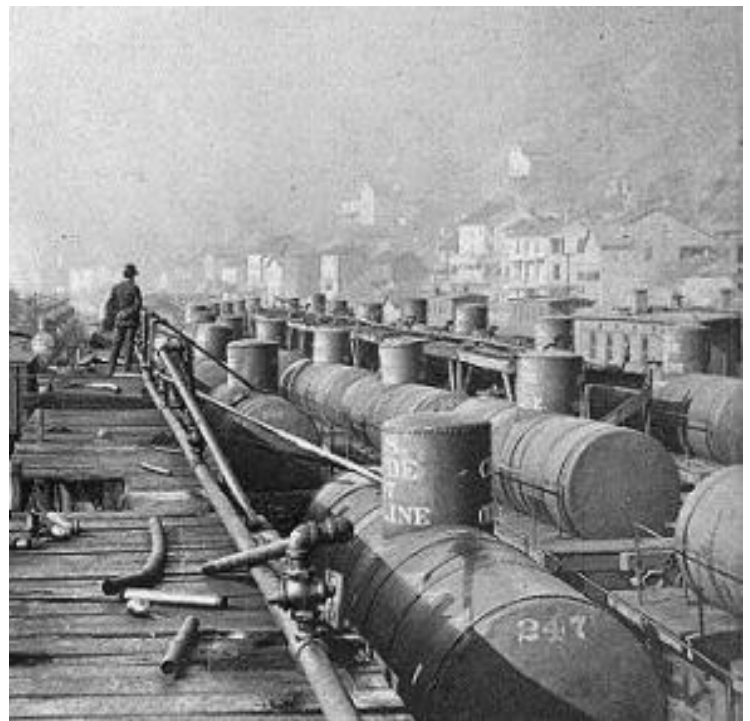
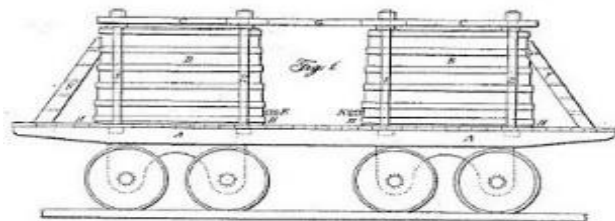
We're Going Global

Rail Services – Tank Cars

Evolution of the Tank Car

Transporting crude by rail in the United States dates back to the late 1800's. It proved a viable manner to transport product to and from inland refineries. Tank cars transport the full range of natural resources, products and chemicals that serve as raw material and end products for the petroleum industry as well as other industries including food grade service, fertilizer, cosmetics and insecticides.

Safety and economics are the driving factors on the improvement and modernization of the tank car. Any breach or incident brings public and governmental scrutiny which can result in greater regulatory control. The progression and evolution the tank car is evidenced by the photographs and diagram below:



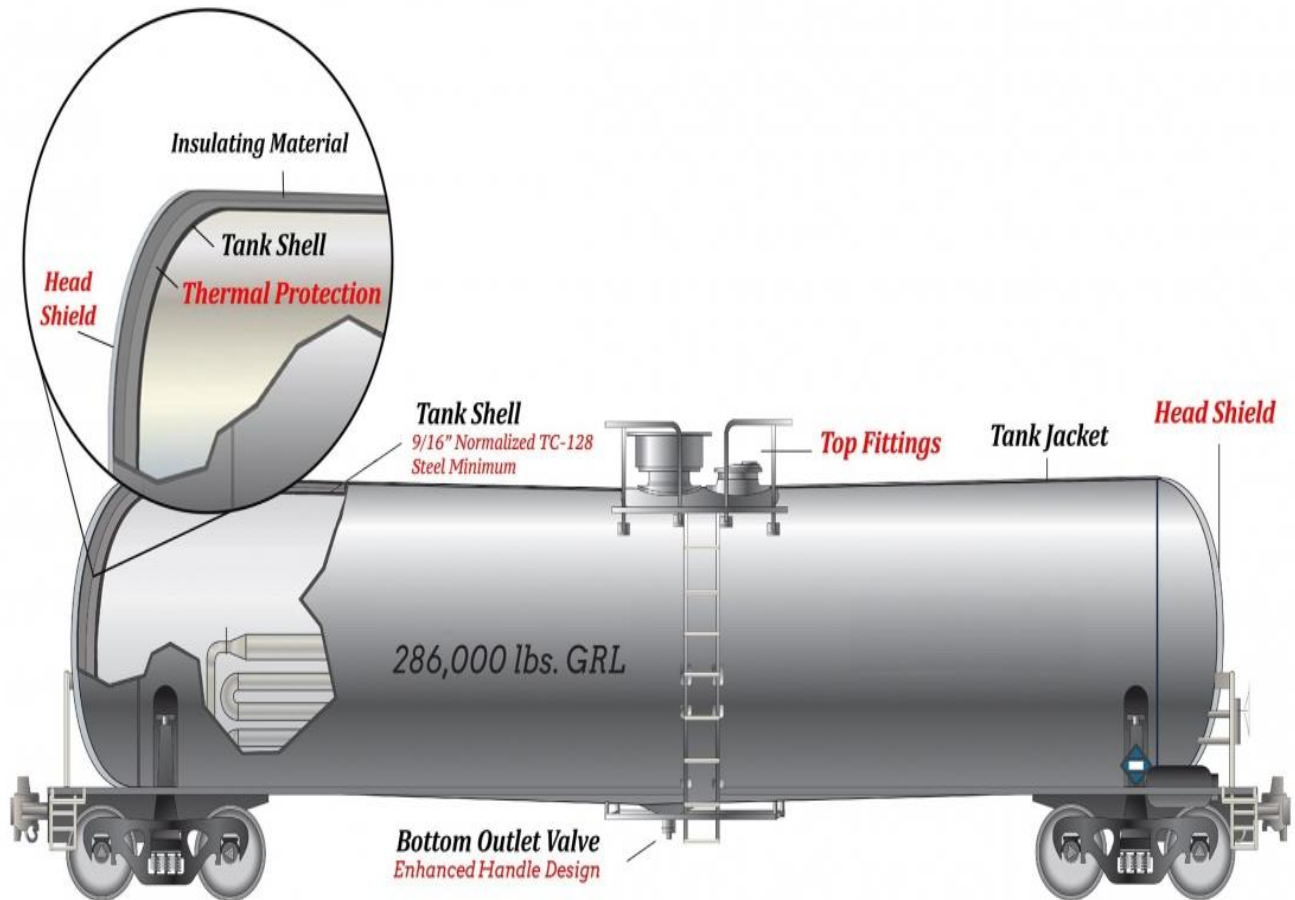
Photos: PA History.org

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Tank Car Design: "DOT 117" Tank Car, as regulated by HM 251

DOT 117 Specification Car



Safety enhancements of DOT Specification 117 Tank Car:

- Full-height ½ inch thick head shield
- Tank shell thickness increased to 9/16 inch minimum TC-128 Grade B, normalized steel
- Thermal protection
- Minimum 11-gauge jacket
- Top fittings protection
- Enhanced bottom outlet handle design to prevent unintended actuation during a train accident

Photo Schematic: Transportation.org rule summary

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Crude and Petroleum Products by Rail

Due to the wide range use of railcars, this TECHTALK issue will focus on Crude by Rail and LPG by Rail Unit Trains and Regulation.

LPG pressure cars – 33,000 gallons

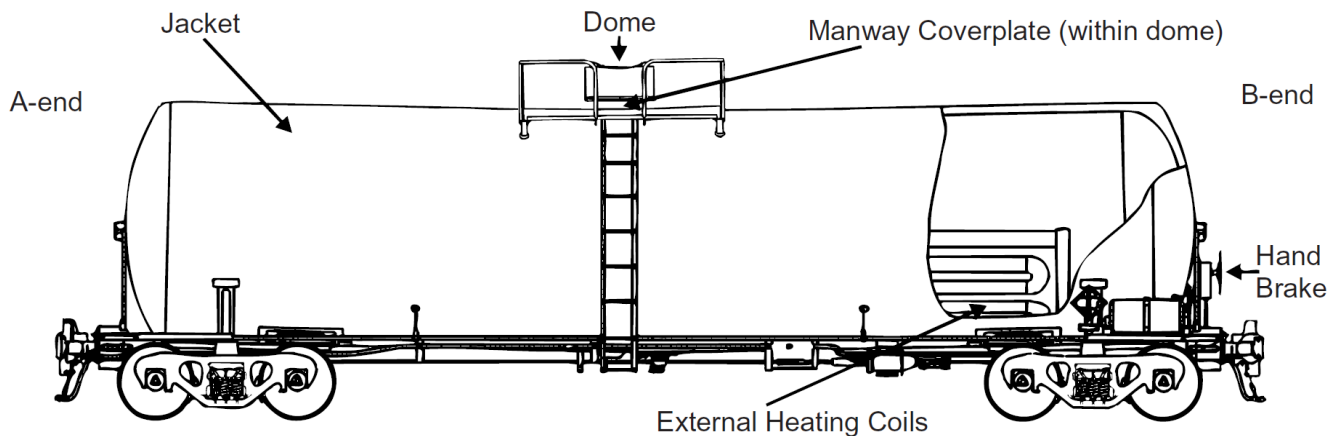
LPG cars do not require a “jacket” for thermal protection, insulation or a secondary protection measure against puncture because pressure cars have a naturally “thicker” grade steel plate. The product specification reporting and rules involving functions, such as travel speed, are controlled by new regulations.

Crude / Ethanol / Products and Chemical Cars – 30,000 gallons.

Hazardous Materials 251 regulation states tank cars, excluding pressure cars, must contain jackets. The jackets provide a shell for insulation, thermal protection, and heating coils. Applying jackets add weight which could affect the quantity of product carried if weight restriction is reached before the tank car is fully loaded.

Coiled Cars – tank cars designed to transport crude and products which require heat to stay in liquid form. They have steam coils on the outside of the tank which connect to terminal steam generation. These cars also have insulation and thermal protection over the tank, which is covered by a jacket or a second “shell” made of rolled half-inch plate steel.

Non-coiled cars – tank cars designed to transport crude and products that do not require heat to stay in liquid form -



Schematic: Wikipedia.org

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Weight limits – Federal Railroad Administration approves a gross weight on rail of up to 286,000 pounds. This includes the Rail Car itself and the product it carries. Capacity in gallons or barrels is determined by product weight. The heavier the product, the less volume can be loaded before reaching weight restrictions.

Tare Weight (empty or un-laden weight) plus Product Weight = Total Allowable Weight.

Basic Tank Car Capacity Chart HM 251 Tank Car:

	Pounds / Gallon	Tare Weight	Total Weight	Max. BBls
Propane	4.25	100,000 lbs	186,000 lbs	750
Ethanol	6.59	80,000 lbs	206,000 lbs	715
15 API Crude	8.05	80,000 lbs	206,000 lbs	610
40 API Crude	6.87	80,000 lbs	206,000 lbs	715

Based on Max. Rail Weight of 286,000 lbs less approximate Tare weight of car and 98% max. fill.

Tank Cars and Inspection

- Independent inspection includes but is not limited to quantity & quality and inventory control. Commercial contracts for quantity determination can vary based on method. These methods can include physical gauge, meter, weight or use of tank car contained devices such as magnetic gauge device and thermometer wells.
- Although the inspector determines quality, the shipper is responsible for reporting the product specifications to the Department of Transportation.
- The inspector reports and verifies defective railcars that do not meet restrictions of facilities.
- Inspection ensures railcars are filled to capacity for maximum freight benefit and safety considerations. It also confirms the railcars are as empty as possible after off load.

AmSpec specializes in Railcar Inspection.
If you have any questions regarding this service,
please contact George Bachar - Railcar Manager
george.bachar@amspecgroup.com or call 610-730-0583.

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