



August 25 – 26 / Houston / USA

Rail Car Owners / Lessors and Manufacturers
Working Together to Create a Safer Tomorrow



Sunoco Logistics



National Steel Car Limited



National Steel Car Limited: Certifications

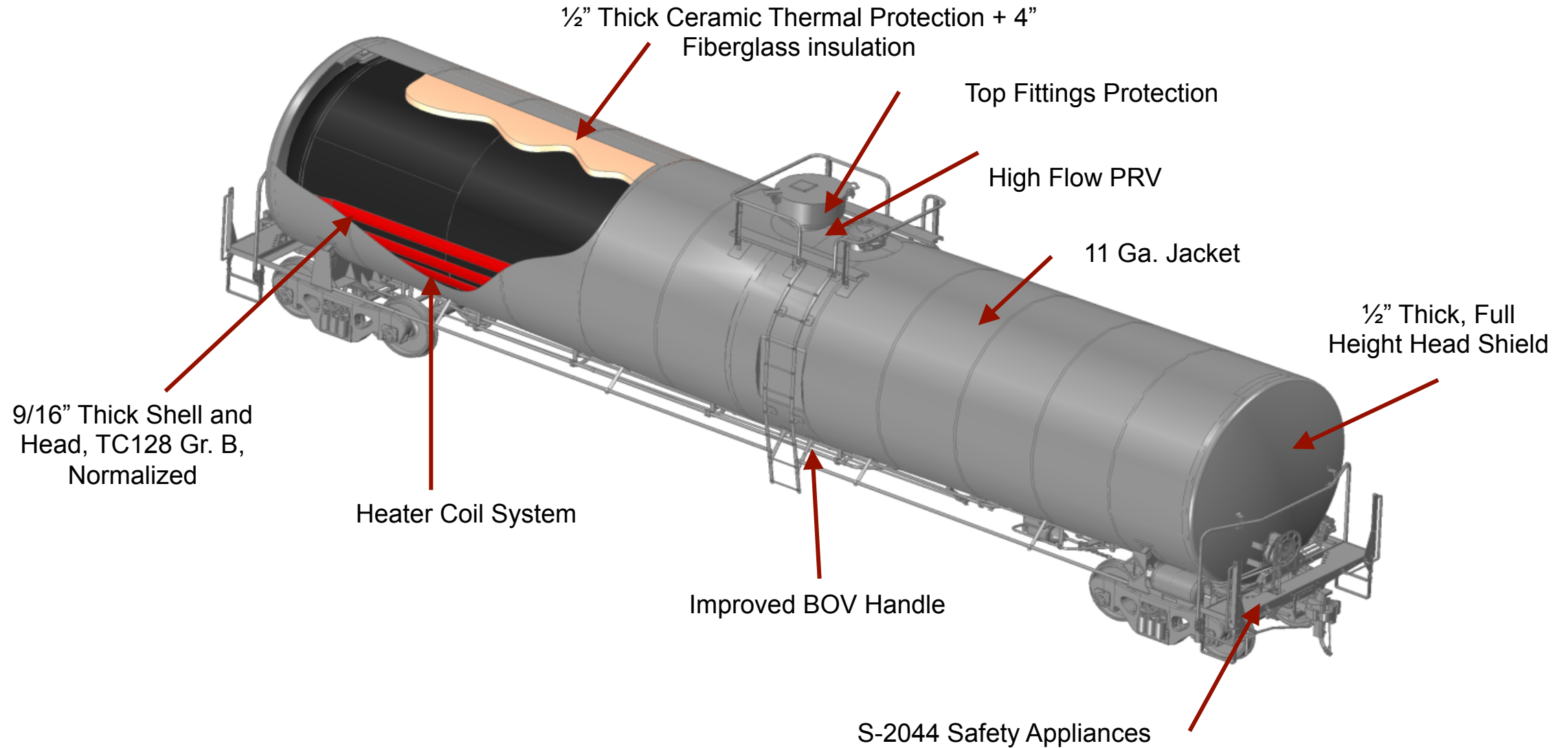
- Founded in 1912, celebrating over 100 years of railcar building excellence
- Largest, single-site railcar manufacturing plant in North America
- All Types of Freight Cars: 12 different car types with over 76 models
- Capacity to produce up to 15,000 railcars annually
- Ongoing plant modernization
- Certified to AAR M-1003 and AAR M-1002 (expiration 11/14/2019)
- The only car builder certified to ISO 9001-2008 in North America
- NSC was the only car builder to have been awarded the TTX SECO award in 2013
- NSC is a multi-year recipient of the TTX Excellent Supplier Award. In 2014, we achieved the highest audit score awarded by TTX



Our Company: Car Portfolio



New DOT 117 Standard



Comparison: DOT111 car and DOT 117 car

Table 18: Safety Features of DOT Specification 117 Tank Car

Tank Car	Bottom Outlet Handle	GRL (lbs.)	Head Shield Type	Pressure Relief Valve	Shell Thickness	Jacket	Tank Material	Top Fittings Protection	Thermal Protection System	Braking
Selected Option: DOT Specification 117 Tank Car	Bottom outlet handle removed or designed to prevent unintended actuation during a train accident	286K	Full-height, 1/2 inch thick head shield	Reclosing pressure relief device	9/16-inch Minimum	Minimum 11-gauge jacket constructed from A1011 steel or equivalent. The jacket must be weather-tight	TC-128 Grade B, normalized steel	Must be equipped per AAR Specifications for Tank Cars, appendix E paragraph 10.2.1	Thermal protection system in accordance with § 179.18	Dependent on service
DOT 111 A100W1 Specification (Currently Authorized)	Bottom Outlets are Optional	263K	Optional; Bare Tanks half height; Jacket Tanks full height	Reclosing pressure relief valve	7/16-inch Minimum	Jackets are optional	TC-128 Grade B, normalized steel*	Not required, when equipped per AAR Specifications for Tank Cars, appendix E paragraph 10.2.1	Optional	EOT device (See 49 CFR part 232)

Source: DEPARTMENT OF TRANSPORTATION 49 CFR Parts 171, 172, 173, 174, and 179, page 113



New DOT 117 Standard

Estimated new car cost:

\$165,000 to \$175,000

Price varies by tank type with the specialties selected

The NSC version is already in service



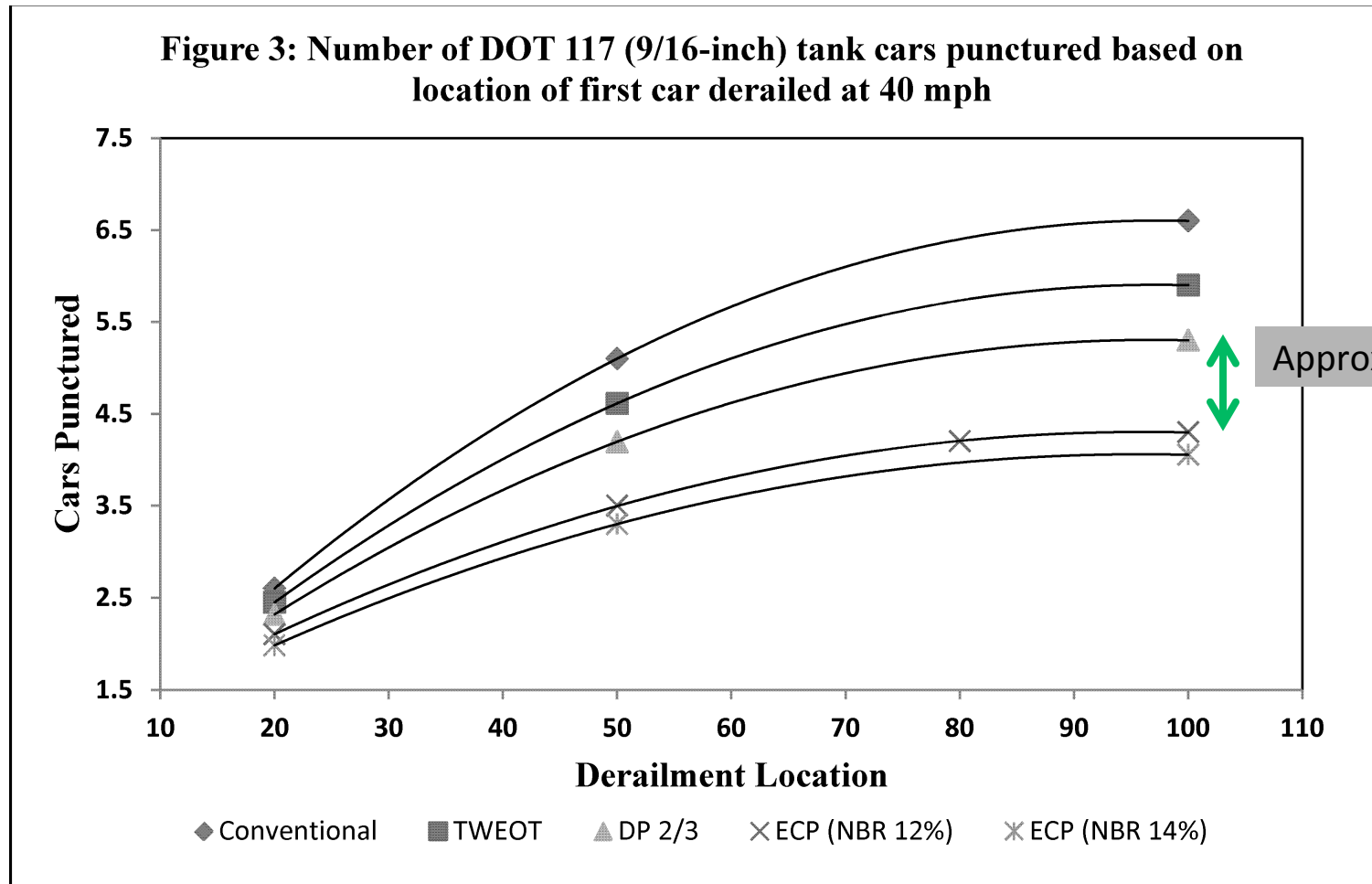
Improvements to shell and head puncture velocity:

	Shell Puncture Velocity (improvement relative to DOT-111 non-jacketed)	Head Puncture Velocity (improvement relative to DOT-111 non-jacketed)
DOT-117	12.3 mph (66%)	18.4 mph (114%)
CPC-1232 unjacketed	8.5 mph (15%)	Top – 10.3 mph (20%) Bottom – 117.6% (105%)
DOT-111 jacketed	9.3 mph (26%)	11.6 mph (35%)

Based on PHMSA 49 CFR Parts 171, 172, 173, 174, and 179, page 118



Safety benefits:



Approx. 1 car improvement

Thermal protection system:

Provides sufficient thermal resistance so that there will be no release of any lading within the tank car except release through the pressure release device when subject to:

- A pool fire for 100 minutes and
- A torch fire for 30 minutes

Source: PHMSA §179.18, Thermal Protection systems, page 265



Dangerous Commodity Tank Car Fleet Estimate

Tank Car Category (as of 3rd. Q. 2013)	# Cars
Total # of Tank Cars	334,869
Total # of DOT 111	272,119
Total # of DOT 111 in Flammable Liquid Service	80,500
Total # CPC 1232 in Flammable Liquid Service	17,300
Total # of Tank Cars in Crude Oil Service	42,500
Total # of Tank Cars in Ethanol Service	29,780
CPC 1232 (Jacketed) in Crude Oil Service	4,850
CPC 1232 (Jacketed) in Ethanol Service	0
CPC 1232 (Non-Jacketed) in Crude Oil Service	9,400
CPC 1232 (Non-Jacketed) in Ethanol Service	480
Dot 111 (Jacketed) in Crude Oil Service	5,500
Dot 111 (Jacketed) in Ethanol Service	100
Dot 111 (Non-Jacketed) in Crude Oil Service	22,800
Dot 111 (Non-Jacketed) in Ethanol Service	29,200

Source: RSI presentation at the NTSB Rail Safety Forum, updated June 18, 2014



The Number of Retrofit Candidates Covers a Broad Range of Cars:

Conservative estimates indicate that approximately:

- 36,000 “legacy” cars and
- 29,000 “2004-2009” era cars; or
- **60,000** total cars

This number may actually equal 90,000 cars. In some cases, if not many, retrofit costs exceed original equipment costs.

Newer CPC-1232 tank cars are estimated as follows:

- 40,000 coiled/insulated 29,00-gallon tank cars
- 15,000 non-coiled/non-insulated 30,800-gallon tank cars; or
- **55,000** total CPC-1232 cars



Capacity penalty caused by the new standard:

	GRL. (#)	Tare Weight (lbs.)	Ethanol (gals.)	Crude Oil (gals.)	Total Weight of Car (lbs.) (ethanol)	Total Weight of Car (lbs.) (crude)
DOT-111 non-jacketed	286,000	67,800	29,700	29,700	233,226	269,166
DOT-111/CPC-1232 non-jacketed	286,000	75,200	29,700	29,700	270,626	276,566
DOT-111/CPC-1232 jacketed	286,000	80,800	29,700	29,700	276,226	282,166
DOT-117	286,000	85,500	29,700	29,572	280,926	286,000

Note: Estimates based on:
 Ethanol: 6.58 lbs./gal
 Crude Oil: 6.78 lbs./gal.



Based on PHMSA 49 CFR Parts 171, 172, 173, 174, and 179, page 127

Car retrofit cost estimate to bring older cars to new performance standard:

(excludes new 286,000 lbs. trucks)	Cost
Bottom outlet valve handle	\$1,200
Pressure relief valve	\$1,500
Thermal protection	\$4,000
Full jacket	\$23,000
Full height head shield	\$17,500
Top Fitting protection (if nonexistent)	\$24,500

- The retrofit cost will vary depending on the built date and equipment of the car to be modified
- The total retrofit cost could vary between \$10,000 and \$80,000
- Reality tends to show that the retrofitting cost will be on the higher side



Based on PHMSA 49 CFR Parts 171, 172, 173, 174, and 179, page 131, data provided by Watco and Railway Supply Institute

Estimated Repair Facility Retrofitting Capacity: Sources disagree on the retrofit industry capacity

	2015	2016	2017	2018
AllTranstek	2,883	3,089	3,303	3,711
Railway Supply Institute	5,700	5,700	5,700	5,700
PHMSA	0	0	0	22,062

Source: Alltranstek, RSI and PHMSA



ECP brake system features:

- Compatibly between the Wabtec and New York Air Brake systems
- Instantaneous brake application to all cars
- Possible modulation of brake application/release
- Each car providing the same % of brake
- Constant charging of car air reservoirs
- Possible set up of fix brake rate

Based on PHMSA 49 CFR Parts 171, 172, 173, 174, and 179, page 131



DOT Estimated benefits for the ECP car fleet:

- Standalone system: \$7,000 - \$8,000 per car
- Overlay system: \$8,500 - \$9,500 per car

DOT Estimated benefits for ECP car fleet:

- Benefits (7%): \$470.3 - \$1,114 million
- Costs (7%): \$492 million

20 Year Costs and Benefits by Stand-Alone Regulatory Amendments 2015-2034

Federal Register, Vol. 80, No. 89, May 2015, Part II



Tank cars that will be affected by the PHMSA regulations for ECP brakes:

- January 1st. 2021:
Unit train (HHFUT) - cars in trains comprised of 70 or more loaded tank cars containing Class 3 flammable liquids traveling at greater than 30 mph— transporting at least one packing group I flammable liquid be operated with an electronically controlled pneumatic (ECP) braking system
- May 1st. 2021:
All other HHFUTs be operated with an ECP braking system
- All other HHF unit trains must have ECP braking from 2023

PHMSA: Pipeline and Hazardous Materials Safety Administration

HHFT: High-Hazard Flammable Train

HHFUT: High-Hazard Flammable Unit Train



ECP brake are not part of the new specifications for the DOT 117 standard

- ECP brake system will be part of the new operating rules
- Require HHFTs that contain any tank cars not meeting the enhanced tank car standards required by this rule operate at a 40mph speed restriction in high threat urban areas defined by the Transportation Security Administration's regulations at 49 CFR 1580.3.
- Technical discussions between U.S. and Canada to achieve harmonized U.S./Canada braking requirements

HHFUT: High-Hazard Flammable Unit Train



More on Operating Rules

On July 29th, US FRA and Transport Canada published new operating rules

	U.S.	Canada
# of handbrakes	Each R.R. to have their rules	Specified, based on train tonnage and track grade
Verification	Mandatory by a <u>trained</u> and <u>qualified</u> employee	Mandatory, no qualification specified
Locomotive locks	High emphasis	Low emphasis

US: FRA-2014-0032, Notice 2, (134 pages), Emergency Order, Federal Register / Vol. 78, No. 152 / Wednesday, August 7, 2013 / Notices

Canada: Transport Canada, Revised Rule 112 in the Canadian Rail Operating Rules (3 pages)



- Too early to determine if the new standards will permit to reduce the number of derailments and their severity
- Tank car design is one of several elements included in new tank car regulations. Track maintenance & monitoring, operations, crew training, commodity classification, emergency response and routing will also contribute
- Although overall tank car demand is currently uncertain, alliances between Rail Car Owners/Lessors and Manufacturers will insure to the market a reliable source of equipment



Thank You