

POWER OF PARTNERSHIP

2023 DTNA PARTS CONFERENCE

Smooth Rides Save Money:

The relationship between shocks, springs and your customer's budget

Marco Bellesi, Firestone
Mike Pierzynski, Gabriel
David O'Neal, DTNA Parts

DTNAParts™

What is the most frequently replaced part on a truck and trailer?



2% of a truck's annual operating cost is TIRES.

The average cost of a tractor trailer tire is about \$600.

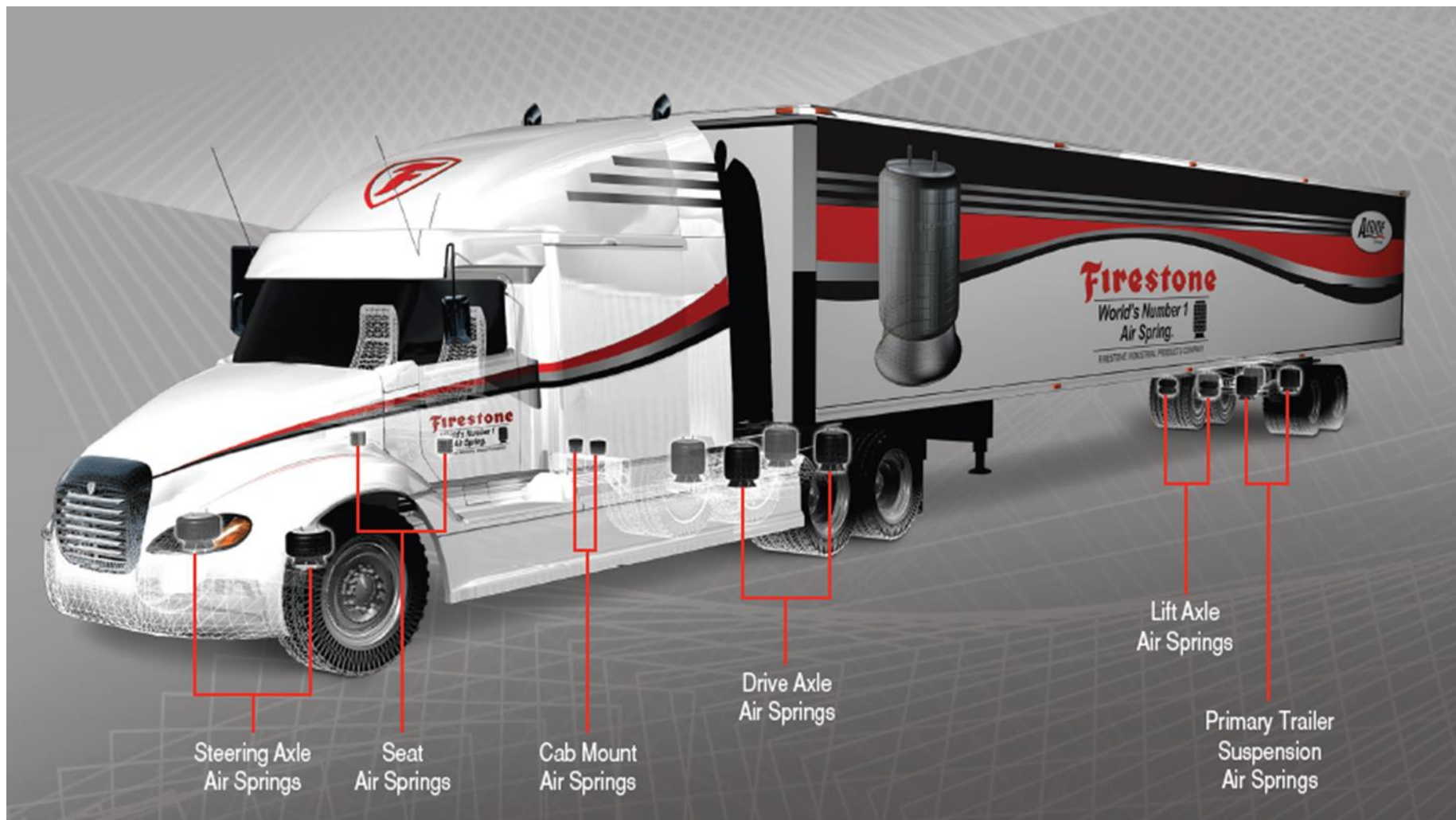
The average cost of a shock and an air spring is about \$130.

FIRESTONE AIR SPRING HISTORY

- Firestone is the pioneer of air spring technology and is a world leader and partner to most names in mobility.
- Patented the world's first Air Spring in 1938 and is currently the largest supplier to the electric vehicle market.
- With more than 80 years of innovation, Firestone continues to lead the path in making mobility more efficient.

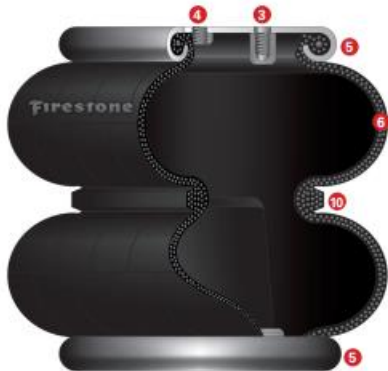


- \$500M Business
- Fully Integrated & Global
 - 6 plants, 5 sales offices, 2 labs
- Share Leaders in Most Applications
- Accelerated Growth





1T Reversible Sleeve Example



Double Convoluted Example

1. Stud

A permanent part of the bead plate assembly, used to attach the air spring to the suspension.

2. Combo Stud

Combination mounting stud and air fitting.

3. Blind Nut

A permanent part of the bead plate assembly, used to attach the air spring to the suspension.

4. Air Fitting Hole

A tapped hole that provides an air entrance for the part.

5. Bead Plate

Steel plate, permanently crimped to the bellows to form an airtight assembly.

6. Bellows

The air spring bellows is a flexible, airtight composite of rubber and reinforced fabric, which allows the assembly to roll up and down, providing an air-cushioned spring effect within the suspension.

7. Bumper (Optional)

A solid, molded rubber fail-safe device used on many suspension applications. Prevents excessive damage to vehicle and suspension in the case of sudden air pressure loss.

8. Piston

The lower section of the 1T and 1X style of air spring made from aluminum, steel, or fiber reinforced composite. Provides lower mounting arrangement for the air spring in the form of tapped holes or studs.

9. Piston Bolt

Attaches the piston to the bellows assembly. Extended on the bottom of the piston, in some cases, to serve as a means of attaching the spring to the suspension.

10. Girdle Hoop

A ring molded into the bellows of the convoluted type air spring.

ASSEMBLY ORDER NUMBER & BELLOWS NUMBER



W01-358-9082

Assembly Order Number (AON)

1T15M6
or
1T15 Series
C013582149

Bellows Number

1T spring shown.

To identify an Airide spring for replacement, find the Assembly Order Number (AON) on the label adhered to the bead plate (e.g., W01-358-9082). This number is used for ordering purposes. Do not confuse this with the stamped 8-digit bead plate number. See page references below for detailed instructions on identifying your air spring.

For 1T and Convoluted springs, the bellows number is typically molded directly underneath the Firestone logo and tells exactly which bellows is needed.

1T spring samples:	Convoluted spring samples:
<ul style="list-style-type: none"> • 1T15M6 or 1T19L7 • 1T15 Series, C013582149 	<ul style="list-style-type: none"> • 113, 20, or 312

This number will help narrow your choice of assemblies to just a few.

Start by identifying your style of air spring by comparing to the illustrations below. Then, go to the appropriate section of this guide or the cross references for more information on determining the corresponding order numbers.

AIR SPRING STYLES



1T REVERSIBLE SLEEVE

PRIMARY TRUCK & TRAILER AXLE
PAGE 10



CONVOLUTED

AUXILIARY / TAG AXLE
PAGE 94



SLEEVE

CAB & SEAT
PAGE 128



SLEEVE

STEERING AXLE
PAGE 148

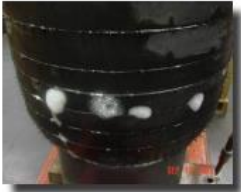
Want an online resource for air spring identification? Visit:
firestoneip.com/product-search
to use our online air spring identification tool.



- Balances the load of the truck and trailer
- Bellow extends and contracts based on the load and its movement
- Works in tandem with the shock to keep tires on the road and the ride smooth.

Did you know?

Air springs should be inflated to a minimum of 10 PSI.



Soap Test



Cracking



Over Extension

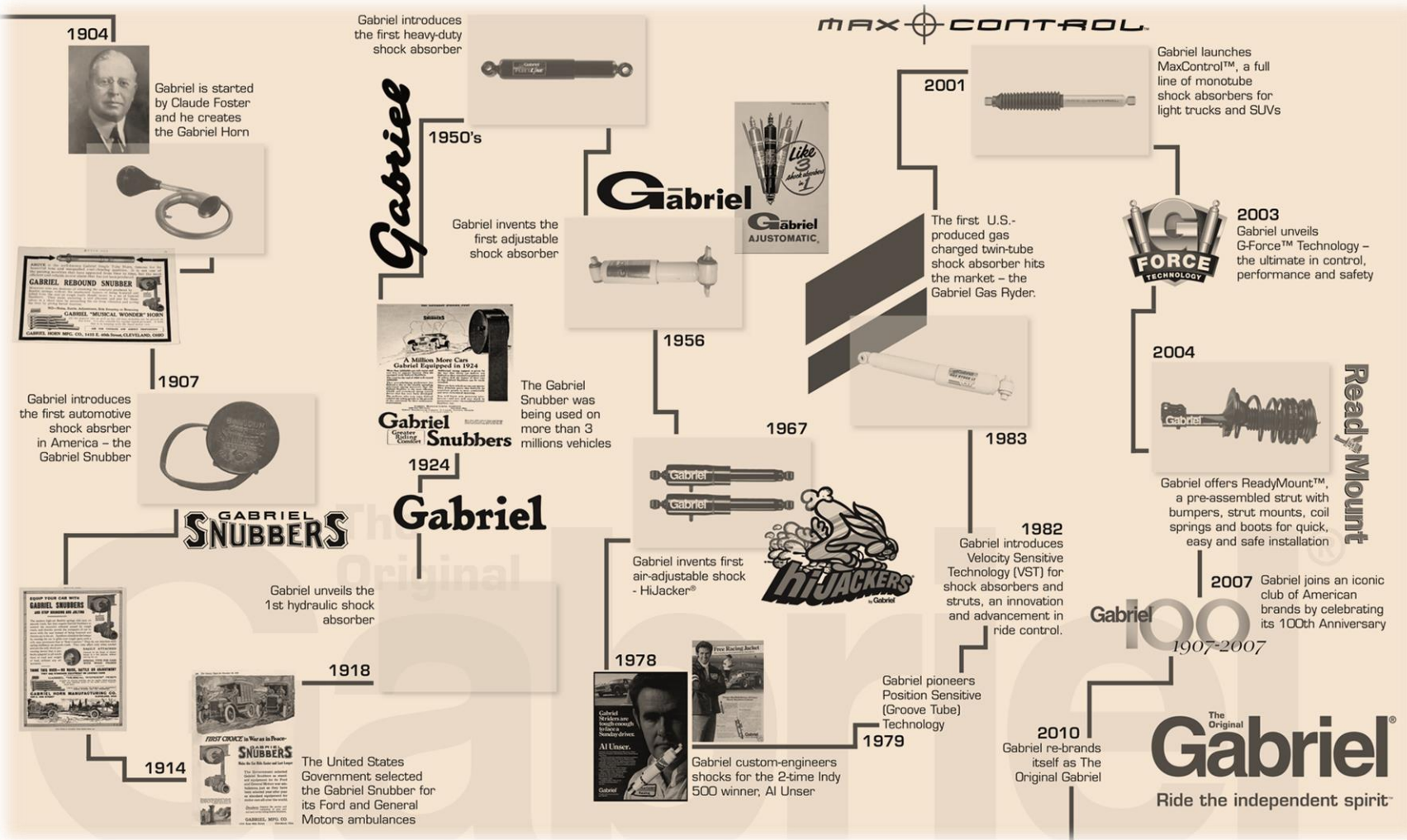


Trapped Debris

- Inspect every 50k miles or bi-annually
- Look for cuts, nicks, deformities or rubs
- Clean with soapy water and look for bubbles
- Check both sides of the truck to make sure the air springs are from the same manufacturer.

Why is this important?

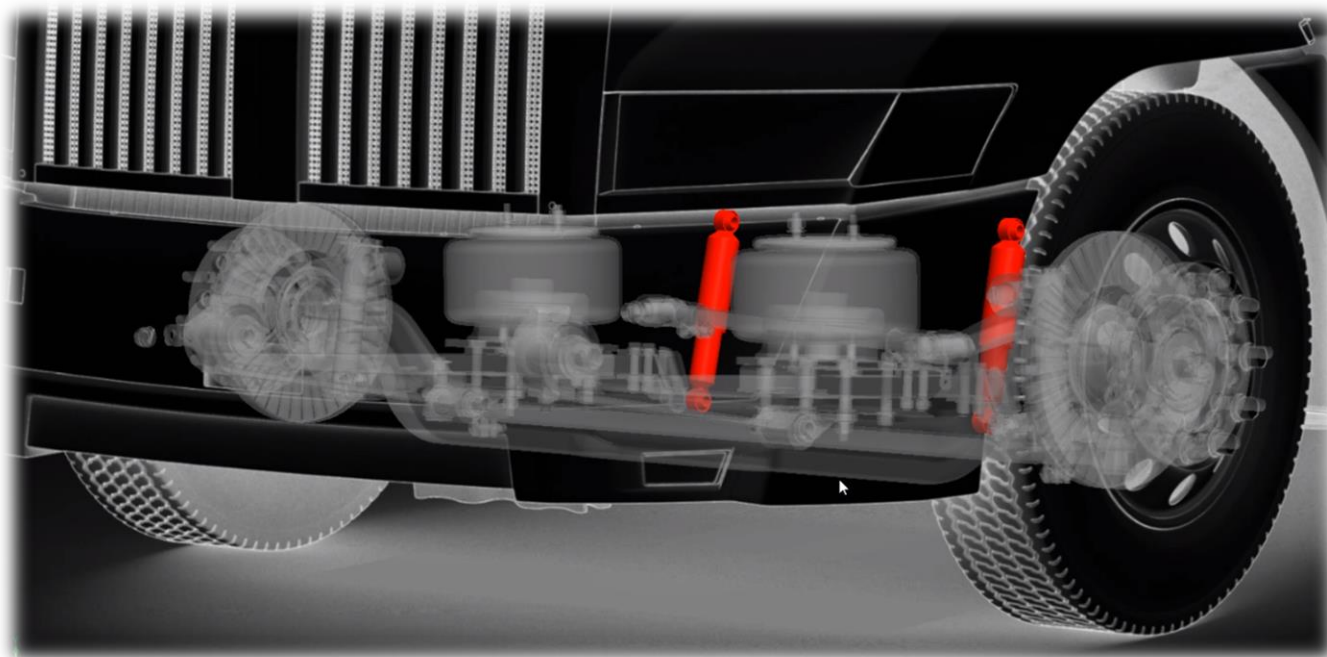
A problem with an air spring can lead to other more costly issues with suspension systems.



Gabriel began in 1907 and has a long history of proven performance.

That's 116 years of strength, product innovation & continuous improvement!

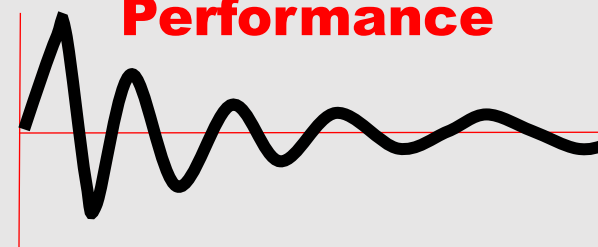
A shock absorber is a velocity sensitive device which restricts and/or limits movement by converting *mechanical energy received from the suspension into heat energy*, which is in turn absorbed by the oil and then dissipated into the atmosphere.



Did you know?

96% of new trailer builds ride on Gabriel shocks
1 out of every 2 new commercial vehicles ride on Gabriel shocks

Performance



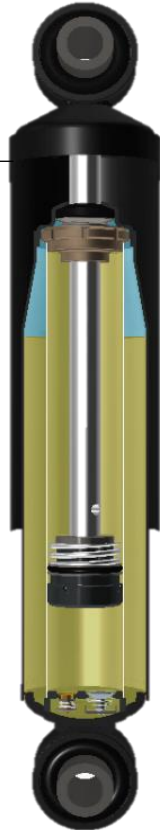
How is heat dissipated from a shock absorber?

3 Types of Shocks

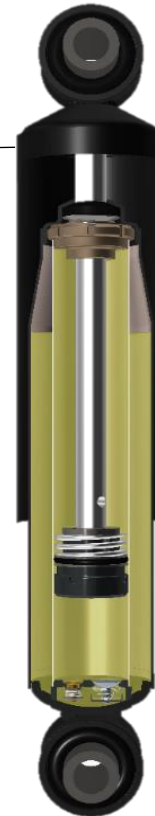
- Gas-charging is common for cars & light duty truck shocks, but Commercial Vehicles (CV) have very different performance requirements from automotive
- CV OEM's and their engineers consistently choose hydraulic (non-gas) shocks for OE installation

Gas-charged

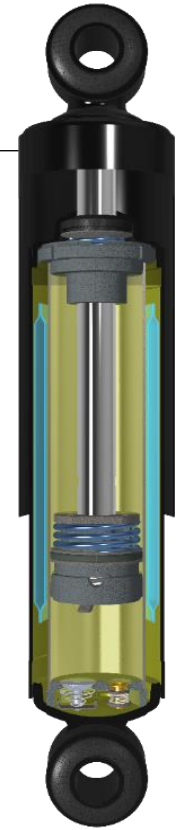
Competitor



Hydraulic



Gas Cell



FOR BEST PERFORMANCE!

Alliance

- Cab, Truck & Trailer Shocks
- Hydraulic or Gas-Charged
- 1yr/100,000 mile warranty



FLEETLINE

- Cab, Truck & Trailer Shocks
- Hydraulic
- 1yr/100,000 mile warranty



GasSLX

- 3 Position Adjustability
- HT Oil and Gas Cell
- 2yr/200,000 mile warranty



\$AVINGS

- Protect tires from cupping
- Protect air-springs from pulling apart & excess wear
- Reduces vibration of expensive components

SAFETY

- Helps with braking effectiveness by keeping your tires on the road
- Improves vehicle handling
- Controls the transfer of weight

COMFORT

- Improves driver comfort for better driver retention



How do I know if a shock is bad?

Visual Inspection



Bent or dented



Upper or lower
mount broken



Upper or lower
bushing torn



Broken internally
or jammed in
collapsed position



Improper
installation



Dust tube
torn



Truck mount
failure

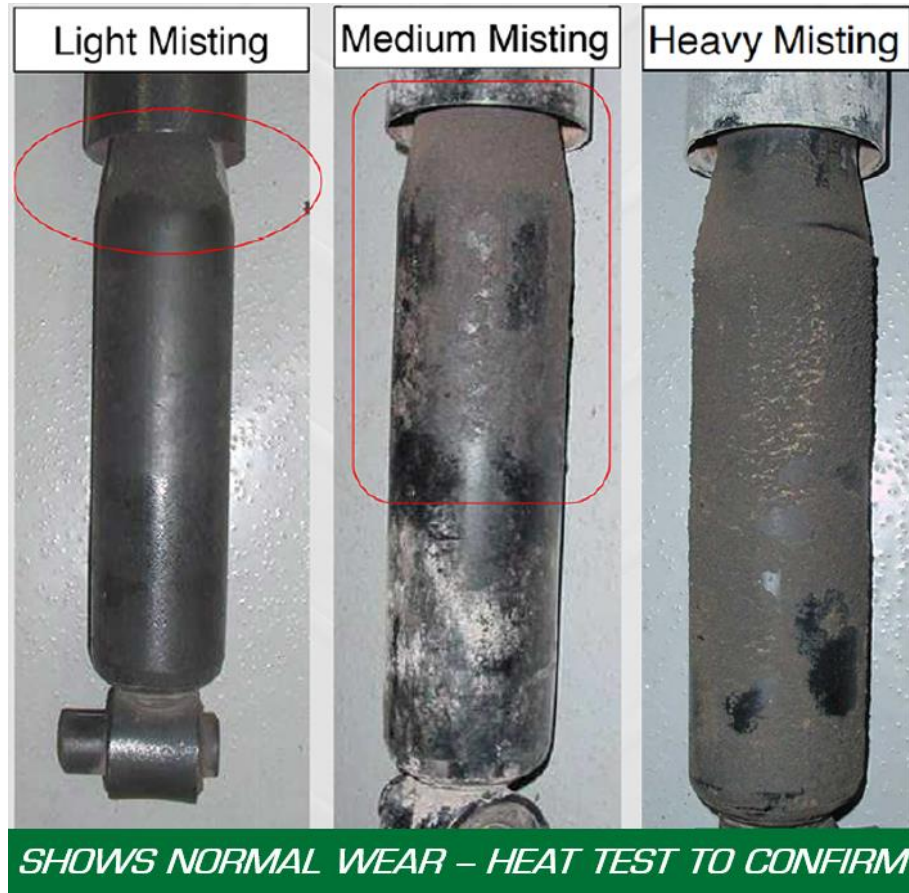


Leaking

Did you know?

Shocks are the most overlooked replacement part because they gradually wear out over time.

Misting versus Leaking: Can you tell the difference?



A shock doesn't have to look bad to be bad.

- When a shock has worn out internally, it is visually undetectable
- Shocks generate heat when working, so the shock body should be slightly warm to hot after normal use



Gabriel Heat Test:

1. Drive the vehicle for at least 15 minutes.

2. Within five minutes after parking, establish a reference temperature of the vehicle chassis frame using an infrared thermometer gun.

Next, check the temperature of the shock absorber body **below the dust tube** (about 1" from the bottom cap: see photo).

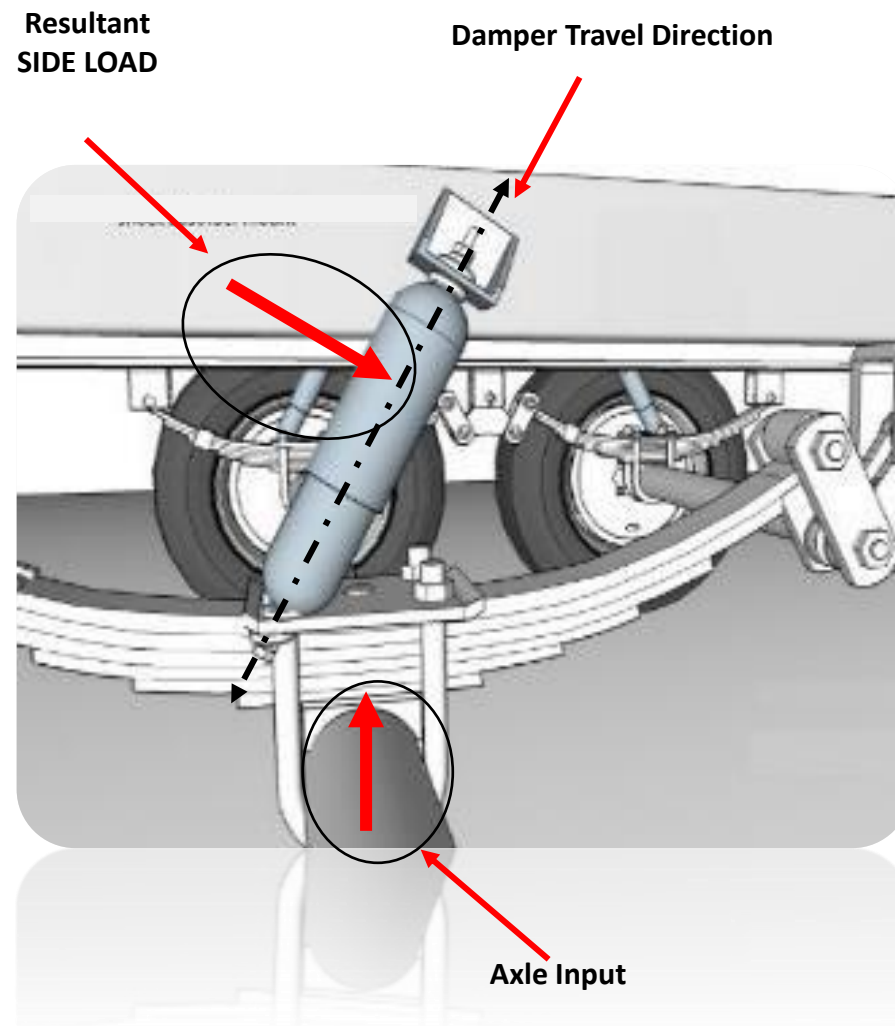
WARNING: DO NOT touch the shock as it may be hot and could cause a burn injury – an infrared thermometer gun or similar measuring device is recommended.

3. All shock absorbers should be warmer than the chassis.

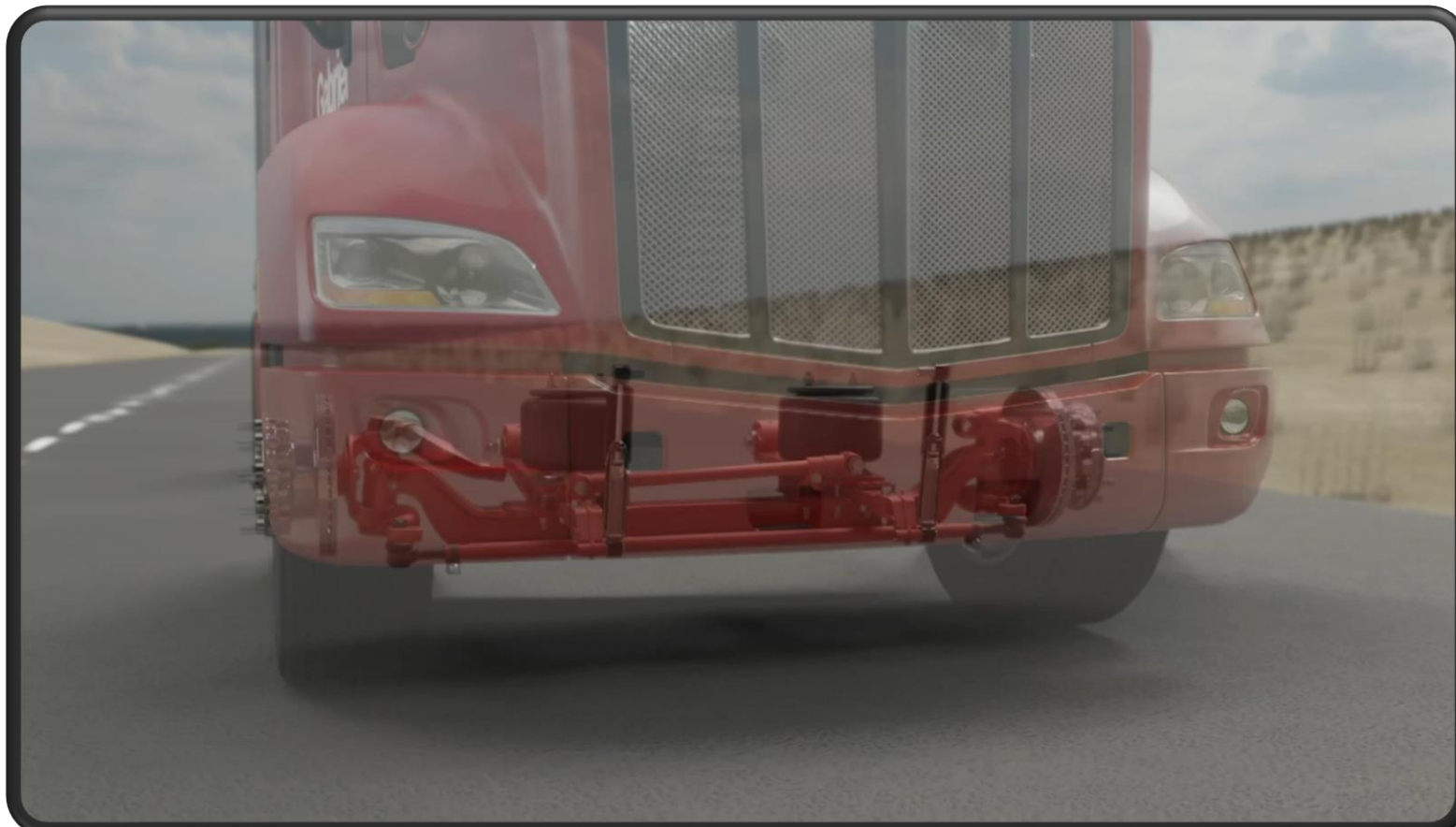
Suspect a failure in any shock absorber that is noticeably cooler than its mate on the other end of the axle.

If it's COLD, it's OLD!

- High operating temperatures
- Corroded/pitted piston rod
- Excessive Side-loads (*see illustration*)
- Improperly installed bushings
- Loose dust tube
- Improper ride height
- Poorly maintained air springs



Shocks & Springs in Tandem



Shocks & Air Springs work together & WEAR TOGETHER!

A customer comes into your shop with this:



Explain to them:

- Air spring damage can be caused by a bad shock - or has caused shock damage
- An air spring that has hyper-extended did so WITH the nearest shock
- Since shocks & air springs work together, only replacing the air spring does *not* solve the problem
- Replacing only the air spring will result in premature wear from worn shocks (and possibly warranty replacement in the future!)

Recommendation: Ask for the sale, sell a shock with an air spring!



Did you know?

Every spring you sell without a shock is a lost sale.

**Selling Tip:
Bag Tags**



POWER OF PARTNERSHIP
2023 DTNA PARTNERSHIP

Worn Shocks = Wheel Bounce



A customer rolls into your shop with these:

Explain to them:

- How worn shocks cause tire cupping because of wheel bounce
- Worn shocks will continue to cause cupping, even on their brand new tires!
- **TMC Recommended Practice** says "Fleets have found it beneficial to install new shocks when installing new tires to maximize tire life."



Recommendation: Ask for the sale!



While a customer's vehicle is in for maintenance

to replace other nearby suspension components, such as:

- Bushings, King Pins, Shackles, Steering components or Alignments

Explain to them:

- Let them know that your shop offers **COMPLETE SUSPENSION JOBS** for total satisfaction, instead of replacing only some worn components that will likely lead to less-than-desirable results, like early wear or failures on the replacement parts they just purchased.

Then recommend to them:



When a customer comes to the front counter with a torn air spring, how would you suggest adding shocks to the sale?

What are three benefits of riding with new shocks and springs?

Why should you recommend a customer replace both the left and right air spring and shocks at the same time?

What is the greatest single expense for truck owners?

What is the last line of protection for an air spring when a truck hits a bump in the road?

What is the recommended minimum PSI for an air spring?

What are some visual cues that a shock needs to be replaced?

How often should
air springs be inspected?



**OK, your turn.
Questions?**

A customer comes into the dealership with a torn air spring.

He's complaining that his back hurts and he's late for traffic court because he ran a traffic light in his truck.

What do you do?

- **WIIFM: Safety, Savings, Comfort**
- Air Springs and Shocks work together to save tires
 - Tire \$600.00, Shock and Air Spring \$130.00
- Air Spring Maintenance: 50k Miles / 6 Months
- Leaking or damaged shocks: REPLACE
 - Heat test can identify bad shocks
- Shocks are the last line of defense to prevent Air Spring damage.
- Always sell shocks with air springs
- Air Springs and Shocks should be sold by axle, 2 shocks, 2 air springs.

If you'd like to reach out to any of our presenters:

Gabriel: Mike Pierzynski - michael.pierzynski@gabriel.com

Firestone: Marco Bellesi - BellesiMarco@fsip.com

DTNA Parts: David O'Neal – david.oneal@daimlertruck.com