



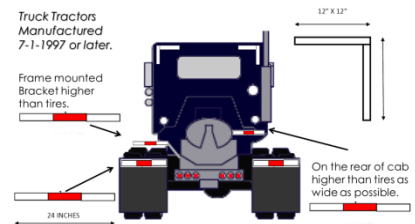
FMCSA DOT Annual

Commercial Motor Vehicle Inspection Training



Truck Tractors
Manufactured
7-1-1997 or later.

Frame mounted
Bracket higher
than tires.



On the rear of cab
higher than tires as
wide as possible.

Student Reference Manual



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PURPOSE

This training program is intended to provide individuals responsible for the inspection, repair, and maintenance of commercial motor vehicles with information regarding FMCSA vehicle component and inspection requirements. The content of this training will include, but is not limited to:

- Federal Motor Carrier Safety Regulations Part 393 / Parts and Accessories Necessary for Safe Operation
- Federal Motor Carrier Safety Regulations Part 396 / Inspection, Repair, and Maintenance
- FMCSR Appendix G (minimum periodic inspection standards)
- Federal Motor Vehicle Safety Standards 108 and 121

*due to changes in federal and state regulations, Truck Safety Services cannot guarantee the accuracy of material after the published date. Check current versions of the regulations for any applicable changes. All information provided herein including any technical or legal references are for illustrative purposes only. Content of this manual is not be used in place of recommended maintenance procedures, nor be construed as any form of legal advice.

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Terms you will find in this manual;

CMV – commercial motor vehicle.

GVW – gross vehicle weight (actual weight of a vehicle including all cargo)

GVWR – gross vehicle weight rating (the manufacturer’s recommended maximum gross weight)

FMCSR – Federal Motor Carrier Safety Regulations

OOS - Out of service.

What is a Commercial Motor Vehicle? FMCSR 390.5

Since everything in this program is about inspecting Commercial Motor Vehicles, we should learn what a CMV is. **FMCSA 390.5**

First, in order for a vehicle to be a CMV it must be used in commerce. This includes any business activity regardless of size or nature.

Next, it has to meet any one of the following criteria;

1. Has a total actual weight (GVW) of 10,001 lbs. or more (for combination vehicles, you must add the GVW of each unit together for the total GVW), or
2. Has a total manufacturers rating (GVWR) of 10,001 lbs. or more (for combination vehicles, you must add the GVWR of each unit together for the total GVWR), or
3. If the vehicle doesn't meet the above standards, it may also be a CMV if it meets the passenger or hazardous materials criteria:
 - For hire transportation (limousine, taxi, etc.) - is designed or used to transport more than 8 passengers (including the driver)
 - Not for compensation (churches, community support organizations, etc.) - is designed or used to transport more than 15 passengers, (including the driver)
 - Used to transport any placardable amount of hazardous materials.

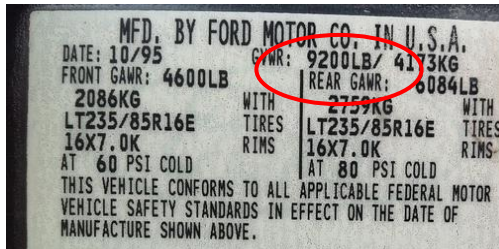
Churches, farms, builders, service trucks, snowplowing, landscaping, race car teams, horse stables and a variety of home based businesses are examples of organizations that may operate vehicles that meet this definition and are subject to CMV regulations.

For a list of exceptions to CMV regulations, please see FMCSR 390.3

Determining GVWR

Gross vehicle weight rating is usually assigned by the manufacturer and for self-propelled CMVs can usually be found on the specification label located on the inside of the driver's door. For trailers, the GVWR information may be anywhere but is generally located near the coupling on a sticker or similar identification plate.

Example of GVWR information



MANUFACTURED BY / FABRIQUE PAR:		THOR IND
GVWR/PNBV	4790	KG(10560 LB)
GAWR/PNBE		TIRES/PNEU
FRONT/ 1996	KG	
AVANT (4400	LB)	ST225/75R15(D)
		RIMS/JANTI
		15X6

Example of combined GVWR



GVWR – 7200 lbs	GVWR – 7000 lbs
<i>TOTAL Combined GVWR – 14,200 lbs.</i>	
If this combination of vehicles is used for any business related purposes, it is considered a CMV and subject to State and Federal CMV regulations.	

Inspector Qualifications 396.19

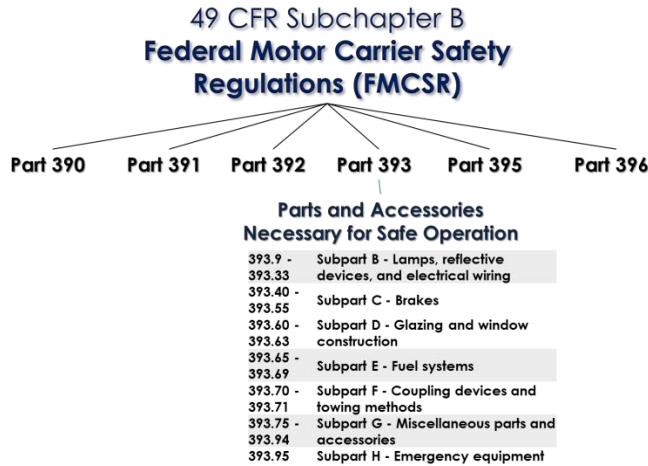
Inspectors performing Periodic Inspections must meet the following qualifications.

- (1) Understand the inspection criteria set forth in part 393 and appendix G of this subchapter and can identify defective components;
- (2) Are knowledgeable of and have mastered the methods, procedures, tools and equipment used when performing an inspection; and
- (3) Are capable of performing an inspection by reason of experience, training, or both as follows:
 - Successfully completed a Federal-or State-sponsored training program or have a certificate from a State or Canadian Province that qualifies the individuals to perform commercial motor vehicle safety inspections, or
 - Have a combination of training or experience totaling at least 1 year. Such training or experience may consist of...
 - Participation in a commercial motor vehicle manufacturer-sponsored training program or similar commercial training program designed to train students in commercial motor vehicle operation and maintenance;
 - Experience as a mechanic or inspector in a motor carrier or intermodal equipment maintenance program;
 - Experience as a mechanic or inspector in commercial motor vehicle maintenance at a commercial garage, fleet leasing company, or similar facility; or
 - Experience as a commercial motor vehicle inspector for a State, Provincial or Federal government.

Evidence of each inspector’s qualifications must be on file while they are performing inspections.

Introduction to FMCSR

The Federal Motor Carrier Safety Regulations are divided into separate parts that each covers their own topics. For example, Part 395 includes requirements for maximum driving time and records of duty for drivers while Part 391 includes requirements for driver physical requirements and record checks. The part which specifies which components a CMV must be equipped is **Part 393**.



Required Parts, Defective Conditions, and other Roadside Violations

Our main concern when large trucks are being operated on a public roadway is safety. Operating a heavy truck in an unsafe condition is very dangerous to the driver and the motoring public. It also poses many legal and civil liabilities for companies and drivers. The first step to a safe vehicle is to be compliant with the law.

FMCSR part 393 lists all the required parts for CMVs and defective conditions which are not allowed. Carriers must make sure these parts are maintained in good working order can expect to receive tickets and fines for components not meeting requirements of Part 393 as well as have their CSA scores affected.

Appendix G is a list of minimum components that must be inspected during a Periodic (or annual) DOT inspection. The conditions

Out of Service Criteria is a document published yearly that is used by roadside inspectors to determine which conditions are serious enough to not allow the vehicle to continue on its route. Vehicles that are placed out of service must be repaired at the scene or in some cases can be removed by a tow truck.

Practice Exercise 1

Using the criteria we discussed, read the following scenarios and decide if the vehicle in question is a CMV for our purposes.

Scenario 1

A trucking company is operating a truck tractor with a GVWR of 52,000 lbs. This truck tractor is used to transport empty trailers between company owned facilities within the same city.

Is this a CMV? YES or NO

Explain

Scenario 2

A mobile truck repair company is operating a box truck with a GVWR of 9995 lbs. A mechanic drives the truck only to perform service calls and the total weight is 12,000 lbs.

Is this a CMV? YES or NO

Explain

Scenario 3

A construction company operates a 2500 HD pickup truck that has a GVWR of 9200 lbs. that is used to tow a small equipment trailer with a GVWR of 7000 lbs. The company has equipped the truck with a custom made service box and the trailer has been outfitted with a permanently mounted generator.

Is this a CMV? YES or NO

Is the equipment added by the company legal to have on the vehicle? YES or NO

Explain

Lights, Reflectors, Batteries and Wiring FMCSR 393.9 - 393.30 FMVSS 108

In this section we will learn what lighting and reflective devices are required on CMVs.

After completing this section you should be able to:

- Identify the proper placement and color of required lighting and reflectors
- Identify prohibited lighting combinations.
- Identify proper placement of retro reflective sheeting for required vehicles.
- Understand battery and wiring installation requirements

All required lights must be able to work at all times and no required lights or reflective material can be obscured by tarps, load, dirt, additional equipment, or any other condition that reduces the visibility of the lamp or reflector.

393.19 When hazard flashers are on, all turn signals must flash at the same time.

393.23 (except for lamps on projecting loads) All lamps must be powered by the vehicles electrical system.

393.24 Headlamps must be properly aimed in accordance with fmvss 108.

393.25 all lamps are required to be steady burning. Other than the exceptions in 393.25 (such as school buses, oversize, emergency or service vehicles) lights can not flash or flicker including flickering due to a loose plug or connection.

393.11 Stop lamps and taillights cannot be amber in color.

393.3 Additional lamps are allowed if they are consistent with color and location of required lamps. Lamp and reflector colors such as blue, green, or purple are inconsistent with the required colors therefore are not allowed.

393.11 Color, Location, Number

There are specific requirements on where the lights and reflectors are located along with the color and placement. The required devices vary depending on the type of CMV.

The following tables and illustrations list the specific requirements for all lights and reflectors*

*tables are condensed for quick reference. See FMCSR Part 393.11 for complete table information.

Front of Vehicle

Head lamps

<i>Required on</i>	All buses, trucks, and truck tractors
<i>How many are required?</i>	2, with an equal number on each side
<i>Where?</i>	On the front, 22 – 54 inches from the ground. (properly aimed, with high and low beams)
<i>Color?</i>	White

Turn signals (front)& front hazard warning signals

<i>Required on</i>	All buses, trucks, and truck tractors
<i>How many are required?</i>	2, with one on each side, as far apart as practicable and at same height
<i>Where?</i>	At or near the front, 15 – 83 inches above the ground
<i>Color?</i>	Amber
<i>Footnotes</i>	#2 / tractors with double faced signals do not need rear signals. #12 / In addition to signaling turns, the front and rear signals must flash simultaneously as a warning signal.

Identification lamps (front)

<i>Required on</i>	buses, trucks, and truck tractors 80 inches or wider
<i>How many are required?</i>	3, one at the centerline with one on each side equally spaced 6 – 12 inches apart
<i>Where?</i>	On the front, at the top of the vehicle or top of the cab, all at the same height
<i>Color?</i>	Amber
<i>Footnotes</i>	#1 / For offset cabs, they can be on the centerline of the cab. Cannot be below the top of the windshield for any vehicle.

Clearance lamps (front)

<i>Required on</i>	buses, trucks, truck tractors, trailers and projecting loads 80 inches or wider.
<i>How many are required?</i>	2, one on each side depicting the overall width
<i>Where?</i>	On the front, as high as possible, at the same level
<i>Color?</i>	Amber
<i>Footnotes</i>	#8 / special provisions for pole trailers. #9, #10 / projecting loads must have clearance lights when headlights are required #15 overall width does not include lamps, mirrors or mud flaps Can be located other than front to indicate the widest part, or to prevent damage to lights Truck tractors can indicate cab width rather than vehicle width #17 / Boat trailers can have one amber and one red near the midpoint to indicate overall width.

Parking Lamps

<i>Required on</i>	Buses and trucks less than 80 inches wide
<i>How many are required?</i>	2, on each side of the center, as far apart as practicable
<i>Where?</i>	On the front, 15 – 83 inches above the ground, the same height on both sides
<i>Color?</i>	Amber

Side of Vehicle
Front Side Marker Lamps

<i>Required on</i>	All buses, trucks, truck tractors, trailers.
<i>How many are required?</i>	2, one on each side
<i>Where?</i>	As far to the front as possible, no lower than 15 inches from the ground.
<i>Color?</i>	Amber
<i>Footnotes</i>	#16 / Trailers less than 6 feet in length including the tongue are not required to have front side marker lamps or reflectors.

Front Side Reflectors

<i>Required on</i>	All buses, trucks, truck tractors, trailers.
<i>How many are required?</i>	2, one on each side
<i>Where?</i>	As far to the front as possible, 15 – 60 inches from the ground.
<i>Color?</i>	Amber
<i>Footnotes</i>	#16 / Trailers less than 6 feet in length including the tongue, is not required to have front side marker lamps or reflectors.

Intermediate Side marker lamps

<i>Required on</i>	All buses, trucks, trailers longer than 30 feet.
<i>How many are required?</i>	2, one on each side
<i>Where?</i>	At or near the midpoint of the front and rear marker lamp no lower than 15 inches from the ground.
<i>Color?</i>	Amber
<i>Footnotes</i>	

Intermediate side reflectors

<i>Required on</i>	All buses, trucks, trailers longer than 30 feet.
<i>How many are required?</i>	2, one on each side
<i>Where?</i>	At or near the midpoint of the front and rear marker lamp 15 – 60 inches above the ground
<i>Color?</i>	Amber
<i>Footnotes</i>	

Rear side marker lights

<i>Required on</i>	All buses, trucks, trailers
<i>How many are required?</i>	2, one on each side
<i>Where?</i>	As far to the rear as possible, no lower than 15 inches above the ground (trailers must be 15 – 60 inches)
<i>Color?</i>	Red
<i>Footnotes</i>	#4 / any trailer after 2-28-1979 rear side markers must be 15 – 60 inches above the ground.

Rear side reflectors

<i>Required on</i>	All buses, trucks, trailers
<i>How many are required?</i>	2, one on each side
<i>Where?</i>	As close to the rear as possible, 15 – 60 inches above the ground
<i>Color?</i>	Red

Rear of vehicle

Tail lamps

<i>Required on</i>	All buses, trucks, truck tractors, trailers, and projecting loads
<i>How many are required?</i>	2, with one on each side, as far apart as practicable and at same height
<i>Where?</i>	On the rear, 15 - 72 inches from the ground.
<i>Color?</i>	Red
<i>Footnotes</i>	#5 / special conditions for converter dollies towed singly. #11 / to be illuminated when the tractor headlights are on.

Stop lamps

<i>Required on</i>	All buses, trucks, truck tractors, trailers.
<i>How many are required?</i>	2, one on each side, as far apart as practicable and at same height
<i>Where?</i>	On the rear, 15 - 72 inches from the ground.
<i>Color?</i>	Red
<i>Footnotes</i>	#5 / special conditions for converter dollies towed singly. #13 / to be activated when the service brake is applied.

Rear reflectors

<i>Required on</i>	All buses, trucks, truck tractors, and trailers.
<i>How many are required?</i>	2, with one on each side of the centerline, as far apart as practicable.
<i>Where?</i>	On the rear, 15 - 60 inches from the ground, both at same level
<i>Color?</i>	Red
<i>Footnotes</i>	#5 / special conditions for converter dollies towed singly. #6 / Pole trailers must have on one each side of to indicate the extreme width of the vehicle.

Rear Turn signals& rear hazard warning signals

<i>Required on</i>	All buses, trucks, truck tractors, trailers
<i>How many are required?</i>	2, one on each side, as far apart as practicable and at same height
<i>Where?</i>	At or near the front, 15 – 83 inches above the ground
<i>Color?</i>	Red
<i>Footnotes</i>	#5 / special conditions for converter dollies towed singly. #12 / In addition to signaling turns, the front and rear signals must flash simultaneously as a warning signal.

Rear Identification lamps

<i>Required on</i>	buses, trucks, and trailers 80 inches or wider
<i>How many are required?</i>	3, one at the centerline with one on each side equally spaced 6 – 12 inches apart
<i>Where?</i>	On the rear, as close to the top as practicable, all at the same height
<i>Color?</i>	Red
<i>Footnotes</i>	#3 / ID lights don't have to be visible or lighted if obscured by a vehicle in the same combination. #7 / Pole trailers don't need rear ID lights if the tow vehicle has compliant rear ID lights and they are mounted higher than the load on the trailer. #15 / overall width does not include lamps, mirrors, flexible fender extensions or mud flaps. When rear ID lights are at the extreme height of a vehicle, rear clearance lamps are not required to be at the top of the vehicle.

Rear Clearance lamps

<i>Required on</i>	buses, trucks, trailers and projecting loads 80 inches or wider.
<i>How many are required?</i>	2, one on each side depicting the overall width
<i>Where?</i>	On the rear, as high as possible, at the same level
<i>Color?</i>	Red
<i>Footnotes</i>	#8 / special provisions for pole trailers. #9, #10 / projecting loads must have clearance lights when headlights are required #15 / overall width does not include lamps, mirrors, flexible fender extensions or mud flaps. Can be located other than rear to indicate the widest part, or to prevent damage to lights. When rear ID lights are at the extreme height of a vehicle, rear clearance lamps are not required to be at the top of the vehicle. #17 / Boat trailers can have one amber and one red near the midpoint to indicate overall width.

Back up Lamp

Required on	All buses, trucks, truck tractors
How many are required?	1 or 2
Where?	On the rear
Color?	White
Footnotes	#14 / Required to operate when vehicle is in reverse.

License Plate Lamp

Required on	All buses, trucks, truck tractors, and trailers.
How many are required?	1 at the rear license plate
Where?	On the rear, illuminating the plate from the sides or top.
Color?	White
Footnotes	#11 / must be illuminated when tractor headlamps are on.



Conspicuity Treatments (Red and White Reflective Tape or Reflectors) FMVSS 571.108

In addition to the required lamps, conspicuity systems are required on trailers 80 inches or wider with a GVWR of 10,001 lbs. or more and truck tractors that were manufactured on or after July 1st 1997.

(Example; a trailer that is 102" wide and has a GVWR of 9500lbs does not need it. It must be 80" or wider AND have a GVWR of 10,001 lbs. or more)

This requirement can be met with approved sheeting (tape), reflectors, or a combination of both. Certified reflective tape markings are DOT-C2, DOT-C3, or DOT-C4. Certified reflex reflector markings are DOT-C.

Trailers 80 inches or wider and 10,001 lbs. GVWR or more.*Sides*

A horizontal strip of reflective tape (or an array of reflectors) is required on each side:

- Starting as close to the front and ending as close to the rear as possible.
- as close as practicable to 15 - 60 inches above the ground.
- The total length of all segments must be at least one half of the trailer length.
- Spaces between segments must be distributed evenly across the entire length.

Rear

A horizontal strip of reflective tape (or an array of reflectors) is required on the rear:

- the full width of the trailer
- As close to the extreme edges as practicable
- as close as practicable to 15 - 60 inches above the ground.
- two white strips 12 inches long in the upper outside corners or sections.
- the full width of any under ride protection device (if equipped)

Rear of Truck Tractors manufactured on or after 7/1/1997

In each upper corner of the cab rear

- one horizontal and one vertical strip
- 12 inch min. white

On the rear fenders, mudflap brackets or mudflaps,

- 24 inches alternating red and white, no lower than 12 inches from the top of the flap
- If no mudflaps are used, must be on the rear of cab or frame mounted bracket.

Trailers

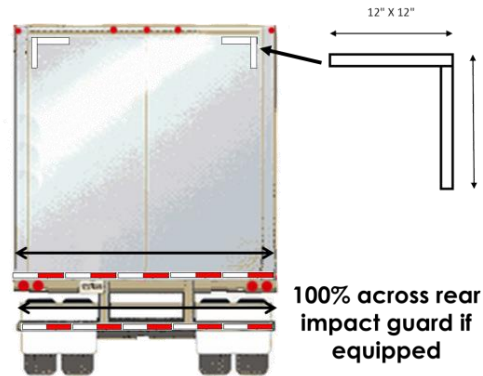
80 inches or wider and has a GVWR more than 10,000 lbs



Trailers

80 inches or wider and has a GVWR more than 10,000 lbs

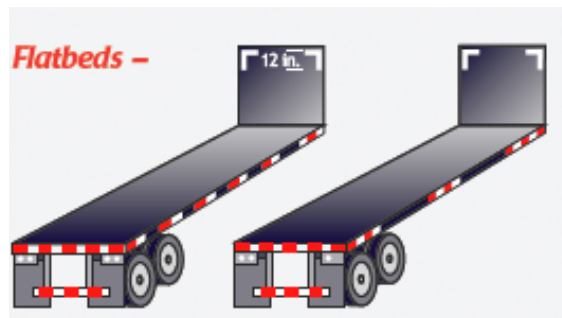
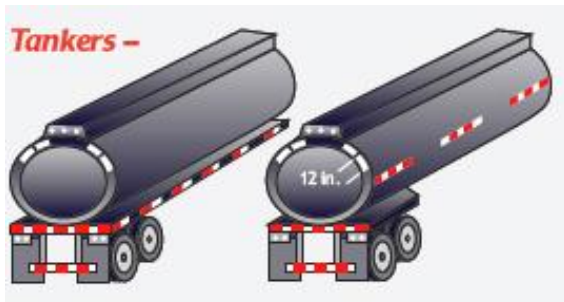
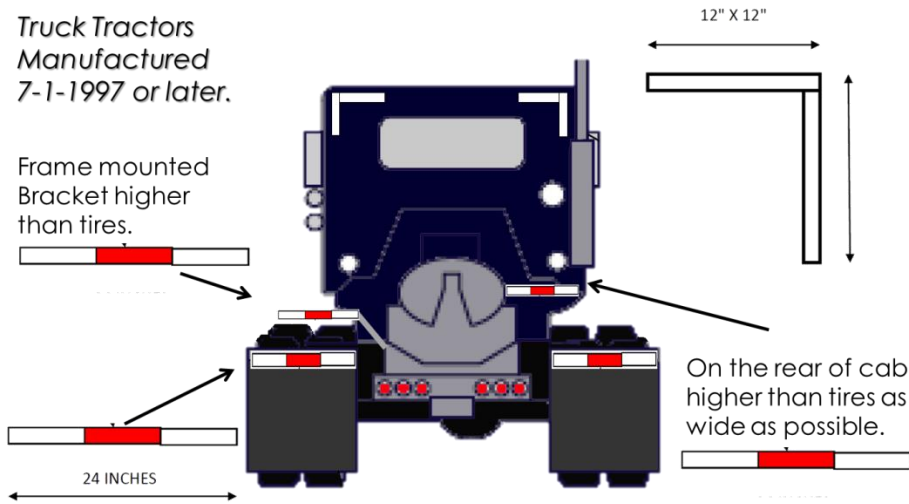
Must be 100% of the total width



*** TRAILERS WITH CONSPICUITY TREATMENTS THAT MEET THE LOCATION AND VISIBILITY REQUIREMENTS OF TABLE 1 REFLEX REFLECTORS NEED NOT BE EQUIPPED WITH TABLE 1 REFLEX REFLECTORS***

*Truck Tractors
Manufactured
7-1-1997 or later.*

Frame mounted
Bracket higher
than tires.



SAE Markings for lights and reflectors

- A** - Reflex reflectors
- H** - Sealed beam headlamps
- HH** - Sealed beam headlamp housing
- HR** - Replaceable bulb headlamp
- I** - Turn signal lamps
- I3** - Turn signal lamps spaced from 75 mm to less than 100 mm from headlamp
- I4** - Turn signal lamps spaced from 60 mm to less than 75 mm from headlamp
- I5** - Turn signal lamps spaced less than 60 mm from headlamp
- I6** - Rear mounted turn signal lamps and front mounted turn signal lamps mounted 100 mm or more from the headlamp, for use on vehicles 2032 mm (80 inches) or more in overall width
- I7** - Front mounted turn signal lamps mounted less than 100 mm from the headlamp, for use on vehicles 2032 mm (80 inches) or more in overall width
- I8** - Truck turn signal lamps spaced less than 60 mm from headlamp
- J590** - Turn signal flasher
- J945** - Hazard warning signal flasher
- J1054** - Warning lamp alternating flasher
- L** - License plate lamps
- L2** - License plate lamps for use on vehicles of 2032 mm (80 inches) or more in overall width
- P** - Parking lamps
- P2** - Clearance, sidemarker, and identification lamps
- P3** - Clearance, sidemarker, and identification lamps for use on vehicles 2032(80 inches) mm or more in overall width
- PC** - Combination clearance and sidemarker lamps
- PC2** - Combination clearance and side marker lamps for use on vehicles 2032 mm (80 inches) or more in overall width
- R** - Back-up lamps
- S** - Stop lamps
- S2** - Stop lamps for use on vehicles 2032 mm (80 inches) or more in overall width
- T** - Tail lamps (rear positions lamps)
- T2** - Tail lamps (rear position lamps) for use on vehicles 2032 mm (80 inches) or more in overall width



Battery and Wiring Installation 393.28

Defective wiring conditions can result in breakdowns and/or reduced visibility to other traffic. Extra care should be taken when inspecting wiring including looking for improper repairs. Some conditions to look for when inspecting the wiring are:

- Burned or charred wires
- Corroded or loose connections
- Loose or unprotected wiring
- Improper repairs or splices

Electrical wiring must be installed and maintained to the SAE Standard J1292 as incorporated by FMCSR. 393.28

Batteries 393.30

Batteries must be installed securely. If equipped with a removable cover, it must also be securely attached and sufficient to protect the batteries. The battery box (or equivalent) should be secure and have a protective coating to prevent corrosion. Batteries should be tested and inspected regularly.

When inspecting the battery, some concerns are:

- loose mounting
- corroded connections
- loose, missing, or insufficient battery cover
- rusted or otherwise insufficient battery tray or box



No protective cover on batteries

Minimum Inspection Standards

All lighting devices and reflectors required by Section 393 must be operable and in good condition to meet minimum inspection standards. Any lamp or reflective device that is missing, inoperable or obscured is a failing criteria.

Practice Exercise 2

Using the information in the previous section, answer the following questions.

Question 1

What vehicles are required to have conspicuity treatments?

Question 2

Performing an inspection on a truck tractor, you find it is equipped with additional tail lights that are amber. Is this lighting combination allowed?

YES NO Which regulation covers this subject _____

Question 3

It is acceptable to have bare wires or corroded terminals as long as the light still works.

TRUE FALSE explain _____

Question 4

As long as the battery is properly secured, it does not need a cover.

TRUE FALSE explain _____

Question 5

How many tail lights are required on a **truck** manufactured on Jan 1, 1998?

How many tail lights are required on a **truck tractor** manufactured *before* Jan 1, 1998?

Question 6

What are the conspicuity requirements for a box truck manufactured on Jan. 1, 2001?

Brakes FMCSR 393.40 - 393.55

Brakes are a very important component of a commercial motor vehicle and a complex part of the FMCSRs. There are many types of CMVs and they are equipped with a wide variety of brake systems. Almost 30% of CMVs that are put out of service (have violations so serious they are not allowed to continue) is due to brake defects and half of those are out of adjustment conditions. In this section we will discuss required brake systems for CMVs and how to identify defective components.

**It is important that you have knowledge of the specific brake system you are inspecting and the manufacturer's required procedures before attempting to make any adjustments to the brake system.*

After completing this section, you should be able to:

- Identify the required braking systems for CMVs.
- Identify defective brake system components.
- Inspect brake system peripherals to ensure proper functioning, including but not limited to; ABS malfunction indicators, low pressure warning devices, tractor protection valve.

Brake System Components and Functional Tests

Each CMV must have a brake system that provides safe and reliable stopping without excessive fading or grabbing 393.47(a). This is accomplished through proper inspection and maintenance of the brake components and keeping the system in adjustment. There are many components that must work in conjunction to provide sufficient braking performance and a properly adjusted and functioning brake system will provide reliable power to stop the vehicle safely. In this portion we will discuss brake components and defects.

Required Brake Systems 393.40

Each CMV must have a Service Brake system, Parking Brake System and Emergency Brake System that meets the applicable standard found in Part 393. These systems are commonly interconnected using the same components to accomplish all three requirements.

- Service Brakes (used to slow the vehicle in normal operation) 393.40(b)
- Parking Brake (used to hold the vehicle when unattended) 393.40 (c)
- Emergency Brakes (used to stop the vehicle in case of service brake pressure or fluid loss) 393.40 (d)&(e).

Service Brake Requirements 393.42

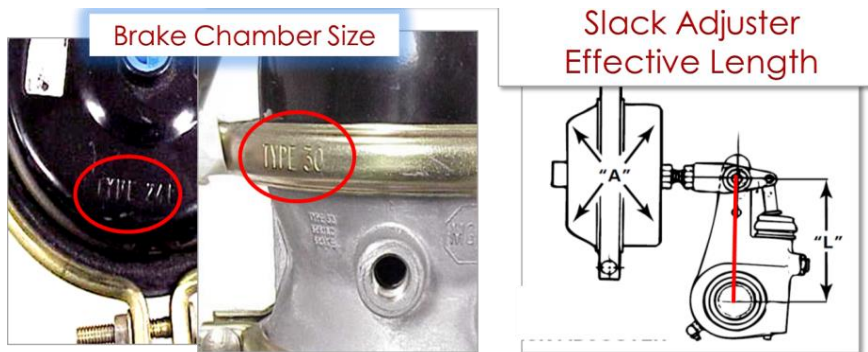
CMVs must have brakes acting on all wheels.

Exemptions 393.42 (b) 1-6

- Front brakes for some vehicles prior to 7-25-1980
- Driveaway/Towaway
- Trailers 3000 lbs or less gross weight and not more than 40% of towing vehicle capacity.
- Special purpose dollies or trailers
- Raised lift axles

All service brake components must be in good working order with no loose, broken, missing or excessively worn components. Each service brake must function when the brake pedal is applied.

All axles must have the same size brake chamber and slack adjuster effective length at each end.



Defective components will vary depending on the type of brake system the vehicle is equipped with and it is important that you have adequate training and/or experience before inspecting any brake system.

Some defects you may find during inspections may include:

Air Brake Components

Heavy trucks, Truck tractors
Trailers and Buses.

- Excessively worn or damaged
- S-Cam, Rollers,
 - Return Springs,
 - Cam bushings,
 - Slack adjusters,
 - Pushrods or retainers
- Along with any
- loose or missing chamber mounting or pushrod connecting hardware.

Hydraulic Brake Components

- Cracked, loose or missing brake linings and pads,
- Frozen Adjuster assemblies,
- Loose or broken anchor pins,
- Missing or broken return springs,
- Leaking wheel cylinders,
- Stuck caliper piston,
- Worn or sticking caliper slides, and
- Loose or broken Caliper mounting bolts or brackets.

Electric Brake Components



Various trailers and towed vehicles.

- Excessively worn magnets
- Broken or missing return springs
- Loose or broken shoes or linings,
- Broken actuating arm
- Frozen adjusters
- Excessively worn magnet runs.



Missing return spring and roller



Missing slack adjuster clevis pin.

Service Brake Minimum Inspection Standards

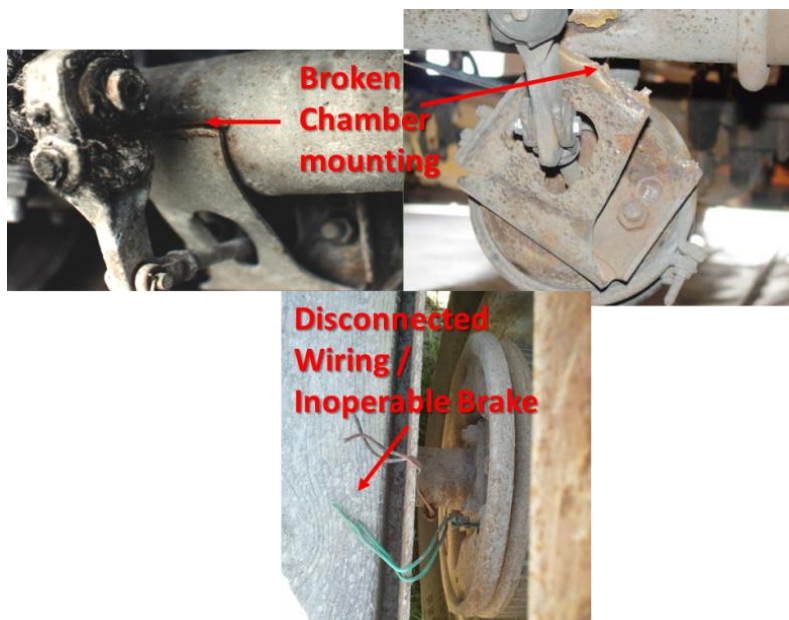
(1) All service brakes must apply when service pedal is activated (*application is verified at each brake when friction material makes contact with drum or rotor*). It is the inspector’s responsibility to use the correct procedure for the vehicle being inspected to verify application.

(2) Foundation brake can have no missing or broken mechanical components including: shoes, lining pads, springs, anchor pins, spiders, cam rollers, push-rods, chamber mounting bolts. Inspector must verify all components are in good working order for any brake type or design they are inspecting.

(3) All brake components including air chambers, spiders, and cam shaft support brackets must be properly secured and not loose.

(4) There can be no leaks at air brake chambers (Example—ruptured diaphragm, loose chamber clamp, etc.). *Both spring and service chambers should be checked when filled with air from vehicle supply with reservoir pressure of at least 100 psi.*

(5) There can be no mismatched chamber size or slack adjuster effective length on a steering axle.



Brake Linings, Drums, Rotors 393.47

Linings cannot be cracked, broken or be contaminated with any grease or oil such as with a leaking wheel seal. Linings must be within the allowable limits.

LININGS FOR STEERING AXLES	
TYPE	MIN. THICKNESS
AIR DRUM	3/16" for a continuous shoe 1/4" for two separate shoes at center or to manufacturer wear indicators
AIR DISC	1/8"
Hydraulic Drum, Disc, Electric	1/16"

LININGS FOR NON STEERING AXLES	
TYPE	MIN. THICKNESS
AIR DRUM	1/4" at center or to manufacturer wear indicators
AIR DISC	1/8" at center
Hydraulic Drum, Disc, Electric	1/16" at center



Drums and Rotors cannot be broken, cracked, worn beyond manufacturer specs. or have any evidence of metal to metal contact.

Drum/Rotor Minimum Inspection Standards

- (1) No cracks that open upon application and no parts can be loose or in danger of falling away.

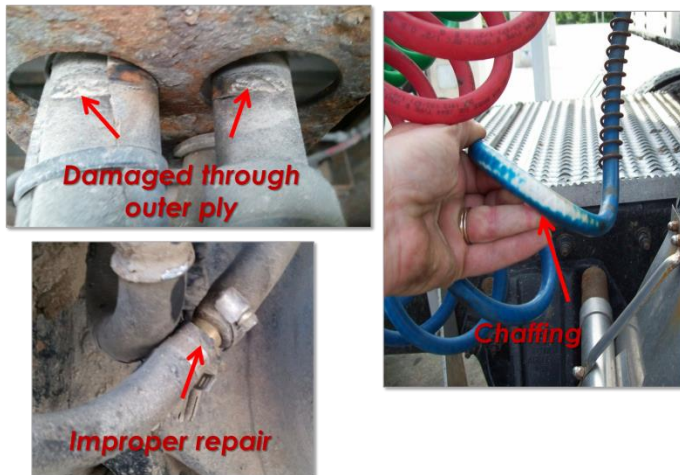
Brake Hose and Tubing 393.45 571.106

Brake hose and tubing must not have any damage including chaffed, cut, or kinked and there can be no leaks or swelling when the brakes are applied.

Brake hoses must be installed long and flexible enough so they are not damaged during normal operation and be attached in a way that protects from damage.

There cannot be any unapproved repairs such as sliding two ends of hose over a tube and clamping the hose down. All repair splices must be DOT approved fittings.

For nonmetallic brake tubing used between a power unit and towed unit or as a connection to sliding sub frames, the ends must be equipped with a spring guard or similar device to prevent kinking.

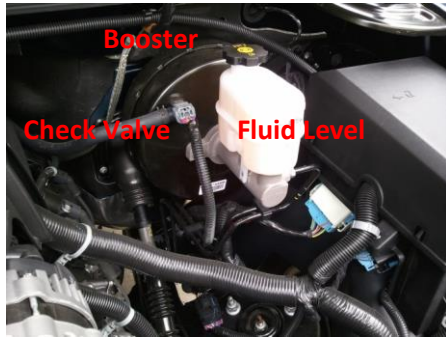


Brake hose/tube Minimum Inspection Standards

- (1) Cannot have damage extending through outer reinforcement layer. (Thermoplastic nylon may have braid reinforcement or color difference between cover and inner tube. Exposure of second color is failing damage).
- (2) There can be no bulges, swelling or leaks when pressure is applied.
- (4) There can be no improperly joined hoses or unapproved splices (such as a splice made by sliding the hose ends over a piece of tubing and clamping the hose to the tube).
- (5) Cannot be cracked, broken or crimped or damaged by heat.

Hydraulic Brakes (Including Power Assist Over Hydraulic and Engine Drive Hydraulic Booster).

- (1)(6) Master cylinder must have proper fluid level (cannot be less than 1/4 full) and there can be no leaks anywhere in the system.
- (2) Must have pedal reserve with engine running (without pumping pedal)
- (3) Power assist unit must be operating properly (including reserve capacity).
- (4) Brake hoses cannot leak or swell under application of pressure or be damaged through outer cover-to-fabric layer.
- (5) Check valve must not be missing or inoperative.
- (8) Brake lines or connections cannot leak, be restricted, crimped, cracked or broken.
- (9) Brake failure or low fluid warning light must function properly (use pre start check).



Inspection of Master Cylinder / Booster

1. Inspect master cylinder for proper fluid level, mounting and any leaks or damage.
2. Check booster for proper mounting and for any damage or indications of leaks.
3. With engine off, pump the brake pedal until it gets solid and hold.
4. While depressing the pedal, start the engine. If pedal resistance does not change or there is no feedback in the pedal, the booster may be defective.
5. With engine running, apply and hold the brake pedal. Check for pedal reserve, if no reserve (pedal goes all the way to the floor) the brake system may be defective.
6. If there is reserve travel, hold for one minute. The pedal should stay at the same level during the test. If the pedal depresses further, there may be a leak or other defect.
7. Release pedal, turn engine off, then depress brake pedal. There should be enough reserve energy for at least one pedal application.

Service Brake application

After all components have been inspected, verify that each brake applies when the service brake is activated. ***If any brake fails to apply when the service brake is activated, it does not meet minimum inspection standards.*** This includes conditions where the lining moves but does not contact the friction surface.

USDOT Interpretation 396.17

Question 12: May an inspector certify a Commercial Motor Vehicle (CMV) as meeting the periodic inspection standards of [§396.17](#) if he/she cannot see all components required to be inspected under appendix G?

Guidance: No. The affixing of a decal or sticker or preparation of a report as proof of inspection indicates compliance with all requirements of appendix G to [part 396](#).

Inspection of S-Cam Air Brake

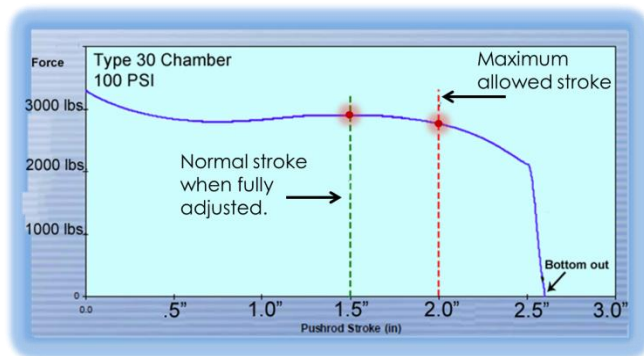
**vehicle should be on level ground with wheels chocked and brakes released*

1. **Inspect brake chamber** – Chamber should have no damage or any loose or broken mounting. Pushrod should not be damaged.
2. **Inspect the slack adjuster** – Check for automatic type if required. Check that all pushrod connecting hardware is not loose, missing or excessively worn. Adjuster should not be damaged or excessively worn.
3. **Inspect the S Cam** – Check the cam bushings are not excessively worn and mounting brackets are not loose or broken. Inspect cam lobe for excessive wear.
4. **Inspect the brake hardware** - Look for signs of broken, missing or broken return springs, worn or missing rollers, anchors, or other damaged components.
5. **Inspect the linings** – Check they are not broken, loose or have any missing pieces. Linings cannot have any oil or grease contamination.
6. **Drums** – Check for any cracks, evidence of metal to metal contact or excessive wear.

Air Brake Adjustment 393.47

Brake violations account for approximately 30% of all roadside violations and roughly half of them are adjustment related. It is required to check the applied stroke of each brake to determine whether or not the vehicle meets minimum inspection standards.

First, a properly functioning brake that is operating in the correct range is capable of producing adequate force for braking. As the stroke approaches and then exceeds the maximum allowed measurement, braking force drops off quickly.



The maximum allowed stroke depends on the chamber type and size. Using the charts provided in Appendix G determine the maximum allowed stroke for the type you are inspecting.

Clamp-Type Brake Chambers

Type	Outside diameter	Brake readjustment limit: standard stroke chamber	Brake readjustment limit: <i>long stroke</i> chamber
6	4 1/2 in. (114 mm)	1 1/4 in. (31.8 mm)	
9	5 1/4 in. (133 mm)	1 3/8 in. (34.9 mm)	
12	5 11/16 in. (145 mm)	1 3/8 in. (34.9 mm)	1 3/4 in. (44.5 mm).
16	6 3/8 in. (162 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm).
20	6 25/32 in. (172 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm).2 1/2 in. (63.5 mm).1
24	7 7/32 in. (184 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm).2 1/2 in. (63.5 mm).2
30	8 3/32 in. (206 mm)	2 in. (50.8 mm)	2 1/2 in. (63.5 mm).
36	9 in. (229 mm)	2 1/4 in. (57.2 mm)	

1. For type 20 chambers with a 3-inch (76 mm) rated stroke.
2. For type 24 chambers with a 3-inch (76 mm) rated stroke.

Bendix DD-3 Brake Chambers

Type	Outside diameter	Brake readjustment limit
30	8 1/8 in. (206 mm)	2 1/4 in. (57.2 mm).

Bolt-Type Brake Chambers

Type	Outside diameter	Brake readjustment limit
A	6 15/16 in. (176 mm)	1 3/8 in. (34.9 mm).
B	9 3/16 in. (234 mm)	1 3/4 in. (44.5mm).
C	8 1/16 in. (205 mm)	1 3/4 in. (44.5 mm).
D	5 1/4 in. (133 mm)	1 1/4 in. (31.8 mm).
E	6 3/16 in. (157 mm)	1 3/8 in. (34.9 mm).
F	11 in. (279 mm)	2 1/4 in. (57.2 mm).
G	9 7/8 in. (251 mm)	2 in. (50.8 mm).

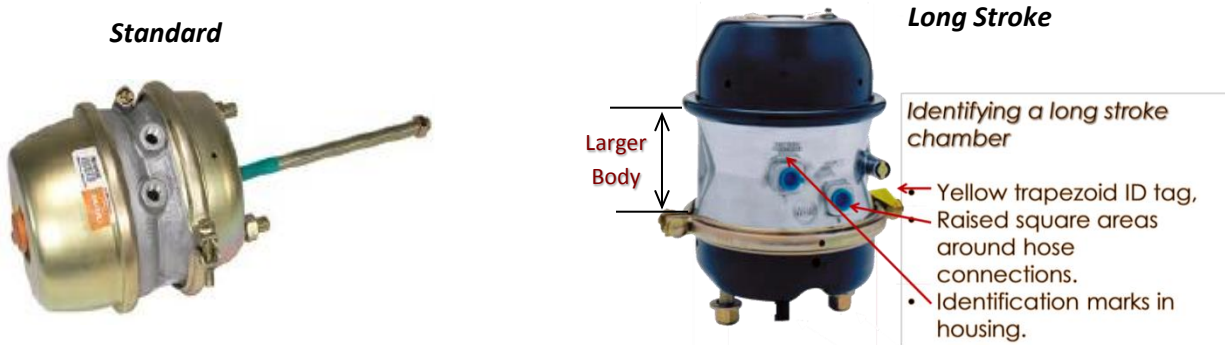
Rotochamber-Type Brake Chambers

Type	Outside diameter	Brake readjustment limit
9	4 9/32 in. (109 mm)	1 1/2 in. (38.1 mm).
12	4 13/16 in. (122 mm)	1 1/2 in. (38.1 mm).
16	5 13/32 in. (138 mm)	2 in. (50.8 mm).
20	5 15/16 in. (151 mm)	2 in. (50.8 mm).
24	6 13/32 in. (163 mm)	2 in. (50.8 mm).
30	7 1/16 in. (180 mm)	2 1/4 in. (57.2 mm).
36	7 5/8 in. (194 mm)	2 3/4 in. (69.9 mm).
50	8 7/8 in. (226 mm)	3 in. (76.2 mm).

(b) For actuator types not listed in these tables, the pushrod stroke must not be greater than 80 percent of the rated stroke marked on the actuator by the actuator manufacturer, or greater than the readjustment limit marked on the actuator by the actuator manufacturer.

Clamp Type Chambers

The most common type of chamber found on air braked CMVs today is clamp type. Some are available in a long stroke design which can be identified by a larger housing, markings on the housing, by square raised areas around the hose connection ports or by a tag indicating the rated stroke.



Automatic Brake Adjusters

All air braked CMVs manufactured since 10-20-1994 must have a self-adjusting feature incorporated into the brake system. Most commonly this is done by using an automatic or self-adjusting slack adjuster. It is prohibited to equip a CMV made since 10-20-1994 with a manual adjuster.

Automatic

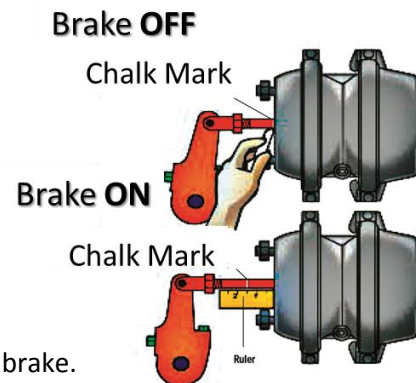


Manual



Brake Adjustment Check

1. Build air pressure until governor cut out.
2. Shut off engine, secure the vehicle from rolling and release all brakes.
3. With brakes released mark each pushrod at the chamber or note measurement to adjusting nut or clevis at each brake.
4. If necessary, adjust air pressure to 90 – 100 psi at the dash gauge and using a prop or a helper, make a full brake application using the foot pedal and hold.
5. Measure the distance the pushrod has extended from the chamber with brake applied.
6. Verify measurements are within limits for that specific type and size of chamber.



**Any brake that measures past the allowable limit is a violation of 393.47. However, minimum inspection standards allow the vehicle to pass if only one brake is less than ¼' past the limit.*

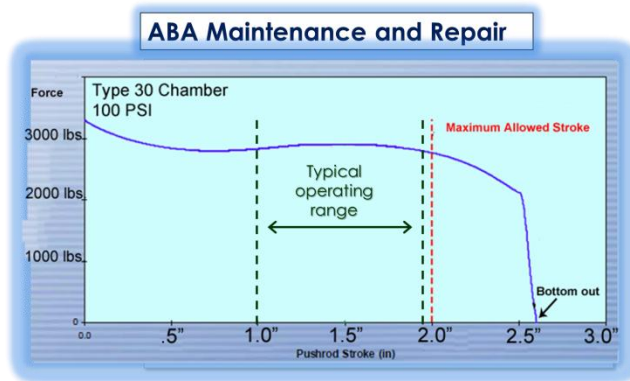
Brake Adjustment Minimum Inspection Standards

If two or more brakes are past the allowed limit or one brake is ¼' or more past the limit the vehicle does not meet minimum inspection standards.

Facts about Automatic Brake Adjusters (ABAs)

When dealing with self-adjusting brakes, there are a few things to keep in mind that differ from manual adjusters.

1. Don't readjust ABAs as part of regular maintenance. Regular manual adjustment can prematurely wear or damage adjusting mechanisms which will cause the adjuster to fail.
2. A properly functioning ABA will normally have a measured stroke between 50% and almost 100% of its allowed stroke. Do not readjust an ABA just because it is near the limit.
3. If an ABA equipped brake is past the allowed limit, the brake should be diagnosed to determine the cause of the problem. Many times the adjuster is not the reason for the out of adjustment condition.



ABA Maintenance and Repair

Defects that can cause ABA equipped brakes not to adjust properly.

- Improper ABA Maintenance
- Improper Installation
 - Must follow manufacturer instructions.
 - Must use compatible parts.
- Restricted Travel
 - Broken power springs.
 - Weak pushrod return springs.



Brake Warning Signals 393.51

Every bus, truck and truck tractor must be equipped with a signal that provides a warning to the driver when a failure occurs in the vehicle's service brake system.

Hydraulic braked vehicles must have a warning indicator that indicates a loss of pressure, loss of fluid, or that the parking brake is applied. The light should illuminate when the ignition is first turned to the "ON" position and go off within a few seconds if no problems exist.

Air braked vehicles must have a warning device that will activate and warn the driver if the reservoir pressure is low. The device must come on by the time reservoir pressure has dropped to 55 PSI.

Vehicles made **3-1-1975 or later must have a visible warning.**

Vehicles made **prior to 3-1-1975 can have either an audible or visible warning.**



Air Reservoirs 393.50

Air reservoirs must be securely attached and be equipped with a drain that can be manually operated.



Air Compressor 396.3

The air compressor cannot have any loose or broken mounting hardware. If belt driven, must not have damaged or loose pulleys or belt.

Minimum Inspection Standards

If Low air warning is inoperable or does not activate by 55 psi, the compressor mounting or belts are loose or damaged, or an air reservoir is broken free from its mounting points. The vehicle does not meet minimum inspection standards.

Anti Lock Brakes 393.55 571.121 571.105

Although not included in Minimum Inspection Standards, ABS is required on CMVs and must be functioning properly including a malfunction indicator.

ABS and MALFUNCTION SIGNAL REQUIRED			
	Tractor	Trailer	Truck
Air	On or after 3/1/1997	On or after 3/1/1998	On or after 3/1/1998
Hydraulic			On or after 3/1/1999

FMCSR Part 393.55
Anti Lock Braking

ABS Malfunction Indicators

- Must illuminate and then go off during startup check.
- It is a violation of Part 393 standards if there is an ABS malfunction or if the indicators do not work.



Manufacture Date		Truck or Bus with Hydraulic Brakes
<u>Before</u> March 1, 1999		ABS is not required.
<u>On or after</u> March 1, 1999		Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that the truck or bus ABS malfunction lamp turns on and after a few seconds the lamp goes out. Any other response indicates a malfunction of the ABS.
		Truck or Bus with Air Brakes
<u>Before</u> March 1, 1998		ABS is not required.
<u>On or after</u> March 1, 1998		Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that the truck or bus ABS malfunction lamp turns on and after a few seconds the lamp goes out. Any other response indicates a malfunction of the ABS.
		Truck or Bus with Air Brakes Equipped to Tow Another Vehicle with Air Brakes
<u>Before</u> March 1, 1998		ABS is not required.
<u>On or after</u> March 1, 1998		Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that the ABS malfunction lamp turns on and after a few seconds the lamp goes out. Any other response indicates a malfunction of the ABS.
<u>On or after</u> March 1, 2001	Not connected to any trailer or connected to a trailer manufactured <u>before</u> March 1, 2001.	Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that the truck or bus ABS malfunction lamp turns on and after a few seconds the lamp goes out. Any other response indicates a malfunction of the ABS. The trailer ABS malfunction lamp will not illuminate in this case.*
	Connected to a trailer manufactured <u>on or after</u> March 1, 2001.	Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that <u>both</u> the truck or bus, and trailer ABS dash lamps turn on and after a few seconds the lamps go out. Any other response indicates a malfunction of the ABS.***
		Truck Tractor with Air Brakes
<u>Before</u> March 1, 1997		ABS is not required.
<u>On or after</u> March 1, 1997		Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that the ABS malfunction lamp turns on and after a few seconds the lamp goes out. Any other response indicates a malfunction of the ABS.
<u>On or after</u> March 1, 2001	Not connected to any trailer or connected to a trailer manufactured <u>before</u> March 1, 2001.	Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that the tractor ABS malfunction lamp turns on and after a few seconds the lamp goes out. Any other response indicates a malfunction of the ABS. The trailer ABS malfunction lamp will not illuminate in this case.*
	Connected to a trailer manufactured <u>on or after</u> March 1, 2001.	Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that <u>both</u> tractor and trailer dash-mounted ABS malfunction lamps turn on and after a few seconds the lamps go out. Any other response indicates a malfunction of the ABS.
		Trailer with Air Brakes (Including a Trailer Converter Dolly)
<u>Before</u> March 1, 1998		ABS is not required.
<u>On or after</u> March 1, 1998	Connected to a truck or truck tractor manufactured <u>before</u> March 1, 1997.	Apply the brake pedal and confirm that the trailer-mounted ABS malfunction lamp turns on and after a few seconds goes out before the brake is released. Any other response indicates a malfunction of the ABS.
	Connected to a truck or truck tractor manufactured <u>on or after</u> March 1, 1997.**	Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that the trailer-mounted ABS malfunction lamp turns on and after a few seconds the lamp goes out. Any other response indicates a malfunction of the ABS.
<u>On or after</u> March 1, 2001	Connected to a truck or truck tractor manufactured <u>before</u> March 1, 2001.	Test in the same manner as trailers manufactured <u>on or after</u> March 1, 1998.
	Connected to a truck or truck tractor manufactured <u>on or after</u> March 1, 2001.	Begin with the ignition key in the "off" position. Turn the ignition key "on". Confirm that both the trailer dash-mounted ABS malfunction lamp and the trailer-mounted ABS malfunction lamp turn on and after a few seconds the lamps go out. Any other response indicates a malfunction of the ABS.

* The trailer ABS lamp in the dash only operates when the tractor is connected to a trailer manufactured after March 1, 2001.

** Power to the trailer's ABS circuit is delivered by a dedicated circuit from the truck tractor.

*** When the external ABS lamp on a trailer indicates a malfunction, and the ABS light on the dash of the tractor indicates the malfunction for the trailer, the indicator lamp on the tractor is functioning as designed. As a result, the tractor light on the dash **WILL NOT** be documented as a violation. The tractor ABS light for the trailer will never result in a violation for the tractor because it cannot be determined at roadside if the problem is with the tractor or the trailer.

Parking Brake Requirements 393.41

There must be a parking brake on all power units and air braked trailers that is capable of holding the vehicle or combination of vehicles in place when parked with some exceptions.

As defined in 393.5 ***an agricultural commodity trailer, converter dolly, heavy hauler trailer or pulpwood trailer is not required to have a parking brake***, however trailers exempt from having a parking brake must carry sufficient chocks to prevent movement while parked.

Once engaged, the parking brake cannot be held in place by fluid, air or electricity.

Minimum Inspection Standards

If no brakes apply when the parking brake is engaged it does not meet minimum inspection standards.

Trailer Breakaway Brakes 393.43(d)

All trailers, regardless of brake type, that are required to have brakes must have a breakaway braking system. In the event the trailer becomes disconnected in transit, the brakes must immediately apply and hold for at least 15 minutes. Except for trailers with 3 or more axles, all brakes must apply when the breakaway brakes are activated. Activate the breakaway brakes and verify application at each brake.

Minimum Inspection Standards

If no brakes, or less than the required number of brakes apply when activated, it does not meet minimum inspection standards.

FMCSR Part 393.43 Trailer Break-Away Brakes

- Required for every trailer equipped with brakes.
- All brakes must apply except for trailers with 3 or more axles.
- Must hold for at least 15 minutes.



Tractor Protection Valve 393.43

Air braked vehicles that are equipped to tow air braked trailers must have a functioning TPV which must be checked during an inspection. It must stop air to the supply and service lines in the event of a major air loss from the trailer before air pressure in the power unit drops below 20 psi. To check the TPV with the vehicle coupled to a trailer:

1. Secure the vehicle from rolling, build air to governor cut out and release all brakes.
2. Disconnect the service line, then the supply line. (air should be escaping from the supply line)
3. After air flow stops, verify the pressure gauge reads at least 20psi.
4. Apply service brake pedal and verify no air is escaping from the service line.

Minimum Inspection Standards

If TPV does not activate, activates at less than 20psi, or air escapes from service line after it has been activated the vehicle does not meet minimum inspection standards.

Practice Exercise 3**Question 1**

A truck with hydraulic brakes does not need a functioning parking brake if it has an automatic transmission and is in "PARK".

TRUE FALSE

Question 2

On a tandem axle trailer with a GVWR of 62,000 lbs. how many spring chambers should apply when checking the "Breakaway Braking"?

Question 3

On an S-Cam air brake, which of the following is an indication the brake linings may not be making contact with the drum? Circle any that apply.

- | | |
|---|---|
| A. Cracked or missing portions of the linings | B. Rust accumulation on the contact surface of the drum |
| C. Oil or grease contamination on the linings | D. Significant gap between the linings and drums with the brakes released |

Question 4

You find a lift axle (non steer axle) is equipped with a clamp 24 chamber on one side and a clamp 30 on the other. Is this condition a defect? YES NO

If yes, Regulation Part____ Section____

Question 5

For trailers under 10,000 lbs. GVWR, only one axle is required to have brakes.

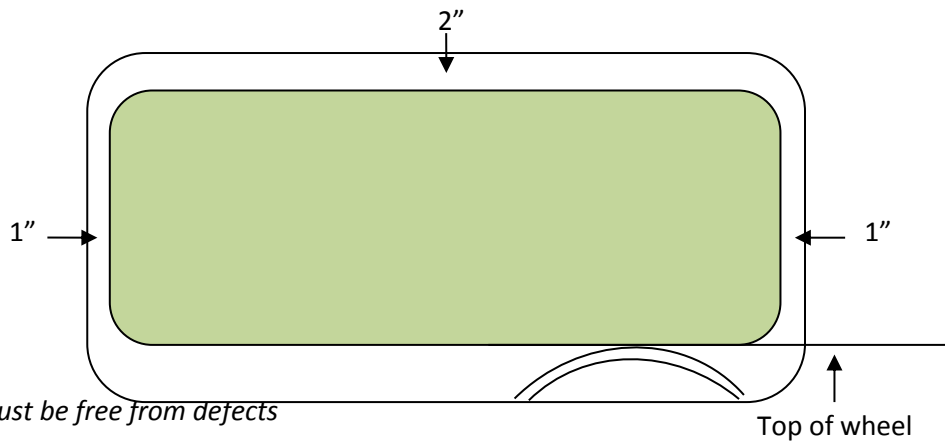
TRUE FALSE

Exterior Cab and Body Components

Window Glazing and Construction (FMCSR 393.60-62 FMVSS 205) - All windows and windshields must meet the FMVSS standard for safety glazing. Manufacturers must use approved windows that have met specified testing and any replacement windows must uphold the same standard. Windows using approved glazing will be marked with the required ANSI DOT information.

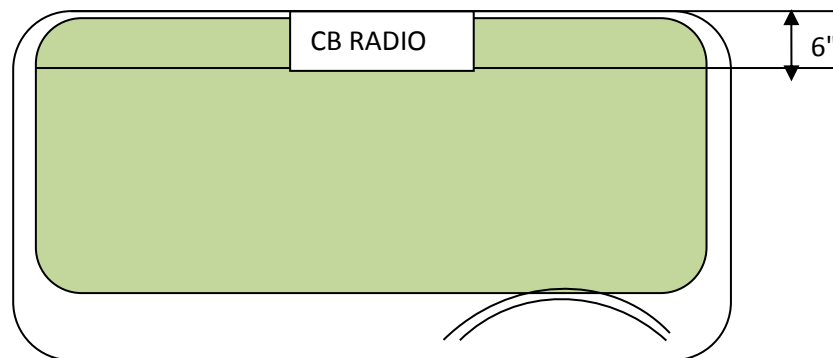
Coloring and Tinting- Windows directly to the right and left of the driver and the windshield may not have less than 70% light transmittance of a section of the window marked "not less than 70% transmittance". Other windows have no coloring or tinting limits.

Windshield - The windshield must be free from defects within the area starting at the level of the top of the steering wheel, 1 inch from each side and 2 inches from the top.



Equipment Mounting on Windshield

Equipment mounted at the top of the windshield cannot extend more than 6 inches below the top edge of the windshield and must be outside the wiper path. This includes any navigation or other device on removable mounting.



Decals required by Federal, State or local laws

CVSA or other decals required by state and federal laws must be outside the wiper path and no more than 4.5 inches above the bottom of the windshield.

Although FMCSA regulations make exceptions for certain types of damage within the illustrated green area, any damage (other than previously repaired stone chips) in the drivers field of view will be noted on the TSS Inspection Report

Rear Vision Mirrors (393.80)

At least one outside rear vision mirror is required to be securely attached on each side reflecting a view of the rear to the driver. Mirrors must meet specific standards under 571.111 including being adjustable both vertically and horizontally.

Cab and Body Components (393.203)

Hood – must be securely fastened and operate properly.

Doors – must open and close properly, no broken or missing parts, cannot be sagging.

Front bumper – must be securely attached and not protruding beyond vehicle to create a hazard.

Body Mounts – No body or cab mount can be broken, loose or missing.

Wipers and Washers (393.78)– Both wipers must be in good condition and washers must work.



Interior Equipment and Components

Windshield Defrosters and Defogging (393.79 571.103) - CMVs must also be equipped with a defogging system that either applies heat to the windshield or removes humidity from the cab.

Floors (393.84) - Must be substantially constructed, free from unnecessary holes or openings (including shifter boot) to avoid fumes, exhaust gases, or fire from entering the cab. Also, the floors cannot be permeated with oil or other substances.

Seats (393.203) and Seatbelts (393.93) – Must meet applicable FMVSS for mounting and integrity. Seats and seatbelt anchors should not be modified from OEM specs or damaged. All seats must be securely mounted and belt assemblies should not be cut, frayed or otherwise damaged.

Television or similar viewing devices (393.88) – Any television or similar device cannot be mounted at a point forward of the back of the driver’s seat or visible to the driver when driving. Also the controls of the device must not be within the driver’s reach when driving.

Radar Detectors (392.71) – Any type of speed detection device is prohibited from use or possession in CMVs.

Emergency Equipment 4.4

Sleeper Berth (393.76) – There are minimum standards for a compartment to be considered an approved sleeper berth. Most tractors equipped with a sleeper berth will meet these requirements. However, some smaller CMVs or expediting vehicles may have improvised sleeper berths that are in violation. If the driver is using the sleeper berth line on the daily log, the compartment must have:

- Adequate bed clothing

- Mattress
- Ventilation
- Readily accessible entrance and exit into the drivers compartment
- Occupant restraint
- Minimum size of 75" long, 24" deep and 24" high above the top of the mattress (see 393.76 for other size requirements)

Horn (393.81)

Although many heavy trucks are equipped with 2 separate horns, only one is required. There is no specific requirement for the horn to be air or electric.

Emergency Equipment (393.95)

Every self-propelled CMV must be equipped with the following items:

Fire Extinguisher – Must be proper type, securely mounted and filled with an indicator that it is charged. The extinguisher must have the proper UL rating for the vehicle.

- **No HazMat requiring placards** – 5 B:C or more. (2 separate extinguishers of 4 B:C or more is equivalent to a 5 B:C)
- **Carrying HazMat** requiring placards – 10 B:C or more

Spare Fuses – If the vehicle is equipped with fuses, one spare fuse for every type used to operate a required part must be in the vehicle.

Warning Devices – The vehicle must be equipped with devices that can be used to warn other traffic that the CMV has broken down and is stopped in the roadway or on the shoulder of the roadway. The timely use and proper placement of the devices will alert other traffic that a large vehicle is stopped ahead. This requirement can be met by:

- **3 reflective triangles** – This type is the most efficient and easiest to use. Usually sold in a pack of three with a carrying case, these are reusable and store easily in the vehicle, or...
- **6 Flares (3 liquid burning)** – Traditional road flares may be used in some instances. However, they cannot be used with flammable cargo or CMVs with a compressed gas fuel source. If flares are used, the vehicle must have enough additional flares for the entire time the vehicle is stopped.



Practice Exercise 4**Question 1**

On a vehicle equipped with two separate windshields, only the driver side wiper has to function to meet FMCSR standards.

TRUE FALSE

Question 2

During an inspection you find the seatbelt assembly is not functioning properly. The driver who is assigned to the truck has a doctor's diagnosis that indicates the driver should not wear the seatbelt for medical reasons. Does this exempt the seatbelt from having to work properly while this driver is using the vehicle?

YES NO

Question 3

Which of the following are not required on power units as emergency equipment. Circle all that apply.

- A. First Aid Kit B. Fire extinguisher
C. Warning devices D. Jumper cables

Question 4

Which of the following is not a required component? Circle all that apply.

- A. Windshield Washers B. Air conditioning
C. CB Radio D. Windshield Defroster
E. Dome light F. Front bumper

Fuel Systems FMCSR 393.65 - 69

The "fuel system" includes all auxiliary equipment that stores or uses fuel to operate (such as a refrigeration units, compressors or generators).

Fuel tanks must meet specific criteria for FMCSA standards and tanks made July 1, 1989 or later must provide information on the tank that certifies it meets those standards. *For exemptions see 393.67.*

Fuel Tanks

1. Cannot be loosely mounted or leaking.
2. Must have proper filler cap.
3. No part of the tank can be forward of the front axle.
6. Filler must not be in passenger or cargo compartments.



Fuel Lines and other components

1. All lines must be protected from damage including sources of heat.
2. No part of a fuel system can extend past the vehicle
3. All crossover or other lines below the bottom of the tank must be protected from impact

Minimum Inspection Standards

Any tank that is not securely attached, a missing filler cap or a leak anywhere in the fuel system does not meet minimum inspection standards.



Fuel leak at connection



Fuel Leak at Engine

Coupling Devices 393.70*

393.70 specifies the requirements for proper coupling devices. There are many types of couplings that are used on CMVs including variations of fifth wheels, pintle hooks, and receivers. However, there are a few basic guidelines to keep in mind when inspecting any coupling:

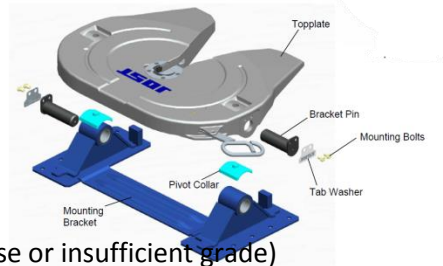
1. The device must be securely mounted to the vehicle with no missing or loose fasteners or any cracked or broken welds.
2. The device must be in good condition and cannot be cracked or deformed due to overloading, fatigue or other damage.
3. The device cannot be excessively worn. Unless specified in the regulations, refer to manufacturer specifications for wear tolerances.

Minimum Inspection Standards

FIFTH WHEELS (lower)

Fifth wheel mounting to frame cannot have any of the following:

- Any fasteners that are missing or ineffective (includes loose or insufficient grade)
- Any movement between mounting components.
- Any mounting angle iron cracked or broken.



Mounting plates cannot have any of the following:

- Any fasteners that are missing or ineffective (includes loose or insufficient grade)
- Any welds or parent metal cracked.
- Pivot brackets Cannot have more than 3/8 inch horizontal movement between pivot bracket pin and bracket.
- Pivot bracket pin must be present and properly secured.

Sliding Fifth Wheels:

- Must have all locking devices that function properly.
- Must have front and rear stops that are securely attached.
- Cannot have movement of more than 3/8 inch between slider bracket and slider base.
- Cannot have any slider component cracked in parent metal or weld.

FIFTH WHEELS (upper)

The upper coupler should be flat and securely mounted with no cracks or other damage which would affect the integrity. The kingpin must not be loose or broken and cannot be worn beyond manufacturer limits.

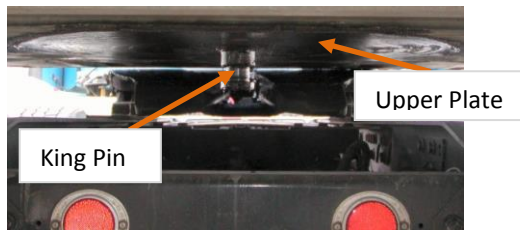


FIGURE 4

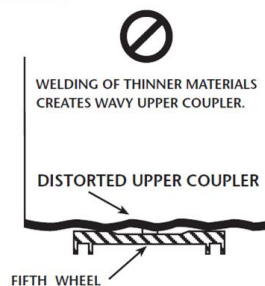
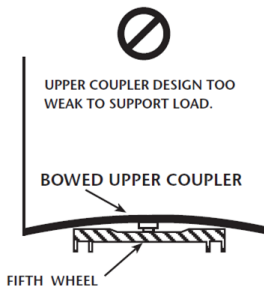


FIGURE 5



FIFTH WHEELS (Coupled)

- Cannot have horizontal movement between the upper and lower halves that exceeds 1/2 inch.
- Operating (manual release) handle must be in closed or locked position (cannot have damage that would prevent locking when coupled)
- Kingpin must be properly engaged (or capable of proper engagement when coupled)
- Upper and lower coupler should be evenly coupled without separation allowing light to show through from side to side (cannot have a condition that would cause separation when coupled)
- Lower plate must not have any cracks.

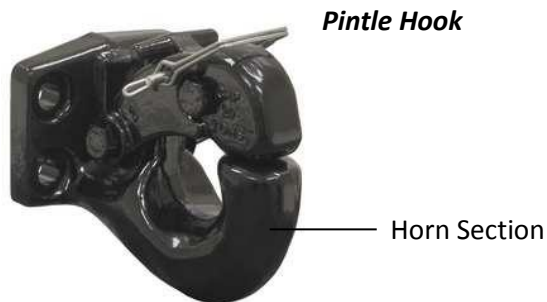
Exceptions: Cracks in fifth wheel approach ramps and casting shrinkage cracks in the ribs of the body of a cast fifth wheel.

- Locking mechanism must be in good working condition without missing, broken, or deformed parts to the extent the kingpin is not securely held (or incapable of being securely held)

FULL TRAILERS

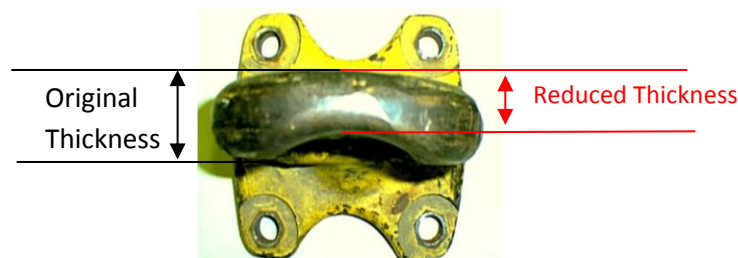
Pintle Hooks

- (a) Cannot have any cracks anywhere in pintle hook assembly.
- (b) Must not have any welded repairs to the pintle hook.
- (c) Cannot have a horn section that is reduced (worn) by more than 20% of the original thickness (as determined by manufacturer)
- (d) Must have secure latch to prevent accidental separation.
- (e) Must be securely attached to the vehicle without any missing or ineffective fasteners.
- (f) Cannot have any cracks in the mounting surface extending from point of attachment (e.g., cracks in the frame at mounting bolt holes) or cracks in frame cross member providing attachment.



Drawbar / Towbar Eyes.

- (a) Cannot be cracked or have welded repairs.
- (b) Cannot have any section reduced by more than 20% of the original thickness
- (c) Must be securely fastened with no missing or ineffective fasteners.
- (d) Cannot have any cracked attachment weld.

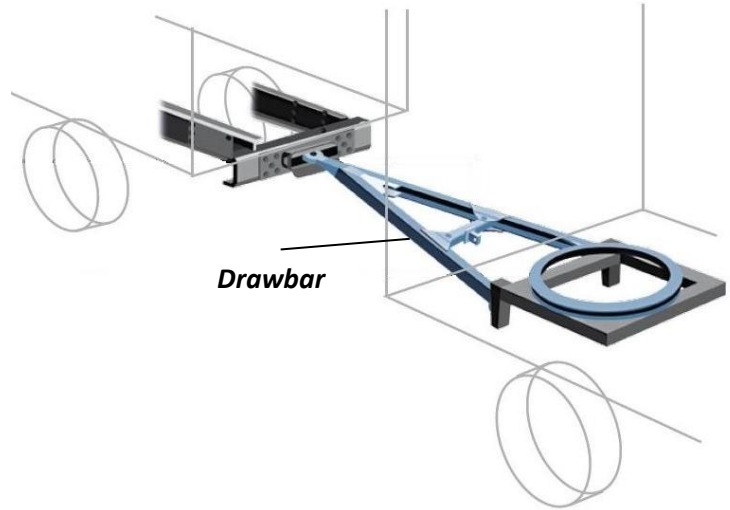
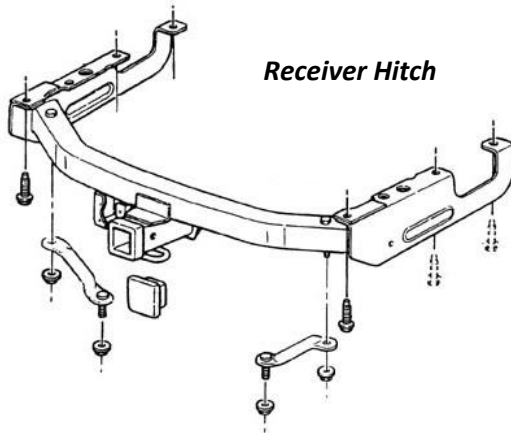


Drawbar/Towbar Tongue.

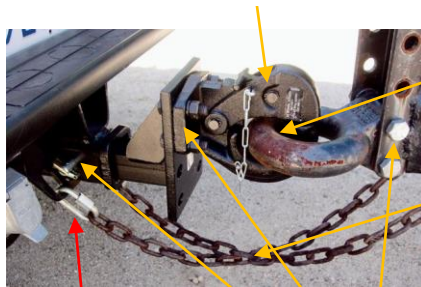
- (a) Cannot have any cracks.
- (b) Must not have more than 1/4 inch movement between subframe and drawbar at point of attachment.

(1) Sliding Drawbar/Towbar (power or manual).

- (a) Must have latching mechanism that functions properly.
- (b) Cannot have missing or ineffective stops.
- (c) Movement between slider and housing cannot be more than 1/4 inch.
- (d) Cannot have any leaking air or hydraulic cylinders, hoses, or chambers (other than slight oil weeping normal with hydraulic seals).



Check for latch



Check for wear

Check chains for damage

Improper link

Check mounting

Safety Devices (except for fifth wheels)

Safety devices must have a breaking strength equal or greater than gross weight of trailer being towed and must be securely attached or capable of secure attachment.

Minimum Inspection Standards

Chains and hooks:

- Must not have any link worn or damaged with a measurable reduction in link cross section.
- Must not have any improper repairs including welding, wire, small bolts, rope and tape.

Cable:

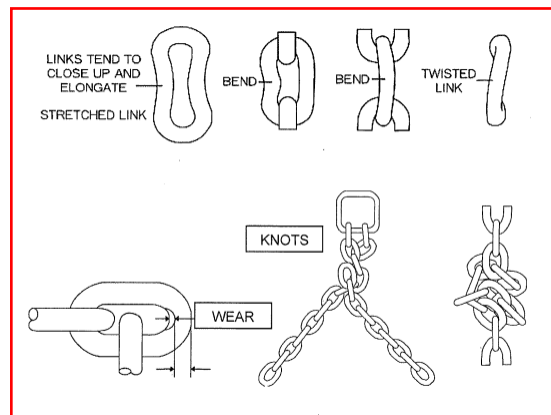
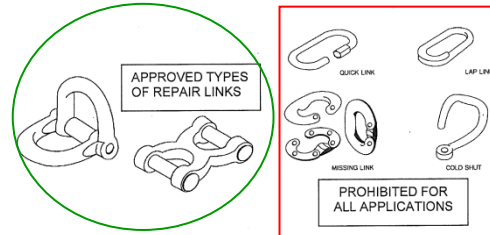
- Cannot have any kinked or broken cable strands.
- Must have proper clamps or clamping devices that are not loose, broken or missing.

Although crossing safety devices is not required unless operating in driveaway/towaway, it is a best practice that minimizes sway and supports the drawbar if trailer becomes disconnected.



Improper link

NOTE: Repairs. Links of the clevis variety, having a strength equal to or greater than the nominal chain are acceptable.

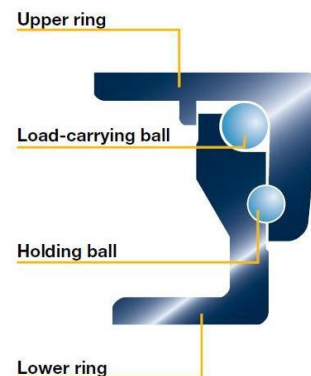


f. Saddle-Mounts cannot have any of the following defects:

- (a) Any missing or ineffective fasteners.
- (b) Loose mountings.
- (c) Any cracks or breaks in a stress or load bearing member.
- (d) Horizontal movement between upper and lower saddle-mount halves that exceeds 1/4 inch.

Full Trailer (Double Ring, Ball-Bearing Turntable)

- (a) Top flange cannot have any missing or loose fasteners.
- (b) Bottom flange cannot have any missing or loose fasteners.
- (c) Cannot have any cracks in welds or parent metal.
- (d) Cannot be excessively worn to the extent upper flange half is touching lower flange half.
- (e) Flanges cannot be cracked.



Exhaust Systems 393.83

The exhaust system is important to driver safety to ensure the driver is not breathing harmful fumes that can cause sickness or even death in severe cases. Also, the exhaust in some models can reach much higher temperatures capable of damaging components placed too close to the exhaust.

Leaks - The entire exhaust system should be checked for obvious leaks or signs of leaks such as soot or carbon deposits around connections. There can be no leaks anywhere below or forward of the cab. Temporary wraps or patches are not allowed.

Mounting - The exhaust system must also be securely mounted to the vehicle with no loose or broken parts. All exhaust components must be mounted where they will not likely burn or damage the fuel system, electrical wiring or other combustible parts.

Discharge location - Truck exhaust must discharge rear of the cab or near the rear if the stacks rise above the cab. No exhaust can discharge below the fuel tank or filler pipe.

Minimum Inspection Standards

(a) Exhaust system can have no leaks at a point forward of or directly below the driver/sleeper compartment (includes engine manifold leaks)

(c) No part of the exhaust system of any motor vehicle shall be located that would likely result in burning, charring, or damaging the electrical wiring, the fuel supply, or any combustible part of the motor vehicle.

(b) A bus exhaust system cannot leak or discharge to the atmosphere:

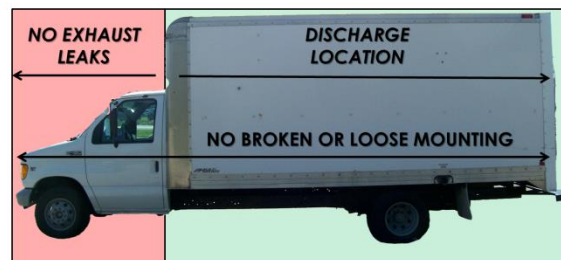
(1) **Gasoline powered**—more than 6 inches forward of the rearmost part of the bus.

(2) **Other than gasoline powered**—more than 15 inches forward of the rearmost part of the bus.

(3) **Other than gasoline powered**—forward of a door or window designed to be opened (except for emergency exits).



Soot indicating exhaust leak under cab



Practice Exercise 5**Question 1**

A fuel leak is not considered a violation if it is located at the following location: Circle all that apply.

1. Engine compartment 2. Refrigeration unit 3. Auxiliary power unit
4. An approved fitting 5. Fuel tank drain fitting 6. None of the above

Question 2

During an inspection of a truck tractor, you find the exhaust stack located at the rear of the cab is leaking due to a broken mounting clamp allowing the stack to move forward and back. Is this a defective condition being on the rear?

Explain your answer _____

Question 3

A trailer with a GVWR of 12,000 lbs. used to transport small machinery is required to have the safety devices crossed.

TRUE FALSE

Question 4

While inspecting a fixed fifth wheel you find one of ten fasteners used to attach the lower half to the frame of the power unit is missing. Is this a defective condition?

YES NO

Tires 393.75

Tires conditions are very important to vehicle handling and stopping. Drivers rely on the tires to provide sufficient traction in all weather conditions to safely operate their vehicle. CMVs operating with defective tires or tires that are past their service life are at a higher risk of being involved in a crash due to loss of control and increased stopping distances.

CMVs cannot be operated with tires that have any of the following conditions:

- Has body ply or belt material exposed through the tread or sidewall.
- Has any tread or sidewall separation (bulges) except for a proper repair 3/8" or less in height.
- Is flat or has a noticeable leak.
- Has a cut to the extent that the ply or belt material is exposed.
- A steer tire with less than 4/32" of tread anywhere in a major tread groove.
- A non-steer tire with less than 2/32" of tread anywhere in a major tread groove.

Sidewall condition must also be checked for any defects that may lead to failure. Sidewalls should not have any bulges (sidewall repairs are allowed and indicated by a blue triangle and cannot exceed 3/8" from sidewall surface) or damage to the extent that ply or belt material is exposed.

Load Ratings - No tire can carry more weight than specified by the manufacturer (see exceptions in 393.75) and regrooved steer tires (on a truck or tractor) must have a rating of less than 4920 lbs.

Tire and Wheel Clearance – The vehicle cannot be operated in any way that causes the tires to contact any part of the vehicle (including dual tires in contact with each other), including a condition caused by loading.

Inspection of Tires

1. Check for sufficient tread depth using a depth gauge. (tread groove that appears to have the least tread should be used for measurement). Note any irregular tread wear.
2. Inspect the sidewalls for cuts or damage with exposed belt and ply material. (note excessive weather checking or other safety related defects not listed in 393)
3. Check for any separation of the tread or sidewall (bulges)
4. Check sidewall for any markings prohibiting specific uses.
5. Check dual assemblies to see if tires are in contact with each other.
6. If a steer tire has been regrooved, check the load carrying capacity is less than 4920 lbs.
7. Check for any sign of contact between the tire and other parts of the vehicle.

Minimum Inspection Standards

a. Tires on steering axles of a power unit can have none of the following defects:

- (1) less than 4/32 inch tread when measured at any point on a major tread groove.
- (2) body ply or belt material exposed through the tread or sidewall.
- (3) any tread or sidewall separation.
- (4) a cut where the ply or belt material is exposed.
- (5) Labeled “Not for Highway Use” or displaying other marking which would exclude use on steering axle.
- (6) A tube-type radial tire without radial tube stem markings. These markings include a red band around the tube stem, the word “radial” embossed in metal stems, or the word “radial” molded in rubber stems.
- (7) Mixing bias and radial tires on the same axle.
- (8) Tire flap protrudes through valve slot in rim and touches stem.
- (9) Regrooved tire except motor vehicles used solely in urban or suburban service (see exception in 393.75(e)).
- (10) Boot, blowout patch or other ply repair.
- (11) Weight carried exceeds tire load limit. This includes overloaded tire resulting from low air pressure.
- (12) Tire is flat or has noticeable (e.g., can be heard or felt) leak.
- (13) Any bus equipped with recapped or retreaded tire(s).
- (14) So mounted or inflated that it comes in contact with any part of the vehicle.

b. All tires other than those found on the steering axle of a power unit cannot have any of the following:

- (1) Weight carried exceeds tire load limit. This includes overloaded tire resulting from low air pressure.
- (2) Tire is flat or has noticeable (e.g., can be heard or felt) leak.
- (3) Has body ply or belt material exposed through the tread or sidewall.
- (4) Has any tread or sidewall separation.
- (5) Has a cut where ply or belt material is exposed.
- (6) So mounted or inflated that it comes in contact with any part of the vehicle. (This includes a tire that contacts its mate.)
- (7) Is marked “Not for highway use” or otherwise marked and having like meaning.
- (8) With less than 2/32 inch tread when measured at any point on a major tread groove.



Dual tires touching



Prohibited Use Markings



Tire contacting frame or body



Belt material exposed



Less than 2/32" non steer axle

Wheels and Rims 393.205

Along with the tires, rims take a large amount of stress during regular operation. There are different types of rims in use but the majority of rims used today is disc type, either hub or stud mounted. These rims can develop cracks or other damage from improper seating, over tightening, loose fasteners, wrong type of fasteners, etc.

There are also demountable wheels in which the rim section is mounted to the spokes and is removable. This type is substantially less common than disc rims. Demountable rims can be tubeless or tube type and the types that use lock rings to seat the tire and can be very dangerous if not serviced properly.

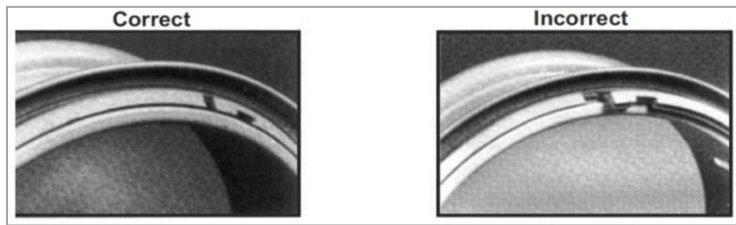
Defective Conditions include:

- Cracked or broken rim
- Loose or missing fasteners
- Elongated bolt holes
- Welded repairs on steering axle rims
- Evidence of slipping on spoke wheels
- Bent or improperly seated lock rings

Minimum Inspection Standards

a. Lock or Side Rings.

Cannot have any bent, broken, cracked, improperly seated, sprung or mismatched ring(s).



b. Wheels and Rims.

Cannot be cracked or broken. Bolt holes cannot be elongated.

c. Fasteners (both spoke and disc wheels).

All fasteners must be properly tightened with no loose, missing, broken, cracked, stripped or otherwise ineffective fasteners.



d. Welds

- (1) Welds attaching disc wheel disc to rim cannot be cracked.
- (2) Welds attaching tubeless demountable rim to adapter cannot be cracked.
- (3) Aluminum wheel(s) on a steering axle can have no weld repairs.
- (4) Steel wheels on steering axles cannot have any welded repair other than disc to rim attachment on steel disc wheel(s).

Wheel Hubs 396.3(a)(1) 396.5(a)(b)

Hubs should be checked for proper fluid level (if applicable) and for any leaks. Hub caps (grease caps) should be in good condition with no loose or missing fasteners.

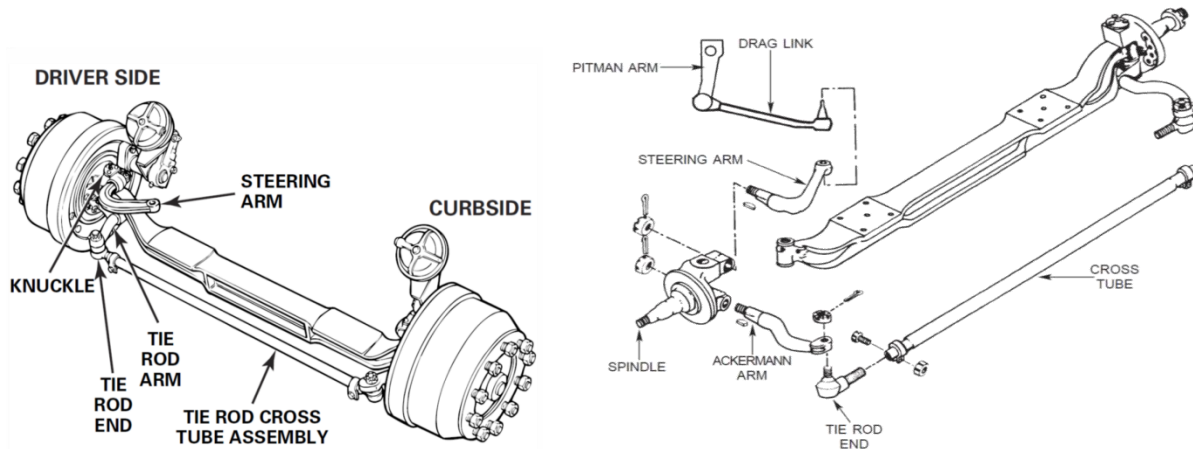
Brake lining contaminated by leaking hub.



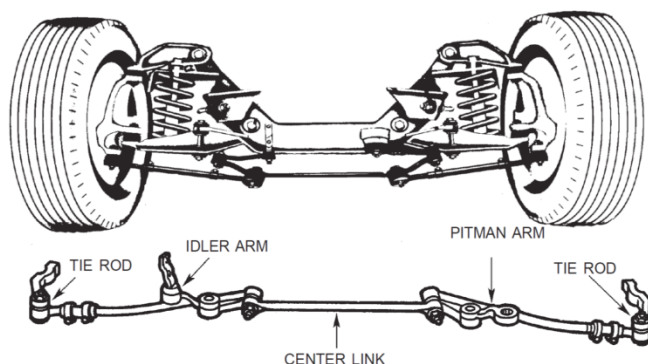
Steering Systems 393.209

Steering systems and components must be in good working order and it may be necessary to raise the steer tires off the ground in some cases to thoroughly check all components.

Typical Medium / Heavy Duty Steering System



Typical Light Duty Steering System



Minimum Inspection Standards

- a. Steering Wheel Free Play must be within following limits:**
(on vehicles equipped with power steering the engine must be running).

Maximum Allowed Free Play

Steering wheel diameter	Manual steering system	Power steering system
(16 inches or less)	(2 inches)	(4 ¼ inches)
(18 inches)	(2 ¼ inches)	(4 ¾ inches)
(19 inches)	(2 3/8 inches)	(5 inches)
(20 inches)	(2 ½ inches)	(5 ¼ inches)
(21 inches)	(2 5/8 inches)	(5 ½ inches)
(22 inches)	(2 ¾ inches)	(5 ¾ inches)

b. Steering Column

- (1) Must be securely attached without any missing or loose U-bolt(s) or positioning part(s).
- (2) Universal joint(s) cannot be worn (no movement other than rotational), faulty or have welded repairs.
- (3) Steering wheel must be properly secured.



c. Front Axle Beam and All Steering Components Other Than Steering Column

- (1) Must be securely attached with no cracks.
- (2) Cannot have any welded repairs.

d. Steering Gear Box.

- (1) Must be securely mounted with no loose or missing mounting bolts.
- (2) Cannot have any cracks in gear box or mounting brackets.



e. Pitman Arm

Pitman arm mounting on output shaft can have no movement between components.
Pitman arm can have no welded repairs.



f. Power Steering.

Power steering systems must not leak.
Auxiliary power assist cylinders must be securely attached and not loose.

g. Ball and Socket Joints.

- (1) There can be no movement under steering load of a stud nut.
- (2) There can be no motion, other than rotational, between any linkage member and its attachment point that exceeds $\frac{1}{4}$ ".

Roadside inspection criteria specifies a ball and socket joint with more than $\frac{1}{8}$ " movement using hand pressure will be placed out of service.

h. Tie Rods and Drag Links.

- (1) Must be securely attached with no damage, loose clamp(s) or clamp bolt(s)
- (2) Any looseness in any threaded joint such as tierod threaded into crosstube.



i. Nuts.

Nuts must be in place and cannot be loose or missing on tie rods pitman arm, drag link, steering arm or tie rod arm.

j. Steering System function.

There can be no modification or other condition that interferes with free movement of any steering component such as tire hitting steering components or hydraulic pump malfunction.

Suspension Systems 393.207

Axle Positioning Parts 393.207(a)

Spring hanger, u-bolts, and other components that are used to keep the axles in alignment cannot be cracked, broken, loose, or missing and all axles must be in proper alignment.

Leaf Spring/Coil Spring/Torsion Bar Suspensions 393.207(c)(d)(e)

No leaf spring, coil spring or torsion bar can be cracked, broken or shifted from its original position.

Air Suspensions 393.207(f)

Air suspensions must not have any of the following defects:

- Any deflated air suspensions (when air gauges show normal operating pressure)
- Uneven inflation causing vehicle to lean left or right
- Noticeable leaks
- Broken or loose mounting
- Any air leak exceeding 3psi in a five minute period at normal operating pressure.

Minimum Inspection Standards

1. Any U-bolt(s), spring hanger(s), or other axle positioning part(s) cracked, broken, loose or missing resulting in shifting of an axle from its normal position. (After a turn, lateral axle displacement is normal with some suspensions. Forward or rearward operation in a straight line will cause the axle to return to alignment).



2. Any leaves in a leaf spring assembly that are broken or missing.



3. Any broken main leaf in a leaf spring assembly. (Includes assembly with more than one main spring).

4. Any coil spring broken.

5. Any rubber spring missing.

6. One or more leaves displaced in a manner that could result in contact with a tire, rim, brake drum or frame.

7. Any broken torsion bar spring in a torsion bar suspension.

8. Deflated air suspension, i.e., system failure, leak, etc.

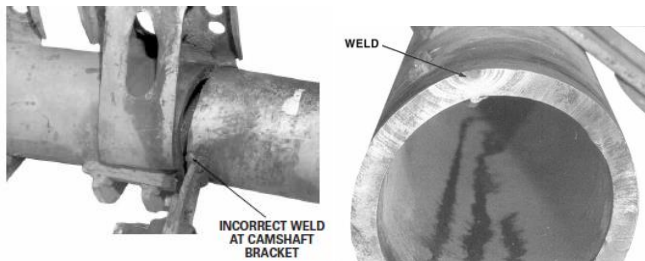
9. Any part of a torque, radius or tracking component assembly or any part used for attaching the same to the vehicle frame or axle that is cracked, loose, broken or missing. (Does not apply to loose bushings in torque or track rods.)



Frames and Axle Beams 393.201

Frames and axles support a significant amount of weight and should be inspected regularly. Frame and axle members should not be welded or drilled unless done in accordance with manufacturer approved procedures. Defects include:

- cracks in flanges
- improper weld repairs
- bent, cut or notched frame rails
- severe corrosion to the point a hole has developed
- broken or loose body mounting points
- damaged cross members
- holes drilled in flanges



This trailer axle failed due to a camshaft support bracket being improperly welded to the axle housing. The repair caused a weak spot in the axle which led to the failure.

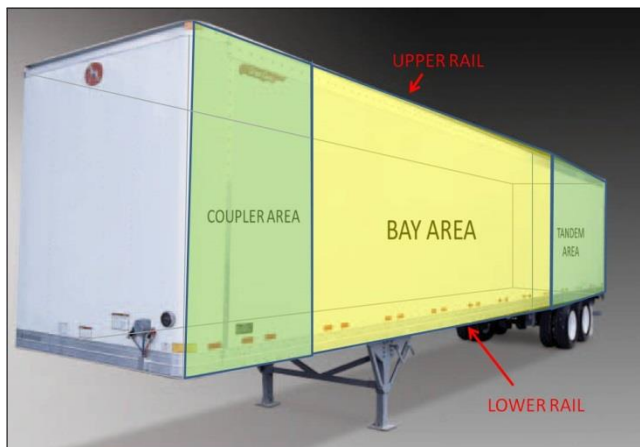
Van and Open Top Trailers

The frame components on van trailers work in conjunction to provide the strength needed to support the weight of cargo placed inside. They are divided into three sections;

Front or Coupler Area – From the nose or bulkhead to and including the upper plate area.

Bay Area – Beginning after the upper plate and continuing to the trailer axles.

Tandem Area – beginning at the trailer axles and continuing to the rear.



Components

Lower rails extend the full length of the trailer on each side and are connected with **floor cross members**. **Upper rails** extend the length of the trailer at the top on each side and are connected by **roof cross members**. **Side panels and struts** connect the upper and lower rails.

Check for any cracks, breaks to rails especially in the Bay Area. Check for any broken, missing, or damaged floor or roof cross members. Check for missing fasteners holding the floor cross members to the lower rail. Check side panels and struts for any cracks, break, or other damage.

Damaged components within the BAY AREA are especially dangerous. This section endures a lot of stress and failures are most likely to occur in this area.

Adjustable axles 393.207(b)

Some trailers have sliding sub frames which allow the trailer axles to be moved to accommodate proper weight distribution. These systems cannot have any of the following defects.

- Unlocked or missing lock pins
- Release handle not in the locked position
- Sliding sub frame is above lock pins
- Partially engaged lock pins

Minimum Inspection Standards

Frame Members.

(1) Must be securely attached and not cracked, broken, loose, or sagging.

(2) Fasteners attaching functional component such as engine, transmission, steering gear, suspension, body parts, and fifth wheel must be secure and not loose or missing.



Tire and Wheel Clearance.

(1) There can be no condition, including loading that causes the body or frame to be in contact with a tire or any part of the wheel assemblies.



Adjustable Axle Assemblies (Sliding Subframes)

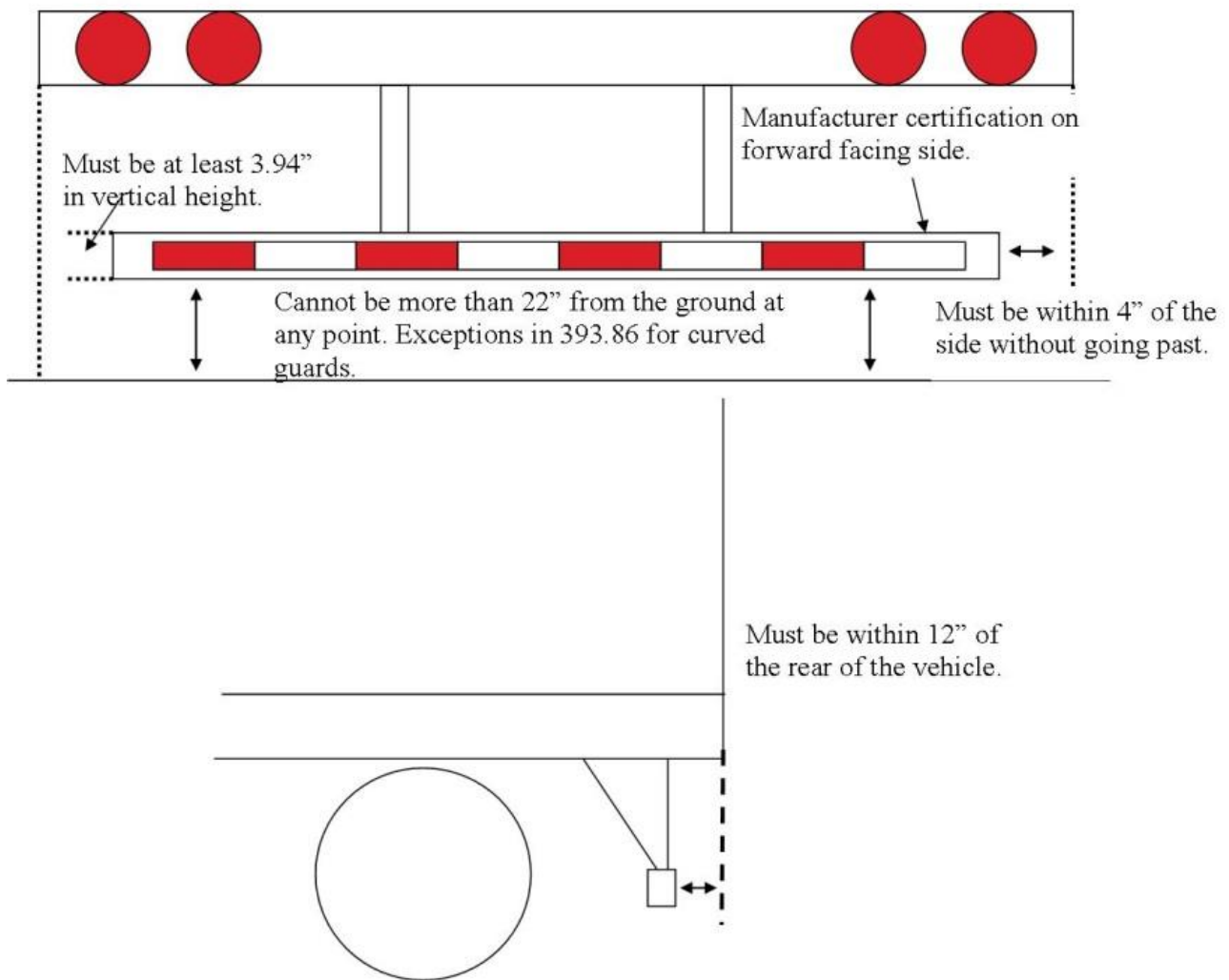
(1) Adjustable axle assembly must be fully locked with no missing or disengaged pins.

Rear Impact Guards 393.86 571.223

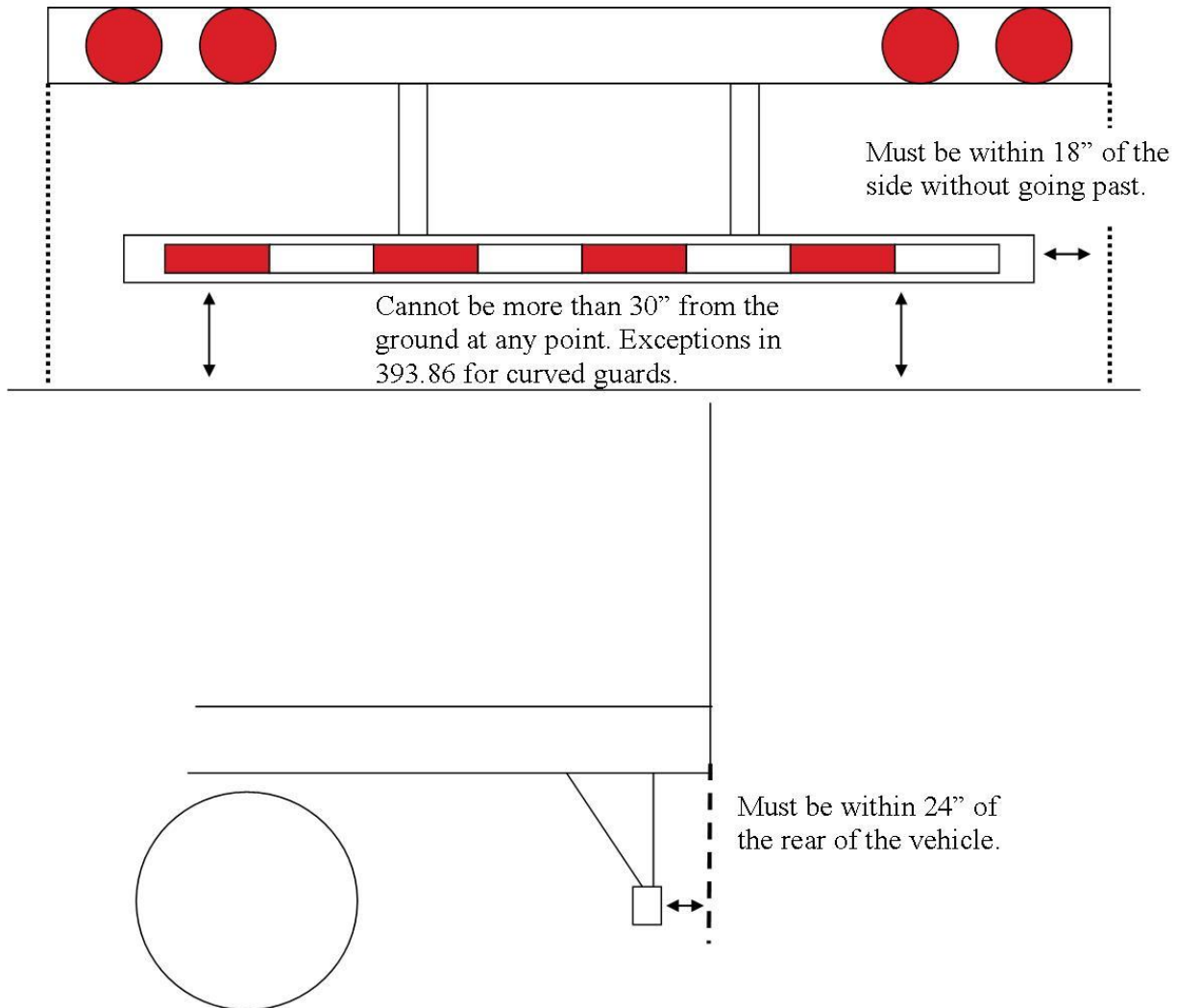
CMVs are required to have rear end protection systems that will prevent other vehicles from going under the CMV in the event of a rear end crash. It should be properly attached to the vehicle in a way that provides strength and rigidity. Any loose, broken, or damaged device should be repaired or replaced.

Exceptions – Some vehicles do not require an additional bumper on the rear if the chassis, body or other vehicle components offer the same rear end protection.

**Rear Impact Guard requirements for Trailers and Semi-trailers
manufactured on or after 1-26-1998**



Rear Impact Guard requirements for **Other Vehicles made after 12-31-1952**
with more than 30" between the ground and chassis



Safe loading

All structures and associated components used to secure cargo (doors, floor, d-rings, etc.)

- Cannot be cracked, loose, missing, broken or have any other condition that would likely result in cargo falling from the vehicle.

Intermodal equipment

- Cannot have any cracked, broken, loose or missing components used to secure a container to the chassis.



Practice Exercise 6**Question 1**

How many springs in a stack of 12 can be broken before it is a violation?

Question 2

If a tire measures below the required tread at only one point is it a violation?

Question 3

Steering components in a power steering system can have up to _____ inches of steering wheel free play when measured on a 18" wheel.

Question 4

During an inspection you find a pitman arm has been welded to the output shaft. Is this allowed if there is no movement between the two parts?

YES NO

Question 5

Besides steering components, what other inspection item may be an indicator of steering system problems? _____

Question 6

How would you check for loose or worn tie rods?

Lubrication and Leaking Fluids 396.5

All CMVs must be properly lubricated and free from oil or grease leaks. This includes engines, transmissions, axles and any other components that require lubrication. Exceptions to this regulation are normal seepage or residue around seals which is normal to the components function.

Significant transmission leak



Significant engine oil leak



396.3(a)(1)

This is sometimes referred to as a “catch-all” regulation that applies to any vehicle components that are not covered specifically in the FMCSR. It requires that all parts must be in safe and proper operating condition including all 393 required parts and any additional equipment that would affect safe operation of the vehicle.

Items typically covered under this regulation are the air compressor, wheel hubs, air reservoir mounting and movement between fifth wheel components.

Vehicle Files 396.3(b)

Every CMV must have its own file that contains all of the following;

- Identifies the vehicle by company number, make, serial number, year and tire size.
- A maintenance plan or schedule of PM service including the services that will be performed and when they are due.
- A record of all inspections, repairs and maintenance performed on the vehicle.
- (buses only) A record of all tests performed on push out windows, emergency doors and emergency door marking lights.

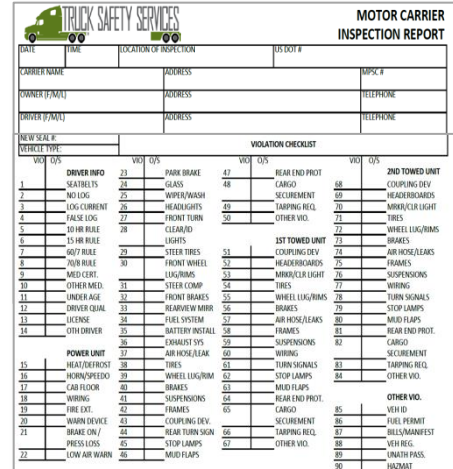
396.3(c) Records must be kept where the vehicle is housed or maintained and entries must be kept for at least one year. For vehicles leaving a carriers control, the records must be kept for at least 6 months from the date the vehicle is released.

Periodic Inspection Reports 396.21

For qualified inspectors performing Periodic Inspections, there are specific requirements that must be followed to properly complete the inspection reports.

The qualified inspector must prepare a report that:

- Identifies the individual performing the inspection.
- Identifies the motor carrier operating the vehicle or intermodal equipment provider.
- Identifies the date of the inspection.
- Identifies the vehicle inspected.
- Identifies the vehicle components inspected and describes the results of the inspection, including the identification of those components not meeting the minimum standards set forth in appendix G to this subchapter.
- Certifies the accuracy and completeness of the inspection as complying with all the requirements of this section.



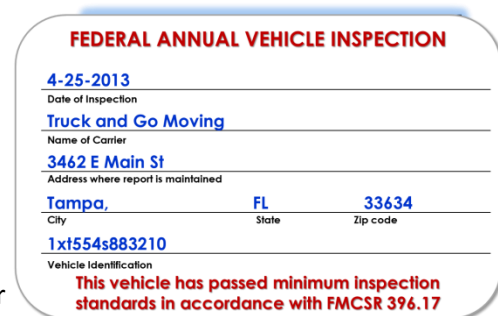
The form is titled "MOTOR CARRIER INSPECTION REPORT" and includes fields for DATE, TIME, LOCATION OF INSPECTION, and DOT #. It has sections for OWNER (NAME, ADDRESS, PHONE #) and DRIVER (NAME, ADDRESS, PHONE #). A "VEHICLE TYPE" field is present, followed by a "VIOLATION CHECKLIST" table. The table lists various vehicle components and their corresponding violation codes (e.g., 1 DRIVER INFO, 2 SEATBELT, 3 NO LOG, etc.).

396.21(b). The original or a copy of the inspection report must be kept for 14 months from the date of inspection and must be kept where the vehicle is housed or maintained. All periodic inspection reports must be made available at the request of a local, state, or federal authorized official.

Proof of Inspection 396.17(c)

Each CMV must pass an inspection at least once in the last twelve months and have proof of the inspection on the vehicle at all times and the driver must be able to produce it at the request of an authorized official. The proof can be a copy of the inspection report prepared by the inspector or can be in other forms like a sticker that contains the following information;

- The date of inspection.
- Name and address of the motor carrier, intermodal equipment provider, or other entity where the inspection report is maintained.
- A certification that the vehicle has passed an inspection in accordance with § 396.17.
- Vehicle identification if no company number or similar is clearly marked on the vehicle.



The sticker is titled "FEDERAL ANNUAL VEHICLE INSPECTION" and contains the following information:

- Date of Inspection: 4-25-2013
- Name of Carrier: Truck and Go Moving
- Address where report is maintained: 3462 E Main St
- City: Tampa, State: FL, Zip code: 33634
- Vehicle Identification: 1xtf554s883210

 At the bottom, it states: "This vehicle has passed minimum inspection standards in accordance with FMCSR 396.17"

If for any reason the proof of inspection is unable to be read, the vehicle is considered to have no proof of inspection.

Driver Vehicle Inspection Reports 396.11 (a)

Each driver must fill out and sign a report at the end of each shift for every vehicle they drove during the shift. The report must include minimum items and list any defects discovered during the course of operation or that no defects were discovered. 396.11(c)(2) Reports must be kept for 3 months from when the report was made.

Corrective Action 396.11(c)

If a driver lists a defective part or condition that affects the safe operation of the vehicle, the carrier must repair the defect before the vehicle is operated again. Someone must sign the driver report certifying the repairs were made or that the defective condition does not affect safe operation.

Driver Inspection 396.13

Before using a CMV, the driver must;

- Be satisfied it is in safe operating condition.
- Review the last DVIR.
- If defects were noted, sign the report to acknowledge the repairs have been made.

Roadside Inspection Reports 396.9

CMVs that are subjected to a Roadside Inspection from an authorized official will receive a Driver/Vehicle Examination Report listing any defects or violations discovered during the inspection. The driver must give the report to the carrier when they get to a terminal or other company facility. If they are not scheduled to be at a terminal or other facility within the next 24 hours, they must send the report by mail, fax, or otherwise transmit the report to the carrier.

Upon receiving the report, the carrier must review the report and any defects listed must be repaired before the vehicle is dispatched again. The carrier must return the inspection form to the issuing agency within 15 days with the signature of a company official certifying the noted defects have been repaired. A copy of the report must be kept by the carrier for 12 months from the date of inspection.

Vehicles that are discovered to have a mechanical condition or loading that is likely to cause an accident or breakdown can be placed Out of Service and not allowed to continue. Upon being placed OOS, the vehicle must be repaired at the scene or, in some cases, can be towed with a wrecker or similar vehicle specifically designed to transport disabled vehicles and utilizes a crane or hoist.

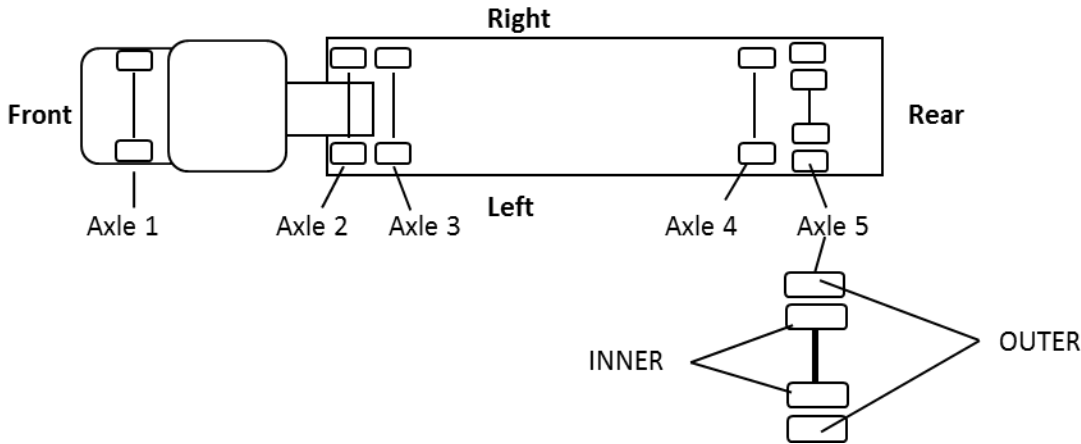
No one can remove the OOS sticker or operate the vehicle until all defects causing the vehicle to be placed OOS are repaired or no longer exist.

Report Terminology

FRONT, REAR, RIGHT, LEFT should be used to determine location on the vehicle.
(Left and right should be used as if sitting in the driver seat. Driver side = LEFT, Passenger side is = RIGHT)

Axles should be referenced by numbering them sequentially beginning with the front most axle (1) and continuing to the rear most axle.

Dual tires should be identified by using INNER/OUTER designations.



Moving Forward...

Safety is a way of thinking, not just an occasional training program. You have taken a great step toward improving CMV Safety by completing this program; however it is just a step. To reach our goal of fewer trucks being involved in crashes, we have to put the knowledge to work for us and implement the necessary changes. Think safe, act safe, be safe!

Saving lives and reducing costs at the same time...

A single large truck crash can have a comprehensive cost of millions of dollars*. By implementing effective maintenance schedules and performing regular inspections, you will reduce the chance of a crash by finding and repairing unsafe conditions early and save money on costly emergency road service calls that can cost up to 4 times as much as in house or scheduled repairs.

**Estimated Costs Associated with Traffic Crashes*

MI Traffic Crash Victim	FATAL	Serious Injury	Moderate Injury	Minor Injury	Property Only
(Comprehensive Cost)	\$3,611,958	\$229,646	\$68,431	\$39,910	\$3,690

(Information from UMTRI Societal Costs of Traffic Crashes and Crime in Michigan: 2011 Update)

