Tires & Brakes: Tips for Maintaining Tank Trailer Equipment

October 2016
The Commercial Vehicle Industry
Trailers – Exclude container Chassis

2016 FORECAST

279,000
Trailer Equipment Age

For-Hire Truck & Trailer Characteristics

AVERAGE AGE

CLASS 6 6.93 YEARS
CLASS 7 10.99 YEARS
CLASS 8 9.32 YEARS
TRAILER 10.10 YEARS

Source: HDT 2016 Fact Book
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Key Priorities!

Key Challenge Priorities

(1-10) RANKING

- Environmental Sustainability: 5.5
- Traffic Congestion: 5.7
- Regulation: 7.4
- Freight Network Management: 7.4
- Fuel Cost: 7.5
- Maintenance Cost: 7.8
- Driver Retention: 8.2
- Utilization: 9.0

Source: HDT 2016 Fact Book

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Tires
Addressing GHG Emissions from Medium- and Heavy-Duty Vehicles is Critical

Medium and heavy-duty vehicles = 20% of GHG emissions from transportation sector, but make up just 10% of vehicles on the road.

GHG emissions from heavy-duty vehicles are growing rapidly and will surpass cars by 2030.

Trucks haul 70% of freight in US.

Source: EPA
GHG Phase 2 Tank Regulations

Non-Box Trailers standards limited to 3 trailer types:

- Tanks
- Flatbeds
- Container Chassis

Enclosed trailers designed to transport liquids or gases. Bulk Tanks currently are excluded.

Technologies to be used to meet GHG standards for Tanks:

1. Lower Rolling Resistance Tires
2. Automatic Tire Inflation Systems (ATIS)
   OR
   Tire Pressure Monitoring Systems (TPMS)
GHG Phase 2 Tank Regulations

TRAILER MODEL YEAR

2018
Tire RR Level of 6.0 kg/ton
ATIS or TPMS

2019

2020

2021
Tire RR Level of 5.1 kg/ton
ATIS or TPMS

Source: EPA
GHG – The Future!

By 2027, fuel consumption and CO2 emissions lowered by up to:

- 25%
- 24%
- 16%

TOTAL FUEL SAVINGS:

$170 BILLION 
Over lifetime of vehicles

Source: EPA
Fuel Costs

ATRI Operational Costs of Trucking: 2015 Update

TOTAL AVERAGE COST PER MILE IN 2014 $1.70

2% INCREASE OVER 2013 TOTAL AVERAGE COST PER MILE

FUEL COSTS & DRIVER WAGES ACCOUNT FOR 61% OF THE TOTAL COST PER MILE

Average Cost per Mile by Region

Source: HDT 2016 Fact Book
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A simple solution to your trailer tire pressure dilemmas

CP features:
• A simple mechanical design — no pressure switches, electronics or transducers
• Factory pre-set to your target inflation pressure setting
• Continually checks tire pressure without pressurizing the axle or wheel ends
• A signal light activates when attention is required
• Requires no special tools to reset target pressure in the field
Tires: Evolution of Solutions

- Checking
  Manually check for under-inflated, over-inflated and unequal tire pressure

- Monitoring
  Review data for under-inflated, over-inflated and unequal tire pressure

- Inflating
  Periodically complete a manual adjustment for over-inflated and unequal tire pressure

- Controlling
  The system automatically controls over-inflation and unequal tire pressure
Equalization

A 5 PSI pressure difference equals a 5/16" difference in tire circumference and 1/10" difference in diameter

Dual tire assemblies will drag/brake each other during operation
Any tire in this pressure range needs to be monitored for over-inflation and equalization.

Average monthly high temps for Dallas, TX
Assumes 100 PSI cold target pressure
Assumes loss of 2 PSI/month
Assumes one exposure to -30°F in January
Maximize Tire Life!

Have a plan for **all** tire pressure conditions!

- Under-inflation
- Over-inflation
- Equalization
Air Disc Brakes
ADB Market Share

Source: HDT 2015 Fact Book
Trailer Disc Brake Market

Growing 1 to 2% annually

- Virtually no brake fade
- Perception of lower maintenance
- Lower CSA violations

Air Disc  Drum
Why is this important to you?

% ADB Estimated by Trailer Type

- Tank: 20%
- Reefer: 15%
- Dump: 12%
- Commodity: 10%
- Livestock: 8%
- Autohauler: 8%
- Platform: 5%
- Dry Van: 3%
- Agricultural: 2%
- Lowboys: 1%
- Specialty: 0%
## ADB Maintenance

### Most Frequent Vehicle Violations in Roadside Inspections, 2014 vs. 2015

<table>
<thead>
<tr>
<th>Violation Description</th>
<th>Number of Violations 2014</th>
<th>Number of Violations 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Vehicle Not Having the Required Operable Lamps</td>
<td>563,066</td>
<td>533,153</td>
</tr>
<tr>
<td>Clamp/Roto-chamber Type Brake(s) Out of Adjustment</td>
<td>198,676</td>
<td>198,254</td>
</tr>
<tr>
<td>Inspection/Repair and Maintenance Parts and Accessories</td>
<td>176,886</td>
<td>178,375</td>
</tr>
<tr>
<td>Tire—Other: Tread Depth Less than 2/32 of Inch</td>
<td>183,057</td>
<td>157,887</td>
</tr>
<tr>
<td>Oil and/or Grease Leak</td>
<td>153,050</td>
<td>144,956</td>
</tr>
</tbody>
</table>

Source: HDT 2016 Fact Book
MAXX22T™ Reduced Maintenance Features

**Torque Plate**
- Notch feature to prevent improper caliper installation

**Dust Shield**
- Bolt-on design with pre-installed nuts
- Easier installation and maintenance
- Built in clearance to allow for rotor inspection
- E-coated for longer corrosion protection

**ABS Routing**
- ABS sensor simple to service
- No need to remove wheel-end to service ABS
- Rotor mounted tone ring keeps ABS cabling away from heat

Designed with fewer moving parts = Higher Reliability & Reduced Weight
Understanding Your Brakes: Considerations When Specifying Air Disc Brakes

Historically, air disc brake designs have not been optimized for the North American commercial vehicle market. In certain operating conditions, this can result in an air disc braking system that is less than ideal for today’s lightweight trailers.

Visit www.MAXX22T.com

Maintenance Videos Available!

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Highlights

- **GHG Phase 2 Regulations**
  - Tanks only have 2 compliances compared to the box trailers
    - Lower Rolling Resistance Tires
    - Automatic tire inflation system or Tire Pressure Monitoring System

- **Air Disc Brake Trailer Market**
  - ADB trailer market growing
  - Most of the ADB growth is in the tanker market