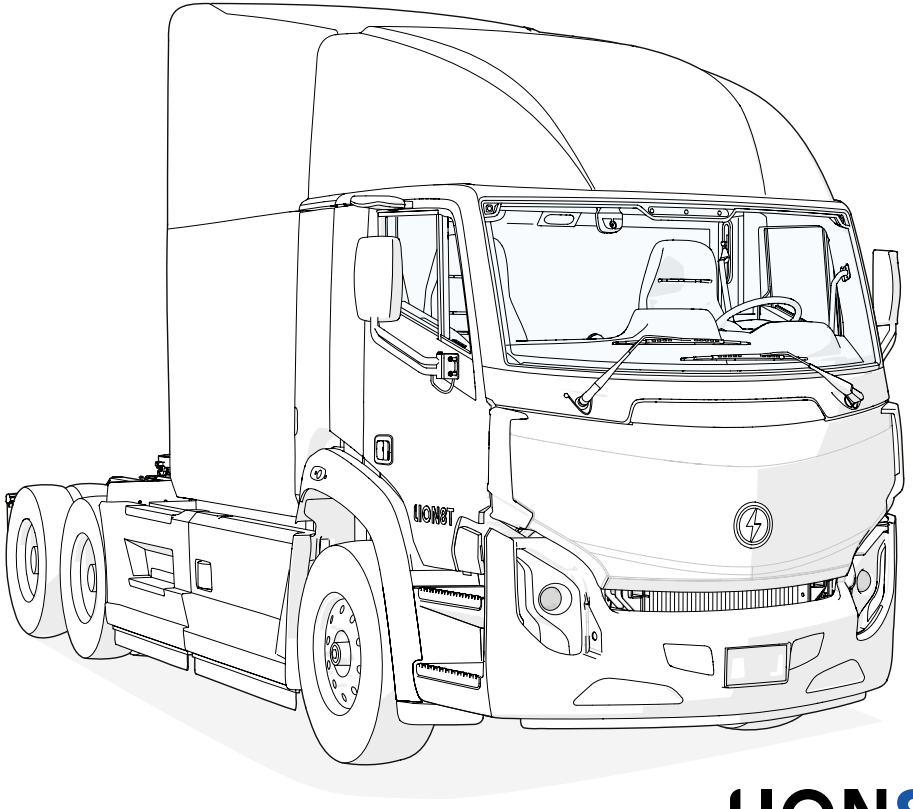
LION ELECTRIC

Towing procedure



LION8 Tractor

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Lion8 Towing procedure — 2024/10/28

TOWING HOOKS

Tow hooks

Two removable tow hooks are stored in the accessories compartment located behind the left front wheel **(Figure 1)**.

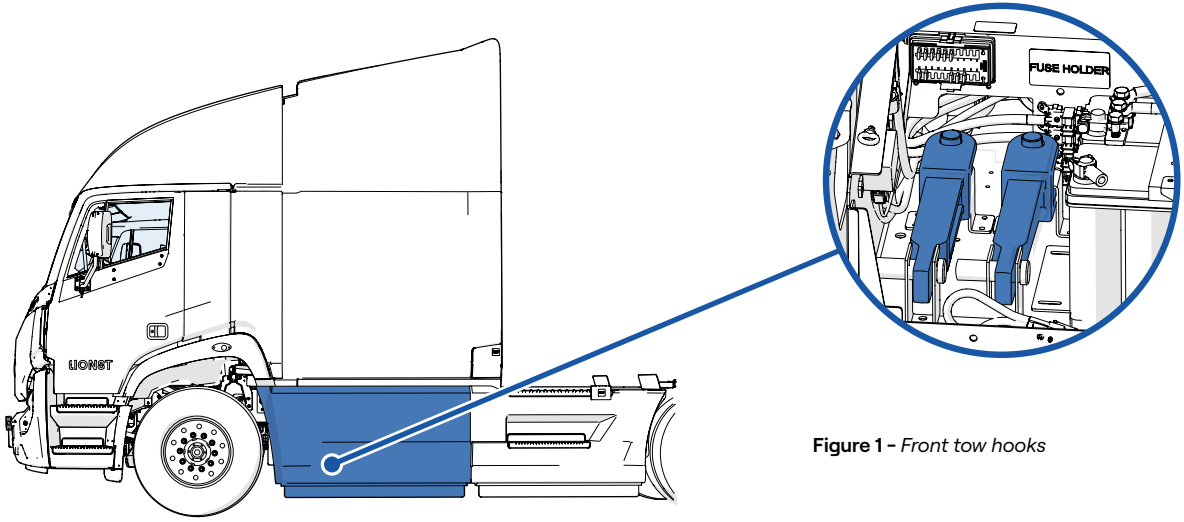

Figure 1 – *Front tow hooks*

Tow hook receptacles

To install the front tow hooks in their receptacle:

- Open the hood.
- Locate the two receptacles at the end of the chassis rails, on each side of the radiator **(Figure 2)**.
- Insert the tow hooks in the receptacles and lock them in place with the dowel pins and lock pins.
- NOTE: the hood must stay open when the tow hooks are in place. Push on both arms of the safety mechanism to lock the hood in the open position.

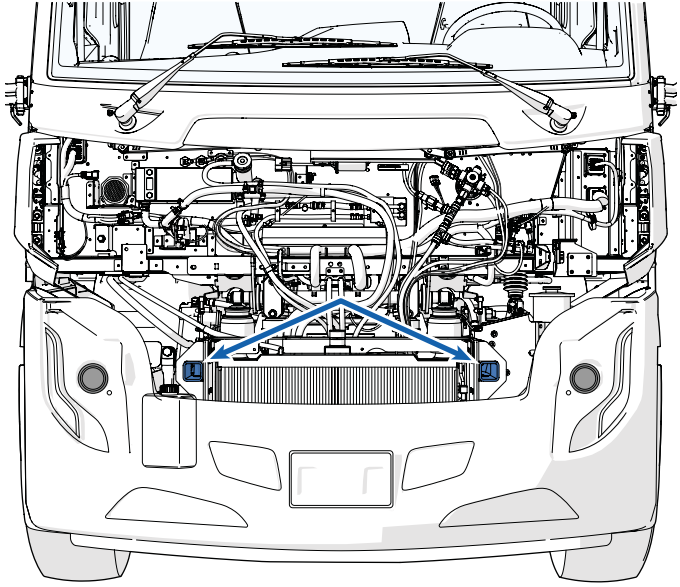

Figure 2 - *Tow hook receptacles*

TOWING GUIDELINES

The **preferred** towing method for the Lion8 Tractor involves placing the truck on a flatbed trailer.

However, it is possible to tow the truck with wheels on the ground but this involves additional steps to prepare the truck.

Flatbed towing procedure:

Install the truck on a flatbed trailer ensuring the following points are respected:

- The parking brake is applied.
- The battery disconnect switch is set to "**OFF**".

NOTE: When installed on the flatbed trailer, if the Lion8 Tractor is too high and additional overhead clearance is required, the top Aero deflector can be disassembled. If left in place, route planning may be required to clear bridges and other over road obstructions.

It is possible to tow the Lion8 Tractor by lifting the rear axle and pulling it backwards with front wheels on the ground.

Towing by lifting the rear axles

1. Chock the rear wheels.
2. Ensure the front wheels are pointing straight ahead.
3. Shift the axles to Neutral; see the "***Shifting to Neutral - Automatic Method***" procedure at the end of this section.
4. Secure the steering wheel straight ahead with the seatbelt looped through it.
5. Lift the vehicle by the rear axle, ensuring not to surpass a tilt angle of 15 degrees.
6. Apply the parking brake.

NOTE: To respect the maximum tilt angle, the rear suspension springs can be deflated while the vehicle is on the ground. Then, the rear axles need to be attach to the vehicle's chassis to avoid rear suspension extension.

Emergency towing by lifting the front axle (limited speed and distance)

Note: See the "**Preparation Procedures**" section of this document for additional instructions for each procedure mentioned below.

1. Chock the rear wheels.

2. Set the battery disconnect switch to "**OFF**".

3. Perform the "***Shift Actuator Removal***" procedure on both rear axles.

4. Perform the "***Detent Removal***" Procedure on both rear axles.

5. Perform the "***Manually lockout axle to Neutral***" procedure on both rear axles.

6. Reinstall the detent bolt on both axles; torque to 52-64 lb-ft (70-90 Nm).

7. Perform the "***Disengage Differential Lock***" procedure.

8. Connect an auxiliary compressed air line to the air dryer fill port.

9. Allow for suspension air springs to fill.

10. Disengage the parking brake.

11. Compress the parking brake spring in each rear brake actuator ("*caging procedure*").

12. Lift the vehicle by the front axle; respect a maximum tilt angle of 20 degrees.

13. The vehicle can now be towed at low speed (**maximum 20 km/h**) on a short distance (**maximum 10 km**). When in a safe location, proceed to tow with the front wheels on the road by lifting the rear end of the truck.

⚠ WARNING ⚠

Failure to follow the towing by lifting the front axle procedure could damage the high voltage electrical components of the vehicle.

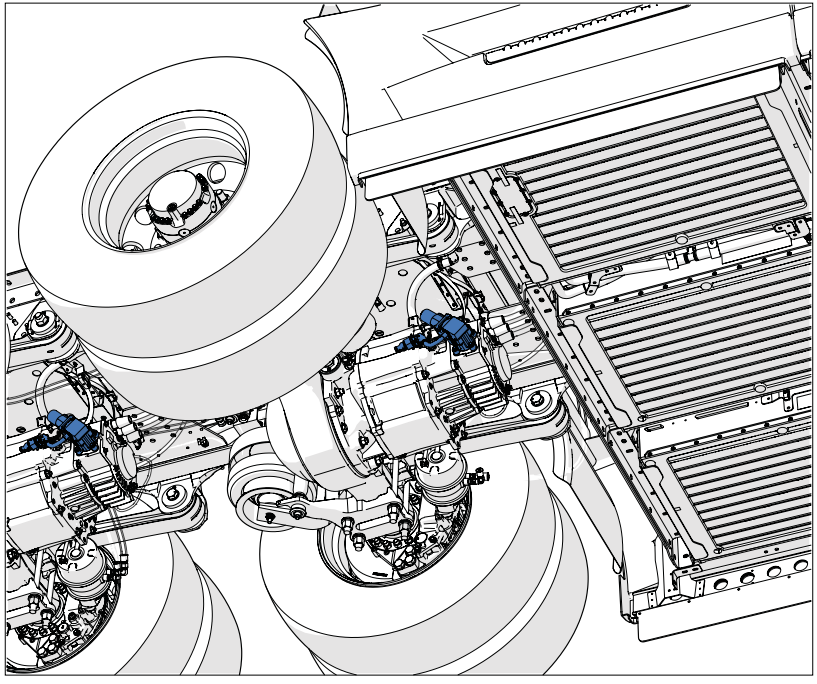

Figure 3 – *Shift actuator locations*

Preparation procedures

Shift actuator removal

1. Cut the zip tie and disconnect the shift actuator connector from the differential carrier wiring harness **(Figure 4)**.

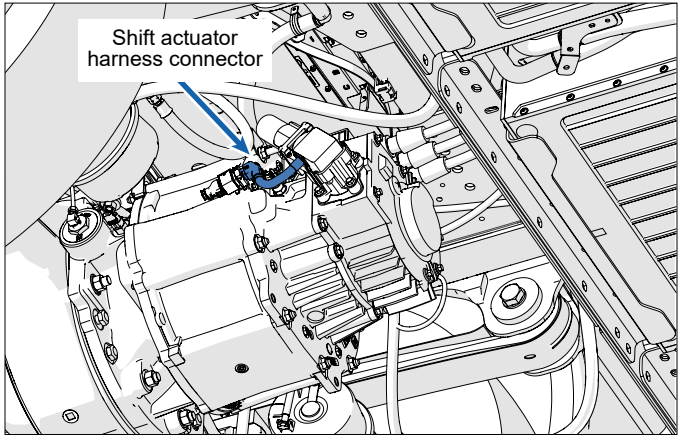

Figure 4 – *Shift actuator wiring harness*

2. Remove the three bolts retaining the shift actuator **(Figure 5)**.

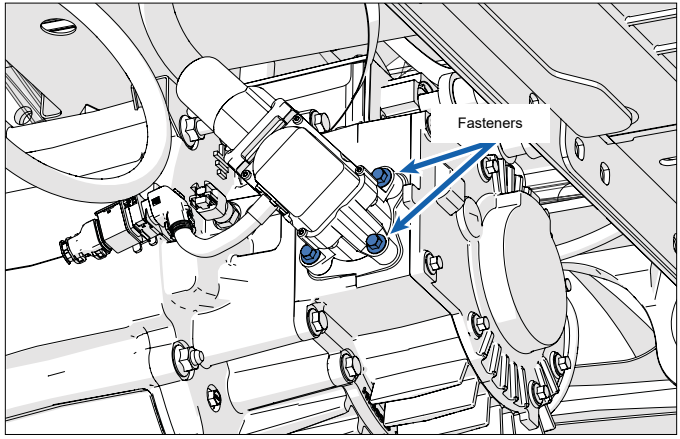

Figure 5 – *Shift actuator bolts*

Shift actuator removal (suite)

3. Remove the shift actuator from the transmission case **(Figure 6)** and store it in a safe location.

4. Take care not to lose the shift actuator O-ring **(Figure 7)**.

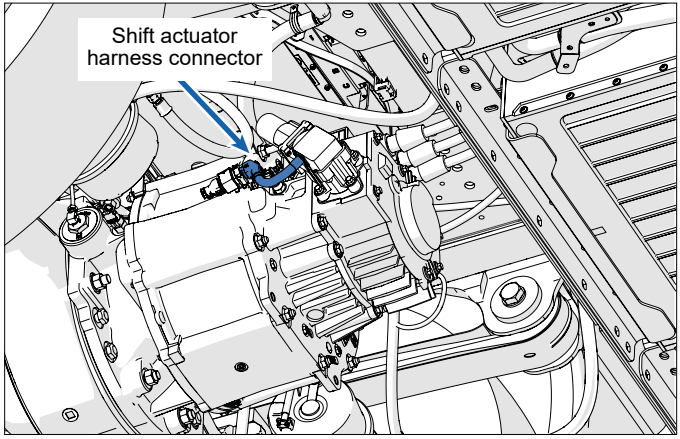

Figure 6 – *Shift actuator removal*

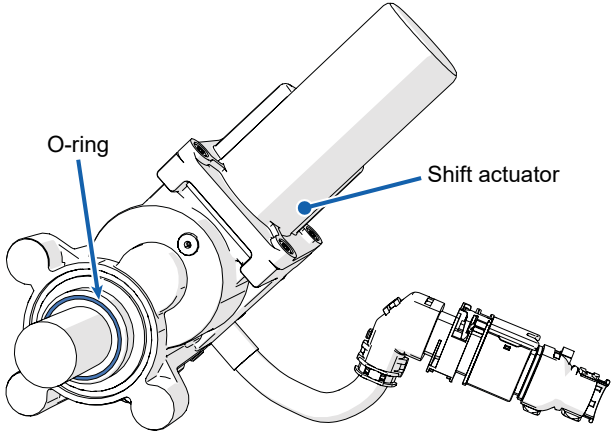

Figure 7 – *Shift actuator O-ring*

Detent removal

Remove the detent bolt (5/8-18 UNF-2A) from the top of the housing **(Figure 8).**

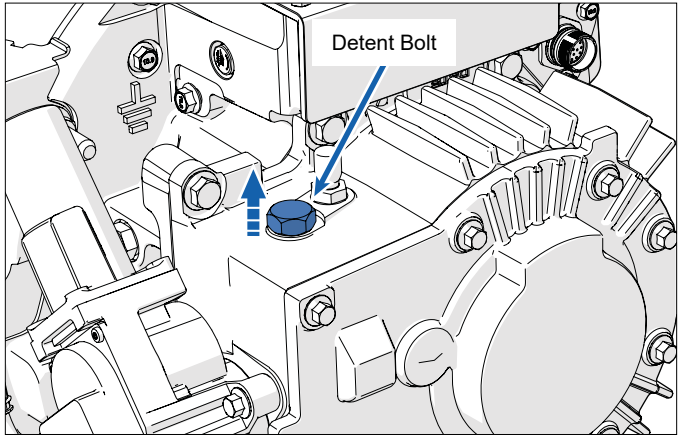

Figure 8 – *Detent bolt*

Manual axle lockout to neutral

NOTE: "**Shift Actuator Removal**" and "**Detent Removal**" must be done before proceeding.

1. Locate the "E-Axle Towing Tool" (15200137-0101) **(Figure 9)** stored in the vehicle's side skirts or in the glove box. If not present, install the O-ring from the shift actuator.

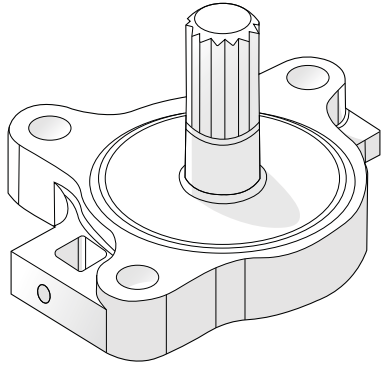

Figure 9 – *E-axle towing tool*

2. Insert the tool splined shaft where the shift actuator was previously mounted. NOTE: if the axle is in gear **(Figure 11 and Figure 12)**, the tool holes don't line up with the holes on the housing. You may need to rotate the tool to align the splines.

3. Shift axle to neutral using a 3/8" ratchet to rotate the shift tool ±30 degrees as required to line up the bolt holes of the tool with the housing holes. When the tool holes line up with the housing holes, the axle is in neutral **(Figure 10)**.

4. Re-use the three shift actuator bolts to secure the shift tool to the housing. Make sure the O-ring is present to prevent lubricant from leaking out.

5. Reinstall detent bolt and torque to 52-64 lb-ft (70-90 Nm).

Perform this procedure on both axles.

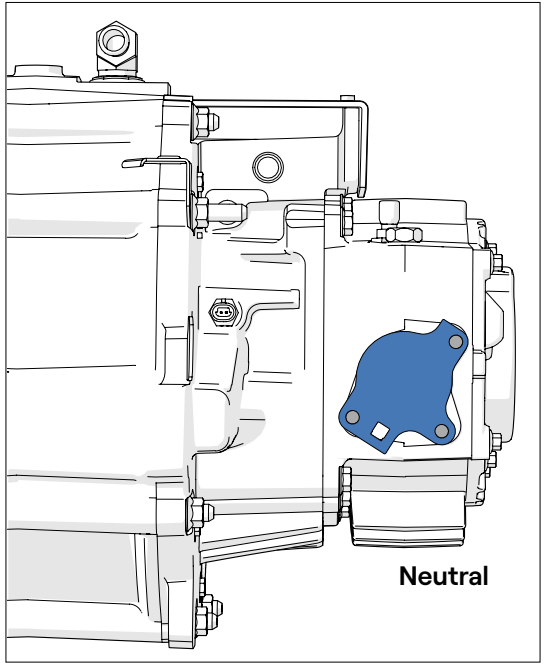

Figure 10 – *E-axle towing tool in neutral position*

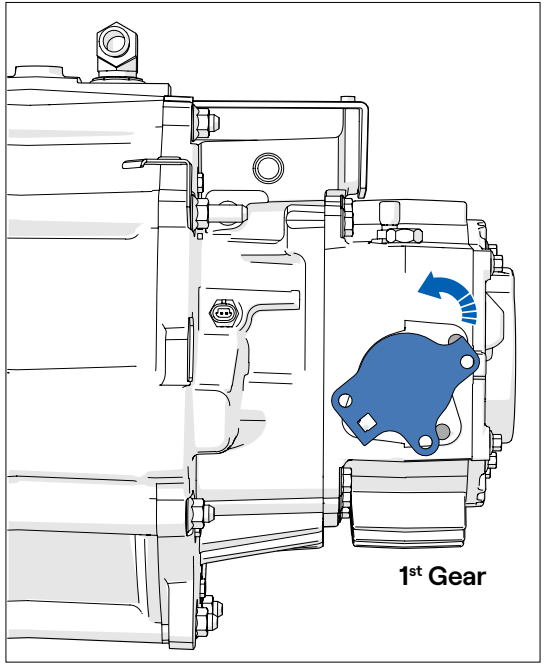

Figure 11 – *E-axle towing tool in 1st gear position*

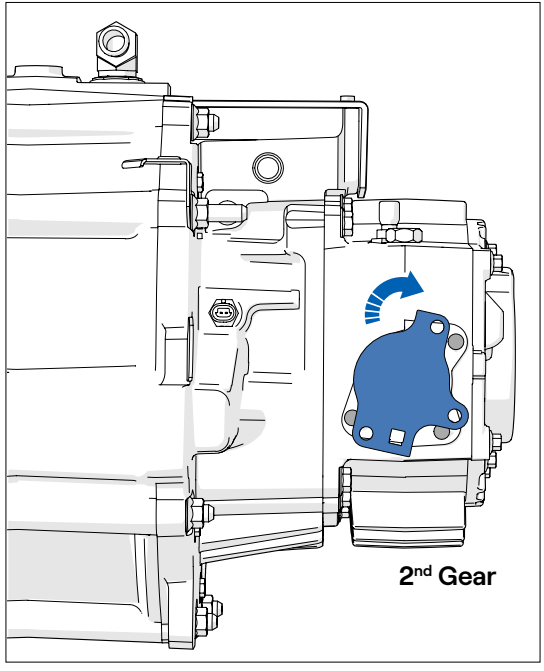

Figure 12 – *E-axle towing tool in 2nd gear position*

Disengaging the differential locks

NOTE: When emergency towing by lifting the front axle, ensure both differentials are unlocked by disconnecting the "DCDL Air Line" **(Figure 13)**.

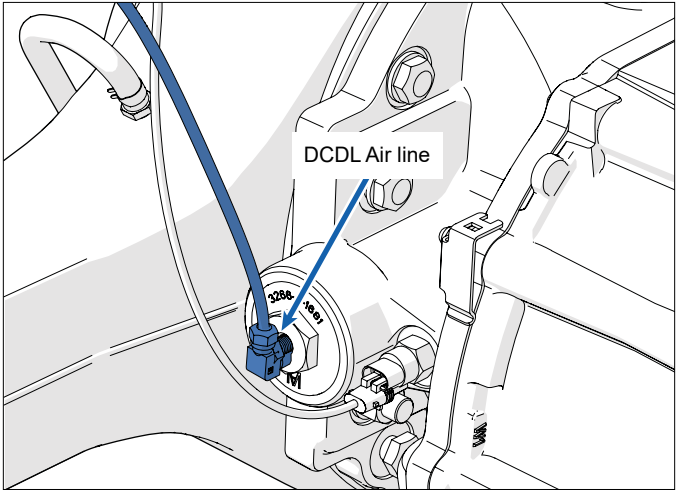

Figure 13 – *DCDL air line*

Shifting axles to Neutral – Automatic Method

Turn the start switch to "**START**" until the vehicle is "**Ready**".

Push the brake pedal and select **"N"** on the drive selector.

Turn the battery disconnect switch to "**OFF**" while the vehicle is still "**ON**".

Disconnect the shift actuator connector on both axles **(Figure 14)**.

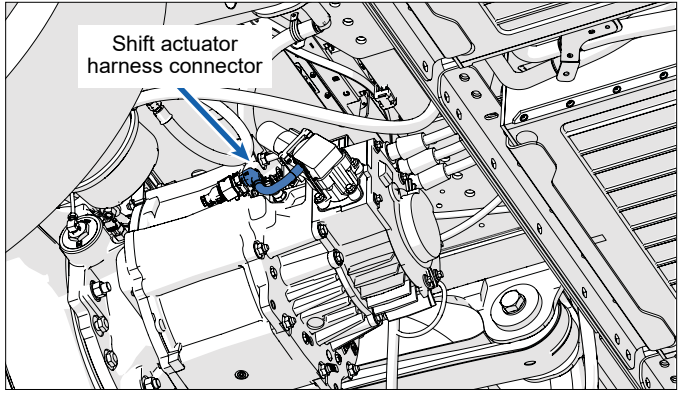

Figure 14 – *Shift actuator wiring harness connector*

⚠ WARNING ⚠

You must read and understand the following instructions before operating your fifth wheel.

These instructions apply to the proper operation of your fifth wheel only. There are other important checks, inspections, and procedures not listed here that are necessary, prudent, or required by law.

Failure to follow all the operating procedures contained in these instructions may result in a hazardous condition or cause a hazardous condition to develop which, if not avoided, could result in death or serious injury.

Pre-coupling inspection procedure

1. Before coupling, be sure that the area is level and clear of people and obstacles.
2. Engage the parking brake on the tractor.
3. Chock the wheels on the trailer.
4. If the trailer is loaded, be sure that the load is secure.
5. Inspect closely the fifth wheel top plate and mounting bracket assembly.
6. Make sure the fifth wheel is securely fastened to the tractor.
7. Inspect welds and fasteners on the fifth wheel assembly.
8. Replace any cracked components. Do not repair cracks by welding.
9. Replace any missing fasteners and tighten all loose fasteners.
10. Inspect the lube plates and make sure lube plates are in place and securely fastened.

TRAILER COUPLING

1. Inspect the fifth wheel slider mechanism to make sure that the plunger lock bars are fully engaged. The slider must be secure and locked in the proper position for safe operation.

2. Make sure that the fifth wheel is in the proper position for the weight distribution on the tractor.

3. Check the articulation of the fifth wheel. The fifth wheel must move freely. Ramps must be tilted down toward the rear and resting on the stops. Ensure that the slider mechanism is greased.

4. Before coupling, visually inspect the fifth wheel lock mechanism to ensure the lock is open and ready for coupling.

5. Check the fifth wheel's throat area to ensure it is free of debris, snow, or ice. Ensure that the top of the fifth wheel and the throat is greased.

6. **If the lock is not open:**
   - Pull the release handle to set it in the unlocked position; or
   - Press the top part of the fifth-wheel release switch to open the lock mechanism.

7. Visually inspect the trailer upper coupler plate. The area supported by the fifth wheel should be free of scrapes or gouges. The leading edge of the trailer bolster or skid plate must also be free of any square or sharp edges.

8. Inspect the kingpin to make sure it is not damaged. Make sure the kingpin is not obstructed by a lock or a security device. Ensure the kingpin is properly lubricated and the upper coupler plate is free of rust and debris. A light oil or rust inhibitor may be applied.

⚠ WARNING ⚠

Failure to follow all the procedure steps contained in these instructions may result in damage to the lube plates.

Coupling procedure

1. Line up the tractor with the trailer using the side view mirrors. Be sure the tractor and trailer are in a straight line. Never back under at an angle. You could push the trailer sideways and damage the landing gear.

2. Set the drive selector in **"R"** (Reverse), back up slowly, and stop short of the trailer. Do not back under the trailer.

3. Completely exhaust air from the tractor's suspension by pressing the top part of the suspension dump switch on the dashboard.

4. Engage the tractor parking brake and put the drive selector in **"N"** (Neutral).

5. Make sure the fifth wheel is below the contact surface of the trailer's upper coupler plate before backing under the trailer. If the trailer is too low, you could damage the tractor, the trailer, or the fifth wheel; use the landing gear to raise the height of the trailer.

6. When you have proper height alignment, slowly back up. Stop when the fifth wheel is under the leading edge of the trailer. Do not attempt to couple with the suspension deflated. The kingpin should not be engaged at this step.

⚠ WARNING ⚠

Attempting to couple a trailer at an improper height may result in a false or improper coupling, allowing tractor and trailer separation which, if not avoided, could result in death or serious injury.

7. Engage the tractor parking brake and put the vehicle's drive selector in **"N"** (Neutral). Exit the cab and verify proper fifth wheel to kingpin alignment. One of the most common mistakes with coupling is incorrect kingpin to fifth wheel alignment. Proper alignment is critical.

8. Air up the tractor's suspension to ride height by pressing the bottom part of the suspension dump switch on the dashboard. The fifth wheel must make complete contact with the upper coupler plate. Note : never inflate the tractor's suspension when the kingpin is above the throat of the fifth wheel. This would damage both the kingpin and the fifth wheel. If the fifth wheel does not make contact with the upper coupler plate, use the landing gear to lower the trailer until the fifth wheel makes contact. If the trailer is too high, the kingpin will not properly connect with the lock mechanism.

9. Disengage the tractor parking brake, set the drive selector in **"R"** (Reverse) and slowly back the tractor in the trailer to engage the kingpin in the fifth wheel. You should hear the sound of the lock mechanism shutting around the kingpin. Avoid hard contact with the kingpin.

10. Engage the tractor parking brake and put the drive selector in **"N"** (Neutral). Connect trailer air and electrical lines and raise the landing gear legs until the pads just come off the ground.

11. Perform a pull test to ensure the coupling procedure has been done correctly. With the trailer parking brake engaged, place the drive selector in **"D"** (Drive) and remove your foot from the brake pedal and press the accelerator just enough to feel resistance and make sure the coupling is secure. If the pull test is successful, engage the tractor's parking brake, set the drive selector in **"N"** (Neutral), and turn the start switch to the **"OFF"** position.

Final visual inspection

1. Visually inspect the fifth wheel top plate.

2. Make sure the release handle is fully retracted with the lock notch secured in the locked position.

3. Make sure there is no gap between the fifth wheel top plate and the trailer's upper coupler plate.

4. Go under the trailer with a flashlight to inspect the fifth wheel lock mechanism. The jaw should be completely engaged and closed around the kingpin with the lock closed behind the jaw. If the jaw is not completely closed around the kingpin, or the lock is not engaged behind the jaw, the coupling was unsuccessful.

5. When a successful coupling has been achieved, retract the landing gear using high gear, secure the crank handle, remove the wheel chocks, and continue with the pre-trip inspection.

⚠ WARNING ⚠

An improperly coupled tractor and trailer may separate while in use which, if not avoided, could result in death or serious injury.

⚠ WARNING ⚠

Do not operate the vehicle without fully retracting the landing gear. Failure to fully retract the landing gear to attain sufficient ground clearance for transit may result in damage to the landing gear or components which, if not avoided, could result in death or serious injury.

Uncoupling procedure

1. Make sure that the trailer is parked on a flat-level surface capable of supporting both trailer and its load. Straight alignment is very important. Pulling the tractor away at an angle has the potential to damage the landing gear.
2. Engage the trailer parking brake. Put the drive selector in **"R"** (Reverse) and slowly back to relieve pressure from the fifth wheel locking mechanism.
3. Put the drive selector in **"N"** (Neutral) and engage the tractor parking brake while the fifth wheel is applying pressure to the kingpin. Do not drop the suspension before uncoupling. Dropping the suspension before uncoupling makes the uncoupling procedure difficult and could damage the fifth wheel and kingpin.
4. Chock the trailer wheels. Lower the landing gear legs using high gear until the landing gear pads touch the ground. Do not raise the trailer off the fifth wheel.
5. Disconnect the air and electrical lines from the trailer and secure them to the tractor.

TRAILER UNCOUPLING

6. Disengage the fifth wheel locking mechanism. You have two options:

- Slide the release handle forward and pull it all the way out. Slide the handle forward and hook it onto the unlock notch; or
- Press and hold the top part of the fifth wheel release switch on the dashboard for three seconds to open the fifth wheel locking mechanism. A popup message appears on the multifunction display. Press the button that corresponds to the **CONFIRM** command. A popup message confirms the unlocking of the fifth wheel.

7. Disengage the tractor parking brake, put the drive selector in **"D"** (Drive), and slowly drive the tractor forward 12 in to 18 in to disengage the kingpin. Do not pull out from under the trailer.

8. Engage the tractor parking brake and set the drive selector in **"N"** (Neutral). Press the top part of the suspension dump switch to exhaust the air from the tractor suspension.

9. Exit the cab and visually inspect the tractor and trailer to make sure the fifth wheel is below the upper coupler plate of the trailer. If, after the air has been exhausted, the fifth wheel is still in contact with the upper coupler plate, use the landing gear to raise the trailer off the fifth wheel. Also, be sure that the landing gear is fully supporting the trailer.

10. Return to the cab, disengage the tractor parking brake, set the drive selector in **"D"** (Drive), and pull away from under the trailer. You may now air up the tractor's suspension to normal ride height.

Front anchoring points capacity

Maximum capacity of the two front anchoring points varies according to the angle of the force exerted. The capacity is listed in **Table 1** and is calculated for two anchoring points working simultaneously.

⚠ WARNING ⚠

The data in the table assumes that the constraints are shared equally between the two anchoring points. Severe damage to the vehicle can occur if the assembly isn't properly secured.

If the vehicle is stuck, use the towing equipment with extreme caution and observe capacity limits. Damage to the axle, suspension or chassis can occur even if the pulling force is less than the maximum capacity.

Direction of the traction exerted	Maximum capacity	
	kg	lb
Straight towards the front	27 215	60,000
Up front in a V	18 144	40,000
Vertical straight	6 622	14,600
Horizontal straight on the side	1 814	4,000
45 degrees up or down	9 072	20,000
45 degrees straight on the side	2 721	6,000

Table 1 – *Towing capacity by direction of pull*

RECOVERY

For safe pulling, we recommend the following:

- Use double chains or ropes to distribute the load evenly between both anchoring points **(Figure 15)**.
- Never run a single chain or cable through both anchoring points.
- Use a spreader bar to distribute the load between the two tow hooks **(Figure 15 no. 1)**, or
- If there is no spreader bar, attach the main drag chain or cable at least 6 feet from the vehicle **(Figure 15 no. 2)**.
- Secure the towed vehicle with two additional chains or cables.

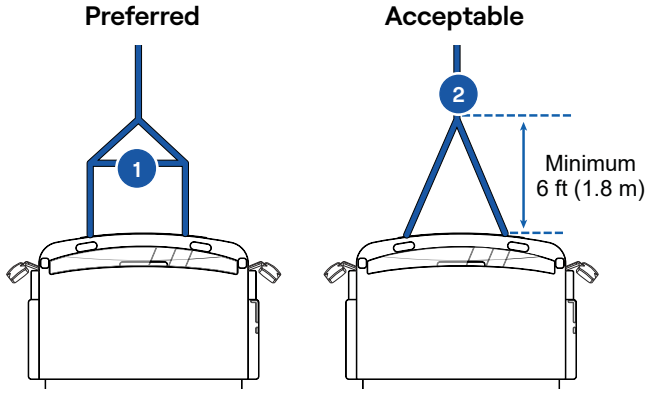

Figure 15 - *Recovery options*

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LION8 Tractor

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