Wheel Off Incident Prevention

Maine State Police - Commercial Vehicle Enforcement Unit

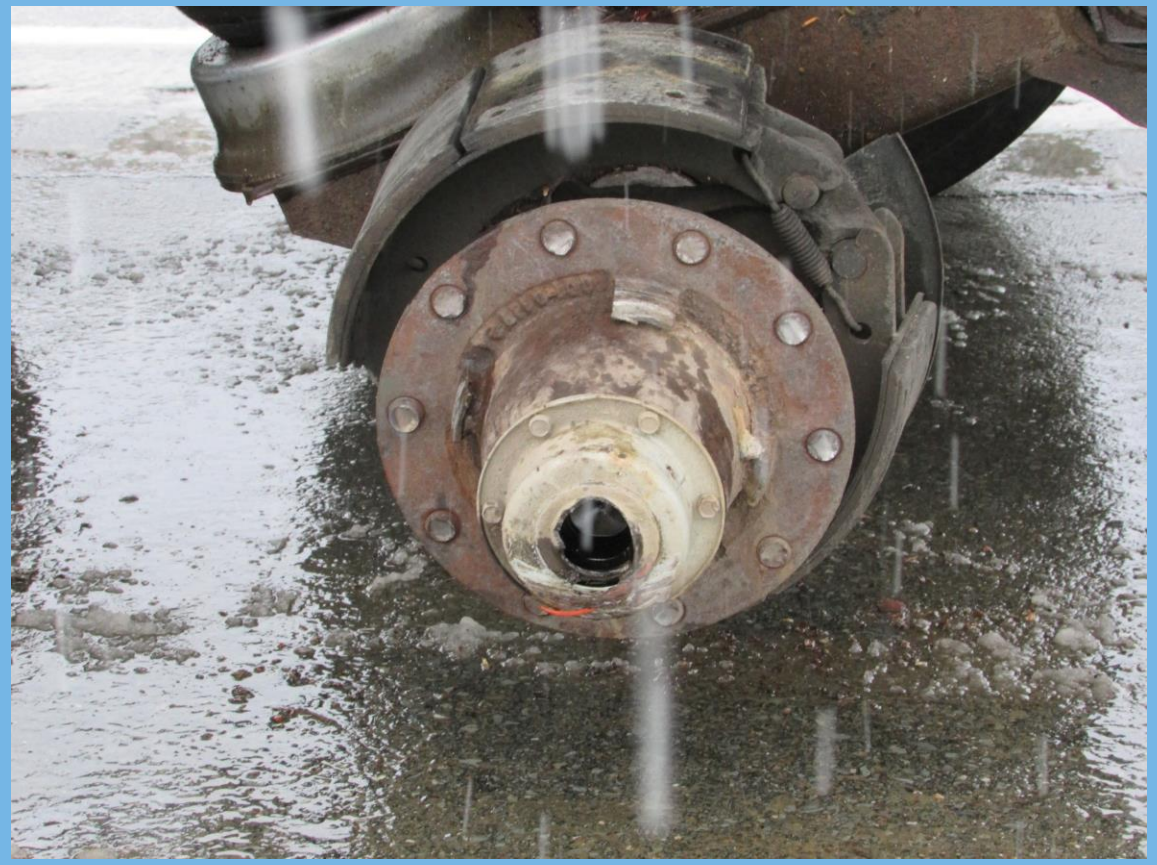
Presenter: Lt. Aaron Hayden

This training is informational and is not a substitute for training requirements of OSHA and the FMCSA discussed later in this presentation.

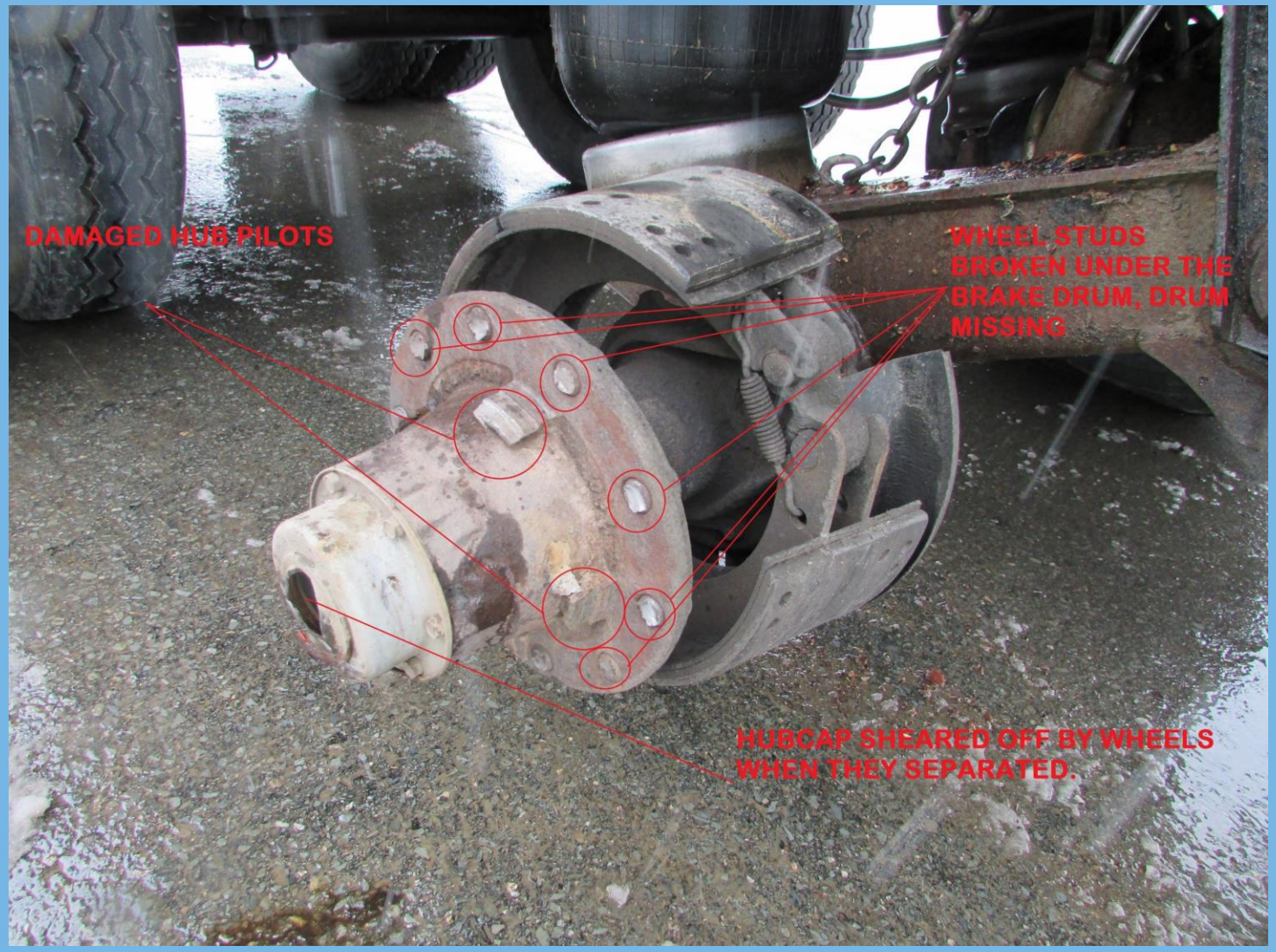
Detective Ben Campbell Crash 4/3/2019

- A crash occurred in Hampden, Maine on 4/3/2019 in which a Maine State Police Detective who was attempting to assist a disabled motorist on I-95 was struck by a tire and wheel that separated from a logging truck. Detective Campbell dies as a result of the injuries he sustained from the impact of the tire and wheel.
- The Maine State Police conducted an investigation into the cause of the wheel separation which yielded some lessons to be taken away by both enforcement and industry.

Photos from the crash scene:



Note indicators visible with the wheels off:



- It was determined during the investigation that the wheels separated due to several mechanical issues, not just one. We will discuss methods of detecting some of the defects discovered.

Defective wheels studs:

- Defective wheel studs causing a loss of clamp force in the wheels are suspected as the first critical event that lead up to the Det. Campbell crash. There are many things that can cause studs to loose their stretching properties, including over tightening by improperly calibrated equipment and impact damage.

- It is critical that technicians thoroughly clean and inspect all wheel studs during every installation.

This is the inside wheel from the Det. Campbell crash:

Wheels:

- Wheels with contaminated, rusty, dirty, or cracked mating surfaces WILL NOT seat correctly, resulting in wheels that become loose in operation. Wheels that are loose in operation will show signs of movement, pay particular attention to any surface that is shiny that shouldn’t be.
- Wheel nuts do not have to be loose for the wheels to move around behind them


Flange nuts have distorted the wheel.

Hub Piloted Wheels, improper centering due to warn hub pilots:

- Hub piloted wheels are particularly susceptible to wheel of incidents if the hub pilots are worn to the point that the wheels contact the studs in a vertical motion. The force of the loaded wheels striking the studs as the axle rotates will fracture the studs causing them to shear off.

Not all fastening systems are the same!!

- Ensure that the installers of your tires know what system they are working with.
- Each system has different requirements including stud length.
- Stud piloted, hub piloted and spoke piloted wheels are not interchangeable.

Technician and driver training

- It is critical to prevent wheel off incidents that technicians working on commercial vehicles have training in inspecting and mounting wheel end components and know which types of hardware are appropriate for hub piloted, stud piloted, and spoke wheels. Please contact your wheel end/ axle manufacturer to obtain training videos and service literature prior to servicing any wheel end component.
- Training videos and materials are available online from Michelin, Accuride, Meritor, Alcoa, and many other reputable manufactures.

OSHA Requirements for technician training

- OSHA Requirements for technician training can be found in 29 CFR 1910.177

FMCSA driver training requirements:

- Requirements for drivers to conduct pre-trip equipment inspections can be found in 49 CFR 392.7

Online Training Videos:

- https://www.youtube.com/watch?v=wrsj2UoMeys
- https://www.youtube.com/watch?v=n1sZ5OAcaFc
- https://www.youtube.com/watch?v=ETOAVzB2cOw
- https://www.youtube.com/watch?v=7hByRqr3gog
- http://archive.constantcontact.com/fs164/1103610692456/archive/1115125676890.html

New Heavy Duty Recovery Vehicle Exemption

- 29-A 2353
- Exemption; Heavy Duty Recovery Vehicle;
- Heavy duty recovery vehicle" shall mean a vehicle that:
- I. Has been designed and manufactured for the specific purpose of recovering large vehicles that have a gross vehicle weight rating, combined gross vehicle weight rating, or actual gross vehicle weight in excess of 80,000 pounds;
- II. Has either 4 or 5 axles;
- III. Has a manufacturer's gross vehicle weight rating of at least 70,000 pounds;
- IV. Has a recovery boom with a rating of at least 70,000 pounds;
- V. Has an air brake system with the capability to provide compressed air to the towed vehicle's breaking and/or suspension system; and
- VI. Has the capability to tow a combination vehicle with an actual gross weight of more than 99,000 pounds.

New Heavy Duty Recovery Vehicle Exemption

- And is used for towing or carrying wrecked or disabled vehicles or freeing vehicles stalled or stuck in snow, mud or sand, when such motor vehicle in fact is being used for one of those purposes. Use of a Heavy Duty Recovery Vehicle would require a Long term Permit as listed in 29-A2382.5