Compressed Natural Gas (CNrG® Tailgate) Option

Common Body Platform

ISSUED MARCH 2026

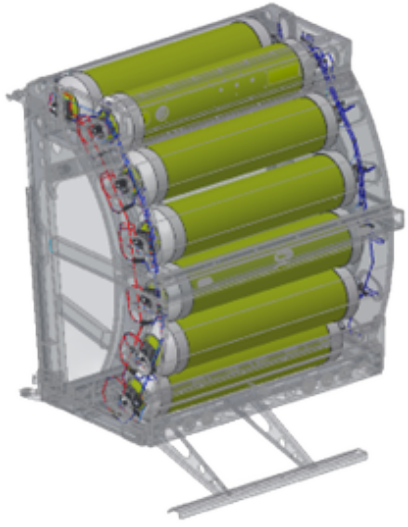
⚠ WARNING

Failure to follow all instructions and safety precautions in this manual, in the Service Manual, in other manufacturers' manuals and on the safety decals attached to the product could result in serious injury or death to operators or bystanders and/or damage to property.

DO NOT operate this vehicle before you READ and UNDERSTAND this Operation Manual, the Service Manual for this unit, other applicable manufacturers' manuals, and the safety decals on the product.

Each operator of this unit must read and understand all directions in this manual before they first operate this vehicle.

Keep this manual in the cab for new operators and to remind all operators about safe use.



TP1CNGCBP-OSM-0326

⚠ **WARNING:** Operating, servicing and maintaining equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your equipment in a well-ventilated area and wear gloves or wash your hands frequently when servicing your equipment. For more information go to **www.P65Warnings.ca.gov**.

⚠ **WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to **www.P65warnings.ca.gov/diesel**.

READ THIS MANUAL!

EVERY PERSON who will **OPERATE, MAINTAIN, REPAIR, OR OTHERWISE WORK** with the Heil unit **MUST READ AND UNDERSTAND** this entire Operator's Manual before starting the engine or activating any switches or controls. **MAKE SURE** to read the Service Manual for the unit BEFORE you do any maintenance or repair procedures.

ALL USERS of this equipment must be trained professionals who understand how the machine operates and know how to avoid the risks associated with driving the vehicle and with picking up, compacting, and dumping refuse in an ever-changing traffic environment.

If you do not understand an operation or instruction, seek additional help or instruction from a qualified source **BEFORE** you operate the unit.

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Compressed Natural Gas (CNrG Tailgate) Option

Common Body Platform

OPERATION & SERVICE MANUAL SUPPLEMENT
ISSUED MARCH 2026 FOR HEIL COMMON BODY PLATFORM CNrG TAILGATE SYSTEM
TP1CNG-OSM-0326

ACRONYMS AND ABBREVIATIONS

CNG: Compressed Natural Gas

CNrG: Heil CNrG Tailgate

NFPA: National Fire Protection Association

AHJ: Authority Having Jurisdiction

FMM: Fuel Management Module

NGV: Natural Gas Vehicle

PRD: Pressure Relief Device

PSI: Pounds per Square Inch

DC: Direct Current

EHS: Environmental, Health, and Safety

COMPRESSED NATURAL GAS (CNG) OPTION

IMPORTANT SAFETY INFORMATION

⚠ WARNING

THIS IS A COMPRESSED NATURAL GAS VEHICLE. CNG units are powered by compressed natural gas, which operates at high pressures. Only those properly trained, certified, and qualified on CNG vehicle applications should perform service. IF YOU ARE NOT SURE IF YOU ARE QUALIFIED, CONSULT YOUR ORGANIZATION'S EHS FUNCTION BEFORE USE OR PERFORMING ANY WORK. Please note that various procedures are different from other Heil bodies due to the CNG system – please read this Manual and related documents in full. This Manual does not substitute for proper training and certification.

NOTICE

A qualified person performing installation, repair, and maintenance work or system inspection on a CNG unit shall be properly trained in such functions. Where required, the training and licensing shall comply with local requirements.

Note: Local requirements can consist of provincial regulations or other requirements of the AHJ.

If there is a difference between procedures or work instructions from Heil and those from other CNG component or system manufacturers, always follow the procedures and work instructions in the Heil CNG manual. This applies only to Heil trucks equipped with a tailgate-mounted Common Body Platform CNG system, and only for emergency or maintenance purposes. If you have any questions, call Heil Technical Services at 866-310-4345.

NOTICE

For CNG units, this manual should be used in conjunction with any associated CNG Fuel System and Cylinder Manufacturers' Operation, Inspection and Maintenance Manuals. Always read and understand all associated manuals alongside the Heil Operation Manual and Heil Service Manual before operating or servicing the unit. When replacing CNG components, replace with equal or higher pressure rated components.

Read, understand and follow the instructions within this document before operating, servicing or adjusting referenced equipment. Anyone using or maintaining this equipment must be familiar with the product and fully trained to operate and maintain the unit. Improper usage or maintenance of this equipment may result in injury or death.

Always keep a copy of this manual readily available for persons who operate the equipment or perform maintenance procedures. Safe working procedures must be followed at all times. **Lock-Out/Tag-Out procedures** must be followed when performing applicable procedures.

A vehicle equipped with a compressed natural gas fuel system will have a blue reflective decal on the rear of the vehicle identifying Compressed Natural Gas (CNG). See the image below.identifying Compressed Natural Gas (CNG). See **"Figure 1. CNG Decal"**

IMPORTANT SAFETY INFORMATION

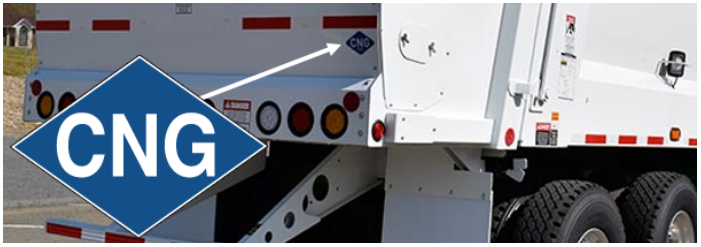

Figure 1. CNG Decal

A. Safety Notices

Throughout this manual, safety notices are included to warn operators and maintenance technicians of the dangers associated with the described equipment operations and maintenance. Improper operation or maintenance procedures may cause serious injury or death. Safety notices accompany potentially hazardous situations throughout this manual. Please read and follow instructions carefully.

For supplemental information, refer to the following codes:

- United States: NFPA 52, State and Local Regulations

⚠ DANGER

The CNG Fuel Module System contains some lines that are under continuous high pressure. DO NOT attempt to loosen or disconnect those lines while pressurized. Verify that all the cylinders and the system is truly empty by following the defueling procedure and verification method listed in this manual.

⚠ DANGER

The Common Body Platform CNrG Tailgate Fuel System contains CNG fuel cylinders that are continuously interconnected and remain under high pressure at all times, even when the manual tank shutoff valve is closed. DO NOT attempt to loosen or disconnect any lines while the system is pressurized. Before performing any maintenance or repair work, verify that all cylinders and the fuel system are completely empty and safe by following the defueling, depressurizing, and verification procedures specified in this manual. Certain lines, fittings, and connections cannot be serviced unless the entire system has been fully defueled and purged.

⚠ DANGER

Natural Gas is Flammable and Explosive. Never use an open flame (match, lighter, or other) to light a work area near the CNG fuel storage system.

⚠ DANGER

Keep work area well ventilated to avoid asphyxiation due to concentrated levels of carbon monoxide.

⚠ WARNING

Do not start the engine if a natural gas leak is detected.

COMPRESSED NATURAL GAS (CNG) OPTION

IMPORTANT SAFETY INFORMATION

⚠ DANGER

Comply to NFPA and other standards requirement per AHJ for the maintenance facility requirements if performing any maintenance work on the vehicle powered by CNG.

⚠ WARNING

Never open system components while the system is under pressure. Treat all cylinders as full until defueling has been completed and verified. Verify that all CNG cylinders and the CNG system is truly empty by following the defueling and verification method listed in this manual.

⚠ WARNING

Never weld or perform any type of “hot work” on any part of a compressed natural gas vehicle unless the compressed natural gas fuel system has been completely defueled and adequately purged with nitrogen. This includes but is not limited to refraining from using sandblasters, unshielded power tools, grinders, or spark-producing hand tools without completely defueling and purging the natural gas fuel system in accordance with the instructions provided herein.

⚠ WARNING

Avoid open flames and sparks near a compressed natural gas vehicle.

⚠ WARNING

When replacing CNG components, replace with equal or higher pressure rated components.

⚠ WARNING

Do not smoke cigarettes, cigars, or use any other lit or sparking items within 30 feet of a compressed natural gas vehicle or a dispensing/filling station. Do not use a cell phone or other electronic device within 30 feet of a compressed natural gas vehicle or a dispensing/filling station.

⚠ CAUTION

Keep the compressed natural gas equipment area well ventilated.

⚠ CAUTION

A portable fire extinguisher must be installed on the vehicle in an accessible location.

NOTICE

Defueling shall be performed only by a qualified person using written procedures.

PROPERTIES OF NATURAL GAS & THE SIGNS OF A FUEL LEAK

CNG is a naturally occurring hydrocarbon gas mixture which consists primarily of methane. This gas is lighter than air, which means if gas were to leak, it would float upwards and quickly dissipate into the atmosphere.

CNG will burn only when in an air-to-gas mixture of approximately 5-15% so its flammability range is limited compared to other fuels. The gas also has an ignition temperature of between 900 °F and 1200 °F which is significantly higher than diesel. As a fuel, CNG is less expensive and burns cleaner than diesel fuel, producing low emissions. These characteristics make CNG an efficient, safe choice for fueling vehicles.

It is:

- Colorless
- Non-corrosive
- Non-toxic
- Auto Ignition Point: 900 - 1170° F (482 - 632°C)
- Lower Explosive Limit (%): 3.8 – 6.5
- Upper Explosive Limit (%): 13 – 17

Fuel Leak Signs

An odorant which smells like rotten eggs is added to compressed natural gas to aid in detection of a leak. If you notice this kind of lingering odor coming from your vehicle, you may have a leak in the CNG fuel system.

NOTE: It is normal to detect this slight odor when the fueling nozzle is being connected or disconnected during the refueling process. The odor should quickly dissipate when fueling has been completed.

If you notice any of the following, you may have a leak in the CNG fuel system:

- Frosting at suspected leak point
- Bubbling in wet area
- Blowing or hissing sound
- Flames, if a leak has ignited

If a fuel leak is suspected, the system should be shut down immediately. Have the unit inspected for leaks by a qualified service technician using a methane detector or an approved liquid leak detector. Do not use any other method or products to find leaks.

CNG FUEL SYSTEM COMPONENTS

The following pages detail a typical CNG system configuration. Your CNG fuel system configuration may vary.

A. Fuel Management Module (FMM) Functions The CNG Fuel Management Module serves multiple functions within a natural gas vehicle (NGV) fuel system.

These functions include:

- Storage tank refueling
- Transfer fueling
- Defueling the CNG system
- Pressure display of **High Pressure** side of system
- Pressure display of **Low Pressure** side of system
- Manual and **Ignition Controlled** fuel shut-off
- Pressure reduction from storage tanks to engine supply
- Fuel system filtration
- Liquid removal from fuel system

B. Fuel Management Module (FMM) Components

1. Manual Shut-Off Valve

   The FMM Manual Shut-Off Valve isolates the fuel storage system from the engine.The manual shut-off valve handle is RED and is located on the left front of the fuel control module. Rotate the handle clockwise so arrow points right to the ‘OFF’ position to prohibit fuel flow from the tanks to the vehicle’s engine. Rotate the handle counterclockwise so arrow points up to the ‘ON’ position to allow fuel flow from the tanks to the vehicle’s engine.

2. High Pressure Gauge

   Refer to the manufacturer’s manual for information.

3. Low Pressure Gauge

   Refer to the manufacturer’s manual for information.

4. Fill Receptacles

   Fill receptacles are used to fill the CNG storage cylinders with fuel. There are two sizes: standard NGV1 (slow) or HD bus transit (fast) fill. The receptacles are equipped with built-in check valves to prevent fuel from escaping when the fuel fill nozzle is connected and disconnected.

5. Fast Fill/HD Bus Fuel Receptacle

   The fast fill/HD bus fuel receptacle is the filling port for fueling the vehicle at public fueling stations.

6. Slow Fill/NGV1 Fuel Receptacle

   The slow fill/NGV1 fuel receptacle is the filling port for fueling the vehicle at slow fueling facility, usually overnight.

7. Defuel Port

   The defueling port allows the transfer of CNG fuel into the fill receptacle of a second CNG vehicle, using a defueling hose, capturing of CNG fuel in a system that can send it back to a CNG fueling station storage facility for reuse, or atmospheric venting (if legal in your area).

CNG FUEL SYSTEM COMPONENTS

8. Defuel Valve

   The defuel valve controls fuel flow when removing fuel from the cylinder during defueling operations. It is a 3-way type valve marked OFF-DEFUEL-VENT. The valve must be in the OFF position when operating the vehicle.

9. Door Sensor

   The door sensor that is located on the FMM functions as a safety interlock to prevent the vehicle from starting if the FMM access door is open.

⚠ WARNING

Fill receptacles shall only be replaced with receptacles that are equal pressure rating.

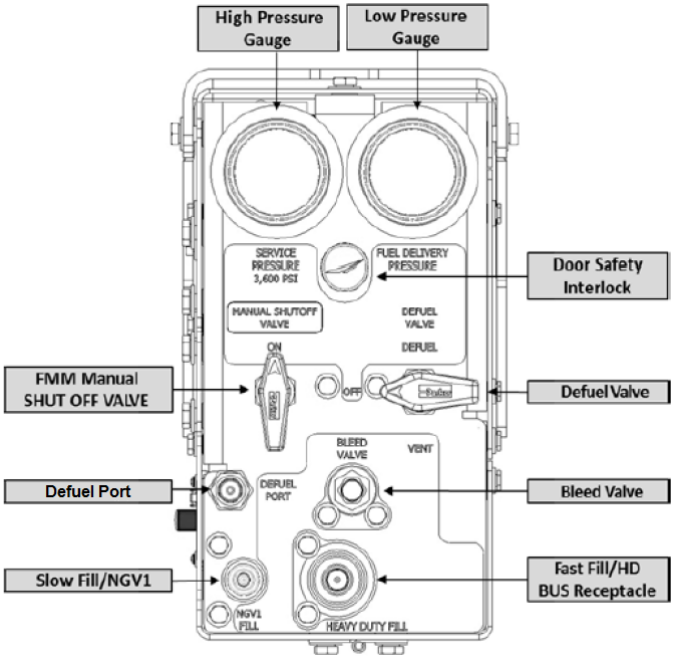

Figure 2. Manual Shut-Off Valve (Typical arrangement; models may vary slightly in component positioning.)

CNG FUEL SYSTEM COMPONENTS

⚠ WARNING

Prohibit personnel from walking on CNG cylinder unless permitted by the cylinder manufacturer.

⚠ WARNING

Prevent hoists or jacks from coming into direct contact with CNG cylinders.

C. CNG Fuel System Components

1. Fuel Cylinder(s)

   The fuel cylinder(s) stores CNG fuel at a service pressure of 3,600 psi. The fuel cylinders used on CNrG Tailgate vehicles are type-4 composite cylinders, manufactured to meet FMVSS 304 and NGV2-2019 and NGV2-2023 specifications. The fuel cylinders used on Top of Body and Back of Cab CNG vehicles varies, as those are supplied by the customer. In accordance with applicable regulations, the cylinders must display permanent labels which provide information necessary for inspection.

2. Cylinder Manual Valve

   The Cylinder Manual Valve installed on each cylinder controls the flow of gas into and out of the cylinder through the top port of the valve (identified by the arrow in the referenced image). This port connects to the main supply line leading to the Fuel Management Module (FMM).
   The two bottom ports of the valve are always open and remain pressurized. As a result, all cylinders are continuously interconnected. Closing the manual valve does not isolate an individual cylinder from the others. If any cylinder in the system contains pressure, all cylinders will remain pressurized.

   To operate the valve:

   - Turn the handle fully clockwise to close the valve.
   - Turn the handle fully counterclockwise to open the valve.

   This description applies only to the Heil Common Body Platform CNrG Tailgate system. Valve operation and system behavior may differ on other systems based on their specific design and intended function.

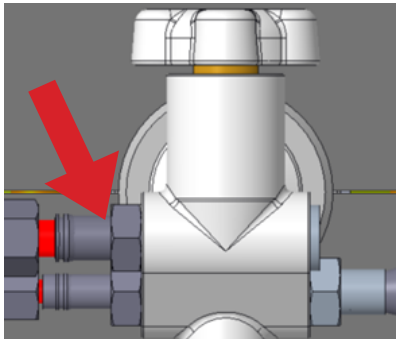

Figure 3.

3. Check Valve

   The 1-way check valve, located in the FMM box, is used to prevent fuel from backing up during the fuel filling process.

CNG FUEL SYSTEM COMPONENTS

4. High Pressure Filter

   This high pressure filter is in the FMM box. Refer to the manufacturer's manual for information.

5. Low Pressure Filter

   The low-pressure fuel filter is located on the frame near the engine and removes contaminants and oil before fuel enters the engine. Refer to the engine manufacturer's instructions for service and replacement.

6. Pressure Regulator

   Refer to the manufacturer's manual for information.

7. Excess Flow Valve

   Excess flow valve, located inside the vertical bolster on the top rear of the body on street side is used to provide a safety feature to the system in event of a line/hose rupture downstream of excess flow valve. Excess flow valve shuts off majority of CNG supply downstream due to pressure differential created in this scenario. Refer to the manufacturer's manual for more information.

8. Bypass Valve For Defueling The Truck

   The defueling bypass valve is located inside the vertical bolster at the bottom rear of the body on the street side. During normal truck operation, this valve must remain closed. It should only be opened when defueling the truck. If the valve is left open during normal operation, the truck will not crank. A visual warning will also appear on the cab display indicating that the valve is open and must be closed. DO NOT DRIVE THE TRUCK WITH THIS VALVE OPEN. If the truck is started and the valve is then opened, the system will not shut down as intended. The system will not operate safely.

9. Locking Pin For Bypass Valve

   A locking pin secures the bypass valve in the closed position during normal operation and provides a proximity-switch input to the system. If the locking pin is not installed, the system detects the bypass valve as open and prevents the truck from cranking. To defuel the vehicle, remove the locking pin first, then rotate the bypass valve handle as required.

10. Quarter Turn Manual Shutoff Valve For System

    The inline manual shutoff valve is a quarter-turn valve installed in the main supply/return line between the fuel cylinders and the Fuel Management Module (FMM). This valve is used to shut down the CNG supply downstream of the valve, isolating the FMM and engine from the fuel tanks. The valve may be used during maintenance operations or in emergency situations to stop gas flow from the cylinders to the FMM/engine.

11. Proximity Switch For Sensing Bypass Valve Handle Position

    This is an inline quarter turn manual shutoff valve located in the main supply/return line going from tanks to FMM box. It can be used for maintenance as well as emergency purposes to shut down the gas supply downstream of the valve going from the tanks to the FMM/engine.

CNG FUEL SYSTEM COMPONENTS

⚠ WARNING

- Only qualified personnel shall be permitted to service pressure relief devices.
- No pressure relief valve that has been in service shall be repaired or reworked without the written authorization of the pressure relief device manufacturer, valve manufacturer, fuel cylinder manufacturer, or vehicle manufacturer. Any device that has been activated shall not be reworked or reused and shall be removed from service.
- No pressure relief device that has been in service shall be reinstalled on another fuel cylinder.

12. Pressure Relief Devices

    The Pressure Relief Devices (PRD) are thermally-activated valves that open at a temperature of approximately 230°F. In the event of a fire, they are designed to release the fuel stored in the cylinders a safe distance from the vehicle to prevent over-pressurizing the fuel cylinders. When activated, the PRD cannot be closed and will vent all gas.

⚠ WARNING

The Bleed Valve shall not be used to defuel the system. The system must be defueled before using the bleed valve.

13. Bleed Valve

    The bleed valve is used to vent the residual pressure left in the CNG fuel system after the CNG system has been completely defueled/depressurized.

14. High Pressure Lines

    These are stainless steel lines carrying high pressure CNG gas in them. They are routed between the FMM box and the CNG tanks located on the truck to connect various CNG components to each other as needed to function correctly. They are also located from any of the auxiliary fill locations you may have as an option on your truck going to FMM box. These lines are high pressure lines that can be isolated from the CNG tanks by closing the shutoff valve on individual tanks for service.

15. High Pressure Live Lines

    These are stainless steel lines carrying high pressure CNG gas in them. They are routed between the CNG tank valve port to the PRD (pressure relief device) and gauges for each tank.

    These lines are high pressure lines that CANNOT be isolated from the CNG tanks by closing the shutoff valve on individual tanks for service and the tank has to be completely defueled and purged before any maintenance work is done on these lines.

CNG FUEL SYSTEM COMPONENTS

16. Vent Lines

    These are stainless steel lines connecting the outlet of PRD (pressure relief device) port and venting the gas to atmosphere at top of the vehicle when the PRD activates. In normal operation, they do not carry any pressure in them and are isolated from the high pressure system as long as the PRD does not activate.

17. High Pressure Gauge inside tailgate

    The tank pressure gauge is located near the lower edge of the tailgate on the street side of the vehicle. When the cylinder manual valves are closed, the gauge indicates the pressure within the fuel cylinders. When the cylinder valves are open, the gauge displays overall system pressure. Refer to the gauge manufacturer's documentation for additional information and specifications.

NOTICE

System component locations may vary based on CNG system configuration.

CNG FUEL SYSTEM COMPONENTS

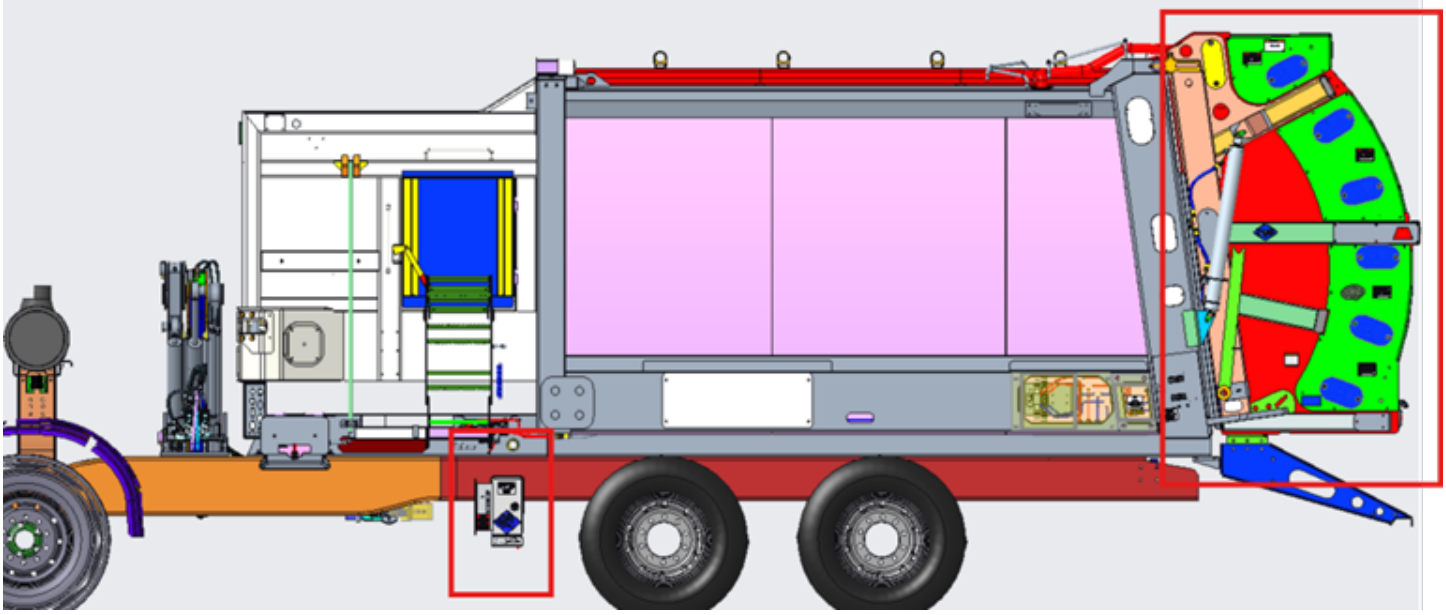

Figure 4. CNrG Tailgate & FMM Locations

CNG FUEL SYSTEM COMPONENTS

A. CNG Fuel System Components Locations

1. CNrG Tailgate FMM Location (Door Closed)

Figure 5. CNrG Tailgate FMM Location (Door Closed)

2. CNrG Tailgate FMM Location (Door Open)

Figure 6. CNrG Tailgate FMM Location (Door Open)

CNG FUEL SYSTEM COMPONENTS

3. CNrG Tailgate CNG Cylinder/Valve Locations

   The CNrG Tailgate CNG cylinder valves (one per cylinder) are located on the street side of the CNrG Tailgate as shown below.

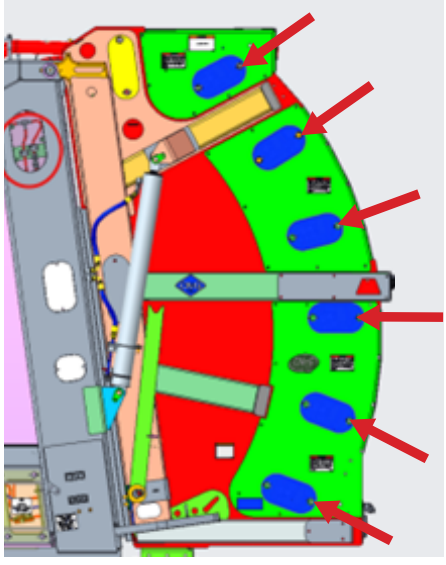

Figure 7. CNrG Tailgate Cylinder Valve Locations (One Per CNG Cylinder)

Figure 8. CNrG Tailgate Cylinder Valve

4. CNrG Tailgate PRD Vents Location (Top of Tailgate, Red Arrows)

Figure 9. CNrG Tailgate PRD Vents Location (Top of Tailgate, Red Arrows)

CNG FUEL SYSTEM COMPONENTS

5. Excess flow valve location.

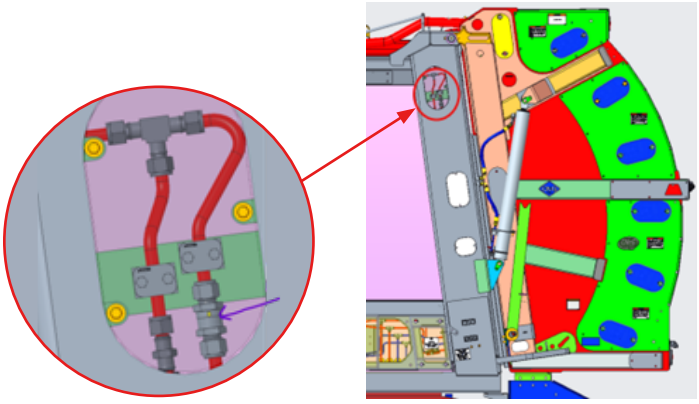

Figure 10.

6. Bypass valve for defueling the truck and locking pin.

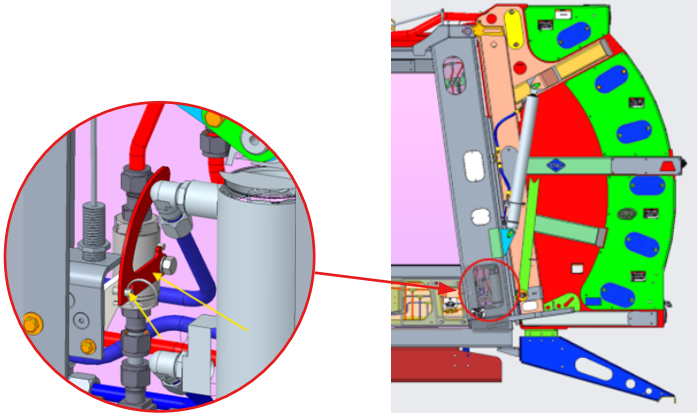

Figure 11.

7. Quarter turn manual shutoff valve for system

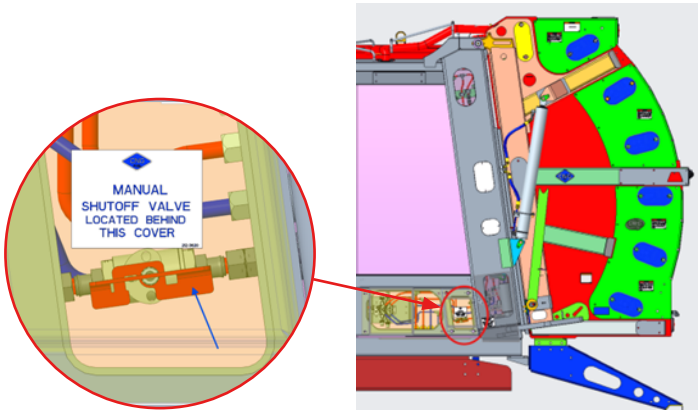

Figure 12.

8. High pressure gauge inside tailgate.

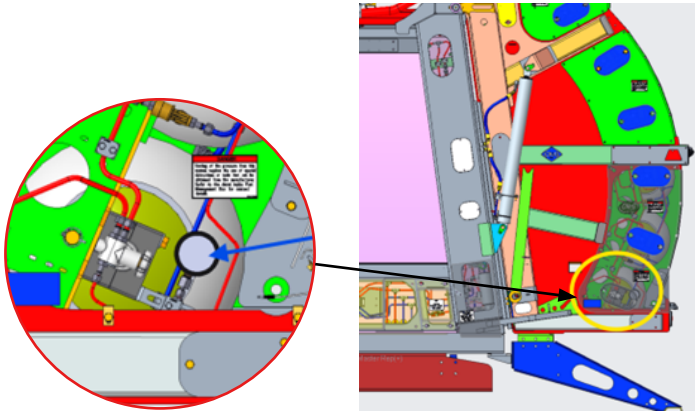

Figure 13.

CNG FUEL SYSTEM COMPONENTS

9. Proximity switch for bypass valve handle position sensing.

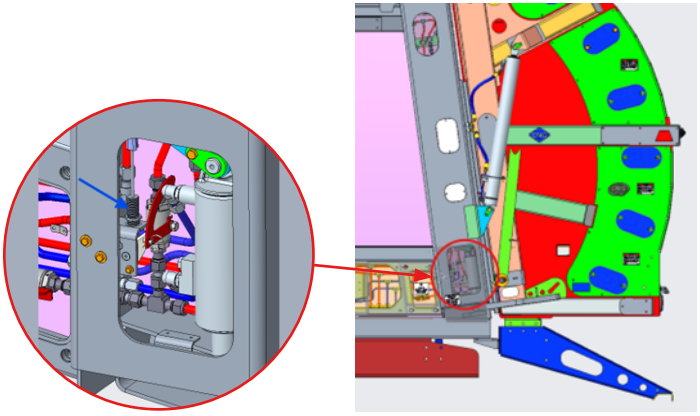

Figure 14.

FUEL SYSTEM SHUTDOWN PROCEDURE

1. Turn OFF the Fuel Management Module (FMM) Manual Shut-Off Valve.
2. Turn OFF the quarter turn Manual Shut-Off Valve for system on side of the body on street side at the rear.
3. Turn OFF the Fuel Cylinder Manual Shut-Off Valve on EACH tank.

CNG VEHICLE OPERATOR EMERGENCY RESPONSE

⚠ WARNING

During an emergency situation, never jeopardize safety to shut down the system. If it becomes evident that the following steps cannot be safely completed, move to a safe distance, call 9-1-1 and alert emergency personnel of the situation, informing them of the presence of a CNG system and that it is not properly shut down.

Emergency Response for Gas Leaks

If the vehicle has sustained damage or a gas leak is detected:

1. Do not approach the vehicle if any sources of ignition may exist such as fire, sparks, electrostatic charges, lights or electronic devices.
2. If the vehicle is indoors, move the vehicle outside and away from any ignition sources. Do not use road flares.
3. Do not smoke or allow anyone else to smoke near the vehicle.
4. Turn OFF the ignition switch, set the parking brake and turn OFF the battery at the main disconnect.
5. If it is safe to do so, turn OFF the Fuel Management Module Manual Shut-Off Valve and turn OFF the Fuel Cylinder Manual Shut-Off Valve on EACH tank. Check the fuel system near the damaged area for leaks by smell, sight, and sound. CNG is odorized and can be detected by smell.
6. Keep traffic and pedestrians away.
7. Beware that gas may continue to leak once ignition is turned off and the manual shutoff valves are closed.
8. Have a qualified technician verify leak locations with suitable methane detection fluid.
9. Have the leaks repaired by a qualified technician immediately.

Vehicle Fire Procedures

In the event of a CNG fire, it is imperative that the vehicle operator acts quickly:

1. Get passengers out of the vehicle as quickly as possible.
2. Evacuate the area.
3. Call 9-1-1.
4. If possible without putting yourself in harm's way, dump the refuse load from the body and move the vehicle a safe distance away from any burning refuse.

CNG Vehicle Emergency Shut Down Procedure

⚠ WARNING

During an emergency situation, never jeopardize safety to shut down the system. If it becomes evident that the following steps cannot be safely completed, move to a safe distance, call 9-1-1 and alert emergency personnel of the situation, informing them of the presence of a CNG system and that it is not properly shut down.

CNG VEHICLE OPERATOR EMERGENCY RESPONSE

NOTICE

Defueling shall be performed only by a qualified person using written procedures.

Complete the following steps to shut down the CNG system:

1. Turn OFF Engine Ignition and Electrical System.
2. Turn OFF Fuel Management Module Manual Shut-Off Valve.
3. Turn OFF the system quarter-turn manual shutoff valve located on the street side at the rear of the body.
4. Turn OFF the Fuel Cylinder Manual Shut-Off Valve on EACH tank.
5. Call Heil Technical Services at 866-310-4345 for further assistance.

Emergency Venting/Defueling Procedure

If an emergency arises in which the fuel must be purged immediately, an emergency vent can be performed as follows:

1. Turn OFF Engine Ignition and Electrical System.
2. Ensure that an electrical ground connection has been established between the cylinders, the vent system, and earth ground.
3. Connect the on-board defueling connection located in FMM box to the vent system using a conductive high pressure defueling hose.
4. Open the defueling quarter-turn valve located at the rear of the truck on the street side by removing the locking pin and rotating the valve handle 90 degrees counterclockwise.
5. Slowly rotate the three-way defueling valve located in the Fuel Management Module (FMM) from the OFF/VENT position to the DEFUEL position to establish a slow, steady gas flow and prevent freezing. This procedure assumes there are no additional valves installed on the facility or station vent system. If no gas flow is observed, the vehicle's excess flow valve may have activated. In this case, verify that any defueling valves on the facility or station vent system are fully open. For additional assistance, consult the vehicle manufacturer.
6. If no gas flow results from an excess flow valve tripping, follow the procedure written in this manual to reset excess flow valve if required.
7. Allow the on-board storage system to vent completely.
8. When defueling is complete, disconnect the on-board defueling connection from the vent system and remove the earth ground. Verify that the pressure gauges located in the Fuel Management Module (FMM) and on the CNG tank inside the tailgate both indicate 0 pressure before disconnecting the on-board defueling connection from the vent system.

STARTING VEHICLE

NOTICE

Starting a natural gas vehicle requires a delay between the battery power being turned on and the starter motor being activated.

NOTICE

Perform visual inspection of the CNG fuel system by a qualified person to ensure there is no physical damage to any CNG fuel system components.

1. Make sure that the system has been properly leak tested and that no leaks exist.
2. Make sure that plastic caps are installed on the end of all exposed vent lines. For tailgate mounted CNG, vent lines route to the top of the tailgate. If the plastic caps are missing, contact Heil Parts Central for replacement caps at 800-528-5308.
3. Make sure that the cylinder shut-off valves (one on each cylinder) are “OPEN” and the manual shut-off valve in the FMM is “ON”.
4. Ensure that the Fuel Management Module (FMM) door is fully closed and that all remote fill receptacle dust caps (if equipped) are securely installed. Verify that the quarter-turn defueling valve located on the body (street side near the tailgate) is in the OFF position and that the locking pin is installed in the valve handle. If any of these conditions are not met, the truck will not start.
5. Without starting the engine, turn the key to the “RUN” position and wait 20-30 seconds. This will allow the fuel to properly fill the system and provide adequate back-pressure for the high-pressure solenoid valve to function properly.
6. Start the engine.
7. If this is the first start of the day, let the vehicle idle for five minutes. This will allow coolant to warm the fuel and ensure that the low-pressure lines down-stream of the primary pressure regulator do not freeze up. On extremely cold days, the vehicle may have to idle for a longer period until the fuel warms adequately.

NOTICE

You MUST confirm that the unit is being filled from a CNG source.

FUELING PROCEDURE

A. CNG Fueling Steps

Two options exist for filling a vehicle with CNG – timed fill or fast fill. Despite the size of the receptacle, the fueling hose connects in the same manner for either type of fill.

The steps include:

1. Turn OFF ignition and ensure there are no heat sources near the vehicle. Make sure that no one smokes around the truck during the fueling procedure.
2. Locate the fueling fill receptacle in the CNG fuel module management module (FMM). Optional fill receptacles may be installed in a remote location on the vehicle's front bumper, or other areas.
3. Remove the dust cap on the fill receptacle.
4. Remove fueling nozzle from the CNG dispenser holder.
5. Connect the fueling nozzle from the fueling station to the fueling receptacle on the truck. Verify that the nozzle is properly engaged before you begin fueling.
6. Begin fueling the CNG vehicle by turning the handle on the nozzle to the ON/FUEL position.
7. When complete, disengage the Fueling Nozzle.
8. Return the nozzle to the CNG dispenser.
9. Replace the dust cover on the receptacle.
10. Close the CNG fuel module door and engage door lock.

B. Types of Fueling Nozzles

Depending on the fueling station, different types of fueling nozzles may be utilized. Refer to the figures below and on the next page to determine which type of fueling hoses you will be using.

NOTE: Instructions provided below are general instructions. Refer to Section B on the next page to find procedures for the specific type of fueling nozzle you have at your fueling location.

1. Type 1:

When utilizing this type of nozzle, follow directions below to refuel:

a. Slide the nozzle over the receptacle intake. In order to properly engage the fill hose with the receptacle, hold the nozzle in one hand. With the free hand, twist the lever counterclockwise to line up the two arrows, facing each other. Complete the connection by pushing the fueling nozzle fully onto the receptacle.

b. Once the nozzle fits completely onto the fill receptacle, you will hear a click and the arrow on the lever will shift, misaligning with the arrow on the actual nozzle. This indicates that the nozzle fueling nozzle is properly seated onto the receptacle.

c. When the nozzle fully connects, turn the lever clockwise until both arrows are pointing toward the fill receptacle to begin fueling.

d. When fueling is complete, release the nozzle connection. Holding the nozzle in one hand, use the other hand to turn the nozzle so that arrows again

FUELING PROCEDURE

point toward each other (as shown in step “a”). You will hear a release of pressure.

e. Disconnect the fuel nozzle and return it to the fuel dispenser.

Figure 15. Type 1 Fueling Nozzle

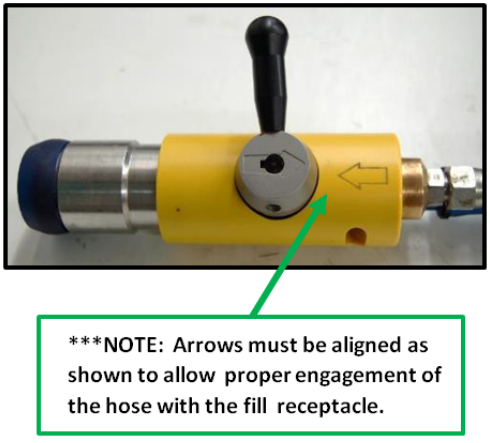

Figure 16. Type 1 Fueling Nozzle

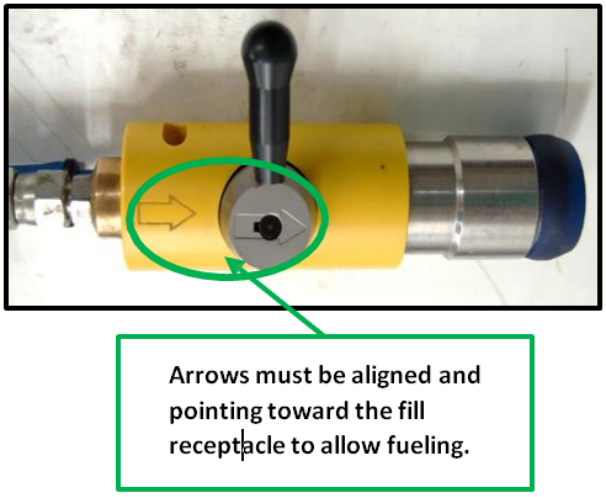

Figure 17. Type 1 Fueling Nozzle

2. Type 2:

   This fueling nozzle operates in the following manner:

a. Locate fill receptacle and remove dust cap.

b. Slide fueling hose nozzle onto the fueling receptacle.

c. Compress the hand grip until the locking lever engages.

d. Begin fueling.

e. When complete, release the locking lever and disconnect the fueling hose.

FUELING PROCEDURE

Figure 18. Type 2 Fueling Nozzle

3. Type 3:

   To utilize this nozzle:

a. Locate fill receptacle and remove dust cap.

b. Holding firmly, press nozzle onto fill receptacle.

c. Rotate lever from the OFF/VENT position clockwise 180° to the ON/FUEL position to begin fueling.

d. When fueling is complete, rotate lever counterclockwise 180° to allow fuel nozzle disconnection.

   NOTE: You will hear a short hissing noise when disconnecting the nozzle. This is the gas between the nozzle and receptacle venting, and should stop in less than 5 seconds.

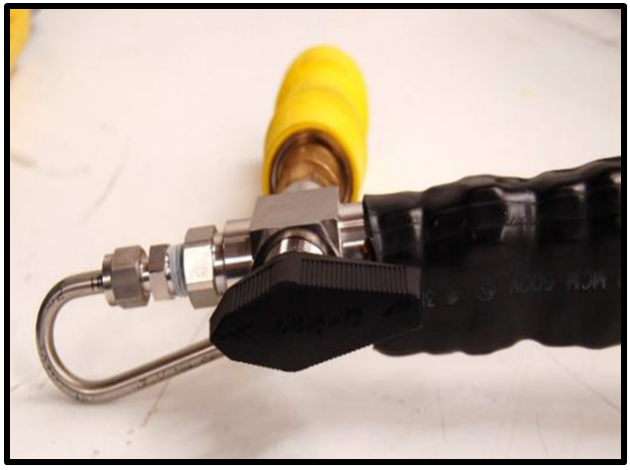

Figure 19. Type 3 Fueling Nozzle

TRANSFER FUELING (DEFUELING) PROCEDURES

Defueling is generally the process of removing any residual fuel from the fuel tanks and on-board fuel delivery system prior to performing any welding or a major repair.

⚠ WARNING

Never weld or perform any hot work that may introduce or produce sparks on a compressed natural gas vehicle unless the compressed natural gas fuel system has been completely defueled and purged with nitrogen.

NOTICE

Defueling shall be performed only by a qualified person using written procedures.

Capturing the CNG in a system that can send it back to a CNG fueling station storage facility for reuse is the most environmentally responsible method. Atmospheric venting of CNG might be against local environmental regulations for your area. Check local laws and regulations before venting CNG to the atmosphere.

Before attempting to defuel a CNG vehicle, read and understand **National Fire Protection Association (NFPA) 52 - 2023 Sections 16.3.4** as they provide a detailed list of requirements to be followed when performing defueling. Also read and understand all of the safety alert messages and procedures in the **Momentum Fuel Management Module Fuel System Operation and Maintenance Manual** and the **Agility/CPI (or equipped fuel cylinder manufacturer) CNG Fuel Cylinder Inspection Manual depending on which cylinders are installed on your vehicle.**

DEFUELING SYSTEM

NOTICE

These instructions apply ONLY to the Heil CNrG Tailgate CNG fuel system installed on Heil Common Body trucks. They are not applicable to any other Heil truck configurations or body types, nor to vehicles manufactured or integrated by other companies.

Defueling procedures for the CNG fuel system vary depending on the specific Heil CNG system design installed on the vehicle. The following sections describe the defueling process for Heil Common Body CNrG Tailgate systems.

NOTICE

This section is ONLY for Heil CNrG Tailgate systems. Refer to the Agility and/or Momentum manuals for their defueling process if you have of these systems installed.

Identification of the Heil Common Body Platform CNrG Tailgate CNG System

To determine whether this manual and the associated procedures apply to your vehicle, visually verify the presence of the components shown in the image below. These components must be installed on the side of the body. If your truck does not have these components, THIS MANUAL DOES NOT APPLY AND MUST NOT BE USED FOR THAT VEHICLE.

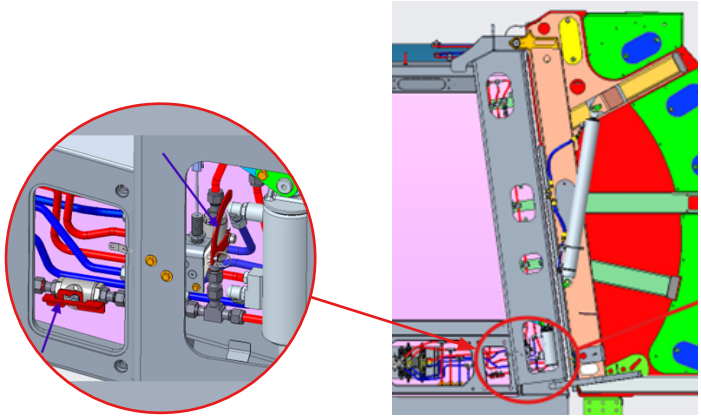

Figure 20.

DEFUELING PROCEDURE FOR HEIL CNrG TAILGATE SYSTEM (COMMON BODY PLATFORM)

NOTICE

ALL TECHNICIANS WORKING WITH CNG SYSTEMS SHOULD BE TRAINED AND QUALIFIED TO DO SO. PLEASE READ THIS PROCEDURE FULLY PRIOR TO BEGINNING ANY WORK.

⚠ DANGER

Never perform any hot-work within 6 feet of any fuel system component without completely defueling the CNG fuel system and components and then purging it with nitrogen. **DO NOT USE COMPRESSED AIR FOR PURGING.** Protect fuel system components from heat damage by either removing or covering the components with a welding blanket or shields rated to 1800°F when working near CNG fuel system or its components. Check for the presence of gas leaks before welding. Welding can ignite the fuel, resulting in an explosion or fire causing serious personal injury or death.

A. Preparation

1. **Initial Focus:** Safety is the primary concern. Remove the fuel from the system BEFORE performing any maintenance procedures on the truck that do not involve working on the CNG fuel system or its components.
2. **Applicability:** This procedure is only applicable to the Heil new CNrG Tailgate system launched in April 2026 Refer to the pictures in the manual to confirm if you have this system or the Heil traditional CNrG Tailgate system before proceeding.

B. Defueling Process

Defueling a CNG vehicle must be a planned event. Whenever possible, ensure the vehicle has not refueled to minimize the amount of fuel onboard that needs to be defueled. Defueling must be conducted following the fuel system OEM's procedures using one of the following methods:

1. **Defueling Panel:** Use a defueling panel at a CNG fueling station to recover the defueled CNG through the CNG station and re-compress it to fill other CNG vehicles.
2. **Fuel Transfer Hose:** Use a fuel transfer hose (truck to truck defueling) to equalize pressure with other CNG vehicles that have lower pressure than the vehicle that needs defueling, then vent or use a defuel panel at a CNG station to empty any remaining CNG.
3. **Defueling Vent Stack:** Use a defueling vent stack that vents the gas greater than 10 feet above ground level and is constructed of 2-inch diameter schedule 80 steel pipe [reference NFPA 52 (2013) 16.3.4.2].

⚠ WARNING

ALWAYS ELECTRICALLY GROUND THE VEHICLE BEING DEFUELED WHEN PERFORMING ANY DEFUELING OPERATION TO DISCHARGE ANY STATIC THAT MAY BUILD DURING THE RAPID FLOW OF FUEL.

DEFUELING PROCEDURE FOR HEIL CNrG TAILGATE SYSTEM (COMMON BODY PLATFORM)

C. Defueling Procedure

1. **Vehicle Setup:** Ensure the vehicle is out of service and cannot be driven. Do not start the vehicle ignition. Park the vehicle outdoors in a well ventilated, designated defueling area where there are no other vehicles, trees, traffic, or other activities within a 50-foot radius. Ensure the ignition is turned OFF, the vehicle is parked on level ground, the parking brake is on, and the wheels are chocked on one axle or more
2. **Grounding:** Establish an electrical ground connection between the cylinders, the vent system, and earth ground.
3. **Cylinder Valves:** Ensure all cylinder manual shutoff valves located on the street side of the CNrG Tailgate behind steel covers are in an OPEN position. See the images below for their **locations, one per CNG cylinder.**

Figure 21. Tailgate Cylinder Valve Locations (One Per CNG Cylinder)

DEFUELING PROCEDURE FOR HEIL CNrG TAILGATE SYSTEM (COMMON BODY PLATFORM)

Figure 22. CNrG Tailgate Cylinder

4. **FMM Valve:** Verify that the Fuel Management Module (FMM) Manual Shut-off Valve located inside the FMM is in the ON position. See **CNG Fuel System Component Locations page 18** and the image below.

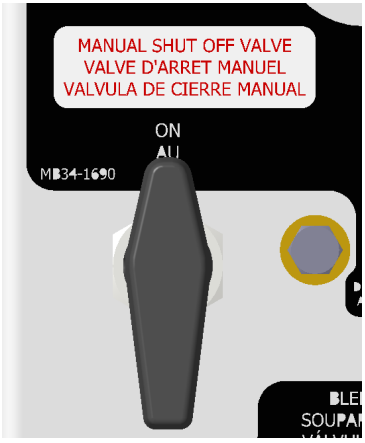

Figure 23. FMM Manual Shut Off Valve

5. **Access Defuel Valve IN FMM:** Open the FMM box door to access the defueling valve and port on the truck.

Figure 24. Design Defuel Valve Location

DEFUELING PROCEDURE FOR HEIL CNrG TAILGATE SYSTEM (COMMON BODY PLATFORM)

6. **Defuel Valve:** Initially, the defuel valve handle will be in OFF position. Turn the 3-way defuel valve handle to the Vent Position. Remove the dust cap from the defuel port.

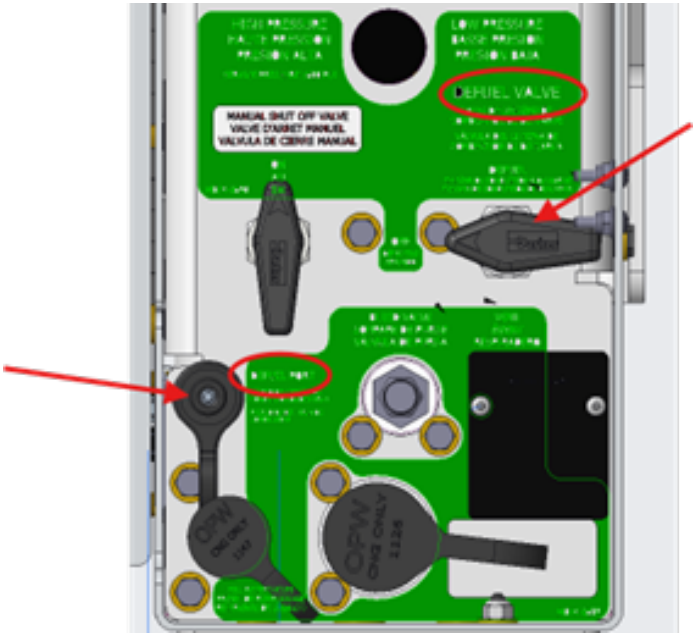

Figure 25. Defuel Valve & Defuel Port

7. **Defueling Quarter - Turn Valve and System Shutoff Valve (Side Bolster)**: Before defueling the truck, verify that the quarter-turn defueling valve located behind the side body panel is open. To open the valve, remove the locking pin and rotate the handle 90 degrees counterclockwise. In addition, ensure that the system quarter-turn shutoff valve located in the skirt is in the OPEN position prior to defueling.

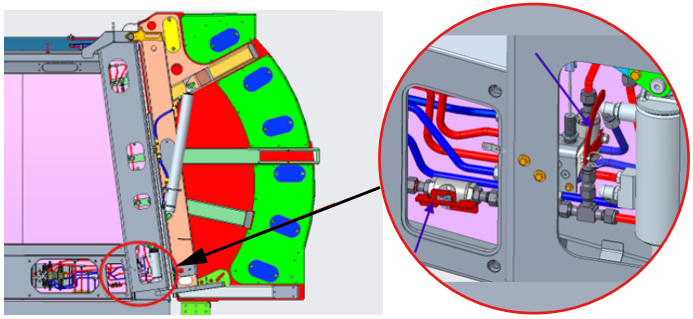

Figure 26. Quarter-Turn Valve and System Shutoff Valve (Side Bolster) Location

The one on the right with curved handle is defueling quarter turn valve (shown in closed/normal operation of truck position) and the one on the left in above picture is the CNG system quarter turn shutoff valve (shown is OPEN position).

D. Defueling Methods (Choose One)

1. Recovering CNG Gas:

a. Connect one end of the defueling hose to the defueling port and the other end to your receptacle at the recovery station using a conductive high-pressure defueling hose. Ensure both ends are properly secured and connected to the mating receptacles.

DEFUELING PROCEDURE FOR HEIL CNrG TAILGATE SYSTEM (COMMON BODY PLATFORM)

b. Slowly turn the three-way defueling valve handle to the DEFUEL position and follow the CNG station's defueling instructions.
Note: Not all CNG station defueling equipment will completely defuel the system. Any remaining pressure must be vented to atmosphere as required.
Verify that the fuel system is fully depressurized by checking the high- and low-pressure gauges in the Fuel Management Module (FMM) and the pressure gauge located inside the tailgate near the bottom edge on the street side.

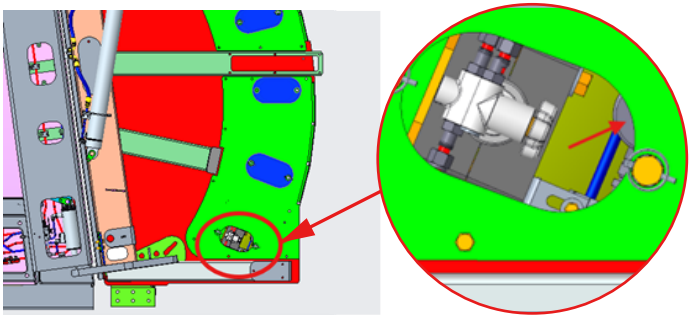

Figure 27. Pressure Gauge Location

2. Transferring to Another Vehicle:

   THIS METHOD ALONE WILL NOT COMPLETELY DEFUEL THE CNG FUEL SYSTEM AND MUST BE USED IN COMBINATION WITH ANOTHER APPROVED DEFUELING METHOD.

   Verify that the receiving vehicle's tank pressure is lower than the tank pressure of the vehicle being defueled. Using a conductive, high-pressure defueling hose, connect one end to the defueling port and the other end to the fill receptacle on the receiving vehicle. Ensure both connections are fully seated and secured to the mating receptacles. Slowly rotate the three-way defuel valve handle to the Defuel position and allow the pressures in both vehicles to equalize. After pressure equalization is complete, use one of the other approved defueling methods listed below to remove the remaining fuel from the source vehicle.

3. Venting to Atmosphere:

   Before proceeding, verify with the local authority having jurisdiction that this defueling method is permitted. Connect one end of the vent hose to the defueling port and the other end to the vent stack receptacle. Ensure the vent stack opening is oriented vertically upward and directed away from personnel, equipment, and other hazards. Slowly rotate the three-way defuel valve handle to the Defuel position, regulating the gas flow to maintain a steady rate and prevent system icing.

E. Defueling

   Vent the gas to the atmosphere, recover it to the fueling station, or transfer it to another vehicle.

⚠ WARNING

Ensure to check your local jurisdiction before venting to the atmosphere.

DEFUELING PROCEDURE FOR HEIL CNrG TAILGATE SYSTEM (COMMON BODY PLATFORM)

F. Post-Transfer:

If you have transferred fuel to another vehicle, disconnect the defuel hose from the second vehicle and vent any remaining CNG to the atmosphere or utilize a defuel station.

G. Purge System:

Purge the system to the atmosphere at least 3 times at 100 psi with nitrogen to ensure no residual gas is left. Verify with a methane detector that the gas coming out when purging has less than 1% methane/CNG content. If the methane detector triggers the alarm, repeat the purge procedure and retest.

H. Completion:

After defueling is complete, slowly rotate the three-way defuel handle to the Vent position. Disconnect the defuel hose nozzle from the defuel port. Slowly rotate the three-way defuel handle to the OFF position. Close the defuel port dust cap and close the FMM door. Close the defuel quarter-turn valve that was opened on the side of the vehicle body and insert the locking pin into the valve handle. Failure to complete this step will prevent the vehicle from starting. Verify that the quarter-turn system shutoff valve, located near the rear of the vehicle body on the street-side skirt, is in the ON/OPEN position.

I. Verification:

Verify that the system is fully defueled by checking the pressure gauges located near the bottom tank/bottom side of the tailgate on the street side and inside the FMM enclosure (both high- and low-pressure gauges). When all gauges indicate 0 pressure, open the bleed valve in the FMM to release any residual gas in the lines. After bleeding is complete, retighten the bleed valve to the specified torque listed in the service manual. Open the drain valve on the engine low-pressure fuel filter to vent the remaining 80–100 psi from the low-pressure side of the engine fuel system.

J. Lock-Out/Tag-Out:

Follow proper Lock-Out/Tag-Out procedures. The truck is now ready for maintenance work.

K. Repositioning:

If required to reposition the vehicle for further maintenance, tow the vehicle according to chassis maker service procedures.

L. Hot Work:

Cover or protect CNG system components with proper welding blankets or shielding material before doing any kind of maintenance/hot work near them. If covering the CNG system components is not possible, uninstall them before performing any hot work.

M. Inspection:

After any work on the fuel system is complete, inspect all components for damage.

CNG FUEL SYSTEM MAINTENANCE

Routine maintenance of the compressed natural gas system in accordance with the CNG Fuel System Inspections Section will ensure that the system and components are functioning properly. Refer to your Heil Service Manual for CNG fuel system schematics.

⚠ WARNING

1. Only qualified personnel shall be permitted to perform maintenance on CNG systems.
2. No pressure relief valve that has been in service shall be repaired or reworked without the written authorization of the pressure relief device manufacturer, valve manufacturer, fuel cylinder manufacturer, or vehicle manufacturer. Any device that has been activated shall not be reworked or reused and shall be removed from service.
3. No pressure relief device that has been in service shall be reinstalled on another fuel cylinder.

⚠ WARNING

A qualified person performing installation, repair, and maintenance work or system inspection shall be properly trained in such functions. Where required, the training and licensing shall comply with local requirements.

NOTE: Local requirements can consist of provincial regulations or other requirements of AHJ.

⚠ WARNING

Reinstall cylinders to their original configuration using approved gaskets, bolts, nuts, washers, and parts in accordance with the recommendations of the vehicle or cylinder manufacturer or system installer.

⚠ WARNING

System components must not be under pressure during servicing. Servicing components under pressure may cause serious injury.

⚠ DANGER

Never perform any hot-work within 6 feet of any fuel system component without completely defueling the CNG fuel system and components and then purging it with nitrogen. DO NOT USE COMPRESSED AIR FOR PURGING. Protect fuel system components from heat damage by either removing or covering the components with a welding blanket or shields rated to 1800°F when working near CNG fuel system or its components. Check for the presence of gas leaks before welding. Welding can ignite the fuel, resulting in an explosion or fire causing serious personal injury or death.

CNG FUEL SYSTEM MAINTENANCE

⚠ WARNING

Never weld on or perform any hot work that may introduce or produce sparks on any part of a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with nitrogen.

⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb in or on the body or on equipment. The unit can be operated intentionally or accidentally when the unit is not in the Lock-Out/Tag-Out mode which can cause serious injury or death to anyone in the hopper, in or on the body or on equipment.

⚠ WARNING

Maintenance of a compressed natural gas system is to be performed ONLY by authorized service personnel. Unauthorized maintenance can result in personal injury and/or extensive damage to the unit.

MAINTENANCE PART NUMBERS

When replacing CNG components, replace with equal or higher pressure rated components.

Customers should replace the FMM with the version/Part Number that is currently on their truck.

PART	NUMBER DESCRIPTION
151-4785	Smart Fuel Management Module

Note: For a complete breakdown of the FMM and CNG system, refer to the Parts Central Electronic Parts Catalog (EPC).

Register online to gain access to the EPC:

https://epc.partscentral.com

Google Chrome web browser is recommended.

DEPRESSURIZING PROCEDURE FOR HEIL CNG TAILGATE SYSTEM

It is necessary to prepare the truck to be serviced. A mechanic's initial focus while preparing the vehicle for service should be **safety.** The primary preparation involves relieving the pressure within the system BEFORE performing any maintenance procedures on the truck that does not involve working on or near CNG fuel system or its components. Use the following procedure to remove fuel pressure from the lines connected to the high-pressure filter assembly.

⚠ WARNING

After following the Depressurization Procedure, pressure will still remain inside the fuel cylinder(s). Use care when loosening fittings for the first time. DO NOT open any cylinder Manual Shut-Off Valves after any CNG fitting, connection, or component is loosened or disassembled

⚠ WARNING

Never weld or perform hot work on a compressed natural gas (CNG) vehicle unless the fuel system is fully defueled and purged with nitrogen. Avoid welding near fuel system components. If working nearby, protect them with approved shielding or remove them. Always check for gas leaks before welding—ignition can cause fire or explosion, leading to serious injury or death.

1. Make sure that the vehicle ignition is turned OFF, vehicle parked on level ground, parking brake on, wheels chocked on one axle or more.
2. Close ALL cylinder Manual Shut-Off Valves (one on each cylinder) by turning the valve clockwise to the OFF position.

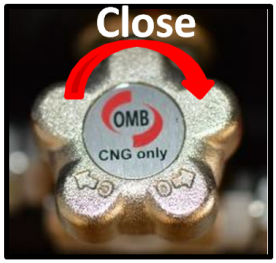

Figure 28. Cylinder Manual Shut-Off Valve

⚠ WARNING

Pressure still remains inside the fuel cylinder(s). Use care when loosening fittings for the first time. Do NOT open the fuel cylinder valves or loosen any fitting / PRD installed in any of the cylinder(s) valve live ports.

3. Verify that the FMM Manual Shut-Off Valve is in the ON position.

Figure 29.

DEPRESSURIZING PROCEDURE FOR HEIL CNG TAILGATE SYSTEM

4. Verify that the quarter turn system shutoff valve at side of the body on street side is in ON position.

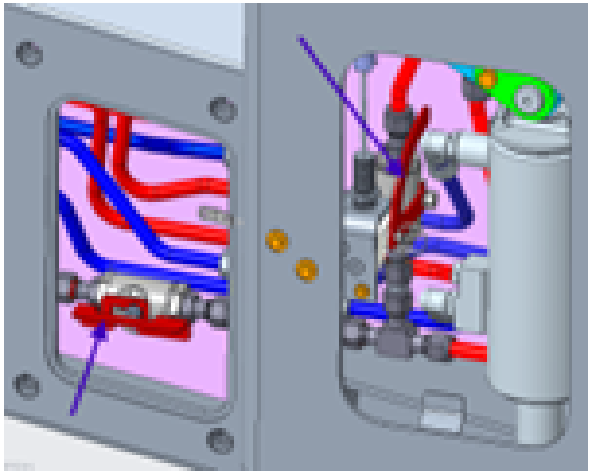

Figure 30.

5. Start the vehicle and let the engine run until it stops. The gauge on the high pressure side should show 0 psi.
6. Turn the vehicle ignition switch OFF.
7. Slowly relieve residual/remaining pressure left in the CNG lines/ components by turning the bleed valve cap on the FMM counterclockwise.
8. Check FMM gauge to ensure all pressure is relieved on high pressure side. The gauge on the high pressure side should show 0 psi. Wait for 10 minutes to ensure the pressure remains at 0 psi and does not rise on the pressure gauge.
9. Slowly open bleed/drain valve on Cummins low pressure filter. Close the FMM door to be able to start the truck. Turn the ignition ON and crank the engine 2-3 times with bleed/drain valve open to bleed the trapped gas in low pressure line.

   NOTE: If there are two Cummins low pressure filters on the chassis, bleed/drain both of them.

   NOTE: Close the valve on both Cummins low pressure filters if you have two of them.
10. Make sure the high pressure and low pressure gauges in the FMM read 0 psi.
11. Turn the vehicle ignition switch OFF. Follow the vehicle manufacturer's recommended vehicle lockout procedures. Remove the ignition key.
12. Once this process is complete, the system will be fully depressurized between the fuel cylinder valves and vehicle engine. Pressure remains inside the fuel cylinders, therefore, do NOT open the fuel cylinder valves or loosen any fitting / PRD installed in any of cylinder(s) valve live ports.
13. Use a welding blanket to shield the fuel system from slag and sparks generated during welding or other hot work operations.

⚠ WARNING

Pressure still remains inside the fuel cylinder(s). Use care when loosening fittings for the first time. Do NOT open the fuel cylinder valves or loosen any fitting / PRD installed in any of the cylinder(s) valve live ports.

RE-PRESSURIZING PROCEDURE FOR HEIL CNG TAILGATE SYSTEM

Once the high-pressure filter drain or change procedure is complete, perform the following procedure to re-pressurize the lines.

1. Make sure that the vehicle is OFF. Take the keys out of the ignition.
2. Close the bleed valve and torque the fitting to 4-5 FT-LBS (48-60 in-lbs).
3. Check that the filter bowl and the drain plug are installed and tightened. Close the bleed/drain valve on Cummins low pressure filter.
4. Check that the FMM Manual Shut-Off Valve and quarter turn system shutoff valve on side of the body are in the ON position
5. Verify that the defueling quarter-turn valve on the side of the vehicle body is in the OFF/CLOSED position and that the locking pin is inserted in the valve handle. Failure to complete this step will prevent the vehicle from starting.
6. On ONE cylinder ONLY, slowly rotate the manual shutoff valve counterclockwise until a slight hissing sound is heard or gas flow is felt. Do not open the valve further. Allow the fuel lines to fully pressurize and wait until gas flow stops. This step is critical to prevent activation of the excess-flow device on the side of the vehicle body.
7. Verify that the pressure inside the cylinder has equalized with the pressure in the fuel lines by checking the gauges in the FMM enclosure and on the tank. Once equalization is confirmed, fully open the valve on that tank, then open the valves on all remaining tanks.
8. Open the valve on that tank completely now and also open the valves on all other tanks.
9. Follow the vehicle manufacturer's recommended vehicle lock-out procedures to unlock the vehicle. Close the FMM door.
10. Insert the ignition key and start the engine to verify everything operates as expected. Remove the ignition key.

⚠ WARNING

Never use compressed air as an alternative to nitrogen to purge the CNG lines or CNG fuel system.

HIGH PRESSURE FILTER DRAIN AND CHANGE

High Pressure Filter Drain Procedure

1. Remove the excess fuel in the filter per the **Depressurizing Procedure**.
2. Make sure the FMM Manual Shut-Off Valve is in the OFF position.
3. Locate and access the high pressure coalescing filter inside the filter service access door. The filter location will vary, depending on the system configuration.
4. Locate the drain plug at the bottom of the filter. Position a suitable drain pan beneath the filter drain port to capture any liquid contained in the filter.
5. Remove the plug and allow the liquid inside the filter to drain.
6. Re-install the drain plug and torque to 27 FT-LBS.
7. Follow the repressurizing procedure in this manual for the system applicable on your truck.

High Pressure Filter Change Procedure

1. Remove the excess fuel in the filter per the **Depressurizing Procedure**.
2. Ensure the FMM Manual Shut-Off Valve is in the OFF position.
3. Locate and access the high pressure coalescing filter inside the service access door/panel. The filter location will vary, depending on the system configuration.
4. Unscrew and remove the filter bowl from the filter housing. Note the filter is equipped with wrench flats to assist removal.
5. Empty and clean the filter bowl.
6. Remove the filter element by grasping and pulling it downward out of the filter housing. Place the new filter element into position and press it into place.
7. Install a new o-ring (supplied with the filter element) into the groove on the filter housing, using lubricant supplied in the kit.
8. Re-install the filter bowl in the filter housing and torque to 40 FT-LBS.
9. Follow the Repressurizing procedure in this manual for the system applicable on your truck.

WELDING AND HOT WORK PROCEDURES

⚠ WARNING

Never weld or perform any hot work that may introduce or produce sparks on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with nitrogen.

⚠ DANGER

Never weld on any fuel system components. Welding can ignite the fuel, resulting in an explosion or fire causing serious personal injury or death.

A. If any welding or 'hot work' (i.e., any work that involves burning or use of tools that produce a spark, flame, or source of ignition) is required on a CNG fuel vehicle excluding the CNG fuel system within 6 feet of fuel system/components, you must perform the following procedures:
   1. Conduct work in a well-ventilated area.
   2. Perform defueling procedure as instructed in this manual.
   3. Purge the CNG fuel system with inert nitrogen, including the tanks.
   4. Use a welding blanket to protect the fuel system from slag and sparks produced from welding and hot work operations.
   5. Once the work is finished, refuel the system and make sure it's running as expected.

B. If welding or other hot work (work involving burning or tools that generate sparks, flames, or other ignition sources) is required on a CNG-fueled vehicle fuel lines should be depressurized where feasible, excluding the CNG fuel system and components beyond 6 feet. A welding blanket must also be used to protect the fuel system from slag and sparks generated during hot work. If depressurizing the fuel lines is not feasible to complete the required repairs, the entire fuel system must be defueled and purged.

LIFTING AND TOWING THE VEHICLE

Lifting

⚠ WARNING

Never use any part of the fuel system as a lifting point to raise the vehicle. Do not allow fuel system components to come into contact with any part of the lifting device. The fuel system can become damaged, resulting in a leak. Serious personal injury or death can occur if the gas is ignited.

Always raise the vehicle using the lifting points recommended by the vehicle manufacturer. Refer to the vehicle manufacturer's instructions for correct lifting instructions.

Towing

⚠ WARNING

Do not attach towing equipment to or allow towing equipment to come into contact with any part of the fuel system. The fuel system can become damaged, resulting in a leak. Serious personal injury or death can occur if the gas is ignited.

Before towing the vehicle, close the Manual Shut-Off Valves on the FMM and all fuel cylinders.

Once the fuel system is shut down, follow the vehicle manufacturer's instructions for towing the vehicle.

PRE-TRIP & POST-TRIP INSPECTIONS

Pre-Trip

Perform a Pre-Trip Inspection each day before driving the vehicle.

1. Verify the Manual Shut-Off Valve on the FMM is in the ON position.
2. Verify that the defueling quarter-turn valve on the side of the body is in the OFF position and that the handle pin is installed
3. Verify that the quarter turn system shutoff valve on side of the body is in ON position
4. Check the high-pressure gauge on the FMM to ensure it is operating and reading in a range consistent with the fuel gauge on the dash board. The fuel system maximum pressure is 3,600 psi.

   NOTE: Pressure of less than 250 psi could make the engine run rough.
5. Check the vent ports and vent caps for any signs the PRDs have been activated. Verify the vent ports and vent caps are clear of debris or damage.
6. Check the entire fuel system for any signs of damage or wear. Include checks for:
   a. Gas leaks – Smell for gas, look for frost or ice, and listen for hissing noises at joints and components.
   b. Look for external damage to housings and covers.
7. Drain the low pressure filters per the engine manufacturer's recommendation.
8. Turn the ignition key to ON and check that the low pressure gauge reading is approximately 85-150 psi.
9. Verify the dashboard fuel gauge is functioning properly.
10. Have the fuel system and cylinders inspected by a certified CSA Cylinder and Fuel System Inspector if damage is found on any part of the components or structural parts of the fuel system.

Post-Trip

Perform a Post-Trip Inspection each day after driving the vehicle.

1. Verify the Manual Shut-Off Valve on the Fuel Management Module (FMM) is returned to the OFF position.
2. Verify the quarter-turn system shutoff valve on the side of the body is returned to the OFF position.
3. Check the high-pressure gauge on the FMM to ensure it is operating properly and indicates a pressure consistent with the dashboard fuel gauge. Maximum fuel system pressure is 3,600 psi.

   NOTE: Pressure below 250 psi may cause rough engine operation.
4. Inspect vent ports and vent caps for indications that pressure relief devices (PRDs) have activated. Ensure vent ports and caps are free of debris and damage.
5. Inspect the entire fuel system for signs of damage or wear, including:
   - Evidence of gas leaks (odor, frost or ice formation, or hissing sounds at joints and components).

PRE-TRIP & POST-TRIP INSPECTIONS

- External damage to housings and protective covers.

6. Drain the low-pressure filters in accordance with the engine manufacturer's recommendations.
7. Turn the ignition key to ON and verify a low-pressure gauge reading of 85–150 psi.
8. Verify proper operation of the dashboard fuel gauge.
9. Turn the ignition key to OFF.

WEEKLY SYSTEM INSPECTION

Perform the Weekly System Inspection to ensure the system is operating correctly, safely, and to maximize component performance.

1. Verify all of the cylinder Manual Shut-Off Valves move freely and are in the ON position.
2. Visually inspect the fuel system for any signs of damage or wear.
3. Check for damage on the cylinder shields and covers.
4. Check to ensure the cylinders are mounted securely. Inspect the mounts, brackets, rubber isolators, and all fasteners.
5. Check for leaks on all CNG fuel plumbing tubes, hoses, and fuel flow components. Check for the odor of rotten eggs. Look for frosting or the sound of hissing at valves and fittings.
6. If any system components or structural parts are damaged, the system and cylinders must be inspected by a certified fuel system inspector.

CNG FUEL SYSTEM INSPECTION/PREVENTIVE CARE SCHEDULE

ITEM	FREQUENCY
Check Vent Lines	Daily
Drain Low Pressure Filter	Daily
Perform **"Daily CNG Fuel System Inspection" on page 49**.	Daily
Replace Low Pressure Filter	Refer to the engine manufacturer for maintenance and replacement guidelines.
Drain High Pressure Filter	Weekly
Replace High Pressure Filter Element	At regular oil change intervals or every 30,000 miles
Inspect Vent Lines	Every month (or immediately if vent cap is missing. MUST replace with new vent cap)
Leak Test with Methane Detector	Monthly, or if involved in any accident, or if you smell gas.
Component Inspection	Monthly
Cylinders	Inspect compressed gas cylinders as outlined by cylinder manufacturer
NOTE: All inspections to be completed by a qualified and trained person.	

CNG FUEL CYLINDER AND SYSTEM INSPECTION

⚠ WARNING

If a CNG-fueled vehicle has been involved in an accident or fire, the system and cylinders must be inspected by a certified CNG fuel system inspector. The system shall be repaired and retested before being returned to service.

NOTICE

Inspections must be performed by qualified inspectors using guidelines from the fuel cylinder manufacturer in addition to the guidelines listed here.

1. Based on cylinder manufacturer recommendations, FMVSS 304, and industry standard practices, visual CNG cylinder inspections should be performed every 12 months by a qualified inspector.
2. In addition, Heil recommends a daily walk-around or pretrip and post-trip visual inspection be performed.
3. The qualified person performing the repair and retesting shall prepare a document certifying that the CNG fuel system is acceptable for return to service and present the document to be retained by the vehicle's owner/operator and a copy to be retained by the qualified person.By license number or vehicle identification number, the document shall identify the vehicle CNG fuel system parts worked on, describe the work done and dates of work, and provide the qualified person's name and contact information.

DAILY CNG FUEL SYSTEM INSPECTION

Inspect the following items each day before vehicle operation:

1. Make sure all manual tank valves and the emergency shutoff valve on the FMM and the side of the body are in the OPEN position.
2. Verify that the quarter-turn defueling valve on the side of the body is in good condition, in the OFF position, and that the handle pin is installed.
3. Check the high pressure gauge in the FMM Box to make sure enough fuel is on-board and refuel if necessary.
4. Drain the low pressure filters located at engine per the engine manufacturers' recommendation.
5. Turn the ignition key to the on position, and watch the low pressure gauge. It should show between 60-100 psi.
6. Check the dashboard fuel gauge to make sure it is functioning.
7. Check the entire fuel system for any signs of damage or wear. Include checks for:
   a. Gas leaks – Smell for gas, look for frost or ice and listen for hissing noises at joints and components.
   b. Pressure Relief Device (PRD) components – Make sure all PRD vent line caps are in place.
   c. Structural damage – Housings, covers bent or damaged, fasteners missing or loose, check inside of tailgate for dents over 1/4" deep, or punctures.
8. Check the FMM door sensor interlock by opening the door and trying to start the vehicle. The vehicle should not start.
9. Check the auxiliary fill locations (if applicable) by removing the dust cap from the receptacles one at a time and trying to start the vehicle. The vehicle should NOT start.
10. Check the defueling valve on the side of the body by removing the pin from the handle and turning the valve to the ON/OPEN position. The vehicle should NOT start.
11. Verify that the pressure gauges inside the tailgate on the street side near the bottom tank are in good working condition.
12. If any system components or structural parts are damaged, perform a detailed inspection. If any damage is found, a qualified CNG system technician should make the necessary repairs. If no damage is found, the vehicle is cleared for normal operation.

DAILY CNrG TAILGATE FUEL SYSTEM INSPECTION

Inspect the following items each day before vehicle operation. If all items pass inspection, the vehicle is cleared for operation. If any issues are identified, a qualified CNG System Technician should make the necessary repairs.

1. Inspect all CNrG Tailgate guards and covers for damage. If damage is detected, a certified technician shall perform a detailed visual inspection.
2. Remove the oblong access covers secured with lock pins.

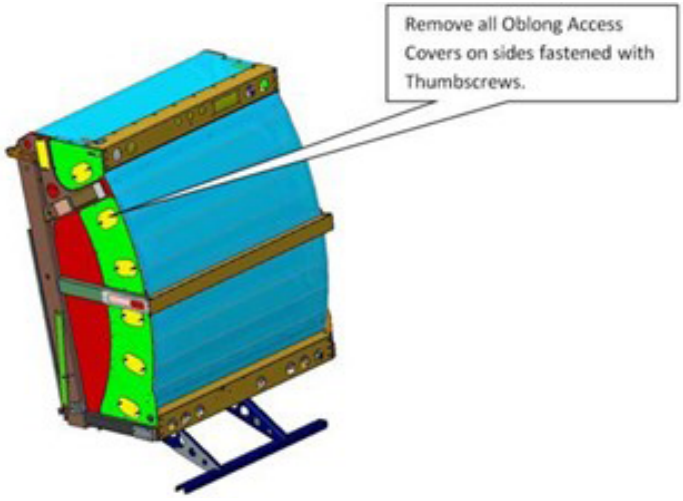

Figure 31. Tailgate Access Covers

3. Thoroughly pressure wash inside (refuse side) of tailgate and inspect for any dents over 1/4” in depth, or punctures.
4. Make sure cylinders mounts are secure. Check mounts and all fasteners for tank mounting.

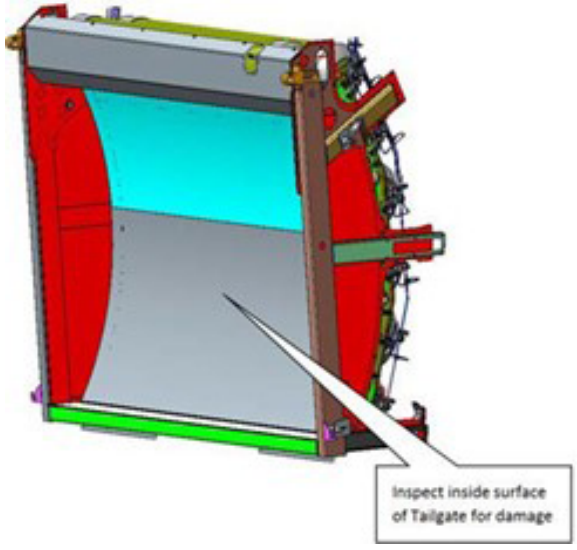

Figure 32. Inside Tailgate Surface

5. Verify cylinder labels are in place and for each cylinder, make sure cylinder service life has not expired.
6. Inspect cylinder valves and PRDs for leaks and damage.
7. Visually inspect all accessible CNG components and make sure there is no damage or leaks. A CNG gas leak detector is recommended.
8. If any damage is found, detailed visual inspection shall be followed by a certified technician.

CNG FUEL SYSTEM TROUBLESHOOTING

Heil offers support via the technical assistance line to assist with troubleshooting.

Please provide the following when calling Heil Technical Services at 866-310-4345 with troubleshooting questions:

1. Serial # of CNG Fuel Module
2. Truck Serial #
3. Details of:
   - When the problem started
   - What the problem entails
   - Any troubleshooting performed
   - Results of troubleshooting actions

CNG FUEL SYSTEM TROUBLESHOOTING

The following table lists possible problems, along with causes, corrections, and results.

PROBLEM OBSERVED	POSSIBLE CAUSES	CORRECTIVE/ DIAGNOSTIC ACTIONS	RESULTS AND OTHER ACTIONS
Vehicle's starter will not operate.	Interrupt door switch signal is not being properly recognized by the vehicle.	Disconnect the 12-pin electrical connector at the rear of the fuel module. Use an ohm meter or continuity tester across pins 9 (GRN) and 10 (YEL) of the fuel module side of the connector (female connector). Press and release the fuel module interrupt door switch. When the switch is depressed, there should be continuity between pins 9 (GRN) and 10 (YEL). Continuity should be lost when the switch is released.	If operation of the door switch makes and breaks continuity as described, and the starter will not operate, there is most likely a problem in the vehicle's wiring. If the operation of the door switch does NOT make or break continuity as described, there is most likely a wiring problem in the fuel module. If the problem cannot be resolved, call **866-310-4345** for technical assistance.

CNG FUEL SYSTEM TROUBLESHOOTING

The following table lists possible problems, along with causes, corrections, and results.

PROBLEM OBSERVED	POSSIBLE CAUSES	CORRECTIVE/ DIAGNOSTIC ACTIONS	RESULTS AND OTHER ACTIONS
Vehicle's starter operates but the vehicle does not run.	Fuel is not making it through the fuel module to the engine.	*The manual valve on the front of the fuel module should be set to "On". *The fuel module high pressure gauge should read above 5000 psi. Disconnect the 12-pin electrical connector at the rear of the fuel module. Use a DC voltmeter across pins 8 (BLU) and 9 (GRN) of the vehicle side of the connector (male connector). The voltage should read: Ignition switch "Off" 0 vdc. Ignition switch "Run" 12 vdc. Ignition switch "Start" 12 vdc. *Reconnect the 12-pin electrical connector at the rear of the fuel module. Have an assistant repeatedly cycle the ignition switch between "Off" and "Run" while listening for the "click" of the fuel solenoid being actuated near the maintenance door.	*If the voltage does NOT change as described, the problem is most likely located in the vehicle's electrical signal that actuates the fuel solenoid. *If the voltage changes as described and the "click" of the fuel solenoid is detected, the problem is most likely an engine control problem prohibiting the vehicle from starting. *If the voltage changes as described but the "click" of the fuel solenoid is NOT detected then the problem is most likely a failed solenoid in the fuel module. *If the problem cannot be resolved, call **866-310-4345** for technical assistance.

CNG FUEL SYSTEM TROUBLESHOOTING

The following table lists possible problems, along with causes, corrections, and results.

PROBLEM OBSERVED	POSSIBLE CAUSES	CORRECTIVE/ DIAGNOSTIC ACTIONS	RESULTS AND OTHER ACTIONS
Heil Standard CNrG Tailgate System Options In-cab fuel gauge does not indicate the fuel level correctly.	The fuel module pressure transducer, the fuel gauge or the interconnecting wiring may be defective.	Confirm that the 12-pin electrical connector at the rear of the fuel module is connected and place the vehicle's ignition switch in the "Run" position. Use a voltmeter to read: • Voltage between connector positions 2 (RED) and 3 (BLK). the voltage should be 12 vdc. • Voltage between connector positions 3 (BLK) and 4 (WHT). the voltage should be between 0.5 to 5.0 vdc.	*If the voltage across 2 and 3 is 0 or significantly below battery voltage, there is a problem with the vehicle's wiring not supplying power to the fuel module's pressure transducer. *If the voltage across 3 and 4 is either 0 or 5.5 vdc, the fuel module's pressure transducer is most likely defective. Call **866-310-4345** for technical assistance. *If the voltage across 3 and 4 is between 0.5 to 5.0 vdc then the fuel module's pressure transducer is operating correctly. The problem is likely in the vehicle's wiring or the in-cab fuel gauge. *If the problem cannot be resolved, call **866-310-4345** for assistance.

CNG FUEL SYSTEM TROUBLESHOOTING

Perform this troubleshooting procedure below. If you have any questions, call Heil Technical Services at 866-310-4345.

A. Operating Instructions to open the Manual Shutoff Valve if service was performed downstream of the valve and system was defueled.

When a unit is defueled downstream of the manual shutoff valve located in FMM (Fuel Management Module), the following procedure must be followed to refill the empty line and to open the shutoff valve in FMM (Fuel Management Module). See Figure FMM below. for the FMM (Fuel Management Module). In the figure below, you will see the arrow pointing to the quarter turn manual shutoff valve (currently in the ON position which is during normal operation of the unit).

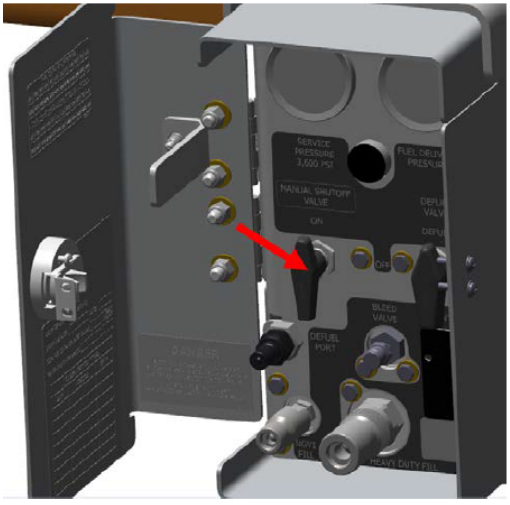

Figure 33. FMM (Fuel Management Module) Box

1. Make sure all fittings, connections and lines are securely tightened and leak checked before moving forward.
2. Initially the manual shutoff valve in FMM should be in the OFF position. If the line was defueled by a technician for service purposes, it would show no pressure in low pressure gauge and some pressure in the high-pressure gauge in the FMM box.
3. To pressurize the downstream CNG line without activating the excess flow valve, remove the retaining pin from the quarter-turn defueling valve handle located on the street side of the body and open the valve. Slowly rotate the manual shutoff valve in the FMM box from OFF to ON until the line is fully pressurized and gas flow downstream stops.
4. Make sure that the truck key is in ignition ON position for the solenoid to open and let the gas flow downstream when you are doing this procedure.
5. Once the line is fully pressurized and downstream gas flow has stopped, return the defueling valve on the street side of the body to the OFF/CLOSED position. Reinstall the retaining pin in the valve handle.

CNG FUEL SYSTEM TROUBLESHOOTING

6. Monitor the gas pressure on low pressure side to make sure that it remains constant and does not drop down below 70 psi when you run the truck for few minutes on idle. This MUST be completed before going on route or driving on the road. This is to confirm that the excess flow device did not get triggered accidentally and shut down the fuel supply downstream of the excess flow device.

B. Troubleshooting a Shutdown Unit From Accidental Trigger of the Excess Flow Valve

When the steps mentioned in the procedures in this manual above are not followed for units equipped with the excess flow valve, the excess flow valve might trigger accidentally/unintentionally which will lead to shutdown of fuel supply to the engine and shutdown the unit. Follow the steps listed below to reset the excess flow valve again to allow fuel to the engine:

1. To open the excess flow valve, the main supply line downstream of the valve must be refilled until the upstream and downstream pressures equalize. This is accomplished by opening the defueling quarter-turn valve on the side of the body. Remove the retaining pin and allow the pressure to build until the pressure indicated on the FMM box gauge matches the pressure shown on the gauge near the tank valve in the tailgate. Once the pressures have equalized, return the defueling valve on the side of the body to the OFF/CLOSED position and reinsert the retaining pin into the valve handle.
2. Once this happens, the excess flow valve will open up and the unit should have fuel to operate. To verify the excess flow valve has been reset, allow the vehicle to idle for
3. Once this happens, the excess flow valve will open up and the unit should have fuel to operate. To verify the excess flow valve has been reset, allow the vehicle to idle for 5-10 minutes and monitor high and low pressure gauges to ensure they remain constant and do not drop. Low pressure gauge should read between 60-100psi.

NOTICE

An alternative option is to keep the truck down for a few minutes to an hour, allowing the excess flow valve to slowly bleed gas downstream. This valve has a bleed rate of approximately 1% or less, which gradually equalizes the pressure on both sides and allows it to open. You can verify this by checking the high-pressure gauge in the FMM box and comparing it to the individual pressure gauges on each tank to ensure they all read the same pressure, with no pressure differential. You can also connect the truck to fill station/pony tank (if this option is viable) and fill the supply line downstream of excess flow till it equalizes with tank pressure.

CNG FRONT OF BODY / TOP OF BODY DECAL PLACEMENT

In addition to the decal shown below, there may be other decals placed on the Fuel Management Module (FMM), tank compartments or elsewhere on the CNG system components. Refer to the CNG Fuel System Manufacturer's Operation and Maintenance Manuals for replacement decal part numbers.

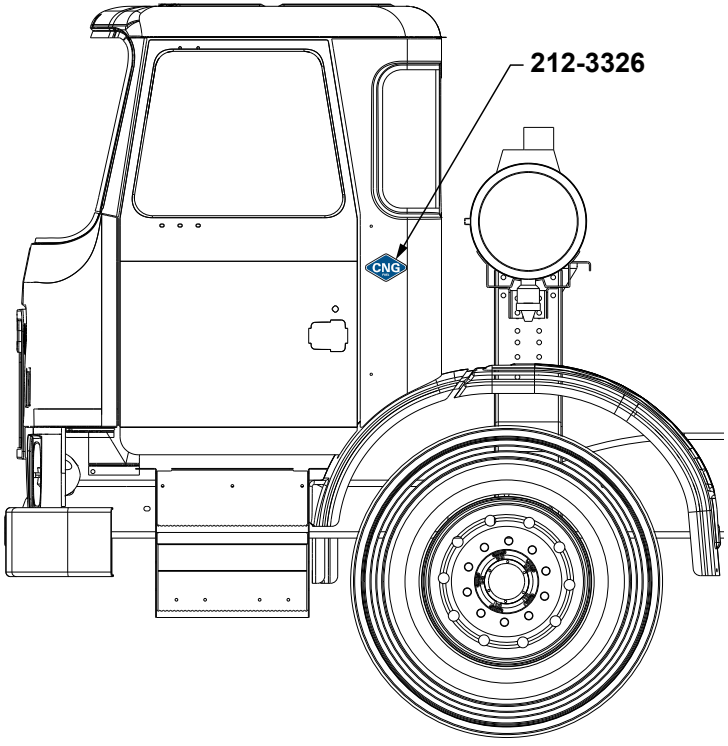

Figure 34. Front Side Decal

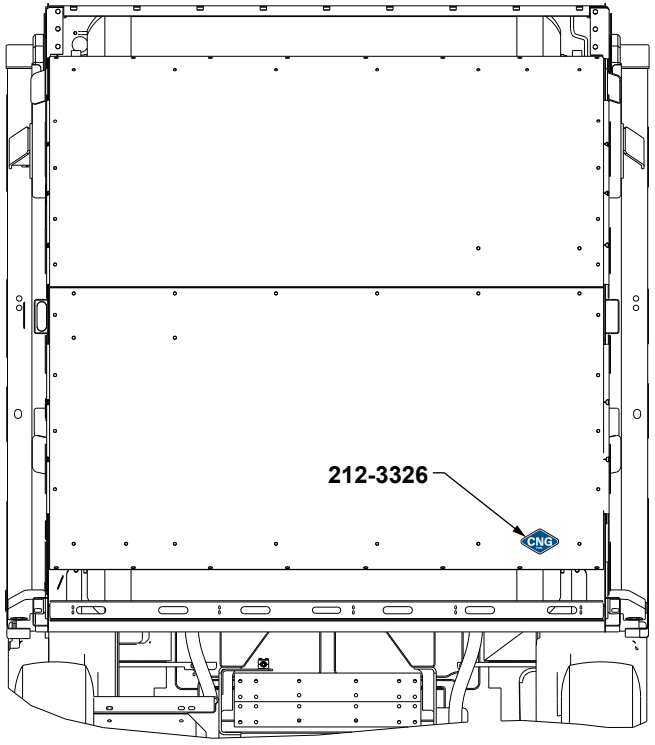

Figure 35. Rear Decal

CNrG TAILGATE DECAL PLACEMENT

In addition to the decals shown below, there may be other decals placed on the Fuel Management Module (FMM), tank compartments or elsewhere on the CNG system components. Refer to the CNG System Manufacturer's Operation and Maintenance Manuals for replacement decal part numbers.

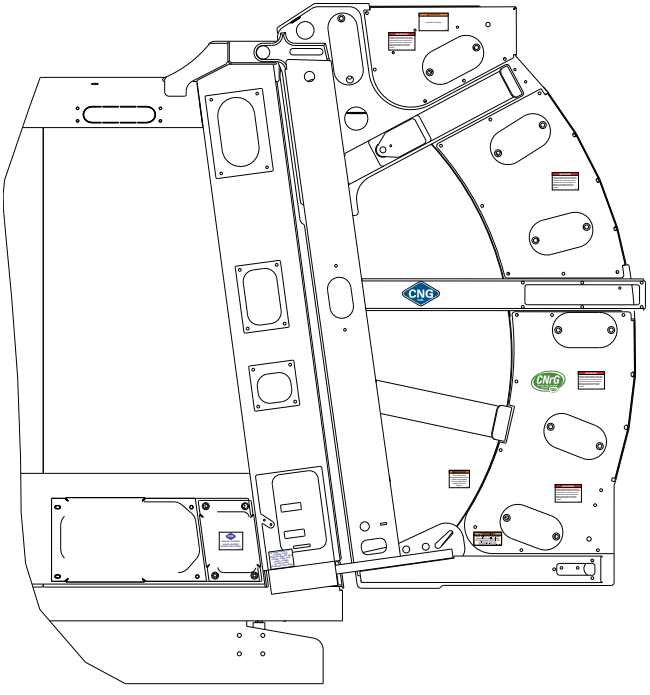

Figure 36. Side Rear Decal

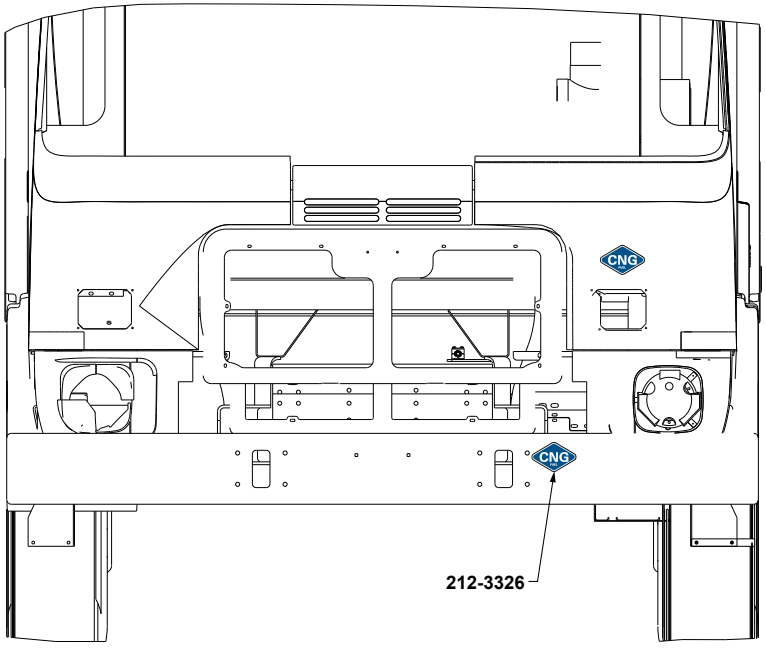

Figure 37. Front Bumper Decal

CNrG TAILGATE DECAL PLACEMENT

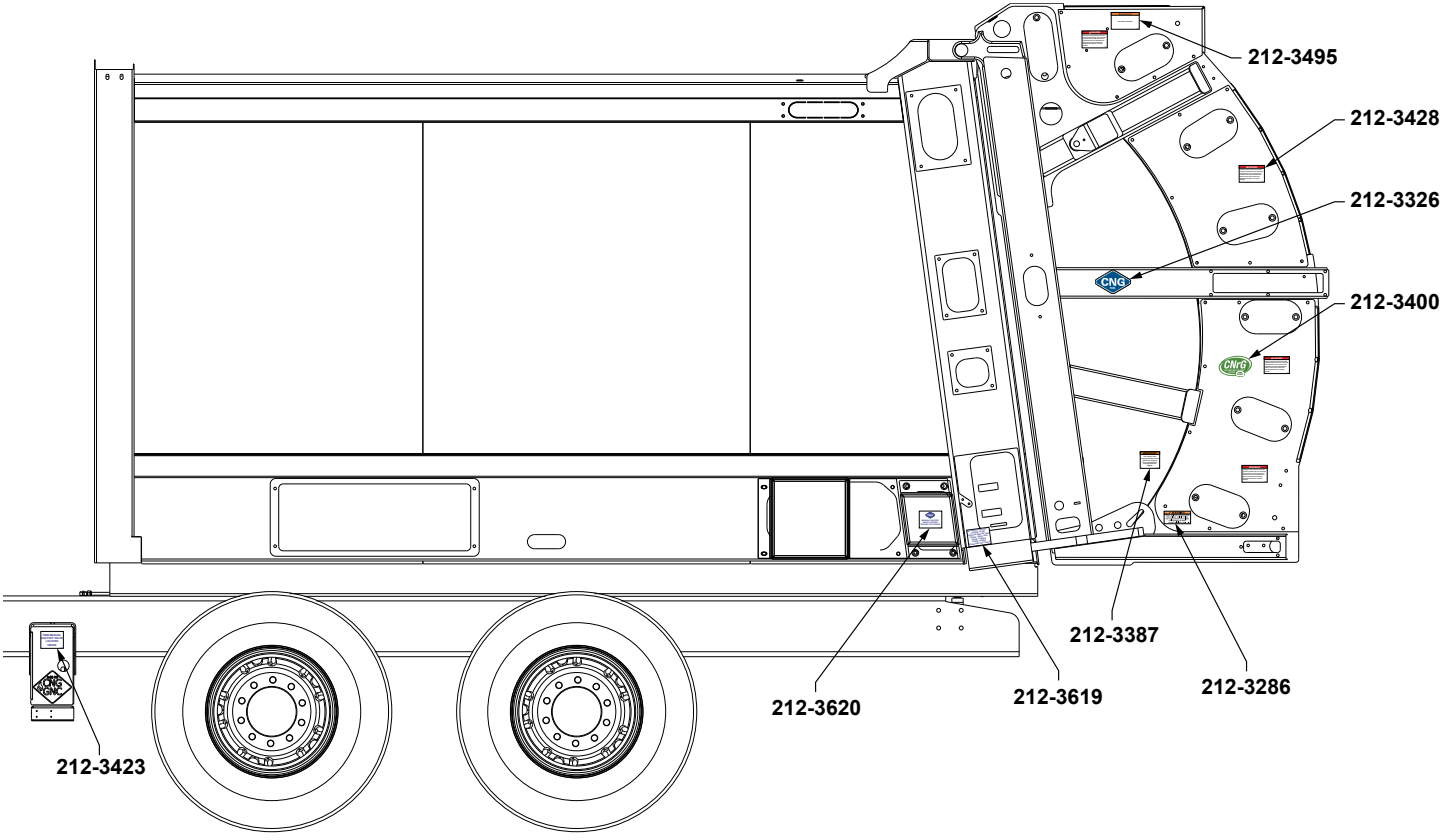

Figure 38. Side & Rear Decal

CNrG TAILGATE DECAL IMAGES

Figure 39. CNG Fuel (5.88” x 3.88”), PN 212-3326

Figure 40. Heil CNrG Tailgate Fuel Delivery System, PN 212-3400

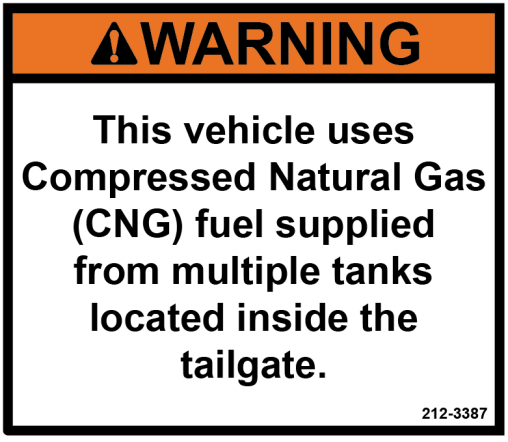

Figure 41. Warning: Vehicle uses CNG fuel, PN 212-3387

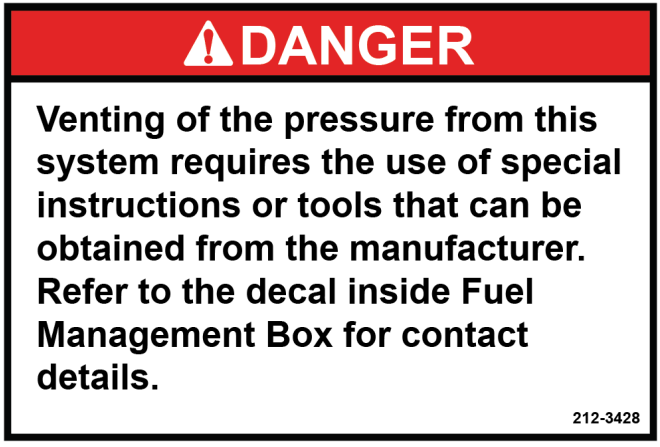

Figure 42. Danger, Venting Requires Special Instructions/Tools, PN 212-3428

CNrG TAILGATE DECAL IMAGES

Figure 43. Attention, CNG Vent Location, PN 212-3495

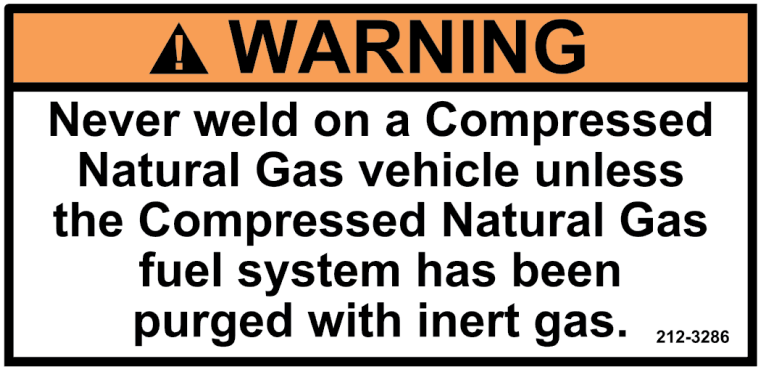

Figure 44. Warning, Never weld on CNG vehicle unless purged, PN 212-3286

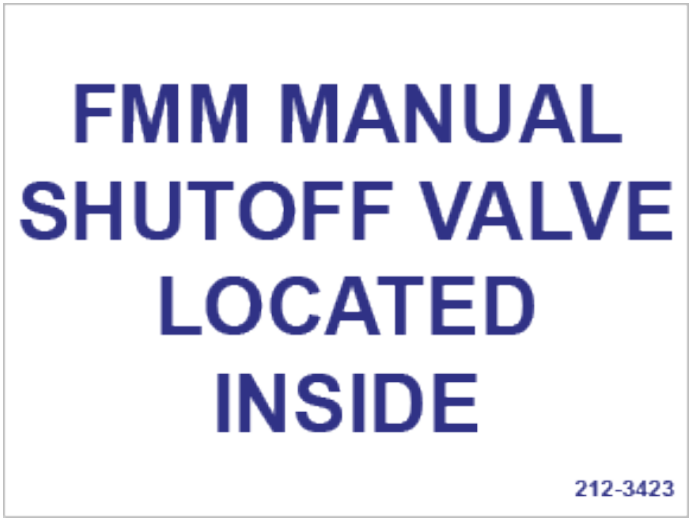

Figure 45. FMM Manual Shutoff Located Inside, PN 212-3423

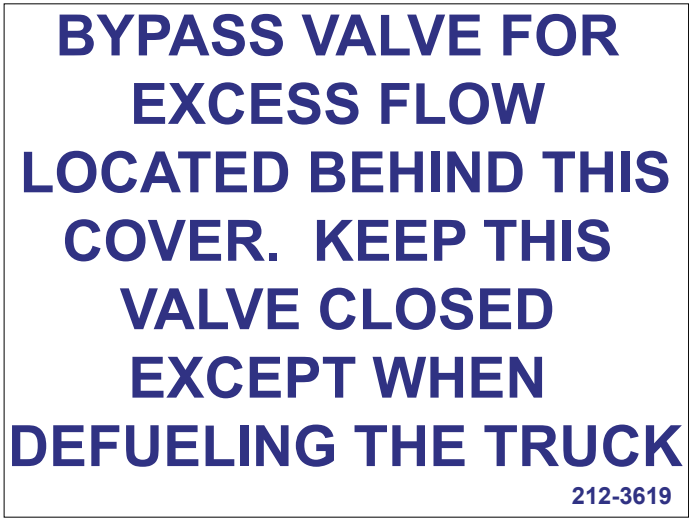

Figure 46. Bypass Defueling Valve CNG PN 212-3619

CNrG TAILGATE DECAL IMAGES

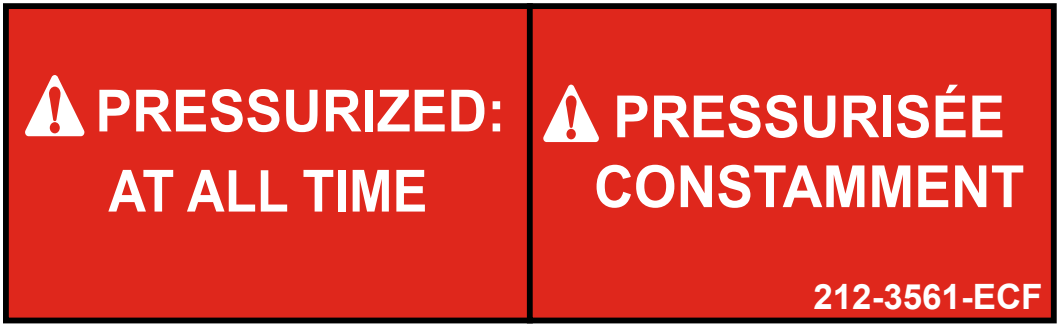

Figure 47. Danger, Live PRD, CNG, PN 212-3561-ECF

Figure 48. Danger, Live PRD, CNG, PN 212-3557-ECF

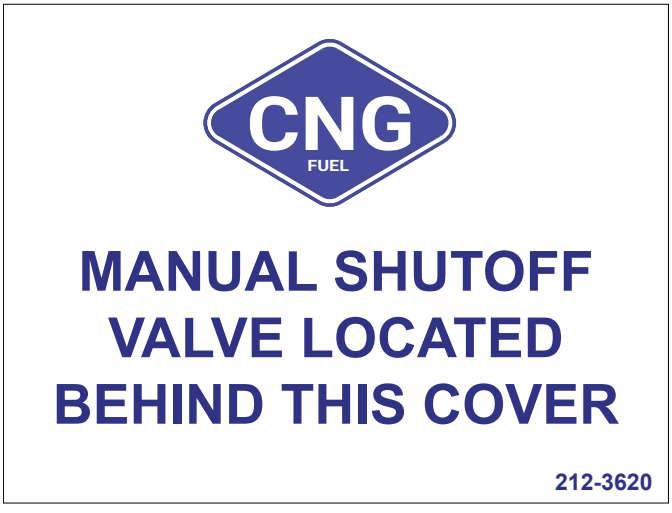

Figure 49. Manual Shutoff Valve CNG PN-3620

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HEIL ENVIRONMENTAL WARRANTY STATEMENT

The Heil Co. d/b/a Heil Environmental (“Heil”) warrants its solid waste collection equipment to be free from defects in material and workmanship under normal use for a period of one (1) year or 2000 hours of operation (whichever comes first) from the date of equipment In-Service or during the period of coverage offered by an extended warranty program, when proper service and maintenance as described in Heil Service Bulletins and Parts & Service Manuals are performed. The standard or extended equipment warranty is not transferable except for sales demonstration units.

This warranty is expressly limited to the repair or replacement of any component or part thereof, of any such refuse or recycling collection body manufactured by Heil that is proven to Heil’s satisfaction to have been defective in material or workmanship. Such components or parts shall be repaired or replaced at Heil’s option without cost to the standard purchaser for parts and labor provided such unit is returned to an authorized Heil Distributor for replacement or repair. The repair or replacement must be made during the standard or extended warranty coverage period. Before any warranty can be allowed on new equipment, a validated warranty registration form must be on file with Heil’s Customer Service Department within sixty (60) days of the equipment’s In-Service date. Wear items are excluded from warranty coverage.

All OEM service parts sold by Heil have a six (6) month warranty from the date of purchase. Aftermarket parts purchased from Heil are supported by a 90-day warranty. The parts warranty covers parts only, providing that factory inspection reveals a defect in material or workmanship. Labor, troubleshooting, equipment downtime, etc. is not covered under the parts warranty policy.

HEIL MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. HEIL DOES NOT ASSUME ANY LIABILITY OR ACCEPT CLAIMS FOR LOSS OF PROFITS, PRODUCT DOWN TIME OR ANY OTHER DIRECT, INCIDENTAL OR INDIRECT CONSEQUENTIAL LOSSES, COSTS, DAMAGES OR DELAYS.

Any improper use, operation beyond rated equipment or component capacity, substitution of parts that are not Heil-approved, or any alteration or repair by others in such a manner as in Heil’s sole judgment affect the product operation or integrity shall void the warranty.

Other than the extension of the standard warranty period purchased under a supplemental Heil Extended Warranty Program, no employee or representative is authorized to modify this warranty in any way nor shall any other warranties be granted. No dealersupplied warranty program is endorsed or supported by Heil.

Heil retains the right to modify its factory warranty program prospectively at any time.

The statements included herein is merely a summary of the full Limited Warranty provided by Heil. Please see the full limited warranty as outlined at https://www.heil.com/warranty/ under Heil Warranty Policies and Procedures.

Revised 6/2024

WE NEVER STOP WORKING FOR YOU

www.heil.com

Customer Care:
866-ASK-HEIL
(866-275-4345)

The Heil Co.
4301 Gault Avenue North
Fort Payne, AL 35967-9984

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