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ADS Equipped Freightliner Cascadia First Responder Interaction Plan

Torc Emergency Number: 1-888-429-6916

The purpose of this document is to assist first responders and safety officials who may interact with Torc trucks equipped with TorcDrive our Automated Driving System (ADS) on how to engage with the truck in the event of an emergency. This information will be updated on a periodic basis as required.

Physical copies of this guide may be found in both the driver-side and passenger-side door pockets.





ADS Equipped Freightliner Cascadia First Responder Interaction Plan

Interacting with a Torc Truck

Torc operations include missions with a human driver behind the wheel and driverless missions. If a Torc truck is stopped on a public road, Torc support personnel will be in the cab, on foot near the truck, or in an escort vehicle nearby. They will assist first responders in accessing and responding to the stopped truck.

Torc support personnel will advise First Responders when the vehicle is safe to approach, provide additional guidance and support to ensure responder safety while they perform their duties, and keep the vehicle stationary until all First Responder needs are met. If Torc support personnel are not available, First Responders should fall back on their standard training and protocols.

First Responders can reach remote Torc support by calling 1-888-429-6916. This phone number, along with a QR code linking to this plan, is displayed on both sides of the tractor.

Emergency Vehicles

Emergency vehicles should interact with Torc trucks the same way they would with any other truck on the road today. When positioned directly behind the truck and trailer, make sure the side mirrors on the front of the truck are clearly visible. The AV truck may travel a slightly longer distance to arrive at a safe shoulder location.

Fleet/Vehicle Compliance Documentation

If the vehicle is driverless, compliance documentation can be found in the binder in the passenger side door pocket.





ADS Equipped Freightliner Cascadia First Responder Interaction Plan

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1. Identification / Recognition

The Torc ADS-Equipped Freightliner Cascadia has been modified for ADS operations and can be identified by the following exterior features (**Figure 1**):

- Sensors and cameras mounted to the cab on the roof, the bumper, and below the doors.
- Torc branding may be present on the front hood and doors.

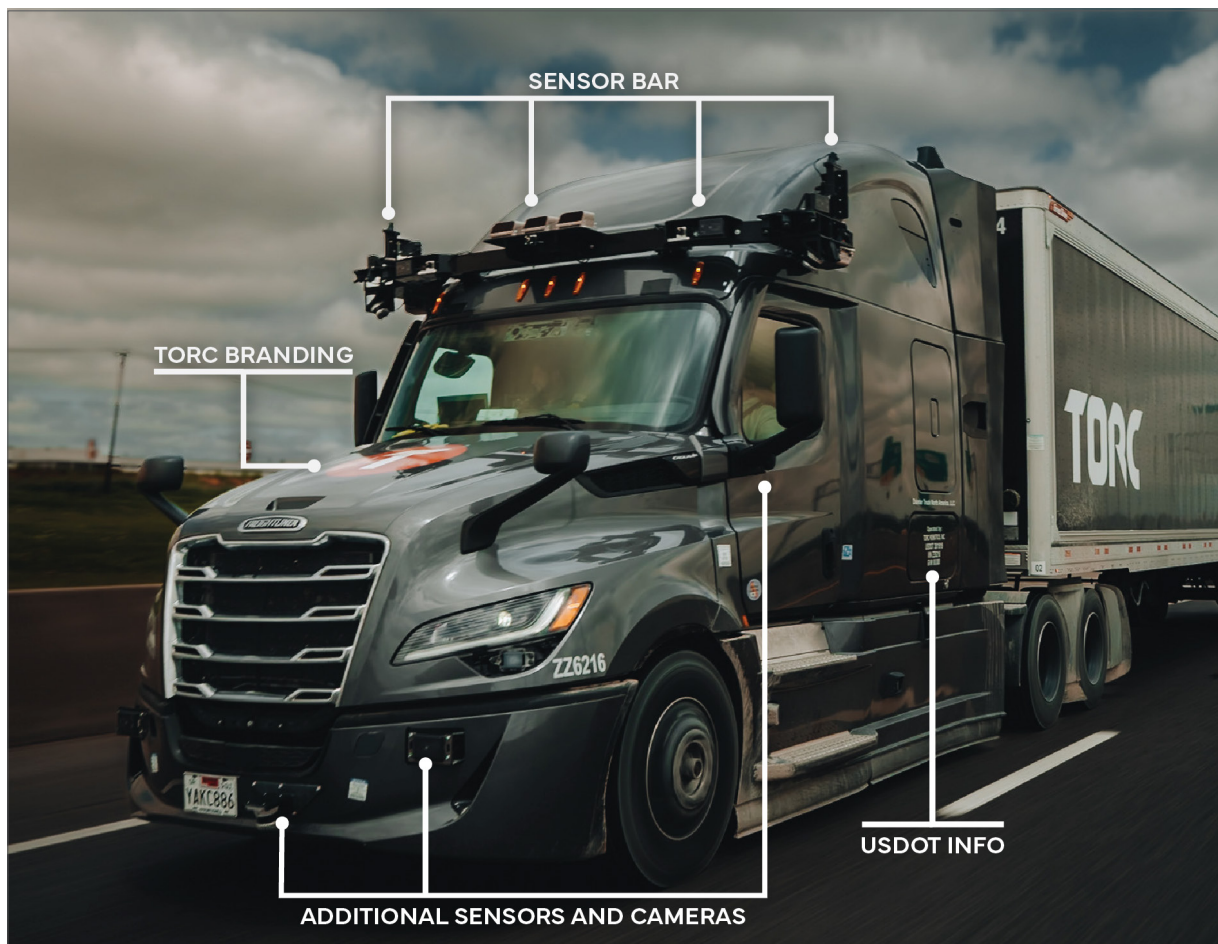


Figure 1. Torc truck

- A trailer displaying either Torc or Torc partner branding may be attached to the tractor.

- Truck markings can be found on both sides of the tractor located on or near the baggage compartment door. Information provided:
 - A QR code pointing to a digital version of this guide.
 - Emergency contact information.
 - The US Department of Transportation (USDOT) number: TORC Robotics, Inc. USDOT #3811919
 - Last 6 of VIN
 - GVW 80,000
- AUTONOMOUS indicator will be present on both the driver and passenger doors if operating driverless with no humans in the cab.

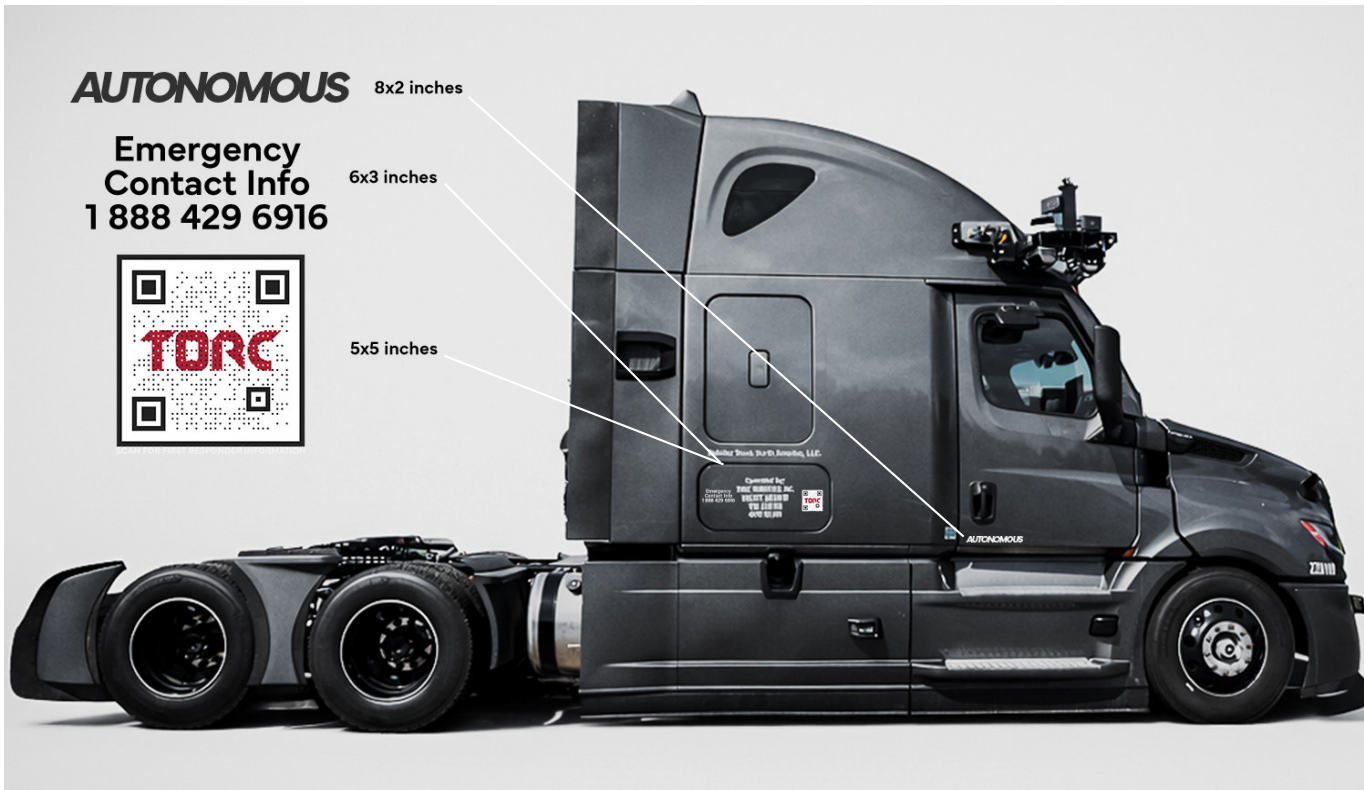


Figure 2. Torc truck markings and placements, side view.

NOTE: There are no ADS features to consider when detaching a trailer from the tractor; all ADS hardware is located on the tractor.

Support personnel either in the truck or in an escort vehicle will be able to inform first responders of the ADS status.

2. Immobilization / Stabilization

Support personnel either in the truck or in an escort vehicle will assist in ensuring the ADS is disabled and the truck will remain stationary.

If no support personnel are present to ensure that the ADS is disabled and the truck remains stationary, the following steps should be taken in sequence:

1. Call 1-888-429-6916 to notify Torc support personnel.
2. Retrieve the wheel chocks from the driver side baggage compartment (**Figure 2**) and chock the wheels.
3. The compartment can be opened by pulling the handle (**Figure 3**) immediately inside the driver side door. If hazard warning devices are necessary, they can be found in the same location.
4. Press the yellow Emergency Manual Override (EMO) button (**Figure 4 and 5**) located on top of the dashboard to disable the ADS system.
5. Apply the parking brake by pulling both the red and yellow brake switches (**Figure 6**).



Figure 2. Driver-side baggage compartment



Figure 3. Driver-side baggage compartment handle



Figure 4. Emergency Manual Override (EMO)

The status of the ADS can be determined from the interior of the truck. Indicator lights on the dash indicate ADS status.

Identifying ADS status:

The lights below the yellow EMO button indicate the ADS status.

Green: ADS driving available but not engaged

Blue: ADS driving engaged

Red: ADS driving not available



Figure 5. Dashboard view of EMO and parking brake location



Figure 6. Parking brake switches



Figure 7. Ignition

5. Turn the ignition off (Figure 7).

6. Turn all six battery disconnects (two inside access panel below driver steps [Figure 8], two on either side of catwalk in rear of truck [Figure 9]) to the "off" position (Figure 10).

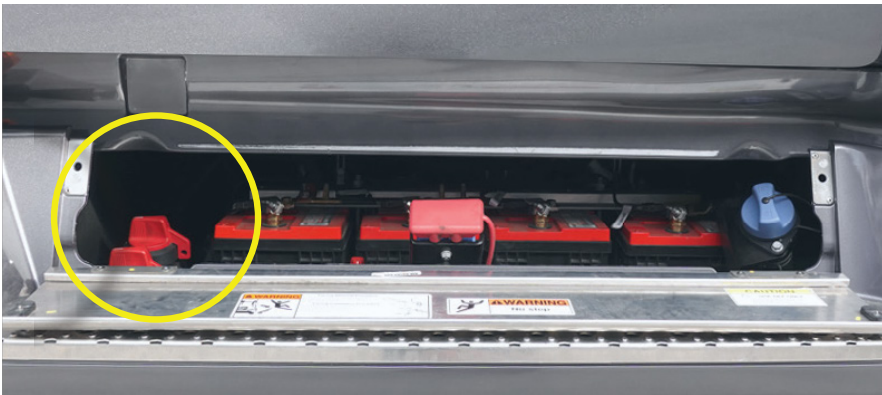


Figure 8. Driver step hatch with battery bank and disconnects



Figure 10. Switches in off position

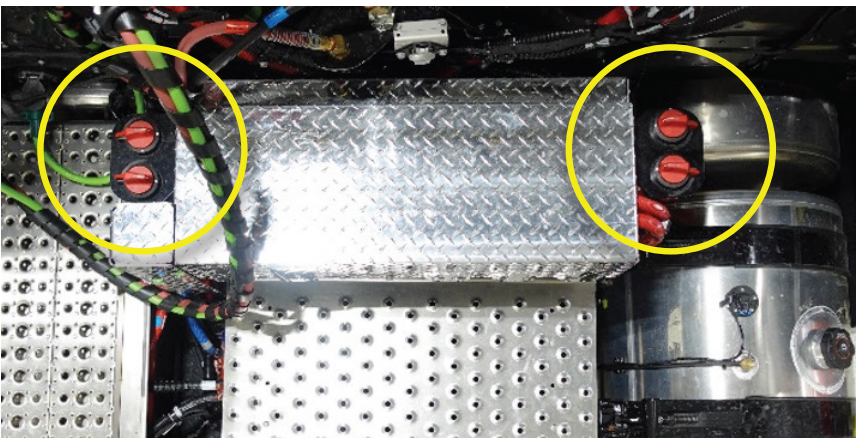


Figure 9. Birds eye view of rear battery disconnects

3. Disable direct hazards

Figure 11. Emergency Manual Override (EMO)



Emergency Manual
Override disables ADS

Figure 12. Passenger-side
battery disconnects



Red switches
cut power to
ADS system



Figure 13. Driver-side
battery disconnects

Keyed ignition turns
off the engine

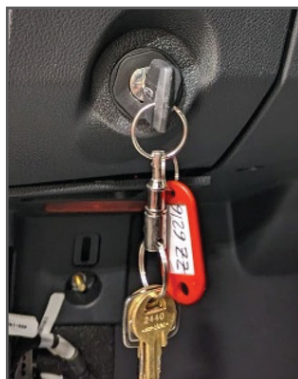


Figure 14. Ignition

4. Access to occupants

Indicator for Cab Occupancy

If the door indicator AUTONOMOUS (Figure 15) is present, there are no occupants in the cab. This indicator will be present on both the driver-side and passenger-side doors, just below the handle.

Cab Access and Occupant Capacity

The autonomous Freightliner Cascadia truck seats a maximum of four people and has two points of entry: the driver-side door and the passenger-side door (Figures 17 and 18).



Figure 15. AUTONOMOUS door indicator. If present, truck is driving autonomously.

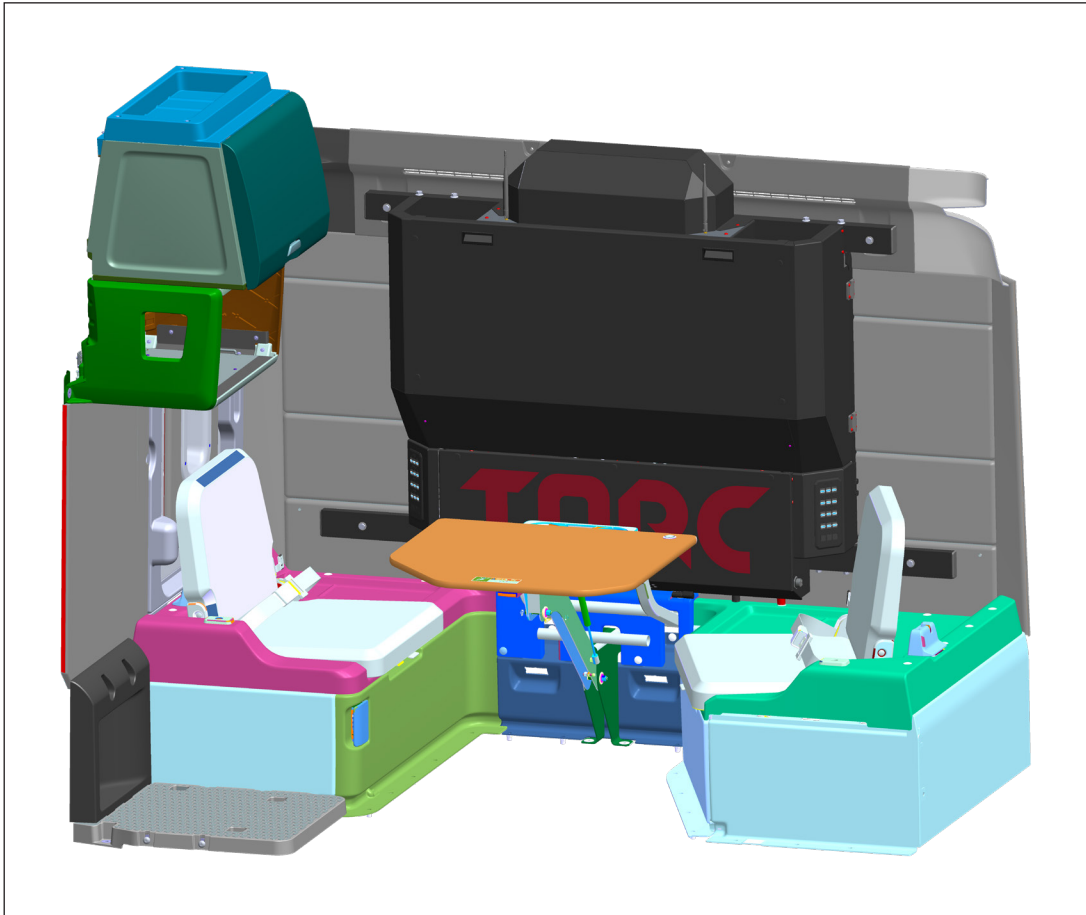


Figure 16. Rear of cab

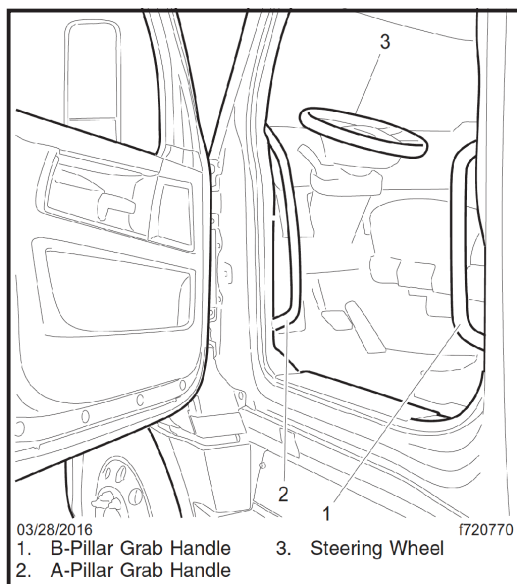


Figure 17. Driver-side entry (DTNA, 2024)

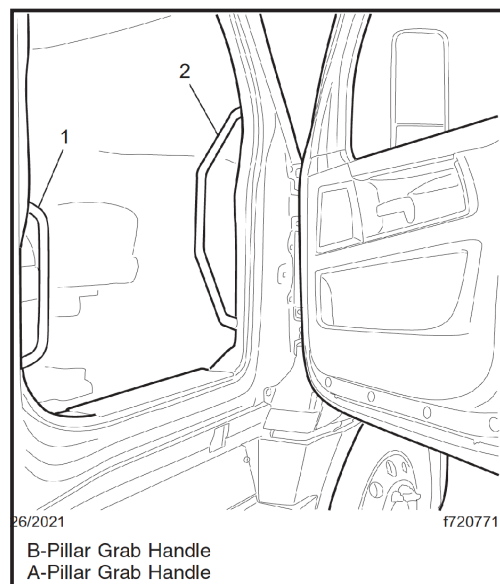


Figure 18. Passenger-side entry (DTNA, 2024)

5. Stored energy / Liquids / Gases / Solids

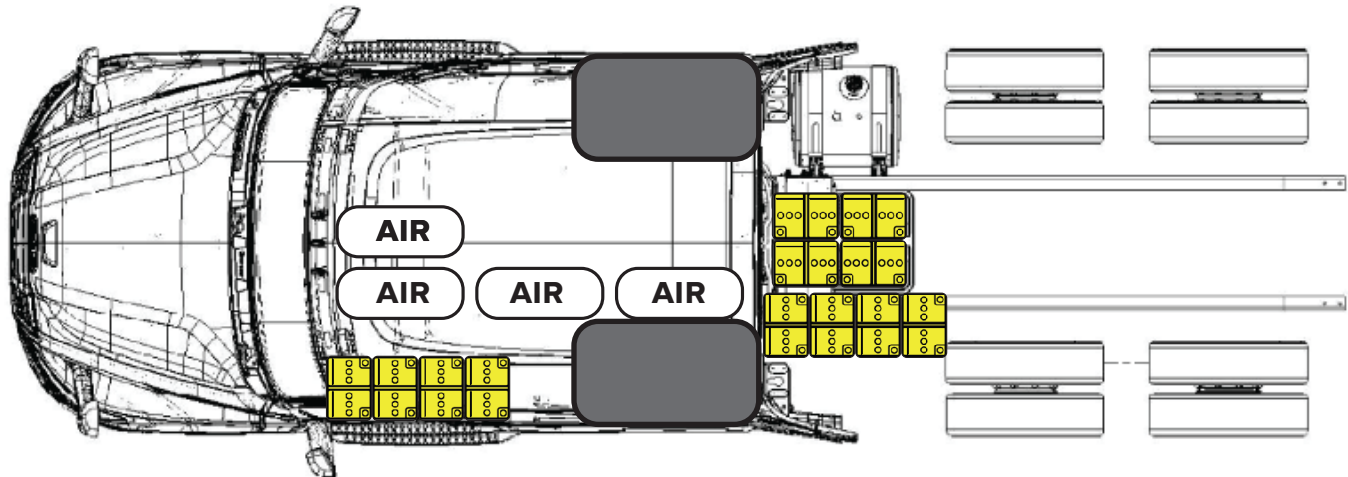


Figure 18. Stored energy locations

AIR

Stored compressed air



Diesel fuel tank



Battery

The Torc Autonomous Freightliner Cascadia has multiple types of stored energy, including battery banks, diesel tanks, and compressed air. Be extremely cautious around any exposed wiring, air lines, or fuel lines.

6. In case of fire

Accessing The Cab

To safely enter/exit the truck from either the driver or passenger side:

- Use a firm grasp on the handholds. Always maintain three points of contact with the truck, moving only one limb at a time.
- Be certain to use the designated footholds. Never use a tire or a wheel hub as a foothold, as these surfaces are likely to be slippery, and rounded surfaces do not provide good traction.
- To reduce the likelihood of personal injury, do not attempt to exit the truck with your back to the cab.

Fire

The Torc ADS-Equipped Freightliner Cascadia is NOT equipped with any alternative fuel sources. The truck is conventionally powered with diesel tanks on either side of the cab. Standard firefighting protocols can be utilized. A fire extinguisher can be found inside the cab, mounted directly behind the driver-side seat as seen below (Figure 19).



Figure 19. Fire extinguisher

7. Towing / Transportation

Before removing the truck from the roadway, ensure that the ADS is fully disabled according to Section 2, Immobilization/Stabilization. **NOTE:** There are no ADS features to consider when detaching a trailer from the tractor; all ADS hardware is located on the tractor.

If the truck is drivable, a qualified Torc driver should move it. If a driver is unavailable and the truck is not impeding traffic, contact Torc's remote assistance at 1-888-429-6916 to dispatch a driver as soon as possible.

If the truck is impeding traffic and a driver is unavailable, or the truck is not drivable, the truck must be recovered and/or towed.

Recovery

- If recovery is necessary, remove the recovery hooks, which are located under the hood, behind the driver-side bumper (Figure 20).
- There may be knock out covers over the attachment locations (Figure 21) that will need to be removed prior to attaching the recovery hooks.

NOTICE

When using recovery hooks to move the truck, do not pass a sling (for example, a rope or chain) from one hook to another. Known as reeving, this practice is not permissible in most industrial applications of towing and hoisting. Reeving can overload the hooks and result in damage to the truck. (DTNA, 2024) **NOTE:** Recovery hooks are to be used for recovery only, not towing.

The truck should be towed with a heavy-duty wrecker, and upon removal from the scene a lowboy trailer may be used if longer distance transport is required.

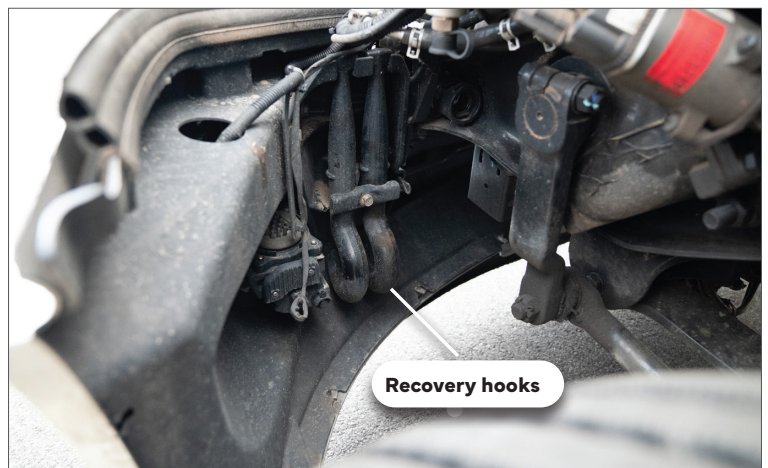


Figure 20. Recovery hook location



Figure 21. Recovery hook attachment locations



ADS Equipped Freightliner Cascadia First Responder Interaction Plan

8. Important additional information

Torc is an independent subsidiary of Daimler Truck AG. We are developing ADS-equipped trucks that will operate without human intervention in defined domains and conditions. Our initial product offering is long haul, middle-mile operation. The truck is equipped with sensors for perceiving the environment, and automated controls for steering, braking, and throttle, which allow the truck to navigate the roadways autonomously.

Our tests are conducted using a systematic test progression plan and an operating design domain (ODD) that defines the operating conditions appropriate for testing. The conditions and locations where we conduct testing will expand incrementally over time following our rigorous, systematic development process that includes the use of computer simulation and closed course testing. Torc's trucks currently operate on a variety of roadways, including highways, ramps, and surface streets. Torc's trucks may operate in either daytime or night-time conditions.

This document was designed with guidance from ISO 17840.

Other Resources

Automated Vehicle Safety Consortium. (2020). Best Practice for First Responder Interactions with Fleet-Managed Automated Driving System-Dedicated Vehicles (ADS-DVs). SAE Industry Technologies Consortium.

Daimler Truck North America LLC. (2024, May 3). Freightliner Cascadia Driver's Manual. Retrieved November 4, 2024, from [https://www.dtnatechlit.com/portal-public/0000113192-new-cascadia-drivers-manual/0000113192.xml/\\$/0000087562](https://www.dtnatechlit.com/portal-public/0000113192-new-cascadia-drivers-manual/0000113192.xml/$/0000087562)

For more information visit torc.ai.

**In the event of an emergency, first responders can call
Torc's First Response Team at 1-888-429-6916**



ADS Equipped Freightliner Cascadia First Responder Interaction Plan

Support

Steven Siko
Vice President, Product Safety Assurance
safety@torc.ai

Emergency Phone
1-888-429-6916

Press Inquiries
press@torc.ai





FIRST RESPONDER QUICK REFERENCE

IDENTIFY & SECURE

This truck is an autonomous Freightliner Cascadia operated by Torc Robotics, an independent subsidiary of Daimler Truck AG.

The truck can be identified by Torc branding, sensors and cameras mounted to the cab and roof. USDOT info is also found on each side: #3811919 – 405 Partnership Dr. Blacksburg, VA 24060.

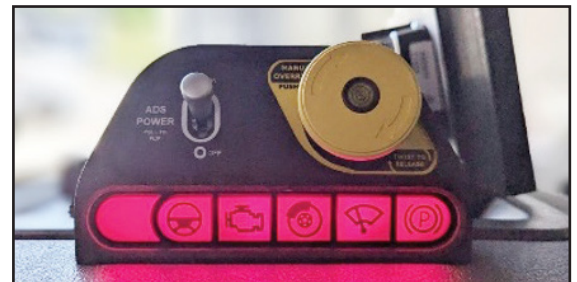
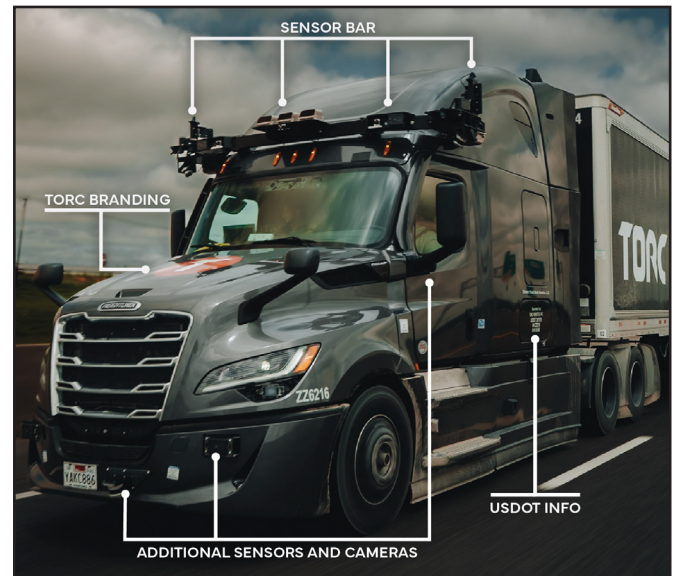
Torc support personnel will be in the cab, on foot near the truck, or in an escort vehicle nearby. First Responders can reach remote Torc support by calling 1-888-429-6916. This phone number, along with a QR code linking to this plan, is displayed on both sides of the tractor. Full guides can be located in each door pocket.

If no support personnel are present to ensure that the ADS is disabled and the truck remains stationary, the following steps should be taken in sequence:

1. Call 1-888-429-6916 to notify Torc support personnel.
2. Retrieve the wheel chocks from the driver side baggage compartment and chock the wheels. The compartment can be opened by pulling the handle immediately inside the driver side door. If hazard warning devices are necessary, they can be found in the same location.
3. Press the yellow Emergency Manual Override (EMO) button located on top of the dashboard to disable the ADS system.
4. Apply the parking brake by pulling both the red and yellow brake switches.

Emergency Contact
Torc's First Response Team
1-888-429-6916

Scan for full
First Responder
Interaction Plan and
additional information.



EMO Button



Parking brake switches

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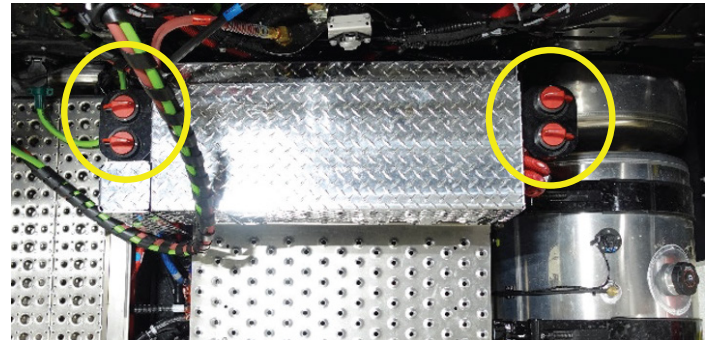


Switches in off position



Driver step hatch with battery bank and disconnects

5. Turn the ignition OFF.
6. Turn all six battery disconnects (two inside access panel below driver steps, two on either side of catwalk in rear of truck) to the "off" position.



Birds eye view of rear battery disconnects

OTHER IMPORTANT INFORMATION

Indicator for Cab Occupancy: If the door indicator AUTONOMOUS is present, there are no occupants in the cab. This indicator will be present on both the driver-side and passenger-side doors, just below the handle.

Cab Access and Occupant Capacity: The autonomous Freightliner Cascadia truck seats a maximum of four people and has two points of entry: the driver-side door and the passenger-side door.

Stored Energy: The Torc Autonomous Freightliner Cascadia has multiple types of stored energy, including battery banks, diesel tanks, and compressed air.

- Two diesel fuel tanks located beneath the cab on either side.
- 12V lead acid batteries located under driver side door and underneath the rear catwalk.
- Stored compressed air found in four tanks located beneath the cab.

Towing: Ensure the ADS is fully disabled. There are no ADS features to consider when detaching a trailer from the tractor; all ADS hardware is located on the tractor. If the truck is drivable, a qualified Torc driver should move it. If a driver is unavailable and the truck is not impeding traffic, contact Torc's remote assistance at 1-888-429-6916 to dispatch a driver as soon as possible.

Fire: Standard firefighting protocols can be utilized. A fire extinguisher can be found inside the cab mounted directly behind the driver-side seat.

