Compressed Natural Gas (CNG) Option

OPERATION AND SERVICE MANUAL

ISSUED JULY 2024

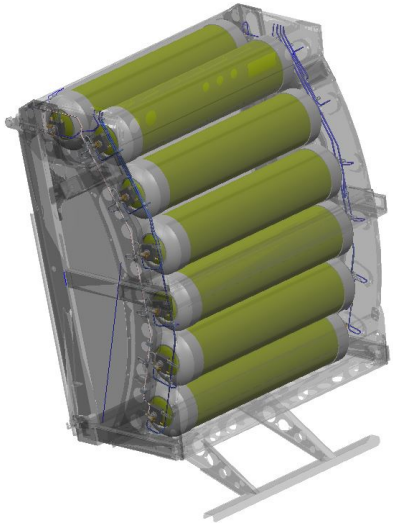
⚠ WARNING

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.



TP1CNG-OSM-0724

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 (CNG) Option

INCLUDES CNRG™ TAILGATE

OPERATION AND SERVICE MANUAL SUPPLEMENT

ISSUED JULY 2024

TP1CNG-OSM-0724

NOTES:

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 under significant pressures. Only those properly trained. certified, and qualified on CNG vehicle applications should perform service. All users must be aware of the risks associated with electric vehicles. 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.

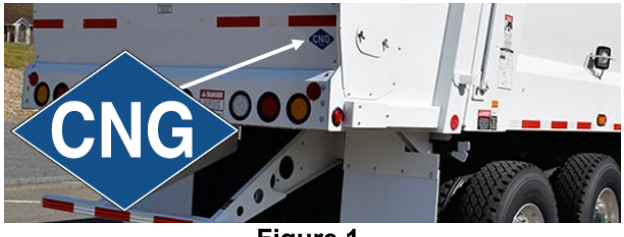


Figure 1.

IMPORTANT SAFETY INFORMATION (CONTINUED)

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 Parts and 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.

IMPORTANT SAFETY INFORMATION (CONTINUED)

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, FMVSS 304
- Canada: CSA B109

⚠ DANGER

The CNG Fuel System contains some lines that are under continuous high pressure. DO NOT attempt to loosen or disconnect those lines.

⚠ 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.

⚠ WARNING

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

IMPORTANT SAFETY INFORMATION (CONTINUED)

⚠ WARNING

Never open system components while the system is under pressure. Treat all cylinders as full until defueling has been completed.

⚠ 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 purged with inert gas. This includes but is not limited to refraining from using sandblasters, unshielded power tools, grinders, or spark-producing hand tools without completely 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

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.

⚠ WARNING

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

IMPORTANT SAFETY INFORMATION (CONTINUED)

⚠ 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

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 range of flammability is limited compared to other fuels. The gas also has an ignition temperature of 1076°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
- Odorless
- Non-corrosive
- Non-toxic

It has an:

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

SIGNS OF A FUEL LEAK

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. Refer to **Fuel System Shut Down Procedure** 14. 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)
- 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.

CNG FUEL SYSTEM COMPONENTS (CONTINUED)

⚠ WARNING

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

⚠ WARNING

Prevent hoists or jacks from coming into direct contact with containers.

B. Fuel Management Module Components (Continued)

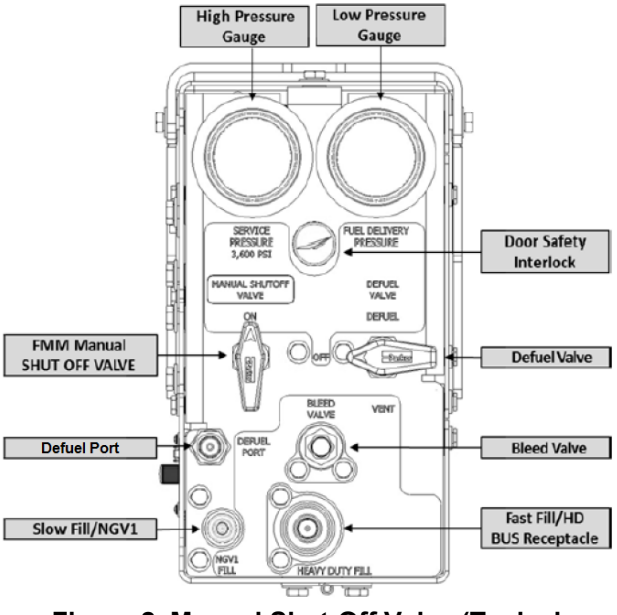


Figure 2. Manual Shut-Off Valve (Typical arrangement; models may vary slightly in component positioning.)

CNG FUEL SYSTEM COMPONENTS (CONTINUED)

⚠ WARNING

Prohibit personnel from walking on containers unless permitted by the container manufacturer.

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 containers, manufactured to meet FMVSS 304 and NGV2-2019 specifications. The fuel cylinders used on Top of Body and Back of Cab CNG vehicles with the Agility FMM 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 Shut-Off Valve

   The cylinder Manual Shut-Off Valve attached to each cylinder controls the flow of gas in and out of the cylinder. Each valve is located under a valve access cover labeled "MANUAL SHUTOFF VALVE" that is adjacent to the cylinder. Turn the valve handle FULLY clockwise to close the valve or FULLY counter-clockwise to open it.

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.

4. High Pressure Filter

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

5. Pressure Regulator

   Refer to the manufacturer's manual for information.

6. Solenoid Valve

   Refer to the manufacturer's manual for information.

7. 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.

CNG FUEL SYSTEM COMPONENTS (CONTINUED)

⚠ WARNING

The Bleed Valve shall not be used to defuel the system. The system must be defueled before using the bleed valve. See **Transfer Fueling (Defueling) section**.

C. CNG Fuel System Components (Continued)

8. High Pressure Lines

   These are stainless steel lines carrying high pressure CNG gas in them. They are routed between FMM box and 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.

9. High Pressure Live Lines

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

10. 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 or is not uninstalled.

⚠ WARNING

1. Only qualified personnel shall be permitted to service pressure relief devices.
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 container 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.

NOTES:

FUEL SYSTEM SHUT DOWN PROCEDURE

1. Turn OFF the Fuel Management Module (FMM) Manual Shut-Off Valve.
2. 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 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.
3. Do not use road flares.
4. Do not smoke or allow anyone else to smoke near the vehicle.
5. Turn OFF the ignition switch, set the parking brake and turn OFF the battery at the main disconnect.
6. 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.
7. Keep traffic and pedestrians away.
8. Beware that gas may continue to leak once ignition is turned off and the manual shutoff valves are closed.
9. Have a qualified technician verify leak locations with suitable methane detection fluid.
10. 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 OPERATOR EMERGENCY RESPONSE (CONTINUED)

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 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.

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 Ignition and Electrical System.
2. Turn OFF Fuel Management Module Manual Shut-Off Valve.
3. Turn OFF the Fuel Cylinder Manual Shut-Off Valve on EACH tank.
4. Call 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. Ensure that an electrical ground connection has been established between the cylinders, the vent system, and earth ground.
2. Connect the on-board defueling connection to the vent system using a conductive high pressure defueling hose.
3. Slowly open the hand valve to achieve a slow and steady flow to prevent freezing. No gas flow may indicate a normally closed solenoid valve on the cylinder. Consult the vehicle manufacturer for information on opening electronic solenoids.
4. Allow the on-board storage system to vent completely.
5. When completed, disconnect the on-board defueling connection from the vent system and disconnect the earth ground.

STARTING VEHICLE

NOTICE

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

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 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 is “ON”.
4. Make sure that the FMM door is closed and all the remote fill locations (if present on truck) dust cap on receptacle are closed. If open, the truck will not crank.
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.

FUELING PROCEDURE

NOTICE

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

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.

⚠ WARNING

BEFORE fueling the CNrG® Solenoid System (if equipped), **Fuel Fill Mode** MUST be engaged on the in-cab InSight™ Diagnostic Display. **While Fuel Fill Mode is engaged, the system will not detect leaks.**

The steps include:

1. Locate the fueling fill receptacle in the CNG fuel module. Optional fill receptacles may be installed in a remote location on the vehicle's front bumper.
2. Remove the dust cover on the fill receptacle.
3. Remove fueling nozzle from the CNG dispenser holder.

FUELING PROCEDURE (CONTINUED)

5. Begin fueling the CNG vehicle.
6. When complete, disengage the Fueling Nozzle.
7. Return the nozzle to the CNG dispenser.
8. Replace the dust cover on the receptacle.
9. Close the CNG fuel module door and engage door lock.

B. Types of Fueling Nozzles

Dependent upon 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.

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 hose 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.

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

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

   e. Disconnect the fuel hose, and return it to the fuel dispenser.

Figure 3. Type 1 Fueling Nozzle

FUELING PROCEDURE (CONTINUED)

B. Types of Fueling Nozzles (Continued)

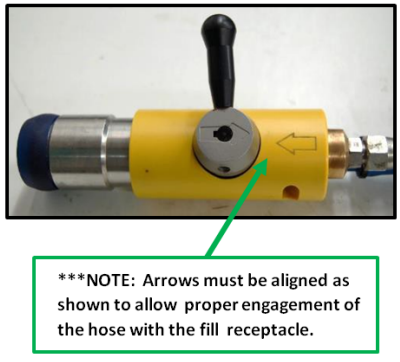


Figure 4. Type 1 Fueling Nozzle

1. Type 1 (Continued):

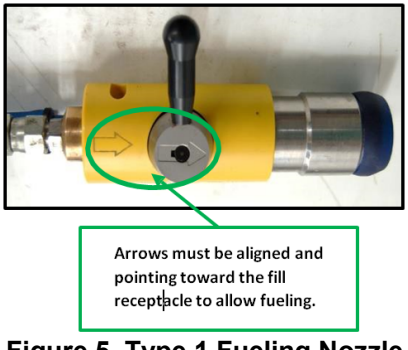


Figure 5. Type 1 Fueling Nozzle

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.

Figure 6. Type 2 Fueling Nozzle

FUELING PROCEDURE (CONTINUED)

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

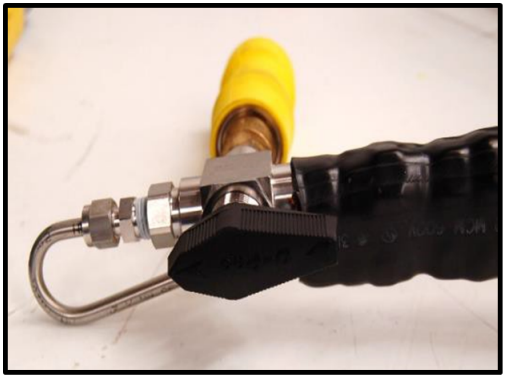


Figure 7. Type 3 Fueling Hose

NOTES:

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 purged with inert gas.

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 illegal and 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) - 2023 version 52 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 or Agility CNG Fuel System Operation and Maintenance Manual** and the **Agility (or equipped fuel cylinder manufacturer) CNG Fuel Cylinder Inspection Manual**.

DEFUELING SYSTEM

NOTICE

These instructions are specifically for Heil CNrG.

Defueling of the CNG fuel system will vary based on what design of the HEIL CNG fuel system you have on your truck. In the next few pages we will describe how defueling needs to be done in each of the two system design scenarios.

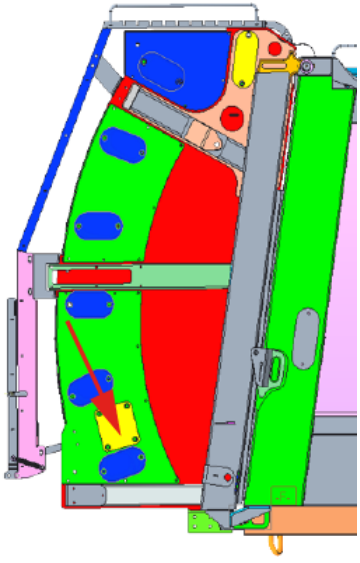
There are two different HEIL CNG systems:

1) Latest design launched in 2024 in which defueling of the truck will have to be done from tailgate of the truck.

2) This is traditional HEIL CNG system design in which defueling of the truck will take place from your fuel management module (FMM) box.

NOTICE

Refer to the Agility and/or Momentum manuals for their defueling process.



8. Defueling Procedure

System 1: If you have the rectangular panel (shown above) and defuel valve behind it when you open the panel, follow the procedure of latest design defueling.

DEFUELING SYSTEM (CONTINUED)

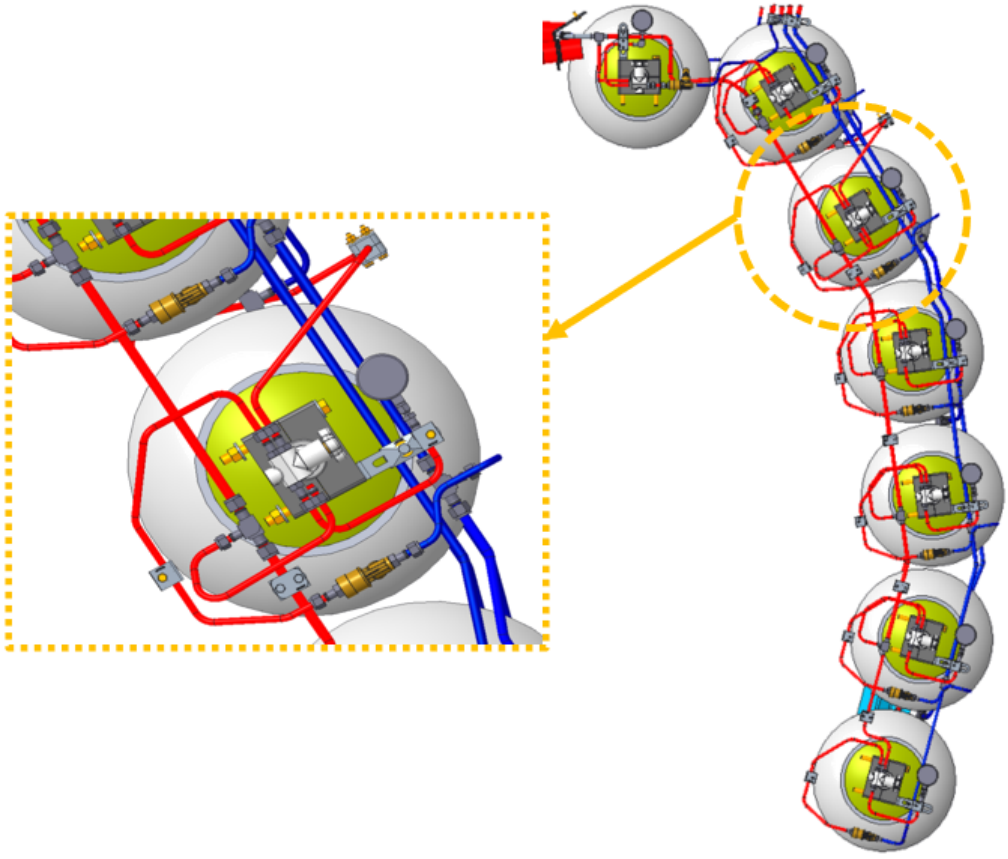


Figure 9. Defueling Tube Assembly for New Heil System - Launched in April 2024

DEFUELING SYSTEM (CONTINUED)

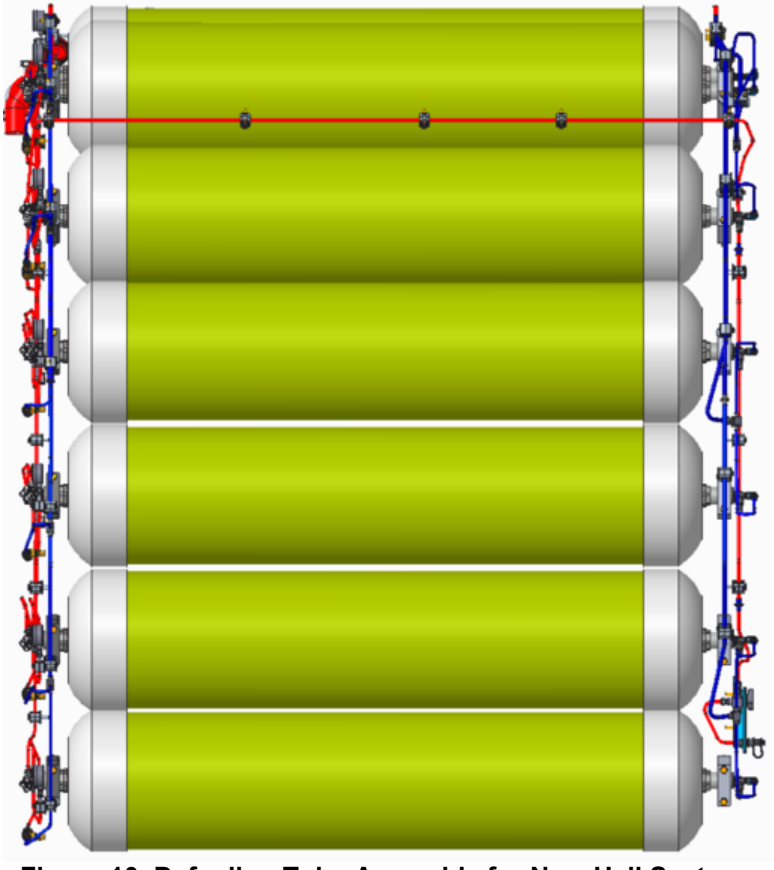


Figure 10. Defueling Tube Assembly for New Heil System - Launched in April 2024

DEFUELING SYSTEM (CONTINUED)

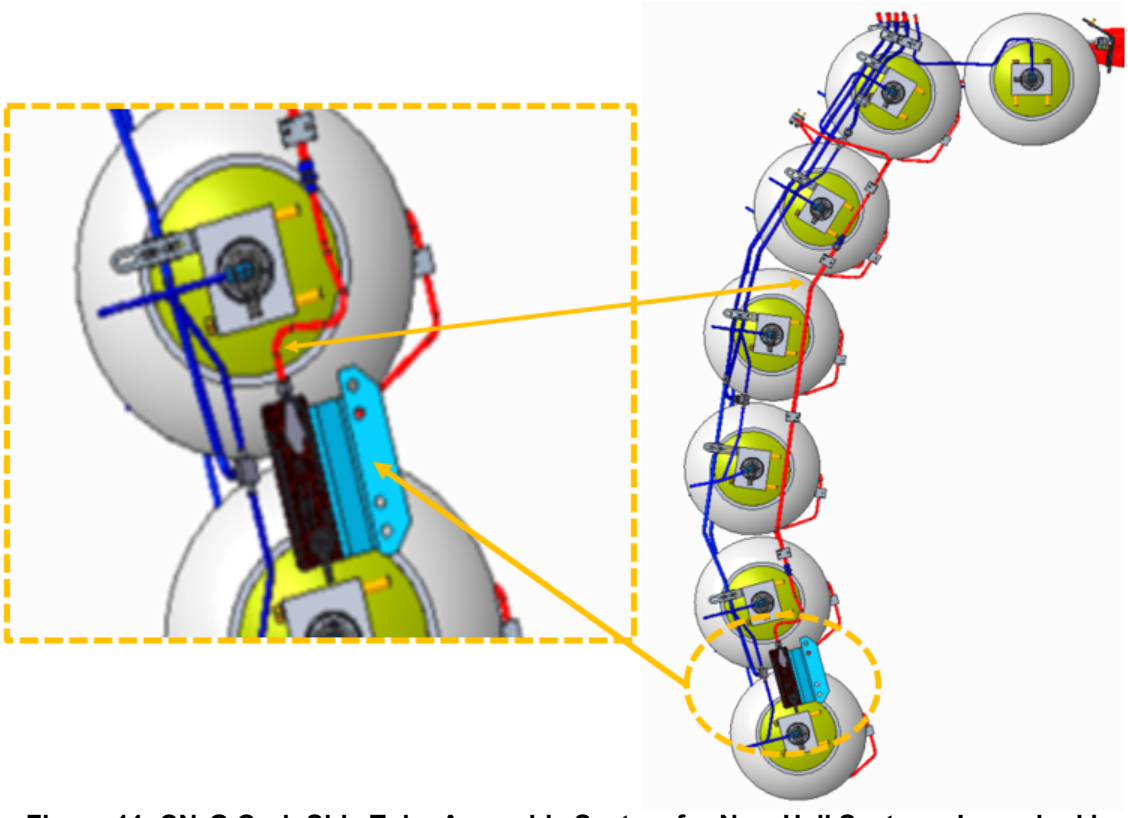


Figure 11. CNrG Curb Side Tube Assembly System for New Heil System - Launched in April 2024

DEFUELING SYSTEM (CONTINUED)

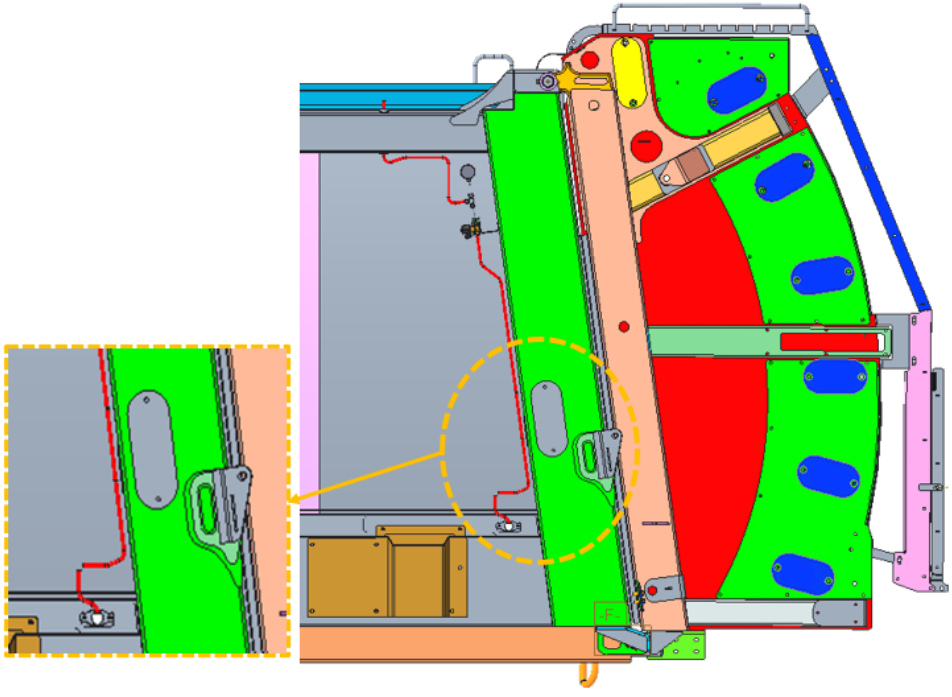


Figure 12. Street Side Body Tube Assembly for New Heil System - Launched in April 2024

DEFUELING SYSTEM (CONTINUED)

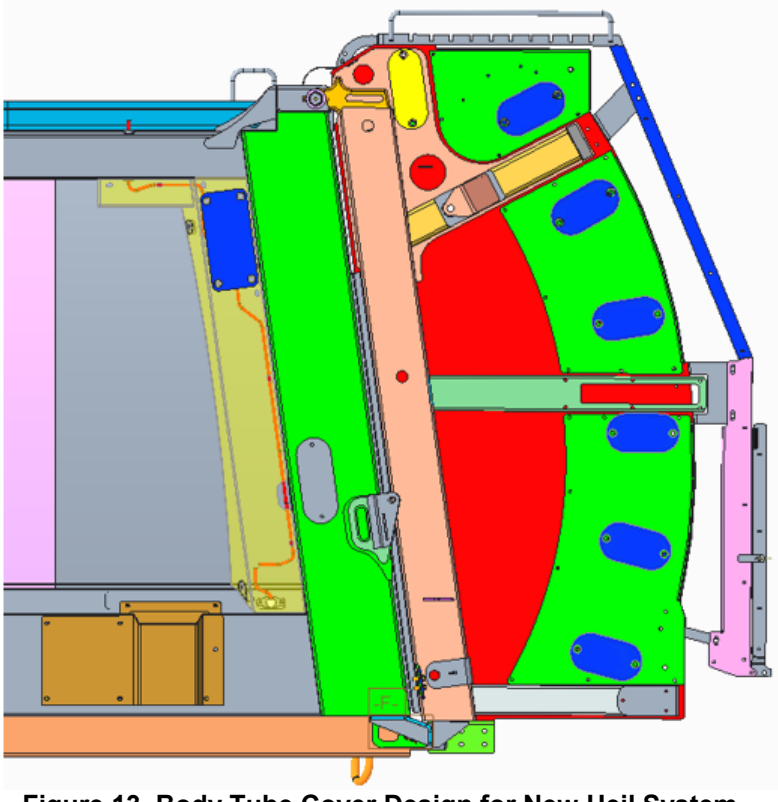


Figure 13. Body Tube Cover Design for New Heil System - Launched in April 2024

DEFUELING SYSTEM (CONTINUED)

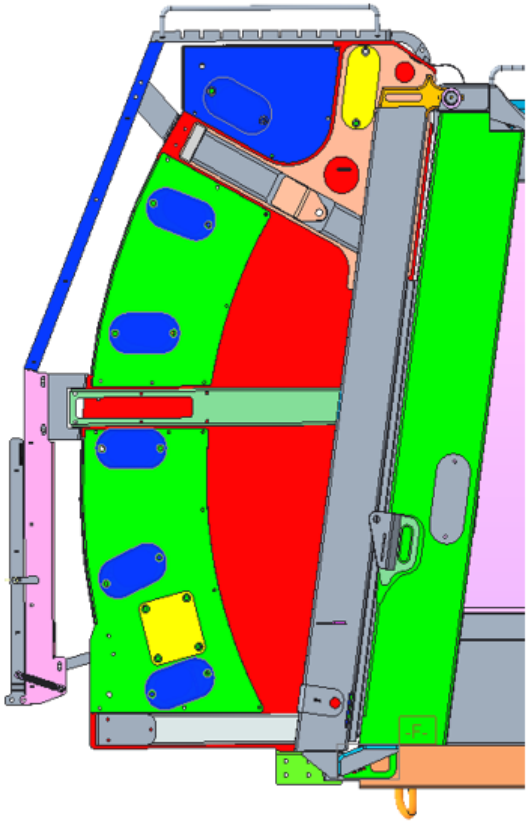


Figure 14. Tailgate Curb Side Panel Kit for New Heil System - Launched in April 2024

CNG FUEL SYSTEM MAINTENANCE

Routine maintenance of the compressed natural gas system in accordance with the **CNG Fuel System Inspections Section** 38 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 service relief devices.
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 container 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 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 containers to their original configuration using approved gaskets, bolts, nuts, washers, and parts in accordance with the recommendations of the vehicle or container manufacturer or system installer.

⚠ WARNING

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

CNG FUEL SYSTEM MAINTENANCE (CONTINUED)

⚠ 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 inert gas.

⚠ 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.

⚠ CAUTION

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
151-4784	Standard Fuel Management Module

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.

NOTES:

DEPRESSURIZING PROCEDURE FOR HEIL TRADITIONAL 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 on any fuel system components without completely defueling the components. Protect fuel system components from heat damage by either removing or covering the components with a welding blanket or other approved shielding 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.

DEPRESSURIZING PROCEDURE FOR HEIL TRADITIONAL CNG TAILGATE SYSTEM (CONTINUED)

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. See the image below.

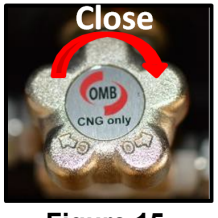


Figure 15. Cylinder Manual Shut-Off Valve

Figure 16. Manual Shut Off Valve

DEPRESSURIZING PROCEDURE FOR HEIL TRADITIONAL CNG TAILGATE SYSTEM (CONTINUED)

3. Verify that the FMM Manual Shut-Off Valve is in the ON position.
4. Start the vehicle and let the engine run until it stops. the gauge on the high pressure side should show 0 psi.
5. Turn the vehicle ignition switch OFF.
6. Slowly relieve residual/remaining pressure left in the CNG lines/ components by turning the bleed valve cap (Refer below picture) on the FMM counter-clockwise. Close the bleed valve once done and torque it to 4-5 FT-LB (48-60 in-lbs).

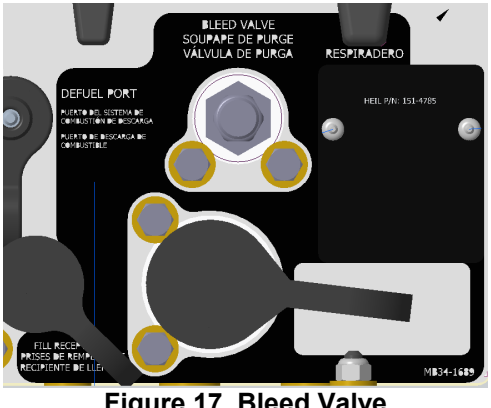


Figure 17. Bleed Valve

7. Check FMM gauge to ensure all pressure is relieved on high pressure side. The gauge on the high pressure side should show 0 psi.
8. 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.

9. Close the bleed/drain valve on Cummins low pressure filter.

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 lock-out 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.

DEPRESSURIZING PROCEDURE FOR HEIL TRADITIONAL CNG TAILGATE SYSTEM (CONTINUED)

13. Use a welding blanket to protect the fuel system from slag and sparks produced from welding and 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 installed in any of the cylinder(s) valve live ports.

NOTES:

RE-PRESSURIZING PROCEDURE FOR HEIL TRADITIONAL CNRG 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.
3. Check that the filter bowl and the drain plug are installed and tightened.
4. Check that the FMM Manual Shut-Off Valve is in the ON position.
5. On any ONE cylinder ONLY, slowly turn the cylinder Manual Shut-Off Valve by turning the valve counter-clockwise so you can barely hear the hissing sound / feel the gas flowing out and filling the lines up. Wait and do not open the valve any more till the line is completely pressurized and the flow of gas stops. this is important to not trigger the excess flow device in the tailgate.
6. Verify the pressures between the inside of that cylinder and the lines have equalized by looking at gauges in FMM and on the tank.
7. Open the valve on that tank completely now and also open the valves on all other tanks.
8. Follow the vehicle manufacturer's recommended vehicle lock-out procedures to unlock the vehicle. close the FMM door.
9. 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 insert gas to purge the CNG lines or CNG fuel system.

HIGH PRESSURE FILTER DRAIN PROCEDURE

1. Remove the excess fuel in the filter per the **Depressurizing Procedure** 31.
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. Hold a cloth under the port to catch any draining liquid.
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 depressurization 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 inert gas.

⚠ 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.

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, you must perform the following procedures:

1. Conduct work in a well-ventilated area.
2. Perform defueling procedure as instructed in this manual.

WELDING AND HOT WORK PROCEDURES (CONTINUED)

3. Purge the CNG fuel system with inert gas, including the tanks. See **Purging with an Inert Gas Prior to Welding or Major Repairs**.
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.

LIFTING THE VEHICLE

⚠ 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 THE VEHICLE

⚠ 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 using the **Fuel System Shut Down Procedure** 14.

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

NOTES:

PRE-TRIP INSPECTION

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. 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.
3. 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.
4. 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.
5. Drain the low pressure filters per the engine manufacturer's recommendation.
6. Turn the ignition key to ON and check that the low pressure gauge reading is approximately 85-150 psi.
7. Verify the dashboard fuel gauge is functioning properly.
8. 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.

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** 40 on next page.	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
Drain 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 pre-trip 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 red-handled emergency shutoff valve on the FMM are in the OPEN position.
2. Check the high pressure gauge to make sure enough fuel is on-board and refuel if necessary.
3. Drain the low pressure filters located at engine per the engine manufacturers’ recommendation.
4. Turn the ignition key to the on position, and watch the low pressure gauge. It should show between 85-140 psi.
5. Check the dashboard fuel gauge to make sure it is functioning.
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. 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.
7. Check the FMM door sensor interlock by opening the door and trying to start the vehicle. The vehicle should not start.

CNG FUEL SYSTEM TROUBLESHOOTING

Heil offers support via the technical assistance line, as well as products, such as a Fuel Module Mini-Tester (Part Number 044-0488), 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

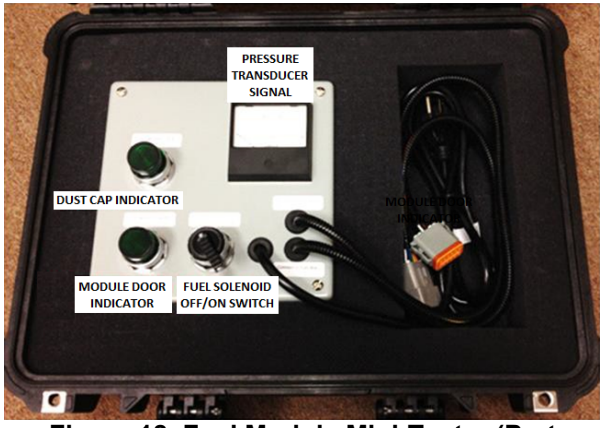


Figure 18. Fuel Module Mini-Tester (Part Number 044-0488)

CNG FUEL SYSTEM TROUBLESHOOTING (CONTINUED)

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 (CONTINUED)

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 (CONTINUED)

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 CNG and CNrG™ Tailgate Solenoid 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 (CONTINUED)

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

PROBLEM OBSERVED	POSSIBLE CAUSES	CORRECTIVE/DIAGNOSTIC ACTIONS	RESULTS AND OTHER ACTIONS
Heil CNrG™ Tailgate Solenoid System Option: In-cab Display does not indicate the fuel level correctly or an alarm is activated on the Display indicating "Transducer-# Unplugged/Short Check Sensor and Wiring" Fail for a given Tank#.	The fuel cylinder pressure transducer or the interconnecting wiring may be defective.	Confirm that the 3pin electrical connector at the transducer is connected and place the vehicle's ignition switch in the "Run" position. Use a voltmeter to read: • Voltage between connector positions A (BRN) and B (BLK). The voltage should be approximately 12 vdc. • Voltage between connector positions B (BLK) and C (YEL). The voltage should be between 0.5 to 5.0 vdc.	*If the voltage across A and B 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 B and C is either 0 or 5.5 vdc, the fuel tank's pressure transducer is most likely defective. Call **866-310-4345** for technical assistance. *If the voltage across B and C is between 0.5 to 5.0 vdc then the fuel module's pressure transducer is operating correctly. The problem is likely in the Display or the Controller. *If the problem cannot be resolved, call **866-310-4345** for assistance.

CNG FUEL SYSTEM WITH EXCESS FLOW VALVE TROUBLESHOOTING

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

A. Operation Instructions of the Manual Shutoff Valve

When a unit with an excess flow valve 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 Figure 1 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).

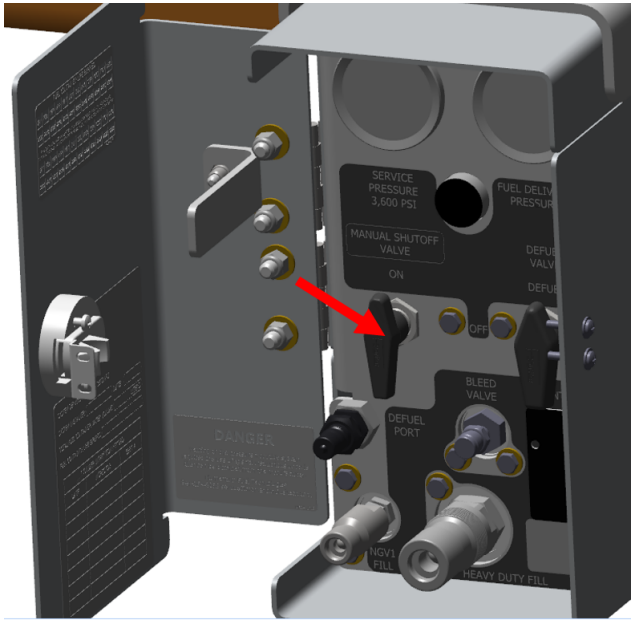


Figure 19. FMM (Fuel Management Module) box.

CNG FUEL SYSTEM WITH EXCESS FLOW VALVE TROUBLESHOOTING (CONTINUED)

A. Operation Instructions of the Manual Shutoff Valve (CONTINUED)

Make sure that your unit as an excess flow valve. See the figure below: Unit With Excess Flow Valve. If your unit does not have an excess flow valve it will look like the figure below: Unit Without Excess Flow Valve.

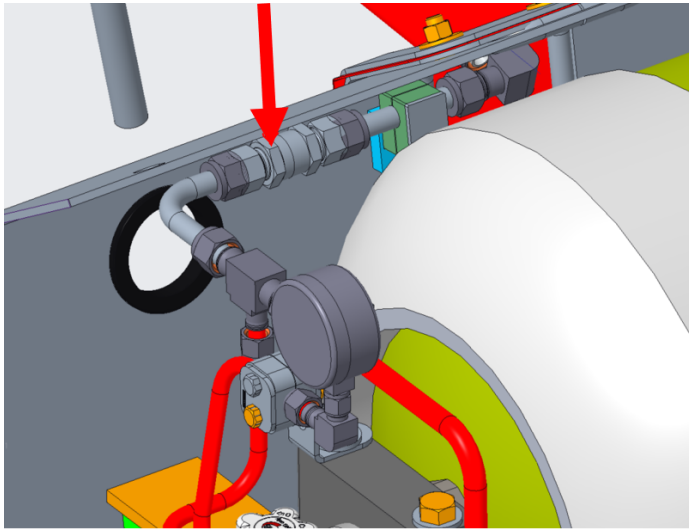


Figure 20. Unit With Excess Flow Valve.

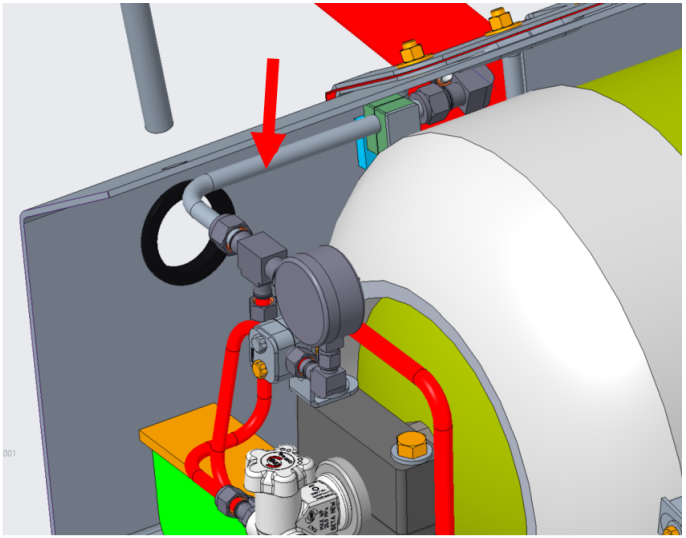


Figure 21. Unit Without Excess Flow Valve.

CNG FUEL SYSTEM WITH EXCESS FLOW VALVE TROUBLESHOOTING (CONTINUED)

A. Operation Instructions of the Manual Shutoff Valve (CONTINUED)

1. Make sure all fittings and connections and lines are securely tightened and leak checked before moving forward.
2. Initially the valve should be OFF position. If the line was defueled by technician for service purposes, it would show no pressure in low pressure gauge
3. In order to get the downstream CNG line pressurized and not trigger the excess flow valve which would shutdown the fuel supply from the tanks downstream, slowly turn the valve from OFF to ON position enough to just hear a small hiss of the gas passing downstream to fill the line. DO NOT OPEN THE VALVE ANY FURTHER ONCE YOU HEAR THE NOISE till the line completely fills up and no more gas is flowing downstream.
4. Once this is done and no more gas is flowing downstream, you can go ahead and slowly open the valve to ON position completely.
5. 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.
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.

CNG FUEL SYSTEM WITH EXCESS FLOW VALVE TROUBLESHOOTING (CONTINUED)

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

When the steps mentioned in the procedure above are not followed for units equipped with the excess flow valve, turn ON the manual shutoff valve in FMM (Fuel Management Module) from OFF position when the line was defueled downstream of manual shutoff valve in FMM (Fuel Management Module). 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 open the excess flow valve again to allow fuel to the engine:

1. In order to open the excess flow valve, you will have to refill the main supply line through the fill receptacle at a gas station, mobile filling unit or a pony tank till the pressure equalizes on the downstream and upstream of the excess flow device.
2. Once this happens, the excess flow valve will open up and the unit should have fuel to operate.

NOTICE

An alternate option which is to keep the truck down for several hours till the excess flow valve slowly bleeds the gas downstream (its bleed rate is approximately 1% or less) and equalizes the pressures on both sides to open.

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.

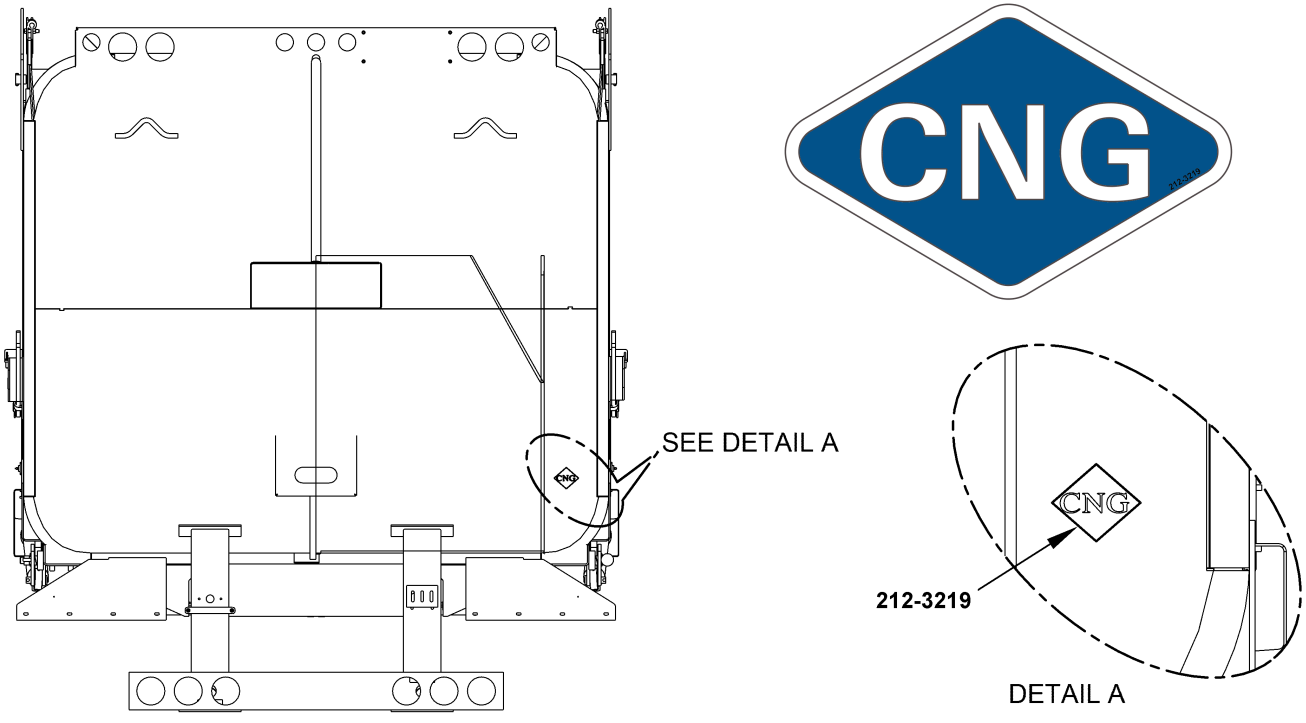
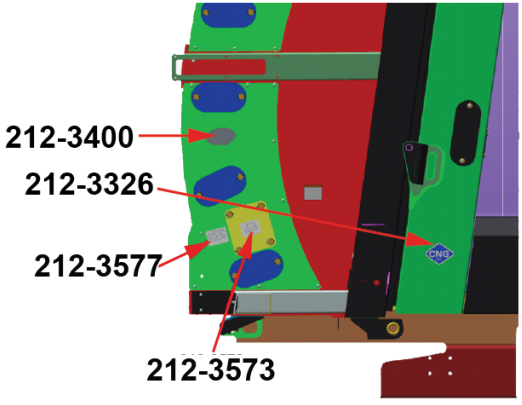
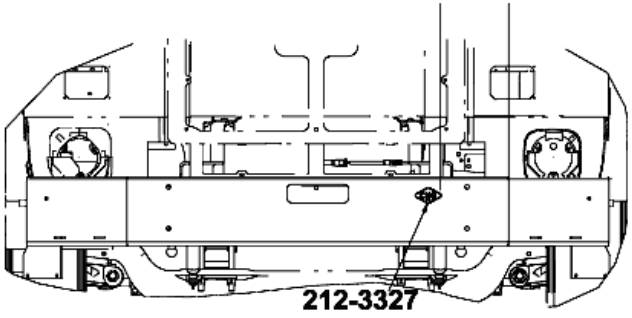


Figure 22.

CNrG TAILGATE DECAL PLACEMENT

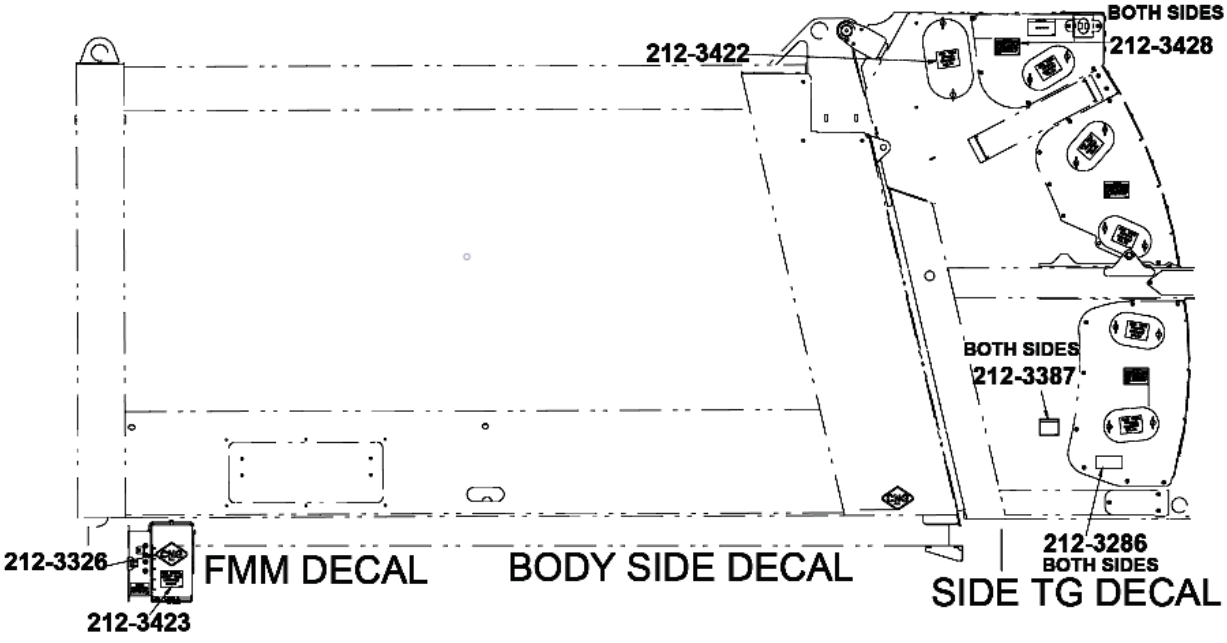
In addition to the decals shown below, there may be other decals placed on the Fuel Management Module (FMM), tank compartments or elsewhere on the CNG system components. Refer to the CNG System Manufacturer's Operation and Maintenance Manuals for replacement decal part numbers.



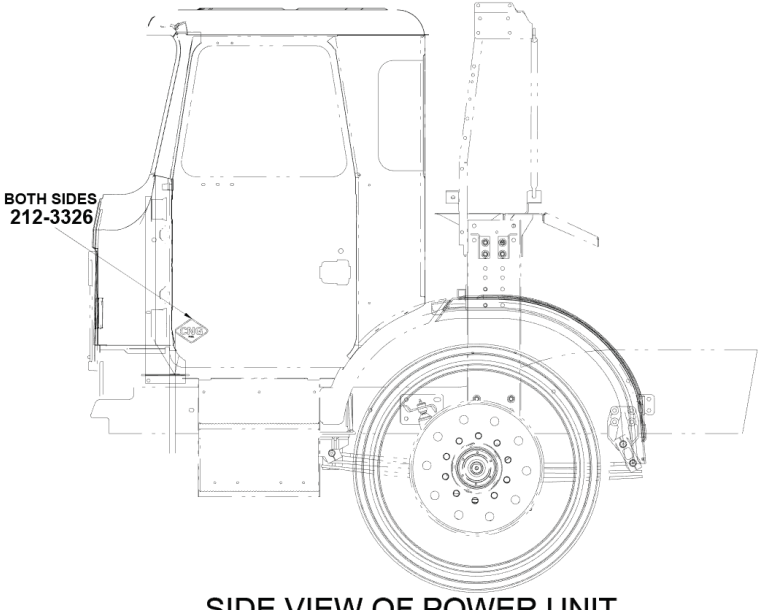


FRONT BUMPER DECAL

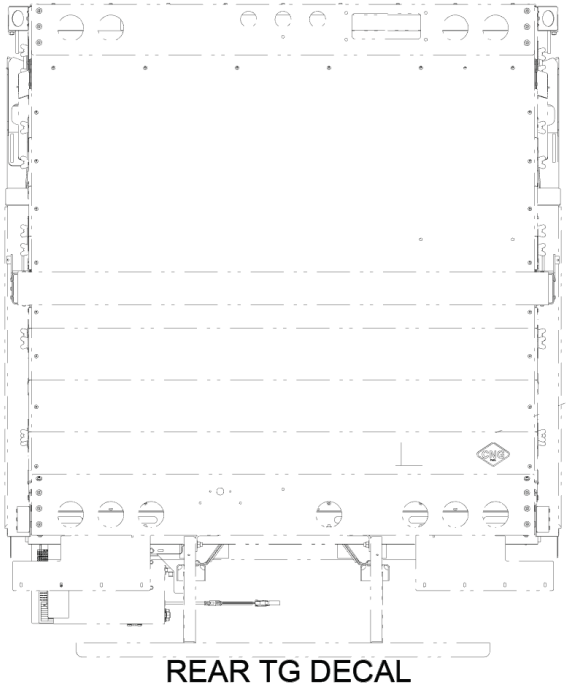
CNrG® TAILGATE DECAL PLACEMENT (CONTINUED)



CNrG® TAILGATE DECAL PLACEMENT (CONTINUED)



SIDE VIEW OF POWER UNIT



REAR TG DECAL

CNrG® TAILGATE DECAL IMAGES

Figure 23.CNG Fuel (5.88" x 3.88"), PN 212-3326

Figure 24.CNG Fuel (4.25" x 2.63"), PN 212-3327

Figure 25. Warning: Vehicle uses CNG fuel, PN 212-3387

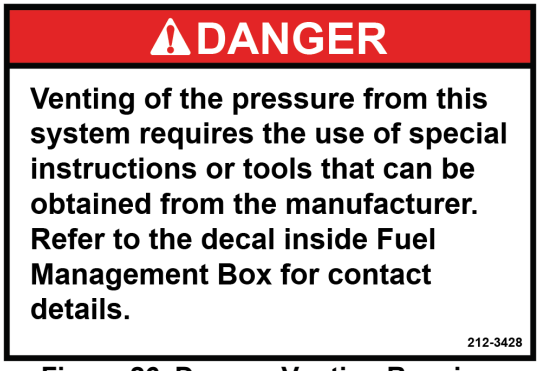


Figure 26. Danger, Venting Requires Special Instructions/Tools, PN 212-3428

CNrG® TAILGATE DECAL IMAGES

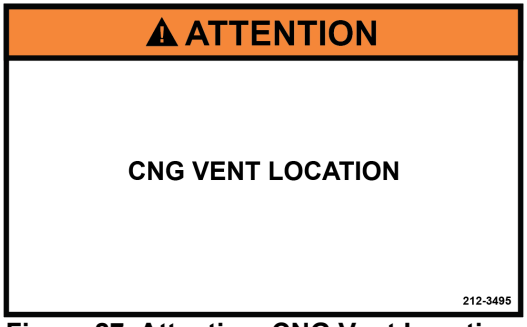


Figure 27. Attention, CNG Vent Location, PN 212-3495

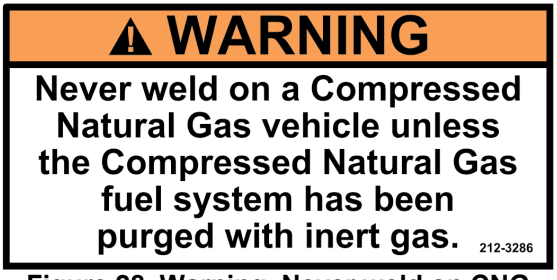


Figure 28. Warning, Never weld on CNG vehicle unless purged, PN 212-3286

Figure 29. Warning, CNrG Solenoid System, CNG tank empty before removing transducer, PN 212-3388

CNrG® TAILGATE DECAL IMAGES

Figure 30. FMM Manual Shutoff Located Inside, PN 212-3423

Figure 31. CNG Tank Manual Shutoff Valve, PN 212-3422

Figure 32. Notice, CNrG Solenoid System, Transducers MUST be functioning, PN 212-3389

Figure 33. Notice, CNrG Solenoid System, Fuel Fill Mode MUST Be Engaged, PN 212-3429

CNrG® TAILGATE DECAL IMAGES

Figure 34. Heil CNrG Tailgate Fuel Delivery System, PN 212-3400

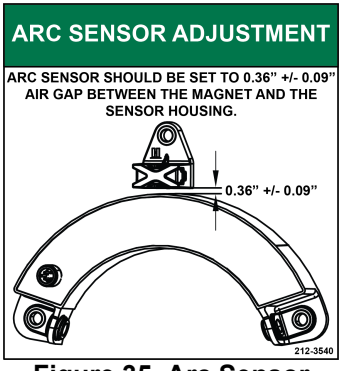


Figure 35. Arc Sensor Adjustment, PN 212-3540

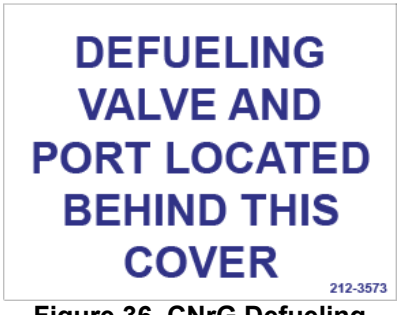


Figure 36. CNrG Defueling Valve and Port Location, PN 212-3573

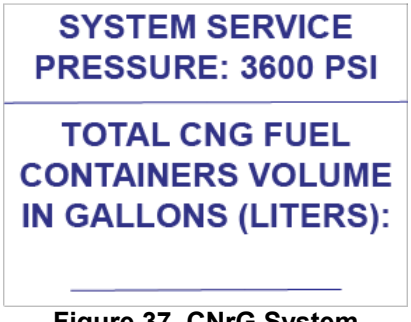


Figure 37. CNrG System Service Pressure, PN 212-3577

CNrG® TAILGATE DECAL IMAGES

Figure 38. Max Capacity ,PN 212-0983-001

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NOTES:

HEIL ENVIRONMENTAL WARRANTY STATEMENT

Our products are subject to a limited warranty as outlined in the document linked below – please see the linked Heil Warranty Policies & Procedures for our full, limited warranty.
As a summary, 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 (if one is offered on a particular product), 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. Heil only warrants the collection body. Please consult respective chassis manufacturer for respective specifics on chassis.

Ask your local Heil Dealer about our Extended Warranty offerings or contact Heil Customer Care at 866-ASK-HEIL (866.275.4345). For Warranty programs for international accounts outside of North America please consult with your Regional Manager for further details and/or appropriate policies.

EXCEPT AS CONTAINED IN THE HEIL WARRANTY POLICIES AND PROCEDURES, 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 FOR LOSS OF PROFITS, PRODUCT, TIME, OR ANY OTHER DIRECT, INCIDENTAL, OR INDIRECT CONSEQUENTIAL LOSSES, DAMAGES OR DELAYS. ANY IMPROPER USE, OPERATION BEYOND RATED EQUIPMENT/ 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 AFFECTS THE PRODUCT OPERATION OR INTEGRITY SHALL VOID THE WARRANTY.

Heil retains the right to modify its factory warranty program at any time. The warranty in place at the time of your respective purchase applies.

Please see the full limited warranty as outlined at https://www.heil.com/warranty/ under Heil Warranty Policies and Procedures.

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