

CONTINUOUS-PACK AUTOMATED SIDE LOADER

OPERATION MANUAL

ISSUED SEPTEMBER 2024

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.





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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Rapid Rail[®]

CONTINUOUS-PACK AUTOMATED SIDE LOADER

OPERATION MANUAL ISSUED SEPTEMBER 2024 TP1RR-OM-0924

Issued September 2024

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NOTES:

SECTION 1 INTRODUCTION

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PREVIEW

Read this section to learn about:

- The responsibilities of the owner, the operator, and the mechanic
- Warranty information
- Telephone numbers and website URL for parts, technical support, warranty claims, training and manuals
- · Identifying the different models
- Identifying the left (street side) of the unit
- The body and lift serial plates
- · Various parts of the unit

HOW TO USE THIS MANUAL

Product Variance

This manual may cover options not included on your unit. Also, the location and appearance of the controls on your unit may be different than those shown in this manual. Make sure you know the location of the controls and how to properly operate the controls on your unit before operation.

Manual Sections

This manual is divided into thirteen (13) sections.

- 1. Introduction
- 2. Safety Messages and Decals
- 3. Lock-Out/Tag-Out Procedures
- 4. Features, Controls, Switches, and Indicator Lights
- 5. Body and Tailgate Props
- 6. Daily Checklist
- 7. Before Going on Route
- 8. On-Route Operation Procedures
- 9. Landfill/Transfer Station/Recycle Center Procedures
- 10.End of Day Procedures
- 11.Cortex Controller™
- 12. Preventive Maintenance Chart
- 13.Lubrication Guide
- 11.

Terminology

This manual uses terminology that is defined in the **Glossary** which is in Section 1, Introduction.

Directives

When we give directions for using the equipment, we capitalize key words. These words are usually a command followed by a result.

For example, "MOVE the body raise switch to LOWER ...".

Use of Bold and CAPITAL Letters

We also put some words in **BOLD AND CAPS** for emphasis, usually related to safety or something of other importance, such as "**MAKE SURE** you close the side doors".

We put some words in just bold for emphasis, such as "All warranty repairs **must** be performed by ...".

Each DANGER, WARNING, and CAUTION notice precedes its applicable text.

TO THE OWNER

This manual is designed to help ensure safe, efficient and proper operation of The Heil Co. d/b/a Heil Environmental ("Heil") Rapid Rail[®] Automated Side Loader (ASL) refuse collection vehicle (or the unit).

The manual will familiarize you with the unit and will give you proper operating procedures and tips.

For chassis operation and maintenance instructions, see the Chassis Owner's Manual and the Rapid Rail[®] Service Manual.

As the owner, you have several responsibilities:

- You must complete and return the warranty registration for the unit to Heil.
- You must make sure that each operator has the proper driver's license.
- You must make sure that the operator does not operate the unit under the influence of drugs or alcohol.
- You must make sure that the unit is properly maintained to meet all local, state and federal requirements along with FMCSA (Federal Motor Carrier Safety Administration) and DOT (Department of Transportation).
- You must keep the vehicle maintained and properly adjusted to meet the manufacturer's standards and recommendations.

- You must keep accurate records of daily inspections, breakdowns, malfunctions, maintenance and repairs of the unit.
- You must make sure that repairs are made that may affect the safe operation of the unit before it is made available for operation.
- You must provide adequate lighting on the unit for safe operation under low light or night conditions.
- You must provide adequate training for each operator and mechanic that will operate the unit BEFORE an operator goes on route or BEFORE a mechanic performs maintenance or repair procedures.
- You must determine if an operator or mechanic has difficulties reading or understanding this manual.
 When a person has difficulties reading or understanding this manual, you must provide adequate assistance so that the person does understand the material in this manual.
- You must make sure that each operator uses the equipment on a route as given in the instructions of this manual and other manufacturers' manuals.
- You must provide on-going training for each operator and mechanic that operates the unit.
- You must make sure that this manual stays with the vehicle at all times.

Properly operated and maintained, your Rapid Rail[®] unit should give you years of low-cost, trouble free service.

TO THE OPERATOR

A DANGER

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand all of the instructions in this manual. Failure to do so may result in injury or death to operators or bystanders.

NOTICE

For Compressed Natural Gas (CNG) units, this Operation Manual should be used in conjunction with any associated CNG System Manufacturer's Operation and Maintenance Manuals. Always read and understand all associated manuals alongside the Heil Parts and Service Manual and Heil Operation Manual.

As the operator of the unit, you have several responsibilities:

- You must have a valid driver's license.
- You must understand and follow all manufacturers' instructions for equipment operation.
- You must observe pertinent laws and regulations.
- Do not use drugs or alcohol while you operate the unit.

- You must read, study and understand all procedures and requirements of this Operation Manual before you operate the unit for the first time. If you do not understand or have difficulty reading this manual, YOU MUST tell the owner or designated person before you operate the unit. DO NOT operate the unit until you understand the procedures and requirements of this manual.
- You must receive proper training before you operate (or service and maintain) the unit. If you have not been trained, you must inform the owner.
- You must perform a daily inspection of the unit before you go on route. Refer to the **Daily Checklist** [87].
- You must make sure that all decals and labels are clean and readable.
- You must report to the owner (or the designated person) any and all deficiencies, malfunctions or problems you find during the daily inspection.
- You must read, understand and obey all safety messages and decals that are on the outside or in the cab of the unit.

TO THE OPERATOR (CONTINUED)

- Always use your employer's Lock-Out/Tag-Out procedures. If your employer does not have Lock-Out/ Tag-Out procedures, use the Lock-Out/Tag-Out Procedure 55 in this manual.
- Before you start the engine or operate the unit for the first time
 - You must clear the area of other people.
 - You must learn and practice safe use of all controls and indicators before you operate the unit in a collection route environment or before you do repair or maintenance procedures.
- Before each time you start the engine or operate the unit, you must clear the area of other people.
- Before you operate the unit in reverse, you must make sure the area behind the unit is clear of other people, vehicles or other obstructions.
- You must make sure the unit is on hard, stable ground when you unload refuse at the landfill or transfer station.

TO THE MECHANIC

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand all of the instructions in this manual. Failure to do so may result in injury or death to operators or bystanders and/or damage to the unit or other property.

A unit that needs service or repair can malfunction and create a dangerous condition. A part failure during operation can cause serious injury or death to a person or damage to the unit. Repair or replace any failed or defective part immediately.

NOTICE

If you do not understand a procedure or instruction, tell the owner or the designated person immediately. Do not operate the unit if you do not understand all procedures and instructions in this manual. The owner or designated person can contact your Heil dealer or Heil for additional help. See **Customer Service and Repair Parts Contact** Information

TO THE MECHANIC (CONTINUED)

As the mechanic of the unit, you have several responsibilities:

- You must have a valid driver's license if you operate the unit on a public road.
- You must understand and follow all manufacturers' instructions for equipment operation.
- You must observe pertinent laws and regulations.
- Do not use drugs or alcohol while you service or operate the unit.
- You must read, study and understand all procedures and requirements of this Operation Manual and the Service Manual before you operate the unit for the first time.
- If you do not understand or have difficulty reading this manual or the Service Manual, you must tell the owner or designated person before you operate or service the unit.
- DO NOT operate or service the unit until you understand the procedures and requirements of this manual and the Service Manual.
- You must receive proper training before you operate or service and maintain the unit. If you have not been trained, you must inform the owner.

- You must read, understand, and obey all safety messages and decals that are on the outside or in the cab of the unit.
- Always use your employer's Lock-Out/Tag-Out procedures. If your employer does not have Lock-Out/ Tag-Out procedures, use the Lock-Out/Tag-Out Procedure 57 in this manual.
- Before you start the engine or operate the unit for the first time:
 - You must clear the area of other people
 - You must learn and practice safe use of all controls and indicators before you operate the unit or before you do repair or maintenance procedures.
- Before you operate the unit in reverse, you must make sure the area behind the unit is clear of other people, vehicles or other obstructions.

A unit that needs service or repair can malfunction and create a dangerous condition. A part failure during operation can cause serious injury or death to a person or damage to the unit. Repair or replace any failed or defective part immediately.

WARRANTY CLAIMS AND INQUIRIES

The HEIL ENVIRONMENTAL WARRANTY STATEMENT is printed on the inside, back cover of this manual. Should a failure occur that is covered by this warranty, contact the nearest Heil dealer for warranty repair unless otherwise authorized by Heil.

For all parts, warranty claims, and inquiries, please give the dealer or service center the unit's model and serial number located on the body serial plate. See **Serial Plate Location** page for the location of the body serial plate.

CONTACT INFORMATION

Customer Care

Phone: 866-275-4345

Technical Service

Phone: 866-310-4345

Parts Central

Phone: 800-528-5308

4301 Gault Avenue North Fort Payne, AL 35967 www.heil.com

MODELS

The Rapid Rail[®] has one body model, the dump model. See the figure below.

The dump model has one basic configuration, a unit with a lift arm.

You use the lift arm to pick up containers, lift the containers and dump the refuse into the hopper. You then use the lift arm to put the refuse container on the ground.

The unit uses a Packer Panel, which is a paddle, and two cylinders to sweep the refuse from the hopper into the body and compacts the refuse. The two cylinders continuously move the paddle, alternating from the left to right directions and right to left directions, except when the manual pack mode is selected. During the manual pack mode, the operator selects a paddle direction, left or right, to move the paddle manually.

The unit does not have an eject mode. You remove the refuse from the body by raising the tailgate and then raising the body.



Figure 1. Dump Model

SERIAL PLATE LOCATIONS

You determine the sides of the unit by facing the direction of forward travel. The left side is the "streetside" and the right side is the "curbside". The figure below shows the location of the serial plate on the streetside of the unit's body and lift arm serial plate. See the next page for a description of the information that is on the serial plate.



Figure 2. Serial Plate Location

READING THE SERIAL PLATE

The serial plate is the "birth certificate" of the unit. See the figure below.

RENT PUBL	ISHED WAR	RANTY
		DATE
HEIL.COM/PA	ATENTS	
	HEIL.COM/P/	HEIL.COM/PATENTS

Figure 3. Reading the Serial Plates

Information stamped in the boxes on the serial plate indicates:

Model number:

```
612-nnnn ("n" is any single-digit number)
```

Unit's unique serial number

Body size (cu. yd.)

Date of manufacture (last number of the year followed by the number of the day of the year, e.g. J078 is year 2018 and the 78th day of 2018).

NOTICE

The code for the year of manufacture is in accordance with FMVSS 115. See the following table.

Year of Manufacture			
Year Code	Year	Year Code	Year
5	2005	F	2015
6	2006	G	2016
7	2007	Н	2017
8	2008	J	2018
9	2009	К	2019
А	2010	L	2020
В	2011	М	2021
С	2012	N	2022
D	2013	Р	2023
E	2014	R	2024

PRODUCT NOMENCLATURE

The figure below shows the major components and their typical location on the unit. See the following pages for brief descriptions of each component shown below.



Figure 4. Product Nomenclature Curb Side

PRODUCT NOMENCLATURE

The figure below shows the major components and their typical location on the unit. See the following pages for brief descriptions of each component shown below.



PRODUCT NOMENCLATURE (CONTINUED)

Hydraulic Pump - The unit's hydraulic pump provides the oil flow for the hydraulic system. It is located either in front of the unit's engine or underneath the unit (powered by the transmission through a Power Take-Off (PTO). With a front-mount pump, the operator turns the pump ON and OFF as needed with the SYSTEM POWER switch located on the in-cab control panel. With a PTO pump, the operator engages the PTO then turns the SYSTEM POWER switch ON to activate the pump. Depending on the pump and PTO combination, hydraulic oil may flow through the system when the pump is off, however, the operator controls are inoperative and the system hydraulic oil pressure is not sufficient to operate the unit's functions.

Moving equipment can be dangerous to bystanders. Serious injury or death can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

Cab Controls – The standard cab control panel is located in the vehicle cab. See **Cab Controls**, **Switches and Indicator Lights** of for the different controls that may be installed in your unit. The standard and optional lift arm controls are located in the cab.

Moving equipment can be dangerous to bystanders. Serious injury or death can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

Lift Arm – Use the loader's lift arm to pick up and dump refuse from a refuse container into the hopper. (The loader is the assembly that includes the lift arm, the grabber assembly, hoses and other parts.) The operator can do this either inside the cab with the standard rocker switches, optional rocker switches or an optional joystick.

Do not enter the hopper unless the unit is in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, the packer/ejector panel can be operated. DEATH or SERIOUS INJURY may occur if the packer/ejector panel moves while a person is in the hopper.

PRODUCT NOMENCLATURE (CONTINUED)

Hopper – The hopper is the front part of the body assembly. The packer panel is in the hopper. The hopper is the loading chamber for the refuse. Refuse dumped into the unit falls inside the hopper where it is moved by the packer paddle into the body.

Body – The body stores the compacted refuse until you dump the refuse at the landfill. **DO NOT** enter the body from the hopper.

Body Props – Always use both body props, one on each side of the unit, when you raise the body for maintenance or service procedures.

A WARNING

BE CAREFUL at all times when you use the ladder rungs and grab handles. Maintain good balance with two feet and one hand, or one foot and two hands, firmly in place.

PRODUCT NOMENCLATURE (CONTINUED)

Ladder Rungs – The ladder rungs are on the street side of the hopper. You use the ladder rungs when it is necessary to look inside the hopper.

Grab Handle – The grab handles are on the street side of the hopper. You use the grab handles when it is necessary to look inside the hopper.

A DANGER

Always prop a tailgate when you leave it raised for maintenance, service or cleaning procedures. Any part of your body between the unit's body and the tailgate while you prop the tailgate or when the tailgate is propped is dangerous. Serious injury or death may occur if any part of your body is between the tailgate and the body if the tailgate suddenly closes.

Tailgate Props – Always use both tailgate props, one on each side of the unit, when you raise the tailgate for maintenance or service procedures.

Tailgate Cylinders – You use these cylinders to RAISE the tailgate before you unload the compacted refuse at the landfill. After you unload the refuse, you use the cylinders to LOWER the tailgate.

Tailgate Latches – The unit uses a mechanical latch on each side of the body to lock (latch) the tailgate. A "flag" at the back of the curb side of the body lets the operator see whether the tailgate is locked or unlocked. The flag is UP when the tailgate is FULLY DOWN (and LOCKED) and DOWN when the tailgate is OPEN (UNLOCKED). See **Unlocking and Raising the Tailgate** 120].

A DANGER

A tailgate in motion is dangerous. Serious injury or death may occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.

Tailgate - Raise the tailgate at the landfill or transfer station to unload the refuse.

PRODUCT NOMENCLATURE (CONTINUED)

The InSight[™] Diagnostic Display shows red when the tailgate is OPEN or UNLOCKED and green when the tailgate is CLOSED and LOCKED.

The packer paddle is dangerous. It can cause serious injury or death if a person is inside the hopper. Make sure no one is inside the hopper before you begin a packer function. Put the unit in the lock-out mode if a person is going to enter the body.

Packer Panel & Cylinders – The packer panel is a paddle inside the hopper. The paddle sweeps the loaded refuse from the hopper into the body. The paddle can be operated either automatically or manually.

When you select the Auto Pack Mode, the paddle makes an approximate 180° sweep, pausing about 0.5 seconds at the end of each sweep, reverses direction of the sweep and the cycle continues. When you select the Manual Mode, you need to press and hold the packer left or packer right buttons to sweep the paddle.

The packer cylinders move the paddle. When the street side cylinder extends the curb side cylinder retracts and the paddle moves in an arc from curb side to street side. When the curb side cylinder extends, the street side cylinder retracts and the paddle moves in an arc from street side to curb side.

See Auto/Manual Pack Mode Feature 631.

When you unload refuse, rotate the packer panel firmly against the refuse.

A DANGER

Any part of your body between the unit's body and the chassis or cylinders while you raise the body is dangerous. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Keep all parts of your body out from underneath the unit's body and away from the cylinders during this procedure.

PRODUCT NOMENCLATURE (CONTINUED)

A DANGER

Do not raise a body that has refuse while you do maintenance or service procedures. Refuse in the body can make the unit unstable. Always unload refuse from the body before you raise it for maintenance or service procedures. Always use the body props when you raise the body for maintenance or service procedures.

Raising the body with the tailgate closed can damage the underride bumper. The underride bumper can hit the ground when the tailgate is not fully raised before you raise the body. Serious injury or death may occur and also cause damage to the unit.

Body Raise (Body Hoist) Cylinders – Use these two cylinders to RAISE the body and unload compacted refuse out through the raised, open tailgate. After you unload the refuse, you use these cylinders to LOWER the body until it rests on the chassis.

You also RAISE the body with these cylinders to perform service or maintenance on the unit. When you do service or maintenance with the body raised, ALWAYS use the body props. After completion of the service or maintenance procedures, always LOWER the body until it rests on the chassis.

Do not operate the lift arm when the transit chain is attached to the grabber assembly and loader track assembly. The chain or the hardware that secures the chain can break. Serious injury or death may occur and also cause damage to the unit.

PRODUCT NOMENCLATURE (CONTINUED)

Loader Transit Chain – One end of a chain attaches to the grabber assembly and the other end attaches to a hook bolt on the loader track assembly. This helps to relieve stress to the loader track assembly due to movement of the grabber assembly during transit.

Cortex Controller™ – The unit has a Cortex Controller. The Cortex Controller monitors critical components, allows safe operation of the various functions, and performs other functions. When the Cortex Controller detects a fault or unsafe condition, it alerts the operator with an indicator light and/or a buzzer alarm. During certain conditions, the Cortex Controller will not allow operation of all functions.

Hydraulic Oil Tank - The tank is the reservoir for the hydraulic oil which operates all hydraulic cylinders described above.

Operating the unit's controls with a suspended load, such as a raised tailgate or a container on a lift mechanism, will allow the load to move even when the hydraulic pump is OFF.

Operator Controls – The standard operator controls for running the components are inside the vehicle cab. See **Controls**, **Switches**, and **Indicator Lights** of for the different controls that may be installed in your unit.

MAKE SURE at the start of each day with the daily inspection that you REMOVE the chain from the grabber assembly and attach it to the hook on the hook bolt.

Loader Latch - An air-driven mechanical latch prevents the lift arm from operation until:

- Either the service brake is applied or the transmission is in neutral AND
- The body pump is ON and the lift arm OUT solenoid is ON (lift arm OUT enabled on rocker switch or joystick).

The air supply then activates the air cylinder which then moves the latch to the open position and allows the lift arm functions.

TERM	DEFINITION
accident	An incident that results in unintended harm.
AutoPack™	A feature on all units that allows an operator to press one button to automatically complete one extend and retract cycle of the packer to compress the refuse.
auto neutral (force to neutral)	A Rapid Rail [®] and STARR [®] System feature that allows an operator to place the transmission in neutral and remain in neutral until commanded to go into drive.
bin	The refuse collection container
body	The complete body assembly or the area of the body where the refuse is stored.
boiling	Refuse material rising from a compacted base to the unit's roof.
bridge	Refuse material densely compacted on a bottom layer with refuse material loose or lightly compacted on a top layer.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
collapsed position	The fully retracted position of a cylinder
Cortex Controller™	Heil Electronic Body Controller (Half/Pack [®] , Half/Pack [®] Freedom, Half/Pack [®] Sierra, Odyssey HP/ HPF/HPS, DuraPack [®] Python [®] , DuraPack [®] 7000, MultiPack [®] , Rapid Rail [®] , and STARR [®] System units only).
Coordinated Lift	A feature of the Rapid Rail [®] loader that automatically lifts and dumps a container and to automatically remove the container from the hopper and bring the lift arm down.
DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
DRIVE	For Rapid Rail [®] and STARR [®] System units, the command to put the transmission into drive when Auto Neutral is activated.
extend/EXTEND	Make a cylinder rod move out its base

TERM	DEFINITION
fall-back	Material loaded in the body that drops from its initial compacted position into the hopper
fouling	Damage to the lid(s) of the refuse bins (containers) that interferes with unloading the refuse
front head	The part of the body that allows access to the body from the front of the body. This is the ONLY access to the body when the unit does not have an optional side access door.
Grabber	The entire grabber assembly or the grabber arms.
GRIP	The command to close the grabber arms around a refuse container.
harm	An action that causes death, injury or property damage.
hazard	A potential source of harm.
hopper	The loading chamber of the unit in front of the packer panel where you dump the refuse material.
illuminate	Make a lamp shine light (the lamp is on).
incident	An unintended and undesired event that has the potential to harm.
interlock	A safety mechanism that disables a function or action.
LATCHED	The side access door is secured closed. / The condition when the tailgate is fully CLOSED, thereby locking the tailgate.
Lift Arm	That part of the Rapid Rail [®] loader that moves IN, OUT, UP, DOWN and PIVOTS.
LOCK	Command to use the tailgate lock/unlock switch and lock the tailgate lock cylinders.
lower/LOWER	Move the body or tailgate down. / Command to move the lift arms, forks, body or tailgate down.
may	You are allowed to do the action, but it is not mandatory. It is understood to be permissive.
must	The action is mandatory.

TERM	DEFINITION
NOTICE	Alerts you to practices not related to personal injury, such as damage to the unit or other equipment.
off/OFF	When a light or lamp does not illuminate / The position of a switch or other control to stop a function
on/ON	When a light or lamp illuminates / The position of a switch or other control to start a function
operator	Any person who uses the unit and its equipment. One who controls the operation of various unit accessories and mechanisms, loads material, performs functions such as operating the loader, cart tipping and packing of wastes or recycled products, and who may also drive the unit along the route during the collection process. The operator may also be the driver.
paddle	For Rapid Rail [®] , STARR [®] System, and Liberty™ continuous pack units, packer panel is a 180° revolving paddle.
PN	Part Number
РТО	Power Takeoff
raise/RAISE	Move the lift arm, body or tailgate up / Command to move the lift arm, body or tailgate up
retract/RETRACT	Make a cylinder rod go into its base / Command to move the packer panel towards the hopper
RPM	Revolutions Per Minute
should	The action is advised.
side access door	The side access door is located on the street side of the unit. This is the preferred access into the body. ALWAYS Lock-Out/Tag-Out 55 the unit BEFORE entering the body.

TERM	DEFINITION
unit	The Heil Rapid Rail [®] refuse collection vehicle referred to in this manual.
UNLATCHED	The side access door is not closed or secured.
UNLOCK	Command to use the tailgate lock/unlock switch and unlock the tailgate lock cylinders
WARNING	Indicates a hazardous situation, which if not avoided, could result in death or serious injury.

SECTION 2 SAFETY MESSAGES AND DECALS

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PREVIEW

Read this section to learn about:

- · General safety precautions and safety precautions for the safe operation and maintenance of the unit
- The safety precautions for NOT towing another vehicle or machine
- Safety decals on the unit.
PRECAUTIONARY STATEMENTS

Read this entire manual and especially this safety section before you operate the vehicle. Failure to follow these important precautions could result in serious injury, death, or property damage.



This safety alert symbol indicates important safety messages in this manual and on safety decals attached to the equipment. Make sure you read all of these messages and follow the instructions and precautions.

In the general text of the manual and in the safety labels attached to the product, signal words indicate the type and seriousness of risk that you could encounter if you do not follow the precautions. The signal words and their definitions follow:

DANGER indicates a hazardous situation which, if not avoided, WILL result in DEATH or SERIOUS INJURY.

WARNING indicates a hazardous situation which, if not avoided, COULD result in DEATH or SERIOUS INJURY.

CAUTION indicates a hazardous situation which, if not avoided, COULD result in MINOR or MODERATE INJURY.

NOTICE

NOTICE addresses practices not related to personal injury, such as property damage or damage to the equipment.

The following pages provide a summary of some of the more important safety precautions that are in this manual. There are additional safety precautions in other sections of this manual that are not contained in this section. You must also read, understand and follow those messages.

GENERAL SAFETY PRECAUTIONS

- **DO NOT** operate the unit under the influence of alcohol or drugs or when extremely tired or when you are not alert, as this may result in an accident that can cause serious injury or death.
- **DO NOT** operate the unit unless you have the proper training and vehicle operator license.
- ALWAYS carry and maintain a fire extinguisher and first aid kit in the unit. MAKE SURE you know how to use them.
- CLEAN AS NECESSARY any safety decals that you cannot read at a safe viewing distance from the hazard because of dirt. If any decals are illegible from damage or wear, REPLACE them IMMEDIATELY. Get decals from your Heil dealer or Heil.
- **DO NOT** use this refuse collection vehicle to TOW another vehicle or equipment. It **IS NOT DESIGNED** or equipped to tow another vehicle or other equipment. Towing another vehicle or equipment may result in injury or death to the operator or other people or damage to the unit.
- **MAKE SURE** all individuals are clear of any moving parts, mechanisms or components of the unit before you operate the controls.

- **DISENGAGE** the PTO or PUSH the SYSTEM POWER switch so the pump shuts off when you are not using the unit, when you are repairing the unit, when you are working on the unit, or when traveling in the unit for longer than two minutes.
- ENGAGE the PTO or PULL the SYSTEM POWER switch ONLY when you are on route OR as necessary to perform repairs.
- When the unit is stored or not in use, you **MUST** do the following:
 - SET ALL lift cylinders (including the body raise cylinders) to the collapsed position.
 - For units with manual transmissions, DISENGAGE the PTO and PUSH the PUMP switch so it shuts off the pump.
 - For units with automatic transmissions PUSH the SYSTEM POWER switch so the pump shuts off.
 - **REMOVE** the key from the ignition. This helps prevent tampering by unauthorized persons.
 - o Refer to Lock-Out/Tag-Out Procedure 55.
- You must be attentive at all times while you operate the controls and be ready to stop or reverse the function if necessary.

A BEFORE OPERATING THE EQUIPMENT

- DO NOT operate or service this machine until you are fully trained and have read and understand this entire manual.
- NEVER operate the unit UNLESS you are fully knowledgeable of all control functions. See the Controls, Switches, and Indicator Lights Chin-Cab Display and Controls of this manual.
- MAKE SURE BEFORE you operate the vehicle or its controls that all individuals are at a safe distance away from the unit.
- DO NOT operate the unit when it needs service or repair.
- DO A VISUAL CHECK at the beginning of each shift of the unit and run it through several cycles to find fluid leaks, broken, missing or malfunctioning, and excessively worn components (including hoses). See the **Daily Checklist section 1** of this manual. If you find leaks, broken, missing or malfunctioning parts, immediately stop and get the condition repaired or serviced.

A USE PERSONAL PROTECTIVE EQUIPMENT

- ALWAYS WEAR the proper safety equipment, such as hard hats, safety shoes, protective eye wear, reflective clothing and gloves. Confirm with the owner/operator that you are using proper safety equipment.
- WEAR PROPER EYE PROTECTION and avoid contact with oil if possible whenever you work on or about hydraulic lines or components. NEVER check for oil leaks with your bare hands.

A BEWARE OF OVERHEAD OBSTRUCTIONS

- **KNOW** the clearance required for **ALL** overhead obstructions (such as viaducts and bridges) that you may encounter when you drive the unit. See the decal in the chassis cab for your unit's overall height.
- NEVER drive the unit under any overhead obstruction of unknown height clearance.
- Become familiar with your route. Be aware of all overhead trees and obstructions that could cause problems during refuse collection.
- **CHECK** the height of the unit after you do any modifications to the chassis suspension. Any chassis suspension modification may change the height of the unit. See Tables 1 and 2.

- LOOK UP AND LIVE. MAKE SURE there is enough clearance between a lowered or raised container and overhead power lines. It is not necessary for the unit or container to touch the electric cable for the electricity to pass through the unit. See Tables 1 and 2.
- STAY IN THE CAB and KEEP AWAY FROM ALL METAL PARTS OF THE UNIT if the unit does touch a power line. STAY IN THE UNIT UNTIL HELP ARRIVES.

OVERHEAD CLEARANCES

NOTICE

Table 1 and 2 is in accordance with OSHA 29CFR 1910.333. (Also refer to ANSI Standard B30.5-2004, 5-3.4.5.) If local rules and laws require more clearance, you must follow those.

Table 1. Overhead Clearances When Operating the Unit

Voltage of Electric Line	Minimum Clearance	
50,000 or less	10 feet (3 m)	
Above 50,000 to 200,000	15 feet (4.6m)	
Above 200,000 to 350,000	20 feet (6.1 m)	
Above 350,000 to 500,000	25 feet (7.6 m)	
Above 500,000 to 750,000	35 feet (10.7 m)	
Above 750,000 to 1,000,000	45 feet (13.7 m)	

Table 2. Overhead Clearances When Driving the Unit

Voltage of Electric Line	Minimum Clearance
750 or less	4 feet (1.2 m)
Above 750 to 50,000	6 feet (1.8 m)
Above 50,000 to 345,000	10 feet (3 m)

Table 2. Overhead Clearances When Driving the Unit

Voltage of Electric Line	Minimum Clearance	
Above 345,000 to 750,000	16 feet (4.9 m)	
Above 750,000 to 1,000,000	20 feet (6.1 m)	

LOADING REFUSE INTO THE UNIT

- YOU MUST BE ATTENTIVE at all times when you load refuse and be ready to stop or reverse the function in use if necessary.
- ALL PERSONS MUST STAND CLEAR when the tailgate is in motion and during the unloading cycle. MAKE SURE no one stands under or crosses under a raised tailgate.
- LOOK UP AND LIVE. Make sure there is enough clearance between a raised container and overhead power lines. Refer to Tables 1 and 2.

A COMPACTING THE LOAD

- YOU MUST pay attention to driving when you pack on-the-move.
- Operating the packer on-the-move REDUCES POWER available for vehicle acceleration.

- MAKE SURE the unloading area is clear of all personnel.
- ALL PERSONS MUST STAND CLEAR when the tailgate is in motion and during the unloading cycle. MAKE SURE no one stands under or crosses under a raised tailgate.
- While you raise the body, be attentive at all times and be ready to stop or reverse the function if necessary.

A WHEN WORKING IN OR AROUND THE VEHICLE

• MAKE SURE the unit is in Lock-Out/Tag-Out [55] condition BEFORE you work in or around the unit.

- **NEVER** put any part of your body between a raised body and the chassis frame unless the frame is securely propped up. Read and follow the instructions for **Propping the Body**.
- **DO NOT** go under the chassis or enter the body area unless the unit is locked-out. To lock-out the unit, stop the engine, apply the brakes and make sure the brakes hold and work properly, chock all wheels, remove the keys from the cab, and place a lock-out tag on the steering wheel. See **Lock-Out/Tag-Out Procedure 55**.

A TOWING OF ANY EQUIPMENT

• Heil DOES NOT recommend that you tow any kind of equipment with the unit. The unit was NOT DESIGNED nor intended for towing.

DECALS

The following pages show the DANGER, WARNING and CAUTION decals and list the reflective safety materials that are on the vehicle. See the Parts and Service Manual for the location and part numbers of all decals on the unit.

NOTICE

Replace any decal with a new decal if the old decal is lost, destroyed, painted over or cannot be read. When you replace a part that had decals, make sure you install new decals on each new part. Decal part numbers can be found below and in the Parts Manual. You can purchase replacement decals from your **Heil Dealer** or from the **Heil Parts Central**, 800-528-5308.

REFLECTIVE SAFETY MATERIALS

See the Parts and Service Manual for the location and part numbers of the reflective safety materials on the unit.

NOTICE

Replace any safety material with new safety material if the old safety material is lost, destroyed, painted over or cannot be seen. When you replace a part that had safety material on it, make sure you install new safety material on the new replacement part. See the Parts and Service Manual for all part numbers and location of the safety materials.

You can purchase replacement decals from your Heil Dealer or from the Heil Parts Central, 800-528-5308.

DECAL PLACEMENT



DECAL PLACEMENT (CONTINUED)



DECAL PLACEMENT (CONTINUED)

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	212-1850	KIT, Decal		REF
1	212-0980	DECAL, Danger, Stay Clear, Container Off Ground		
2	212-1103	DECAL, Danger, Body Elevated,		
3	212-1104	DECAL, Danger, Body Elevated, Small		
4	212-1242	DECAL, Danger, Stand Clear, Automated Lift Device In Motion		1
5	212-1329	DECAL, Instruction, Body Prop		
6	212-1330	DECAL, Warning		
7	212-1542	DECAL, Danger, Hopper and Tailgate Opening		4
8	212-1584	DECAL, Overall Height		
9	212-1626	DECAL, Danger, Tailgate Raise, Before Body		1
10	212-1631	DECAL, Warning, Bumper, Not Step		
11	212-1634	DECAL, Danger, Stand Clear		1
12	212-1764	DECAL, Danger, Under Chassis, Stop Engine		4
13	212-1781	DECAL, Caution, Enter Body, Stop Engine		1
14	212-1782	DECAL, Hydraulic Oil Only		1
15	212-1783	DECAL, Warning, Operator's Manual		3
16	212-1801	DECAL, Danger, Stand Clear		3
17	212-1820	DECAL, Danger, Towing, In Cab		
18	212-1841	DECAL, ANSI Specifications		1
19	212-1899	DECAL, Danger, Stay Clear When Container Off the Ground		1
20	212-1914	DECAL, Caution, Ladder		1
21	212-1915	DECAL, Warranty Parts		1
22	212-1918	DECAL, Safety Instructions		1
23	212-2207	DECAL, Warning, Hydraulic Oil Only		1
24	212-2220	DECAL, Danger		1
25	212-2221	DECAL, Danger		

DECAL PLACEMENT (CONTINUED)

ITEM	PART NO.	DESCRIPTION	EFF	QTY
26	212-2228	DECAL, Proximity Switch, Adjustment		1
27	212-2232	DECAL, Danger, Stay Clear		
28	212-2275	DECAL, Oil Level		1
29	212-2689	DECAL, Flag, Made in the USA		2
30	212-2738-010	DECAL, Auto/Manual Mode, Python lift		1
31	212-2875	DECAL, Battery, Warning		1
32	212-3026	DECAL, No Step		1
33	212-3047	DECAL, Rapid Rail Lub		1
34	212-3269	DECAL, Tailgate Prop Operation		2
35	212-3310	DECAL, Warning HPR Ladder		1
36	212-3321	DECAL, Lubrication Guide		1



Figure 7. Danger: Stay clear container off ground, PN 212-0980



Whenever the body is in any elevated or raised position, it must first be emptied and then securely blocked or propped so it cannot lower, which may cause injury or death!

Figure 8. Danger: Elevated body emtpied and propped, PN 212-1103



Figure 9. Danger: Stand clear automatic lift, PN 212-1242

ADANGER

Whenever the body is in an elevated or raised position it must be securely propped or blocked so it can not fall on anyone. Failure to do so may result in injury or death.

212-1104

Figure 10. Danger: Elevated body propped, PN 212-1104

DECAL IMAGES (CONTINUED)

BODY PROP OPERATION		
A WARNING		
Body must be unloaded before using props. DO NOT MOVE truck while the body is resting on the body props. Two props are installed on the vehicle. BOTH props must be used!		
TO USE PROPS: 1. Raise body to a height where props can be swung into position. 2. Remove transit position body prop retainers and swing body props to supportposition. 3. Lower body until body props support the weight and visually inspect to see that props are located on the saddles and secure. 4. Place unit in Lock-Out/Tag-Out mode before performing any work. NOTE: Hoist is single acting (lowered by gravity only).		
A DANGER		
Do not enter under the body area unless the unit is in Lock-Out/Tag-Out mode. To place unit in Lock-Out/Tag-Out mode, stop the engine, set the brakes and make sure the brakes are holding and working property, chock all wheels, remove the keys from the cab, place keys in a secure location, and insert a Lock-Out Tag on the steering wheel.		
TO STORE PROPS: 1. Raise body slightly. 2. Return props to transit position and install retainers. 212-1329		

Figure 11. Danger: Body Prop Operation, PN 212-1329



Figure 12. Warning: Overall height, PN 212-1584



Figure 13. Warning: Keep away from gear, PN 212-1330

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Always raise tailgate before raising body to prevent bumper from hitting ground. Failure to do so may result in unit damage, personal injury, or death. 212-1626

Figure 14. Danger: Raise Tailgate before Raising Body, PN 212-1626

DECAL IMAGES (CONTINUED)

A DANGER A DANGER A DANGER A DANGER A DANGER

Figure 15. Danger: Stand clear tailgate, PN 212-1634

TO TOGGLE BETWEEN AUTO AND MANUAL LIFT MODES PRESS AND HOLD BOTH GRABBER OPEN AND CLOSE BUTTONS UNTIL BEEP STOPS

Figure 17. Auto/Manual Mode, PN 212-2738-010



Figure 16. Warning: Battery disconnect switch, PN 212-2875

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DECAL IMAGES (CONTINUED)



Figure 18. Warning: Never use bumper as step, PN 212-1631

HYDRAULIC OIL ONLY

WARNING: TANK IS PRESSURIZED. RELIEVE PRESSURE BEFORE REMOVING CAP OR WORKING ON SYSTEM! 2122007

Figure 20. Warning: Tank is pressurized, PN 212-2207



Figure 19. Danger: Do not enter under chassis, PN 212-1764



Figure 21. Warning: Lock-out / Tag-out, PN 212-1781

DECAL IMAGES (CONTINUED)

WARNING

Do not operate or service this machine until you have read and fully understand the operations manual supplied with this equipment. Manuals can be obtained from a HEIL CO. Distributer.

ADVERTENCIA

NO SE DEBE OPERAR O MANTENER ESTAMAQUINA HASTA QUE HAYA LEIDO Y COMPRENDIDO EL MANUAL DE OPERACION ENTREGADO CON ESTE EQUIPO. MANUALES TAMBIEN PUEDEN SER CONSEGUIDOS POR MEDIO DEL DISTRIBUIDOR DE THE HEIL CO.

THE HEIL CO.

212-178

Figure 22. Warning: Operations Manual, PN 212-1783



Figure 24. Danger: Do not use for towing, PN 212-1820

SIEMPRE	Stay clear at
MANTENGASE	all times when
ALEJADO CUANDO	container is
EL RECEPTACULO	off the
ESTE ELEVADO.	ground.

Figure 23. Danger: Stay clear container off groud, PN 212-1899



Figure 25. Caution: Ladder safety/balance, PN 212-1914

DECAL IMAGES (CONTINUED)



212-2220

Figure 26. Danger: Do not operate - Lift cylinder, PN 212-2220



Figure 27. No Step, PN 212-3026



Figure 28. Hydraulic Oil Only, PN 212-1782

A DANGER

DO NOT Operate Truck Unless the Lift In/Out Cylinder and Warning Device are properly Maintained and Working Correctly. Failure to do so may result in personal injury, death or property damage. 212-2221

Figure 29. Danger: Do not operate - Lift cylinder, PN 212-2221

DECAL IMAGES (CONTINUED)



Figure 30. Danger: Stand clear tailgate, PN 212-1801



212-3269

DECAL IMAGES (CONTINUED)

THIS UNIT CONFORMS TO ALL PRESENT AMERICAN NATIONAL STANDARDS INSTITUTE SAFETY REQUIREMENTS Z245.1 IN EFFECT ON THE DATE OF MANUFACTURE.

ESTA MAQUINA ESTA DISENADA CONFORME CON LAS NORMAS DE SEQURIDAD Z 245.1 DE LA AMERICAN NATIONAL STANDARDS INSTITUTE EN VIGOR A LA FACHA DE SU MANUFACTURA. 212-1841 THE

THE HEIL CO.

Figure 32. ANSI Specifications, PN 212-1841

PROTECT YOUR PRODUCT AND WARRANTY - USE GENUINE HEIL REPLACEMENT PARTS PROTEJA SU PRODUCTO Y SU GARANTIA-USE REPUESTOS LIGITINOS HEIL Contact your Heil Distributo rocall 1-800-251-7250 212-1915

Figure 34. Warranty Parts, PN 212-1915 SAFETY INSTRUCTIONS INSTRUCCIONES DE SEGURIDAD

THIS VEHICLE IS EQUIPPED WITH A BACK-UP ALARM. WHEN BACKING, THE ALARM MUST SOUND THE OPERATOR IS RESPONSIBLE FOR THE SAFE USE OF THIS VEHICLE.

ESTE VEHICULO ESTA EQUIPADO CON UNA ALARMA DE RETROCESO. CUANDO EN RETROCESO, EL ALARMA TIENE QUE SONAR EL OPERADOR ES RESPONSABLE POR USAR ESTE VEHICULO EN FORMA SEGURA. 212-1918

Figure 33. Safety Instructions, PN 212-1918



Figure 35. Proximity Switch Adjustment, PN 212-2228

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DECAL IMAGES (CONTINUED)





Figure 38. Flag, Made in USA, PN 212-2689

	OIL LEVEL FULL
4	FILL
NC Fu cy)TE: Level to be between Il and Fill marks with all linders collapsed
	212-2275
1	
	A WARNING
	A WARNING To operate Hopper Ladder: 1. REMOVE BOTTOM two PINS first 2. SUPPORT UPPER LADDER while UNLATCHING LOCK HANDLES 3. ROTATE LADDER to the DOWN position 4. INSERT FINS into REAR HOLES 5. ATTACH WIRE LOCKS on the pins
	To operate Hopper Ladder: 1. REMOVE BOTTOM two PINS first 2. SUPPORT UPPER LADDER while UNLATCHING LOCK HANDLES 3. ROTATE LADDER to the DOWN position 4. INSERT PINS into REAR HOLES 5. ATTACH WIRE LOCKS onthepins The Hopper Ladder must be in the DOWN and PINNED (BOTH PINS) position BEFORE using ladder.
	WARNING WARNING WORDER LADGE AUMONIC BOTTOM TWO PINS first SUPPORT UPPER LADDERS MORTOR LADDERS MORTOR LADDERS MORTOR LOCKS ONTHENS MORTOR LOCKS ONTHENS MORTOR LADDERS MORTOR LADDERS MORTOR LOCKS ONTHENS MORTOR LADDERS MORTOR LADDERS MORTOR LADDERS MORTOR LOCKS ONTHENS MORTOR LADDERS
	WARNING WARNING Second State State Second State Secon
	WARNING Support upper Ladder: Support upper Ladder while UNLATCHING LOCK HANDLES ADTATE LADDER while UNLATCHING LOCK HANDLES ATTACH WIRE LOCKS on thepins The Hopper Ladder must be in the DOWN and PINNED (BOTH PINS) position BEFORE using ladder. The Hopper Ladder must be stored in the UP, LATCHED (BOTH PINS) position BEFORE (BOTH INS) position BEFORE operating unt. Figure 39. Warning: HPR

212-3310

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HYDRAULIC OIL ONLY 40.6 GAL. FILL SYSTEM PRESSURE 2700 P.S.I.

Figure 40. Hydraulic Oil Only, PN 212-2567



Figure 41. City Logo, PN 212-2443

ALEJESE DE LA PLACA COMPACTADORA MIENTRAS ESTE EN MOVIMIENTO.	Stand clear while panel is in motion.

42. Stand Clear, PN 212-1911



Sump door MUST be closed before operating the arms to prevent damage to door. 212-2067

43. Sump Door, PN 212-2067

DECAL IMAGES (CONTINUED)



Figure 44. Rapid Rail Body Lubrication Guide, PN 212-3047



CARE OF DECALS

It is important that the decals are properly cleaned to make sure that they are readable and do not come off the unit. Use the following steps to clean the decals.

General Instructions

- Wash the decals with a blend of mild car wash detergent and clean water.
- Rinse with clean water.
- Let the vehicle air-dry or dry with a micro-fiber cloth.
- Do not allow fuels to stay in contact with the decal for an extended period of time. Remove the fuel contamination as quickly as possible.
- Do not use carnauba-based wax over the decals.
- Do not use a mechanical brush while washing the decals.

Pressure Washer Precautions

- Pressure washing can cause damage to decals. It can cause the edges of the decals to lift and peel the decal away from the unit. Over time, the decal can fade, crack or chip away.
- See the following figures for correct and incorrect methods of pressure washing.
- Use pressure washing only when other cleaning methods are not effective. If you use a pressure washer, use the following precautions.
 - o Spray nozzle opening: 40° wide pattern
 - o Spray angle: 65° from vehicle's body
 - o Distance of nozzle to decal: 15" minimum
 - Water pressure: <= 800 psi
 - o Length of time: not more than 30 sec.
 - $\circ~$ Do not use sharp angles to clean the decals this can lift the decals from the unit.
 - o NEVER use a "turbo pressure nozzle".



ALTERNATIVE CLEANING PROCEDURE

When normal cleaning procedures do not remove difficult debris from the decals, try the following:

Isopropyl alcohol is flammable and is harmful to eyes and skin. Keep isopropyl alcohol away from heat or open sources of ignition. Flush eyes and skin with water for 15 minutes after contact. Seek immediate medical help.

- Spot clean the decal with Isopropyl Alcohol and a micro-fiber cloth (rag).
- If these methods do not work on a problem area, call a Heil Dealer or Heil Customer Service.

NOTES:

SECTION 3 LOCK-OUT/TAG-OUT PROCEDURE

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PREVIEW

Read this section to learn about the proper Lockout/Tagout procedures.

You MUST Lockout/Tagout a unit BEFORE:

- You enter the body
- Do any maintenance or repair procedures.

LOCKOUT/TAGOUT PROCEDURE

A DANGER

This procedure MUST be followed before entering the units body or performing any maintenance repair or cleaning procedures on the unit.

If you do not have functioning Lockout/Tagout gear and/or are not an authorized employee, STOP and DO NOT initiate any service on the unit. Contact your supervisor immediately.

NOTICE

This Lockout/Tagout procedure represents Heil's minimum recommendation and should be used in conjunction with and should not supersede additional or more stringent safety requirements called out by your company's policy. Please check with your supervisor to determine if your company has a specific Lockout/Tagout procedure. Contact your supervisor, Heil Technical Service, or reference OSHA Regulation 1910.147 if you have any questions about Lockout/Tagout.

Watch the Service Shack Video online at **www.Heil.com/** Heil-Service-Shack by selecting Lock-Out/Tag-Out.

- A. Put the unit in a Lockout/Tagout mode:
 - BEFORE you enter the unit's body
 - BEFORE you perform ANY maintenance, repair or cleaning procedures on the unit.

B. All stored energy must be removed and/or protected against, common sources found on Heil units (Including, but not limited to):

- Hydraulics
- Electrical
- Gravity
- Pneumatics
- Mechanical

C. Examples of some basic equipment required, see Figure:

- Multi-hasp
- Single-keyed red lock
- Lockout tag

LOCKING OUT THE UNIT (CONTINUED)

C. Examples of some basic equipment required, see Figure:

- Multi-hasp
- Single-keyed red lock
- Lockout tag



Figure 48. Lock-Out/Tag-Out Tag (Do Not Operate Tag)

Follow These Steps:

- 1. APPLY the brakes. MAKE SURE the brakes do not let the unit move and they work properly.
- 2. Chock all wheels.
- 3. SET the tailgate props when the tailgate is raised for any service, maintenance or cleaning.
- 4. SET the body props when the body is raised for any service, maintenance or cleaning.

- BEFORE disconnecting main battery power, VERIFY all the following stored energy sources are depleted according to your company policy:
 - a. Hydraulic (Such as forks or grabber arm in stowed position)
 - b. Pneumatic (Such as tag axles).
 - c. Mechanical (Such as springs)
 - d. Gravity (Such as tailgate raised)
- 6. REMOVE the key from the ignition and store it in your pocket, or another secured location for your safety.
- 7. Disconnect the battery power by flipping the battery box disconnect switch to OFF.
 - a. VERIFY all electrical stored energy is depleted according to your company procedure.
- 8. INSERT the mufti-hasp into the disconnect switch.
- 9. ATTACH your red single-keyed Lockout/Tagout lock with your tag exposed and visible to the multi-hasp.
 - a. ALWAYS use individually assigned locks and tags when performing ANY service or maintenance with other authorized employees. Each employee MUST place their personally assigned tag and lock to the multi-hasp connected to the disconnect switch.

LOCKING OUT THE UNIT (CONTINUED)

- 10. REMOVE your lock key and put it in your pocket for your safety.
 - a. ONLY the person who placed the lock and tag on the multi-hasp is authorized to remove it.
 - b. NEVER remove another employee's Lockout/Tagout gear without approval from the authorized person responsible.
 - c. Shift or personnel changes: Off-going employees MUST provide all details pertaining to the unit's status to the oncoming employee(s). The oncoming employee(s) MUST perform the Lockout/ Tagout procedure to verify all stored energy is removed from the unit BEFORE applying their Lockout/Tagout gear.
- 11. BEFORE removing your Lockout/Tagout gear to return the unit to service, follow these steps:
 - a. INSPECT the work area to ensure all nonessential items have been removed.
 - b. VERIFY all unit components are operationally intact.
 - c. ENSURE all employees are safely positioned or removed from the area.
 - d. NOTIFY all affected employees that the Lockout/ Tagout devices are being removed.

NOTES:

SECTION 4 FEATURES, CONTROLS, SWITCHES, AND INDICATOR LIGHTS

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PREVIEW

Read this section to learn about the operation of the in-cab and outside controls, switches, buttons, and indicator lights.

NOTICE

The location and appearance of the controls may be different than those shown in this manual. Make sure you know the location of the controls and the how you operate the controls on your unit before you use the vehicle.

This section tells you:

- · Learn about the unit's features and operation specifications
- The in-cab cab controls, switches and buttons
- How the in-cab controls work
- The in-cab indicator lights available
- The outside controls and how they work

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AUTO/MANUAL PACK MODE FEATURE

An electro-hydraulic system, "Auto/Manual Pack", is standard on all units. When the Auto Pack mode is selected, the packer paddle continuously sweeps the refuse from the hopper and packs it into the body. In the Auto Pack mode, the paddle sweeps about 180°, pauses, then reverses movement in the opposite direction. The cycle will continue as long as the Auto Pack mode is selected and the hydraulic pump is on.

The Auto Pack feature allows an operator to load refuse without the need to stop and cycle the packer. The BODY and TAILGATE UP and DOWN functions do not operate when the packer is in the AUTO mode.

The packer paddle reverses direction automatically:

- When it reaches its travel limit
- The packer pressure switch sends a signal to the Cortex Controller.

When the Manual Pack mode is selected, the operator must press and hold the Packer Left or Packer Right buttons on the control panel. The packer paddle will stop movement when the operator releases the button.

See In-Cab Control Panel 64 for the standard in-cab controls.

COORDINATED LIFT/MANUAL LIFT MODE

All units are equipped with the Coordinated Lift/Manual Mode feature. This feature allows the operator to partially automate the lifting, dumping and returning the refuse container to the ground.

You select the Coordinated Lift mode when you PRESS the COORD switch to ON. You extend the lift arm then PRESS and HOLD the GRIP switch (4-button control) or MOVE and HOLD the joystick at the GRIP position.

AUTO NEUTRAL (FORCE TO NEUTRAL) MODE FEATURE

The unit can normally operate-in-gear-at-idle (OIGAI). An option for the unit is the Auto Neutral (Force to Neutral) Mode. When the feature is activated, the unit puts the transmission in NEUTRAL automatically and returns it to DRIVE on demand by the operator. If you need to put the transmission into REVERSE, you must deactivate the Auto Neutral feature – you PRESS the AUTO NEUTRAL switch to the OFF position.

To activate this feature, the operator sets the service brake and selects the Auto Neutral mode (you PRESS the AUTO NEUTRAL switch to ON). When the operator starts a lift EXTEND function, the transmission shifts into neutral.

When an operator needs to re-position the truck to grab a refuse container with the Auto Neutral engaged, the operator can press and hold the DRIVE rocker switch or release the trigger on the joystick, which shifts the transmission into drive. When the operator is ready to go back to neutral, the operator either releases the DRIVE rocker switch or grasps the joystick trigger. (To put the transmission into reverse, the operator must turn the Auto Neutral feature off.)

When the operator releases the refuse container, retracts the lift arm and releases the service brake, the transmission shifts into gear (drive, not reverse).

FEATHER VALVE

One option for the unit is a Feather Valve. The Feather Valve slows down the movements of the lift arm.

The control for Feather Valve option can be either a rocker switch on the main, in-cab control panel or as a footoperated switch in the cab.

CONTROLS

The unit's standard hydraulic controls are located on the In-Cab Control Panel and the 4-Button Control Assembly. Optional controls are available such as a joystick and doormounted or seat-mounted controls.

IN-CAB CONTROL PANEL

There is one basic main control panel for different models of truck chassis. The control panel can be assembled in various enclosures depending on the truck chassis. See the figure to the right. (The lift arm's 4-button control and optional joystick control can be located in various areas of the cab, either as a separate control or attached to a main control panel assembly.)

The control panel has labels or markings that identify each function and its operations, including the optional function, Auto Neutral. When other options are on the truck and are operated from the control panel, its function will be marked. Make sure you are familiar with the control panel in your unit.

The labeling/marking scheme is straight-forward and identifies a function and its operations. For example, look at the figure below and find the TAILGATE function and its RAISE operation. The marking identifies the function (TAILGATE) and its operation (RAISE). When you want to raise the tailgate, for example, you PRESS the TAILGATE RAISE switch (see the figure below) to the UP position and hold it there until the tailgate is at the position you want, then RELEASE the switch and the raise operation stops.

Similarly, the following instructions tell you to PRESS a switch to a position (as given by the panel's label/marking) for the operation shown on the panel's markings/label.



Figure 49. In-Cab Control Panel
IN-CAB CONTROL SWITCHES AND INDICATOR LIGHTS

Use the switches and indicator lights described in the following paragraphs to operate the unit's hydraulic functions.

Push-Pull Switch (System Power)

The following paragraphs describe the push-pull switch that is on your unit.

While the control panel may be in different locations in different cabs, the panel and its label/markings will look similar to the panel and labels/markings shown on the figure to the right.

This red, illuminated push-pull switch supplies power to the Cortex Controller which, depending on several inputs, activates the hydraulic system. The hydraulic system is made up of Heil-installed electrical and hydraulic components. The switch has a large, red push-pull knob that the operator can use to quickly shut down the hydraulic system in an emergency.

When you press the switch, it breaks the signal to the Cortex Controller, which prevents other functions from working. (The switch's light can be ON and the pumps are not on. There are other factors involved for turning the pumps on or off.) It has a label or marking of system power. See the figure to the right.

- Pull the knob to turn the hydraulic system on.
- The switch's red light turns ON.

- Push the knob to turn the hydraulic system off.
- The switch's red light turns OFF.

NOTICE

Unless the pump is a front-mount pump, the pump is driven by the transmission through a PTO. Find the control in the cab to engage the PTO.



Figure 50. System Power Switch

STANDARD ROCKER SWITCHES

The standard rocker switches are at the top of the control panel. See the figure to the right. Three switches (BODY UP/DOWN, TAILGATE UP/DOWN and PACKER LEFT/ RIGHT) are momentary switches – that is, the switch is only active when you press and hold the switch at the operation's position. The switch returns to the NEUTRAL or OFF position when you RELEASE the switch.

The function (such as BODY) continues an operation (such as UP or DOWN) for as long as you keep the switch at the operation's position (such as UP or DOWN). The switch will go to the NEUTRAL (or OFF) position when you RELEASE the switch.

The BODY UP/DOWN and TAILGATE UP/DOWN functions do not operate when the AUTO PACK mode is selected.

The other two switches (PAKER AUTO/MANUAL and COORD OFF/ON) are two-position switches – that is, the function is selected when you PRESS the switch to the function's position and stays selected when you RELEASE the switch.



Figure 51. Standard Rocker Switches

STANDARD ROCKER SWITCHES (CONTINUED)

A DANGER

A tailgate in motion is dangerous. Serious injury or death may occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.

A. TAILGATE UP/DOWN

This momentary switch controls the raising and lowering of the tailgate when the MANUAL PACK mode is selected:

- 1. PRESS the switch to the up position and HOLD it there to RAISE the tailgate.
- 2. PRESS the switch to the down position and HOLD it there to LOWER the tailgate.
- 3. RELEASE the switch to stop an UP or DOWN operation at any time or when the tailgate is fully raised or lowered. The switch's red light goes OFF when the switch is in the neutral position.
- 4. The BODY TAILGATE UP red indicator light is ON when the tailgate is UP and goes OFF when it is fully DOWN.

Any part of your body between the unit's body and the chassis or cylinders while you raise the body is dangerous. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Keep all parts of your body out from underneath the unit's body and away from the cylinders during this procedure.

A DANGER

Do not raise a body that has refuse while you do maintenance or service procedures. Refuse in the body can make the unit unstable. Always unload refuse from the body before you raise it for maintenance or service procedures. Always use the body props when you raise the body for maintenance or service procedures.

A WARNING

Raising the body with the tailgate closed can damage the underride bumper. The underride bumper can hit the ground when the tailgate is not fully raised before you raise the body. Serious injury or death may occur and also cause damage to the unit.

STANDARD ROCKER SWITCHES (CONTINUED)

B. BODY UP/DOWN

This momentary switch controls the raising and lowering of the body when the MANUAL PACK mode is selected:

- 1. PRESS the switch to the UP position and HOLD it there to raise the body.
- 2. PRESS the switch to the DOWN position and HOLD it there to lower the body.
- The BODY TAILGATE UP red indicator light is ON when the body no longer rests on the chassis and it goes OFF when the body fully rests on the chassis.
- 4. Release the switch to stop the up or down operation at any time or when the body is fully raised or lowered.
- 5. Always lower the body until it fully rests on the chassis.

NOTICE

You must LOWER the tailgate AFTER you LOWER the body.

C.PACKER LEFT/RIGHT

This momentary switch controls the direction of the packer paddle in the packer manual mode:

- 1. You PRESS the button to the LEFT position and hold the button to make the packer paddle sweep to the left direction.
- 2. When you RELEASE the button, the paddle stops moving in the left direction.
- 3. You press the button to the RIGHT position and hold the button to make the packer paddle sweep to the right direction.
- 4. When you RELEASE the button, the paddle stops moving in the right direction.
- 5. The PACKER LEFT green indicator light is ON when you select the LEFT position and the PACKER RIGHT YELLOW indicator light is ON when you select the RIGHT position. Otherwise, the lights are OFF.
- D. PACKER AUTO/MANUAL

This switch selects either the AUTO packer mode or the MANUAL packer mode:

- 1. The packer is in the AUTO mode until you press the switch to the MANUAL position.
- 2. You can return to the AUTO mode from the MANUAL mode when you PRESS the switch to the AUTO position.
- 3. When the AUTO mode is selected the BODY and T/G UP and DOWN functions do not operate.

STANDARD ROCKER SWITCHES (CONTINUED)

NOTES:

E.COORD OFF/ON

This switch selects either the Coordinated Lift mode or the Manual Lift mode. The unit is in the Manual Lift mode until you select the Coordinated Lift mode.

- 1. PRESS this switch to the ON position to enable the Coordinated Lift Mode.
- 2. PRESS this switch to the OFF position to enable the Manual Lift mode.
- 3. You must use the 4-button control or the joystick (if available) to control the operations of the lift arm in either Lift mode.

OPTIONAL ROCKER SWITCHES

The optional rocker switches include the switches for the optional Auto Neutral feature and one of the options for the Feather feature. Other options may have a labeled rocker switch in one of the open switch locations. See the figure on the right.

A. AUTO NEUTRAL ON/OFF

This switch activates and deactivates the optional Auto Neutral (Force to Neutral) feature.

- 1. PRESS this switch to the ON position to enable the Auto Neutral feature.
- 2. PRESS this switch to the OFF position to disable the Auto Neutral feature.

B. AUTO NEUTRAL DRIVE

This switch temporarily shifts the transmission into DRIVE or NEUTRAL when Auto neutral is enabled.

- 1. PRESS this switch to the DRIVE position to shift the transmission into drive.
- 2. PRESS this switch to the OFF (unmarked) position to shift the transmission into neutral.

C. FEATHER

This switch activates a feather valve. The feather valve makes the movements of the lift arm slower.

- 1. PRESS this switch to the ON position and HOLD to feather the movement of the lift arm drive.
- 2. RELEASE this switch to STOP feathering the arm lift.



Figure 52. Optional Rocker Switches

INDICATOR LIGHTS

The following paragraphs describe the eight indicator lights that may be on your unit, depending on the options. See the figure to the right for locations of the standard lights on the control panel.

A. PUMP ON

This green light is ON when you PULL UP the SYSTEM POWER switch and one of the two pumps (Loader or Pump 1 and Body or Pump 2) are on. It goes OFF when you PUSH the SYSTEM POWER switch or both pumps are off.

B. PACKER PSW

This yellow light is ON when the packer pressure switch senses a packer pressure greater than a pre-set limit. The light is OFF when the packer pressure switch senses a packer pressure less than the pre-set limit.

C.PACKER RIGHT

This YELLOW light is ON when the PACKER RIGHT position is selected on the PACKER LEFT/RIGHT switch.

D.PACKER LEFT

This green light is ON when the PACKER LEFT position is selected on the PACKER LEFT/RIGHT switch.





E. TRANS TEMP

This red light flashes ON once per second when the temperature of the transmission fluid is above the manufacturer's recommended maximum operating temperature. If this occurs, either:

- 1. Shift the truck to neutral, continue to run the engine and let the transmission cool
- 2. Or drive at a continuous speed without operating the pump

INDICATOR LIGHTS (CONTINUED)

F. BODY TAILGATE UP

This red light is ON when either the body does not fully rest on the chassis or the tailgate is not fully closed. An in-cab alarm (chime) will sound with either condition.

G.FILTER CHANGE

This red light is ON when the filter is in the bypass condition and you need to change the filter element.

The light will be OFF after you change the filter. See **Hydraulic Pump Shutdown**

H. OPTION

If your unit has an option with an indicator light, it may be in any one of these positions. A label will identify the function of the light.

STANDARD 4-BUTTON CONTROL FOR THE LIFT ARM

A standard 4-button control is included with every unit except when lift arm control options are selected at the time the unit was ordered from Heil. See **Optional Standard Joystick Control** 74 and **Optional Deadman Joystick Control** 77 when the truck has lift arm control options. See the figure to the right for locations of the control switches and their labels.

Each switch is a momentary rocker button switch – that is, you press the switch to the position of an operation and HOLD it there to enable that operation. When you RELEASE the switch, the operation stops.

For example, if you want to do a GRIP operation, you PRESS the switch to the GRIP position and HOLD it there until the grabber closes sufficiently around the refuse container to lift it, then you RELEASE the switch.



Figure 54. Standard 4-Button Control

A. OUT/IN

This switch controls the IN and OUT movement of the lift arm. PRESS the switch to the OUT position and HOLD it there to move the lift arm OUT. RELEASE the switch when the lift arm is at the correct position.

PRESS the switch to the IN position and HOLD it there to move the lift arm in. RELEASE the switch when the lift arm is at the correct position.

STANDARD 4-BUTTON CONTROL FOR THE LIFT ARM (CONTINUED)

B.GRIP/RELEASE

This switch controls the GRIP and RELEASE functions of the grabber arm. PRESS the switch to the GRIP position and HOLD it there until the grabber arms are closed sufficiently to lift the refuse container.

PRESS the switch to the RELEASE position and HOLD it there until the grabber arms open sufficiently to release the refuse container.

C.DOWN/UP

This switch controls the DOWN and UP movement of the lift arm. PRESS the switch to the DOWN position to lower the lift arm. PRESS the switch to the UP position to raise the lift arm.

D.DUMP/UNDUMP

This switch controls the pivoting of the lift arm to empty a refuse container (DUMP) into the hopper and to return it from the hopper to a level position after emptying the refuse container (UNDUMP).

PRESS the switch to the DUMP position to empty the refuse container. PRESS the switch to the UNDUMP position after the refuse container is empty.

E.COORDINATED LIFT Mode

You use the 4-button control to start and control the COORDINATED LIFT mode.

When the COORDINATED LIFT mode is enabled (the COORD switch on the control panel is at ON), you start the COORDINATED LIFT when you PRESS the GRIP switch to the GRIP position and HOLD.

The grabber arms will close around the refuse container and approximately one (1) second later, the lift arm IN and UP functions will start. When the lift arm meets the dump proximity switch, the lift arm will pivot and DUMP the refuse container.

You remove the refuse container from the hopper and lower the container when you PRESS the UNDUMP switch and HOLD it there. This will cause the lift arm to remove the refuse container from the hopper (UNDUMP) and lower the lift arm. You then manually extend the lift arm with the IN/OUT switch (PRESS and HOLD the IN/ OUT switch at the OUT position) until the refuse container is where you want it, then you RELEASE the IN/OUT switch.

You finish the COORDINATED LIFT mode when you PRESS and HOLD the GRIP/RELEASE switch at the RELEASE position. RELEASE the switch and the grabbers will release the refuse container and retract (move in) the loader arm.

F. MANUAL LIFT Mode

You use the four switches to control the functions of the lift arm as previously described.

OPTIONAL 4-BUTTON CONTROLS FOR THE LIFT ARM

There are optional 4-button controls. The controls look similar but may be located:

- On different consoles
- On different panels
- On a door
- Under a seat.

Some of the controls have the push-button switches in a straight line (similar to the standard 4-button control) while others may have one switch (DUMP/UNDUMP) off-set. See the figure to the right for the off-set 4-button control.

The 4-button control that mounts on a door separates the DUMP/UNDUMP switch from the other three switches. The DUMP/UNDUMP switch is near the other three switches, but has its own mounting assembly. An operator can use the door-mount and under-seat mount controls while standing outside the cab.

The optional controls operate in the same manner as the standard 4-Button Control. Become familiar with the control in your unit.



Figure 55. Optional 4-Button Control

OPTIONAL STANDARD JOYSTICK CONTROL

Read all of this section for the descriptions of the operation of the standard, in-cab joystick control for the lift arm functions. The standard joystick control will look similar to the controls shown above. The standard joystick control can be located in various areas of the cab, either as a separate control or attached to a main control panel assembly. There are two orientations of the rocker switch – the current production places the rocker switch in a horizontal position. Become familiar with the location of and the functions of the standard joystick control in your unit.

OPTIONAL STANDARD JOYSTICK CONTROL (CONTINUED)



Figure 56. Optional Joystick Control

The joystick controls the operation of the lift arm and the grabber assembly. The joystick controls the lift arm's OUT, GRIP, RELEASE and UNDUMP functions. The rocker switch on the top of the joystick assembly controls the UP and IN functions.

The joystick has a decal that shows you where to push/pull (move) the joystick for each function and direction of the lift arm. The decal also shows the operation of the rocker switch. See the figure to the left.

The operation of the joystick function continues until you MOVE the joystick back to the center or neutral position or let go of the control, as it is self-centering.

The operation of the rocker switch function continues until you release the rocker switch.

For example, if you want to grab a refuse container, you move the joystick to the GRIP position and HOLD it there until the grabber closes on the refuse container sufficiently to lift it, then you release the joystick and the GRIP operation stops.

OPTIONAL STANDARD JOYSTICK CONTROL (CONTINUED)

Moving equipment can be dangerous to bystanders. Serious injury or death can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

- A. OUT (Arm) Use the joystick to move the lift arm out.
 - Move the joystick towards the OUT position to move the lift arm away from the unit.
 - RELEASE the joystick when the arm is at the position you want and the operation stops.
- B. IN (Arm) Use the rocker switch on the top of the joystick to move the arm in.
 - PRESS the rocker switch to the IN position and HOLD to move the lift arm in.
 - RELEASE the rocker switch when the arm is at the position you want. The IN operation stops when you release the rocker switch.

NOTICE

Grabbing a refuse container with too much pressure can damage the container. The container can become unusable. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

C.GRIP/RELEASE (Grabber)

- MOVE the joystick towards the GRIP (right) position to close the grabber and secure the container.
- RELEASE the joystick to stop the GRIP operation when the container is securely grasped.
- MOVE the joystick towards the RELEASE (bottom) position to open the grabber and release the container (when it is on the ground).
- RELEASE the joystick to stop the RELEASE operation.
- When the COORDINATED LIFT feature is enabled, after a pre-set time and the grabber is closed around the container, the lift arm raises automatically, EXCEPT when the FINESSE function is enabled. In this case, the grabber assembly operates normally with GRIP and RELEASE functions and there is no UP operation.

OPTIONAL STANDARD JOYSTICK CONTROL (CONTINUED)

- D. UP (Arm) Use the rocker switch on the top of the joystick to move the arm up and pivot the grabber assembly to dump the refuse into the hopper.
 - PRESS the rocker switch to the UP position and HOLD to move the lift arm up
 - RELEASE the rocker switch to stop the UP operation.
- E. UNDUMP (Arm) Use the joystick to pivot the grabber assembly out of the hopper and move the arm down.
 - PRESS the rocker switch to the UNDUMP position and HOLD to rotate the grabber assembly out of the hopper and move the lift arm down.
 - RELEASE the rocker switch after the UNDUMP operation. The UNDUMP (and LOWER) operation stops when you release the rocker switch.

F. COORDINATED LIFT and UNDUMP

- PRESS the COORD switch to ON and release.
- MOVE the joystick to the OUT position and HOLD until the arm is in position to pick up the refuse container.
- MOVE the joystick to the GRIP position and HOLD. About one second later, the lift arm will move IN and UP, AND DUMP the refuse container.

- When the container is empty of refuse, MOVE the joystick to the UNDUMP position and HOLD. The lift arm will rotate the container out of the hopper and lower the container.
- MOVE the joystick to RELEASE and the grabbers will release the container and move the lift arm IN.

OPTIONAL DEADMAN JOYSTICK CONTROL

The optional "Deadman" joystick is for use with units that have the Auto Neutral option. (The deadman joystick is not required for the Auto Neutral option.) The joystick operation is the same as with a standard joystick with one added feature, the "deadman" trigger.

When the Auto Neutral function is activated, you use the joystick lift functions when the transmission is in neutral. The joystick functions do not operate when Auto Neutral is activated and the transmission is in drive.

As explained previously in this section (see **Auto Neutral Mode Feature** (70)), after you enable Auto Neutral, the service brake is applied, and you grasp the joystick and its deadman trigger, the transmission shifts into neutral when you start a lift extend function. You can then operate the joystick lift functions while the transmission is in neutral.

OPTIONAL DEADMAN JOYSTICK CONTROL (CONTINUED)

When you need to move forward (for example to reposition the truck to grab a refuse container) you RELEASE the trigger, which puts the transmission into drive. After you move the truck, you can shift the transmission back into neutral when you GRASP the trigger.

You must de-activate Auto Neutral to put the transmission into reverse.

See the figure to the right for details of the Deadman In-Cab Joystick.



OPTIONAL REMOTE AUTO NEUTRAL CONTROL

A remote Auto Neutral control is available. It can be located anywhere in the cab that is convenient for the operator. See Figure below.

With Auto Neutral enabled, you can put the transmission into neutral when you MOVE the toggle switch to NEUTRAL.

With Auto Neutral enabled, you can put the transmission into DRIVE when you MOVE the toggle switch to DRIVE.



STANDARD OUTSIDE CONTROLS

There are no standard outside controls for the unit.

OPTIONAL OUTSIDE CONTROLS

There are no optional outside controls for the unit.

NOTES:

SECTION 5 BODY AND TAILGATE PROPS

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PREVIEW

Read this section to learn about:

- Using the body props
- Using the tailgate props

PROPPING THE BODY

Operators **MUST KNOW** how to **SAFELY** prop up the unit's body. You may need to prop the body up when you clean the inside of the body or for maintenance or repair procedures.

Use the factory-supplied body props to prop the body as described below.

Observe and obey the following DANGER and WARNING notices while you prop the body with the factory body props.

Factory Body Props

Follow These Steps:

A. To lower the body props:

A DANGER

Any part of your body between the unit's body and the chassis or cylinders while you raise the body is dangerous. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Keep all parts of your body out from underneath the unit's body during this procedure.

NOTICE

Empty body of all refuse before using body props.

A DANGER

The unit may roll when you raise the body on unstable or uneven ground and cause serious injury or death to you or bystanders. Do not prop the body while the unit is on unstable or uneven ground. Clear the area of all people not necessary for this procedure and set the unit on stable and even ground before you start this procedure. Make sure all tire pressures are correct.

Interconnected body props are installed on the unit. Both props MUST be used.

NOTICE

Units manufactured after April 2009 have the manual override valve. If you have not experienced problems with the service hoist, you may not need the override valve. If you have experienced problems with the service hoist, contact your Heil dealer or Heil.

- 1. Make sure the packer is in the MANUAL mode.
- 2. Raise the tailgate and prop it. See **Factory Tailgate Props** 85.
- 3. Use the BODY UP/DOWN switch and raise the body sufficiently to operate the body props.

Factory Body Props (Continued)

- 4. RELEASE the body props and let the body props down.
- 5. Use the BODY UP/DOWN switch and LOWER the body so that the props rest in the body prop support.
- 6. The BODY T/G light is ON.
- 7. Put the unit in the lock-out mode and remove the ignition keys. Refer to the Lock-Out/Tag-Out Procedure 55.
- 8. When you complete the service or maintenance action, take the unit out of the lock-out mode, insert the ignition key and start the engine.



Factory Body Props (Continued)

B. To store the body props:

Any part of your body between the unit's body and the chassis or cylinders while you raise the body is dangerous. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Keep all parts of your body out from underneath the unit's body during this procedure.

- Use the BODY UP/DOWN switch and RAISE the body sufficiently to REMOVE the load from the body props.
- 2. Lift each body prop and RETURN the props to the transit position and secure each body prop.
- 3. LOWER the body until it completely rests on the chassis.
- 4. Use the T/G UP/DOWN switch and RAISE the tailgate sufficiently to REMOVE the props from their pockets.
- 5. STORE the tailgate props and lower the tailgate.
- 6. The BODY T/G light is OFF.

PROPPING THE TAILGATE

YOU MUST prop the tailgate when you open it for service or maintenance. Use the instructions that follow and prop the tailgate with either the factory-installed tailgate props or a tailgate prop built specifically for your unit.

Observe and obey the following DANGER and WARNING notices while you prop the body with either the factory body props or with alternate props.

A DANGER

A tailgate in motion is dangerous. Serious injury or death may occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.

Factory Tailgate Props

YOU MUST USE BOTH of the two support props at the rear of each unit whenever you open the tailgate for service or maintenance.

1. MAKE SURE the unit is on flat, stable ground and apply the parking brake and chock the wheels.

Factory Tailgate Props (Continued)



Figure 60. Tailgate Props

\Lambda DANGER

Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Any part of your body between the unit's body and the tailgate while you prop the tailgate or when the tailgate is propped is dangerous. Serious injury or death may occur if any part of your body is between the tailgate and the body if the tailgate suddenly closes.

- 2. Make sure the packer is in the MANUAL mode.
- 3. Use the TAILGATE UP/DOWN switch and raise the tailgate enough to RELEASE and rotate the props so that you can put each prop in its prop pocket on each side of the tailgate. LOWER the tailgate enough to secure the props in the pockets.
- 4. The BODY TAILGATE light is ON.
- 5. Put the unit in the lock-out mode and remove the ignition keys. Refer to the Lock-Out/Tag-Out Procedure 55.
- 6. When you complete the service or maintenance action, take the unit out of the lock-out mode, insert the ignition key and start the engine.
- Use the TAILGATE UP/DOWN switch and RAISE the tailgate sufficiently to remove the props from their pockets.
- 8. Store the tailgate props.
- 9. LOWER the tailgate until it is completely CLOSED.

SECTION 6 DAILY CHECKLIST

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DAILY CHECKLIST

Make sure you perform a daily check of the unit. Make copies of the **Refuse Vehicle Daily Inspection** and the next several pages to have the Operator mark completed items before each route. Many checks in the Daily Checklist are maintenance related, such as checking tire pressures and hoses for wear and damage.

Refer to the Daily Checklist Maintenance Items Chart below for items to check and the required action.

DAILY CHECKLIST MAINTENANCE ITEMS		
Item	Required Action	
Low air pressure in tires	Inflate the tire to the correct air pressure given on the tire	
Worn tire	Replace when the wear is greater than allowed by law or before the tread is no longer visible	
Damaged tire	Replace immediately BEFORE going on route.	
Hydraulic pump leaks	Determine the cause of the leak and repair immediately.	
Damaged hydraulic pump	Repair or replace IMMEDIATELY	
Loose or missing hardware for the hydraulic pump	Tighten loose hardware Replace missing hardware immediately	
Damaged decal or decal not readable	Replace decal immediately	
Low level of hydraulic oil	Fill the hydraulic oil tank immediately	
Worn or damaged hoses	Replace immediately	
Leaks at cylinders, hoses or fittings.	Tighten loose connection	
Loose or missing hardware	Tighten loose connections Replace missing hardware	
Worn fiber guards	Replace hoses/fittings as necessary Install new fiber guard on new hoses	
Worn or damaged tailgate lock components	Replace worn or damaged components	
Loose or missing tailgate lock hardware	Tighten loose hardware Replace missing hardware	

DAILY CHECKLIST MAINTENANCE ITEMS		
Item	Required Action	
Damaged tailgate seal	Replace seal	
Body structure has loose or missing hardware	Tighten loose hardware Replace missing hardware	
Body structure has cracked weld joints	Repair immediately	
Body mounting brackets have loose hardware, damaged hardware or cracked welds	Tighten loose hardware Replace missing hardware Repair cracked welds	
Air regulator (typically located at front of body)	90 PSI	



REFUSE VEHICLE	DATE:	/	/	_
DAILY INSPECTION				

UNIT NO.

Enter one of the following codes in the Inspection Results Code column:

Use a $\sqrt{10}$ to indicate inspected and no repair, service or adjustment is necessary. Use an **R** to indicate repair, service or adjustment is necessary. Use an N to indicate vehicle not equipped.

FOLLOW ALL APPLICABLE LOCK-OUT / TAG-OUT PROCEDURES

Printed Name of Operator:

D

I certify with the signature that follows that I performed a complete inspection in accordance with the following check list on the date given above.

Signature of Operator:

Refer to **Preventative** Maintenance Chart 135 and Lubrication Guide [13] for additional information and requirements.

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CHECKS AND INSPECTIONS

INSPECTION RESULTS CODE (√/R/N)

	(√/R/N)
INSPECT PER APPLICABLE MANUFACTURER MANUAL	
Cab/Drive	
Wheels and Tires	
Tractor and Chassis Electrical	
Chassis	
Engine & Transmission & Fluid Levels	
Tractor, 5 th Wheel and Chassis Lubrication	
REFUSE COLLECTION SYSTEMS AND COMPONENTS	
CAB OUTSIDE AREA	
Check air pressure of tires. Add air to any tire with air pressure lower than recommended before going on route.	
Check wear of tire tread. Replace tire worn below tire manufacturer's recommendation or state requirement before going on route	
Check tires for damage. Replace any damaged tire before going on route	
Inspect pump for leaks	
Inspect pump for damage or loose hardware	
Inspect decals on bumper for damage and readability	
Inspect unit for refuse on or about the engine or exhaust components. Remove all refuse to prevent a fire	
BODY AND CHASSIS CURB SIDE INSPECTION	
Inspect level of hydraulic oil if tank is mounted on curb side. It must be full. Add recommended oil as necessary	
Inspect loader hydraulics for	

CHECKS AND INSPECTIONS

INSPECTION RESULTS CODE (√/R/N)

	(√/R/N)
Cylinder, hoses and fittings for leaks	
Hoses for wear and damage	
Cylinders for damage	
Loose or missing mounting hardware	
Wet fiber guards – replace hoses/fittings as necessary – MAKE SURE TO INSTALL FIBER GUARD ON NEW HOSE TO PREVENT HYDRAULIC LEAKS REACHING ENGINE SURFACES WHICH CAN CREATE A FIRE HAZARD	
Inspect decals on body prop for damage and readability	
Inspect body structure for damage, loose or missing nuts and bolts and for cracked welds and metal	
Inspect body mounting brackets for cracked welds, missing bolts or nuts or movement	
Inspect decals on curb side body for damage and readability	
Check air pressure of tires. Add air to any tire with air pressure lower than recommended before going on route	
Check wear of tire treads. Replace any tire worn below tire manufacturer's recommendation or state requirement before going on route	
Check tires for damage. Replace any damaged tire before going on route	
Inspect tailgate raise components	
Cylinder, hoses and fittings for leaks	
Hoses for wear and damage	
Cylinder for damage	
Loose or missing mounting hardware	
Inspect tailgate lock components	
Latch components for wear or damage	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Loose or missing mounting hardware	
Tailgate is locked	
TAILGATE	
Inspect decals on tailgate and underride bumper for damage and readability	
Inspect tailgate seal for visible damage	
Inspect underride bumper for damage and loose components	
BODY AND CHASSIS STREET SIDE INSPECTION	
Tailgate is locked	
Inspect tailgate lock components	
Latch components for wear and damage	
Loose or missing mounting hardware	
Inspect tailgate raise components	
Cylinder, hoses and fittings for leaks	
Hoses for wear and damage	
Cylinder for damage	
Loose or missing mounting hardware	
Check air pressure of tires. Add air to any tire with air pressure lower than recommended before going on route	
Check wear of tire treads. Replace any tire worn below tire manufacturer's recommendation or state requirements before going on route	
Check tires for damage. Replace any damaged tire before going on route	
Inspect all decals on curb side body for damage and readability	

CHECKS AND INSPECTIONS

INSPECTION RESULTS CODE (√/R/N)

	((in a ray
Inspect body structure for damage, loose or missing nuts and bolts and for cracked welds	
Inspect body mounting brackets for cracked weld, missing bolts or nuts or movement	
Inspect decals on body prop for damage and readability	
Inspect level of hydraulic oil if tank is mounted on streetside. It must be full. Add recommended oil as necessary	
If equipped, the hopper cover is DOWN	
Battery disconnect switch is turned to OFF then:	
Check wiring and battery cables from the battery box to the engine starter for wear and other damage. IMMEDIATELY REPLACE WORN OR DAMAGED WIRING	
Check wiring and cables for loose connections. IMMEDIATELY TIGHTEN LOOSE CONNECTIONS	
OPERATION OF UNIT - Skip this section if the unit will not be operated today	
Close the air tank drain valve	
Turn battery disconnect to ON	
Apply parking brake	
Make sure the starter interlock operates – make sure unit will not start in gear	
Start the engine. Indicator lights and gauges show normal operation of engine	
Make sure the parking brake does not allow the vehicle to move forward or reverse at idle	
Make sure the throttle advance (if equipped) operates only in neutral	
Make sure all cab, body and tailgate lights operate	
Make sure the backup alarm and light operate	
Make sure all people not necessary and any hazards are clear of the area and then:	
If equipped, engage the PTO	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Pull the System Power knob UP – the switch's red light is ON and the PUMP ON light is ON	
Push the System Power knob DOWN – the switch's red light is OFF and the PUMP ON light is OFF	
Pull the System Power knob UP – the switch's red light is ON and the PUMP ON light is ON	
The FILTER CHANGE light is OFF. If not, and the filter was not changed before starting the unit, report this to your supervisor immediately. DO NOT go on route until the unit is repaired if the filter was not changed	
Operate the packer in the auto mode – the packer continuously sweeps left and right	
Operate the packer in the manual mode – manually move the packer to the left. The PACKER LEFT light is ON	
Operate the packer in the manual mode – manually move the packer to the right. The PACKER RIGHT light is ON	
The PACKER PSW light is OFF. If not, report this to your supervisor immediately. Do not go on route until the unit is repaired	
The TRANS TEMP light is OFF. If not, report this to your supervisor immediately. Do not go on route until the unit is repaired	
Operate all eight single functions of the lift with the standard 4-button controls:	
OUT, GRIP, UP and DUMP	
UNDUMP, DOWN, RELEASE and IN	
Do a Coordinated Lift cycle with the standard 4-button controls	
If equipped, operate all eight single functions of the lift with the remote 4-button controls:	
OUT, GRIP, UP and DUMP	
UNDUMP, DOWN, RELEASE and IN	
If equipped, do a Coordinated Lift cycle with the remote 4-button controls	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
If equipped, operate all six single functions of the lift arm with joystick	
OUT, GRIP and UP (joystick)	
Use the 4-button controls and do a DUMP	
UNDUMP (joystick)	
DOWN (4-button control)	
RELEASE and IN (joystick)	
If equipped, do a Coordinated Lift cycle with the joystick and 4-button controls	
If equipped, do a Coordinated Lift cycle with the joystick and the remote 4-button controls	
If equipped, operate the standard Auto Neutral controls	
If equipped, operate the remote Auto Neutral controls	
If equipped with deadman joystick, and Auto Neutral is ON, operate the standard Auto Neutral controls:	
RELEASE the trigger – the transmission should shift into drive	
GRASP the trigger – the transmission should shift into neutral	
Turn Auto Neutral OFF	
If equipped, enable the Feather Valve controls and operate all lift arm functions. The lift arm should be slower	
OPERATION OF UNIT - Continued	
If the body has refuse:	
Raise the body slightly – the BODY T/G UP light and alarm are ON	
Lower the body completely until it rests on the chassis	
The BODY T/G UP light and alarm are OFF	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
If the body does not have refuse, use the in-cab controls and:	
Raise the body	
The BODY T/G UP light and alarm are ON	
Make sure the body props rotate fully down, then store the body props	
Lower the body completely	
The BODY T/G UP light and alarm are OFF	
Open the tailgate	
The BODY T/G UP light and alarm are ON	
Set the tailgate props	
Inspect the tailgate seal for damage	
Store the tailgate props and raise the tailgate completely	
Close the tailgate	
The BODY T/G UP light and alarm are OFF	
Make sure the tailgate flag is DOWN.	
Move the lift arm to the TRANSIT position – lift arm is stowed and the grabber is fully OPEN and against the unit OR move the lift arm to the alternate position – lift arm is IN and the grabber is in the hopper	
Keep the engine running and continue the inspection	
IN-CAB INSPECTION	
Inspect all in-cab decals for damage and readability	
Do one automatic packer cycle	
Make sure the following lights are OFF:	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Body T/G UP	
TRANS TEMP	
FILTER CHANGE	
PUMP ON light is OFF – if it is ON, push the System Power knob DOWN	
f equipped, check the operation of each camera	
FINAL INSPECTION	
While you walk completely around the vehicle, look for:	
Fluid leaks	
Cracked or damaged welds and metal	
Loose or missing bolts, nuts and clamps	

SECTION 7 BEFORE GOING ON ROUTE

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PREVIEW

Read this section to learn proper procedures for:

- Checking the unit each day
- Starting the unit in cold weather
- Setting the unit up for the route
- Removing power to the unit during periods of not using the unit.
BATTERY DISCONNECT SWITCH

The battery box is typically located on the streetside of the chassis frame near the front of the body, however it can be mounted at a different location on different chassis. Become familiar with the location of the battery box and battery disconnect switch on your unit.

- 1. You must turn the battery disconnect switch to the OFF position whenever the unit is shut off for any length of time especially when the unit will be left unattended.
- 2. You must turn the battery disconnect switch to the ON position whenever you will use the unit.
- 3. You must check the position of the battery disconnect switch as part of the daily inspection.

NOTICE

Battery cables must be securely anchored and not rubbing other equipment. Cable insulation must be free of damage and abrasion. Inspect weekly.

NOTICE

Always disconnect the battery before welding on the chassis or body.

DAILY CHECKLIST

See the **Daily Check section** for the daily checks and procedures checklist. Make a copy of the check list.

A unit that needs service or repair can malfunction and create a dangerous condition. A part failure during operation can cause serious injury or death to a person or damage to the unit. Repair or replace any failed or defective part immediately.

BEFORE STARTING A ROUTE

Before you start a route, do the following:

- □ Perform an inspection of the unit with the **Daily** Checklist 87.
- □ Check the Hydraulic Oil Level.
- □ Cycle all Hydraulic Functions.
- □ Check the "In-transit" Settings.

Use the Daily Checklist to Inspect the Unit

It is the operator's responsibility to do a visual inspection of the unit and make sure the unit is in good operating condition before you start a route.

The requirements for the daily checks are given in the **Daily Checklist section 1**871. Make sure you complete the inspections on the checklist and you make all entries, including your signature.

COLD WEATHER WARMUP PROCEDURE

When ambient air temperature is cold (below 0 degrees F), it is necessary to warm up the unit's hydraulic oil before you start your daily route operation or to check the oil level. The hydraulic oil is sufficiently warmed when the temperature is between 120° and 160° F.

Moving parts on the unit are dangerous. Serious injury or death can occur if a person is struck by the equipment. Clear all people from the area before you operate the unit

Follow the steps below to warm up the hydraulic oil.

- 1. START the TRUCK and let the engine idle.
- 2. APPLY the PARKING BRAKE and make sure it holds.
- 3. ENGAGE the HYDRAULIC PUMP for approximately five minutes.
- 4. MAKE SURE the AREA IS CLEAR of all unnecessary people BEFORE you operate the controls.
- 5. OPERATE the PACKER EXTEND and PACKER RETRACT functions through ten (10) cycles while the engine idles.
- 6. Make sure the oil temperature on the site gauge is between 120° and 160°F. If not, repeat step 5.
- 7. Check for fluid leaks. Repair if necessary.

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PREPARING THE UNIT TO CHECK THE HYDRAULIC OIL LEVEL

Before checking the oil level or adding oil, make sure the oil is warmed up and the unit is in the following position with all cylinders collapsed:

- Truck on level ground
- Body fully down
- Tailgate fully down and locked
- Packer Panel in the in-transit position with all cylinders retracted
- Lift Arm is fully retracted

Check Hydraulic Oil Level

Check the hydraulic oil level (after warming up the oil) daily or every eight (8) hours, whichever comes first. Fill as necessary.

Cycle All Hydraulic Functions

☑ Follow These Steps:

- 1. Operate the lift arm, packer panel, and tailgate functions two or three times each. See **Section 4** for proper operation of controls.
- 2. Put the unit back in the position described above and check the oil level again.

3. Add oil if necessary. Refer to the Service Manual for instructions for filling the oil tank.

Current Heil standard hydraulic oil is **Shell Tellus S2 VX 32**. Please see product TDS and MSDS for more detail information about it. We strongly recommend to use it on Heil products to get best system performance and oil service life. Refer to the Service Manual for other approved hydraulic oils.

NOTICE

Cold weather operation requires special oil considerations. Viscosity should not exceed 7500 SSU at lowest startup temperature. Continuous operation should range between 40–1000 SSU for all temperature ranges.

NOTICE

Contamination is a hydraulic system's worst enemy. DO NOT let dirt enter the system. Use a clean rag and remove dirt or other contamination around any system component before you disconnect or remove it. While you fill the reservoir, filter the oil through a 200 mesh (or finer) screen. NEVER use a cloth to filter the oil.

HYDRAULIC OIL TANK WITH SIGHT GAUGE



Figure 61. Hydraulic Oil Tank with Sight Gauge

CYCLE ALL HYDRAULIC FUNCTIONS

Check the operation of all hydraulic controls on the unit. See **Section 4** [61] for proper operation of controls.

A. Lift Arm

Do at least one load and unload cycle (all lift arm functions) with the lift arm and the grabber.

B. Packing Cycle

Set the packer to the MANUAL mode, do at least one each of the packer left and packer right cycle of the packer panel.

Set the packer to the AUTO-PACK mode and let the packer cycle at least once.

C.Body Raise Cycle

If the body is not full of refuse, do a body up and down cycle. DO NOT raise the body when it contains refuse.

D. Tailgate Raise Cycle

If the body is empty, do a tailgate up and down cycle. DO NOT raise the tailgate with refuse in the body.

NOTES:

CHECK THE TRAVELING OR "IN-TRANSIT" POSITION

When you travel to and from the landfill or transfer station, make sure the unit is in the IN-TRANSIT position as follows (see figure to the right):

- The body and tailgate are fully LOWERED. Check the BODY TAILGATE UP light in the cab. It must be OFF.
- For a unit with refuse, the packer panel is up tight against refuse:
- The lift arm is in a transit position:
 - The lift arm is fully stowed
 - The grabber arm assembly is against the body and the arms are fully open
 - An ALTERNATE transit position is:
 - The lift arm is IN and UP.
 - The grabber assembly is in the hopper.
- The SYSTEM POWER switch is OFF.
- If equipped, the PTO is DISENGAGED.
- If equipped, the hopper cover is DOWN.
- The mirrors are properly adjusted and clean.
- ALL body lights operate correctly.



Figure 62. In-Transit Position

SECTION 8 ON-ROUTE OPERATION PROCEDURES

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PREVIEW

Read this section to learn about:

- Setting up the unit for a route
- Loading refuse manually with the lift arm
- Packing the load
- Packing on-the-move
- Setting up the unit for the landfill or transfer station.

DRIVING TO PICK-UP LOCATIONS

Whenever you drive the Rapid Rail unit to and from a route, along the route, to the landfill, etc., make sure the unit is set up as follows:

- 1. The body and tailgate are fully LOWERED (DOWN).
- 2. The BODY TAILGATE UP light is OFF.
- 3. The packer paddle
 - a. For empty unit idle position
 - b. For full unit up tight against refuse
- 4. The lift arm is in a transit position:
 - a. The lift arm is fully STOWED.
 - b. The grabber arm assembly is against the body and the grabbers are fully OPEN.
 - c. An ALTERNATE transit position is:
 - The lift arm is IN and UP.
 - The grabber assembly is in the hopper.
- 5. If equipped, the PTO is disengaged.
- 6. The SYSTEM POWER switch is OFF.
- 7. If equipped, the hopper cover Is DOWN.
- 8. The mirrors are properly adjusted and clean.
- 9. ALL body lights operate correctly.

USE OF CURB SIDE DRIVE

If equipped, drive from the curb-side driver position ONLY on the collection route. DO NOT use this station during travel to or from a route, landfill or transfer station.

LIFTING AND LOADING REFUSE WITH THE LIFT ARM

Use the following procedures at each stop along the route to load refuse into the Rapid Rail unit with the lift arm. Observe the DANGER and WARNING notices.

NOTICE

If local rules and laws require more clearance, you must follow them.

- 1. Move the unit to a position that is best to load the refuse with the lift arm. Practice this maneuver for best results.
- 2. ADJUST the container spot mirror for BEST overhead vision of the hopper while you raise container.
- 3. PULL the SYSTEM POWER switch (and engage the PTO if equipped) UP. The PUMP ON light should be ON.

LIFTING AND LOADING REFUSE WITH THE LIFT ARM (CONTINUED)

Moving equipment can be dangerous. Serious injury or death may occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

- 4. Make sure the loading area is clear of all unnecessary people.
- 5. Make sure the packer is in the AUTO pack mode.
- 6. If equipped, the hopper cover is UP. You can damage the unit if you try to load refuse if the hopper cover is DOWN.

4-BUTTON LIFT CONTROLS

Use the instruction that follow for either the standard 4button controls or a remote (optional) 4-button control.

Contact of the unit with overhead electric lines is dangerous. Serious injury or death may occur. Make sure there is adequate overhead clearance before you raise the container. If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives. If local rules and laws require more clearance, you must follow them.

- Use the 4-button control and MOVE the lift arm IN/ OUT and UP/DOWN to position the grabbers to grip the refuse container.
- 2. Make sure the container is in the center of the grabbers. DO NOT use the tips of the grabbers to squeeze and lift the container.

Grabbing a refuse container with too much pressure can damage the container. Pieces of the container can "fly" off the container and cause moderate or minor injury to a bystander. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

NOTICE

Grabbing a refuse container with too much pressure can damage the container. The container can become unusable. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

3. PRESS the GRIP/RELEASE rocker switch to the GRIP position until the container is firmly secured with the grabber.

4-BUTTON LIFT CONTROLS (CONTINUED)

A DANGER

Contact of the unit with overhead electric lines is dangerous. Serious injury or death may occur. Make sure there is adequate overhead clearance before you raise the container. Refer to the **Overhead Clearances Tables** and If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives.

NOTICE

If local rules and laws require more clearance, you must follow them.

- 4. Use the 4-button control and move the lift arm with the UP/DOWN and IN/OUT functions until the lift arm is in position to unload the refuse container in the hopper.
- Use the 4-button control and PRESS the DUMP/ UNDUMP switch to the DUMP position to unload the refuse into the hopper.
- 6. After the refuse container is empty, use the 4-button control and PRESS the DUMP/UNDUMP switch to the UNDUMP position to rotate the grabber out of the hopper.
- 7. Use the 4-button control IN/OUT and the UP/DOWN switches to move the lift arm until the lift arm sets the refuse container on the ground.

- 8. Use the 4-button control and PRESS the GRIP/ RELEASE switch to the RELEASE position to open the grabbers, releasing the refuse container.
- 9. Use the 4-button controls IN/OUT and the UP/DOWN switches and set the lift arm to the TRANSIT position. (You can do this while the packer operates.)
 - MOVE the lift arm fully DOWN and IN. This is the stowed position.
 - MOVE the grabber against the body and fully open the grabber with the RELEASE control.

10. Go to the next stop on the route.

JOYSTICK LIFT CONTROLS

Grabbing a refuse container with too much pressure can damage the container. Pieces of the container can "fly" off the container and cause moderate or minor injury to a bystander. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

 Use the joystick and the 4-button control and move the lift arm with the UP (joystick) and DOWN (4-button control) and IN (joystick) and OUT 4-button control) functions until the lift arm is in position to grab the refuse container.

NOTICE

Grabbing a refuse container with too much pressure can damage the container. The container can become unusable. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

2. MOVE the joystick to the GRIP position until the container is firmly secured with the grabber.

A DANGER

Contact of the unit with overhead electric lines is dangerous. Serious injury or death may occur. Make sure there is adequate overhead clearance before you raise the container. Refer to Table 1 on page 29. If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives.

NOTICE

If local rules and laws require more clearance, you must follow them.

- 3. Use the joystick and the 4-button control and move the lift arm with the UP (joystick) and DOWN (4-button control) and IN (joystick) and OUT (4-button control) functions until the lift arm is in position to unload the refuse container.
- 4. Use the 4-button control and PRESS the DUMP/ UNDUMP switch to the DUMP position to unload the refuse into the hopper.
- 5. After the refuse container is emptied, move the joystick to the UNDUMP position to rotate the grabber out of the hopper.
- 6. Use the IN/OUT (joystick) and the DOWN (4-button control) to move the lift arm until the lift arm sets the refuse container on the ground.

JOYSTICK LIFT CONTROLS (CONTINUED)

7. MOVE the joystick to the RELEASE position to open the grabbers, releasing the refuse container.

A DANGER

Contact of the unit with overhead electric lines is dangerous. Serious injury or death may occur. Make sure there is adequate overhead clearance before you raise the container. Refer to the **Overhead Clearances Tables** and If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives.

NOTICE

If local rules and laws require more clearance, you must follow them.

- 8. Use the 4-button controls IN/OUT and the UP/DOWN switches and set the lift arm to the TRANSIT position. (You can do this while the packer operates.)
 - MOVE the lift arm fully DOWN and fully IN.
 - MOVE the grabber against the body and fully OPEN the grabber with the RELEASE control.
- 9. Go to the next stop on the route.

COMPACTING THE LOAD

In addition to the Auto Pack mode during loading, you can pack the refuse manually any time after loading the refuse in the hopper. You can use the in-cab controls for the packer panel to compact the load again with a manual cycle.

Many factors affect how often you need to compact the load, including the operator's experience. See **Auto/Manual Pack Mode Feature 63** for operation of the Auto Pack feature.

See Achieving Payloads first for helpful information and guidelines.

Auto Pack Mode

Use the following procedures to compact the load with the unit's in-cab Auto Pack feature. See the figure on the next page.

NOTICE

To attain maximum efficiency in loading and unloading, the unit is designed to have a packing cycle time (empty body) of about eight (8) seconds.

1. If the hydraulic system is not activated, engage the PTO if equipped, PULL the SYSTEM POWER switch UP to the ON position, otherwise, simply PULL the SYSTEM POWER switch UP. The PUMP ON light will turn ON.

Auto Pack Mode - Continued

- 2. PRESS and RELEASE the PACKER AUTO/MANUAL switch to the AUTO position.
- 3. The packer panel will continuously and automatically do a 180° sweep then reverse direction and do a 180° sweep, pushing and compacting refuse from the hopper into the body.



Figure 63. Control Panel

Manual Pack Mode

Use the following procedures to compact the load with the unit's in-cab MANUAL PACK mode.

NOTICE

To attain maximum efficiency in loading and unloading, the unit is designed to have a packing cycle time (empty body) of about eight (8) seconds.

- 1. If the hydraulic system is not activated, engage the PTO if equipped, PULL the SYSTEM POWER switch UP to the ON position, otherwise, simply PULL the SYSTEM POWER switch UP. The PUMP ON light will turn ON.
- 2. PRESS the PACKER AUTO/MANUAL switch to the MANUAL position. See the figure on the left.
- 3. PRESS and HOLD either the PACKER LEFT or RIGHT switch. The packer paddle will sweep in the direction you selected. The packer paddle will stop when you RELEASE the switch. To operate the packer paddle in the other direction, PRESS and HOLD the other PACKER LEFT or RIGHT switch. Repeat the cycle as many times as you want.
- 4. To change the packer mode back to AUTO PACK, PRESS the PACKER AUTO/MANUAL switch to the AUTO position.

PACKING ON-THE-MOVE

Heil Rapid Rail[®] units can pack on-the-move. This means you can operate the packing mechanism while the vehicle is moving, as well as when it is stationary. The default mode of the body pump is the AUTO PACK mode. This allows for continuous packing while the SYSTEM POWER switch is set to ON (and if equipped, the PTO is engaged), the pump is ON and the unit's engine is running.

You can pack-on-the-move when the PLC determines that all conditions are OK. The PLC shuts down the pump system when the engine RPMs are above safe operating speeds or the PLC determines that conditions are not correct for pump operation. The packing cycle will not begin if the RPMs are above a safe operating speed.

Refer to **Auto/Manual Pack Mode Feature** 63 for operation of the Auto Pack feature.

ACHIEVING PAYLOADS

Read this section for advice and tips on how to pack the most efficient loads with your Heil Rapid Rail® unit.

Payloads in any refuse/waste handling vehicle will vary greatly, depending on the type of material loaded. Dry bulk cardboard and reconstruction/building materials, Styrofoam, foam packing materials, loose plastic, etc. cannot be compressed and packed as effectively as wet, soft, garbage type materials. If dry materials can be mixed with some wet material, more effective payloads can be achieved. Follow these techniques to attain greater efficiency in packing the load in your Rapid Rail[®] unit:

- After you empty the first few bins, the body begins to fill and material can begin to "fall back" into the hopper as the packer sweeps in the other direction. This is normal. In the AUTO PACK mode, the packer paddle will complete a sweep in one direction then reverse direction for the next sweep. The AUTO PACK mode provides continuous packing of the refuse.
- 2. If the route allows, mix some wet bins in with dry bins. This helps compact the dry material more. Wet material also helps lubricate the body, which results in better packing. Of course some routes will not let you selectively pick up bins. (It is not wise to drive long distances just to mix wet material with dry material.)

LEAVING THE ROUTE FOR THE LANDFILL/ TRANSFER STATION

At the end of the route, or when the unit has a full load, prepare the unit to go to the landfill. See **Driving to Pick-up Locations** 109 of this section and make sure the unit is properly set up for travel.

- A. The body and tailgate are fully LOWERED. Check the BODY T/G UP light in the cab. It must be OFF.
- B. The Packer Panel is tight against the refuse.
- C. The SYSTEM POWER switch is OFF.

NOTES:

LEAVING THE ROUTE FOR THE LANDFILL/ TRANSFER STATION (CONTINUED)

- D. Put the lift arm and grabber in the TRANSIT (or STOWED) position.
 - The lift arm is fully DOWN and IN.
 - The grabber is fully OPEN and against the unit's body.

An alternate position is the lift arm is IN and UP with the grabber assembly in the hopper.

- E. The PTO is disengaged (if equipped).
- F. The SYSTEM POWER switch is DOWN or OFF.
- G. If equipped, the hopper cover is DOWN.
- H. The mirrors are properly adjusted and clean.
- I. ALL body lights operate correctly.

SECTION 9 LANDFILL/TRANSFER STATION/ RECYCLE CENTER PROCEDURES

Issued September 2024 Landfill/Transfer Station/Recycle Center Procedures Copyright 2024, The Heil Co. Printed in the U.S.A.

PREVIEW

Read this section to learn about:

- Setup conditions to dump the refuse
- Unloading the refuse
- Preparing the unit to return to route.

OVERVIEW OF LANDFILL/TRANSFER STATION PROCEDURES

Use the following information as an overview of the steps to follow when you dump a load of refuse at the landfill. For each step in this overview, read and follow the detailed instructions that follow the overview:

1. Set the Rapid Rail unit in position for dumping.

NOTICE

The location of the controls on your unit may be different than those shown in this manual. Make sure you know your unit's control pattern before you operate the Rapid Rail.

- 2. Fully RAISE the tailgate.
- 3. Keep the packer panel against the refuse and fully RAISE the body.
- 4. After the refuse empties from the body, LOWER the body.
- 5. Fully LOWER the tailgate.
- 6. Prepare the unit to return to the route.

SETTING UP THE UNIT FOR DUMPING

Make sure the unit is on firm, stable ground before you raise the body and clear the area of all unnecessary people. Do not prop a body unless it is on firm, stable ground. A unit not on firm, stable ground may roll when raising or propping the body. This may cause serious injury or death to you or bystanders.

After you position the unit on firm ground for dumping at the landfill, set it up properly before dumping the refuse.

Follow These Steps:

- 1. Some suspensions allow more movement in the chassis than others. Always stop the unit on the most stable, hard, dry and level surface you can find before you raise the body.
- 2. Shift the transmission to NEUTRAL.
- 3. If equipped, engage the PTO and PULL the SYSTEM POWER switch UP. If there is no PTO, just PULL the SYSTEM POWER switch UP.

UNLOCKING AND RAISING THE TAILGATE

Unlocking the Tailgate

The unit does not have a control switch to unlock (or unlatch) the tailgate. The tailgate unlocks as it starts to open. There is a flag on the curb side tailgate latch to indicate that the tailgate has cleared the locking mechanism while you raise the tailgate. The flag will be DOWN when the tailgate clears the locking mechanism.

When the tailgate is completely closed, the flag on the tailgate latch will be UP. See the figure below.



Figure 64. Tailgate Locked/Unlocked Flag

Raising the Tailgate

1. Put the packer in the MANUAL mode - PRESS the AUTO PACK button to MANUAL.

A DANGER

A tailgate in motion is dangerous. Serious injury or death may occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.

- 2. PRESS the TAILGATE UP/DOWN switch to UP and HOLD the switch until the tailgate is COMPLETELY raised, which is about 30° above the body. See the figure on the next page.
- 3. RELEASE the switch.

NOTICE

The BODY TAILGATE UP light turns ON and the in-cab alarm will sound to indicate the tailgate is open.

A DANGER

Make sure the unit is on firm, stable ground before you raise the body and clear the area of all unnecessary people. Do not prop a body unless it is on firm, stable ground. A unit not on firm, stable ground may roll when raising or propping the body. This may cause serious injury or death to you or bystanders.

A DANGER

Any part of your body between the unit's body and the chassis or cylinders while you raise the body is dangerous. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Keep all parts of your body out from underneath the unit's body and away from the cylinders during this procedure.

Raising the body with the tailgate closed can damage the underride bumper. The underride bumper can hit the ground when the tailgate is not fully raised before you raise the body. Serious injury or death may occur and also cause damage to the unit.

- 2. PRESS the TAILGATE UP/DOWN switch to UP and fully raise the tailgate, then RELEASE the switch.
- 3. PRESS the BODY UP/DOWN switch to UP and HOLD the switch until the body is COMPLETELY raised.

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RAISING THE TAILGATE (CONTINUED)

FIRM STABLE GROUND

Figure 65. Raising Tailgate

UNLOADING REFUSE

Raising the Body

1. A unit with a tag axle may be unstable during dumping. ALWAYS lower the tag axle BEFORE you raise the body.

RAISING THE BODY (CONTINUED)

- 4. When the body is completely raised, RELEASE the BODY UP/DOWN switch. See the figure below.
- 5. Use the PACKER LEFT/RIGHT switches and rotate the packer left and right as necessary to clear the hopper of refuse.



Figure 66. Raising the Body

Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised may make the body unstable and tip or roll the unit over. This may result in injury or death to the operator and damage the unit. Use only sufficient movement to loosen the load so that it will leave the body.

NOTICE

Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised puts a very high load on the body raise cylinders and could damage one or both cylinders and make the body unstable unable to lower. Inspect the cylinders after you dump each load and replace if necessary.

- 6. When the refuse stops falling out of the body, SLOWLY BUT SUDDENLY move the unit FORWARD a short distance and then STOP to allow more refuse to fall out of the body. Experience will teach you how fast to move safely forward or backward before you apply the brakes.
- If necessary, perform step 6 again but go BACKWARD and then STOP to allow more refuse to fall out of the body.
- 8. Perform steps 6 and 7 as necessary to remove all of the refuse from the body.

NOTICE

Important: If a body raise cylinder hangs up for any reason as you raise the body, RELEASE the switch IMMEDIATELY so the body stops raising.

LOWERING THE BODY

ALWAYS lower the body BEFORE you lower the tailgate. If you used body props, MAKE SURE they are in the stored position BEFORE you attempt to lower the body.

Follow These Steps:

A DANGER

Any part of your body between the unit's body and the chassis or cylinders while you raise the body is dangerous. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Keep all parts of your body out from underneath the unit's body and away from the cylinders during this procedure.

- 1. PRESS the BODY UP/DOWN switch to the DOWN position.
- 2. HOLD the switch UNTIL the body fully mates with the chassis. When the body is COMPLETELY lowered, RELEASE the switch.

NOTES:

LOWERING THE BODY (CONTINUED)

NOTICE

Important: If a body raise cylinder hangs up for any reason as you lower the body, RELEASE the switch IMMEDIATELY so the body stops lowering.

CLEAN AND INSPECT THE HOPPER AND PACKER PANEL

Follow These Steps:

- PRESS the PACKER RIGHT or LEFT switch and let the packer paddle sweep to the right (or left) then RELEASE the switch.
- 2. PUSH the SYSTEM POWER switch DOWN. The PUMP ON light should be OFF.
- 3. Put the unit in the lock-out mode and remove the ignition keys. Refer to Locking Out the Rapid Rail 55.

BE CAREFUL at all times when you use the ladder rungs and grab handles. Maintain good balance with two feet and one hand, or one foot and two hands, firmly in place

4. Use the ladder rungs and grab handles on the street side and look into the hopper.

- 5. INSPECT the packer panel and hopper floor for excessive wear or possible damage. If there is excessive wear or other damage, report the damage to your supervisor for repair or replacement of parts as soon as possible.
- 6. Take the unit out of Lock-Out/Tag-Out mode, then use the ignition keys and start the unit.
- 7. PULL the SYSTEM POWER switch UP (and engage the PTO if equipped).
- 8. PRESS the PACKER AUTO/MANUAL switch to AUTO and let the packer do several automatic cycles of sweeping left and right. MAKE SURE the packer travels fully LEFT and RIGHT. If it does not, report the problem to your supervisor for maintenance action.
- 9. PRESS the PACKER AUTO/MANUAL switch to MANUAL.

CLEAN AND INSPECT THE TAILGATE SEAL

BEFORE you lower the tailgate, MAKE SURE the area where tailgate seal mates with the body is CLEAN AND FREE of any refuse and debris. Inspect the seal for possible excessive wear or damage and replace if necessary. Report any excessive wear or damage to your supervisor.

LOWERING THE TAILGATE

Follow These Steps:

A DANGER

A tailgate in motion is dangerous. Serious injury or death may occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.

- 1. PRESS the TAILGATE UP/DOWN switch to the UP position and RAISE the tailgate sufficiently to rotate the props out of the prop pockets.
- 2. STORE the tailgate props.
- 3. PRESS the TAILGATE UP/DOWN switch to the DOWN position and fully LOWER the tailgate until the tailgate flag is UP, then RELEASE the switch.

NOTICE

The BODY TAILGATE UP warning light will go OFF and the alarm will stop when body is FULLY down and the tailgate is completely closed.

Lock the Tailgate

The tailgate locks when it is completely CLOSED. The tailgate flag should be UP. If the flag is not UP, OPEN and CLOSE the tailgate again. The flag must be UP and the BODY TAILGATE light must be OFF.

REMOVE REFUSE FROM THE ENGINE AND EXHAUST AREAS

NOTICE

Inspect unit for refuse on or about the engine or exhaust components. Remove all refuse to prevent a fire.

PREPARING TO RETURN TO ROUTE

MAKE SURE before you leave the landfill or transfer station:

- 1. The body and tailgate are fully DOWN.
- 2. The BODY TAILGATE light is OFF.
- 3. If for some reason the unit has refuse upon leaving the landfill/transfer station, select the MANUAL packer mode and put the packer panel tight against the refuse.
- 4. Put the lift arm and grabber in the TRANSIT (or stowed) position.
 - a. The lift arm is fully DOWN and IN.
 - b. The grabber is fully OPEN and against the unit's body.
- 5. The PTO (if equipped) is disengaged.
- 6. The SYSTEM POWER switch is DOWN or OFF.
- 7. If equipped, the hopper cover is DOWN.
- 8. The mirrors are properly adjusted and clean.
- 9. ALL body lights operate correctly.

SECTION 10 CORTEX CONTROLLER™

lssued September 2024 Cortex Controller™ Copyright 2024, The Heil Co. Printed in the U.S.A.

PREVIEW

Read this section to learn about:

- Troubleshooting the Cortex Controller
- Operational specifications
- Hydraulic Filter Bypass
- Diagnostic Fault Codes

CORTEX CONTROLLER™ INSIGHT™ DIAGNOSTIC DISPLAY NOTIFICATIONS

When a fault has been set the In-Cab Alarm will sound a number of beeps that indicate which fault has occurred. See **InSight Diagnostic Display Notification Indicators**, the decal in the cab, or Service Manual Rapid Rail/STARR System Cortex Controller Program 109-0283 for a list of InSight Diagnostic Display Notifications.

NOTICE

The In-Cab alarm is overridden by the Tailgate/Body alarm. For example, if the tailgate is open or the body is raised on Eject units, the alarm will sound for 2 seconds and pause for 10 seconds until that condition is resolved. Any diagnostic codes that are still present after the tailgate alarm has been resolved will then sound.

Hydraulic Pump Shutdown

The unit's pump shutdown system turns off the hydraulic pump when the return line filter becomes blocked (clogs) which starts the filter bypass system.

The sequences 1 thru 3 occur after the filter clogs and bypass begins.

NOTICE

A filter bypass condition allows you to operate the hydraulic pump when the return line filter is blocked with sediment and other materials. You can cause damage to hydraulic components if you operate the unit with a blocked hydraulic oil filter. Change the filter as soon as you can.

- START OF BYPASS TO END OF FIRST (1st) HOUR

 The bypass light does not come on and the Cortex Controller does not beep.
- 2. SECOND (2nd) HOUR THROUGH FIFTH (5th) HOUR OF BYPASS – The filter bypass light flashes ON and OFF after the first full hour of bypass. The number of ON flashes indicates the number of full hours of bypass. The time the flash is OFF starts at about 5 seconds (for the first full hour of bypass) and decreases about 1 second for each full hour of bypass beginning with the second full hour of bypass the OFF time. For example, during the third hour of bypass (two complete hours of bypass), the light flashes ON twice and is OFF for approximately 4 seconds and the cycle repeats.
- SIXTH (6th) HOUR AND AFTER The pump will function for three minutes. The filter bypass light comes ON solid. The Cortex Controller beeps 13 times in a minute, pauses and the cycle repeats until you change the filter.

CORTEX CONTROLLER™ INSIGHT™ DIAGNOSTIC DISPLAY NOTIFICATIONS (CONTINUED)

Hydraulic Pump Shutdown (Continued)

4. UNTIL YOU CHANGE FILTER - You can operate the pump for three (3) minutes at a time until you change the filter. You can turn the pump OFF then turn it back ON.

After Hydraulic Filter Change

- The Cortex Controller[™] alarm continues to beep until the filter is clear for 15 minutes, then stops and the filter bypass light goes OFF.
- 2. To start the hydraulic system after you change the filter:
 - MAKE SURE the SYSTEM POWER switch is ON.
 - PRESS the PUMP ON switch.
- 3. The filter must stay clean for 15 minutes before the Cortex Controller resets the shutdown timer and normal operation resumes.

NOTES:

SECTION 10 END OF DAY PROCEDURES

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PREVIEW

Read this section to learn about:

- Parking the Unit
- Final Inspection
- Report to Employer/Supervisor
- Ignition Keys

END OF DAY PROCEDURES

Parking the Unit

- 1. Park the unit in the space designated by your employer/supervisor.
- 2. Set the parking brake.

Final Inspection

Perform a final inspection of the unit:

- 1. Clear the area of all people.
- 2. Start the engine if it is not running.
- 3. Make sure all lights and in-cab control switches operate correctly.
- 4. Put the transmission in reverse while you press the service brake. The backup alarm should sound in the cab. If the alarm does not sound in the cab, report this to your employer/supervisor immediately.
- 5. Check the unit for fluid leaks from the hoses, cylinders, valves, pump and fittings. Report any leaks to your employer/supervisor.

- 6. Make sure all cylinders (except tailgate lock cylinders) are in their retracted position..
- 7. APPLY the parking brake.
- 8. Put the transmission in neutral and turn the engine OFF.
- 9. Put the unit in the Lock-Out/Tag-Out mode 57.
- 10. Open the air tank drain valve.
- 11. Turn the battery disconnect switch to OFF.
- 12. Follow the company policy for locking the cab doors.

Reports to Employer/Supervisor

Complete any reports required by your employer/supervisor. If you found any problems during the final inspection, prepare the necessary report for the employer/supervisor.

Ignition Keys

Put the ignition keys in a secure storage area designated by your employer/supervisor.

NOTES:

SECTION 11 PREVENTIVE MAINTENANCE CHART

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BODY PREVENTIVE MAINTENANCE CHART

Preventive maintenance must be performed to ensure the safe and reliable operation of your unit. Use the chart below as a guideline for when essential items should be checked and serviced.

*HOURS OF OPERATION						
COMPONENT/SYSTEM	8	40	200	1000	2000	CHECK/SERVICE
Hydraulic System						Check oil level – add if necessary
						Check cylinders, pump, hoses, tubes, fittings, and adapters for leaks. Check hoses for cracks, crushes, and cover blisters. Repair or replace if necessary with genuine Heil parts. Any replacement hose should be the same size and pressure rating as listed on the original OEM hose.
						Check Control valve seals for leaks. Repair or replace if necessary.
						Replace filter after first 30 days of operation, then every 6 months or 1000 hours of operation OR when filter bypass light is ON.
				V		Replace tank breather filter every time you replace filter element.
						Drain, flush, and refill. Change filter element.
Electrical, Battery Cables						Check for proper operation.
						Check battery cables from battery to starter for loose cables, rubbing or damage and abrasions to cables. Replace if necessary.
*HOURS OF OPERATION						
--	---	----	-----	------	------	---
COMPONENT/SYSTEM	8	40	200	1000	2000	CHECK/SERVICE
Operator Controls						
Front Mount Pump or Power Take-Off (PTO)						Check seals for leaks and operation. Replace if necessary
						Check drive line for smooth operation. Replace as necessary.
						Check set screws for tightness. Tighten as necessary.
						Make sure keys are in place. Replace if necessary.
						For greaseable PTOs (non-wet spline), remove the pump's bolt flange about 2 inches from the PTO and apply grease to female pilot of PTO pump flange. Failure to lubricate female pilot of PTO as given may cause damage to the pump shaft. Greasing is NOT required on wet spline PTOs such as the Chelsea 890/897 series.
Grease Fittings		N				Lubricate as shown on Body Lube Chart.
Body Undercoating						Inspect body undercoating and repair as necessary.
Tailgate Seal Integrity						
* Daily = 8 hrs. Weekly = 40 hrs. Monthly = 200 hrs. 6 Months = 1000 hrs. Yearly = 2000 hrs.						

NOTES:

SECTION 12 LUBRICATION GUIDE

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BODY LUBRICATION GUIDE

Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess grease. Lubricate moveable mechanical parts without fittings every 60 days with non-detergent engine oil.



Figure 67. Body Lubrication Guide

LIFT LUBRICATION GUIDE

Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess grease. Lubricate moveable mechanical parts without fittings every 60 days with non-detergent engine oil.



Figure 68. Lift Lubrication Guide

NOTES:

SECTION 13 COMPRESSED NATURAL GAS (CNG) OPTION

Issued September 2024 Compressed Natural Gas (CNG) Option Copyright 2024, The Heil Co. Printed in the U.S.A.

IMPORTANT SAFETY INFORMATION

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 69.

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

A DANGER

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

A 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.

A DANGER

Keep work area well ventilated.

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

IMPORTANT SAFETY INFORMATION (CONTINUED)

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

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.

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

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.

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

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** 152. 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)

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

A WARNING

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

B. Fuel Management Module Components (Continued)



Figure 70. Manual Shut-Off Valve (Typical arrangement; models may vary slightly in component positioning.)

CNG FUEL SYSTEM COMPONENTS (CONTINUED)

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 thermallyactivated 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 overpressurizing the fuel cylinders. When activated, the PRD cannot be closed and will vent all gas.

CNG FUEL SYSTEM COMPONENTS (CONTINUED)



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. 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.

A WARNI NG

- 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

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

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.

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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.

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:

- 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.
- 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 71. Type 1 Fueling Nozzle

FUELING PROCEDURE (CONTINUED)

B. Types of Fueling Nozzles (Continued)



1. Type 1 (Continued):



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 74. 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 75. Type 3 Fueling Hose

NOTES:

CNG FUEL SYSTEM MAINTENANCE

Routine maintenance of the compressed natural gas system in accordance with the **CNG Fuel System Inspections Section I**(165) will ensure that the system and components are functioning properly. Refer to your Heil Service Manual for CNG fuel system schematics.

- 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.

A 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.

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.

A WARNING

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

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	

<u>Note</u>: 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.

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

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 76. Cylinder Manual Shut-Off Valve



Figure 77. Manual Shut Off Valve

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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.

A 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:

HIGH PRESSURE FILTER DRAIN PROCEDURE

- 1. Remove the excess fuel in the filter per the **Depressurizing Procedure** 160.
- 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

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.

A 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

NOTES:

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

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** 152.

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

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 for 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

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.

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

CNG FUEL SYSTEM TROUBLESHOOTING (CONTINUED)

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)

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)

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)

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 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.



HEIL CNrG SENTINEL® SOLENOID SYSTEM OPTION

When equipped, the optional Heil CNrG Solenoid System will monitor and display live in-cab CNG system and tank pressures and notifications on the InSight Diagnostic Display. Additionally, the system detects and alerts of leaks (visually and audibly) while closing solenoid valves of affected tanks to isolate the leak(s).

On the display, tanks are numbered starting with the tank at the top of the of the CNrG tailgate, "TANK-1", and ending with the tank lowest in the CNrG tailgate, in the system shown below, "TANK-7". When the system is operating without any issues, all boxes are green as shown below.



Figure 80. Main Display Screen

Summary of Features

- Display screen inside the cab which gives live pressure monitoring for each tank and system.
- Visual warning in form of messages and color on the screen along with audible alarm whenever solenoid failure occurs.
- System visual and audible warning if one of the pressure transducers is unplugged in either ignition ON or OFF conditions.
- Whenever the ignition is OFF and truck is not running, system gives audible alarm in the event of any leaks on tank or system side. The operator needs to turn the ignition ON and check the display screen that will show the tank location of the leak.
- As a safety feature, all solenoids will be closed whenever there is a leak. A maintenance bypass code will need to be entered to be able to open solenoids and drive the vehicle. The leak detection feature is available only when the ignition is OFF.
- Leaks are detected at a pressure difference of 600 psi.

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

Pressure Transducer Sensors

ALL Pressure Transducer Sensors MUST be functioning for System to be able to detect a leak.

Tank MUST be empty before removing tank Pressure Transducer Sensor.

Plugged directly into the live port of the valve of each tank and behind the FMM (Fuel Management Module) box live line, the pressure transducer sensors measure live pressures of each tank and of the system. When a pressure transducer sensor fails or becomes unplugged, the system sends a visual warning on the InSight Diagnostic Display along with an audible alarm.

Whenever there is a single sensor issue, the main screen will show which sensor has failed as shown in the figure to the top right. However, if there are multiple sensor issues, it will tell you to go to alarm summary screen to get more details as shown in the figure to the bottom right.

NOTICE

The audible buzzer will be active regardless of ignition ON or ignition OFF and will not turn OFF until the issue is corrected.



Figure 81. Pressure Transducer Sensor behind FMM



Figure 82. Multiple Pressure Transducer Sensors Unplugged/Faulty

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

The Alarm Summary Screen can be reached by pressing the right arrow on the display twice.



Figure 83. Path to Alarm Summary Screen



Figure 84. Alarm Summary Screen

Solenoid System Function

The valve body on each CNG tank has an integrated solenoid. The solenoids are normally closed when the ignition is OFF and open when ignition is ON and a voltage is supplied to them.

Leak Detection/Solenoid Lock

The system is capable of detecting a leak in the system or leak in any tank when the ignition is initially OFF and the leak starts. For safety purposes, if a leak is detected, all solenoids are locked in the closed position and not allowed to open until a maintenance code is entered and bypass is activated. The audible alarm activates whenever there is pressure difference detected of 600 psi or more and the truck ignition is OFF (ignition must be turned ON to see more details about the leak on the display screen).

NOTICE

Authorized Service Personnel should contact Heil Technical Service for the maintenance code to unlock the CNG solenoids.

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

Leak Detection/Solenoid Lock (Continued)

The figures on this page show example display screenshots of possible leak detection notifications. Other leak detection notifications exist and are not shown here.

You must follow all safety/emergency procedures of your company in the event of a CNG leak. At a minimum, follow the instructions on Emergency Shutdown Procedure section of this manual.



Figure 85. Tank 1 Leak. Maintenance Bypass Required.



Figure 86. Mutiple Tank Leaks. Maintenance Bypass Required.



Figure 87. System Leak. Maintenance Bypass Required.

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

Solenoid Failure Detection

The system is capable of detecting solenoid failures to open (in the event of a wiring or component issue) when the ignition is turned ON as per requirement of NFPA 52.

Whenever there is a single solenoid issue, the main screen will show which solenoid has failed as seen on the figure to the top right of this page. However, if there are multiple solenoid issues, it will tell you to go to alarm summary screen to get more details as seen in the figure to the bottom right. **Alarm Summary Screen** [176] can be reached by pressing the right arrow on the display twice.

The figures on this page show example display screenshots of solenoid failure detection notifications. Other solenoid failure detection notifications exist and are not shown here.

To defuel after a solenoid failure on one of the tanks, first refer to **Heil CNrG™ Solenoid System Defueling After Solenoid Failure 183** and then use one of the methods described in CNG Fuel Module Defueling Methods.

NOTICE

The audible buzzer will be active only when ignition is ON and will not turn OFF until the issue is corrected.



Figure 88. Display Screenshot: Tank 2 Solenoid Failure



Figure 89. Display Screenshot: Multiple Solenoids Failed

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

Maintenance Bypass

The following are the steps must be followed by a qualified maintenance technician after getting any display messages described in this manual. This will allow a qualified service person to get the truck back on route/correct the issue:

Enabling Bypass Mode will disable System Leak Interlocks. Bypass will not open the solenoid of a leaking tank.

- 1. Driver will need to call maintenance department of their company in order to drive/move the truck since all solenoids are locked and need maintenance bypass for them to open.
- 2. For any leaking tank, open the oblong access covers on the street side of the CNrG tailgate and then close that tank's manual shut off valve. (You must correct the leaking tank before the system will allow the solenoid for that tank to open.) In case of system leak, solenoids will not open until Bypass Mode is "ON" (system leak is a leak detected in the line going from FMM to tanks on high pressure side).
- 3. Go inside the cab and on display screen hold "ok" button on screen until it prompts you to enter maintenance code.
- 4. Enter the maintenance bypass code and you will see the screen shown in the figure to the right.

NOTICE

Authorized Service Personnel should contact Heil Technical Service for the maintenance bypass code to unlock the CNG solenoids.



Screenshot: Maintenance Screen

- 5. Make sure you have first closed the manual shut off valves on the tanks that are leaking (Step 2). You will notice that the Bypass Mode is OFF by default. Press "ok" button and turn ON Bypass Mode. Once you do this, all solenoids (except leaking tank/tanks) open. However, all tanks are now connected to each other and to the main supply/return line. This is the reason it is very important to first perform Step 2 before performing this step.
- You will now be able to drive the truck to your maintenance department to evaluate and repair the leak. The audible alarm will not go OFF until the issue is corrected.

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

Low Fuel Level Detection

The system is capable of detecting low fuel levels and will give audible and visual alerts that the truck needs to be refueled, as shown in the figure below. Whenever pressure drops below 500 psi on the system side, the system will show a Low Fuel Warning alert message along with an audible alert.



Figure 91. Display Screenshot: Low Fuel Warning

CNG Tank Option Configuration

The system is designed for different tank configurations and is a common design which will work from 3 tank to 7 tank system. This helps the customer to upgrade to higher DGE (Diesel Gallon Equivalents) by adding more tanks without need to modify anything in this system. The figure below shows a snapshot of the Tank Option Configuration maintenance screen where you can configure the number of tanks on the truck.



Figure 92. Display Screenshot: Tank Option Configuration

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

System Inputs

The display screenshot shown below (within the maintenance mode menu) is used for troubleshooting and maintenance to gather information for the current status of the Ignition Power (ON or OFF) and the system voltage being supplied to the Controller. It also provides the software revisions of the Display and Controller programs.



Figure 93. Display Screenshot: System Inputs

System Outputs

The display screenshot shown below (within the maintenance mode menu) is used for troubleshooting and maintenance to gather information for the current status of the Solenoids on each Tank (ON or OFF). It also provides the status of the System Alarm for the Controller.



Figure 94. Display Screenshot: System Outputs

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

Ignition Power OFF

The display notification shown in the figure below will only be displayed in the event that the InSight[™] Diagnostic Display has Ignition Power and the Controller does not have Ignition Power. This Alarm can be beneficial in the event that all Tank Solenoids Valves have failed to open due to the loss of Ignition Power, which is required to open the Tank Solenoids Valves.



Figure 95. Display Screenshot: Ignition Power OFF

System Over Voltage

The display notification shown in the figure below will only be displayed in the event that the System Voltage is greater than 36 volts for 10 seconds, indicating that there is voltage too high to safely operate the Controller and Display.



Figure 96. Display Screenshot: System Over Voltage

HEIL CNrG SENTINEL SOLENOID SYSTEM OPTION (CONTINUED)

System Under Voltage

The display notification shown in the figure below will only be displayed in the event that the System Voltage is less than 8 volts, indicating that there is voltage too low to safely operate the Controller and Display.



Figure 97. Display Screenshot: System Under Voltage

Rapid Rail

Fuel Fill Mode

For the CNrG Solenoid System only, engage Fuel Fill Mode on the in-cab InSight[™] Diagnostic Display to open the CNG solenoids, allowing for fast fill fueling. The "FUEL FILL MODE" button turns green when engaged. After Fuel Fill Mode is engaged, the Fuel Fill Mode remains active for one (1) hour or until the ignition key switch cycles ON-OFF-ON.

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.



Figure 98. Display Screenshot Fuel Fill Mode OFF

Figure 99. Display Screenshot: Fuel Fill Mode ON

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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 <u>https://www.heil.com/warranty/</u> under Heil Warranty Policies and Procedures.



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