



ONTARIO PROVINCIAL POLICE

Wheel Separation

Sgt. Scott Parker
Highway Safety Division



Wheel Separation

Overview

- Statistics, 2013-2016
- Causation:
 - Fastener Failure
 - Bearing failure
 - other causes
- Incidents
- Prevention:
 - Driver's pre-trip inspection
 - Re-Torque
 - Communications
 - Legislation



Wheel Separation

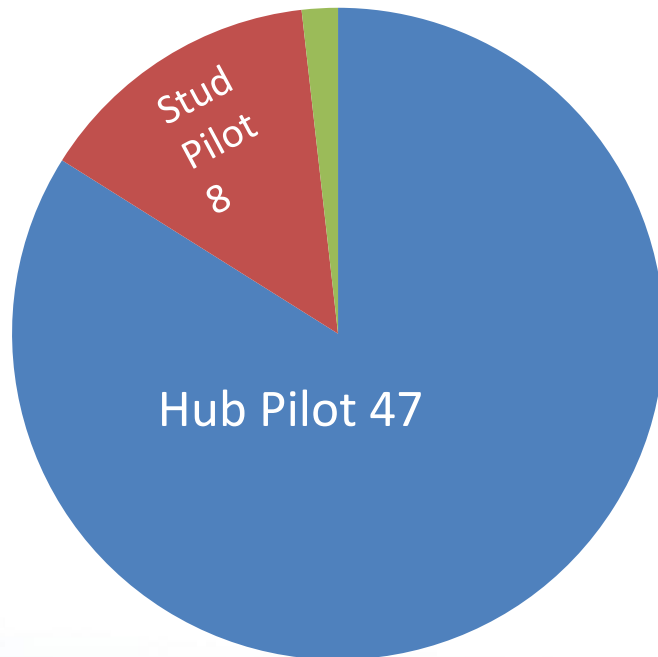
Stats, what are the numbers

- For the calendar year 2016 (up to Sept 26) there were reported 56 wheel separation events.
- Reported by MTO, O.P.P. and Municipal Police Services.
- We know that there were more events that simply were not reported.
- This numbers thus far are consistent with previous years.



Wheel Separation

What the numbers show us as far as the type of wheel involved in these events

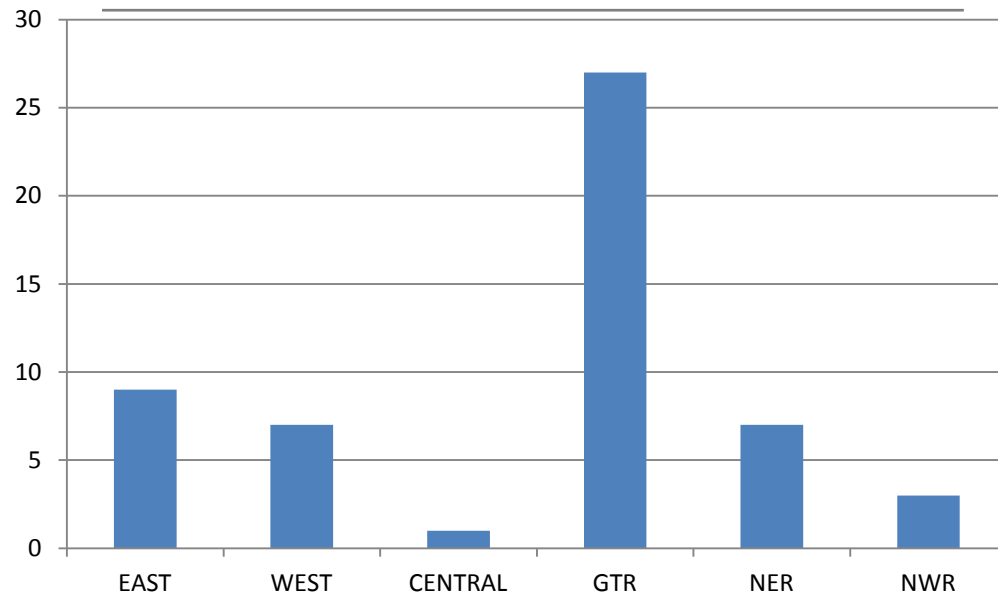


- Of the 56 reported events, 47 involved hub piloted wheels.
- Not surprising, given that hub piloted are the most common wheels in use.
- Stud piloted wheels were involved in 8 of the reported events
- Spoke wheels accounted for 1 event.



Wheel Separation

Where the incidents are occurring

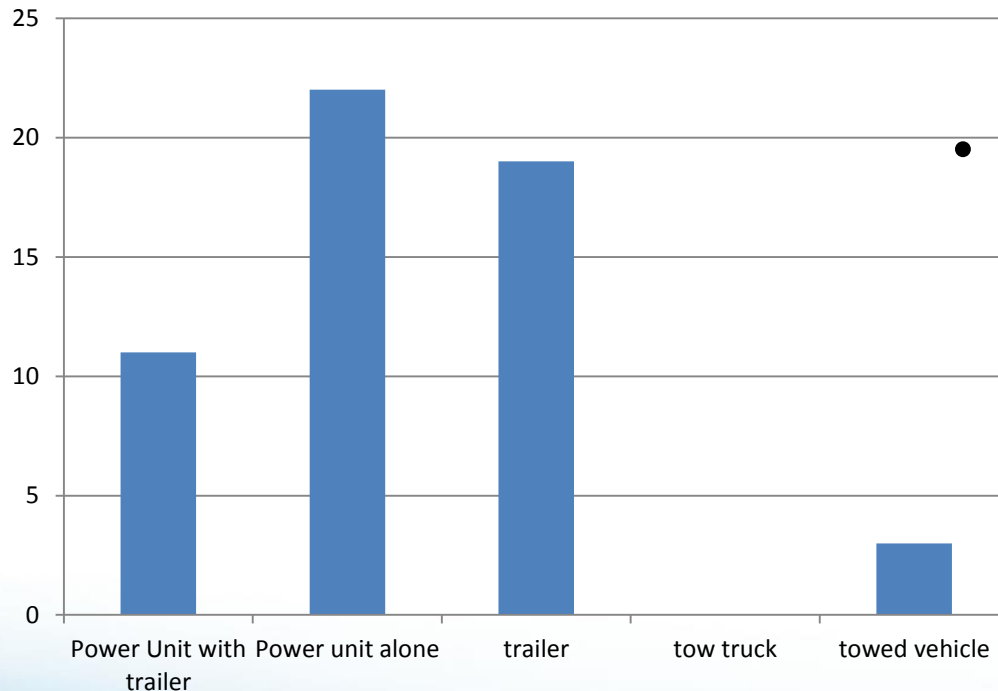


- Based upon O.P.P. Regional Boundaries.
- East, NE and NW comprise the majority of the Province's land mass.
- GTR is expected to see more events due to increased volume of traffic



Wheel Separation

What type of vehicles are involved in these events

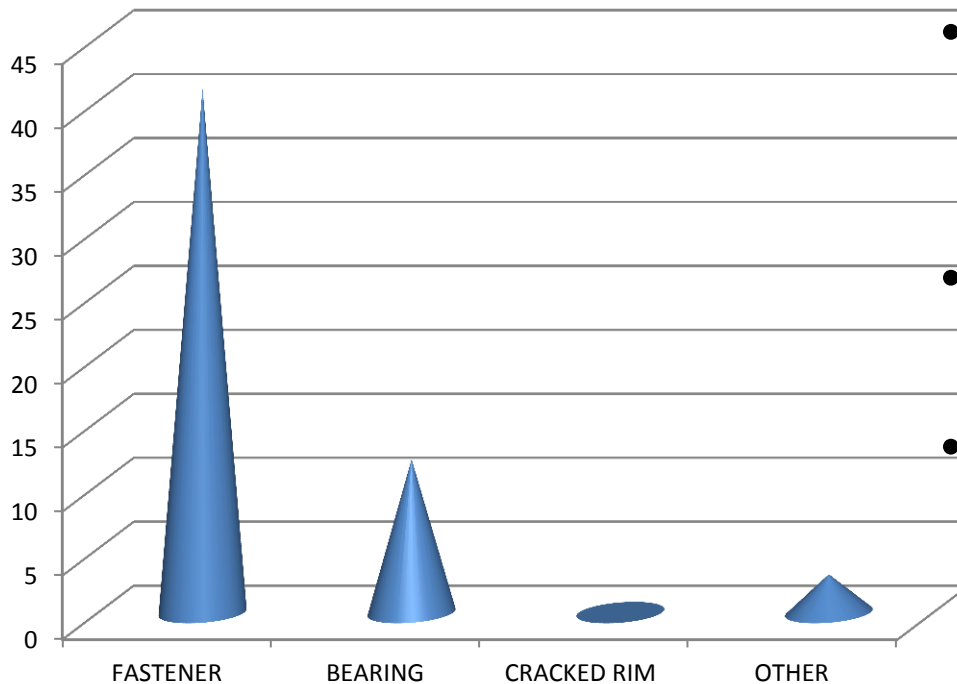


- 22 of the reported incidents involved wheels separating trucks.
- 19 of the events were the result of wheels separating from trailers.
- Power Units losing their wheels while hauling a trailer accounted for 11 events..



Wheel Separation

What event triggered the wheel separation events

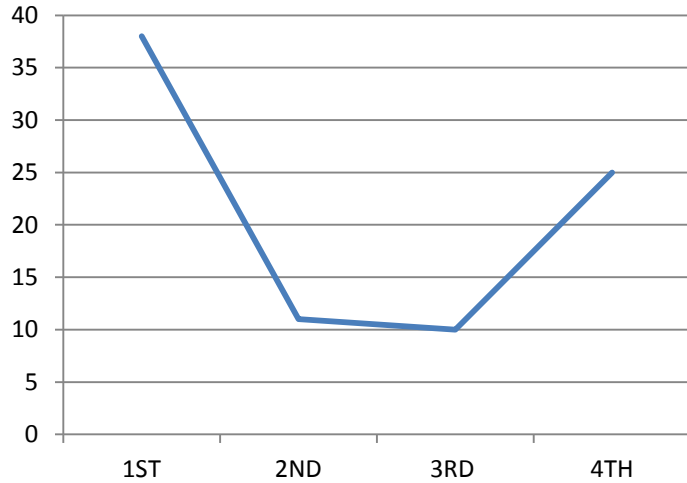


- In 41 of the reported events the fasteners failed resulting in separation.
- 12 of the events resulted from bearing failures.
- Events such as broken wheel rims accounted for 3 of the wheel separation events..



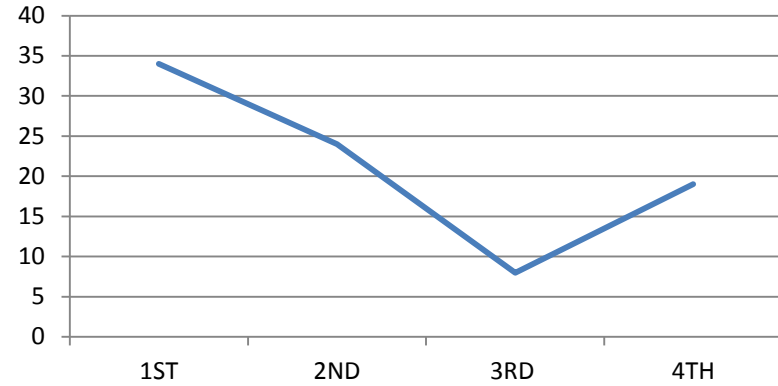
Year after year comparison

2013

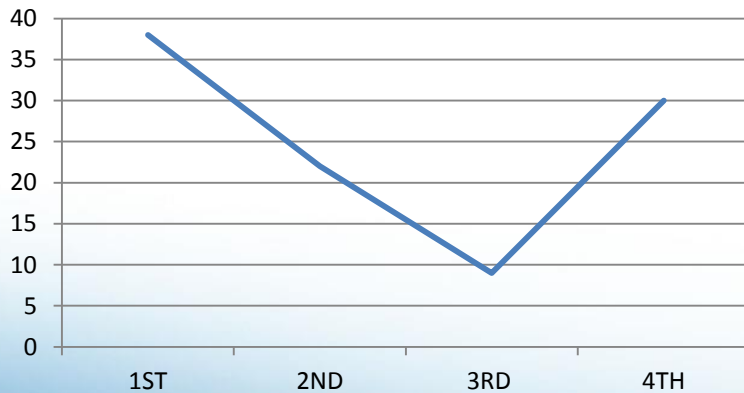


Wheel Separation by Quarter

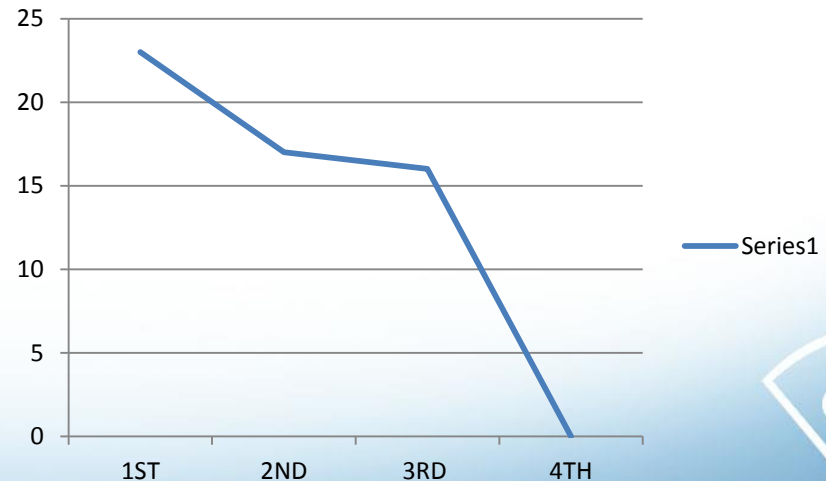
2014



2015

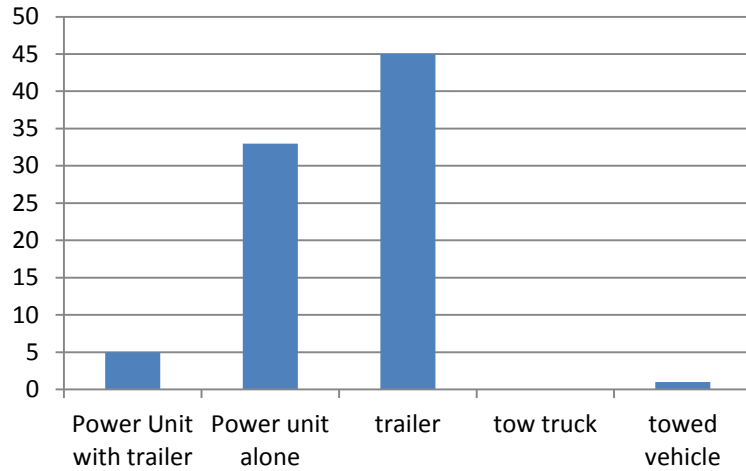


2016



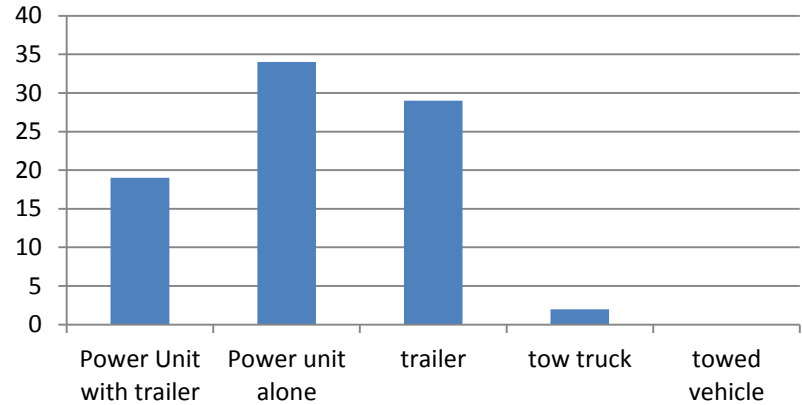
Year after year comparison

2013

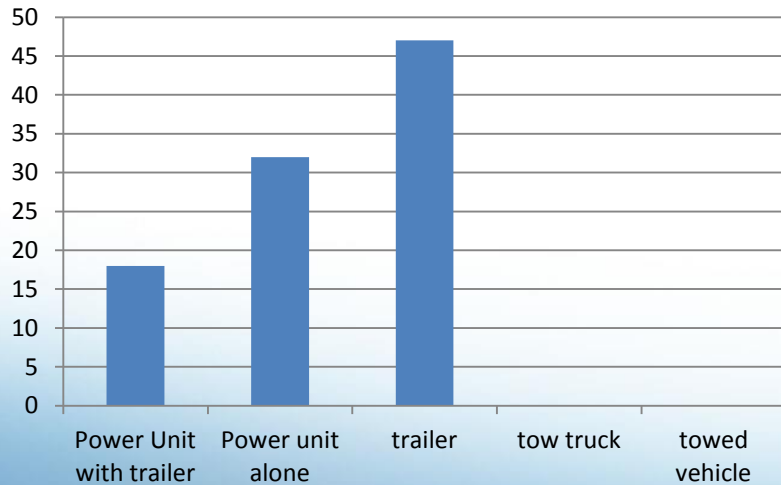


Wheel Separation by Vehicle Type

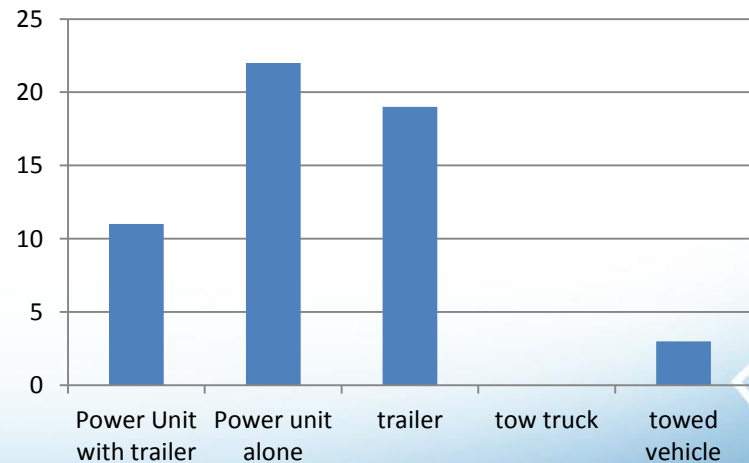
2014



2015

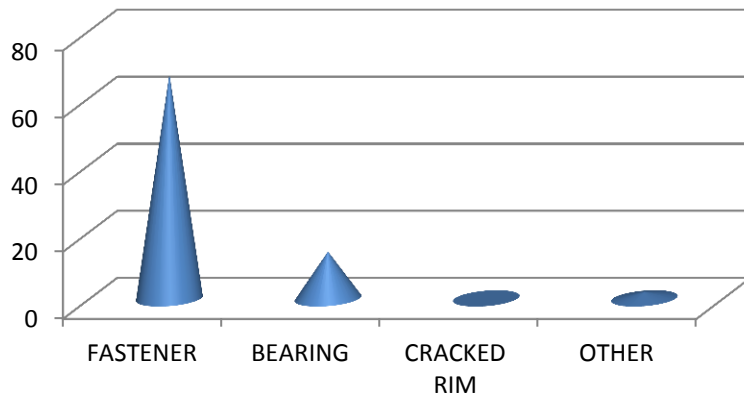


2016



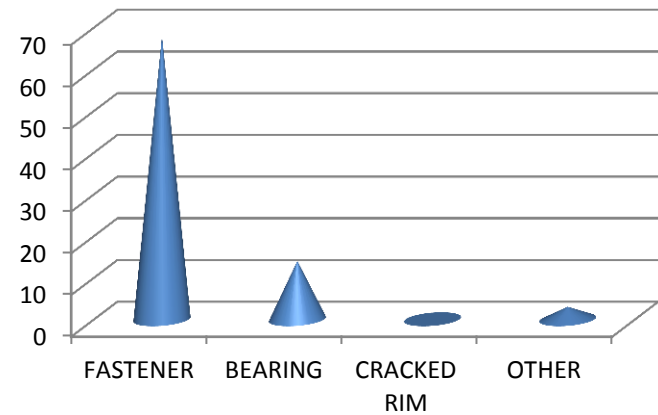
Year after year comparison

2013

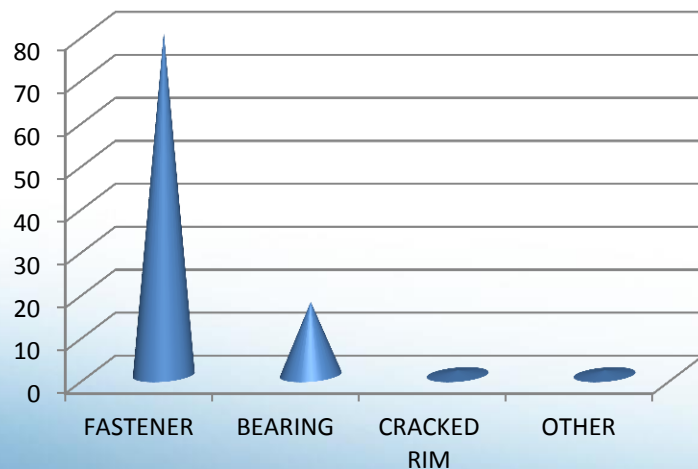


Reason for Wheel Separation

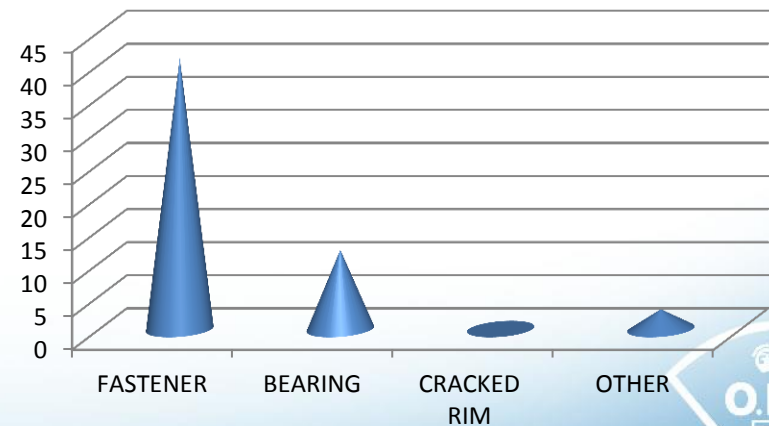
2014



2015

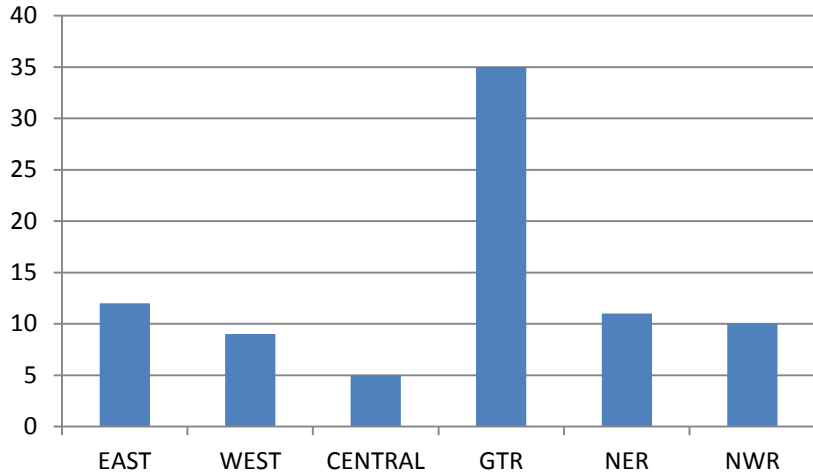


2016

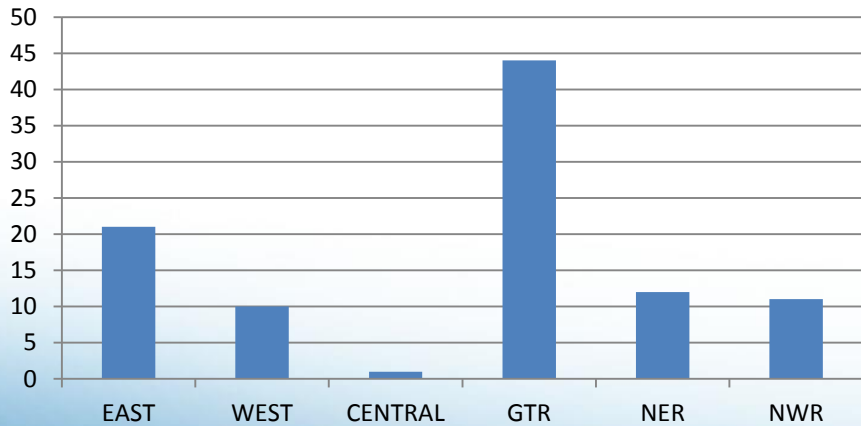


Year after year comparison

2013

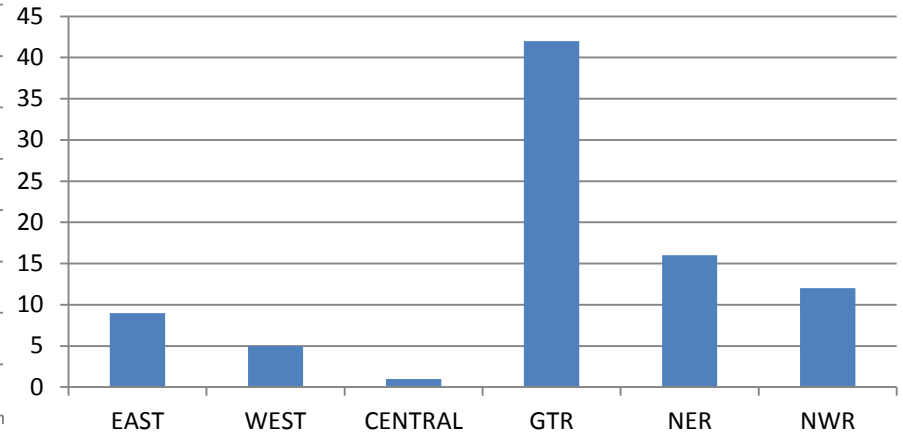


2015

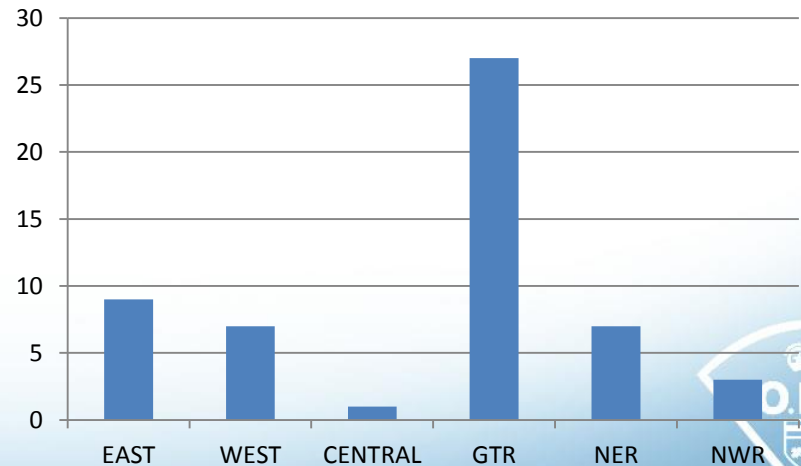


Geographic Regions for events

2014

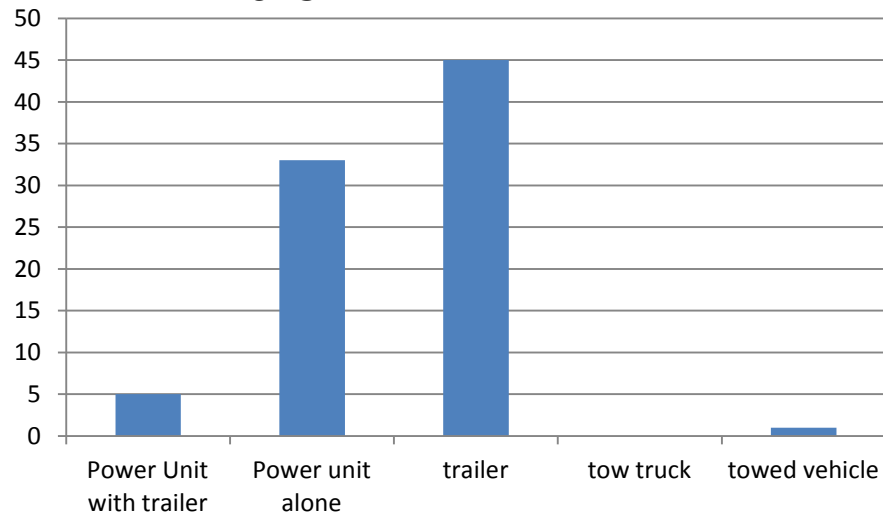


2016



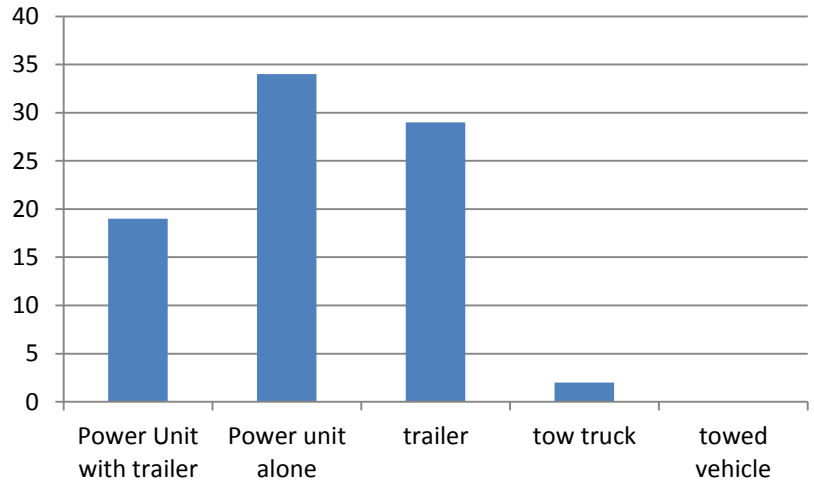
Year after year comparison

2013

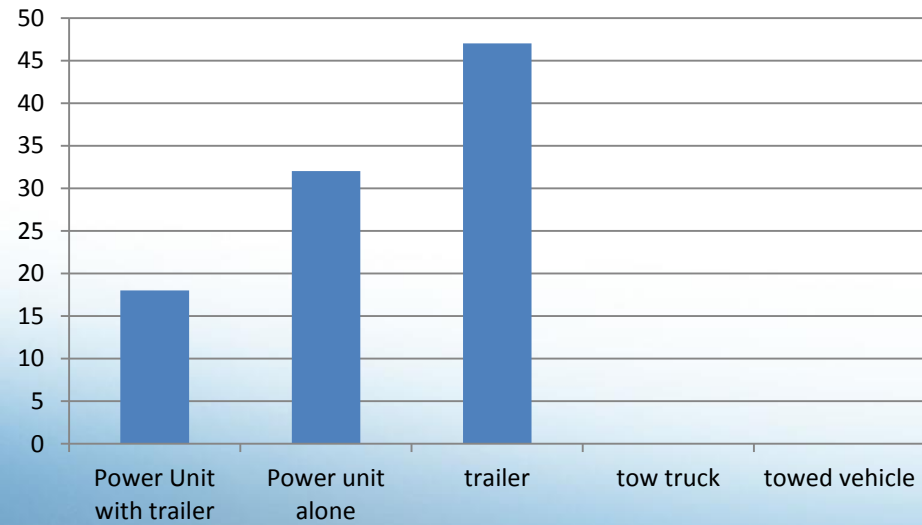


Which vehicles are losing their wheels

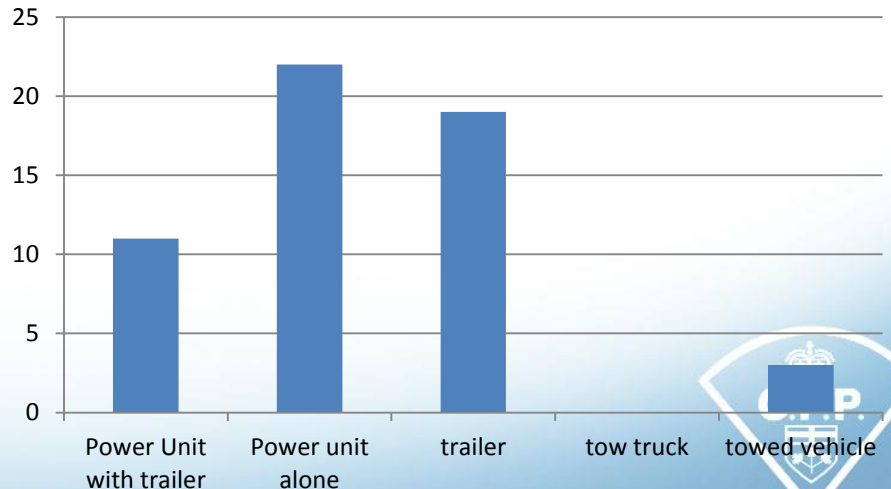
2014



2015

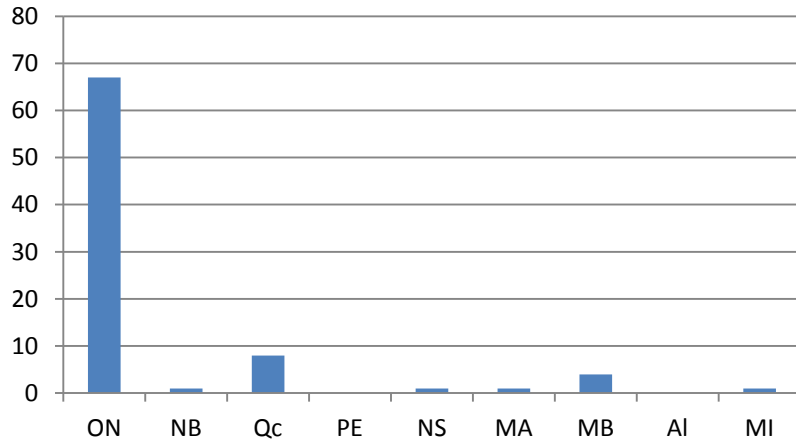


2016



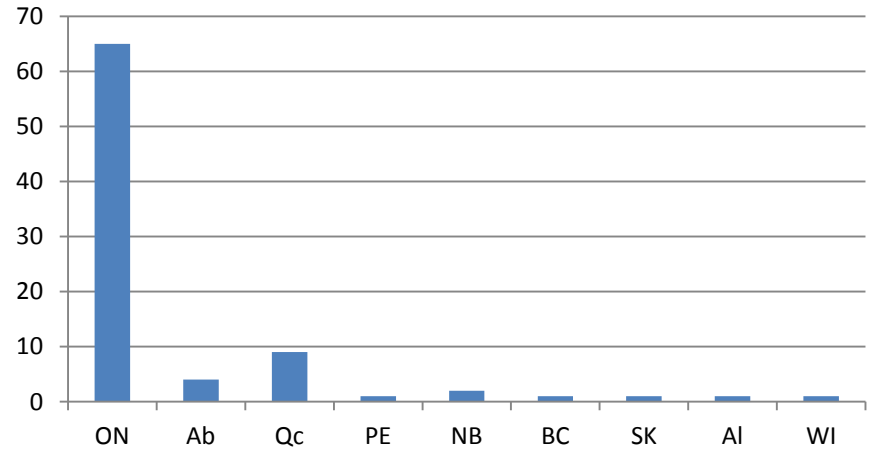
Year after year comparison

2013

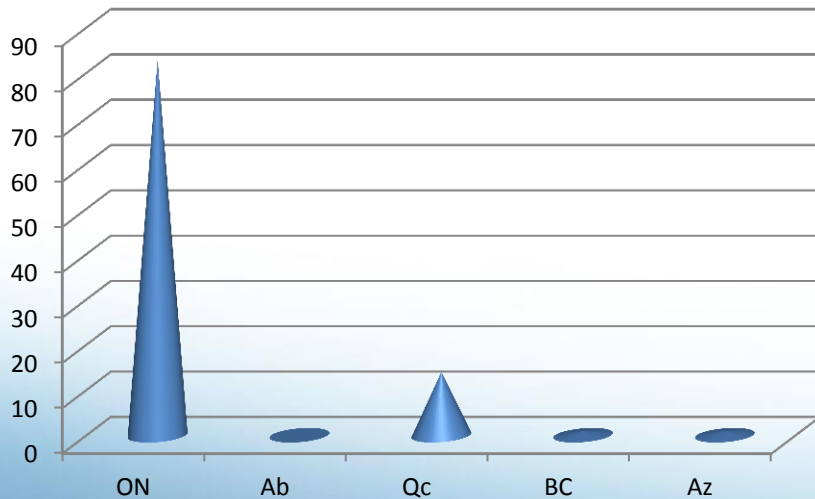


Where are the vehicles coming from

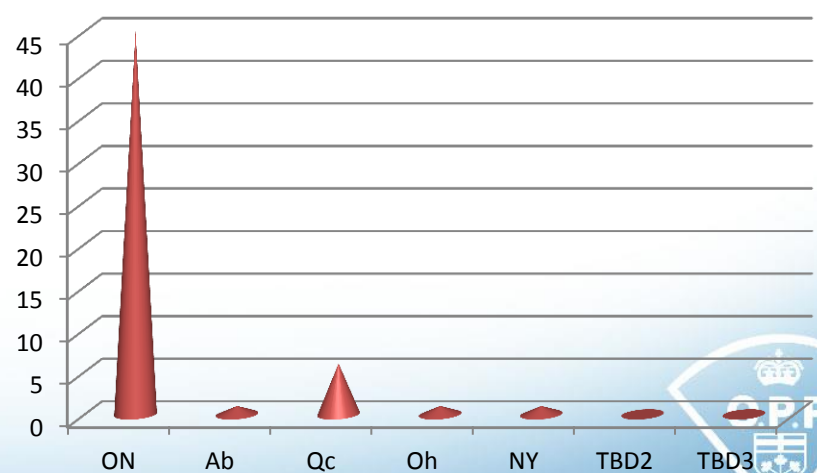
2014



2015



2016



Wheel Separation

What causes this to happen?



Wheel Separation

<p>Part 21. Tires</p>	<p>(a) damaged tread or sidewall of tire. (b) tire leaking, if leak cannot be heard.</p>	<p>(a) flat tire. (a.1) tire leaking, if leak can be felt or heard. (b) tire tread depth is less than wear limit.¹¹ (c) tire is in contact with another tire or any vehicle component other than mud-flap. (d) tire is marked "Not for highway use". (e) tire has exposed cords in the tread or outer sidewall area.</p>
<p>Part 22. Wheels, Hubs and Fasteners</p>	<p>(a) hub oil below minimum level (when fitted with sight glass). (b) leaking wheel seal.</p>	<p>(a) wheel has loose, missing or ineffective fastener. (b) damaged, cracked or broken wheel, rim or attaching part. (c) evidence of imminent wheel, hub or bearing failure</p>

- Why is it being missed



Wheel Separation

Anatomy of a fastener failure



dump truck lost wheel hits car.mp4

Wheel Separation

Anatomy of a fastener failure



- Left side fastener failure of axle 2
- Recovered fasteners
- Studs were still mounted and protruding from the brake drum



Wheel Separation

Anatomy of a fastener failure



- Some damage to threads on the wheel studs visible
- Relative location of damage on wheel studs is consistent

Wheel Separation

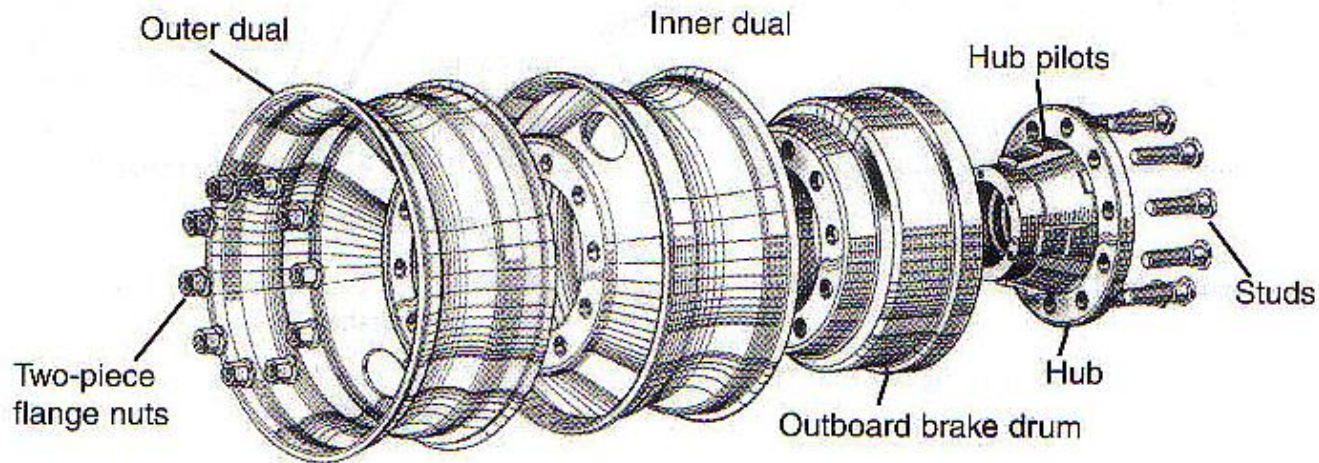
Anatomy of a fastener failure



- In this event we recovered 7 of the 10 flange type wheel fasteners
- Damage to the threads is apparent.

Wheel Separation

Anatomy of a fastener failure



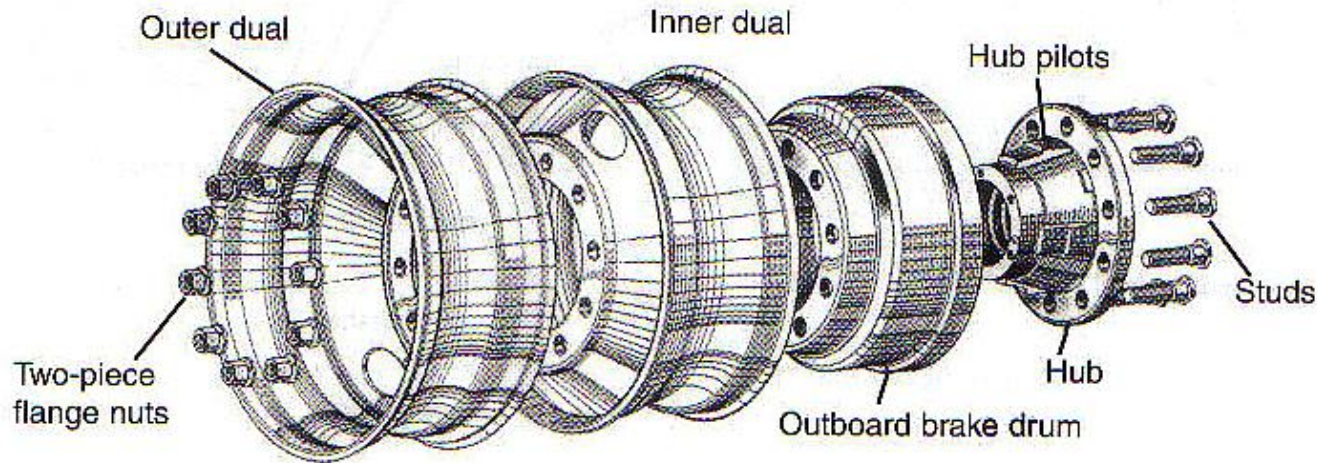
- The 2 piece flange nuts mark the outer surface of the outer rims as the clamping force is lost.

As the wheel rotates the wheel stud holes elongate



Wheel Separation

Anatomy of a fastener failure



- The movement of the rim against the studs increase, further elongating the stud holes.
- The stud holes in the rim become marked by the threaded surface of the studs.
- Fasteners release and studs may begin to break
- The outer wheel separates followed by the inner

Wheel Separation

Anatomy of a fastener failure



- The stud hole is from the wheel rim recovered show evidence of the flange type fastener wearing into the metal of the rim.
- The evidence of elongation of the stud holes is obvious..

Wheel Separation

Anatomy of a fastener failure



- The evidence of abnormal contact between the stud and the rim's stud hole is obvious.

Wheel Separation

Anatomy of a fastener failure



- Another example of abnormal contact between the stud and the stud hole is obvious.

Wheel Separation

Anatomy of a fastener failure



- Elongation of stud holes is apparent

Wheel Separation

Anatomy of a fastener failure



- The damage to the threads is typical of what we find when a fastener fails
- The grinding away of the threads is related to the abnormal contact being made between the wheel rim stud hole and the stud due to elongation of the stud hole.

Wheel Separation

Anatomy of a Bearing failure



dual wheels hir car .mp4



Wheel Separation

Anatomy of a Bearing failure



- Generally when a bearing fails on a tandem wheel, both wheel separate as one unit.
- The case study I have is on a steering axle

Wheel Separation

Anatomy of a Bearing failure



- The inboard bearing is still present.
- From the photo the lack of lubrication is obvious.
- The bearing failed, most likely due to insufficient lubrication.
- Why this occurred is apparent as we look at other wheels on the truck.



Wheel Separation

Anatomy of a Bearing failure



- Axle two, right side.
- What do you notice about the sight glass?
- Proper pre-trip?.

Wheel Separation

Anatomy of a Bearing failure



- Axle two, right side.
- What do you notice about the sight glass?
- Proper pre-trip?.

Wheel Separation

Anatomy of a Bearing failure



- Axle four, left side.
- All sight glasses were in the same condition on each wheel?
- Preventable?

Wheel Separation

Anatomy of a Bearing failure



- Lets look at the wheel opposite to the bearing that failed, axle one, left side.

Wheel Separation

Anatomy of a Bearing failure

Part 21. Tires	<p>(a) damaged tread or sidewall of tire.</p> <p>(b) tire leaking, if leak cannot be heard.</p>	<p>(a) flat tire.</p> <p>(a.1) tire leaking, if leak can be felt or heard.</p> <p>(b) tire tread depth is less than wear limit.¹¹</p> <p>(c) tire is in contact with another tire or any vehicle component other than mud-flap.</p> <p>(d) tire is marked "Not for highway use".</p> <p>(e) tire has exposed cords in the tread or outer sidewall area.</p>
Part 22. Wheels, Hubs and Fasteners	<p>(a) hub oil below minimum level (when fitted with sight glass).</p> <p>(b) leaking wheel seal.</p>	<p>(a) wheel has loose, missing or ineffective fastener.</p> <p>(b) damaged, cracked or broken wheel, rim or attaching part.</p> <p>(c) evidence of imminent wheel, hub or bearing failure</p>

ets look at the wheel opposite to the bearing that failed, axle one, left side.

reventable?



Wheel Separation

Other Causes of Wheel Separation



- Cracked rims.
- Eventually crack enlarge.
- When the crack start or end near openings in the rims such as centre, stud or hand holes failure of the rim is a matter of when.

Wheel Separation

Other Causes of Wheel Separation



Wheel Separation

Other Causes of Wheel Separation



Wheel Separation

Recent Events



Hwy 401
near
London.

Wheel
separated
from a
Commercial
Motor
vehicle
killing the
occupant of
the vehicle
depicted.



Wheel Separation

Recent Events



Wheels fly off dump truck in Mississauga, woman seriously hurt

BY MARYAM SHAH, TORONTO SUN

FIRST POSTED: FRIDAY, SEPTEMBER 18, 2015

01:01 PM EDT | UPDATED: FRIDAY, SEPTEMBER 18, 2015 06:58 PM EDT

Diane Tsialtas

Diane Tsialtas (Supplied photo)

Article

UPDATE: Diane Tsialtas died of her injuries.



Wheel Separation

Prevention – Starts with the Driver’s pre-trip inspection

		(a) flat tire
		(a) flat tire
Part 21. Tires	(a) damaged tread or sidewall of tire. (b) tire leaking, if leak cannot be heard.	(a) flat tire. (a.1) tire leaking, if leak can be felt or heard. (b) tire tread depth is less than wear limit. ¹¹ (c) tire is in contact with another tire or any vehicle component other than mud-flap. (d) tire is marked “Not for highway use”. (e) tire has exposed cords in the tread or outer sidewall area.
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Wheel Separation

Pre-trip inspection

Prevention



- Wheel separation event I investigated on a patient transfer vehicle
- Wheel on left side had separated.
- This wheel had a cover over the fasteners
- When I removed the cover this is what I found
- If the operator covers the fasteners, how is the driver to do a proper pre-trip



Wheel Separation

Prevention

The question I ask drivers and have yet to get an answer other than I do not know



Wheel Separation

Prevention

Proper Bearing Maintenance
and Lubrication



Wheel Separation

Prevention

Communication:



Just as important to know which trailer the driver is to pick up, the driver must know:

- 1) When was the last maintenance on this trailer.
- 2) Were the wheels off this trailer recently.
- 3) Do I need to have this trailer wheel fasteners re-torqued within the next 80 km or sooner?



Wheel Separation

Highway Traffic Act

Legislation

Offence if wheel detaches from commercial motor vehicle

[84.1 \(1\)](#) Where a wheel becomes detached from a commercial motor vehicle, or from a vehicle being drawn by a commercial motor vehicle, while the commercial motor vehicle is on a highway, the operator of the commercial motor vehicle and the owner of the vehicle from which the wheel became detached are guilty of an offence. 1997, c. 12, s. 12.

Penalty

[\(3\)](#) Upon conviction of an offence under subsection (1), the person is liable to a fine of not less than \$2,000 and not more than \$50,000. 1997, c. 12, s. 12.



Wheel Separation

Highway Traffic Act

Legislation

No imprisonment or probation

[\(4\)](#) A person convicted of an offence under subsection (1) is not liable to imprisonment or to a probation order under subsection 72 (1) of the *Provincial Offences Act* as a result of the conviction or as a result of default in payment of the fine resulting from the conviction. 1997, c. 12, s. 12.

Absolute liability offence

[\(5\)](#) It is not a defence to a charge under subsection (1) that the person exercised due diligence to avoid or prevent the detaching of the wheel. 1997, c. 12, s. 12.



Wheel Separation

Highway Traffic Act

Legislation

Offence if parts, etc., detach

[84.2 \(1\)](#) Where any part of a vehicle or anything affixed to a vehicle becomes detached from the vehicle while it is on a highway, the driver of the vehicle is guilty of an offence. 2005, c. 26, Sched. A, s. 14.

Penalty

[\(3\)](#) Upon conviction of an offence under subsection (1), the driver of the vehicle is liable to a fine of not less than \$100 and not more than \$2,000. 2005, c. 26, Sched. A, s. 14.

Same

[\(4\)](#) Where the vehicle from which the part or thing becomes detached is a commercial motor vehicle, a vehicle drawn by a commercial motor vehicle, a mobile crane or a road-building machine, the driver of the vehicle is liable on conviction to a fine of not less than \$400 and not more than \$20,000, and not as provided in subsection (3). 2005, c. 26, Sched. A, s. 14.



Wheel Separation

Highway Traffic Act

Legislation

Licence suspension

[\(5\)](#) In addition to the penalty under subsection (3) or (4), as the case may be, the court may suspend the person's driver's licence for a period of not more than 60 days. 2005, c. 26, Sched. A, s. 14.



Wheel Separation

Highway Traffic Act

Legislation

Offence of causing parts to detach

[84.3 \(1\)](#) Every person who performs work to repair or maintain a vehicle or a vehicle part and who does anything that causes a part of the vehicle or anything affixed to the vehicle to become detached from the vehicle while it is on a highway is guilty of an offence. 2005, c. 26, Sched. A, s. 15.

Same

[\(2\)](#) Every person who carries on a business of repairing or maintaining vehicles or vehicle parts and who does anything or permits another person to do anything that causes a part of a vehicle or anything affixed to a vehicle to become detached from the vehicle while it is on a highway is guilty of an offence. 2005, c. 26, Sched. A, s. 15.



Wheel Separation

Highway Traffic Act

Legislation

Penalty

[\(4\)](#) Upon conviction of an offence under subsection (1) or (2), a person is liable to a fine of not less than \$100 and not more than \$2,000. 2005, c. 26, Sched. A, s. 15.

Same, commercial motor vehicle

[\(5\)](#) Where the vehicle from which the part or thing becomes detached is a commercial motor vehicle, a vehicle drawn by a commercial motor vehicle, a mobile crane or a road-building machine, the person who is guilty of an offence under subsection (1) or (2) is liable on conviction to a fine of not less than \$400 and not more than \$20,000, and not as provided in subsection (4). 2005, c. 26, Sched. A, s. 15.



Wheel Separation

Criminal Code

Legislation

219 (1) Every one is criminally negligent who

(a) in doing anything, or

(b) in omitting to do anything that it is his duty to do,

shows wanton or reckless disregard for the lives or safety of other persons.

(2) For the purposes of this section, ***duty*** means a duty imposed by law.

R.S., c. C-34, s. 202.



Wheel Separation

Criminal Code

Legislation

Causing death by criminal negligence

220 Every person who by criminal negligence causes death to another person is guilty of an indictable offence and liable

- (a)** where a firearm is used in the commission of the offence, to imprisonment for life and to a minimum punishment of imprisonment for a term of four years; and
- (b)** in any other case, to imprisonment for life.

R.S., 1985, c. C-46, s. 220;
1995, c. 39, s. 141.

Marginal note: Causing bodily harm by criminal negligence

221 Every one who by criminal negligence causes bodily harm to another person is guilty of an indictable offence and liable to imprisonment for a term not exceeding ten years.

R.S., c. C-34, s. 204.



Wheel Separation

Criminal Code

Legislation

Parties to offence

21 (1) Every one is a party to an offence who

- (a) actually commits it;
- (b) does or omits to do anything for the purpose of aiding any person to commit it; or
- (c) abets any person in committing it.



Wheel Separation

Criminal Code

Legislation

TRANSPORT DRIVER SENT TO JAIL FOR THREE YEARS FOR NEGLIGENCE CAUSING DEATH

My Prescott Now

22MAR16

On Friday, transport driver Martin Lauzon was sentenced to three years in jail for his part in the death of 24-year-old Jason Eligh in 2011. In December of that year, Lauzon was on a five-day long haul and he failed to properly inspect all equipment. A wheel assembly came loose and hit Eligh's vehicle on the 401 near Brockville. The young father was killed in the crash.

In court, the judge said the incident clearly could have been avoided if the truck driver had done the required spot checks. He is hoping the sentence will convince other truck drivers to be more diligent.



Wheel Separation

Criminal Code

Legislation

Wheel separation results in criminal charges

May 15, 2016

by Truck News

Categories

Health & Safety

TORONTO, Ont. — The Ontario Provincial Police (OPP) have charged a Quebec driver with criminal negligence causing death, after the truck he was driving lost a set of duals, killing another motorist.

The crash happened Jan. 27 at 9:19 a.m. on Hwy. 400. Driver Bruno Bergeron of St. Rouyn-Noranda, Que. is facing charges. He is scheduled to appear in Newmarket court June 14 to answer the charge.

Transport LEO Labelle of Beam, Que. has also been charged in connection with the crash. It will be represented in court July 22 to answer the charge.



Wheel Separation



Questions?

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