TRAINING TOOL

Coupling & Uncoupling a Tractor-Trailer

DRIVING THE FUTURE

TruckingHR Canada

Coupling a Tractor-Trailer 1

When operating articulating vehicles such as a truck-trailer combination, frequent coupling and uncoupling of the vehicles becomes a routine part of the job. A systematic routine approach must be used for the coupling process that may vary based on the specific vehicles involved and the location where coupling is performed.

Completion of 'Coupling a Tractor-Trailer' includes the safe and effective performance of the following steps.

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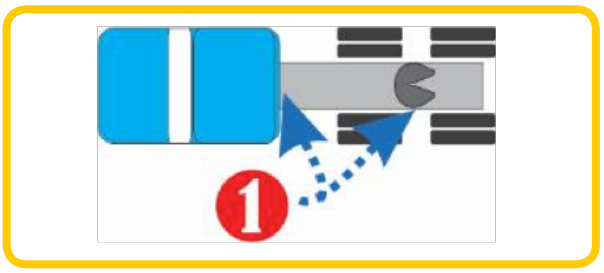
1 Inspect tractor

Make sure the transmission is in neutral and the tractor parking brakes are applied. Get out of the tractor and inspect the 5th wheel and connectors.



1

Inspect the 5th wheel for damage and other defects. Check that the 5th wheel is open.
To conduct a proper 5th wheel inspection, you need to know what are normal conditions and have some idea of the kinds of things that can go wrong. You will learn this from your trainer and your own experience. You also need to be prepared for unexpected problems.

Among the items you need to inspect on a 5th wheel are:

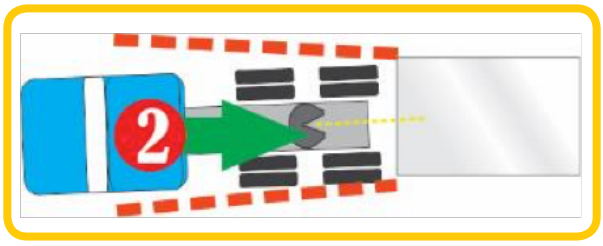
- The condition of the 5th wheel, making sure there is no damage, crack, missing fastener or bent parts.
- The condition and position of the lock and release mechanism.
- The 5th wheel must be tilted down at the rear.
- For a sliding 5th wheel, confirm the slider is in the proper locked position and is free of damage. If the sliding mechanism is air-operated check those components as well.
- Confirm there is enough lubricant on the plate.

2

Inspect the air and electrical lines. Confirm they are in good condition, are properly installed and are free of damage. Confirm the gladhands are in good condition, look for damaged or missing seals. Confirm the 7-way connector and the cord itself are in good shape and free of damage.

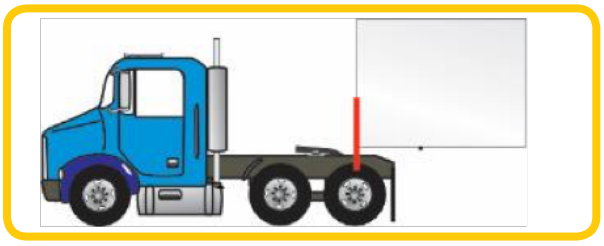
2 Align trailer

Enter the tractor, release the parking brakes and reverse slowly, approach the trailer with the tractor as straight in line as possible. Reverse at a walking pace to approach the trailer. When the tractor has a rear window, use it to align the tractor and trailer. If there is no rear window, use the mirrors. The tires, frame and/or body can be used to visually align to the trailer. You should have the tractor roughly in a straight line with the trailer, and have the tractor wheels positioned to align within vertical lines extending downward from the sides of the trailer.



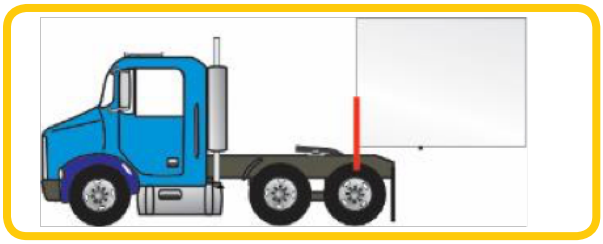
1

You may face challenges involving uneven or slippery ground surface conditions as you reverse toward a trailer and you need to know how to overcome these challenges. Using the inter-axle differential lock, and putting down sand or gravel, are a couple of ways to gain traction on slippery surfaces. Sometimes it may be necessary to put chains on the tires and in other cases, you can get by simply placing chains on the ground right in front of the trailer to get enough traction.



2

Stop when the 5th wheel is just ahead of the trailer, touching the trailer or is slightly under the trailer, but not against the kingpin. Stop before coupling the 5th wheel. How close you get to the trailer will depend on several factors. A good reference for the distance that you need to be under the trailer is to get the center of the rear axle of the tractor just under the front of the trailer. Your ability to see is the primary factor the will determine how close you get.

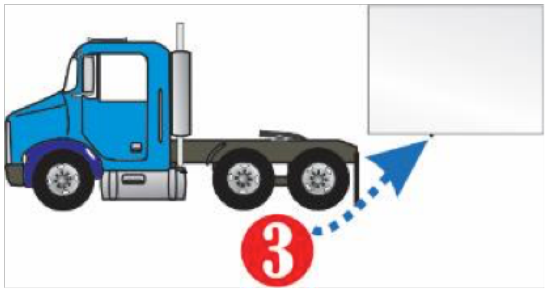


3

You must be able to judge the height and alignment of the 5th wheel to the trailer kingpin. Being more than 1 meter from the trailer is too far away and having the front edge of the 5th wheel fully underneath the trailer is too far back.

3 Inspect trailer

Apply the tractor parking brakes and exit the tractor to inspect the trailer upper coupler and the kingpin. The upper coupler must be flat, free of rust and damage and the kingpin must also be free of damage. Inspect the air and electrical connections for damage and other problems.

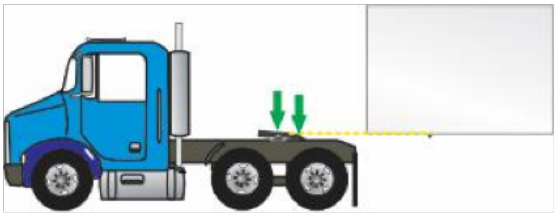


5th Wheel Guide Ramps

Alignment Target

1

Confirm that the kingpin is aligned so that it will only contact the guide ramps of the 5th wheel lower coupler. Adjust height if necessary so that contact of the upper coupler will be on the bottom half of the 5th wheel lower coupler face.



2

Your height is correct when the trailer contacts the 5th wheel in the bottom half of its upper face. Tractor to trailer height is wrong when the trailer contacts the 5th wheel near the bottom of the tapered section of the 5th wheel, or when the 5th wheel plate fails to fully contact the trailer as it begins to slide under. Any gap between the 5th wheel and trailer requires pulling forward and adjusting height before proceeding with coupling.

3

Alignment is correct when the kingpin contacts the tapered guide section of the 5th wheel. Alignment is incorrect when the kingpin touches any upper face of the 5th wheel.

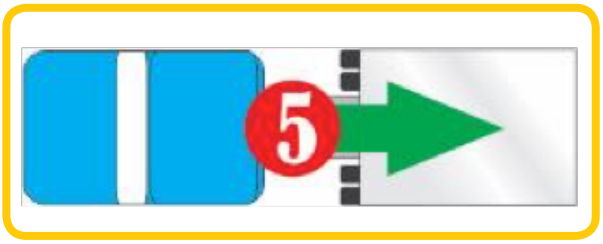
4 Chock wheels (SITUATION DEPENDENT)*

Place wheel chocks to secure the trailer.

Newer trailers are equipped with trailer brakes, which may discount the need for wheel chocks during coupling and uncoupling. However, proper placement of wheel chocks is a necessary skill for drivers, particularly in situations that require additional safety precautions, such as slippery road conditions or trailer inspections (e.g. when the trailer brakes must be released) or during provincial/territorial licensing road-tests.

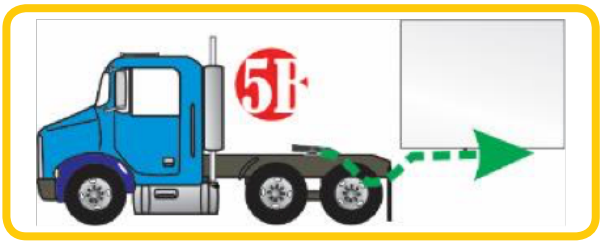
5 Engage 5th wheel

Release the tractor parking brakes and reverse under the trailer. Monitor the trailer's position during coupling using the mirrors to confirm proper alignment and trailer stability. Gently but firmly engage the 5th wheel.



A

Listen for and feel the 5th wheel latching into its locked position.



B

When using a tractor with an air suspension drop feature, drop the tractor air suspension only after confirming correct coupling height and before reversing under the trailer. Once the 5th wheel is fully under the trailer, but still ahead of the king pin, raise the suspension to normal ride height.

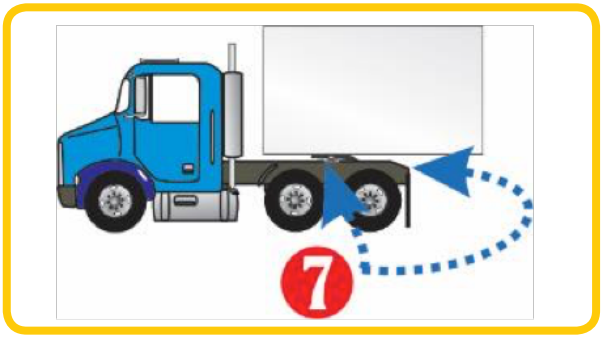
6 Test lock

Attempt to move the tractor forward (perform a "tug test"). This must be done in the lowest forward gear and with the engine idling. The 5th wheel coupling will hold if it is properly engaged and locked.

If the 5th wheel is not fully engaged and locked, the 5th wheel will release and tractor will move forward. This will require reversing again to properly engage and lock the 5th wheel. Gently but firmly engage the 5th wheel. Listen for and feel the 5th wheel latching into its locked position.

7 Confirm 5th wheel lock

Apply the tractor parking brakes and exit the tractor to visually confirm that the 5th wheel is in full contact with the trailer upper coupler. There must not be any gap between the 5th wheel and the trailer. Confirm that the 5th wheel latch is in the locked position by checking the release handle position.



Get into a position under the trailer to visually check that the 5th wheel locking mechanism is in the proper closed position. Watch your head as you get under the trailer and wear protective head gear if that is a workplace requirement. Look for closed jaws or the lock bar position, depending on the style of 5th wheel.

8 Connect

Connect the air and electrical lines properly, and confirm normal operation.

9 Raise landing gear

Raise the trailer landing gear fully and stow the handle into its retainer.

10 Supply air

Get back in the tractor and confirm air pressure gauges show normal pressure levels. Start the engine, (if necessary to raise air pressure to normal operating range), then supply air to the trailer by opening (pushing in) the trailer supply valve.

1

Check the air gauges and make sure pressure is normal. It should be in the normal operating range and should not be dropping, which could indicate a leak. The pressure will drop initially if the trailer system is completely empty of air; however, once the trailer system is fully charged, the system should stabilize.

2

Shut off the engine, (if you needed to run it to raise air pressure), and listen for air leakage at the supply gladhand. Apply the service brakes, watch air pressure to make sure it stays normal, and listen for air leakage at the service gladhand. If there are no leaks, you are ready to go.

11 Test brakes

If wheel chocks were used, remove them. Drive forward slowly a short distance and apply either the trailer service brakes only, or the full service brakes to test brake operation. If the tractor is equipped with a hand valve for the trailer brakes, both the trailer service brakes and full-service brakes should be tested for operation.

Coupling to a trailer without parking brakes

Older trailers with air brakes sometimes use parking brakes that require air pressure to stay in an applied position. After being parked for a period, the air pressure could have dropped far enough that the parking brakes will no longer hold the trailer stationary. Some special design trailers may also be made without normal parking brake features.

Not having the trailer secured by parking brakes creates a potential challenge when trying to couple to it. Any force of trying to couple the 5th wheel can cause the trailer to roll away. A different procedure is needed for coupling to a trailer when it has no parking brakes. One method is to chock the wheels. Another method is to connect the air brakes system and apply either the trailer parking brakes or the service brakes before trying to couple the 5th wheel.

2 Uncoupling a Tractor-Trailer

When operating articulating vehicles such as a truck-trailer combination, frequent coupling and uncoupling of the vehicles becomes a routine part of the job. A systematic routine approach must be used for the uncoupling process that may vary based on the specific vehicles involved and the location where uncoupling is performed.

Completion of ‘Uncoupling a Tractor-Trailer’ includes the safe and effective performance of the following steps.

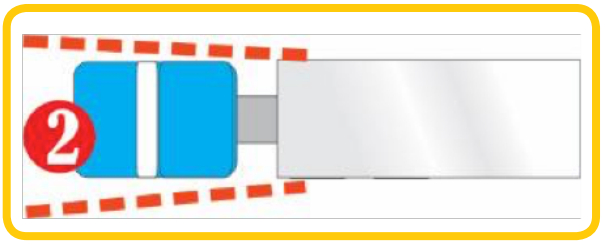
1 Select location and check ground condition

Confirm you have a location that is suitable and safe for uncoupling

It is important that you know the approximate weight of the trailer you are towing. This will allow you to make the right decision about where you can drop the trailer. Select a location that is known to be suitable and firm enough to support the weight of the trailer.

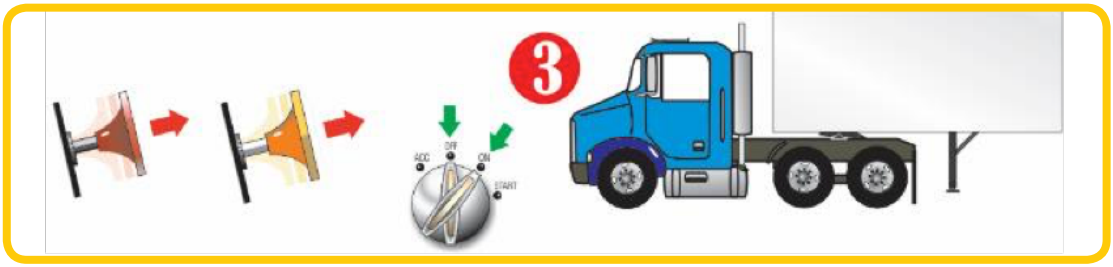
2 Park the trailer

Park the trailer in the selected location with the tractor and trailer in as straight a line as possible.



3 Secure tractor and trailer

Apply the trailer parking brakes, secure and exit the tractor.



Apply both the tractor and trailer parking brakes using the appropriate airbrake system controls (the trailer supply valve [red knob] and the spring brake control valve [yellow knob]).

4 Chock trailer wheels

Place any required wheel chocks and blocks, or engage locks into position.

Exit the cab and place wheel chocks into positions that will prevent rolling in both forward and rearward direction. This can be between the axles, or in front of and behind the same axle. (See illustration on acceptable placement of wheel chocks).

Newer trailers are equipped with trailer brakes, which may discount the need for wheel chocks during coupling and uncoupling. However, proper placement of wheel chocks is a necessary skill for drivers, particularly in situations that require additional safety precautions, such as slippery road conditions or trailer inspections (e.g. when the trailer brakes must be released) or during provincial/territorial licensing road-tests.

5 Support landing gear

Place adequate support material under the landing gear, if necessary.

1

Wet ground and ground that is thawing are riskier surfaces for dropping a trailer. Freshly disturbed soil and grass are soft and may not even be able to support an empty trailer. Packed gravel driveways and parking lots are normally adequate to support loaded trailers. Paved and concrete surfaces are generally necessary for the heaviest loads.

2

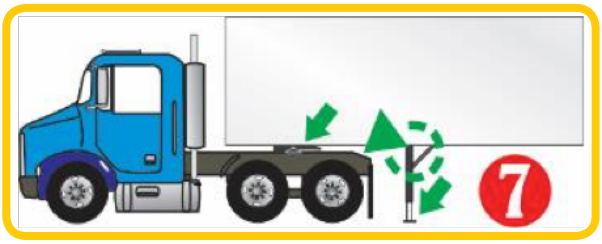
Depending on the combination of trailer weight and surface conditions, blocks, beams or pads may be needed under the landing gear to prevent them from sinking into the ground surface. When trailers will be left in a location for longer periods of time, it can also be necessary to provide some sort of support under the landing gear.

6 Set suspension

Operate trailer air suspension controls when and as required.

7 Lower landing gear

Lower the trailer landing gear until it is just above the ground, or just touches the ground, but does not raise the trailer from the fifth wheel.



1 Use the landing gear crank handle to lower the landing gear until it either is just above the ground, just touching the ground, or taking some of the trailer weight. The trailer landing gear is extended too far when there is a gap between the fifth wheel lower plate and the trailer. The trailer landing gear is not extended far enough when there is more than 2 cm (about 1 inch) between the landing gear and the ground.

2 The tractor suspension may react to loss of trailer weight by exhausting air from the air bags. The air may start to exhaust right away or after a short delay. This is an indication that the trailer landing gear is down too far. It may just be down a little too far, but some suspension systems are very sensitive to slight weight changes. You can crank the landing gear up just a little to keep the air suspension at its normal height. Place it in low gear and turn it a full turn higher and put the crank handle back in the stow position.

8 Stow handle

Stow the landing gear handle. It may be good practice to place the landing gear into low range before stowing it to prevent the handle from getting jammed. (The “low range” position of the landing gear usually involves pushing the handle shaft inwards. The “high range” position of the landing gear then involves pulling the handle shaft outwards, but some work the other way around.)

Note: Steps 9 and 10 can be completed in the reverse order, where the 5th wheel is released before the lines are disconnected.

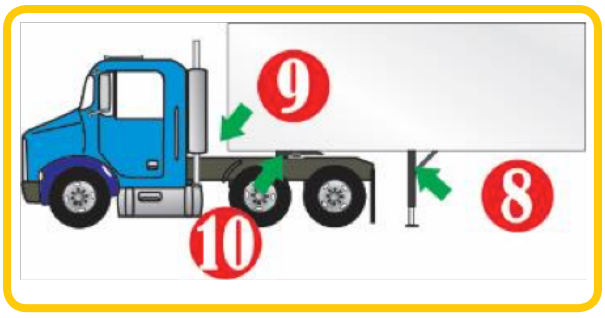
9 Remove connections

Disconnect air and electrical connections and stow them.

Connect the gladhands to "dummy" couplers and place the 7-way electrical connector into the receiver. If you are going to couple onto another trailer in the same yard, the lines can be secured onto the tractor deck or "catwalk" using a strap as you travel to the next trailer.

10 Unlock 5th wheel

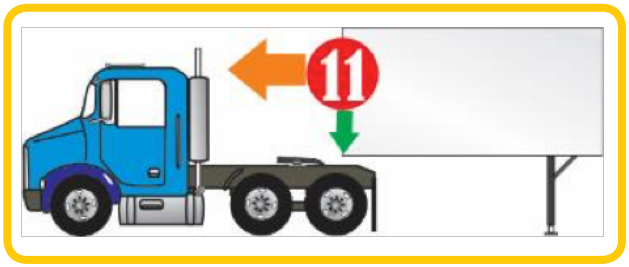
Release the fifth wheel coupler lock.



Note: In some cases, the trailer suspension will drop when the air is exhausted out of the supply line. This can cause the trailer to shift a little forward or backward. This movement can cause the 5th wheel to jam, making it impossible to pull the 5th wheel release handle. When this occurs, you can reverse the tractor a little, to relieve the tension. Sometimes just releasing the tractor parking brakes will loosen the 5th wheel. Remember to apply the tractor parking brake again before you get out. Try the 5th wheel release again. You may also be able to avoid this problem by releasing the 5th wheel before disconnecting the air lines.

11 Disengage 5th wheel

Enter the tractor, drive slowly forward far enough to release the fifth wheel from the kingpin. Stop the tractor when the fifth wheel lower coupler is fully out from under the trailer, but the tractor frame is still under the front of the trailer.



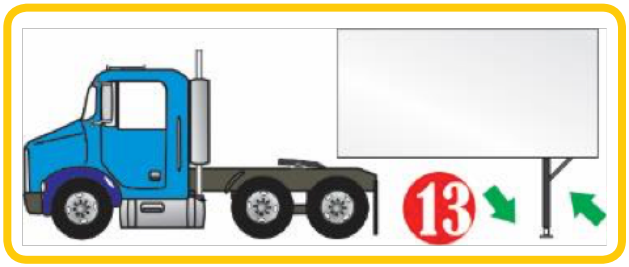
12 Disengage 5th wheel with suspension drop

(OPTIONAL)

For a tractor with air suspension drop feature, drive forward slowly far enough to unlatch the fifth wheel coupler and stop. Operate the control to drop the tractor suspension. Watch the trailer in the mirrors or out of the rear window, confirm the trailer is stable.

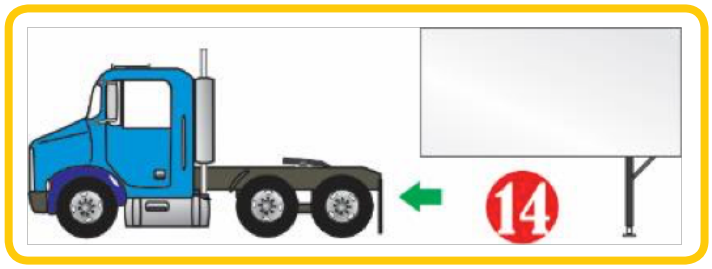
13 Confirm trailer is secure

Place the transmission in neutral, apply the tractor parking brake and shut off the engine. Exit the tractor and confirm that the trailer and landing gear are stable and secure.



14 Clear trailer

Re-enter the vehicle and drive forward slowly until the tractor is clear of the trailer.



NOTE: For a tractor with an air suspension drop feature, raise the tractor suspension to the normal position.