



ASSOCIATION  
OF AMERICAN  
RAILROADS

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December 18, 2006

CASUALTY PREVENTION CIRCULAR

(CPC-1178)

SUBJECT: AAR Requirements for Tank Cars in  
Anhydrous Ammonia or Chlorine Service

T87.2/T87.3

TO THE MEMBERS AND PRIVATE CAR OWNERS:

Please refer to Circular No. CPC-1176 dated October 18, 2006 and Circular No. CPC-1175 dated July 28, 2006, wherein proposed additions to Chapter 2 of M-1002, *Specifications for Tank Cars*, were issued for public comment. Senior AAR Committees have considered appeals to the proposed Tank Car Committee actions, and it has been agreed to go forward with the proposals as developed by the Tank Car Committee, modified to delay the target dates by one year.

The revised paragraphs are included in this circular and are in effect as of the publication date of this circular. Revisions are shown in bold text.

Under the provisions of Standard S-050, which may be found in each section of the Manual of Standards and Recommended Practices, this circular reflects the final action on this matter.

Respectfully Submitted,

P. G. Kinnecom

The goal of these proposals is to enhance safety in the rail transportation of hazardous materials by reducing the probability of release of product from a tank car, given a derailment. The expected performance improvement will be calculated using the information available in RSI/AAR Tank Car Safety Project Report RA 05-02. The target figures for improvements to heads, shells, head shields and jackets were selected based on earlier work done by the University of Illinois at Urbana-Champaign and are intended to reflect a verifiable level of risk reduction. These improvements, in conjunction with the top fittings protection design criterion, are intended to achieve the desired overall reduction in risk.

## 2.1.8 Ammonia, Anhydrous

### 2.1.8.1 Definitions:

**Base car** - 100-ton 112J340W car with 115.909 inches inside diameter, 0.608" thick heads and shell, TC128 steel, 1/2" thick ceramic fiber or mineral wool, and 11 gauge steel jacket with full height 1/2-inch thick head shields)

**Car owner** is defined as the owner of the reporting mark stenciled on the car. Where multiple owners exist under one reporting mark, the Owner's Mark field in UMLER is to be used.

**CPR** = Conditional Probability of Release

**HS** = Expected reduction in CPR resulting from changes to the head shields.

**H** = Expected reduction in CPR resulting from changes to the heads.

**JT** = Expected reduction in CPR resulting from changes to the jacket.

**S** = Expected reduction in CPR from changes to the shell.

### 2.1.8.2 Implementation

Car owners are to provide plans which must provide for compliance (per paragraph 2.1.8.3) for 100 percent of their fleet used to transport Anhydrous Ammonia by **December 31, 2018**. Plans must be considered and approved by the Tank Car Committee. Car owners are to submit implementation plans to AAR by **December 31, 2008** and provide progress reports by March 31 each year. For purpose of measuring compliance with the fleet reduction requirements described above, starting fleet size will be determined on the date an implementation plan is submitted to AAR, but no later than **December 31, 2008**.

### 2.1.8.3 New and Existing Cars

Effective **January 1, 2008**, tank cars ordered built new for anhydrous ammonia service must comply with DOT specification 112J500W and be equipped with full-height 1/2" thick or equivalent head shields and top fittings protection in accord with paragraph 2.1.8.4. Alternatively, cars may comply with the following:

Tank cars which have been equipped with top fittings protection in accord with paragraph 2.1.8.4 and built or modified to demonstrate a 32% or greater reduction in CPR relative to the base car using the following formula are also acceptable:

$$(HS+H) + (JT+S) = 32\%$$

Alternative validation methodology and analysis techniques may be utilized, subject to approval by the AAR Tank Car Committee.

### 2.1.8.4 Top Fittings Protection

Top fittings protection must be designed to withstand, without loss of lading except through the pressure relief device, a rollover with a linear velocity of 9 mph minimum, applied at the geometric center of the loaded tank as a transverse vector. The rolling surface is assumed to be flat, level, and rigid.

## 2.1.9 Chlorine

### 2.1.9.1 Definitions:

**Base car** - 90-ton 105A500W car with 102 inches inside diameter, 0.787" thick heads and shell, TC128 steel, 2" fiberglass insulation over 2" ceramic fiber or mineral wool, and 11 gauge steel jacket and jacket heads

**Car owner** is defined as the owner of the reporting mark stenciled on the car. Where multiple owners exist under one reporting mark, the Owner's Mark field in UMLER is to be used.

**CPR** = Conditional Probability of Release

**HS** = Expected reduction in CPR resulting from changes to the head shields.

**H** = Expected reduction in CPR resulting from changes to the heads.

**JT** = Expected reduction in CPR resulting from changes to the jacket.

**S** = Expected reduction in CPR from changes to the shell.

### 2.1.9.2 Implementation

Car owners are to provide plans which must provide for compliance (per paragraph 2.1.9.3) for 100 percent of their fleet used to transport Chlorine by **December 31, 2018**. Plans must be considered and approved by the Tank Car Committee. Car owners are to submit implementation plans to AAR by **December 31, 2008** and provide progress reports by March 31 each year. For purpose of measuring compliance with the fleet reduction requirements described above, starting fleet size will be determined on the date an implementation plan is submitted to AAR, but no later than **December 31, 2008**.

### 2.1.9.3 New and Existing Cars

Effective **January 1, 2008**, tank cars ordered built new for chlorine service must comply with DOT specification 105J600W and be equipped with full-height ½" thick or equivalent, head shields and top fittings protection in accord with paragraph 2.1.9.4. Alternatively, cars may comply with the following:

Tank cars which have been equipped with top fittings protection in accord with paragraph 2.1.9.4 and built or modified to demonstrate a 45% or greater reduction in CPR relative to the base car using the following formula are also acceptable:

$$(HS+H) + (JT+S) = 45\%$$

Alternative validation methodology and analysis techniques may be utilized, subject to approval by the AAR Tank Car Committee.

### 2.1.9.4 Top Fittings Protection

Top fittings protection must be designed to withstand, without loss of lading except through the pressure relief device, a rollover with a linear velocity of 9 mph minimum, applied at the geometric center of the loaded tank as a transverse vector. The rolling surface is assumed to be flat, level, and rigid.