# EMERGENCY VEHICLE OPERATOR

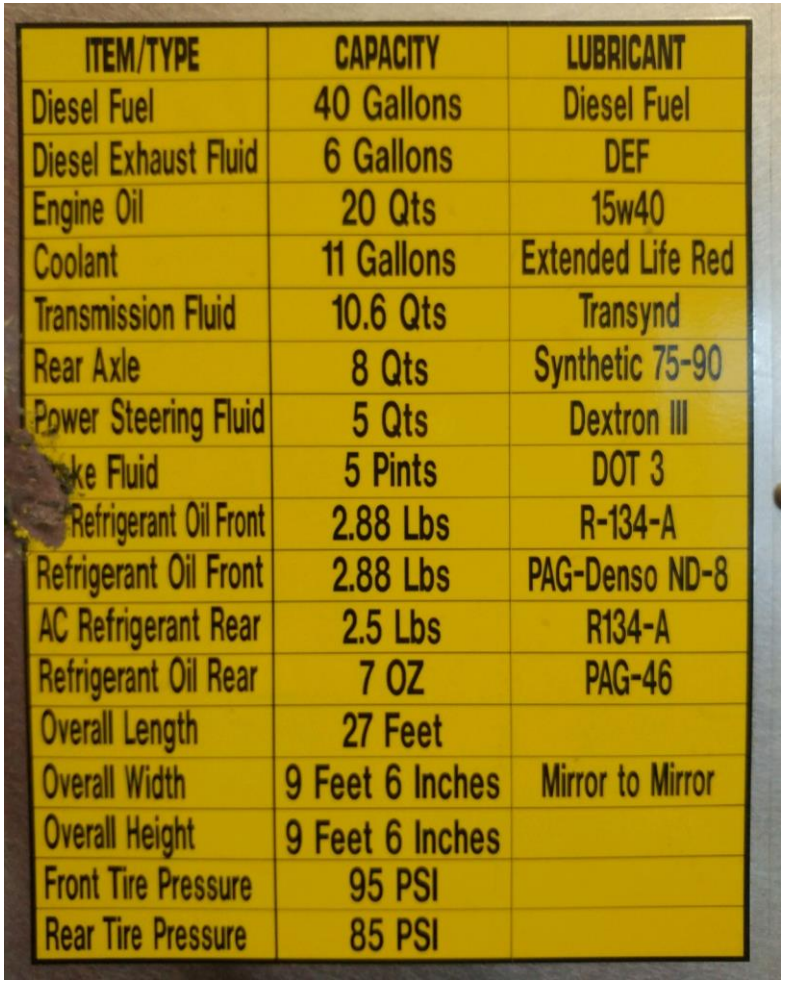
*Pre-Trip Inspection Reference Guide*

# Definitions

- DOT – Department of Transportation – Federal agency that regulates motor vehicles
- CMF – MCFRS Central Maintenance Facility
- Leakage
  - Class 1:  seepage of fluid; not enough to form drops
  - Class 2:  leakage great enough to form drops; drops do not drip
  - Class 3:  leakage great enough for drops to drip
- Operational Test: A test to determine the operational readiness of a component on a fire apparatus by observing the actual operation of the component.

# Vehicle Data Plate

- ✓Each apparatus should have a manufacturer's data plate in the cab
- ✓Information may differ from the information found on the chassis data plate on the door frame
  - ○Manufacturer's data plate reflects final completed "as built" vehicle
  - ○Chassis data plate reflects just the chassis information prior to body installation or customization
- ✓Use the manufacturer's plate as the reference for the finished vehicle



| ITEM/TYPE | CAPACITY | LUBRICANT |
|---|---|---|
| Diesel Fuel | 40 Gallons | Diesel Fuel |
| Diesel Exhaust Fluid | 6 Gallons | DEF |
| Engine Oil | 20 Qts | 15w40 |
| Coolant | 11 Gallons | Extended Life Red |
| Transmission Fluid | 10.6 Qts | Transynd |
| Rear Axle | 8 Qts | Synthetic 75-90 |
| Power Steering Fluid | 5 Qts | Dextron III |
| ke Fluid | 5 Pints | DOT 3 |
| Refrigerant Oil Front | 2.88 Lbs | R-134-A |
| Refrigerant Oil Front | 2.88 Lbs | PAG-Denso ND-8 |
| AC Refrigerant Rear | 2.5 Lbs | R134-A |
| Refrigerant Oil Rear | 7 OZ | PAG-46 |
| Overall Length | 27 Feet | |
| Overall Width | 9 Feet 6 Inches | Mirror to Mirror |
| Overall Height | 9 Feet 6 Inches | |
| Front Tire Pressure | 95 PSI | |
| Rear Tire Pressure | 85 PSI | |

# Step to an Inspection

1. Prior PM records
2. Vehicle overview
3. Walk around check
4. Engine compartment
5. Cab area
6. Undercarriage check
7. Compartment equipment check
8. Functional test
9. Complete inspection documentation

*The key is to develop a consistent and logical approach to avoid missing components or systems.

# Walk Around
## Front

Look for:

- ✓ Leaning
- ✓ Loose or damaged components
- ✓ Previously unreported damage
- ✓ Wires, leaks, or components hanging below

# Walk Around
## Sides

- ✓ Inspect entire side bumper to bumper
- ✓ Leaning – rear suspension raised?
- ✓ Assure that all doors close and latch securely
- ✓ Previously unreported damage

# Walk Around
## Rear

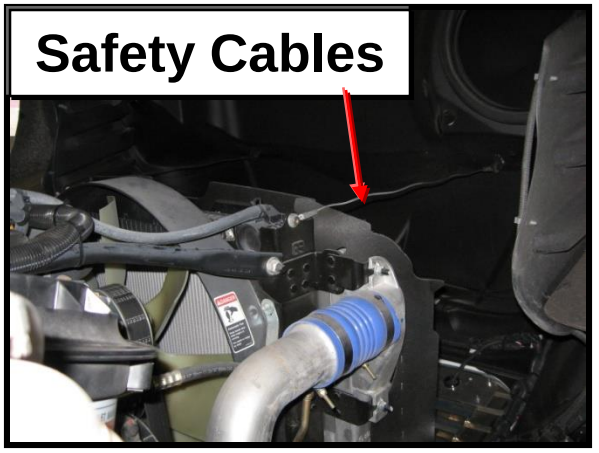
- ✓ Inspect rear body
- ✓ Previously unreported damage
- ✓ Hanging or broken wires and fluid leaks
- ✓ Leaning, which indicates broken or weak suspension
- ✓ Automatic snow chains
- ✓ Objects on rear bumper
- ✓ Rear door latches
- ✓ Rear step folded down

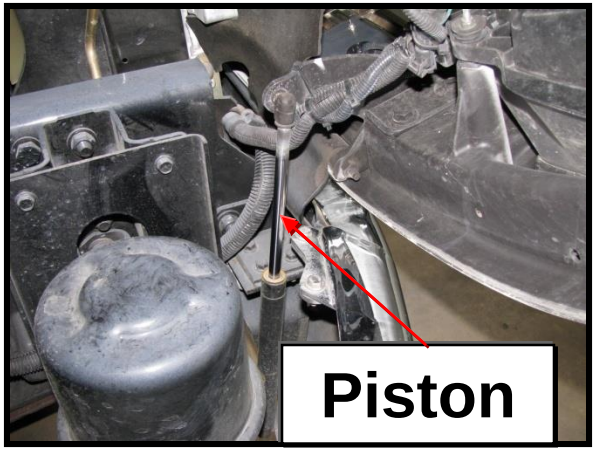
# Engine Compartment

- ✓Unlatch hood latches; check for damage and function
- ✓Open hood and verify cables are holding the hood
- ✓Begin check on the curb side and work counterclockwise around the motor

# Engine Compartment
## Hood Safety Cables

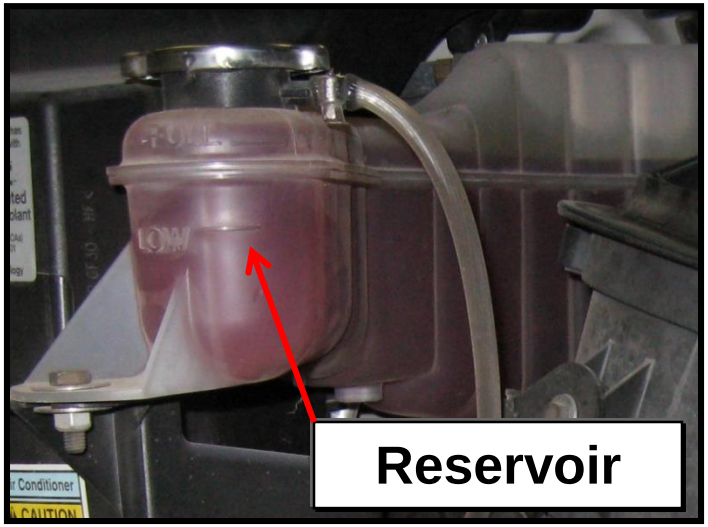
- ✓ Safety cables intact with no missing parts
- ✓ Pneumatic gas piston assists with raising and lowering hood

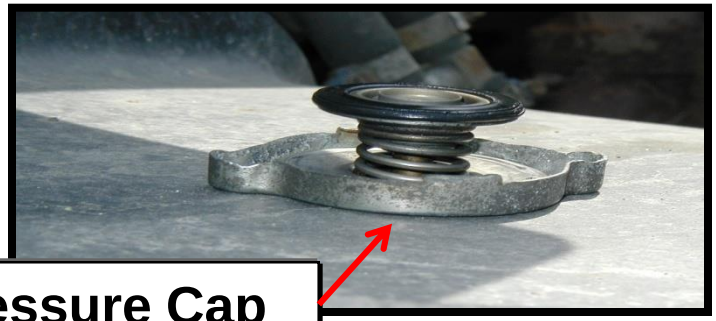


# Engine Compartment
## Radiator Reservoir

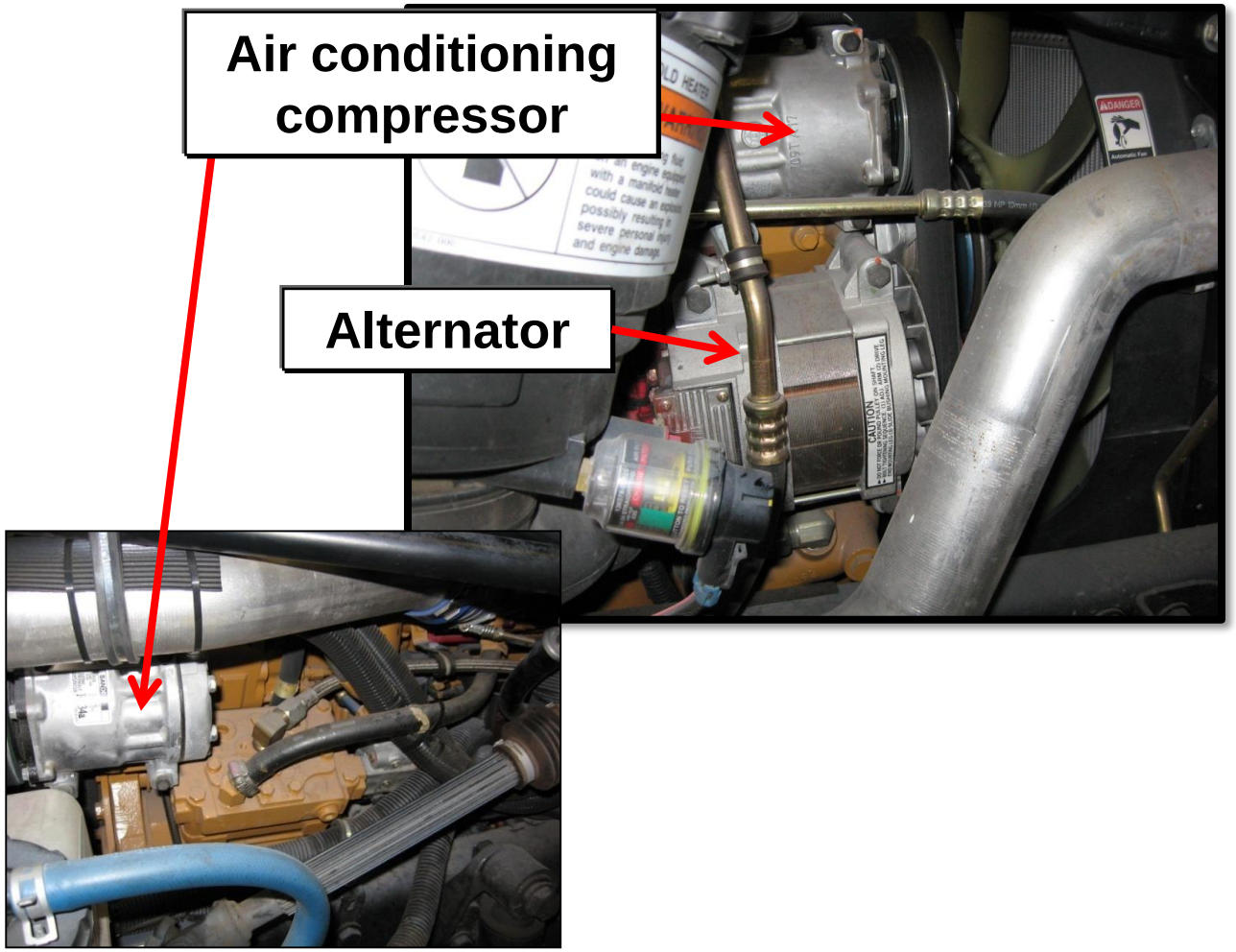
- ✓Unit securely mounted
- ✓Unit is not leaking
- ✓Filled to proper level
  - Note there are different levels for hot and cold
- ✓Proper cap
- ✓Check all hoses
  - Secure, no leaks, no large cracks or tears



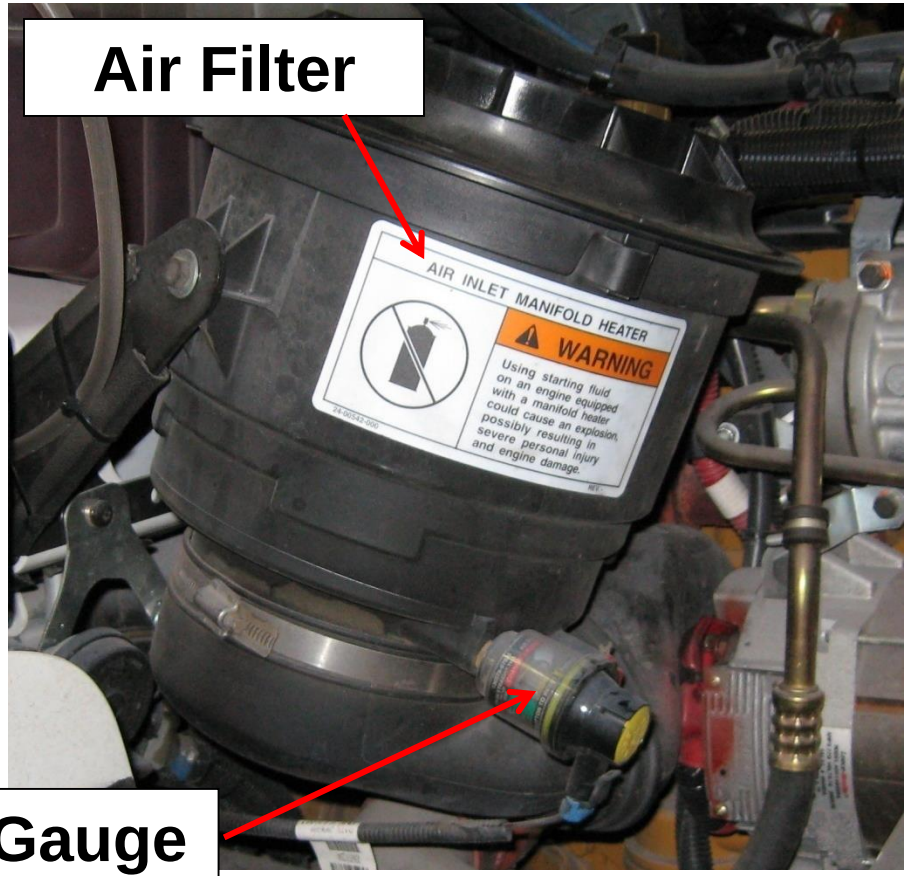
# Engine Compartment
## Alternator & AC Compressors

- ✓ Unit is securely mounted
- ✓ Belt is not frayed, cut or broken
- ✓ Belt has no more than ¾ inch deflection
- ✓ Electrical connections are not loose, frayed or broken



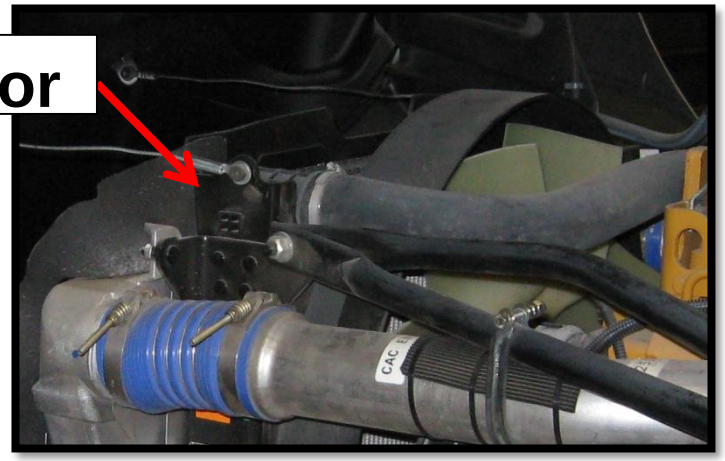
# Engine Compartment
## Air Filter

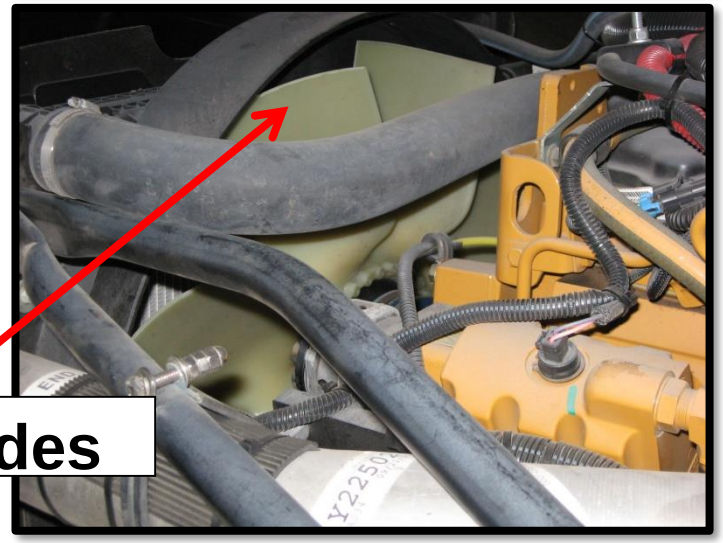
- ✓ Air filter is securely mounted
- ✓ Air restriction gauge in the green
  - Obstructed filter would indicate red



# Engine Compartment
## Radiator & Fan

- ✓Radiator secure and not leaking
- ✓Hoses secure, not leaking, no damage
- ✓All fan blades present & not broken



# Engine Compartment
## Water Pump

- Water pump location may vary
  - Look for hoses that circulate water
  - Belt driven

✓Check condition of hoses

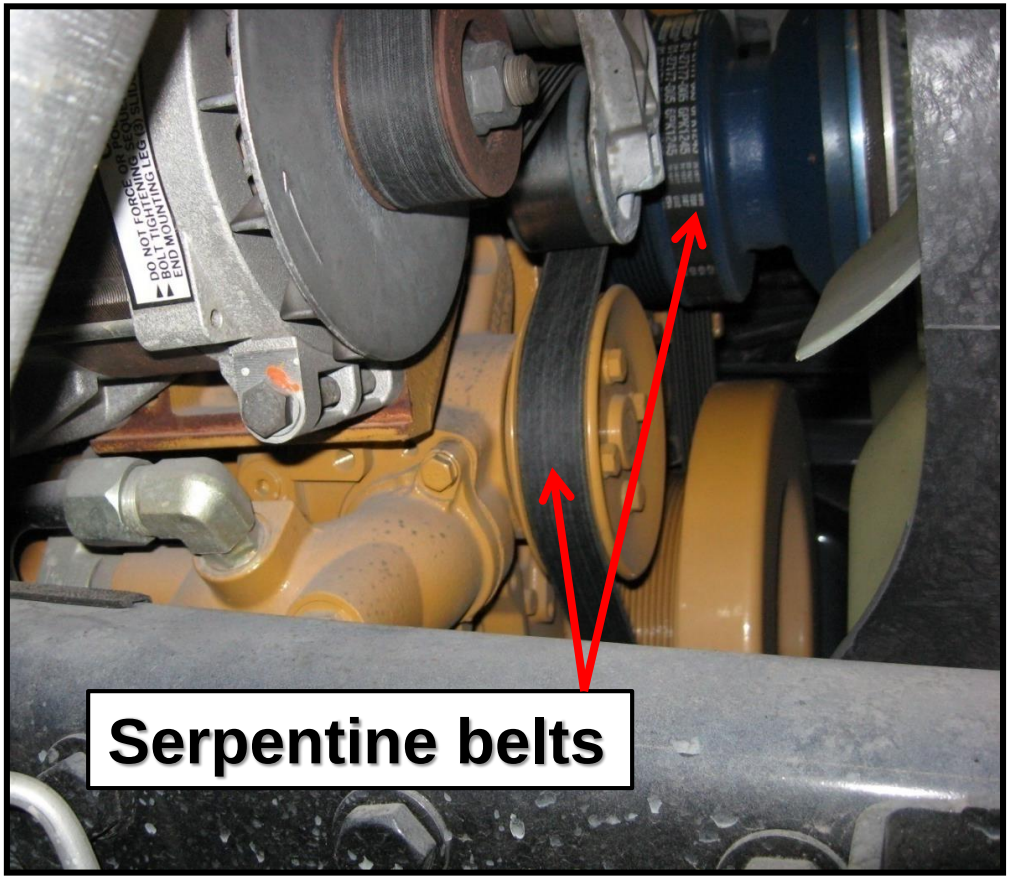
✓Ensure hoses are securely connected

✓No obvious leaks

✓Most obvious sign of defect is the motor overheating

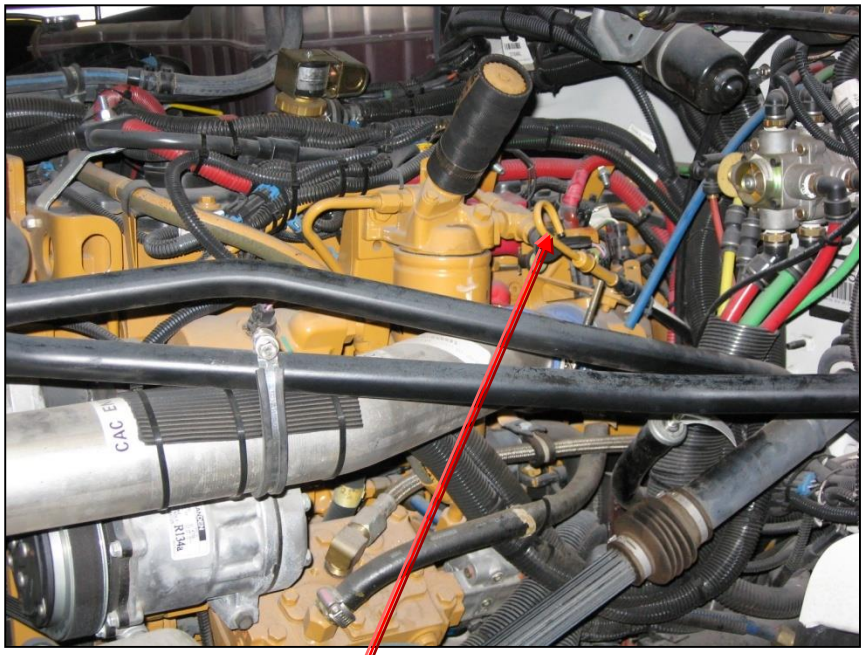
# Engine Compartment
## Belts & Hoses - General

- ✓Free of cuts, rubs, and cracks
- ✓No fluid leaks
- ✓No fraying or cuts
- ✓No more than ¾ inch deflection when pushed on with thumb



# Engine Compartment
## Motor Oil

- ✓Not foamy
  - Water in the crankcase
- ✓No diesel fuel smell
  - Bad motor seals
- ✓Dipstick intact and seating properly
- ✓Filled to proper level
- ✓Checked with engine cold!
  - Wait at least 10 minutes after shutdown to check

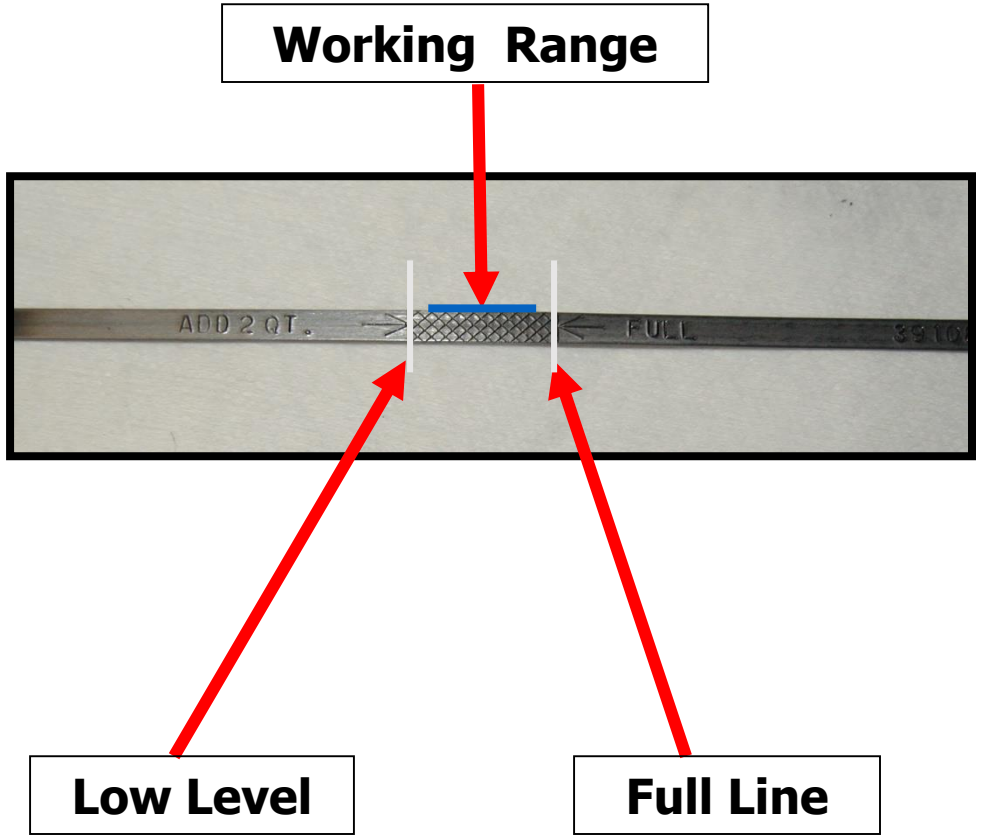


**Oil Dipstick**

# Engine Compartment
## Motor Oil

### Checking the Level

- ✓Level should be within working range
- ✓Add only when below the low level line
- ✓Refer to data plate for proper oil
- ✓Do not overfill



# Engine Compartment
## Transmission Fluid – in cab check

The transmission fluid level is best checked in the cab via the key pad selector.

The engine must be running at idle and the unit must be on level ground.

The engine must idle at least 5 minutes from a cold start.

The transmission must heat to at least 140  degrees F.

Push both the up and down arrow buttons at the same time on the key pad.

# Engine Compartment
## Transmission Fluid – in cab check

After simultaneously pushing both buttons, the symbol “OL” (Oil Level) will display in the screen. “OL” will be followed by one of the following:

- OK
- -1 thru 7 (oil is low by X quarts), or
- +1 thru 7 (oil is overfilled by X quarts).

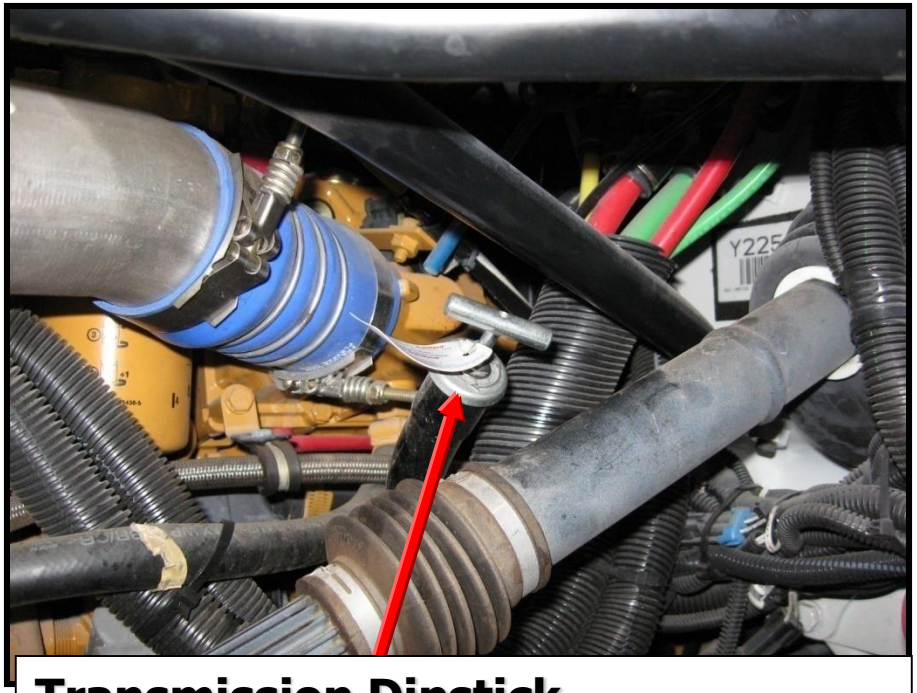
Any other message indicates another problem. You should consult the shop.

Always confirm + or – readings by manually checking the dipstick before adding or requesting to drain fluid.

If fluid is needed, refer to the vehicle data plate to select the right fluid.  If doubt exists, contact CMF.

# Engine Compartment
## Transmission Fluid – manual check

- ✓ Dipstick is intact and secures properly
- ✓ Filled to proper level
- ✓ Not leaking
- ✓ The right color for the fluid
- ✓ Doesn’t smell burned
- ✓ Fluid isn’t foamy
- ✓ Fluid level is checked when transmission is warm

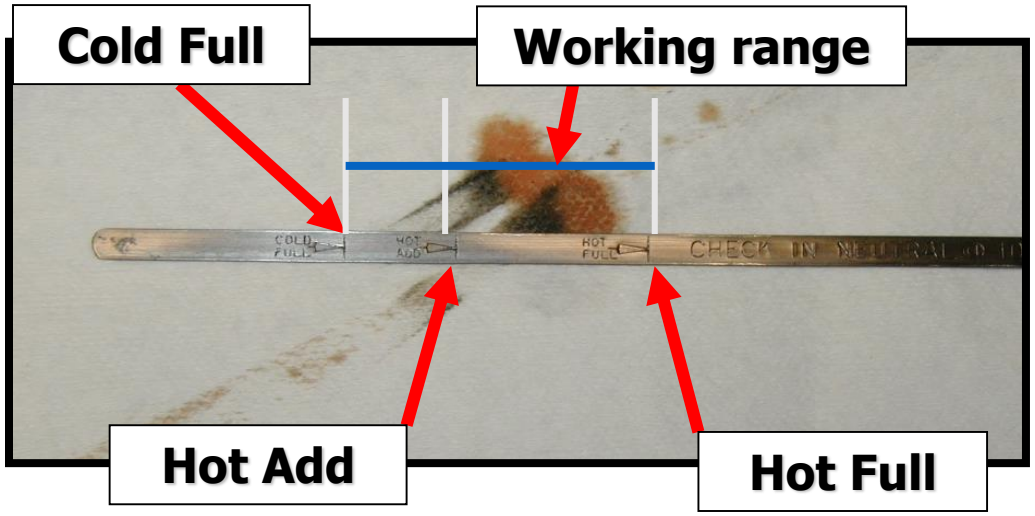


**Transmission Dipstick**

*note: unlike oil dipstick the user must loosen the top by turning the handle counterclockwise before pulling

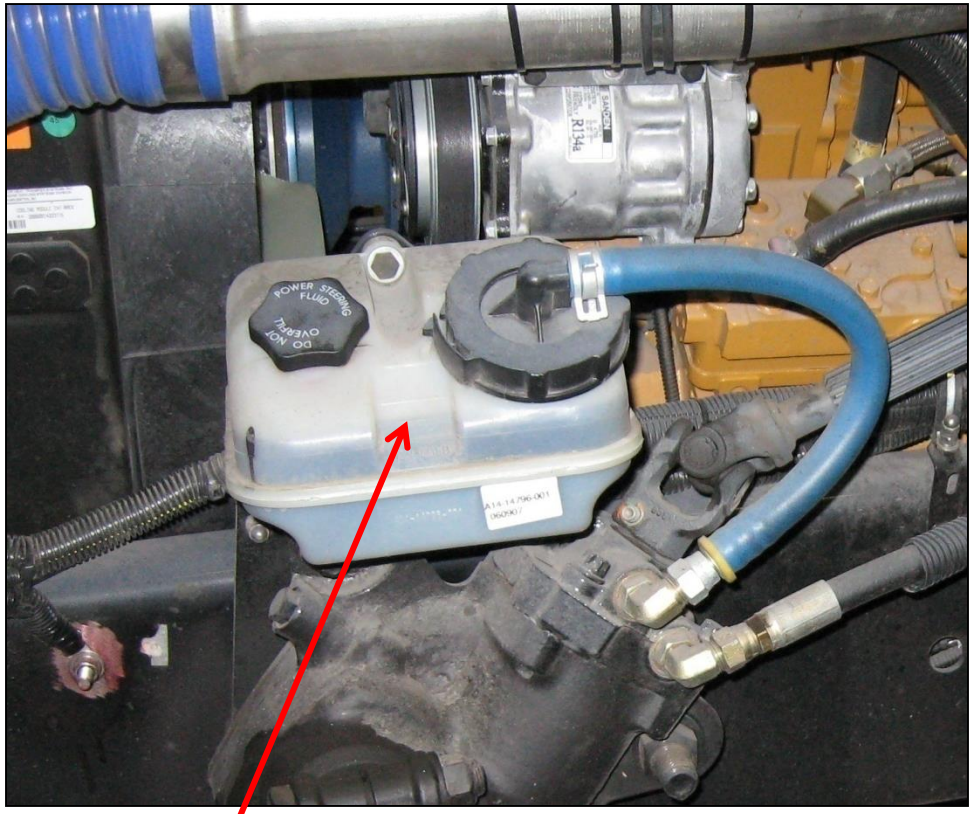
# Engine Compartment
# Transmission Level – manual check

- ✓When cold, level will be at cold full mark
- ✓When hot, proper level will be between Hot Add line and Hot Full line
- ✓Check transmission while motor running and in neutral
- ✓If fluid is low-
  - Identify the right fluid
  - Add only small amounts and check between pours



# Engine Compartment
## Power Steering Reservoir

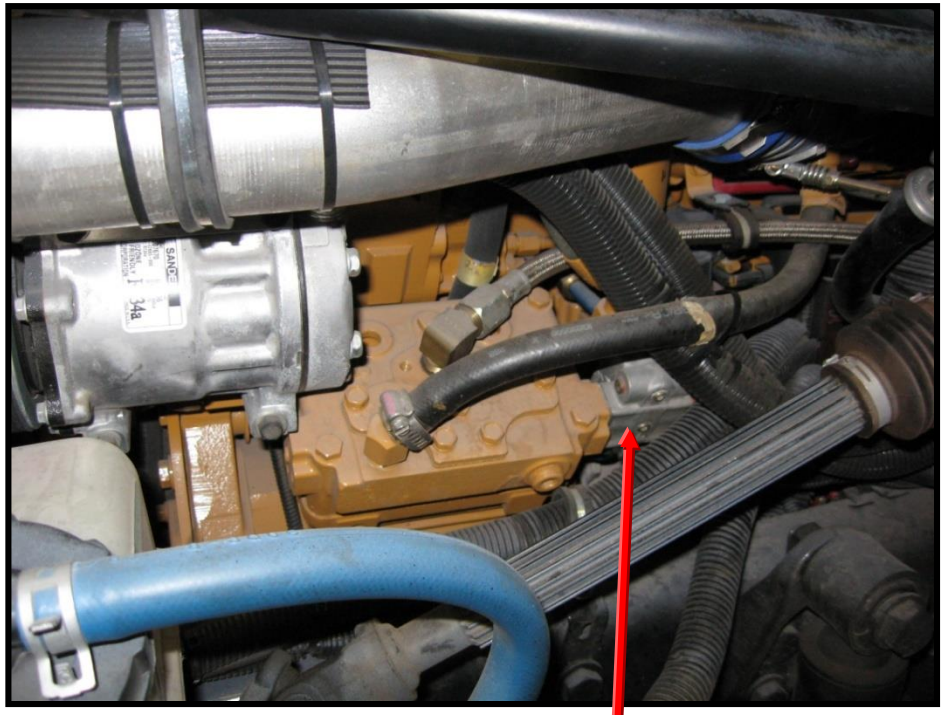
- ✓Securely mounted
- ✓All hoses secure/free from cuts and rubs
- ✓Unit is not leaking
- ✓Proper cap
- ✓Filled to proper level
  - View through translucent reservoir – no dipstick




**Reservoir**

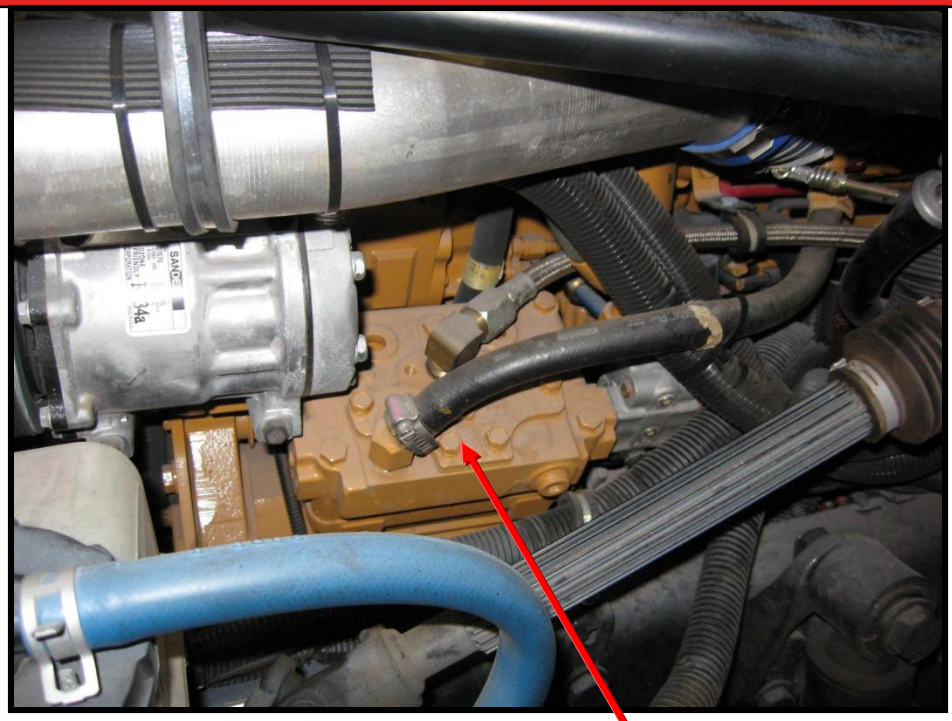
# Engine Compartment
## Power Steering Pump

- ✓ Located on the rear of the air compressor
- ✓ Shares a common shaft with the air compressor
- ✓ Gear driven
- ✓ Securely mounted
- ✓ Unit is not leaking fluid



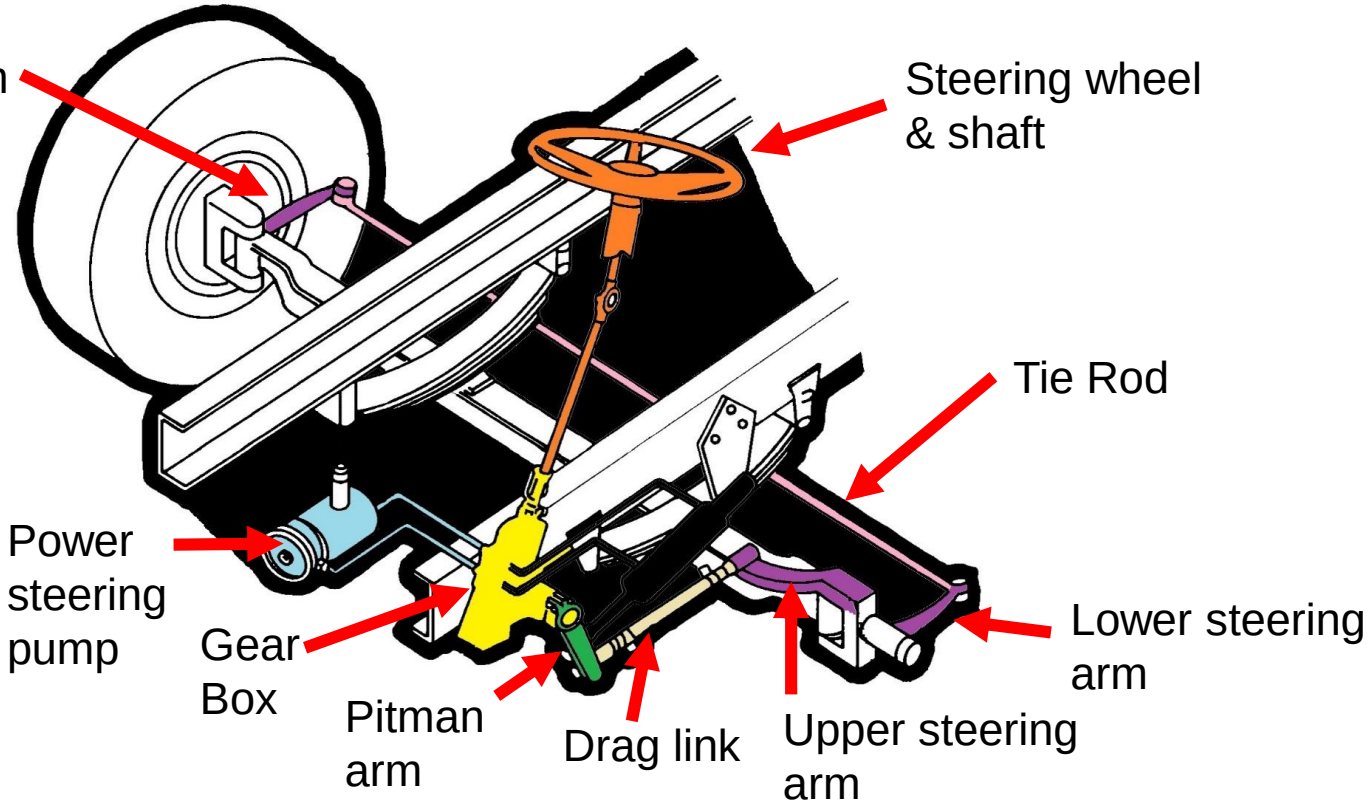
# Engine Compartment
## Air Compressor

- ✓ Gear driven
- ✓ Identifiable by metal braided hose
- ✓ Securely mounted
- ✓ No audible air leaks
- ✓ All hoses free from cuts , rubs and not leaking



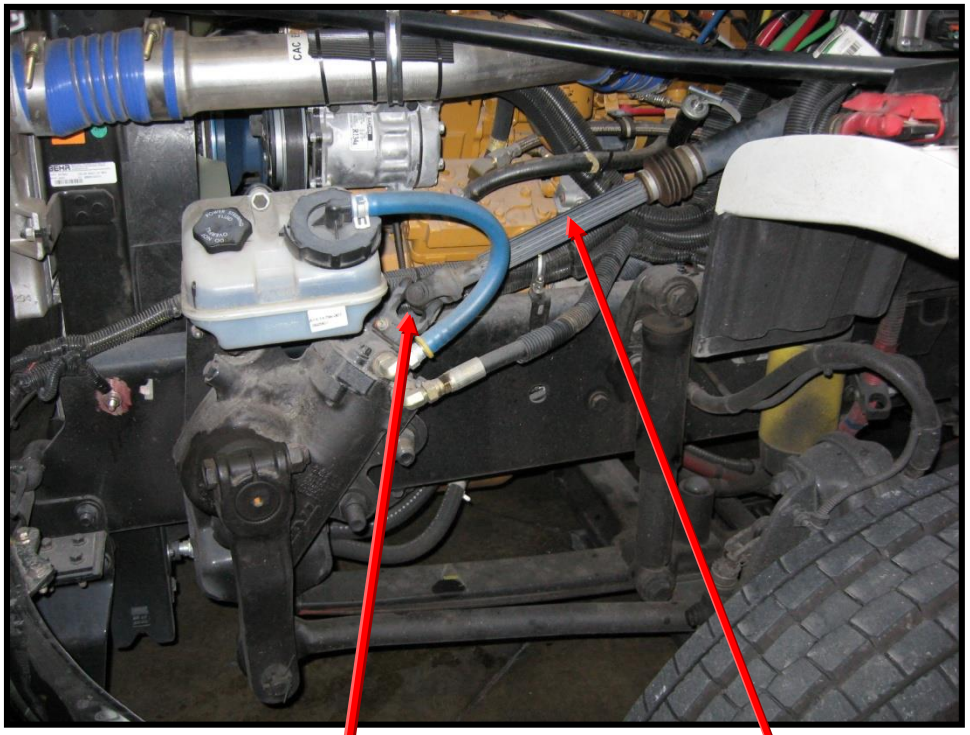

**NOTE : Not all units have service air brakes. The compressor may only supply air to the rear suspension air bags and to the driveline parking brake.**

# Engine Compartment
## Steering System

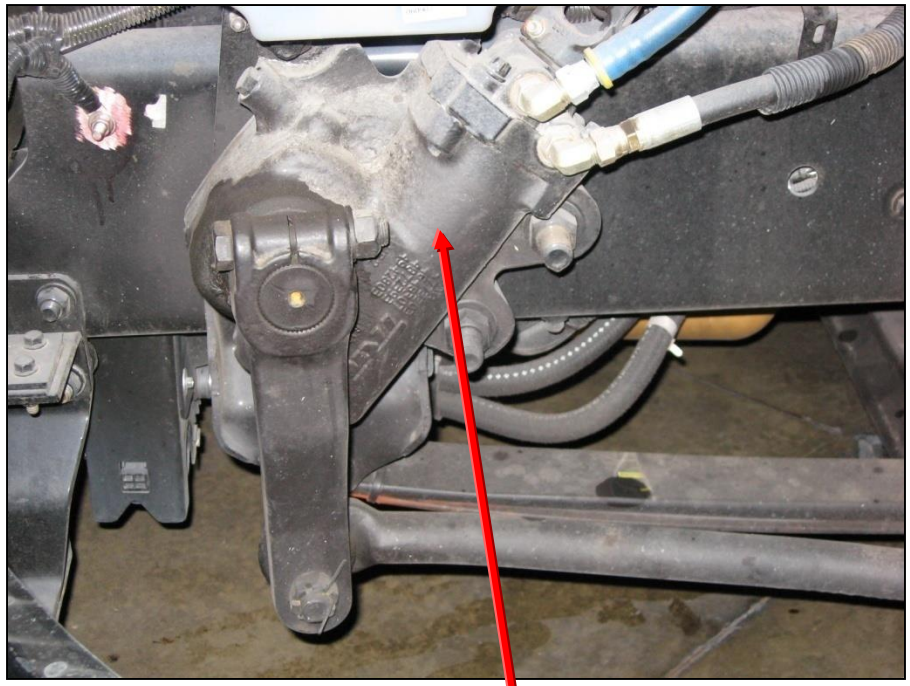
# Engine Compartment
## Steering System

- STEERING SHAFT
  - ✓ Not bent, cracked or broken
  - ✓ Connected to U-Joint
  - ✓ No broken or missing parts



# Engine Compartment
## Steering System

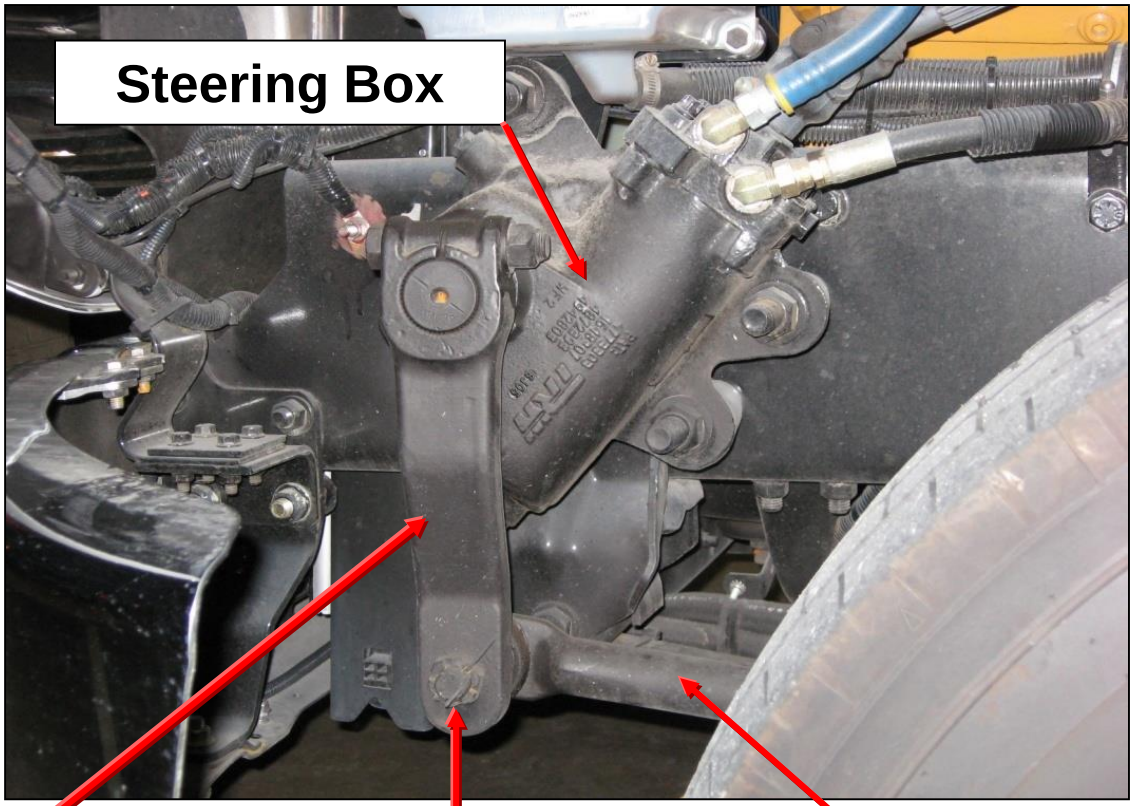
- STEERING BOX
  - ✓ Securely mounted
  - ✓ Unit not leaking
  - ✓ Hoses are secure, free from cuts and rubs
  - ✓ Hoses and fittings are not leaking or wet on the ends



**Steering Box**

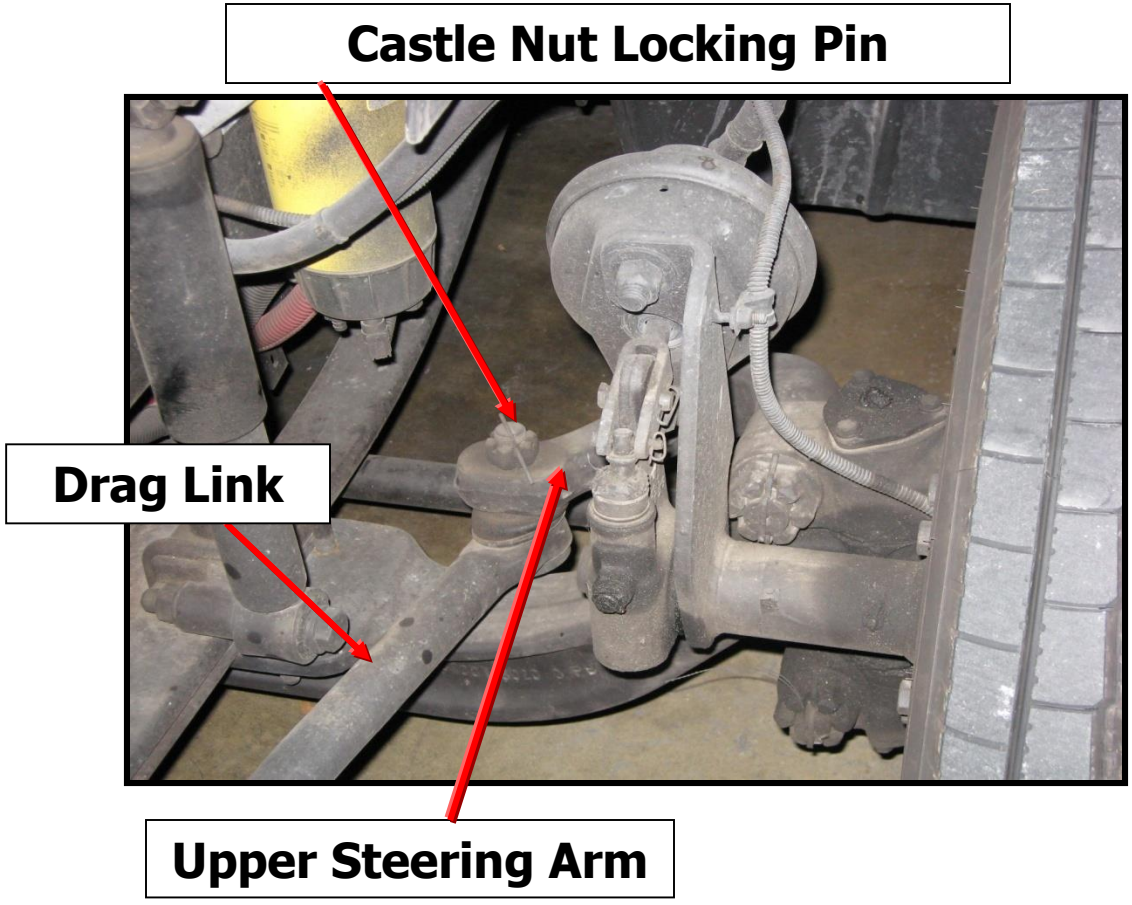
# Engine Compartment
## Steering System

- STEERING LINKAGE
  - ✓ Pitman arm securely attached to steering box and drag link
  - ✓ Reference line aligned on steering box output shaft and pitman arm
  - ✓ Castle nut with locking pin secure



# Engine Compartment
## Steering System

- STEERING LINKAGE
  - ✓ Drag Link securely attached to steering arm with minimal up and down motion
    - Less than 1/8” play
  - ✓ Castle nut and locking pin secure



# Engine Compartment
## Steering System

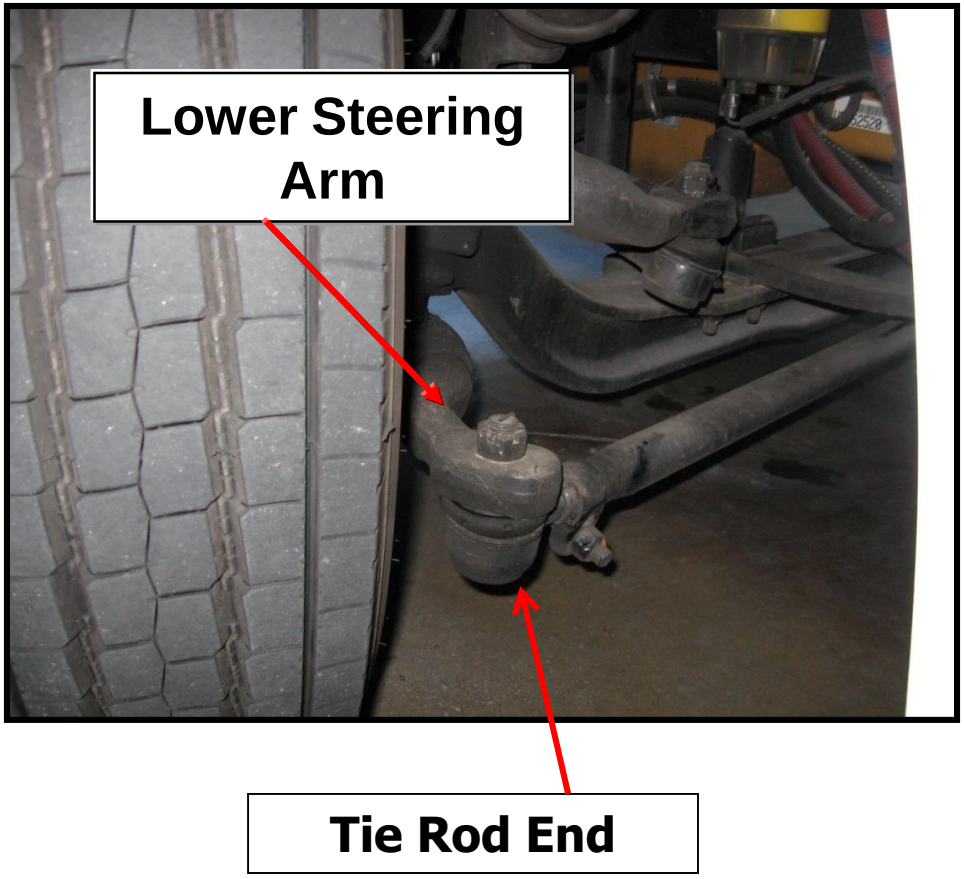
- LOWER STEERING COMPONENTS

✓ Tie rod end securely mounted, with castle nut and cotter pin

✓ Tie rod end have no up/down movement

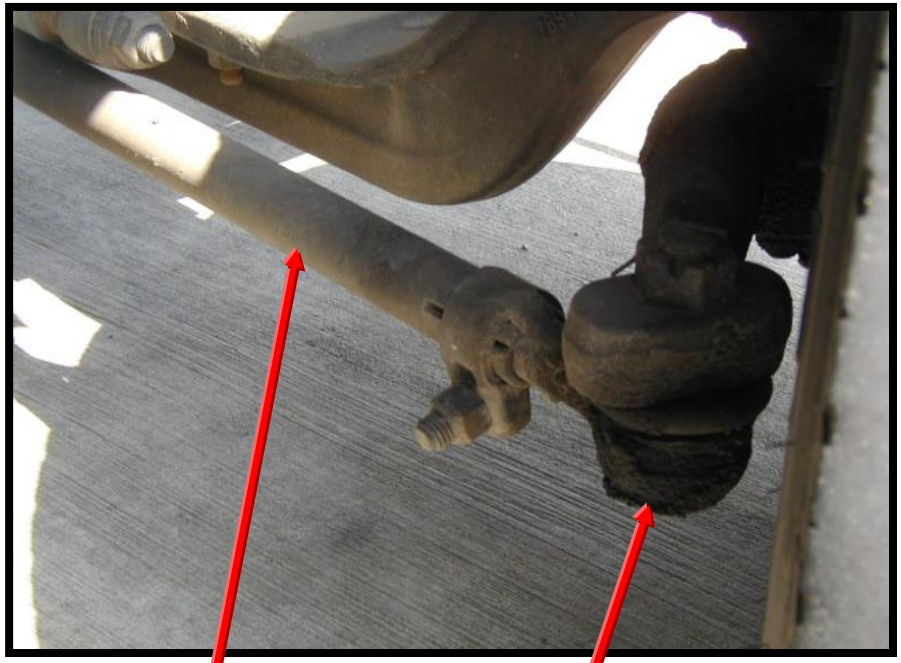
  - Less than 1/8” play

✓ Tie rod not bent, broken, or welded



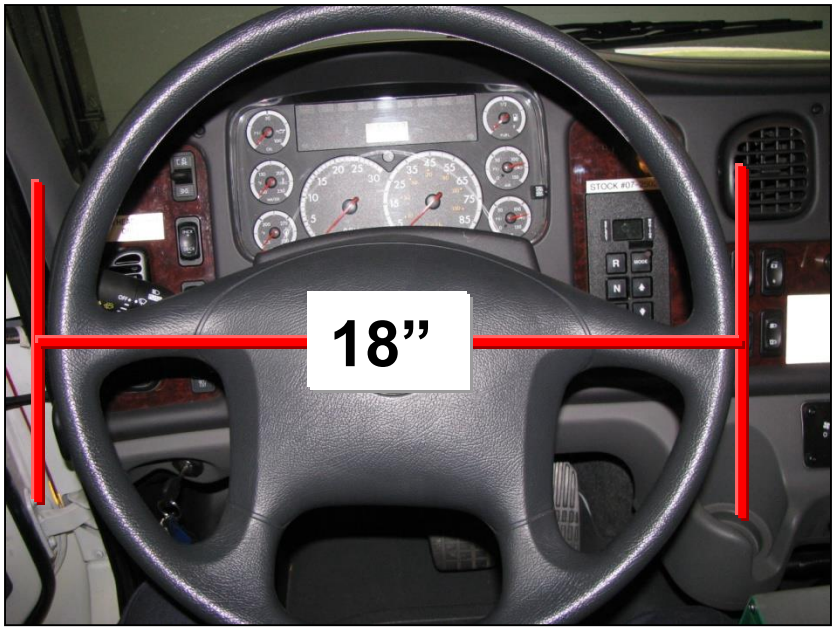
# Engine Compartment
## Steering System

- CURBSIDE STEERING
  - ✓ Tie rod end secure with no missing parts
  - ✓ Tie rod end has no up and down movement
    - Less than 1/8” play
  - ✓ Tie rod not bent or broken



# Engine Compartment
## Steering System

- STEERING WHEEL & HORN
  - ✓ Intact and not broken
  - ✓ With motor running, steering wheel play is <10% of the steering wheel diameter
  - ✓ Horn in working order




**If you turn steering wheel more than 2 inches from center before wheels move, notify shop**

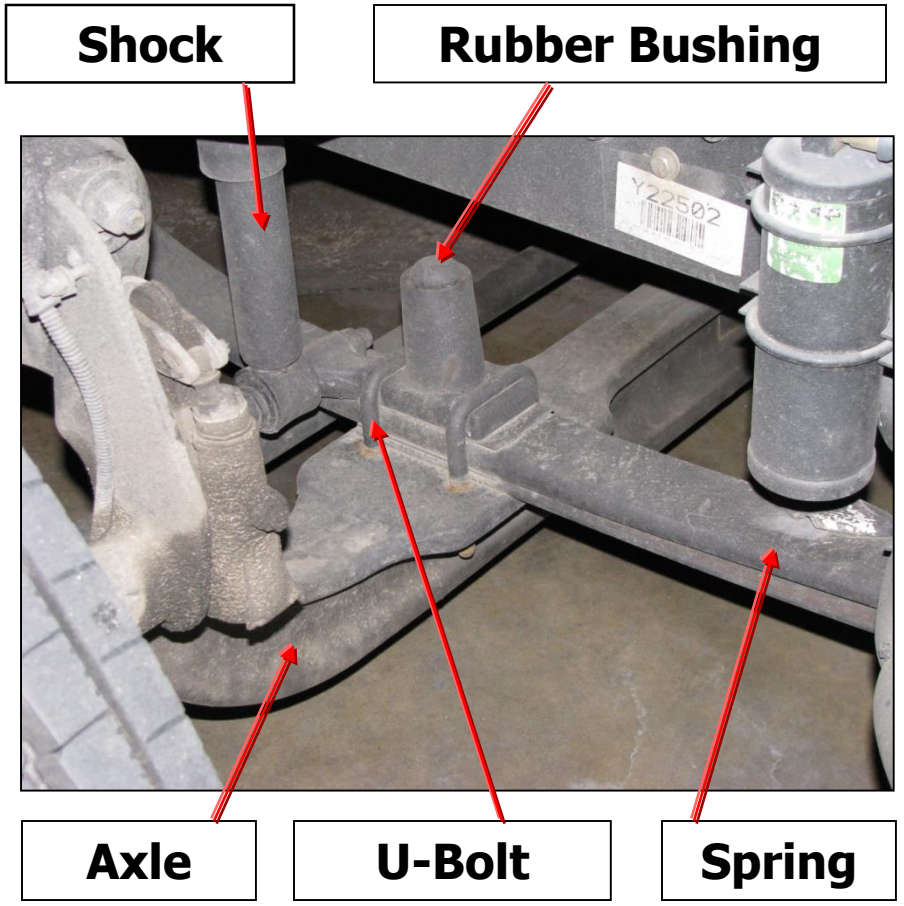
# Undercarriage

## CONDUCTING UNDERCARRIAGE CHECK

- Bleed Moisture From Air Tanks/ Air Brake Systems
- Check Brake Line
- Driveline
- Exhaust System
- Suspension System
- Automatic Chain Systems
- Leaks From Transmission
- Rust
- Loose Parts
- Shiny Spots, Cracks
- Inner Sides Of Wheel & Tires
- Wiring Harness
- Loose Belts & Hoses
- Fuel Tank

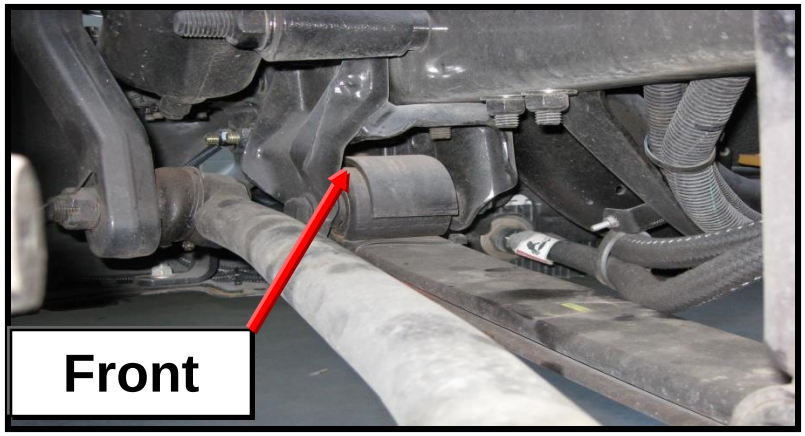
# Undercarriage
## Front Suspension

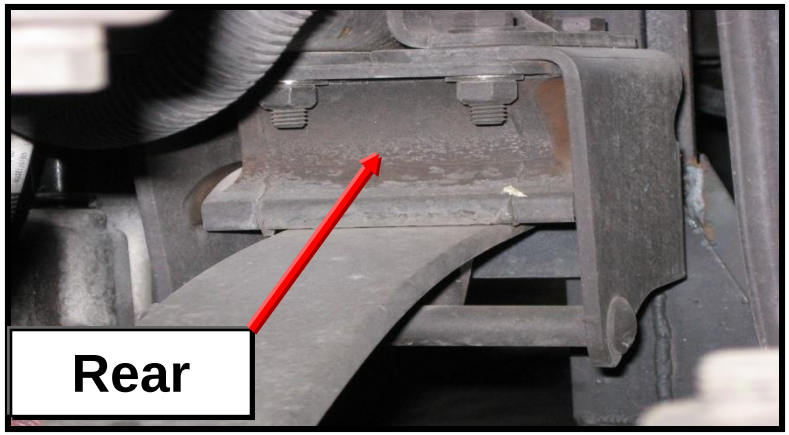
- ✓ Spring not cracked, broken, misaligned or missing leaves
- ✓ U-bolts not loose, broken or missing and securely mounted to axle
- ✓ Rubber bushing in place between U-Bolts
- ✓ Shock securely mounted top and bottom (not loose)
- ✓ Shock not leaking



# Undercarriage
## Front Suspension

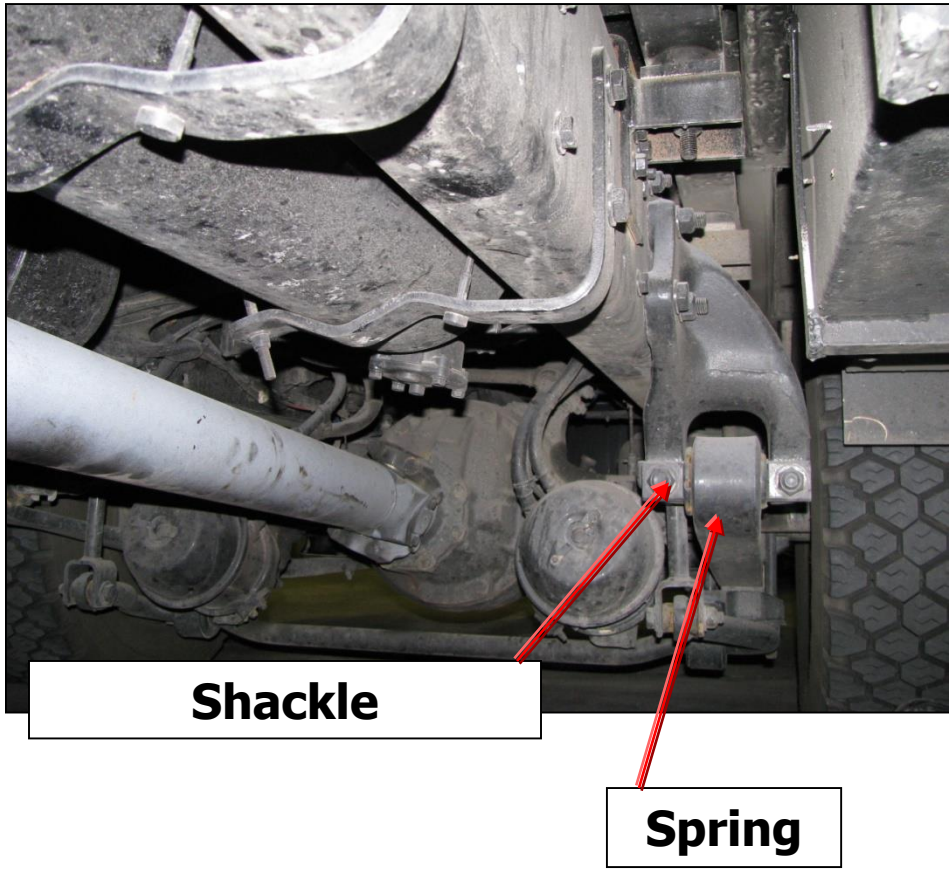
- SPRING SHACKLES
  - ✓ Spring shackles securely mounted to frame
  - ✓ Spring securely mounted to spring shackle



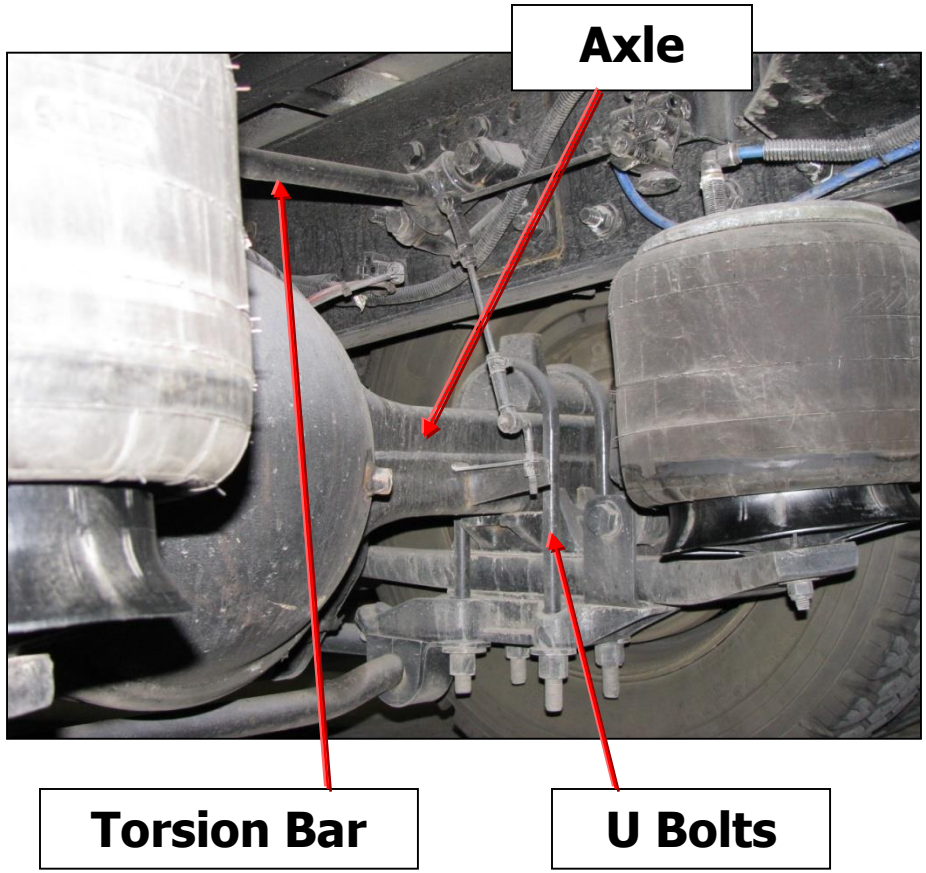
# Undercarriage
## Rear Suspension

- ✓ Spring not cracked, broken, misaligned
- ✓ Spring securely mounted to spring shackle
- ✓ Spring shackles securely mounted to frame



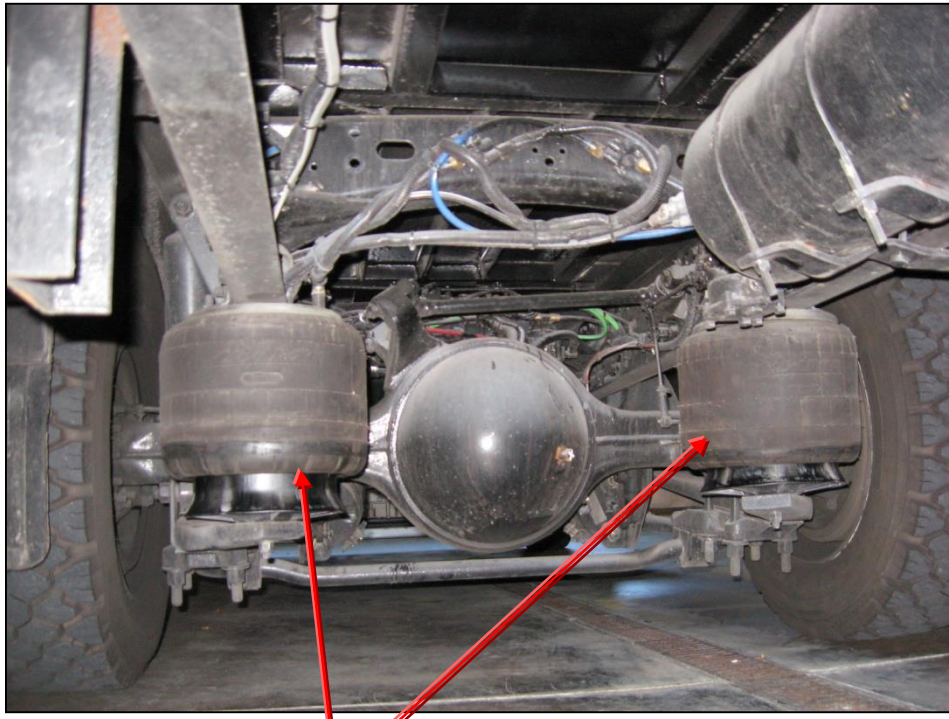
# Undercarriage
## Rear Suspension

- ✓ Torsion bar securely attached to the frame
  - Check for cracks around mounting
- ✓ U-bolts securely attached to axle
- ✓ Torsion bar with no missing parts



# Undercarriage
## Rear Suspension

- ✓ Air bags inflated for proper rear suspension
  - Rear patient compartment doors closed
  - Air dump switch not activated




<u>Caution</u>: Do not allow the suspension to be dumped with personnel underneath the vehicle.

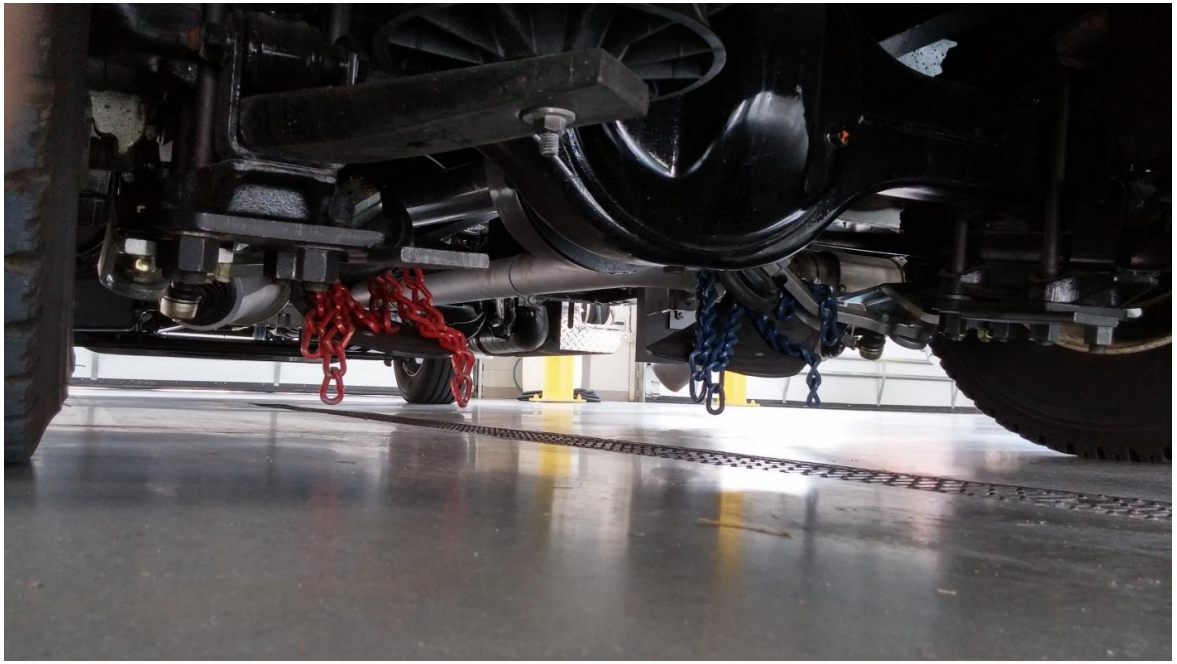
# Undercarriage
## Automatic Tire Chains

- Located at rear axle

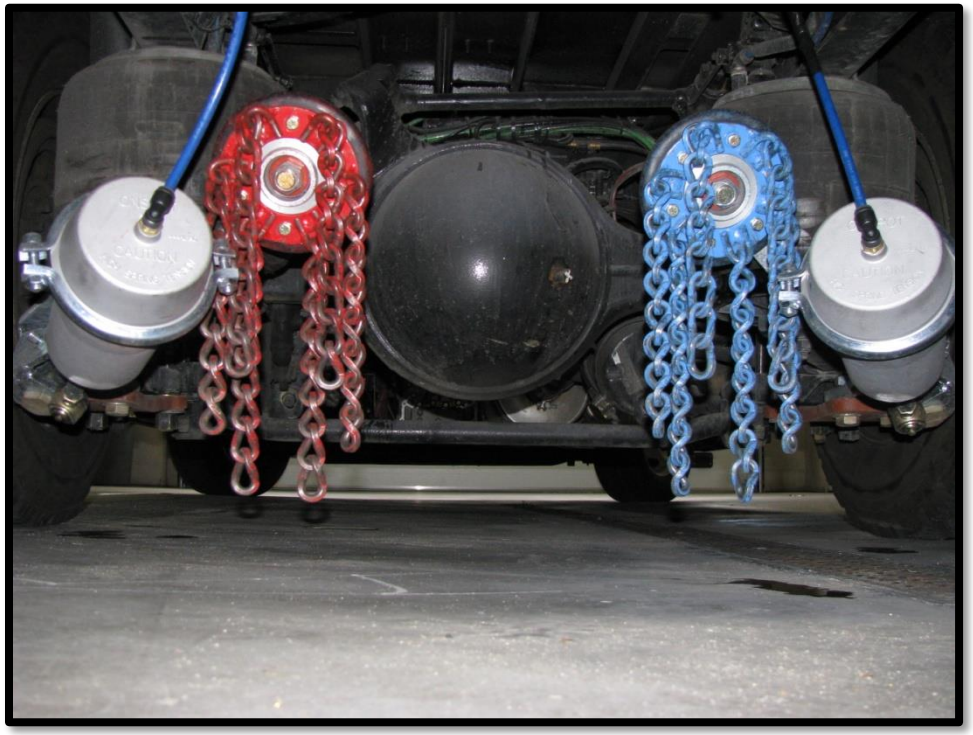
✓Not dragging

✓Chains intact

✓No obvious damage

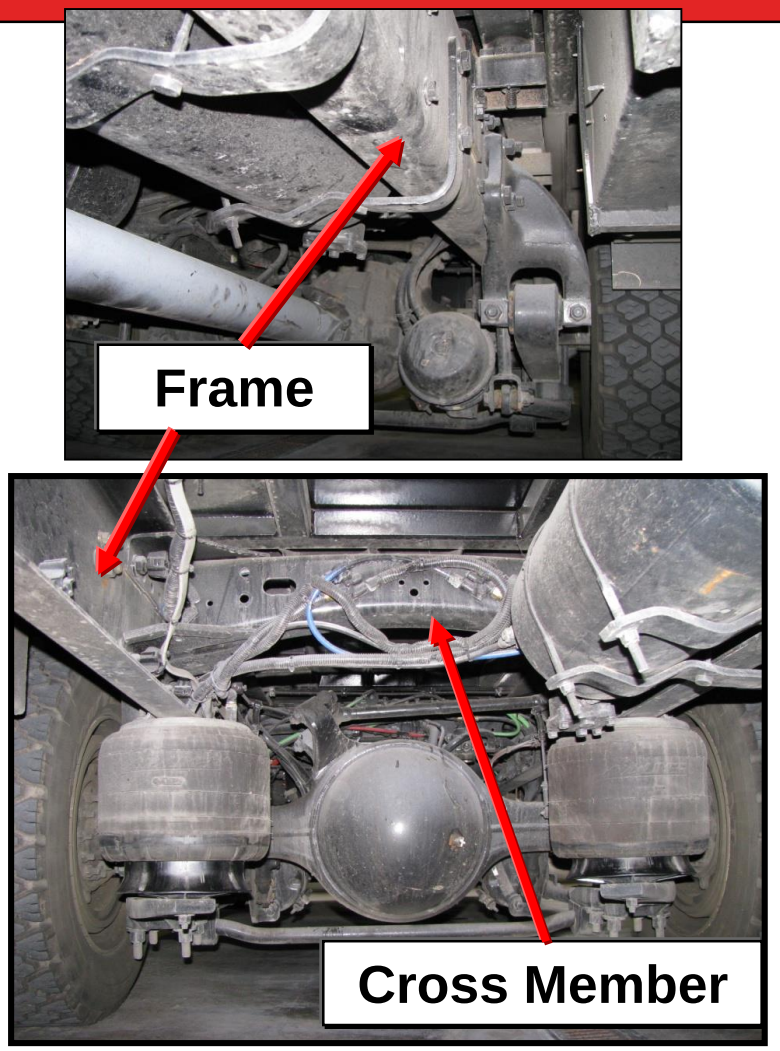



# Undercarriage
## Automatic Tire Chains



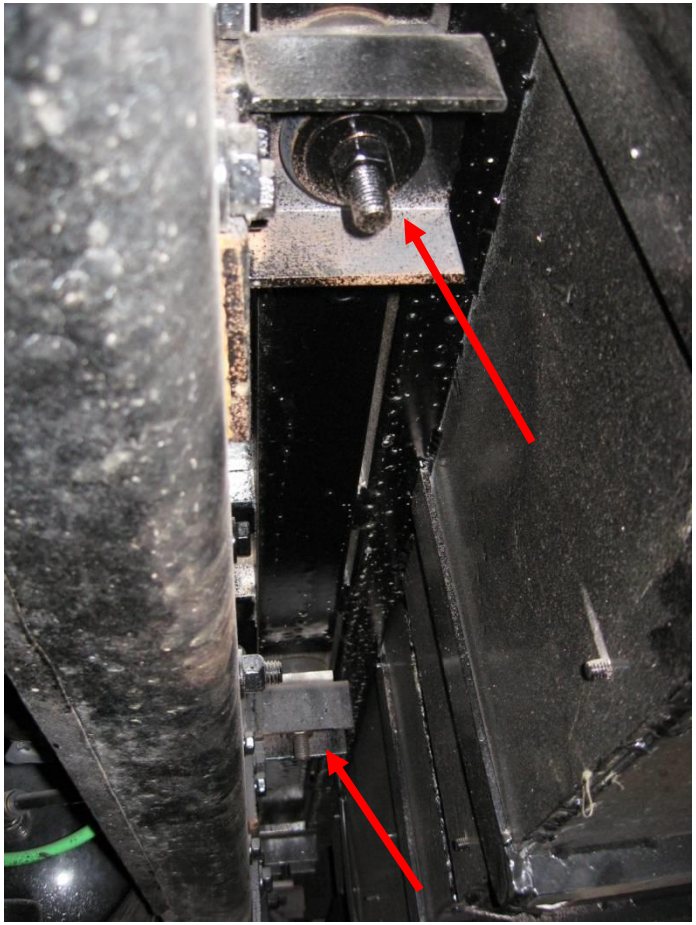
# Undercarriage
## Frame

- ✓ No cracks, deformities, or broken components
- ✓ No illegal drill holes or welds
- ✓ Cross members not cracked or broken
- ✓ Rust may be a clue to cracks or other damage



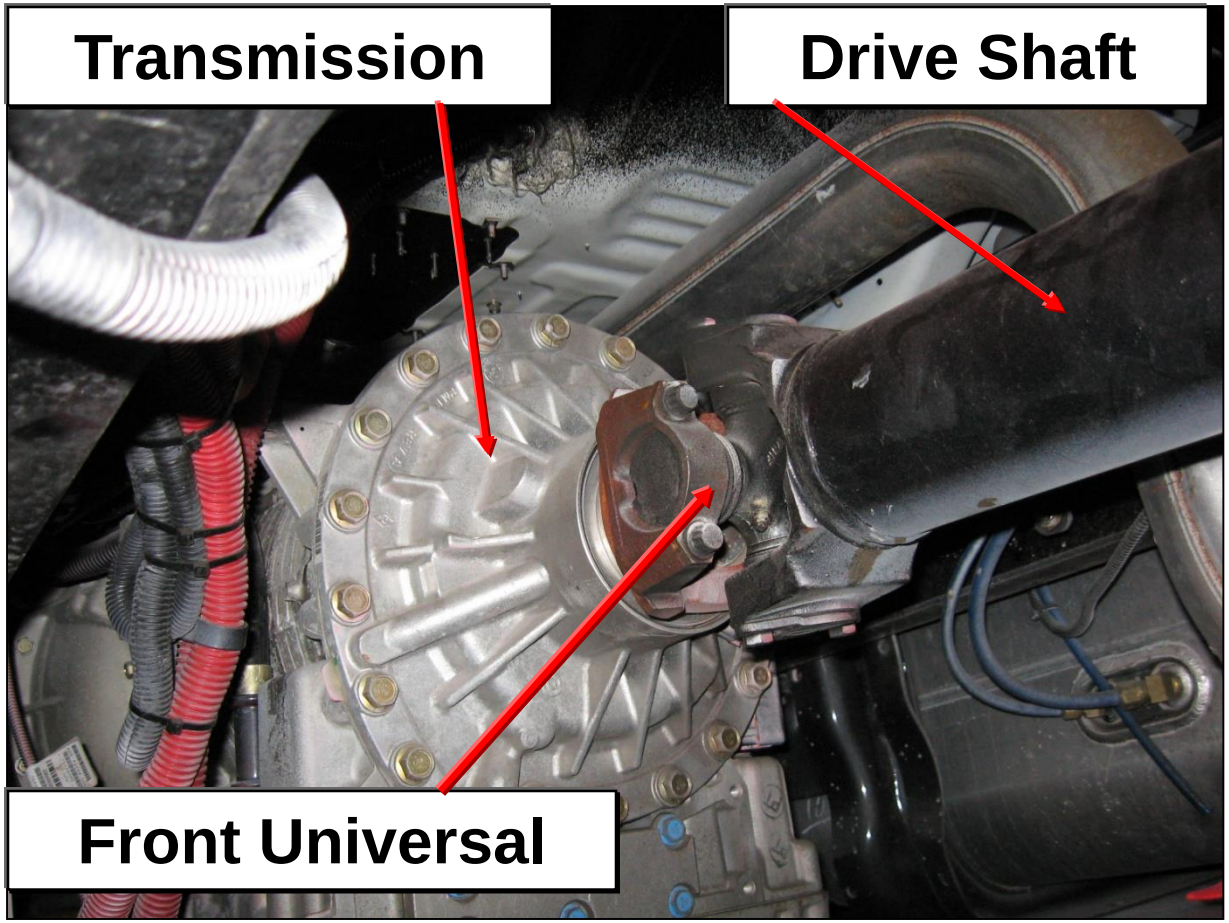
# Undercarriage
## Body Mounts

- There are 10 to 12 body mounts to secure the vehicle body to the chassis frame
- Uneven roads and poor road condition torque the frame and body
- ✓ Scan the mounts to insure they are secure and not broken
- ✓ Look for rust or cracks at attachment points



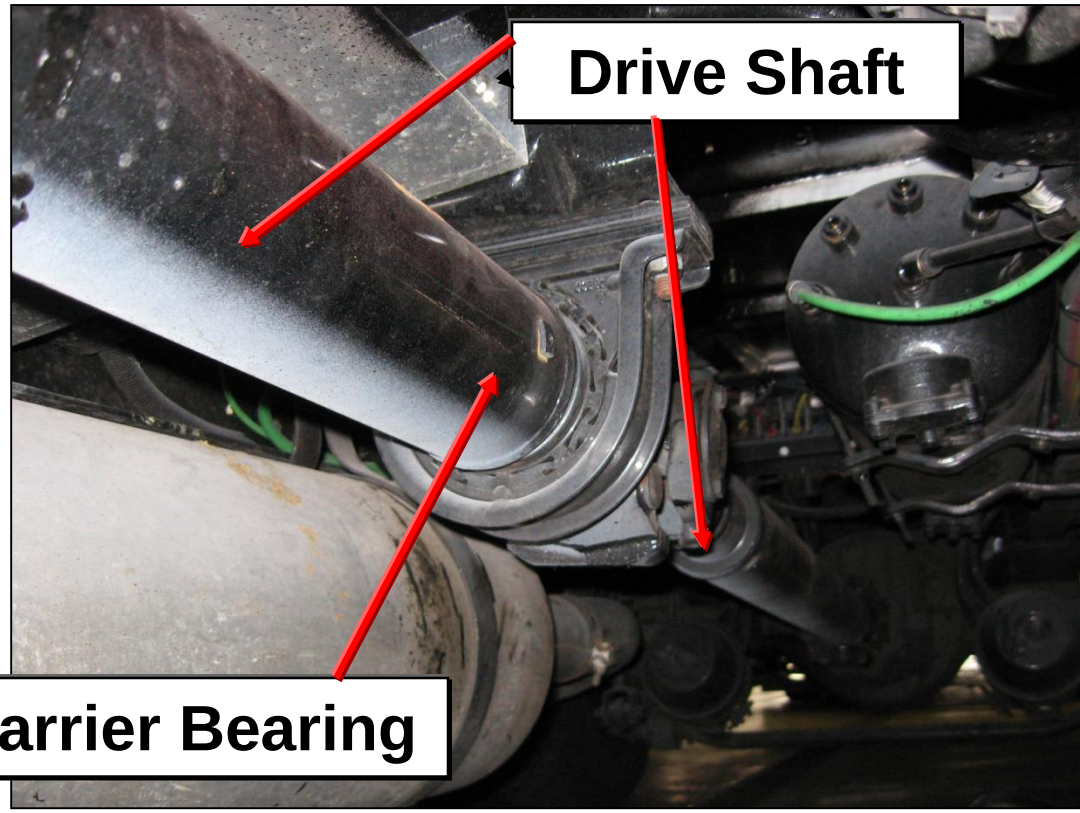
# Undercarriage
## Powertrain

- Transmission housing
- Front universal
- Drive shaft
- ✓Leaks
  - Class 3 transmission leak requires immediate attention
- ✓Universal bolts present and tight



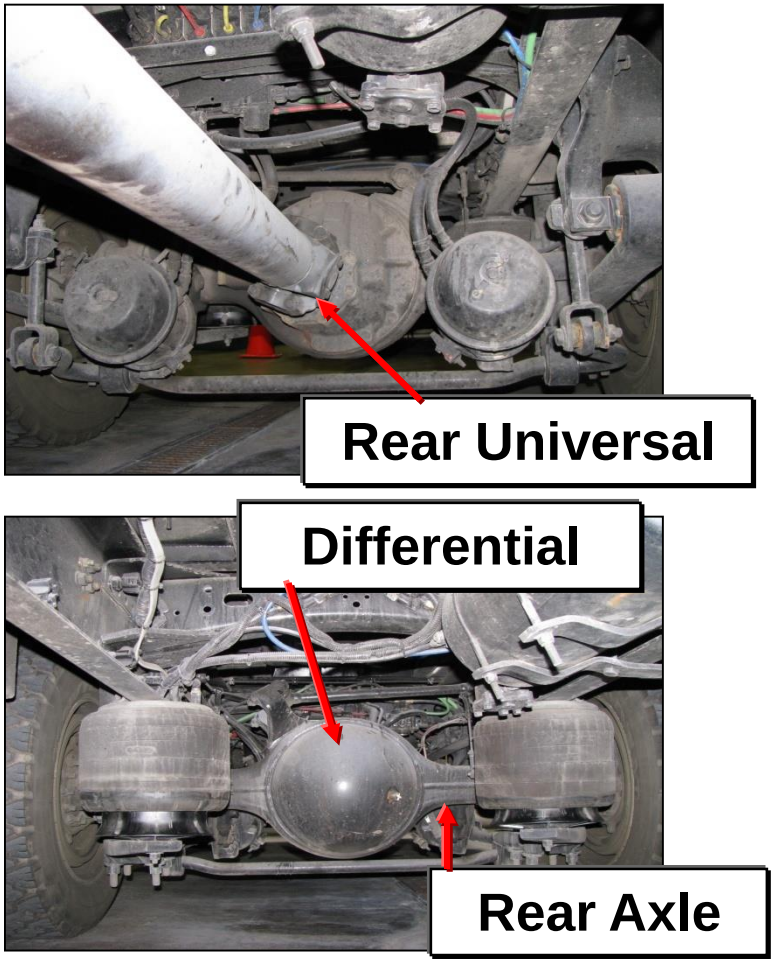
# Undercarriage
## Powertrain

- DRIVELINE
  - Drive Shaft
  - Carrier Bearing
  - Middle Universal
- ✓ Carrier bearing secure and supporting drive shaft
- ✓ No chafing or obvious interference with drive shaft rotation



# Undercarriage
## Powertrain

- DRIVELINE
  - Rear universal
  - Differential
  - Rear axle
- ✓ Universal joint bolts are present and tight
- ✓ No leaks from the differential housing (pumpkin)
- ✓ No leaks or damage to the rear axle

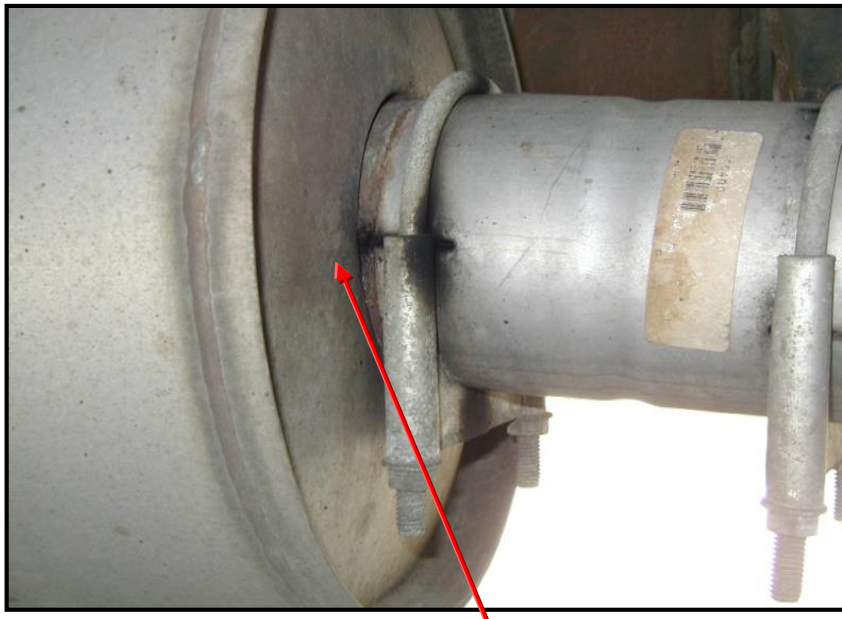


# Undercarriage
## Exhaust System

- ✓Loose, broken, pipes
- ✓Loose, broken or missing mounting brackets, clamps, bolts, or nuts
- ✓Sagging parts
- ✓Parts rubbing against fuel system parts, driveshaft, or other moving parts of vehicle

# Undercarriage
## Exhaust System

- ✓ Exhaust hangers intact
- ✓ Exhaust connections not leaking. Leaks are potential  poison in the cab.
- ✓ No excessive rust



**Black marks indicate leaks**

# Mud Flaps

- ✓Securely mounted
- ✓Not torn or split
- ✓Not dragging the ground

# Brake Systems
## Types of Service Brakes

### Air

- Transmits force applied to the brake pedal to the foundation brakes using compressed atmospheric air
- Used on large vehicles
- Efficient at transmitting high mechanical forces over larger distances

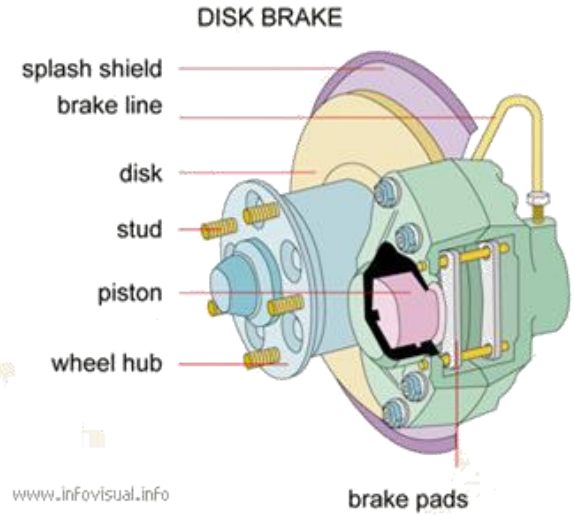
### Hydraulic

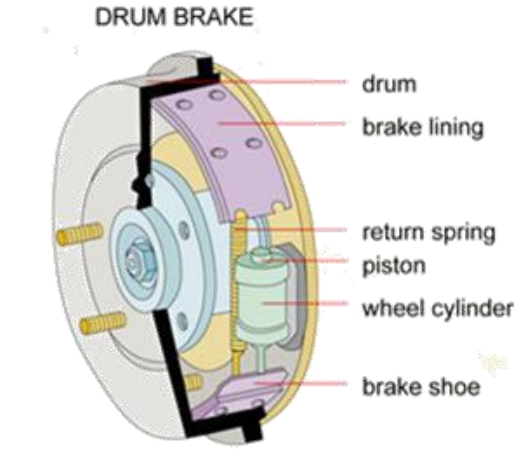
- Transmits force applied to the brake pedal to the foundation brakes using hydraulic fluid
- Generally found on passenger vehicles and light trucks

Both types are in use on MCFRS ambulances.

# Foundation Brakes

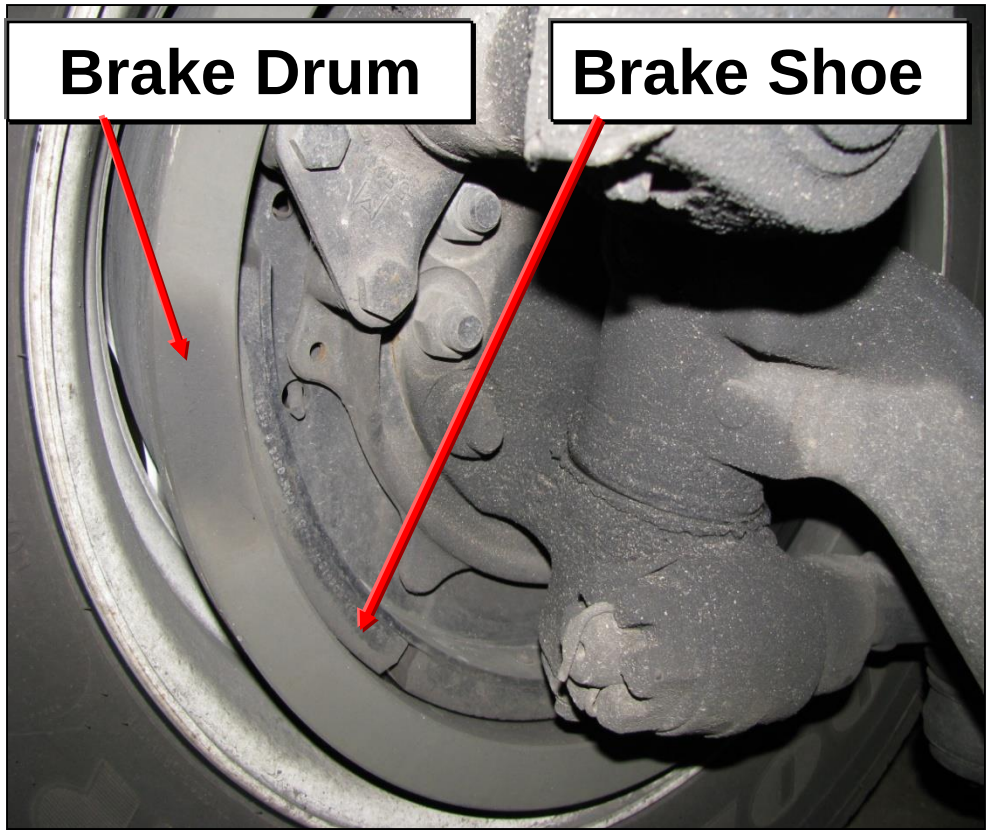
- ✓ Foundation brakes are found at the end of each axle at the wheels
  - Where the friction occurs to slow the vehicle
  - Two types:  disc or drum
- ✓ Disc brakes squeeze on a rotor from both sides.
- ✓ Drum brakes force the shoes against the brake drum



# Drum Brakes

- ✓ Brakes free from oil and grease
- ✓ At least 1/4 inch of shoe
- ✓ Brake drum intact and not broken
- ✓ Heat checks not longer than ½ the width of drum



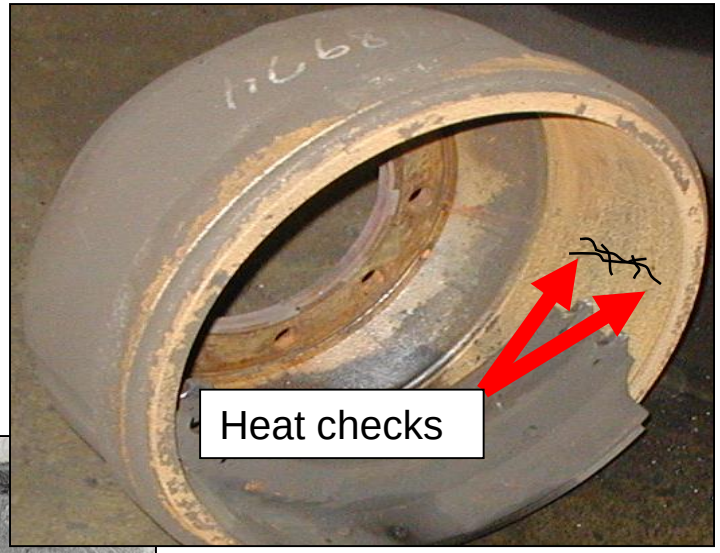
# Drum Brakes
## OOS Criteria - Drums

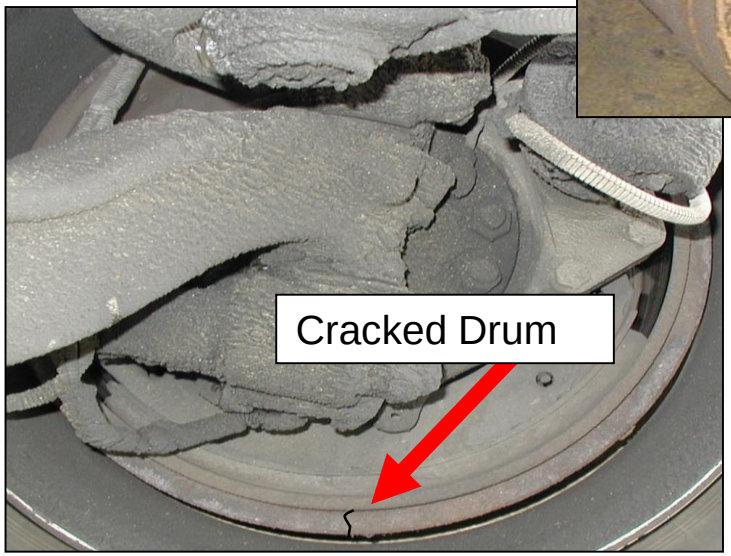
Cracked drums

- ✓ breaks that go thru the drum
- ✓ crack expands when brake is applied

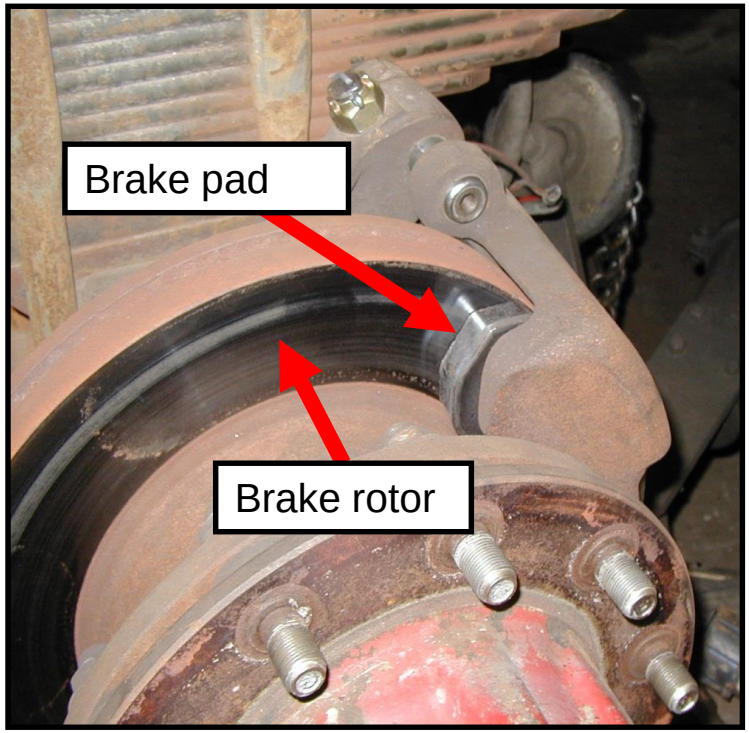
Heat checks

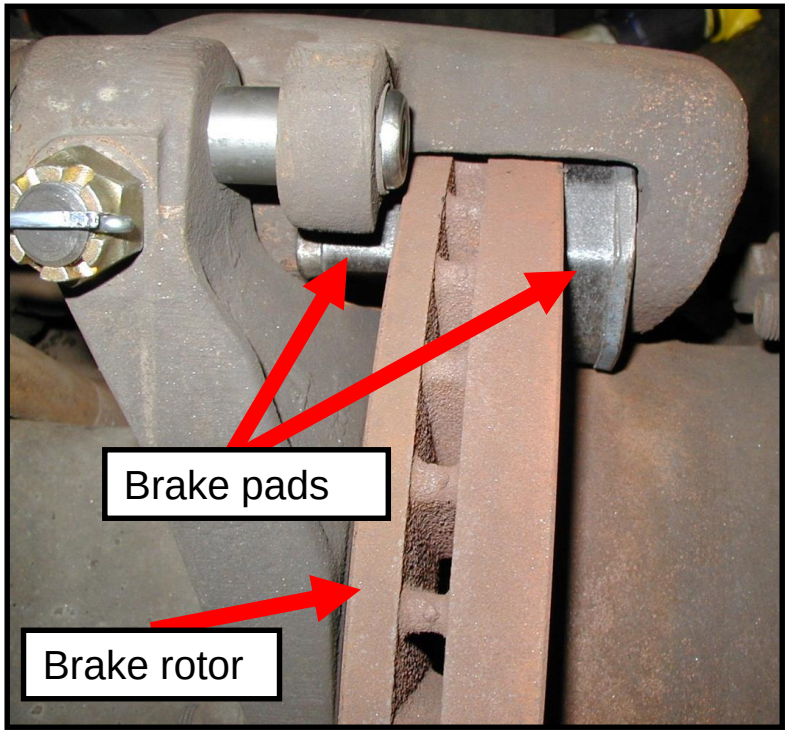
- ✓ >½ the width of the drum, and
- ✓ >1/8” deep
- ✓ Unlikely these will be visible during in-station checkouts



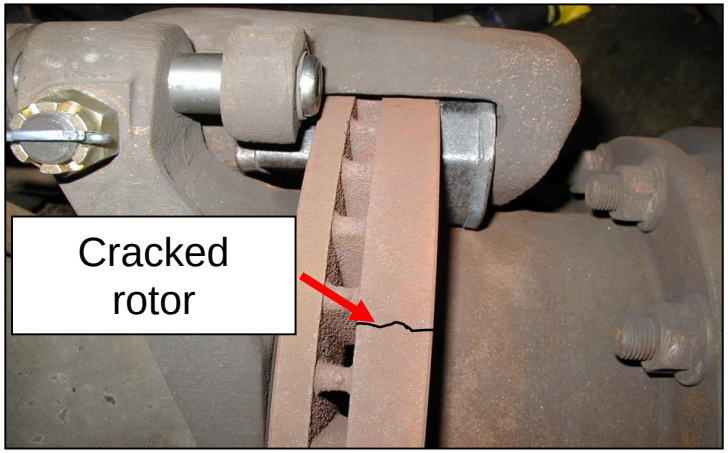
# Disc Brakes
## Components

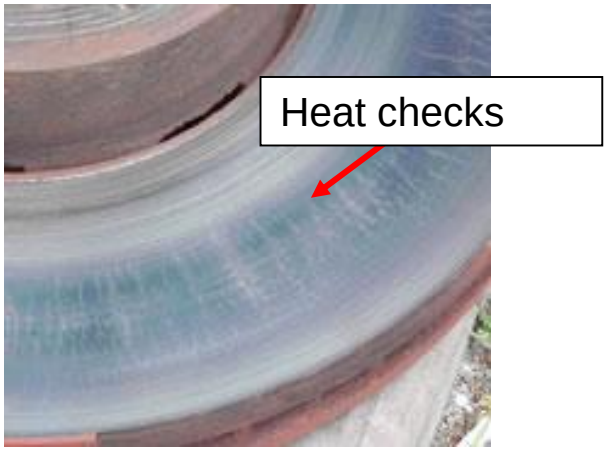


# Disc Brakes
## OOS Criteria - Rotors

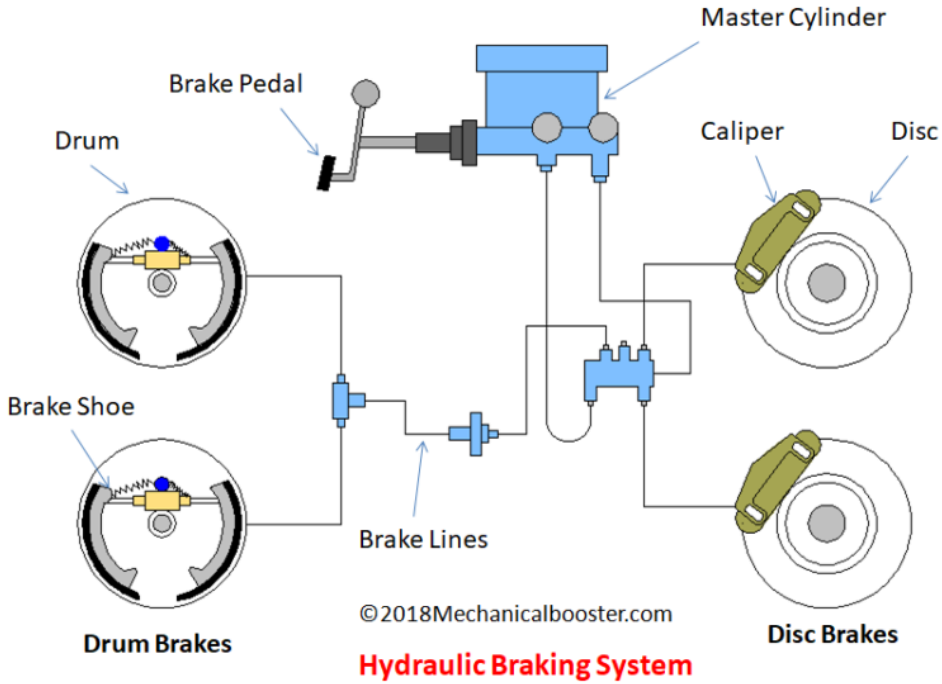
- ✓Cracked rotor
- ✓Broken from the face of the rotor to the cooling fins
- ✓Can occur on either side.
- ✓OOS condition
- ✓Heat checks
- ✓>1/8” deep, or
- ✓Extend >¾ across the face of the rotor



# Hydraulic Brake System

- ✓Hydraulic systems use fluid to translate pressure from the brake pedal to the brakes at the wheels
- Master cylinder converts mechanical pressure of the brake pedal into hydraulic pressure
- Checking the fluid level in the master cylinder is part of the daily pre-trip inspection.



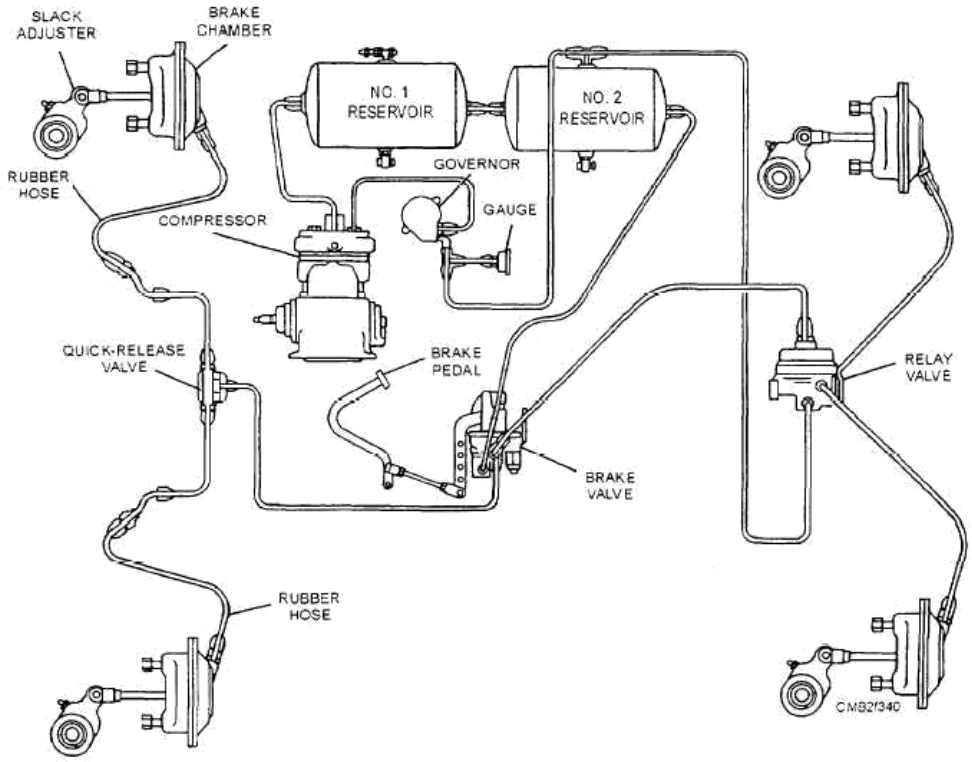

Check BOTH sides of the master cylinder. View fluid level through the housing.
DO NOT remove caps and only add fluid upon direction from CMF.

# Hydraulic Brake System
## OOS Criteria

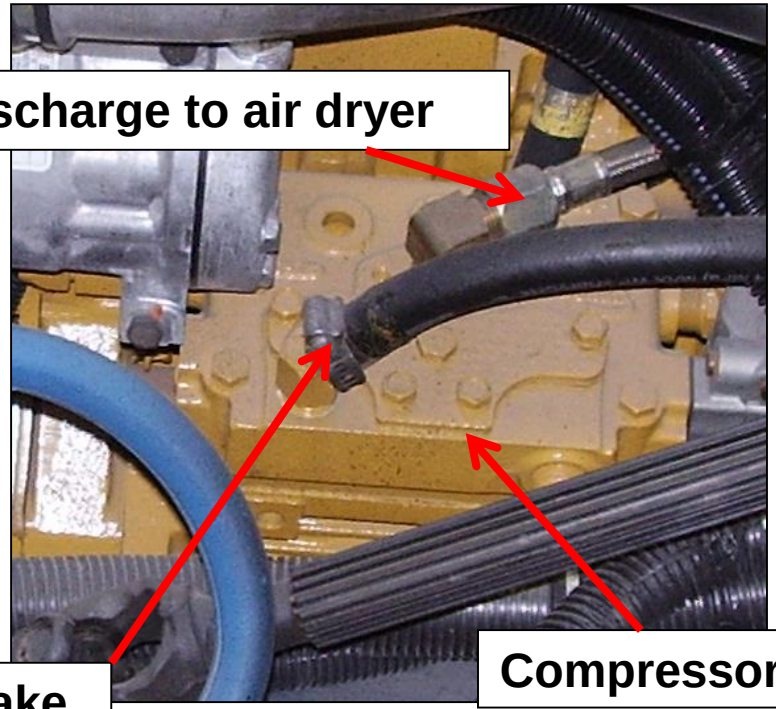
- ✓Brake system components that have a class 2 leakage of brake fluid
- ✓Friction surfaces, brake shoes, or disc brake pads that have grease or oil on them.
- ✓Brake pads with less than 1/4 inch pad (disc brakes is 1/8 inch on each pad)
- ✓Braking operation that is ineffective
- ✓Parking brake operation that is ineffective
- ✓Brake warning light that is activated or brake pedal that falls away or drifts toward the flooring when brake pressure is applied

# Air Brake System

1. Air is drawn into the **air compressor** through the air cleaner. The air is compressed and sent to the **air dryer**. The air dryer removes 95 to 98% of the moisture and oil vapor from the compressed air.
2. The dried air leaves the dryer and is sent to the **supply or, wet tank** where it decompresses and is routed to the **primary, secondary, or accessory reservoirs.**
3. When the air reservoirs come to full pressure the **air governor** disengages the air compressor and activates the **air dryer** to purge its contents to atmosphere.
4. The air gauge on the dash should read approximately **120 to 135 psi**. when the air dryer purges

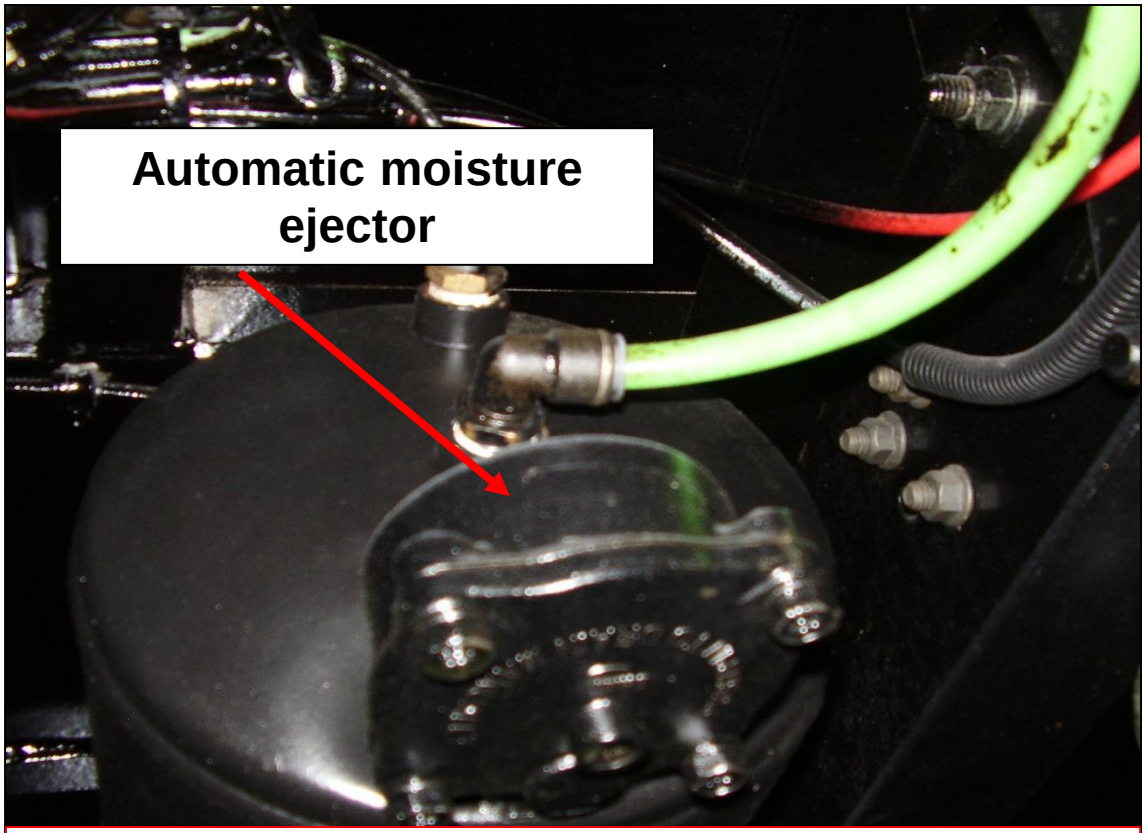


# Air Brake System




# Air Brake System

Air brake systems have 3 to 4 air storage tanks, or reservoirs. These reservoirs serve as a buffer between the compressor and the system using the air. The reservoirs may supply brake systems, air horns, transmission functions, suspension components, and other auxiliary vehicle functions.

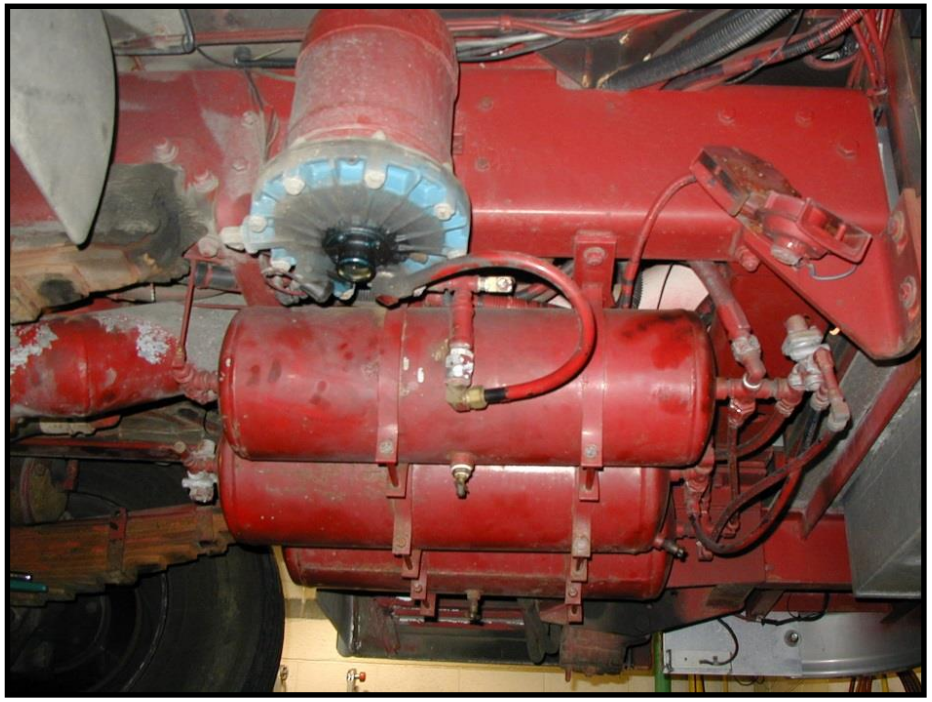



Because air heats up as it is compressed and cools once it enters the reservoirs humidity in the air condenses and collects in the reservoirs.

# Air Brake Systems

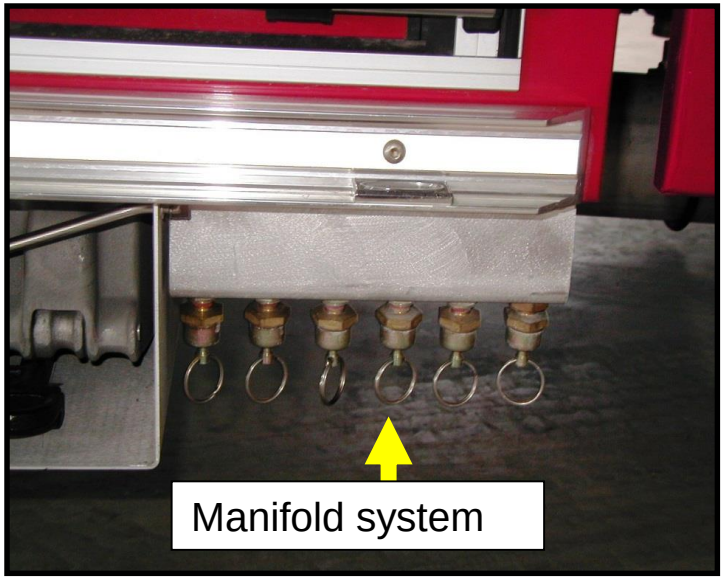
## RESERVOIRS

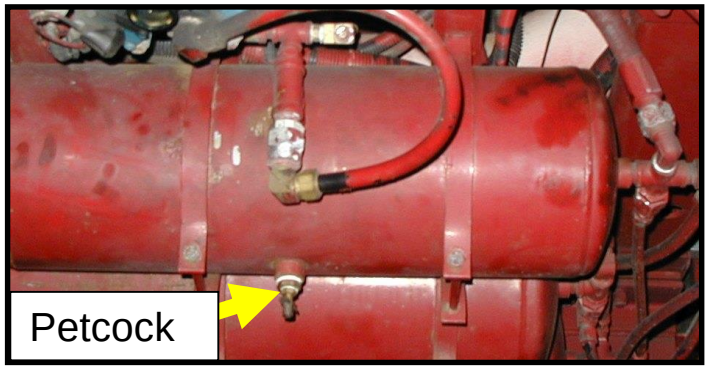
- ✓Wet or Supply Tank
  - First tank after the compressor
  - Generally where heated compressor air cools and water condenses
- ✓Primary, Secondary Tanks
  - Usually two or three
  - Volume depends on the size of the brake system

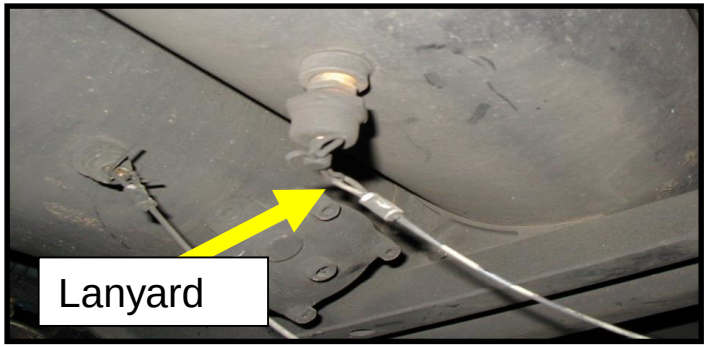


# Air Brake System
## Air Storage - Bleeders

- ✓ Draining the tanks is a weekly task
- ✓ Watch for signs of oil in the water or other discoloration
  - Some rust color can be normal

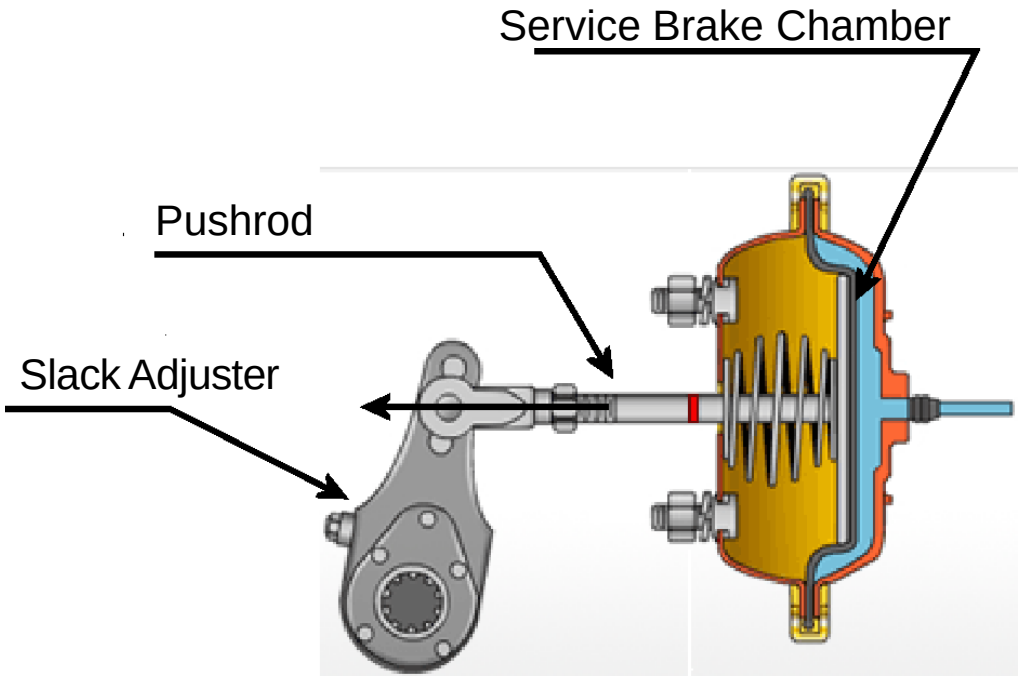


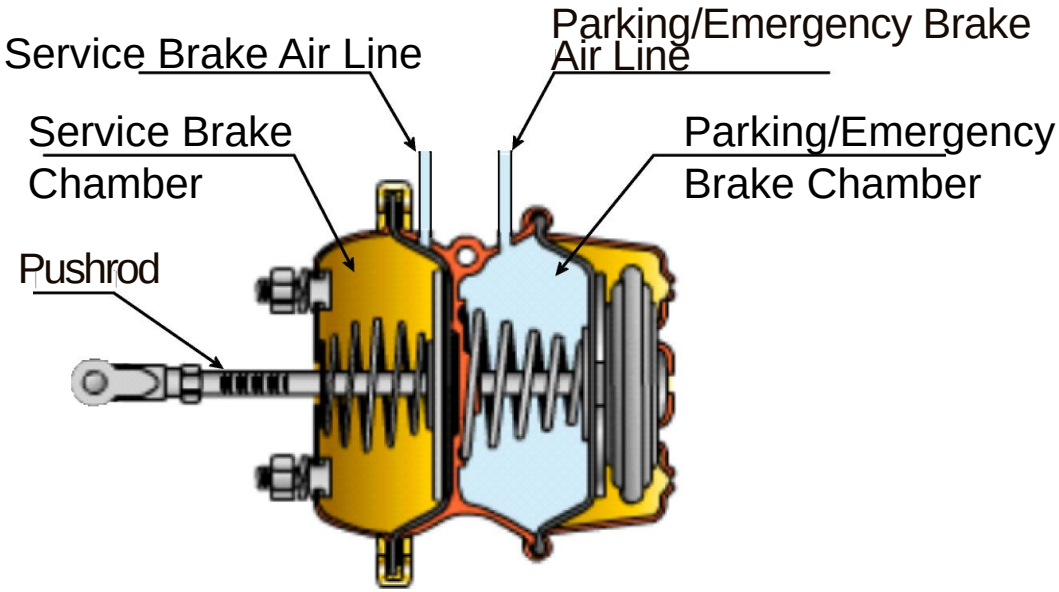



# Air Brake System
## Brake Chambers

### Single Chamber



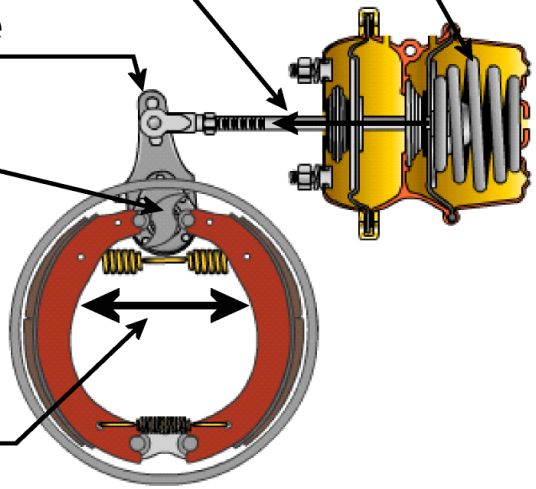

### Dual Chamber



# Air Brake System
## Parking – Spring Brake

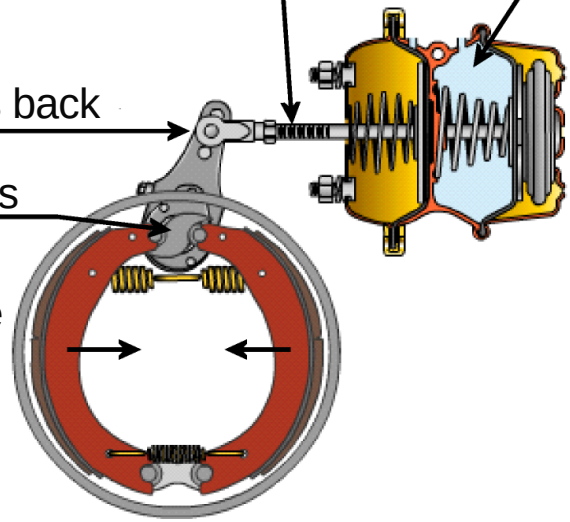

## Parking Brake Applied

1. Air pressure is released; a large spring pushes against a plate
2. Spring moves the pushrod out
3. Rod pushes on the slack adjuster
4. Turns the S Cam
5. Pushes the brake shoes against the brake drum



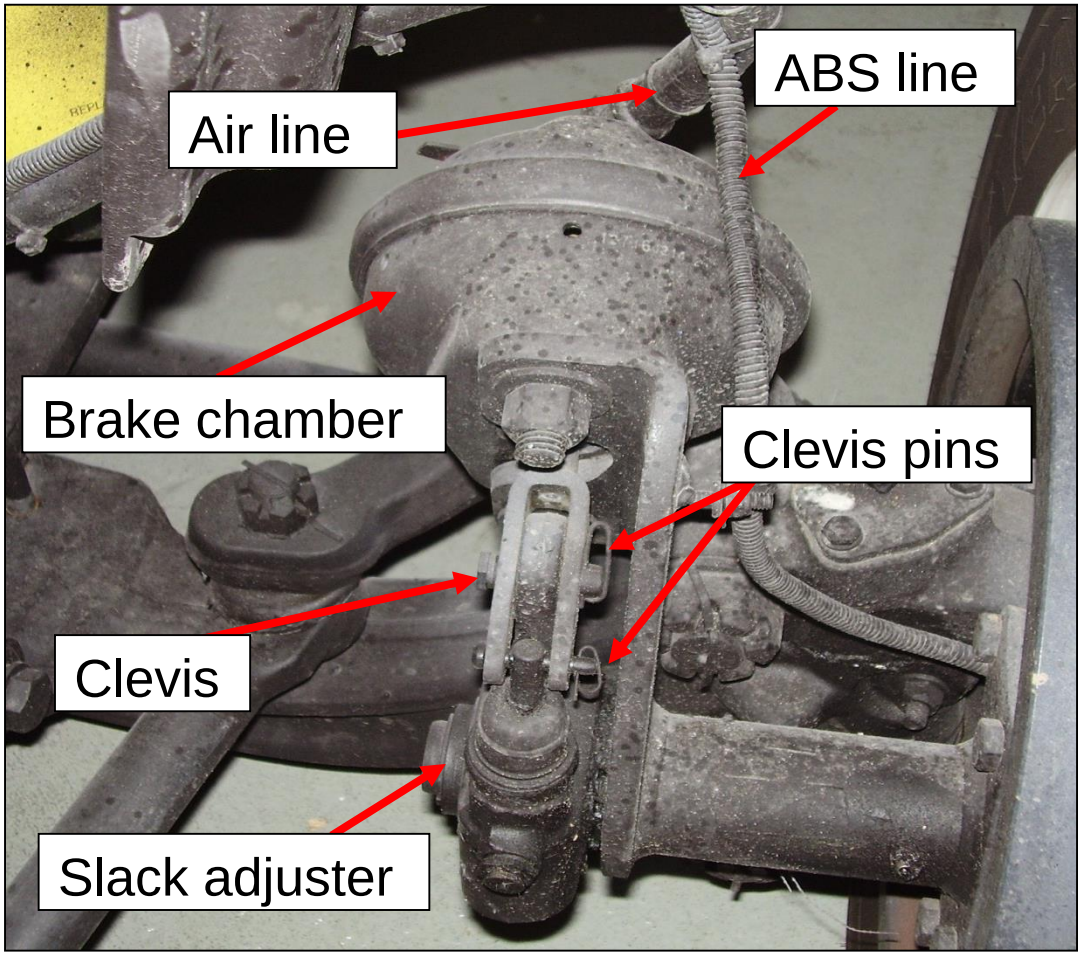

## Parking Brake Released

1. Air pressure pushes the spring back
2. The pushrod pulls back
3. Slack adjuster pulls back
4. The S Cam turns
5. Brake shoes move away from the brake drum, releasing the brakes



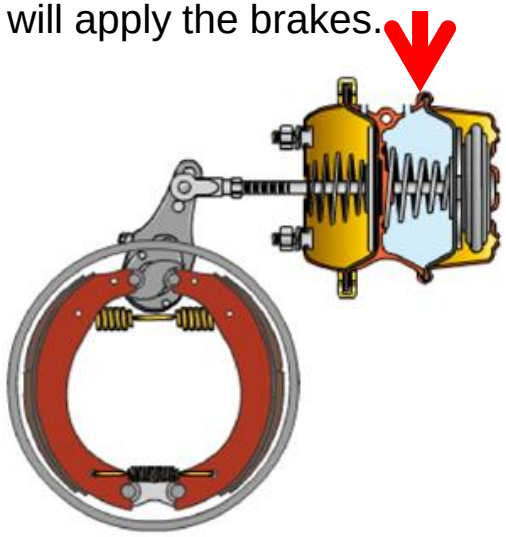
# Air Brake System
## Service Brakes

When air enters the service chamber it pushes on a diaphragm which in turn pushes the push rod and slack adjuster forward. The slack adjuster engages the service brake mechanism, causing the vehicle to slow.

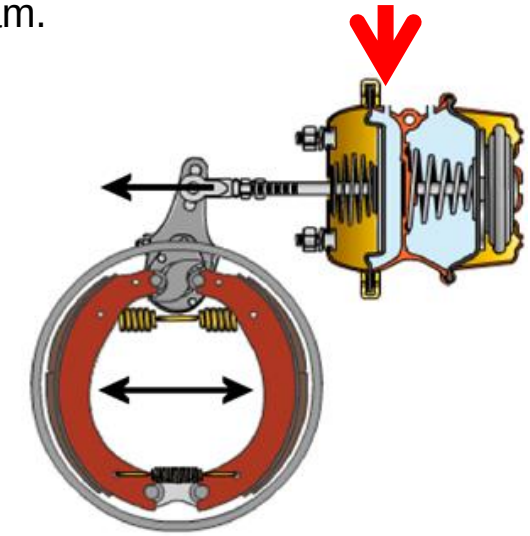


# Air Brake System
## Service Brake

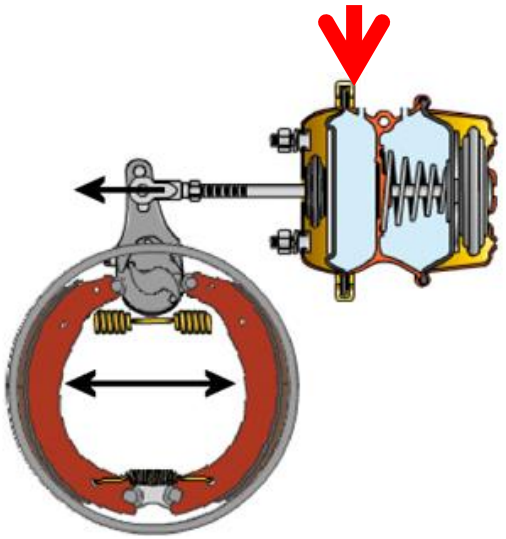
**Accelerating or Coasting**
Air pressure disengages the parking/ emergency brake, so the wheels can turn. If air pressure is lost in this chamber, the spring will apply the brakes.



**Braking – Lag/Reaction Time**
The brake pedal is push and air is forced into the service side brake chamber. The pushrod moves out, turning the slack adjuster and S cam.



**Braking – Slowing/Stopping**
The brake shoes are pushed against the brake drums causing the truck to slow.



Drum brakes are shown, however disc brake systems work in a similar fashion

# Air Brakes
## DOT Inspection

- ✓Conducted in a specific sequence
  - Ensures all critical features are checked properly
- ✓Incorrect sequence
  - Does not check operation of the system sufficiently
  - Will result in a failure during candidate exams - PAGS
- ✓Requires a watch, phone, or other means to keep time
- ✓Park on reasonably flat ground
- ✓Place wheel chocks on both sides of a wheel
- ✓Battery and ignition switches must be on for gauges and warning devices to operate

# Air Brakes
## C-O-L-A

### C=Cut in Pressure

- ✓Indicates compressor is engaging properly
  - Motor running and fanning the service brake
  - Storage pressure drops until compressor engages **>95psi**
  - Cut-in pressure of **<80psi** is OOS criteria

### O=Cut out Pressure

- ✓Indicates governor is working properly and compressor is disengaging properly
  - Motor running and storage tank pressure rising
  - Compressor shuts off between **120** and **135**psi
  - Listen for the air dryer to exhaust air
  - Cut-out pressure of **>135psi** is OOS criteria

# Air Brakes
## C-O-L-A

**L=Low Pressure warning**

- ✓Verifying that the low air alarms are functioning
  - Motor shut down but ignition on
  - Fan the service brakes to bleed storage tanks
  - Low air visual and audible alarms should engage **60** to **90**psi
  - Alarms that do not engage **<60psi** are an OOS criteria
- ✓**A=Air Leakage rate**
- ✓Assessing the ability of the entire system to hold air
  - Motor shut down
  - Monitor storage air levels for 1 minute
  - Levels should drop <**3**psi; or <**4**psi for tractor drawn vehicles

# Air Brakes
## DOT Inspection

1. Release the parking brake
   a. Push valve in
   b. Charges the system with air
2. Let pressure in storage tanks settle
3. Observe the air storage gauges for 1 minute
   a. <3psi loss (<4psi for TDA)
4. Apply steady pressure to the brake pedal
5. Let pressure in the storage tanks settle

# Air Brakes
## DOT Inspection

6. Observe the air storage gauges for 1 minute
   a. <3psi loss (<4psi for TDA)
7. Press and release the brake pedal repeatedly to bleed down the air storage tanks
   a. Low air alarm must sound between 60 and 90psi
   b. Parking brake must automatically engage at 20psi – valve pops out
8. Stop pressing the brake pedal once the parking brake engages
9. Start the motor and increase throttle to 1,200rpm
   a. Pressure must increase from 50psi to 90psi in <3 minutes
   b. Pressure must not exceed 135psi

# Air Brakes
## DOT Inspection

10. Ensure all systems and gauges are back to normal operating conditions
11. Remove the wheel chocks
12. Place the vehicle in forward or reverse gear at idle
    a. Parking brake should restrain the vehicle from moving
13. End the test by engaging the parking brake and returning the transmission to neutral

✓Report any defects to CMF as needed
- Consult with CMF if the safety of the vehicle is in doubt

# Anti-Lock Braking Systems

- ✓Computer control over the air brake system
- ✓Senses the status of each wheel independently
- ✓Allow the tires to turn while the apparatus is slowing down – maintaining rolling friction with the road
- ✓Stops the apparatus in the same – or shorter – distance than regular brakes
- ✓Replaces skid reduction techniques of “pumping” or “threshold” braking
  - Brakes need to be firmly applied and held
  - ABS will NOT work if brakes are “pumped”

# Anti-Lock Braking Systems

- ✓Automatically returns full pressure (air or hydraulic) to the brakes when wheel speed is acceptable
- ✓Any failure in the ABS is designed to return the affected wheel(s) to a non-ABS braking function (i.e. traditional brakes)
  - Should not result in complete loss of brakes
- ✓Illuminated ABS warning light may be an OOS criteria

# Anti-lock Braking Systems

- ✓**Electronic Control Unit**: the brain of the ABS
  - Controls the air pressure to the brake chamber via the modulation valve
- ✓**Exciter or Pulse Ring**: attached to the axle or wheel hub turning at the same speed as the wheel
- ✓**Wheel Speed Sensor**: a small induction coil mounted in close proximity to the pulse ring
  - Generates an impulse to the electronic control unit, which determines the speed at which each wheel is turning.
- ✓**Modulation Valves**: control air or hydraulic pressure to the brake chambers on command from the electronic control unit
  - As quickly as 5 times per second - apply, release, or hold pressure

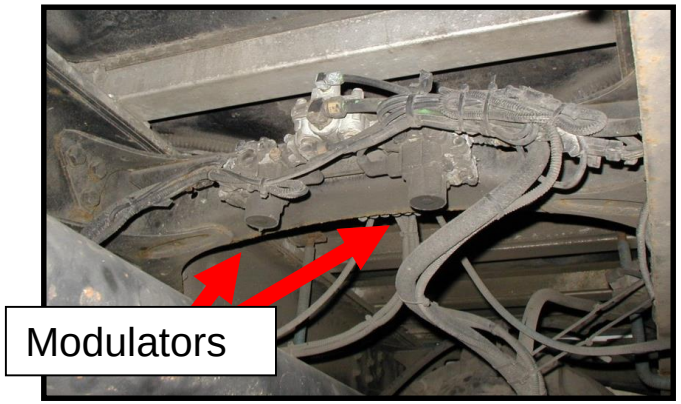
# Anti-Lock Brake Systems

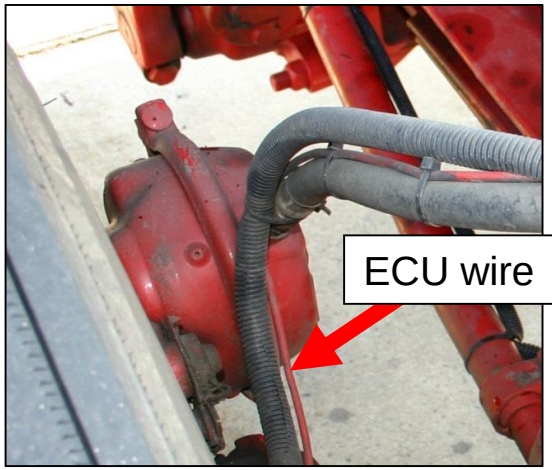
## Physical check

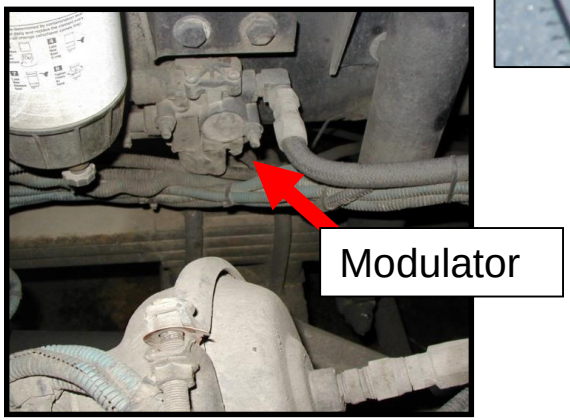
- ✓ Loose or damaged wires
- ✓ Missing or damaged components

## Visual check

- ✓ ABS warning light status



# Tires
## Condition, Inflation, Depth

## C=Condition

- ✓No cuts that expose cord
- ✓No bulges on sidewall which
- ✓Front tires are not regrooved or recapped
- ✓Front tires are not mismatched

# Tires
# Condition, Inflation, Depth

## I=Inflation

- ✓Not leaking or flat
- ✓Tire pressure will match posted pressure on the manufacturer data plate
- ✓Tire pressure will not exceed manufacture's recommended pressure.
- ✓Valve stem will be capped and not touching the wheel
- ✓Rear dual tires are not touch each other

# Tires
## Condition, Inflation, Depth

**D=Depth**

- ✓ **Tread Depth no less than:**
  - **4/32” steering tires**
  - **2/32” non-steering tires**
- ✓ **No tread missing exposing cord**
- ✓ **Tread should be worn evenly**
- ✓ **Tread depth will be obtained from any major groove**

# Tires
## Tread Depth

**Steering Axles—4/32”**

When a Quarter is inserted into the grooves of the tread the top of George Washington’s head should be below the tread surface. The tread depicted in the photo has just enough tread depth.

**Non-Steering Axles—2/32”**

When a Penny is inserted into the grooves of the tread the top of Abraham Lincoln’s head should be below the tread surface. The tread depicted in the photo has just enough tread depth.

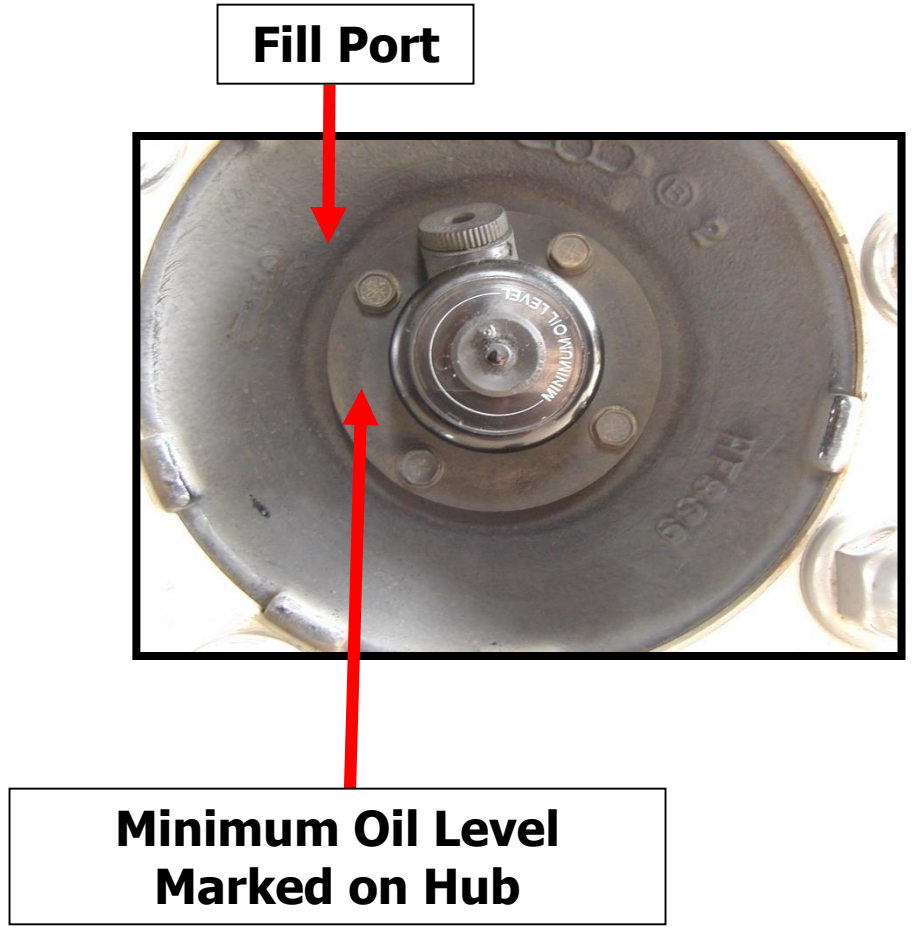
# Tires
## Other considerations

- ✓Steering tires
  - Do the tread patterns match from side to side?
  - Are they the same size and type?
- ✓Non-steering tires - duals
  - Each pair of tires is designed to carry a load together
  - Damage, incorrect inflation, or uneven wear transfers more load to one tire
  - Best practice is to mount only the same brand of tire with the same tread pattern and depth (within 4/32) in a dual assembly

DOT does not mandate tire specifications

# Front Wheel Hub

- ✓Contains gear oil to lubricate wheel bearings
- ✓ Wheel hub no missing bolts
- ✓ Hub oil filled to proper level
- ✓ Hub is not leaking



# Wheels

- ✓Wheels not bent or cracked
- ✓Wheels have no welded repairs
- ✓All wheel studs and lugs present
- ✓No broken or missing studs
- ✓All lugs tight
- ✓Look for rust trails

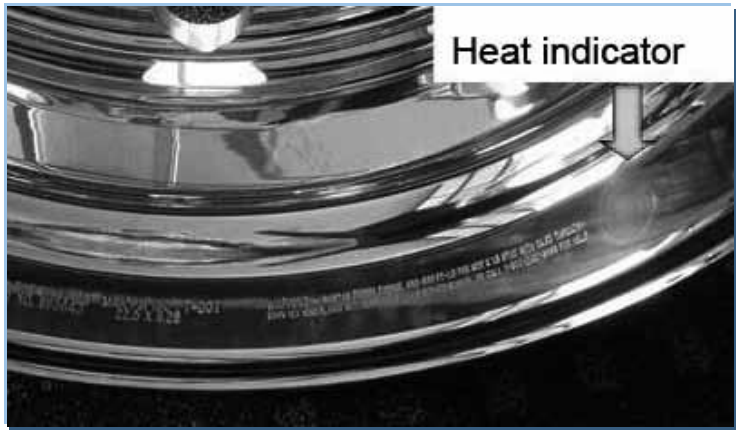
# Wheels
## Aluminum

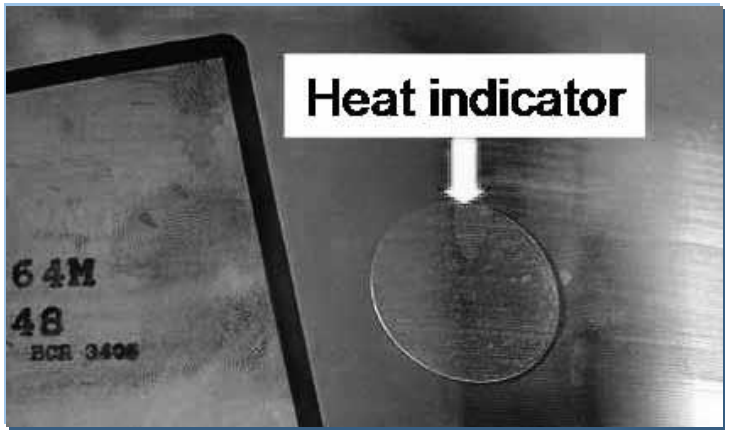
- ✓Single piece aluminum
- ✓Inspect for:
  - Cracks
  - Corrosion
  - Wear
  - Rust streaks
  - Other damage
- ✓Lugs must be hand tight
- ✓Heat damage

# Wheels
## Aluminum – Pre-2009

A blistered, blackened or cracked looking logo decal on an Alcoa wheel may indicate that the wheel has been exposed to excessive heat

# Wheels
## Aluminum – Post-2009

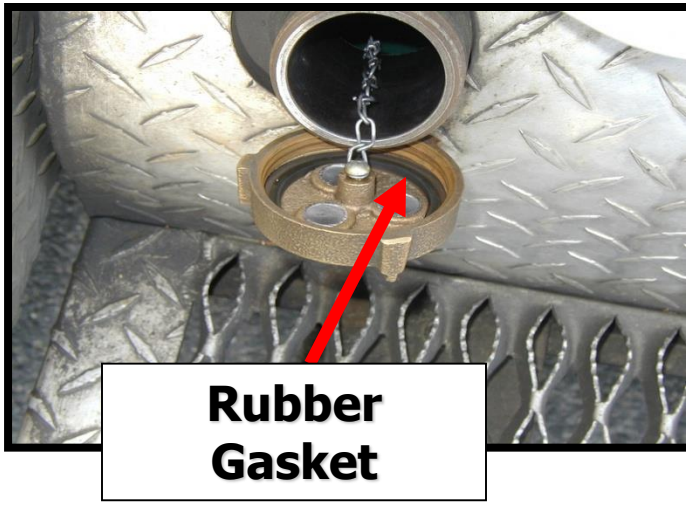



- ✓Starting in January 2009, 1-inch round clear heat indicator near the stamp on the wheel
- ✓Blistering, charred, blackened, or cracked appears indicates excessive heat

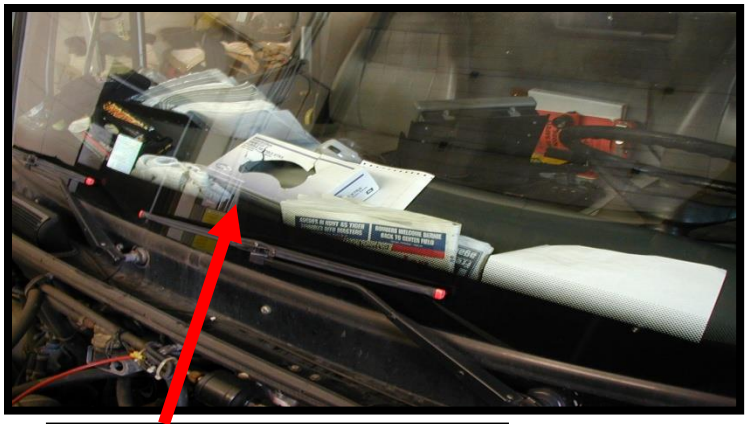
# Fuel Tank

- ✓May be located at the curbside step area or under the body – model year dependent
- ✓Mounts secure and not damaged
- ✓Not leaking or damaged
- ✓Gasket between Tank and Straps in place
- ✓Fuel cap secure and gasket intact

# Cab Area
## Windshield

- ✓All glass clean inside/out
- ✓Windshield no cracks or chips that obstruct view
- ✓No illegal stickers
- ✓Rubber molding intact not broken
- ✓Dash free of loose materials
  - Blocks the defroster
  - Distracts the driver
- ✓No unauthorized decals



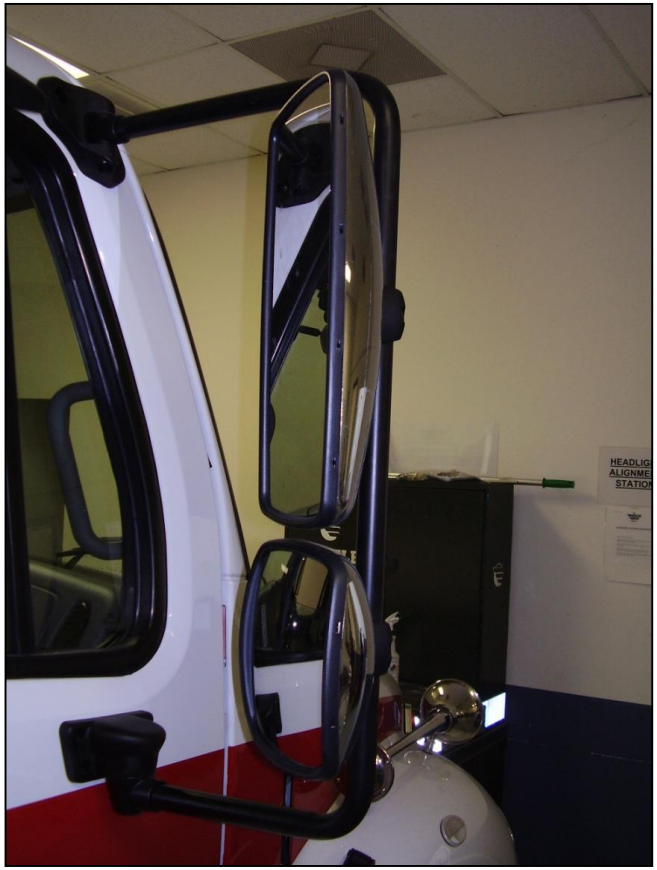
**Loose materials**

# Cab Area
## Windshield Wipers

- ✓Windshield wipers are making proper contact with windshield
- ✓Rubber blades are not cracked, broken or missing
- ✓Wipers in good working order
- ✓Washer fluid level is adequate and pump functions to spray windshield

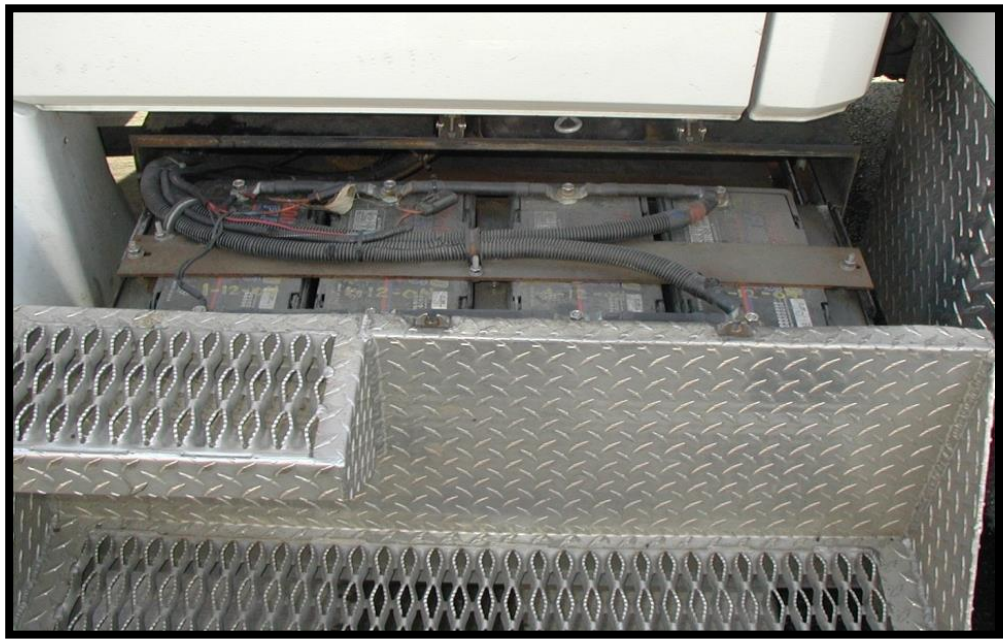
# Cab Area
## Mirrors

- ✓Mirrors properly adjusted
  - Convex mirrors covering blind spots
- ✓View to mirrors is unobstructed
- ✓All wiring intact, secure, and not broken for heated/remote mirrors
- ✓Remote adjustment functions for main mirrors
- ✓Mirror mounts secure with no excessive vibration



# Cab Area
## Battery Compartment

- ✓Battery compartment latches function properly
- ✓Batteries mounted securely
- ✓Battery connections tight and free from corrosion
- ✓Battery cables not frayed, cracked or broken
- ✓Battery tray slides function with no excessive rust



# Cab Area
## Shoreline

- Each model year of ambulance is slightly different – learn your unit

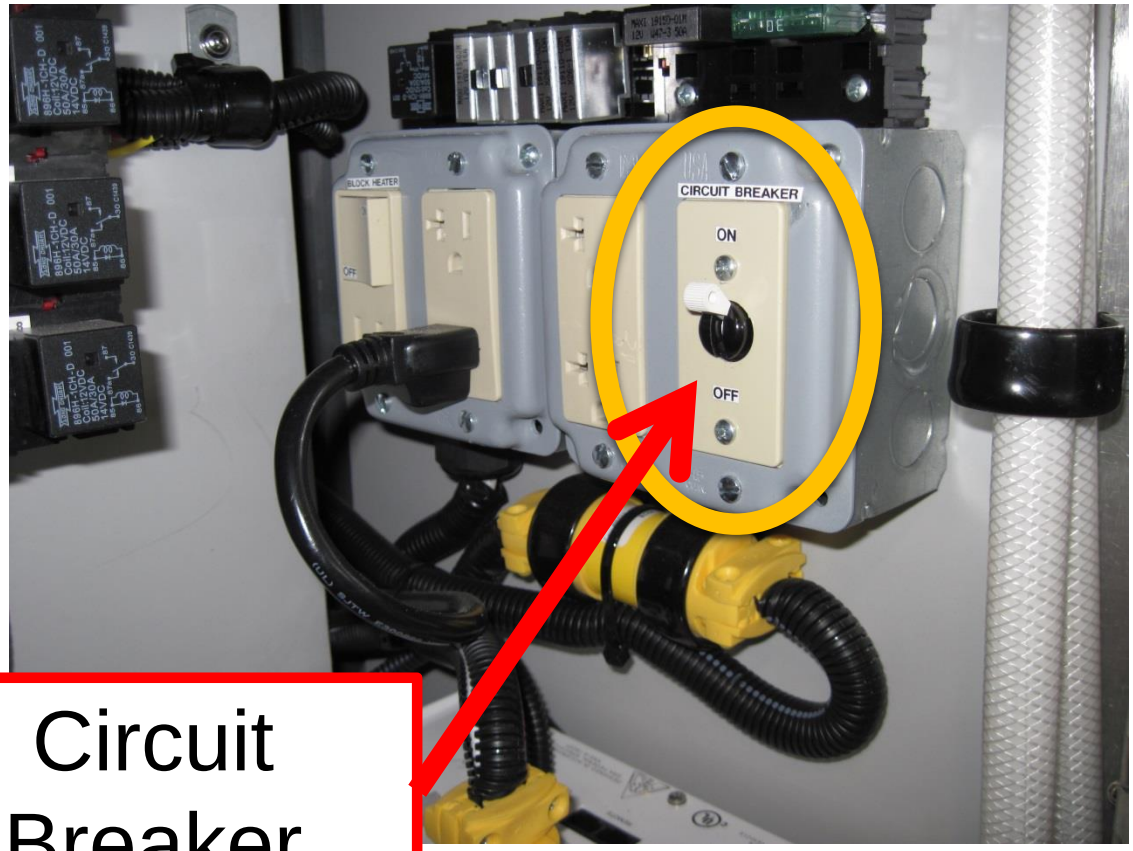
✓ If indicator lights do not illuminate with shoreline plugged in:

a. Ensure shoreline is providing power

b. Check breaker located in the patient compartment

# Shoreline Connection
## 2016 Units

- ✓ If BOTH lights are not illuminated the interior breaker must be reset.
- ✓ Breaker is in the compartment behind the Captain's Chair.



# Cab Area
## Interior and Function Check

- Turn on battery & Ignition
- Instrument Panel
- Accelerator
- Engage/ Disengage Parking Brake
- Conduct Air Brake Test
- Steering Wheel & Seat Adjustment
- Automatic Tire Chains
- Windshield wipers
- HVAC
- Defroster
- Communications Equipment
- DOT Lighting
- Warning Lights & Devices
- Mirrors
- Occupant Restraints

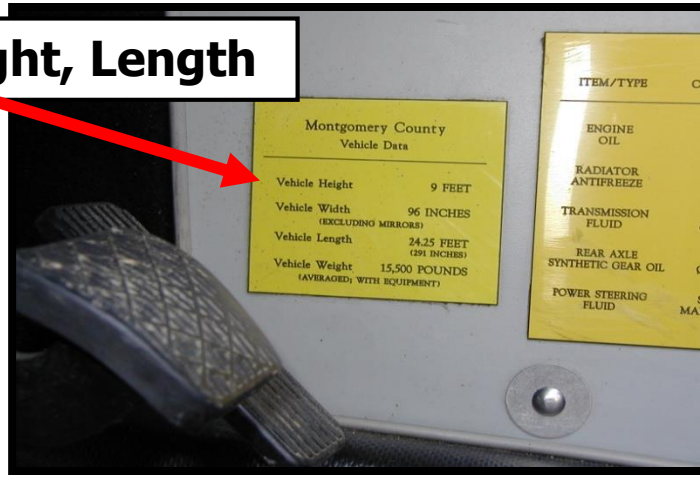
# Cab Area
## Siren

- ✓ “Gain” knob is the on/off switch and volume control for the public address system
- ✓ Center dial changes the cadence
- ✓ Left toggle is a momentary switch to activate the siren or electronic horn
- ✓ Siren may be interlocked with parking brake and/or warning lights

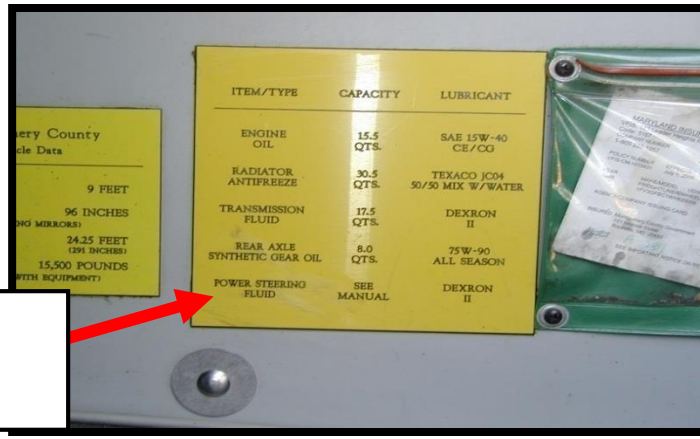
# Cab Area
## Data Plate

- ✓ Ensure the plate is present and legible
- ✓ Utilize the information when conducting other aspects of the pre-trip and during operations

**Height, Weight, Length**




**Fluid Types And Quantity**



# Cab Area
## Official Documents

- ✓ Ensure Vehicle Registration and Insurance Card are present and legible
- ✓ Replacements are available via Fleet Services
- ✓ Ensure a current DOT inspection sticker or CMF referral sticker are present

**Vehicle Registration**

# Cab Area
## Driver's Seat

- ✓ Drivers seat is securely mounted
- ✓ Adjust seat to comfortably reach the pedals
- ✓ Adjustment mechanism intact and functioning
- ✓ Ensure fore and aft adjustment locks

# Cab Area
## Seatbelts

- All seating positions, including the patient compartment
- ✓ Not cut or frayed
- ✓ Latches function properly and buckle effectively
- ✓ Retractors operate
- ✓ Retractor and guides securely mounted

# Cab Area
## Dashboard Display

- ✓ All gauges sweep and return to zero or proper pressure with motor off
- ✓ When motor started all gauges go to proper ranges
- ✓ Backlighting functioning

# Cab Area
## Oil Gauge

- Indicates oil pressure; not quantity or level
- ✓When motor is off gauge should read zero
- ✓When motor is running gauge will read oil pressure
- ✓Normal operating pressure range is 40 - 60psi. Fluctuates with throttle.
- ✓Higher or lower pressures indicate potential problems.  Contact CMF immediately

# Cab Area
## Water Temperature Gauge

- ✓Needle “zeroes” to 100º when motor is off
- ✓Needle will gradually rise as motor temperature increases
- ✓Normal operating temperature range is 150º to 200º

# Cab Area
## Fuel & DEF Level

FUEL

- ✓Fuel gauge reads empty with battery off; reads actual level with battery on
- ✓Maintain fuel between ¾ and full

DIESEL EXHAUST FLUID (DEF)

- ✓Refill when below 1/2

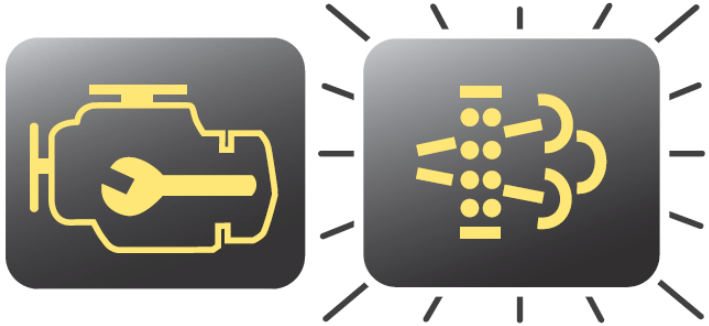
# Cab Area
## Diesel Particulate Filter Warnings

### Aftertreatment Diesel Particulate Filter

- Indicates a regeneration is needed – passive or active
- When flashing, regeneration is more urgently needed

### High Exhaust System Temperature

- Does not signify any need for service – regeneration occurs at high temperatures
- Keep the exhaust pipe outlet away from combustibles



### Flashing DPF Light + Check Engine

- Regeneration is needed immediately
- Active regeneration is required

# Cab Area
## Air Pressure

- Air pressure gauges vary dependent upon model year
- Air brake equipped vehicles have two air pressure displays
- ✓Report the following conditions:
  - Any pressure below 80psi that is not replenishing with the motor running
  - Pressure climbing higher than 135psi
  - Low air alarm not sounding below 60psi

# Cab Area
## Tachometer

- Tachometer displays the speed of the engine
- The tachometer is read in 100's.
  - 5=500 rpm,  10=1000 rpm
- Normal idle range is 600 to 800rpm at idle
- High idle is 1000 to 1200rpm
- Transmission normally shifts at 1400 to 1600rpm during travel

✓Tachometer must work

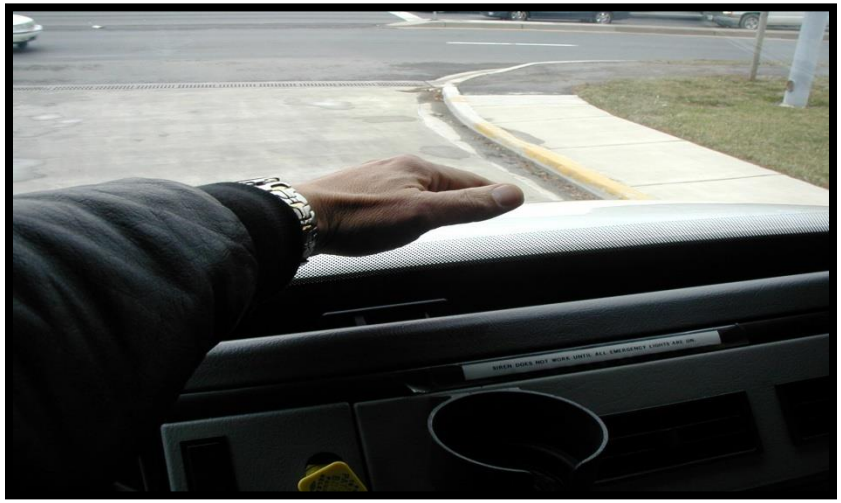
✓Observe for odd fluctuations

# Cab Area
## Speedometer

- ✓Speedometer must return to zero when vehicle is stationary
- ✓Speedometer must read speed when in motion
  - Malfunction is OOS criteria

# Cab Area
## Defroster

- ✓ Defroster in working order
- ✓ With hand over defroster you must feel the air hitting windshield
- ✓ Ensure vents are unobstructed



# Cab Area
## DOT, Scene, & Warning Lights

- ✓ All lights in good working order and proper color
- ✓ No missing fixtures or lens covers
- ✓ All functions working, i.e. brake, turn signal, reverse
- ✓ Low and high beam headlights functioning


# Cab Area
## Voltmeter

- Display may be digital in the main vehicle display panel or a separate analog gauge
- ✓Normal operating range with unit running is 12 to 16 volts


# Compartment & Equipment

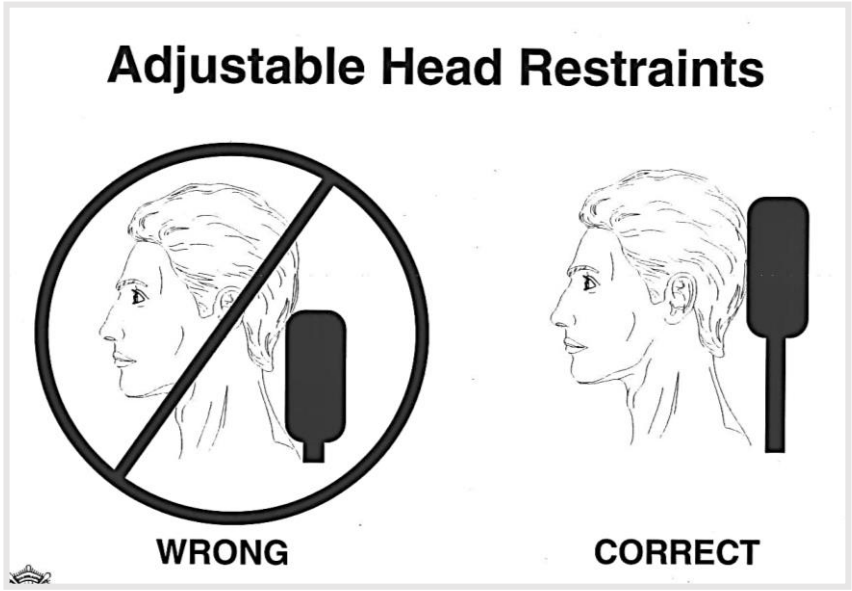
- Compartment latching
- Equipment
- Inventory
- Spare electrical fuses
- Road hazard signaling devices
- Tire chains/ wheel chocks
- PPE
- SCBA
- Specialty equipment
- Fire extinguisher

# Compartment & Equipment
## Safety Equipment

- ✓ DOT requires commercial vehicles to carry:
  - ABC fire extinguisher
  - 3 flares, or road triangles, or traffic cones
- ✓ At least one wheel chock
- ✓ One traffic vest per crew member

# Compartment & Equipment
## Occupant Restraints

- Helps driver maintain vehicle control
- Keeps attendant and patient safe
- Reduces injuries in collisions
- Saves lives
- Adjustable Head Rests
- Seat position
- Attendant's Chair
- Bench seats



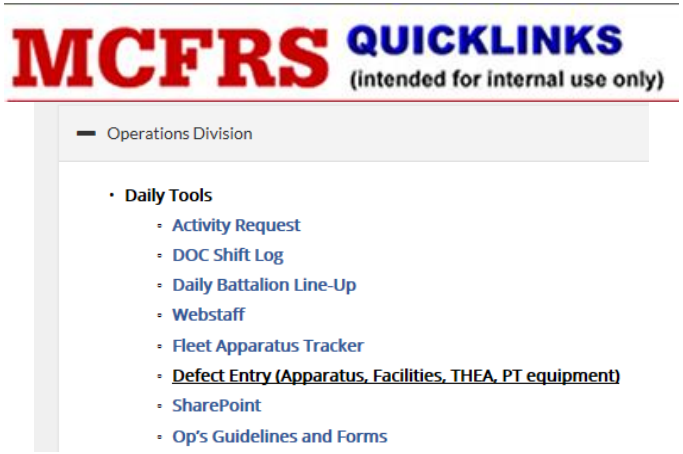
# Functional Test

- ✓Circle Check
- ✓Remove Wheel Chocks, Charging Cords
- ✓Transmission In Neutral / Park
- ✓Batteries & Ignition on / Gauge Sweep
- ✓Start Motor
- ✓Check Gauges, Headlights On!
- ✓Release Parking Brake
- ✓Engage warning devices
- ✓Park in a suitable location – flat ground, away from traffic

# Defect Reporting

## Fleet Management Reporting System

- ✓Requires employee ID # and password
  - Not the same as single sign-in or network info
- ✓Statistics are required to complete the online report
  - Vehicle mileage
  - Engine Hours
  - Pump Hours
  - Generator Hours
- ✓Enter only one defect per report
  - Provide a detailed description of the issue
  - Include photos when applicable
- ✓Permits the operator to see what defects exist and who reported them when



# Additional Resources

- ✓MCFRS Operator's Guide to Fire Apparatus Out of Service Criteria
  - http://www.montgomerycountymd.gov/frs-ql/resources/files/apparatus/MCFRSOOSCriteria12.pdf
- ✓PSTA Driver Training Website
- ✓MCFRS Apparatus Checkout Form
  - http://www.montgomerycountymd.gov/frs-ql/resources/files/apparatus/checkout/ApparatusCheckout.pdf