

Section 7

DOUBLES AND TRIPLES

This Section Covers

- **Pulling Double/Triple Trailers**
- **Coupling and Uncoupling**
- **Inspecting Doubles and Triples**
- **Double/Triples Air Brake Check**

This section has information you need to pass the CDL knowledge test for driving safely with double and triple trailers. It tells about how important it is to be very careful when driving with more than one trailer, how to couple and uncouple correctly, and about inspecting doubles and triples carefully. (You should also study Sections 2, 5, and 6.) You must have both a Class "A" Commercial Driver License and a Double/Triple Endorsement before driving a set of doubles or triples.

NOTE: Triple trailer combinations are **not** allowed on New York highways. The endorsement allows you to pull triple trailers only in those states where it is legal.

7.1 – Pulling Double/Triple Trailers

Take special care when pulling two and three trailers. There are more things that can go wrong, and doubles/triples are less stable than other commercial vehicles. Some areas of concern are discussed below.

7.1.1 – Prevent Trailer from Rolling Over

To prevent trailers from rolling over, you must steer gently and go slowly around corners, on ramps, off ramps, and curves. A safe speed on a curve for a straight truck or a single trailer combination vehicle may be too fast for a set of doubles or triples.

7.1.2 – Beware of the Crack-the-whip Effect

Doubles and triples are more likely to turn over than other combination vehicles because of the "crack-the-whip" effect. You must steer gently when pulling trailers. The last trailer in a combination is most likely to turn over. If you don't understand the crack-the-whip effect, study subsection 6.1.2 of this manual.

7.1.3 – Inspect Completely

There are more critical parts to check when you have two or three trailers. Check them all. Follow the procedures described later in this section.

7.1.4 – Look Far Ahead

Doubles and triples must be driven very smoothly to avoid rollover or jackknife. Therefore, look far ahead so you can slow down or change lanes gradually when necessary.

7.1.5 – Manage Space

Doubles and triples take up more space than other commercial vehicles. They are not only longer, but also need more space because they can't be turned or stopped suddenly. Allow more following distance. Make sure you have large enough gaps before entering or crossing traffic. Be certain you are clear at the sides before changing lanes.

7.1.6 – Adverse Conditions

Be more careful in adverse conditions. In bad weather, slippery conditions, and mountain driving, you must be especially careful if you drive double and triple bottoms. You will have greater length and more dead axles to pull with your drive axles than other drivers. There is more chance for skids and loss of traction.

Allow More Following Distance. Remember the one plus one second rule for following other vehicles. Allow one second for each 10 feet of your vehicle's length. Plus, add one second when you travel 40 or more MPH. A 100 foot long combination vehicle traveling at 35 MPH would need 10 seconds of following distance. At 45 MPH, the same vehicle would need 11 seconds.

Use Special Care in Bad Weather Conditions. Because of the greater length and extra dead axles pulled by the drive wheels, doubles and triples may skid and lose traction easily. On slippery roads allow much more space than you need for ideal driving conditions. Do not use the engine brake or speed retarder on slippery roads. Their use can cause your vehicle to lose traction. Remember the one rule that is important to all skids: "Restore traction to the tire."

Watch For Jackknifing. If your tractor's drive wheels or your trailer wheels lose traction, your vehicle may jackknife. When a set of trailer wheels goes into a skid, you may have a trailer jackknife. You must then restore traction to your tires. Review Section 2.19 if you do not remember how to control and recover from a skid.

Take Care When Changing Lanes. Besides steering gently, you must watch your mirrors closely when changing lanes. Check the mirrors after signaling the lane change, after starting the lane change, and while completing the lane change. Don't change lanes near on-ramps, off-ramps or intersections.

Brake Correctly. Because doubles and triples are longer and heavier, you must apply brakes correctly.

- On long downhills remember to go slowly enough that fairly light use of the brakes will keep your speed from increasing. Never use only the trailer brakes to control your speed.
- On curves, remember to slow to a safe speed before entering the curve, then accelerate slightly during the curve.
- When empty, remember bouncing may cause poor traction and wheel lockup. An empty truck takes longer to stop than a loaded truck.
- In emergency braking situations, use either the controlled or stab braking method to stop your vehicle. These methods will help you stop doubles or triples in a straight line and prevent jackknifing. Review Section 2.17.2 on How To Stop Quickly and Safely, if you cannot remember either the controlled or the stab braking methods.
- Remember that speed increases your stopping distance. If your speed doubles, your stopping distance increases four times. It takes four times the distance to stop at 40 MPH than at 20 MPH.

7.1.7 – Parking the Vehicle

Make sure you do not get in a spot you cannot pull straight through. You need to be aware of how parking lots are arranged in order to avoid a long and difficult escape.

7.1.8 – Antilock Braking Systems on Converter Dollies

Converter dollies built on or after March 1, 1998, are required to have antilock brakes. These dollies will have a yellow lamp on the left side of the dolly.

7.2 – Coupling and Uncoupling

Knowing how to couple and uncouple correctly is basic to safe operation of doubles and triples. Wrong coupling and uncoupling can be very dangerous. Coupling and uncoupling steps for doubles and triples are listed below.

7.2.1 – Coupling Twin Trailers

Secure Second (Rear) Trailer

If the second trailer doesn't have spring brakes, drive the tractor close to the trailer, connect the emergency line, charge the trailer air tank, and disconnect the emergency line. This will set the trailer emergency brakes (if the slack adjusters are correctly adjusted). Chock the wheels if you have any doubt about the brakes.

CAUTION: For the safest handling on the road, the more heavily loaded semitrailer should be in first position behind the tractor. The lighter trailer should be in the rear.

A converter gear on a dolly is a coupling device of one or two axles and a fifth wheel by which a semitrailer can be coupled to the rear of a tractor-trailer combination forming a double bottom rig. See *Figure 7.1*.

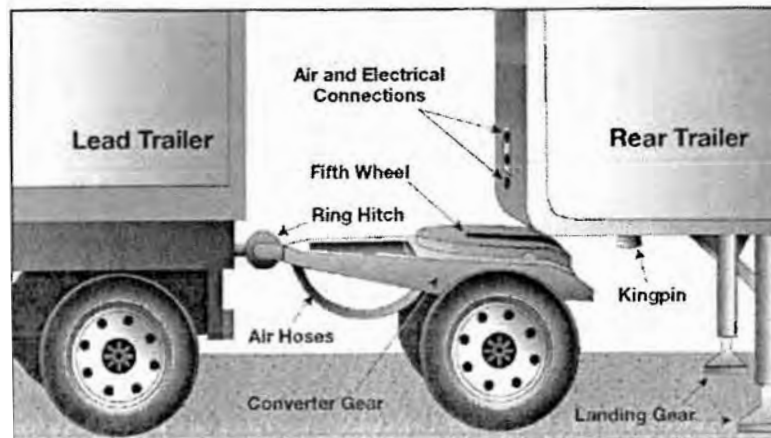


Figure 7.1

Position Converter Dolly in Front of Second (Rear) Trailer

Release dolly brakes by opening the air tank petcock. (Or, if the dolly has spring brakes, use the dolly parking brake control.)

If the distance is not too great, wheel the dolly into position by hand so it is in line with the kingpin.

Or, use the tractor and first semitrailer to pick up the converter dolly:

- Position combination as close as possible to converter dolly.
- Move dolly to rear of first semitrailer and couple it to the trailer.
- Lock pintle hook.
- Secure dolly support in raised position.
- Pull dolly into position as close as possible to nose of the second semitrailer.
- Lower dolly support.
- Unhook dolly from first trailer.
- Wheel dolly into position in front of second trailer in line with the kingpin.

Connect Converter Dolly to Front Trailer

- Back first semitrailer into position in front of dolly tongue.
- Hook dolly to front trailer.
 - Lock pintle hook.
 - Secure converter gear support in raised position.

Connect Converter Dolly to Rear Trailer

- Make sure trailer brakes are locked and/or wheels chocked.
- Make sure trailer height is correct. (It must be slightly lower than the center of the fifth wheel, so trailer is raised slightly when dolly is pushed under.)
- Back converter dolly under rear trailer.
- Raise landing gear slightly off ground to prevent damage if trailer moves.
- Test coupling by pulling against pin of the second semitrailer.
- Make visual check of coupling. (No space between upper and lower fifth wheel. Locking jaws closed on kingpin.)
- Connect safety chains, air hoses, and light cords.
- Close converter dolly air tank petcock and shut-off valves at rear of second trailer (service and emergency shut-offs).
- Open shut-off valves at rear of first trailer (and on dolly, if so equipped).
- Raise landing gear completely.
- Charge trailer brakes (push "air supply" knob in), and check for air at rear of second trailer by opening the emergency line shut-off. If air pressure isn't there, something is wrong and the brakes won't work.

7.2.2 – Uncoupling Twin Trailers

Uncouple Rear Trailer

- Park rig in a straight line on firm level ground.
- Apply parking brakes so rig won't move.
- Chock wheels of second trailer if it doesn't have spring brakes.
- Lower landing gear of second semitrailer enough to remove some weight from dolly.
- Close air shut-offs at rear of first semitrailer (and on dolly, if so equipped).
- Disconnect all dolly air and electric lines and secure them.
- Release dolly brakes.
- Release converter dolly fifth wheel latch.
- Slowly pull tractor, first semitrailer, and dolly forward to pull dolly out from under rear semitrailer.

Uncouple Converter Dolly

- Lower dolly landing gear.
- Disconnect safety chains.
- Apply converter gear spring brakes or chock wheels.
- Release pintle hook on first semi-trailer.
- Slowly pull clear of dolly.

CAUTION: Never unlock the pintle hook with the dolly still under the rear trailer. The dolly tow bar may fly up, possibly causing injury, and making it very difficult to re-couple.

7.2.3 – Coupling and Uncoupling Triple Trailers

NOTE: Triple trailers are illegal in New York State.

Couple Tractor/First Semitrailer to Second/Third Trailers

- Couple tractor to first trailer. Use the method already described for coupling tractor-semitrailers.
- Move converter dolly into position and couple first trailer to second trailer using the method for coupling doubles. Triples rig is now complete.

Uncouple Triple-trailer Rig

- Uncouple third trailer by pulling the dolly out, then unhitching the dolly using the method for uncoupling doubles.
- Uncouple remainder of rig as you would any double-bottom rig using the method already described.

7.2.4 – Coupling and Uncoupling Other Combinations

The methods described so far apply to the more common tractor-trailer combinations. However, there are other ways of coupling and uncoupling the many types of truck-trailer and tractor-trailer combinations that are in use. There are too many to cover in this manual. Learn the right way to couple the vehicle(s) you will drive according to the manufacturer and/or owner.

7.3 – Inspecting Doubles and Triples

Use the seven-step inspection procedure described in Section 2.1.5 to inspect your combination vehicle. There are more things to inspect on a combination vehicle than on a single vehicle. Many of these items are simply more of what you would find on a single vehicle. (For example: tires, wheels, lights, reflectors, etc.) However, there are also some new things to check. Do these checks in addition to those already listed in Section 2.1.5, *Step 5: Do Walk-around Inspection*:

Coupling System Areas

- Check fifth wheel (lower).
 - Securely mounted to frame.
 - No missing or damaged parts.
 - Enough grease.
 - No visible space between upper and lower fifth wheel.
 - Locking jaws around the shank, not the head of kingpin.
 - Release arm properly seated and safety latch/lock engaged.
- Check fifth wheel (upper).
 - Glide plate securely mounted to trailer frame.
 - Kingpin not damaged.
- Air and electric lines to trailer.
 - Electrical cord firmly plugged in and secured.
 - Air lines properly connected to glad hands, no air leaks, properly secured with enough slack for turns.
 - All lines free from damage.
- Sliding fifth wheel.
 - Slide not damaged or parts missing.
 - Properly greased.
 - All locking pins present and locked in place.
 - If air powered, no air leaks.
 - Check that fifth wheel is not so far forward that tractor frame will hit landing gear, or cab hit the trailer, during turns.

Landing Gear

- Fully raised, no missing parts, not bent or otherwise damaged.
- Crank handle in place and secured.
- If power operated, no air or hydraulic leaks.

Double and Triple Trailers

- Shut-off valves (at rear of trailers, in service and emergency lines).
 - Rear of front trailers: OPEN.
 - Rear of last trailer: CLOSED.
 - Converter dolly air tank drain valve: CLOSED.

- Be sure air lines are supported and glad hands are properly connected.
- If spare tire is carried on converter gear (dolly), make sure it's secured.
- Be sure pintle-eye of dolly is in place in pintle hook of trailer(s).
- Make sure pintle hook is latched.
- Safety chains should be secured to trailer(s).
- Be sure light cords are firmly in sockets on trailers.

7.4 – Doubles/Triples Air Brake Check

Check the brakes on a double or triple trailer as you would any combination vehicle. Subsection 6.5.2 explains how to check air brakes on combination vehicles. You must also make the following checks on your double or triple trailers:

7.4.1 – Additional Air Brake Checks

Check That Air Flows to All Trailers (Double and Triple Trailers). Use the tractor parking brake and/or chock the wheels to hold the vehicle. Wait for air pressure to reach normal, then push in the red "trailer air supply" knob. This will supply air to the emergency (supply) lines. Use the trailer handbrake to provide air to the service line. Go to the rear of the rig. Open the emergency line shut-off valve at the rear of the last trailer. You should hear air escaping, showing the entire system is charged. Close the emergency line valve. Open the service line valve to check that service pressure goes through all the trailers (this test assumes that the trailer handbrake or the service brake pedal is on), and then close the valve. If you do NOT hear air escaping from both lines, check that the shut-off valves on the trailer(s) and dolly(ies) are in the OPEN position. You MUST have air all the way to the back for all the brakes to work.

Test Tractor Protection Valve. Charge the trailer air brake system. (That is, build up normal air pressure and push the "air supply" knob in.) Shut the engine off. Step on and off the brake pedal several times to reduce the air pressure in the tanks. The trailer air supply control (also called the tractor protection valve control) should pop out (or go from "normal" to "emergency" position) when the air pressure falls into the pressure range specified by the manufacturer. (Usually within the range of 20 to 45 psi.)

If the tractor protection valve doesn't work properly, an air hose or trailer brake leak could drain all the air from the tractor. This would cause the emergency brakes to come on, with possible loss of control.

Test Trailer Emergency Brakes. Charge the trailer air brake system and check that the trailer rolls freely. Then stop and pull out the trailer air supply control (also called tractor protection valve control or trailer emergency valve) or place it in the "emergency" position. Pull gently on the trailer with the tractor to check that the trailer emergency brakes are on.

Test Trailer Service Brakes. Check for normal air pressure, release the parking brakes, move the vehicle forward slowly, and apply trailer brakes with the hand control (trolley valve), if so equipped. You should feel the brakes come on. This tells you the trailer brakes are connected and working. (The trailer brakes should be tested with the hand valve, but controlled in normal operation with the foot pedal, which applies air to the service brakes at all wheels.)

Section 7
Test Your Knowledge

1. What is a converter dolly?
2. Do converter dollies have spring brakes?
3. What three methods can you use to secure a second trailer before coupling?
4. How do you check to make sure trailer height is correct before coupling?
5. What do you check when making a visual check of coupling?
6. Why should you pull a dolly out from under a trailer before you disconnect it from the trailer in front?
7. What should you check for when inspecting the converter dolly? The pintle hook?
8. Should the shut-off valves on the rear of the last trailer be open or closed? On the first trailer in a set of doubles? On the middle trailer of a set of triples?
9. How can you test that air flows to all trailers?
10. How do you know if your converter dolly is equipped with antilock brakes?

These questions may be on your test. If you can't answer them all, re-read Section 7.
