

Overview of Volvo/ Mack Technology 6x2 Tractors

Tim LaFon, Vice President Regulatory Affairs
Volvo Group North America
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WHAT I HOPE TO ACCOMPLISH

- Raise level of awareness of the systems
- Provide information on how the Volvo/ Mack 6x2 tractor system works
- Provide information on how to identify 6x2 tractors with self leveling feature
- Identify/ address concerns that you may have regarding the system
- Answer questions that you may have on the system

Volvo appreciates the opportunity to come and share information with the Council of Deputy Ministers and the Task Force

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Why 6x2 configurations are becoming popular

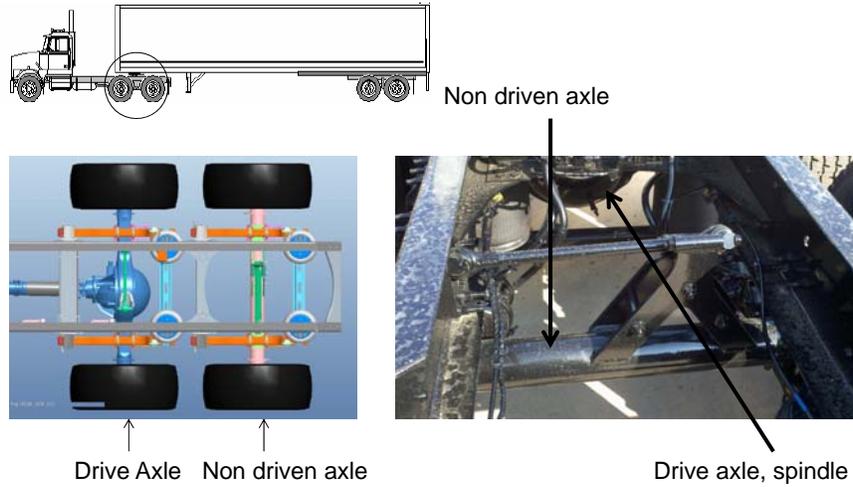
- Weight Savings
- Reduced Maintenance Cost
- Fuel Savings, 2.5 % savings according to the North American Council for Freight Efficiency (NACFE)
- Technology advancements, traction issue resolved

<http://truckingefficiency.org/chassis/6x2-axles>

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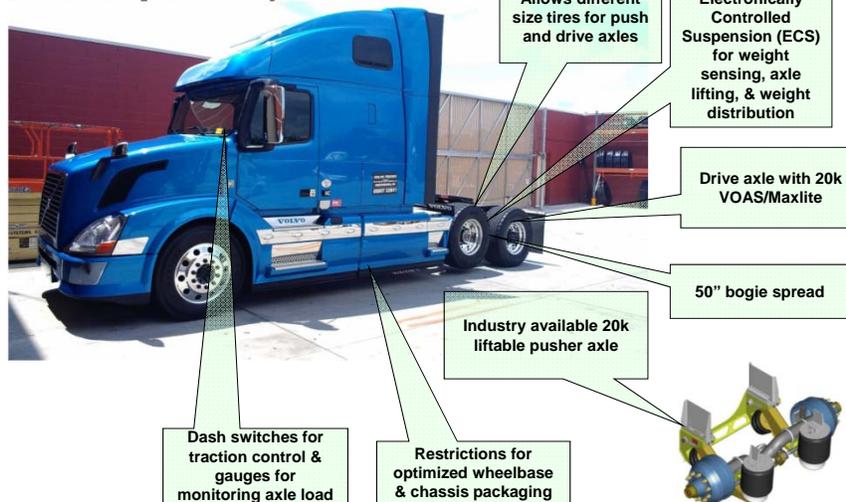
Current Volvo/ Mack 6X2 offering



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Future 6x2 Volvo/ Mack Offering (Under Development)



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How to identify a 6x2, with self leveling feature



Actuator Valves – controls air flow to drive and tag axles

Located inside of frame, driver side frame rail

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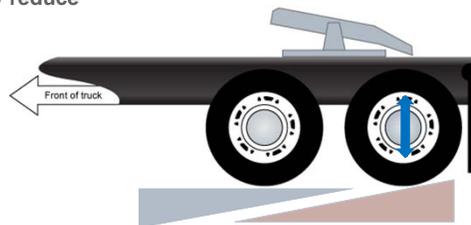
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How the system works

Biased / Dynamic loading

Optimum weight transfer to Front & Drive axle under all load conditions

- improves traction
- prevents wheel slip [dramatically reduce wheel spin]
- improves ride & handling
- improves steering feeling



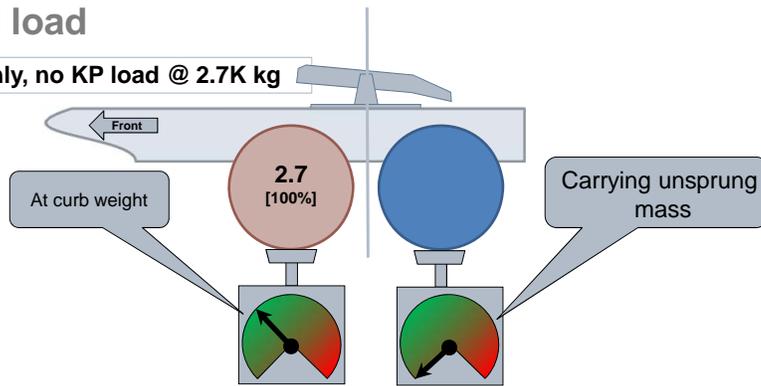
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How the system works

Bobtail load

Chassis only, no KP load @ 2.7K kg



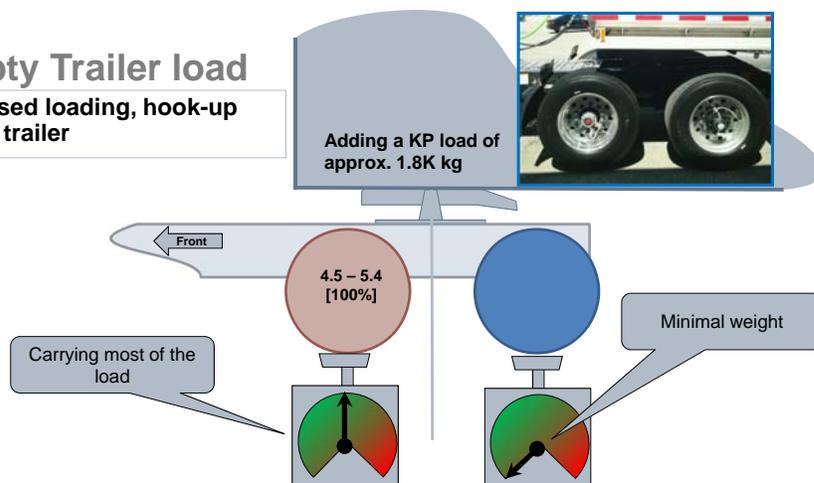
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How the system works

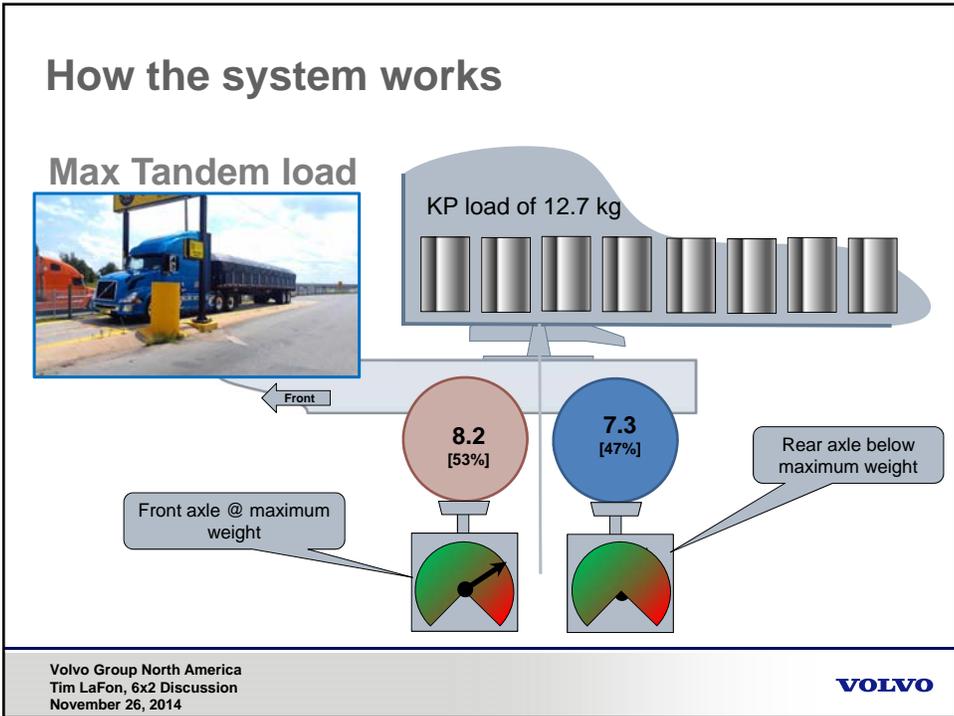
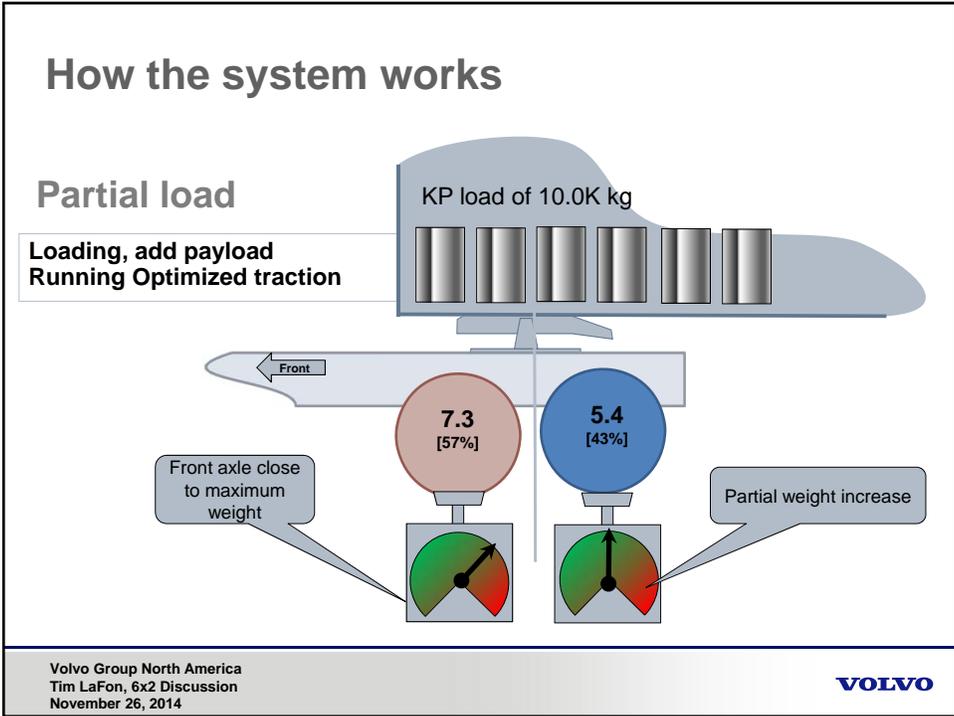
Empty Trailer load

Increased loading, hook-up empty trailer



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Tuning the system

- Available since 2005 – growing in popularity
- Air bag pressure (Volvo working with CVSA)
 - Volvo understands the need for a better understanding of the system
 - Must be able to use tools available to enforcement. Practical solutions that can be used

We are taking action to address this. We are doing studies to address the enforcement concern by adding pressure to make the bag harder, while preserving the benefits of the design

- Weight differential
- Definition
 - Lift axle not lift axle?
 - Tandem Axle?

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Concerns, Air bag

CVSA Working on a Bulletin

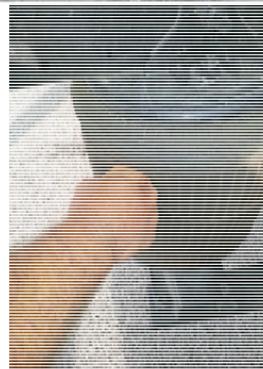
Customer cited for deflated air bags on a 2015 Volvo 6x2 tractor

VIOLATIONS						Trailer was empty
Vio Code	Section	Unit	OOS	Citation #	Verify Crash	Violations Discovered
393.207F	393.207(f)	1	Y		U N	Air suspension pressure loss - #3 AXLE LEFT AND RIGHT SIDE AIR SUSPENSION DEFLATED

§ 393.207: Suspension systems.

(f) Air suspensions. The air pressure regulator valve shall not allow air into the suspension system until at least 55 psi is in the braking system. The vehicle shall be level (not tilting to the left or right). Air leakage shall not be greater than 3 psi in a 5-minute time period when the vehicle's air pressure gauge shows normal operating pressure.

- This is not a safety issue and is by design!
- Air spring will maintain shape but will be soft to the touch.
- Air bags on non-driven axle have minimum pressure when operated without a trailer and empty trailer.



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Concerns, Provincial and State Requirements

- Provinces and States have rules on weight distribution of tandem axles
 - Customers have reported being cited for exceeding the distribution requirements when lightly loaded.

Volvo appreciates the opportunity to better understand the concerns and wants to help address those concerns. Some potential solutions may be

- Provide tractors/ trailers for testing on Canadian roads that are instrumented with strain gauges
- See if a prior test is representative of the configuration

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Other Important Information

- As the load increases, the distribution moves toward a 50/50 split of weight on the driven and non-driven axle.
- This does not result in an overloaded condition if correctly loaded
- Electronically Controlled System (ECS) systems are based on European system designs

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Contact Information

Volvo Group North America Regulatory Affairs

Email: vtna.regulatoryaffairs@volvo.com

Tim LaFon

Office: (336) 393-2233

Mobile: (336) 457-2263

Email: timothy.lafon@volvo.com

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