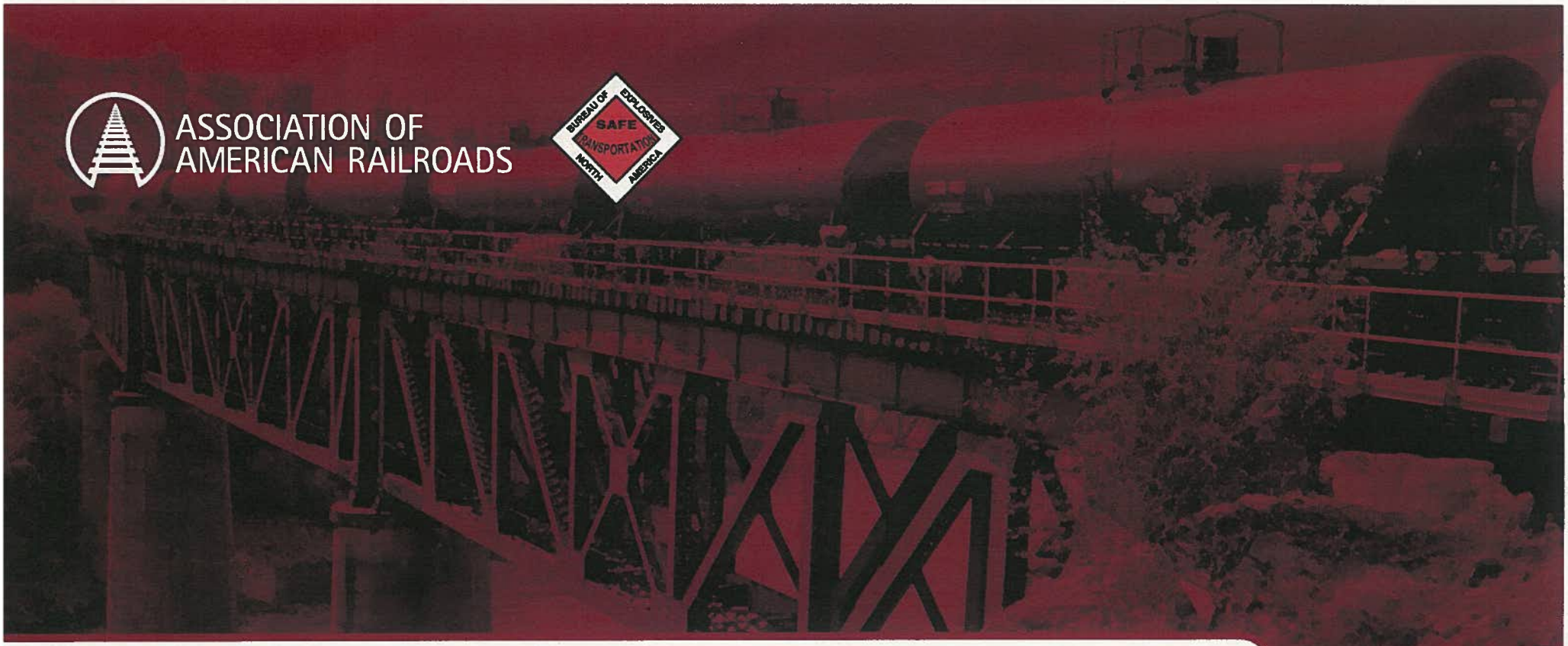
ASSOCIATION OF AMERICAN RAILROADS

BUREAU OF EXPLOSIVES SAFE TRANSPORTATION NORTH AMERICA



Field Guide To Tank Cars

SECTION 5: PRESSURE TANK CARS

Classes DOT-105, 109, 112, 114, and 120 are pressure tank cars used to transport liquefied compressed gases, poison/toxic inhalation hazard (PIH/TIH) materials, reactive materials, and/or corrosive materials requiring the additional protection afforded by a stronger car. There are no equivalent AAR type pressure tank car specifications.

Minimum tank plate thickness ranges from 1/2 inch to 11/16 inch for steel tanks (depending on tank diameter and tensile strength of plate used) and 5/8 inch for aluminum. Depending upon the specification, pressure tank cars have minimum burst strengths from 500 psig to 1500 psig.

Class DOT-105 insulated carbon or alloy (stainless) steel or aluminum pressure tank cars are designed for top loading and unloading. Bottom outlets and washouts are prohibited. Tank test pressures range from 100 psig to 600 psig. These cars may be equipped with tank head puncture resistance and thermal protection systems.

Class DOT-109 insulated carbon steel or aluminum pressure tank cars are designed for top loading and unloading. Bottom washouts are authorized; however, bottom outlets are prohibited. Tank test pressures range from 100 psig to 300 psig. There are very few Class DOT-109 tank cars in service.

Class DOT-112 insulated or uninsulated carbon or alloy (stainless) steel pressure tank cars are designed for top loading. Bottom outlets and washouts are prohibited. These cars may be equipped with tank head puncture resistance and thermal protection systems Tank test pressures range from 200 psig to 500 psig.

Class DOT-114 are insulated or uninsulated carbon or alloy (stainless) steel pressure tank cars with

tank test pressures of 340 or 400 psig. These cars may be constructed of noncircular cross section, and, except for the PRD, the valves and fittings may be located somewhere other than on top of the tank.

Class DOT-114 cars may be equipped with bottom outlets and washouts, and tank head puncture resistance and thermal protection systems. Currently, those in service are similar in appearance to Class DOT-112 tank cars. No noncircular cross section tank cars are in service.

Class DOT-120 tank cars are insulated steel or aluminum pressure tank cars with tank test pressures of 100 to 500 psig. Like Class DOT-114 tank cars, they may have valves and fittings located somewhere other than on top of the tank and may be equipped with bottom outlets and washouts and tank head puncture resistance and thermal protection systems. Few Class DOT-120 tank cars are in service.

Pressure tank cars are most readily identifiable by the presence of a protective housing on top of the tank (not to be confused with an expansion dome found on obsolete Classes DOT-103 and 104 and AAR-203 nonpressure tank cars).

With few exceptions, such as bottom outlet, bottom washout, and a dome-shaped pressure retaining hinged and bolted manway cover or pressure plate, the loading/unloading fittings and the PRD, PRV, or combination PRD will be mounted on a manway cover or pressure plate, and are enclosed within the protective housing.

Unlike nonpressure tank cars, which may be loaded or unloaded using an open system, pressure tank cars are loaded and unloaded using a closed system; i.e., the tank is not opened to the atmosphere during the process. The manway cover or pressure plate is removed only for maintenance purposes at a tank car repair facility.