Keeping Your Wheels On

Presented by:
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CVWS Instructor – Province of Ontario
Wheel Off Incidents

- extremely dangerous
- extremely expensive

- property damage
- potential injuries / fatalities
- fines for drivers/company
- potential jail time if negligent
- potential law suits
- negative impact on the CVOR
- damage your reputation
- damage components / vehicle

Wheel Off Incidents are Preventable!
Agenda - Discussion:

1) Ontario Regulations Covering CVWS - who can / can’t
2) Root Causes of “Wheel Offs”
3) Common Myths Surrounding Wheel Installation
4) Top 4 Common Mistakes - Shop / Field
5) What to “Watch For” - Shop / Service Provider
6) What You Can do to Prevent Forest Fires
7) Available Training - Great for Mechanics as well
8) Open Discussion
9) Questions
Ontario Regulations

Ontario College of Trades and Apprenticeship Act

Commercial Vehicle is defined as a vehicle with a manufacturers GVW rating of 4,500 kg or larger and all Truck / Trailer combinations (Motor Coach 3,400 kg)

Certification is required in Ontario for:

• anyone that removes and replaces wheels or rims on a Commercial Vehicle / Motor Coach
• anyone that torques or re-torques a wheel or rim on a Commercial Vehicle / Motor Coach

Mechanics are “grandfathered” however…..
Fair Statement

The tire and trucking industry creates the desire for speed!

Result – wheels can be installed using “short cuts”
Causes of Wheel Off Incidents

Almost all disc wheel loss incidents can be traced back to one or more of the following 3 major causes

1) Failing to develop the required clamping force due to:
   • using less than top quality fasteners
   • failing to replace defective fasteners
   • failing to properly clean the threads of the studs / nuts
   • failing to lubricate the threads of the stud and wheel nuts
   • failing to tighten the wheels properly
Causes of Wheel Off Incidents

Almost all disc wheel loss incidents can be traced back to one or more of the following 3 major causes

2) Abnormal amount of settling of the tightened wheel assembly due to:
   • failure to get enough clamping force that allows the wheels to start to shift
   • embedded rust, dirt, debris or other material on the mounting surfaces (hub - drum - wheels / rims)
   • completing the wheel service with the brakes applied
   • failing to get the brake drum fully seated against the hub
Causes of Wheel Off Incidents

Almost all disc wheel loss incidents can be traced back to one or more of the following 3 major causes.

3) Failure of the wheel bolts due to:
   - over-tightening during the most recent installation
   - over-tightening during a past installation that has damaged the bolts but has not been detected
   - improper bolt / stud removal and replacement
Causes of Wheel Off Incidents

Almost all disc wheel loss incidents can be traced back to one or more of the following 3 major causes:

When wheel nuts turn during the re-check (re-torque), it is always an indication that some part of the installation was done improperly.
Common Myths Surrounding Wheel Installation

1) The torque keeps the wheel tight on the vehicle
2) Tighter wheel nuts are better
   • torque specs are 450-500 ft lbs - I will go 500 ft lbs
3) Wheels studs won’t stretch much - they will break first
4) I don’t need to use lubrication - I use “anti-seize”
5) The air impact is all I need to properly torque the nut
6) Using a manual torque wrench is not required
7) Torque wrench calibration lasts a year or more
8) I don’t need to do a retorque

“Set it and Forget it” just doesn’t work!
Common Mistakes – In the Shop / Field

1) Dry Installation

Hub Piloted wheel systems require 2 drops of SAE 30 oil on the end of the stud and 2 drops of oil between the nut body and the hardened flange.

Important: you **Lubricate Every Time!** Torque values for hub piloted wheel systems are based on lubricated threads.
Common Mistakes – In the Shop / Field

1) Dry Installation

Hub Piloted wheel systems require 2 drops of SAE 30 oil on the end of the stud and 2 drops of oil between the nut body and the hardened flange.

Clamping force will be too low if the studs and nuts are not lubricated and the wheels can come loose.
Common Mistakes – In the Shop / Field

1) Dry Installation

Hub Piloted wheel systems require 2 drops of SAE 30 oil on the end of the stud and 2 drops of oil between the nut body and the hardened flange.

Video demonstrating the effect of Lubrication on Clamping Force on a Hub-Piloted wheel
Common Mistakes – In the Shop / Field

2) Improper Stud Installation

When one stud is broken, the studs on either side must also be replaced for a total of 3. When 2 or more studs are broken, all the studs must be replaced.

Hub must be flat - within 0.020” - pits as well
Common Mistakes – In the Shop / Field

2) Improper Stud Installation

Wheel studs should **never** be installed by banging the old stud out and installing the replacement with a hammer. It is also **not recommended** to use a pack of washers and a nut to draw the stud into the hub using an impact wrench.

Hub must be flat - within 0.020” - pits as well
Common Mistakes – In the Shop / Field

3) Excess or Uncured Paint

Excess or uncured paint on the mounting surface of the hub, drum or wheel could cause a loose wheel. The maximum thickness of the paint on a mating surface is 0.003” – the thickness of a Time magazine page.
Common Mistakes – In the Shop / Field

4) Vertical Tire Mounts
What to Watch For – Shop / Service Provider

- always use lubrication on Hub Pilot wheel systems
- always finish with a “calibrated” manual torque wrench
- always use the necessary safety equipment
- always properly clean and inspect all parts
- always replace parts that are not in top shape
- always check the stud condition for damage or stretch
- always use proper tire lube on tires and wheels – SAE 30
- never allow anyone to do a vertical mount
- seat new tires on the wheels by laying down to 5 psi/c
- never add air to a tire that is 20% or more underinflated
- use “Winter” air (Ambient Temperature Chart)
Cold Climate Pressure Correction Chart

Because air pressure inside a tire will decrease when the vehicle is taken from a warm environment to a cold one, some adjustments may be necessary when adjusting the tire pressures of a vehicle to be operated in very cold temperatures. These adjustments are only necessary if the pressures are verified and adjusted inside a heated garage with an air supply that is also at the higher room temp.

Adjusted Inflation Pressure (PSI)
(with inflating indoors at 65°F [18°C])

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What You Can Do to Prevent Forest Fires

Know the Signs of Imminent Problems
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Know the Signs of Imminent Problems
Training in Ontario

4 Different Certification Courses Available

Level 1: **Inflation** *(MTCU 850675)*
- for fleets that require their drivers to check and adjust their tire pressures
- modules 1 through 3

Level 2: **Inflation and Checking** *(MTCU 850685)*
- includes everything in Level 1
- for fleets that require drivers to torque wheels
- modules 1 through 5
Training in Ontario

4 Different Certification Courses Available

Level 3: **Remove and Replace** *(MTCU 850695)*
- includes everything in Level 1 and 2
- for fleets that require drivers to jack up vehicles and replace a flat tire with a mounted spare
- also good for mechanics and lube techs
- 4-5 hrs of classroom and a shop demonstration
- no prerequisite
- modules 1 through 9
Training in Ontario

4 Different Certification Courses Available

Level 4: Tire Service Tech (MTCU 850725)

Advanced - includes everything in Level 1, 2 and 3
- designed for full tire service staff – tire dealers
- includes demounting and mounting tires and rims (tubeless and tube type)
- repairing a flat tire – plug and patch method
- how to read a tire data book
- 8-9 hrs of classroom
- minimum of 480 hrs tire service experience
- modules 1 through 17
Training in Ontario

4 Different Certification Courses Available

All CVWS Certificates will expire after 3 years
There will be a 3 year recertification requirement
Older courses will also be invalid and need to be recertified

Details are yet to be determined

Expected to start spring of 2017
Thank You!

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