

Assessment of Wheel Separations from Light-Duty Vehicles

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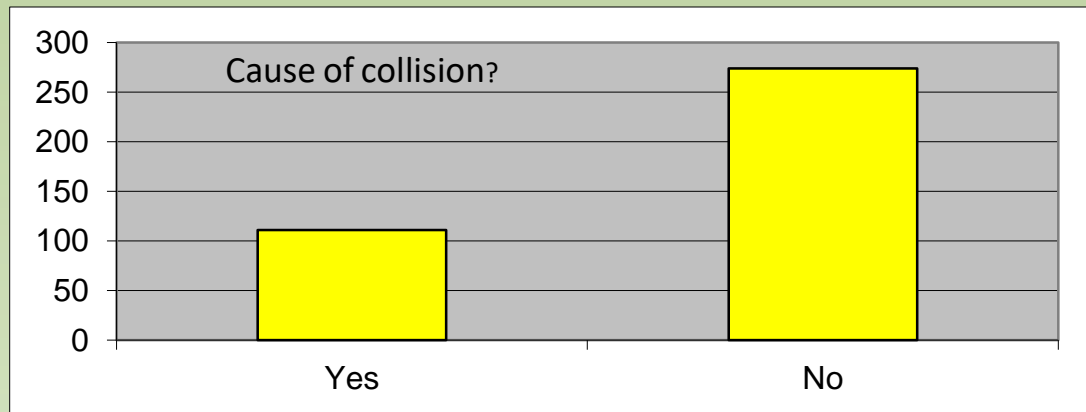
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Introduction

Ontario Provincial Police (OPP) initiated a program to track wheel separations from light duty vehicles (LDVs)

- HDV wheel separations well known; LDV not so much
- Wheel = a tire mounted on a rim
- OPP officers observed frequent wheel separations from LDVs
- Why an issue? → 29% resulted in a collision.



Introduction

2012 OPP initiated a plan to track LDV wheel separations

- GTA – Cambridge – Niagara Peninsula detachments
- Information gathering began in earnest late 2012
- Work continues today
- Today - considering data from 2013-2016



Region monitored



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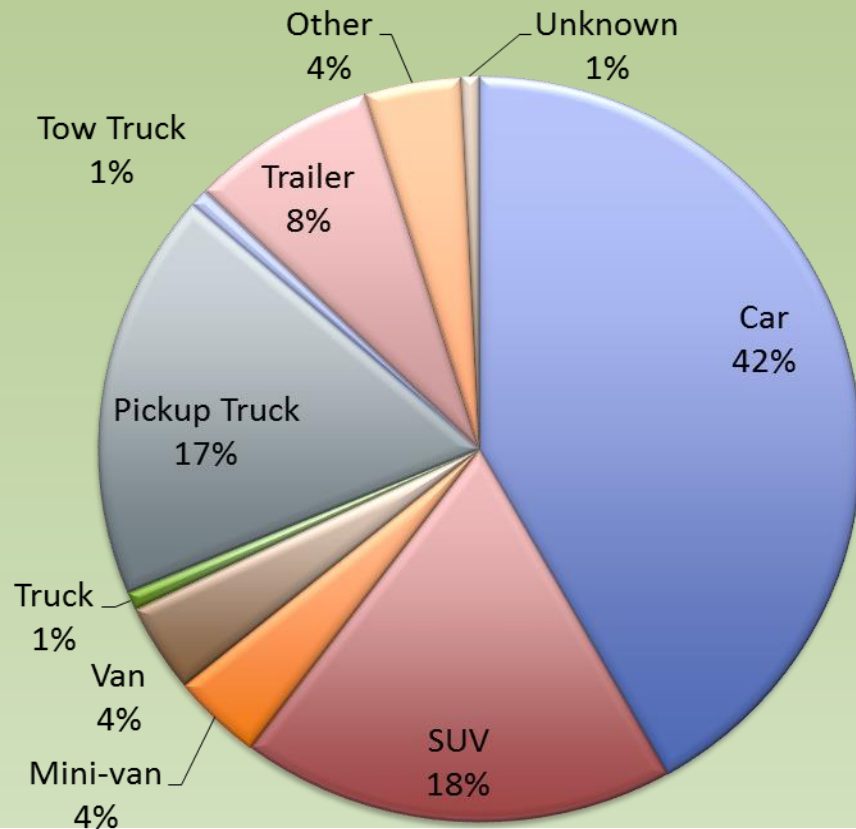
Consequences of Wheel Separation

March 15, 2013 – Pick-up truck tire impacted Honda Civic roof



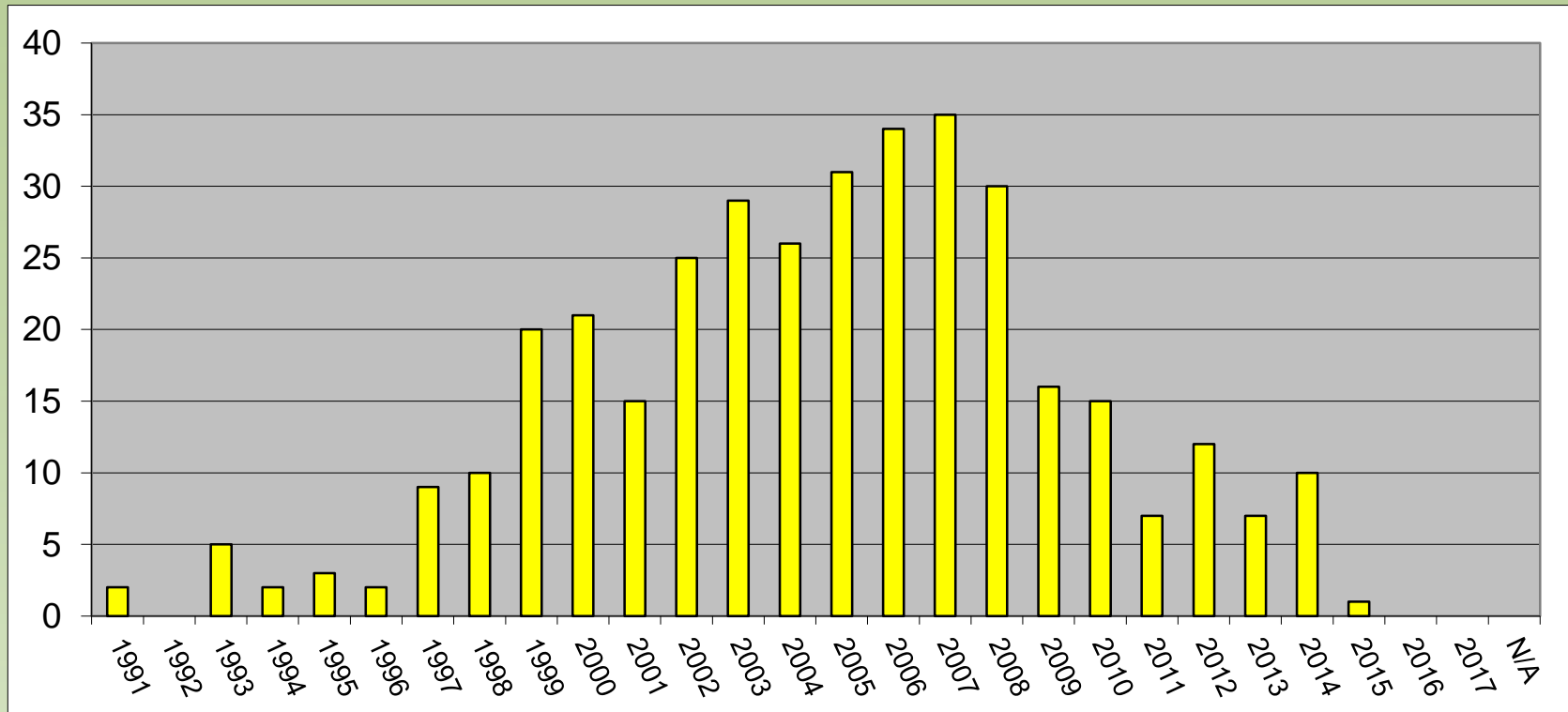
Results

Composition of LDVs in Data



Results

LDV model year distribution



Results

Side from which wheel was released



Results

Causes of wheel separation

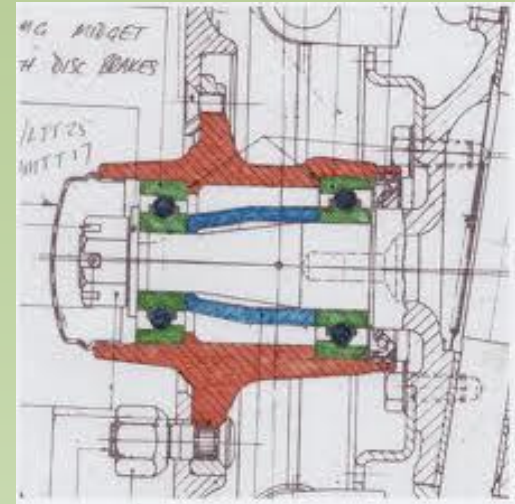


fasteners

wheel bearing

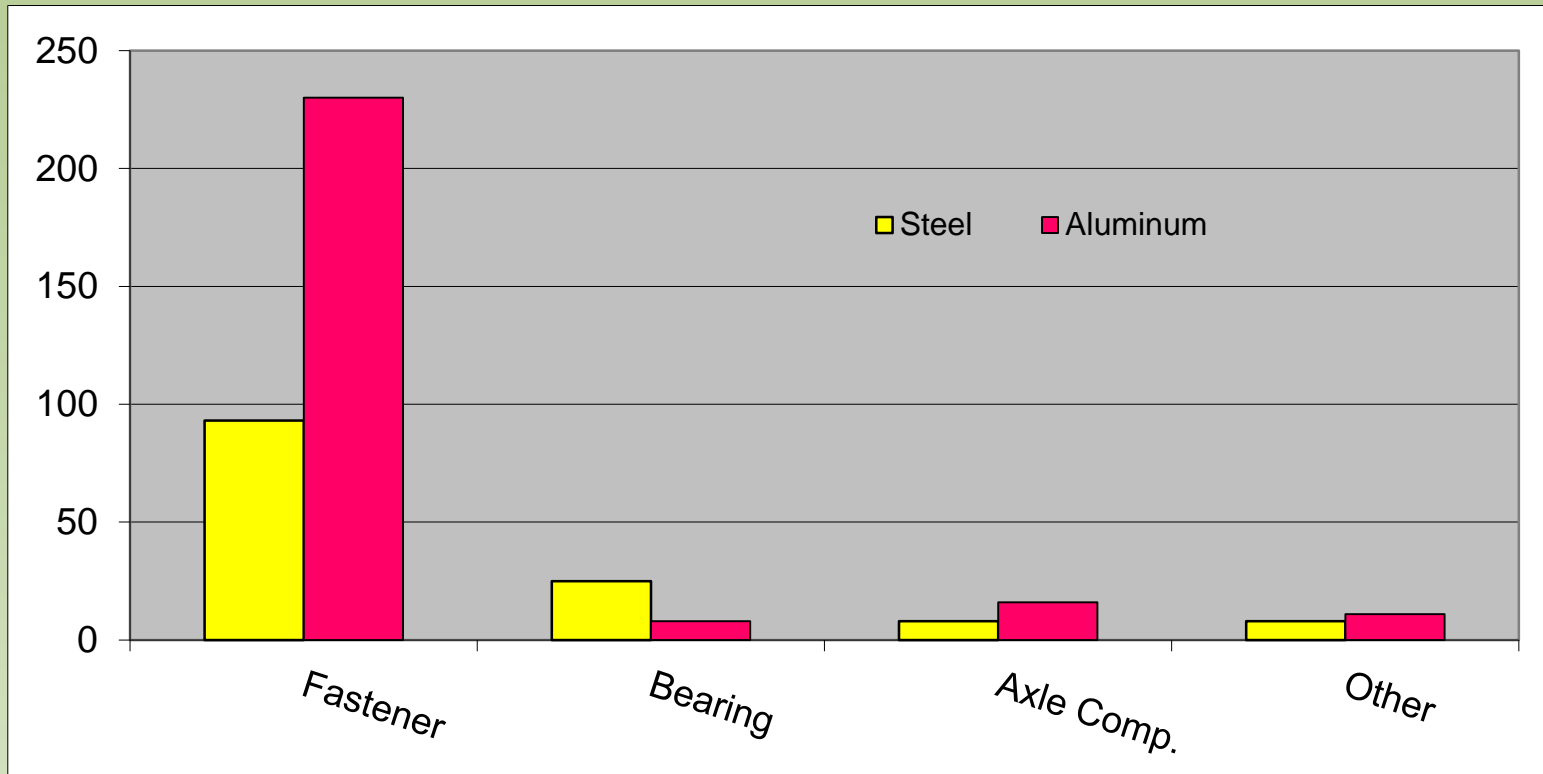


broken axle



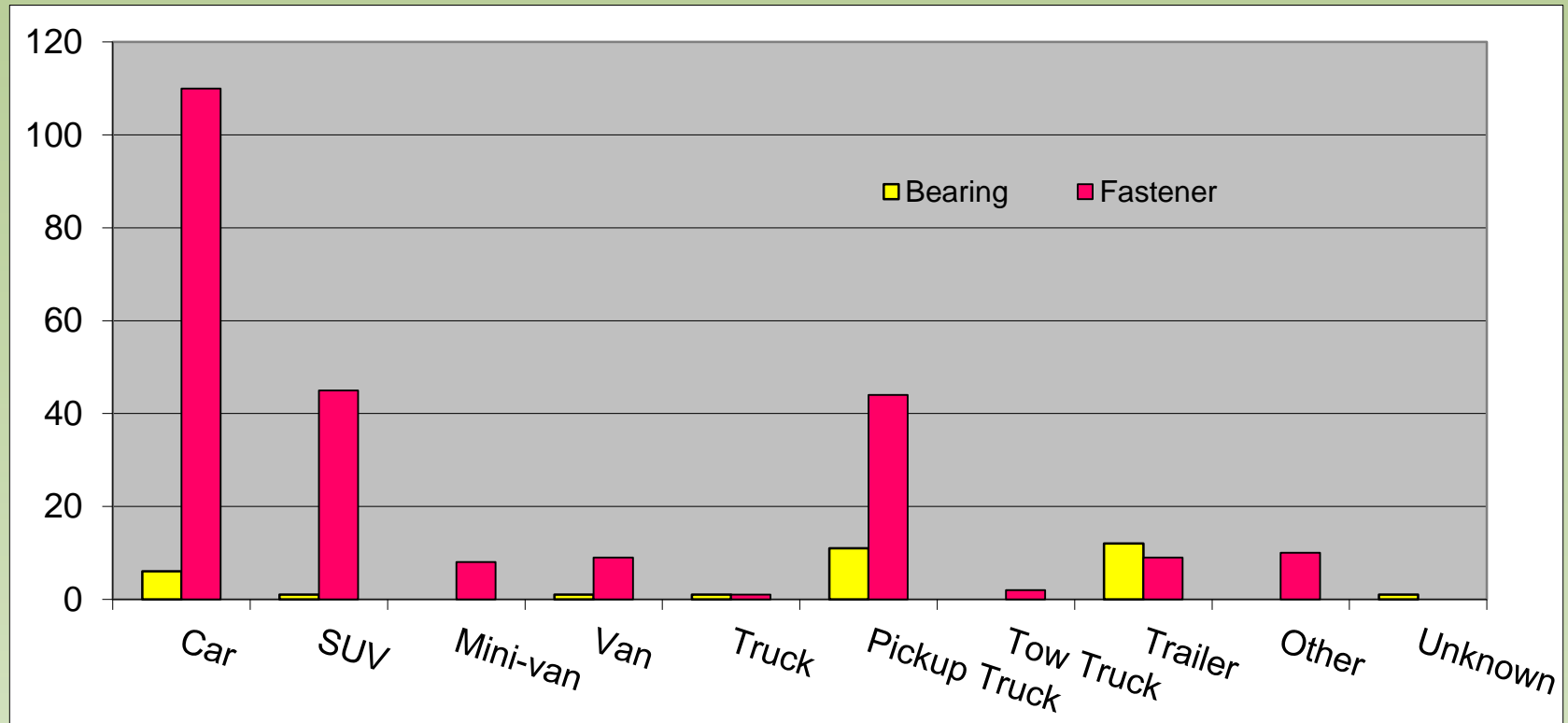
Results

Causes of wheel separation



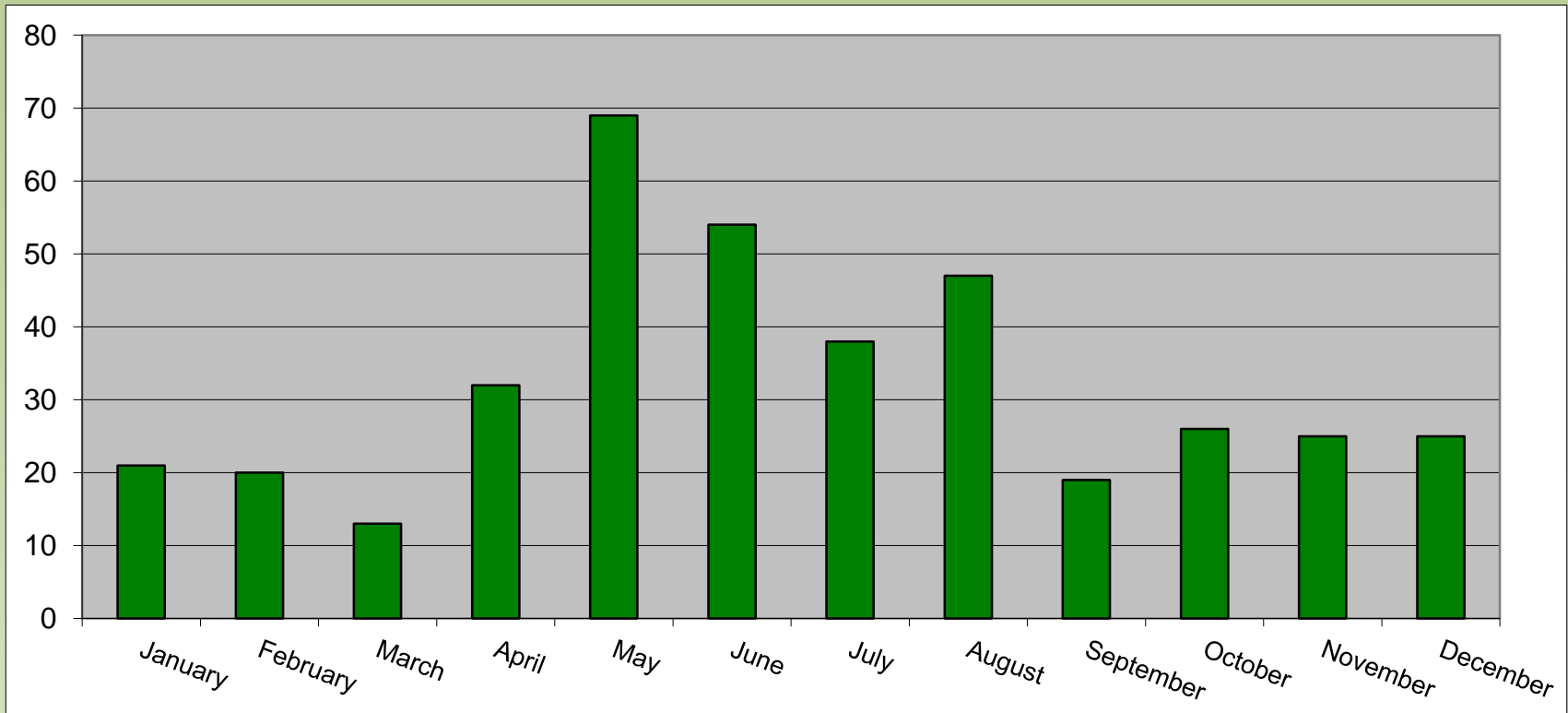
Results

Bearing versus fastener by vehicle type



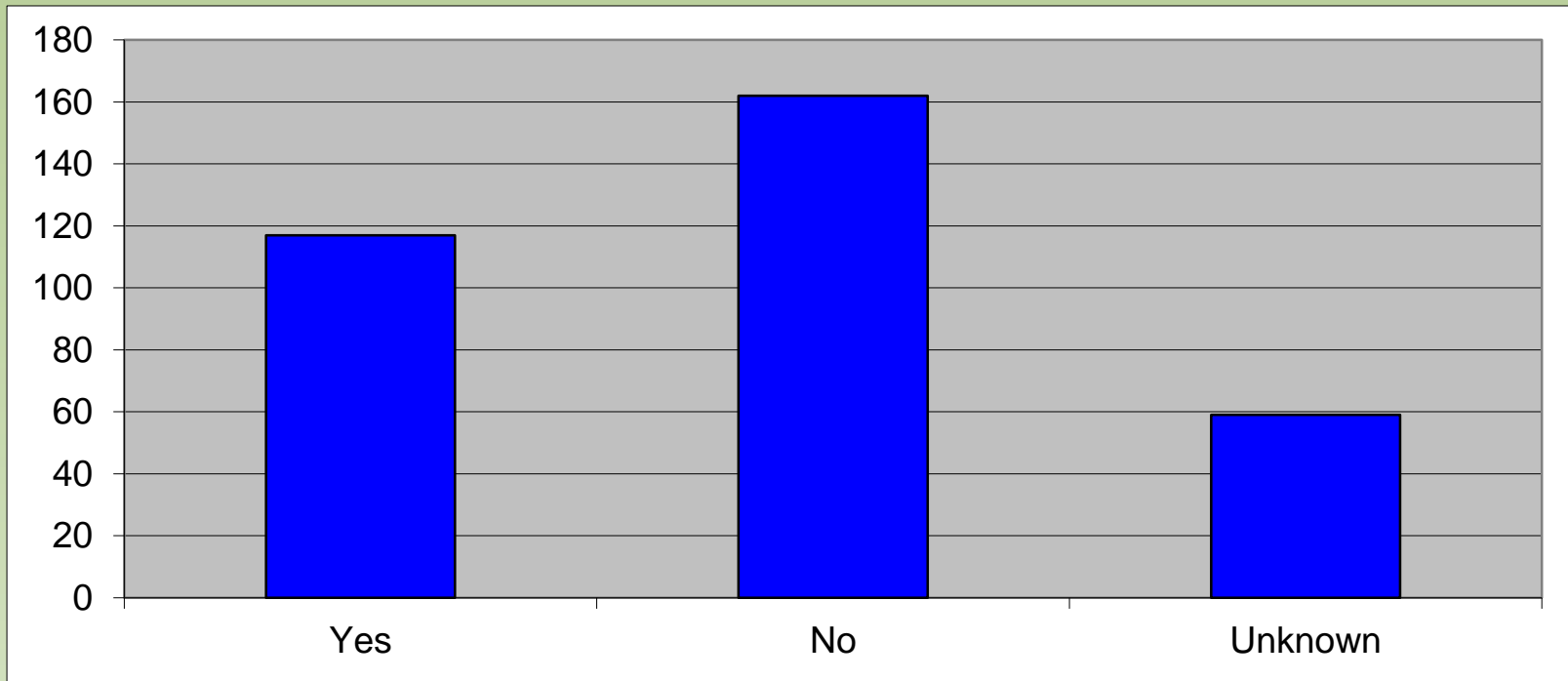
Results

Month of wheel separation occurrence



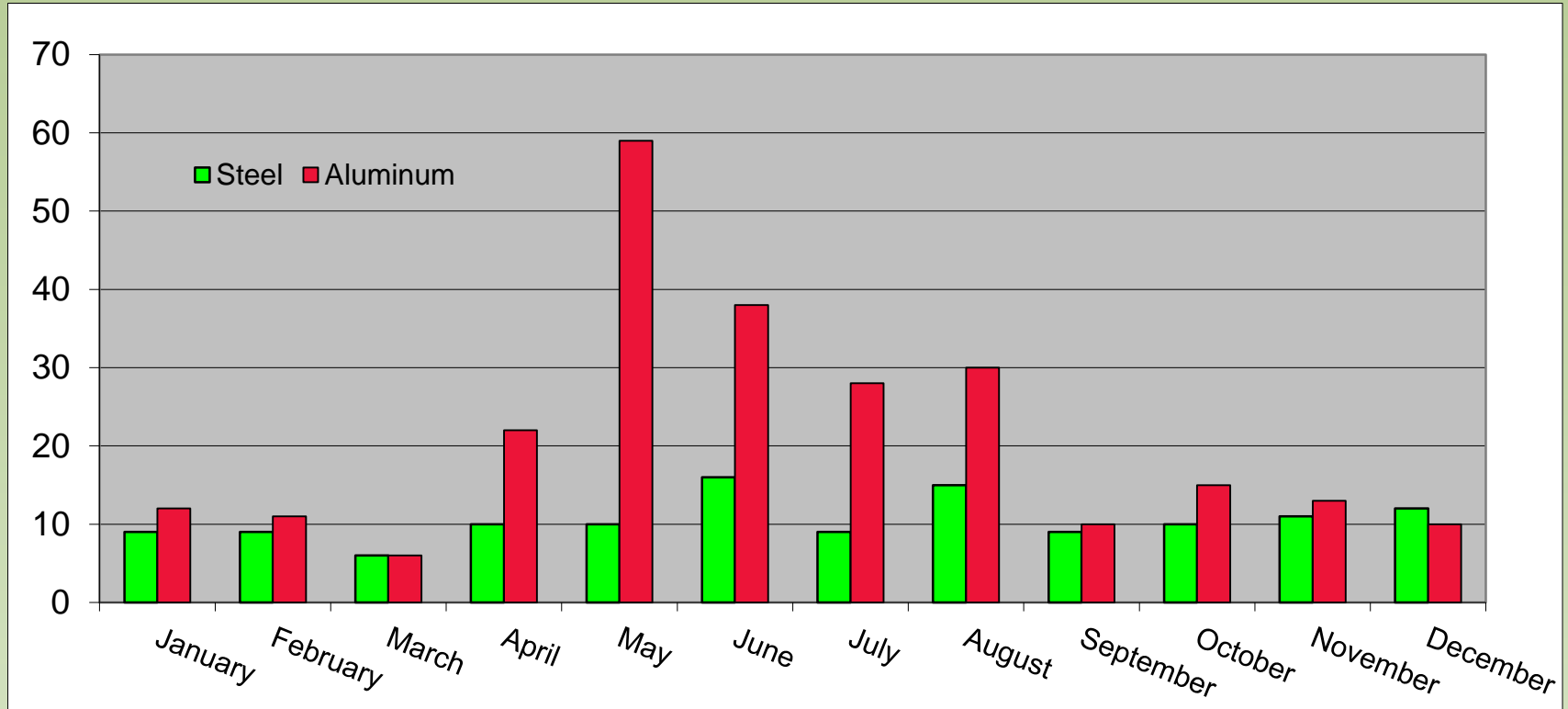
Results

Did wheel separation follow a seasonal tire change?



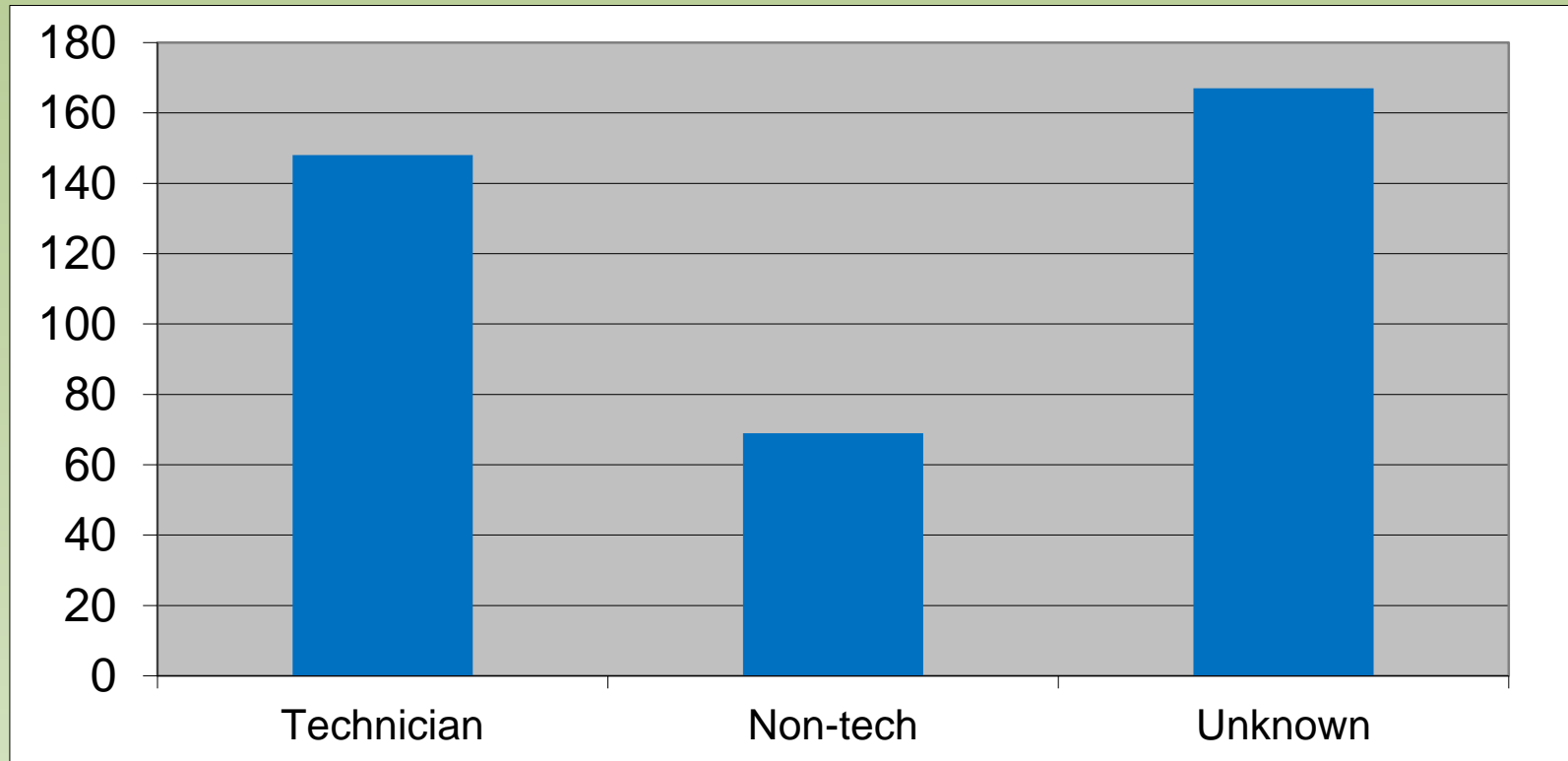
Results

Wheel Composition by Month of Separation



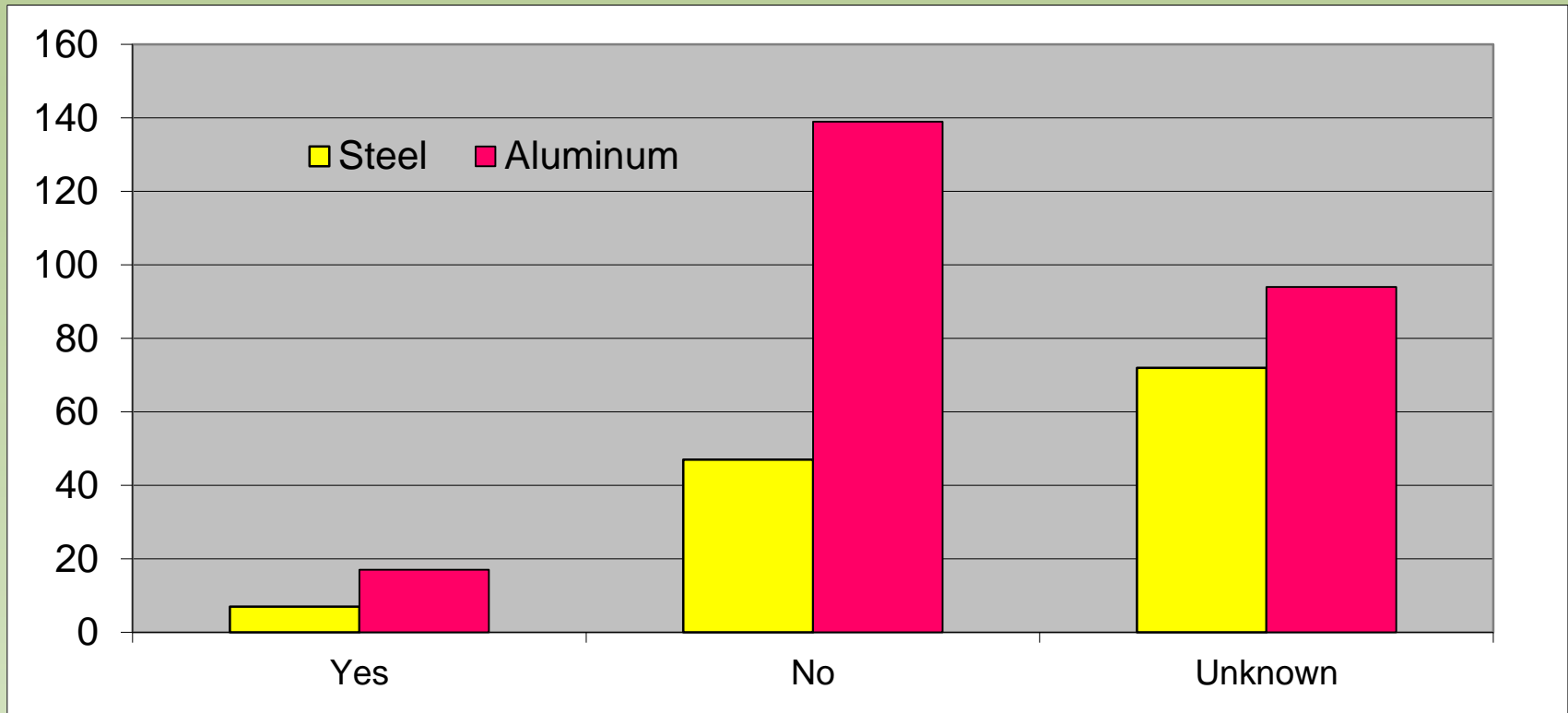
Results

Qualification of wheel installer prior to separation



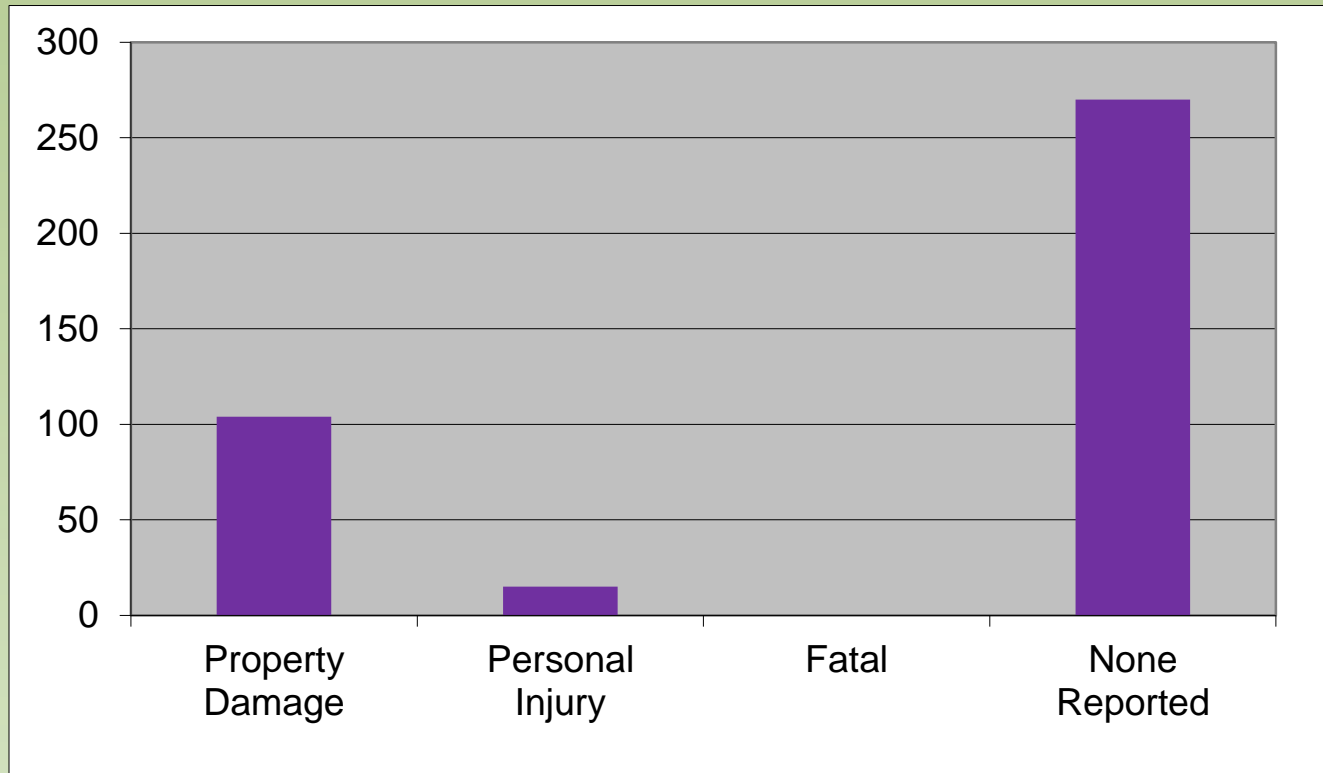
Results

Torque check performed prior to wheel separation?



Results

Damage caused by wheel separation



Results

Rim Composition



CONCLUSIONS

- ❖ LDV wheel separations cause property damage & injury; potential for fatalities.
- ❖ increased traffic congestion due to lane and road closures from broken down vehicles
- ❖ serious efforts need to be taken to address wheel separations from light-duty vehicles.

Problems identified:

- (1) Individuals may be unaware of safe wheel installation practices
- (2) Improper torquing of fasteners
- (3) Missed torque checks

Required:

- ❖ Increased awareness & education
- ❖ correct tools
- ❖ knowledge of proper industry practices



INSTALLATION PRACTICES

Sources of information:

- ❖ owner's manuals
- ❖ Dealers

Recognized industry practices:

- ❖ Ensure mating surfaces are clean & corrosion free
- ❖ Centre hub & hub-mating surface – motor oil lightly
- ❖ Ensure that fastener threads are clean
- ❖ Do not lubricate fastener or mating threads
- ❖ Install all rim-to-hub fasteners finger-tight
- ❖ Progressively tighten fasteners in “star” pattern
- ❖ Tighten to vehicle manufacturer-recommended torque
- ❖ Perform torque check(s) as specified by manufacturer



RECOMMENDATIONS

Raise awareness

- frequency & causes of LDV wheel separations
- potential consequences of these events

Educate wheel installers

- consequences of improper wheel installation
- sources of correct wheel installation information

Encourage diligence

Industry standard practices
follow-up with torque checks

Make use of media

- disseminate industry standard wheel maintenance & installation practices
- consequences of ignoring such practices



THANK YOU!



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