

# Section 7: Doubles and Triples

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 of inspecting doubles and triples carefully (You should also study Sections 2, 5 and 6.)

## This Section Covers

- ***Pulling Double/Triple Trailers***
- ***Coupling and Uncoupling***
- ***Inspecting Doubles and Triples***
- ***Checking Air Brakes***

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.

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.

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 section 6.1 and review figure 6-1 in the combination vehicles section of this manual.

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.

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.

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.

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.

## 7.1 Pulling Double/Triple Trailers

- ***Prevent Trailers From Rolling Over***
- ***Beware of the Crack-the-whip Effect***
- ***Inspect Completely***
- ***Look Far Ahead***
- ***Manage Space***
- ***Adverse Conditions***

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## 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:

- **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.

Couple tractor and first semi-trailer as described earlier.

**Caution:** For the safest handling on the road, the more heavily loaded semi-trailer should be in first position behind the tractor. The lighter trailer should be in the rear.

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

### 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 semi-trailer to pick up the converter dolly:
  - Position combination as close as possible to converter dolly.
  - Move dolly to rear of first semi-trailer 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 semi-trailer.
  - 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 semi-trailer 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 number two semi-trailer.
- 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 trailers (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.

### **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 semi-trailer enough to remove some weight from dolly.
- Close air shut-offs at rear of first semi-trailer (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 semi-trailer, and dolly forward to pull dolly out from under rear semi-trailer.

### • ***Uncoupling Twin Trailers***

### **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.

- ***Coupling and Uncoupling Triple Trailers***

### **Couple Second and Third Trailers**

- Couple second and third trailers using the method for coupling doubles.
- Uncouple tractor and pull away from second and third trailers.

### **Couple Tractor/First Semi-trailer 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.

- ***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.

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Use the seven-step inspection procedure described in Section 2 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. These are discussed below.

Do these checks in addition to those already listed in Section 2, "Step 5: Do Walkaround Inspection."

### **Coupling System Areas**

- Check fifth wheel (lower).
  - Securely mounted to frame.
  - No missing, 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.
- 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.

## **7.3 Inspecting Doubles and Triples**

- ***Additional Things to Check During a Walkaround Inspection***

- 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.

Do these checks **in addition** to Section 5.3, "Inspecting Air Brake Systems."

## 7.4 Doubles/Triples Air Brake Check

Check the brakes on a double or triple trailer as you would any combination vehicle. Section 6.2 explains how to check air brakes on combination vehicles. You must also make the following checks on your double or triple trailers:

- ***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), 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 (s) 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 right, 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.

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 Emergency 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.)

- **Test Trailer Service Brakes**

### 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?

These questions may be on your test. If you can't answer them all, re-read Sections 7.1, 7.2, 7.3 and 7.4.