HALF/PACK® (FEATURING ODYSSEY® CONTROLS)
INCLUDING LOWRIDER™, FREEDOM AND SIERRA

OPERATION MANUAL

ISSUED MARCH 2021

⚠ WARNING

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

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

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

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

TP1HPO-OM-0321

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.

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

On-Route Operation Procedures

Landfill/Transfer Station/Recycle Center Procedures

End of Day Procedures

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

NOTES:

HALF/PACK® (FEATURING ODYSSEY® CONTROLS)

INCLUDING LOWRIDER™, FREEDOM AND SIERRA

OPERATION MANUAL

ISSUED MARCH 2021

TP1HPO-OM-0321

Issued March 2021

NOTES:

SECTION 1
INTRODUCTION

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 unit serial plate
- Various parts of the unit

HOW TO USE THIS MANUAL

Products

This manual covers Heil Half/Pack (featuring Odyssey Controls) Automated Front Loaders (AFLs) and Front End Loaders (FELs). These products can each be configured for Residential or Commercial applications.

Product Application

This manual covers both **Residential** and **Commercial** units and their respective refuse collection applications. Content not otherwise identified applies to BOTH Residential and Commercial units and any distinctions will be made within the topic content. However, some content applies to just Residential OR Commercial units. This content will be identified as either Residential or Commercial.

For example, the **AutoPack™** feature is standard on both Residential and Commercial units and the topic content will be applicable to Residential and Commercial refuse collection applications.

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.

Terminology

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

Manual Sections

This manual is divided into fourteen (14) sections.

1. Introduction
2. Safety Messages and Decals
3. Lock-Out/Tag-Out Procedures
4. 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
14. Compressed Natural Gas (CNG) Option

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") Half/Pack® (featuring Odyssey Controls) 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 Half/Pack® (featuring Odyssey Controls) 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.
- 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 Half/Pack® (featuring Odyssey Controls) unit should give you years of low-cost, trouble free service.

TO THE OPERATOR

⚠ 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

This Operation Manual should be used in conjunction with Curotto-Can, Bayne Can, or other Can Manufacturer Manuals that will be used with this unit. For additional information on the Curotto-Can, refer to the Curotto-Can Operation, Service, and Parts Book that is supplied with the Curotto-Can.

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** 103.
- 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** 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 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

⚠ WARNING

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.

⚠ WARNING

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** 11.

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.

⚠ WARNING

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 Half/Pack® (featuring Odyssey Controls) has two body models:

- Service Lift (Serviceable Eject)
- Service Hoist

Both body models use a Packer/Eject panel and two cylinders to compact the refuse from the hopper into the body (packer mode) and to push all of the refuse from the body (eject mode).

The Service Lift (Serviceable Eject) body model does not have Service Hoist Cylinders. See **Propping the Body of a Service Lift (Serviceable Eject) Unit** 98.

The Service Hoist body model is an Eject body with two Service Hoist Cylinders to raise the body a short distance for service and maintenance operations. See **Propping the Body of a Service Hoist Unit** 95.

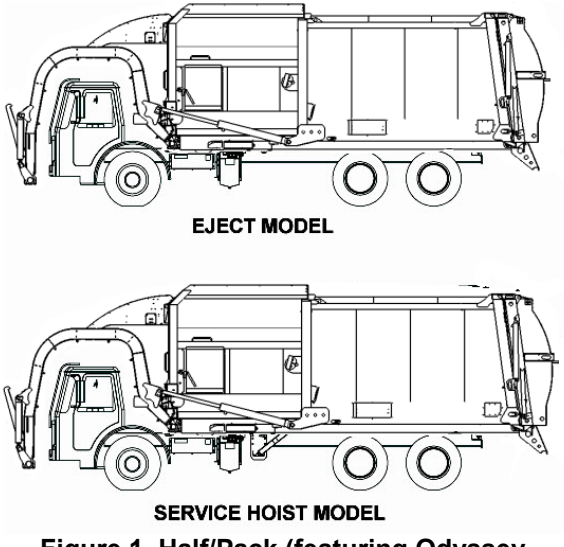


Figure 1. Half/Pack (featuring Odyssey Controls) Models

SERIAL PLATE LOCATION

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 body serial plate on the streetside of the unit’s body. 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.

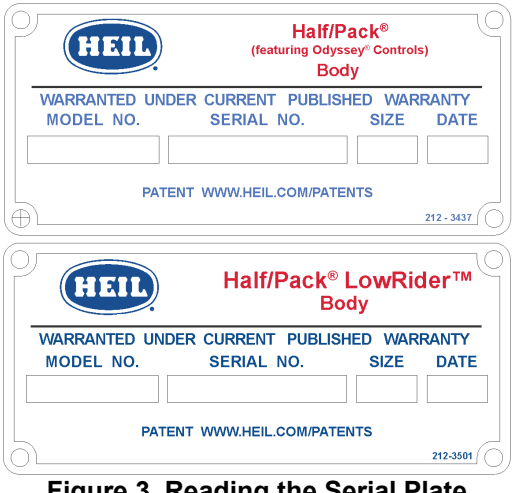


Figure 3. Reading the Serial Plate

Information stamped in the boxes on the serial plate indicates:

- Model number:
  V-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	H	2017
8	2008	J	2018
9	2009	K	2019
A	2010	L	2020
B	2011	M	2021
C	2012	N	2022
D	2013	P	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.

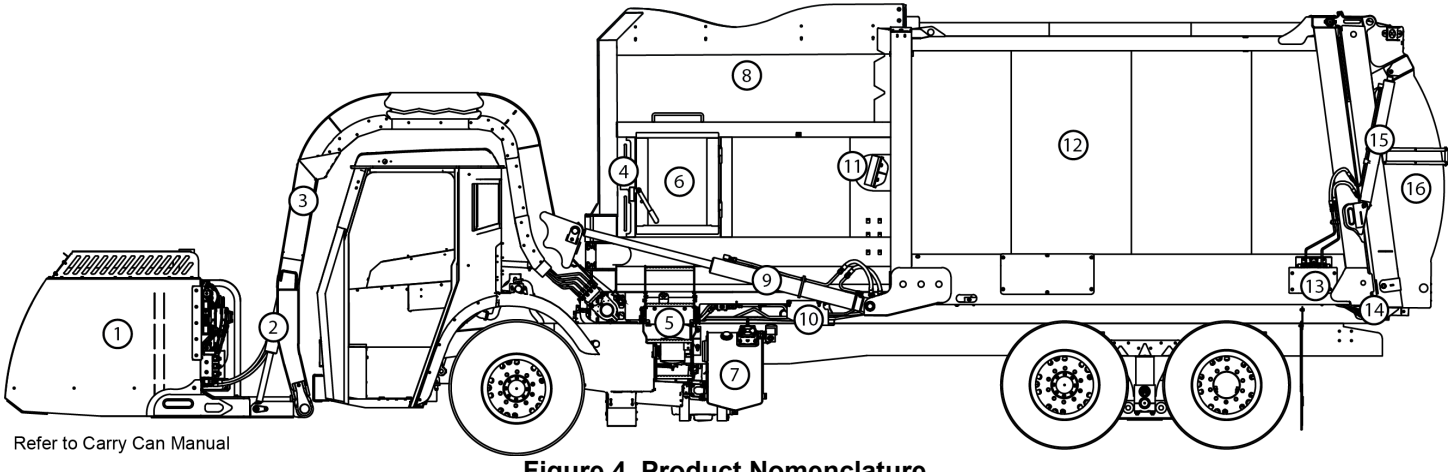


Figure 4. Product Nomenclature

NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION
1	CARRY CAN	5	SIDE DOOR ACCESS LADDER	9	LIFT ARM CYLINDERS	13	TAILGATE VALVE
2	FORKS & FORK CYLINDERS	6	SIDE DOOR	10	BODY VALVE	14	TAILGATE LOCK CYLINDER
3	LIFT ARMS	7	HYDRAULIC OIL TANK	11	ARM STOP	15	TAILGATE CYLINDER
4	PACKER/EJECTOR PANEL & CYLINDERS	8	HOPPER	12	BODY	16	TAILGATE

PRODUCT NOMENCLATURE (CONTINUED)

Access Ladder – MAKE SURE the unit is in Lock-Out/Tag-Out mode before you use the access ladder AND the Top Door (Sliding Top Door) is CLOSED. BE CAREFUL at all times when you use the ladder. Maintain good balance with two feet and one hand, or one foot and two hands, firmly in place at all times.

Arm Stop – The lift arms stop their movement at the arm stops.

⚠ DANGER

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.

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.

Cab Controls – The standard cab control panel is located in the vehicle cab. See **Cab Controls, Switches and Indicator Lights** 6 for the different controls that may be installed in your unit.

Cab Protector – The cab protector helps keep falling debris from landing on the cab.

Carry-Can – The detachable Curotto-Can, Bayne or other carry-can on the unit, used for residential refuse collection.

Cortex Controller™ – The unit has a Cortex Controller. The Cortex Controller monitors critical components and controls operation of the various 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.

PRODUCT NOMENCLATURE (CONTINUED)

⚠ WARNING

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

Fork & Fork Cylinder – You use the two fork cylinders to rotate (RAISE or LOWER) the forks to the correct angle to engage a refuse container's pickup sleeves.

⚠ DANGER

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.

Hopper – The Hopper is the front part of the body assembly between the Packer/Eject panel and the body bin and is under the opening of the optional sliding top door. The hopper is the loading chamber for the refuse. Refuse dumped into the unit falls inside the hopper where it stays until the operator packs the load into the body with the packer/eject panel. NEVER use the hopper as an entrance to the body.

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

⚠ WARNING

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.

Hydraulic Pump – The unit's hydraulic pump provides the oil flow for the hydraulic system. It is located underneath the unit powered by the transmission through a Power Take-Off (PTO).

Lift Arms Cylinders – You use these two cylinders to RAISE and LOWER the lift arms to lift and dump the carry can.

GLOSSARY

TERM	DEFINITION
accident	An incident that results in unintended harm.
AutoLevel™	An optional feature on Residential Non-Curotto-Can Half/Pack® configured units only. This feature allows an operator to lift and dump a refuse container without manual adjustment of the forks to level a refuse container during the pick-up, lift, dump and return container to the ground functions.
AutoLift™	A feature on Residential Half/Pack® (featuring Odyssey® Controls) units that allows an operator to start a cycle to automatically lift and unload a refuse container without manual adjustment of the lift arms.
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.
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
DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
extend/EXTEND	Make a cylinder rod move out its base / Command to move the packer panel towards the body

GLOSSARY

TERM	DEFINITION
fall-back	Material loaded in the body that drops from its initial compacted position into the hopper
AFL	Automated Front Loader
FEL	Front End Loader
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.
fully retracted position (home position)	The packer/extend cylinder is fully retracted and the packer panel is all the way to the front of the hopper. May also be referred to as “Home Position” or “Front Head”.
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 condition when the tailgate is fully CLOSED, thereby locking the tailgate.
LOCK	Command to use the tailgate lock/unlock switch and lock the tailgate lock cylinders.
lower/LOWER	Move the lift arms, forks, 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.

GLOSSARY

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.
PN	Part Number
PTO	Power Takeoff
raise/RAISE	Move the lift arms, forks, body or tailgate up / Command to move the lift arms, forks, 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** 57 the unit BEFORE entering the body.
top door (hopper cover)	This optional top door covers and uncovers the hopper. The cover is closed during transit and must be open during loading of refuse in the hopper.
unit	The Heil Half/Pack® (featuring Odyssey Controls) refuse collection vehicle referred to in this

GLOSSARY

TERM	DEFINITION
	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.

NOTES:

SECTION 2
SAFETY MESSAGES AND DECALS

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

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

WARNING

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

CAUTION

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 cylinders to the collapsed positions EXCEPT the TAILGATE LOCK CYLINDERS and the ARM RAISE CYLINDERS. Keep the Tailgate LOCK CYLINDERS in the LOCKED position. Keep the ARM RAISE CYLINDERS in the LOWERED 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 pump switch so the pump shuts off.
  - **REMOVE** the key from the ignition. This helps prevent tampering by unauthorized persons.
  - Refer to **Lock-Out/Tag-Out Procedure** 57.
- You must be attentive at all times while you operate the controls and be ready to stop or reverse the function if necessary.

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** 61 **In-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** 103 of this manual. If you find leaks, broken, missing or malfunctioning parts, immediately stop and get the condition repaired or serviced.

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.

DO NOT RIDE OUTSIDE THE VEHICLE

The Half/Pack (featuring Odyssey Controls) front loader was not designed like a rear end loader and has no exterior riding steps or handholds.

- **NEVER** ride on the forks.
- **NEVER** ride on or in a Carry Can or anything attached to the forks.
- **NEVER** ride **ANYWHERE** outside the vehicle.

⚠ 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. A unit with a Carry Can has a higher in-transit height. 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.
- Arms and forks in the **UP** position may make the unit too high to clear overhead obstructions.
- **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)

Table 1. Overhead Clearances When Operating the Unit

Voltage of Electric Line	Minimum Clearance
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)
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.

UNLOADING

- **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.

WHEN WORKING IN OR AROUND THE VEHICLE

- **MAKE SURE** the unit is in **Lock-Out/Tag-Out** 57 condition **BEFORE** you work in or around the unit.
- **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 the **Lock-Out/Tag-Out Procedure** 57**.**
- **BE CAREFUL** at all times when you use the ladder. Maintain good balance with two feet and one hand, or one foot and two hands, firmly in place at all times.
- **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** 95.
- **DO NOT** use the hopper opening and tailgate opening as an entrance or exit to the body or hopper. **ONLY USE** the side access door as an entrance or exit to the body.
- If the unit has a washout option, RELIEVE the air pressure in the wash-out tank BEFORE you open the cap.
- **DO NOT** use the cab windshield guard as a ladder.

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.

CUROTTO-CAN EXCLUSION ZONES

⚠ DANGER

Failure to observe Exclusion Zones may result in DEATH or SERIOUS INJURY. See figure and descriptions on the next page.

NOTICE

This Operation Manual should be used in conjunction with the Curotto-Can, Bayne Can, or other Can Manufacturer Manuals that will be used with this OdysseyHalf/Pack (featuring Odyssey Controls) unit. For additional information on the Curotto-Can, refer to the Curotto-Can Operation, Service, and Parts Manual that is supplied with the Curotto-Can.

The term “Exclusion Zones” refers to the areas around the Curotto-Can that **MUST NOT BE ENTERED** while the Curotto-Can is in working condition (engine running with the pump switch ON. See the figure on the next page.

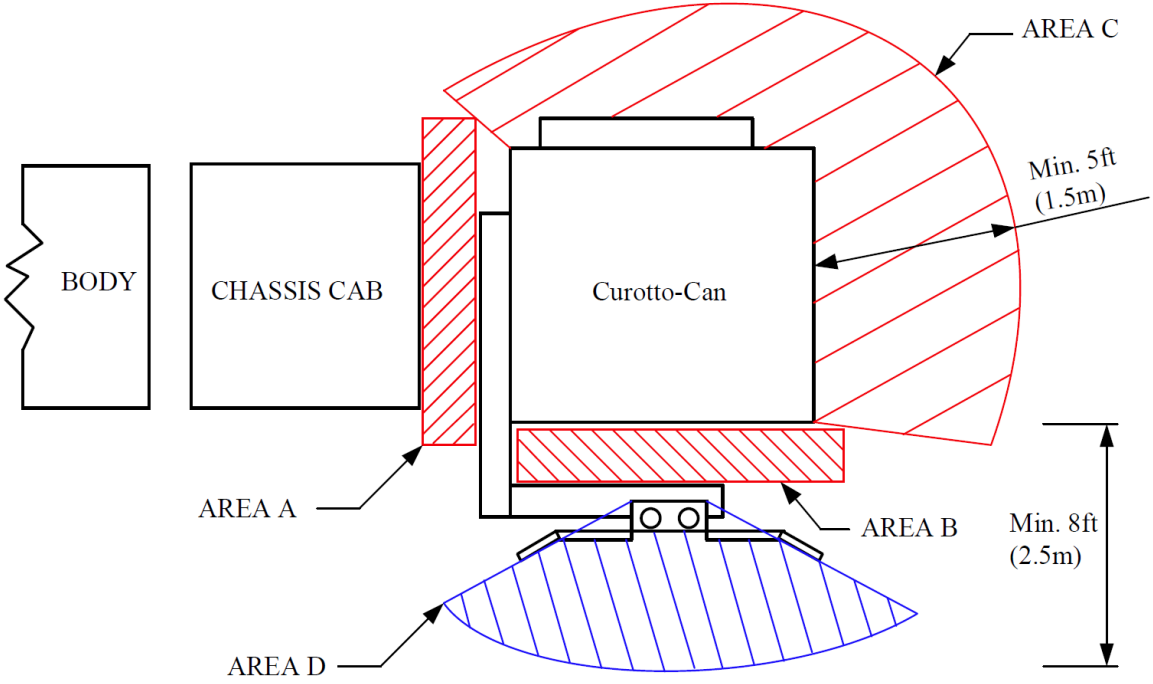
Also, carefully read and follow the Curotto-Can Operation and Service Manual along with the decals on the host-truck and can.

If the Exclusion Zones must be entered during operations, for example, to collect fallen trash, the following procedure should be followed.

- RETURN all Curotto-Can functions to their “HOME” position (slide fully retracted, lift arm fully lowered, and gripper arms fully open).
- Using the fork control, LOWER the Curotto-Can FULLY so that it is resting on the ground.
- Using the multi-function joystick, LOWER the dump arm fully.
- Switch OFF the Curotto-Can activate switch.
- Switch OFF the pump switch.
- APPLY the park brake or work brake (if equipped).
- WHEN SAFE to do so, exit the cab.
- CLEAR the debris.
- Return to the cab, activate controls and continue collections.

CUROTTO-CAN EXCLUSION ZONES (CONTINUED)

A	Between the front of the cab and the rear of the Curotto-Can	C	In front of, to the side of, and underneath the Curotto-Can for a distance of 5ft (1.5m)
B	Between the side of the Curotto-Can and an extended slide/arm (includes under a raised dump arm) up to 5ft (1.5m)	D	Working area - may be entered for collection and hand loading of un-carted trash ONLY when correct conditions are met. See **Curotto-Can Exclusion Zones** 31.



DECALS

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

Also, see the Curotto-Can Operation and Service Manual and Parts Manual for the location and part numbers of all decals on the Curotto-Can.

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

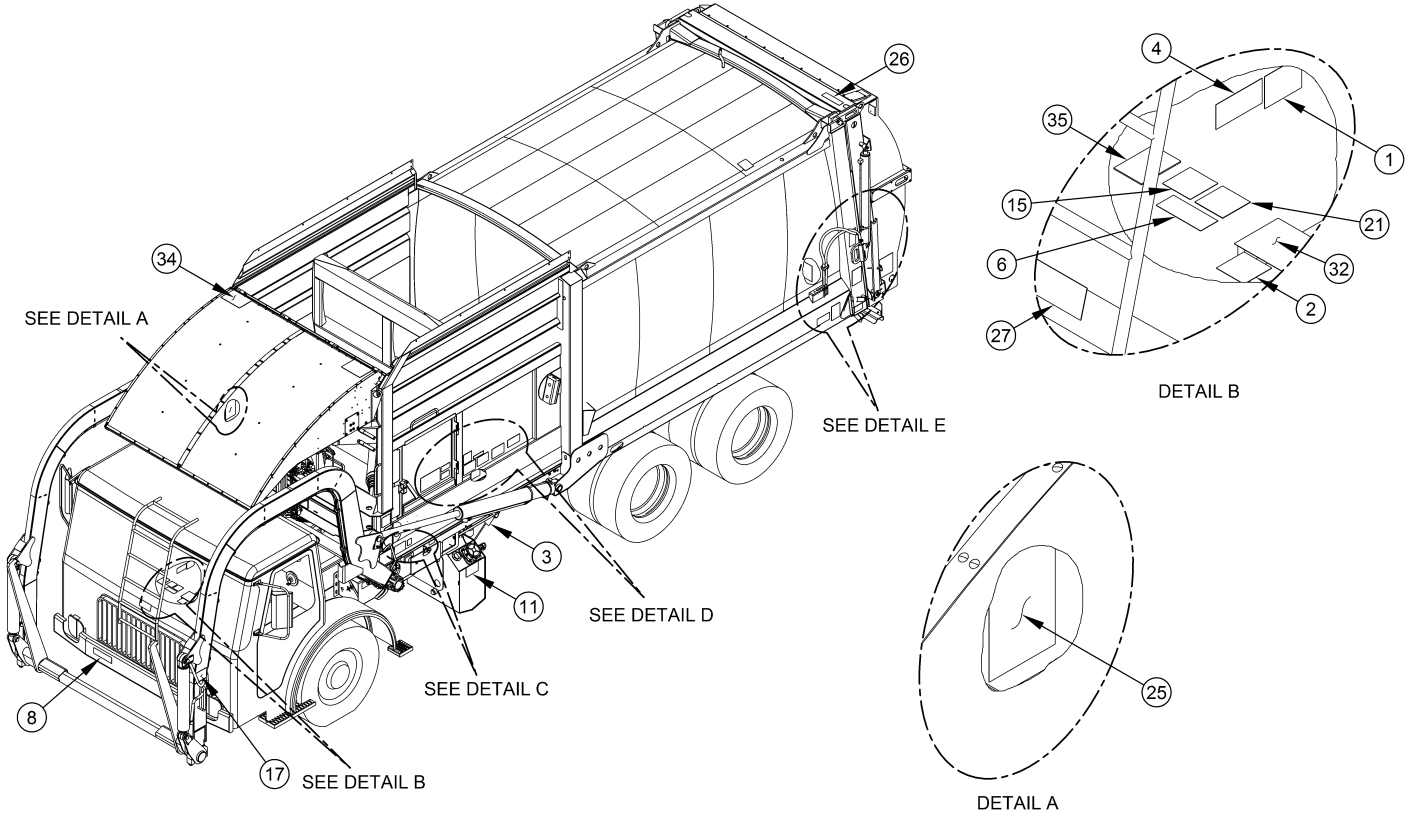
See the Parts and Service Manual for the location and part numbers of the reflective safety materials on the unit.

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.

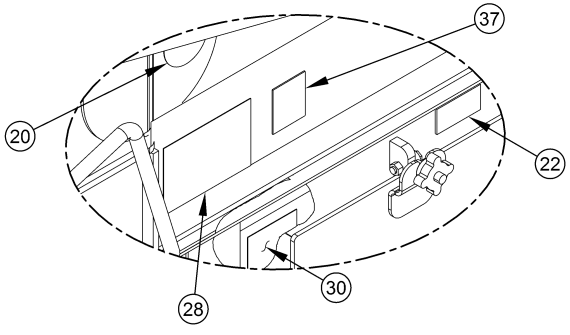
You can purchase replacement decals from your **Heil Dealer** or from the **Heil Parts Central**, **800-528-5308**.

DECAL PLACEMENT

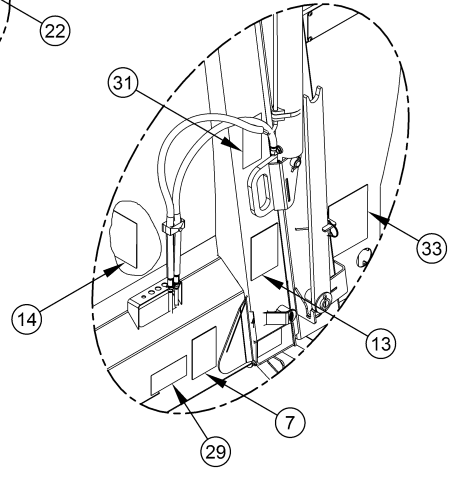


SHEET 1 OF 2

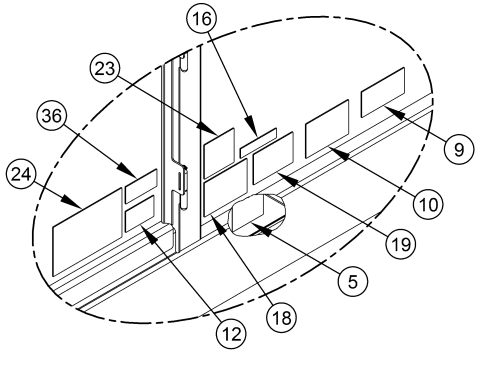
DECAL PLACEMENT (CONTINUED)



DETAIL C



DETAIL E



DETAIL D

SHEET 2 OF 2

DECAL PLACEMENT (CONTINUED)

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-		KIT, Decal, Dump and Eject	-	REF
1	212-0735	DECAL, Warning, Operational Manual	-	1
2	212-0983	DECAL, Lift Capacity	-	1
3	212-1103	DECAL, Danger, Body Elevated	-	2
4	212-1104	DECAL, Danger, Body Elevated, Small	-	1
5	212-1329	DECAL, Instruction, Body Prop	-	2
6	212-1626	DECAL, Danger, Tailgate Raise, Before Body	-	1
7	212-1642	DECAL, Danger, Top Hopper and Tailgate Opening	-	2
8	212-1764	DECAL, Danger, Under Chassis, Stop Engine	-	4
9	212-1780	DECAL, Caution, Side Door	-	1
10	212-1781	DECAL, Caution, Enter Body, Stop Engine	-	1
11	212-1782	DECAL, Hydraulic Oil Only	-	1
12	212-1783	DECAL, Warning, Operator's Manual	-	1
13	212-1801	DECAL, Danger, Stand Clear When T/G Raise	-	3
14	212-1819	DECAL, Danger, Towing	-	1
15	212-1820	DECAL, Danger, Towing, In - Cab	-	1
16	212-1841	DECAL, Safety Requirements, ANSI	-	1
17	212-1899	DECAL, Danger, Stay Clear When Container Off the Ground	-	2
18	212-1907	DECAL, Danger, Access Door Closed	-	1
19	212-1911	DECAL, Caution, Stand Clear When Panel in Motion	-	1
20	212-1915	DECAL, Information-Heil Replacement Parts	-	1
21	212-1918	DECAL, Safety Instructions, Back-Up Alarm	-	1
22	212-2067	DECAL, Caution, Sump Door	-	2
23	212-2228	DECAL, Proximity Switch, Adjustment	-	5
24	212-3352	DECAL, Lube Chart	-	1
25	212-2384	DECAL, Adjustment, Packer/Ejector	-	1
26	212-2394	DECAL, Warning, Unit Locking	-	2
27	212-2611	DECAL, Warning, Windshield Guard	-	1
28	212-2689	DECAL, Flag, Made in the USA	-	2
29	212-2691	DECAL, Warning, Cross or Stand Behind Vehicle	-	2
30	212-2875	DECAL, Warning, Battery	-	1
31	212-3062	DECAL, Operation, Tailgate Props	-	2

DECAL PLACEMENT (CONTINUED)

ITEM	PART NO.	DESCRIPTION	EFF	QTY
32	212-3091	DECAL, Maximum Transit Height, 3-Panel	-	1
33	212-3126	DECAL, Operation, Tailgate Prop	-	2
34	212-3128	DECAL, Caution, Do Not Step	-	2
35	212-3279	DECAL, Warning, Lock Out/Tag Out	-	1
36	212-3287	DECAL, Warning, Daily Inspection Form	-	1
37	212-3288	DECAL, Caution, Ladder Down/Pinned	-	1
-38	212-3352	DECAL, Lubrication Guide	-	1
-39	212-3413	DECAL, Warning, Pinch Points	-	1
-40	212-3415	DECAL, Caution, Pinch Points	-	1
-41	212-3418	DECAL, Warning, Pinch Points	-	1
-42	212-3456	DECAL, Heil Insight Diagnostic Display Function	-	1
-43	212-3539	DECAL, Push Button Notifications	-	1

DECAL IMAGES

Figure 5. Danger: No Towing, PN 212-1819

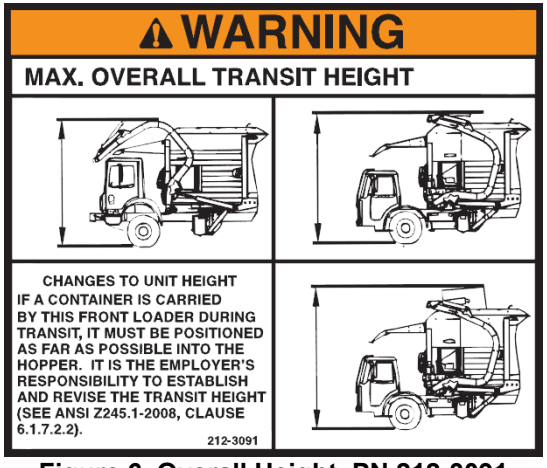


Figure 6. Overall Height, PN 212-3091

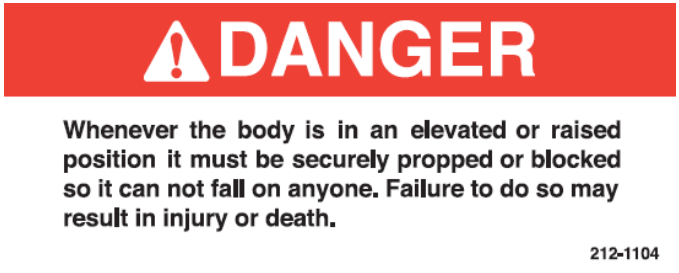


Figure 7. Danger: Elevated Body, PN 212-1104

Figure 8. Danger: Raise Tailgate before Raising Body, PN 212-1626

DECAL IMAGES (CONTINUED)

Figure 9. Danger: Hopper and Tailgate Opening, PN 212-1642

Figure 10. Warning: Read Operation Manual, PN 212-1783

Figure 11. Caution: Side Door, PN 212-1780

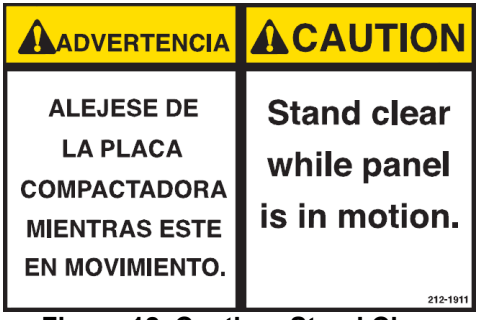


Figure 12. Caution: Stand Clear While Panel in Motion, PN 212-1911

DECAL IMAGES (CONTINUED)

Figure 13. Danger: Do Not Enter Under Chassis, PN 212-1764

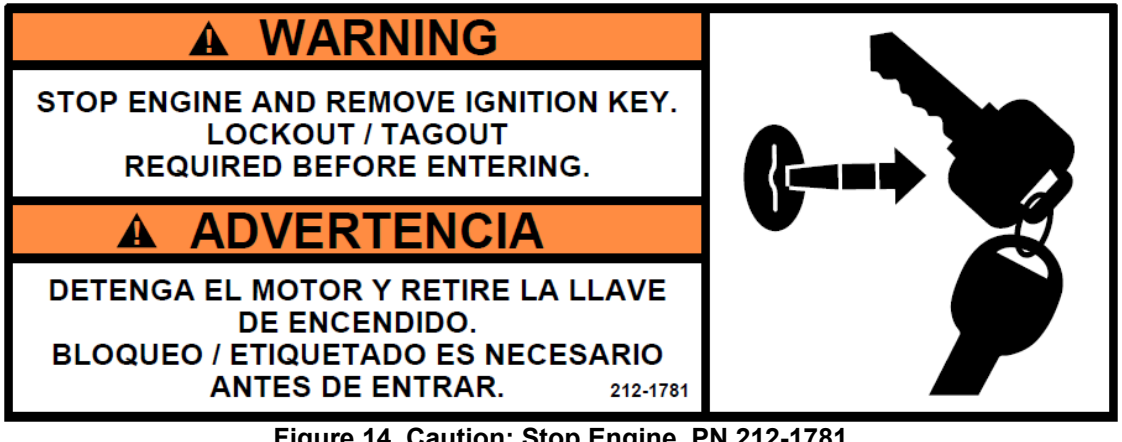


Figure 14. Caution: Stop Engine, PN 212-1781

DECAL IMAGES (CONTINUED)

Figure 15. Warning: Unit Lockout, PN 212-2394

Figure 16. Danger: Windshield Guard Warning, PN 212-2611

DECAL IMAGES (CONTINUED)

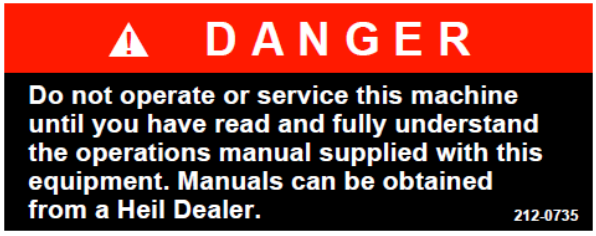


Figure 17. Danger: Read Ops Manual, PN 212-0735

Figure 18. Danger: Empty Body Before Raising, PN 212-1103

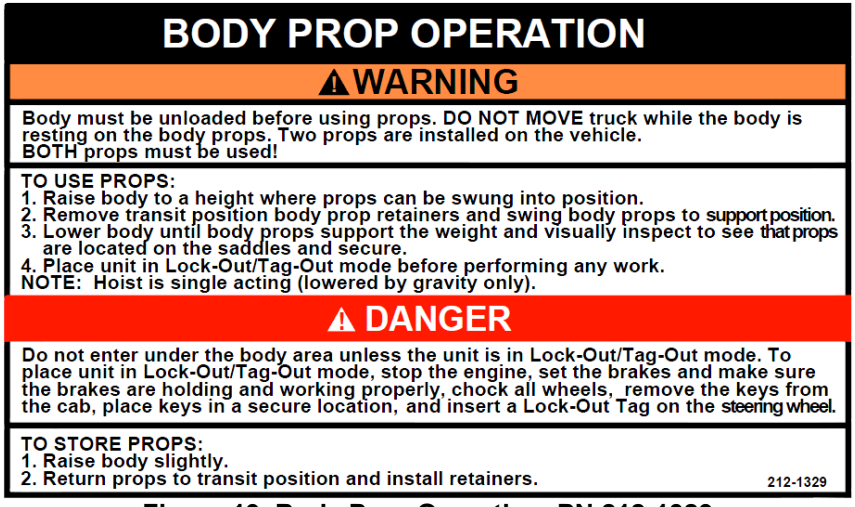


Figure 19. Body Prop Operation, PN 212-1329

DECAL IMAGES (CONTINUED)

Figure 20. Warning: Do Not Cross, PN 212-2691

Figure 21. Danger: Tailgate Props Operation, PN 212-3062

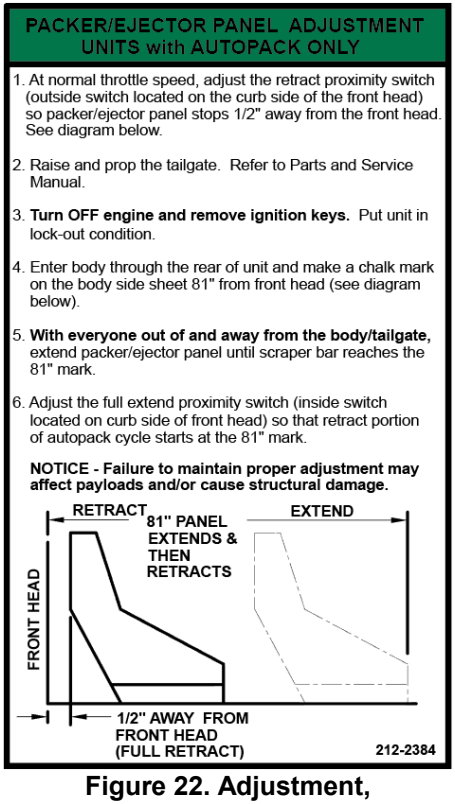


Figure 22. Adjustment, Packer/Ejector, PN 212-2384

DECAL IMAGES (CONTINUED)

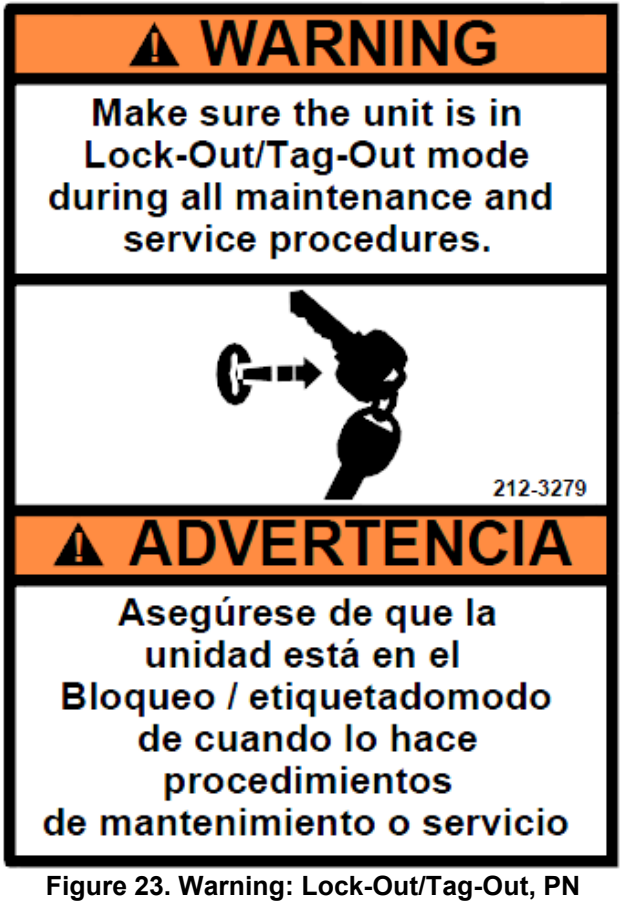


Figure 23. Warning: Lock-Out/Tag-Out, PN 212-3279

PUSH BUTTON STATUS COLORS	
TP DR CLOSE	RED IF TOP DOOR IS NOT FULLY OPEN
T/G UNLOCK	RED IF TAILGATE IS UNLOCKED MAGENTA IF DATA COLLECTION PROCEDURE IS ENABLED
T/G RAISE	RED IF TAILGATE IS NOT FULLY CLOSED
PACK RET	RED IF PACKER IS NOT FULLY RETRACTED
OVHGT OVERIDE	FLASHES RED IF ARMS OVER HEIGHT AND FORKS NOT TUCKED, OR IF COMMERCIAL GRIPPERS / ADJUSTABLE FORKS ARE OVER HEIGHT
PUMP	RED IF OFF, YELLOW IF OIL WARM IS ACTIVE, GREEN IF ON
SEL O PACK	BLUE IF OFF, YELLOW IF ONE PACK CYCLE, GREEN IF TWO PACK CYCLES
212-3539	

Figure 24. Push Button Notifications, PN 212-3539

DECAL IMAGES (CONTINUED)

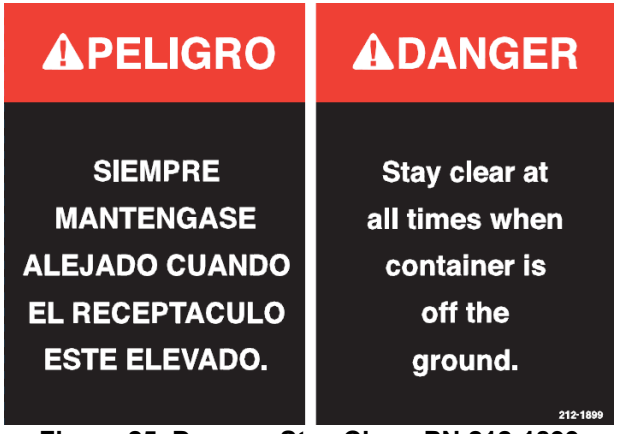


Figure 25. Danger: Stay Clear, PN 212-1899

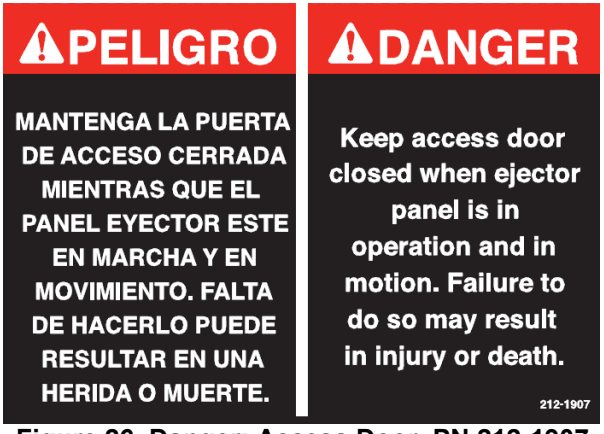


Figure 26. Danger: Access Door, PN 212-1907

Figure 27. Caution: Do Not Step, PN 212-3128

Figure 28. Caution: Sump Door, PN 212-2067

DECAL IMAGES (CONTINUED)

Figure 29. Danger: Stand Clear of Tailgate, PN 212-1801

Figure 30. Danger, No Towing, PN 212-1820

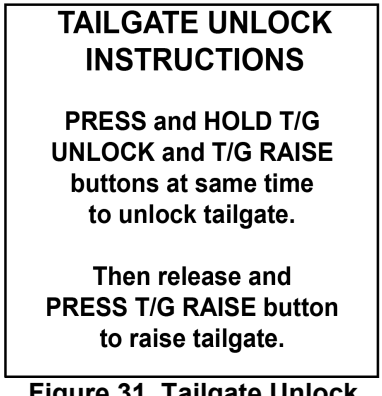


Figure 31. Tailgate Unlock Instructions, PN 212-3452

DECAL IMAGES (CONTINUED)

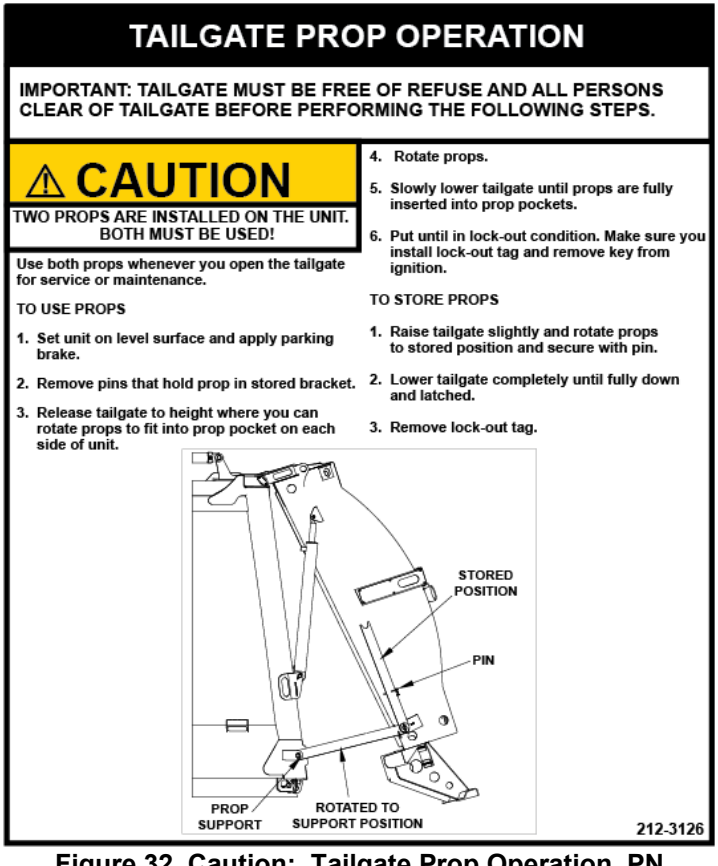


Figure 32. Caution: Tailgate Prop Operation, PN 212-3126

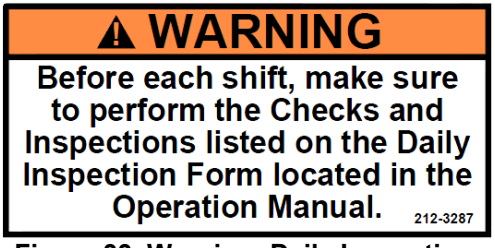


Figure 33. Warning: Daily Inspection, PN 212-3287

Figure 34. Warning: Disconnect Battery, PN 212-2875

DECAL IMAGES (CONTINUED)

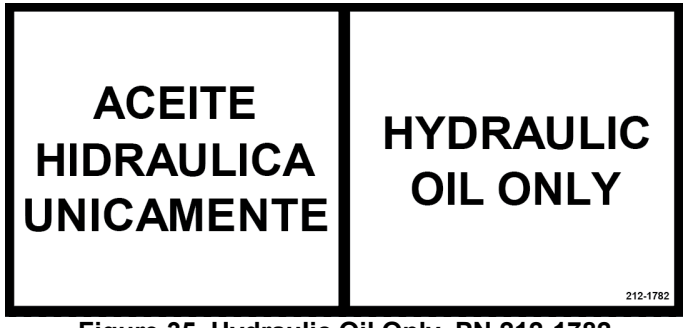


Figure 35. Hydraulic Oil Only, PN 212-1782

Figure 37. Heil Replacement Parts, PN 212-1915

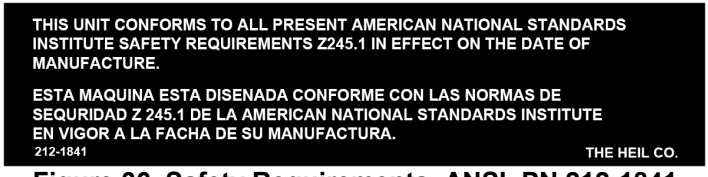


Figure 36. Safety Requirements, ANSI, PN 212-1841

Figure 38. Safety Instructions, Back-Up Alarm, PN 212-1918

DECAL IMAGES (CONTINUED)

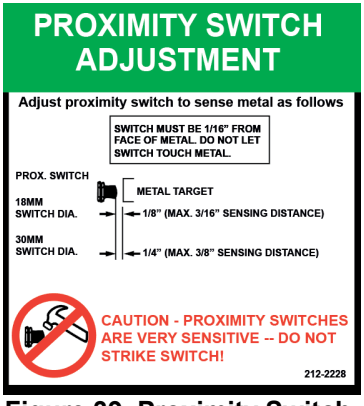


Figure 39. Proximity Switch, Adjustment, PN 212-2228

Figure 40. Flag, Made in the USA, ANSI, PN 212-2689

Figure 41. Lift Capacity, PN 212-3353 (4" Arm Cylinders)

Figure 42. Lift Capacity, PN 212-0983 (4.5" Lift Cylinders)

DECAL IMAGES (CONTINUED)

Figure 43. Warning, Pinch Points, PN 212-3413

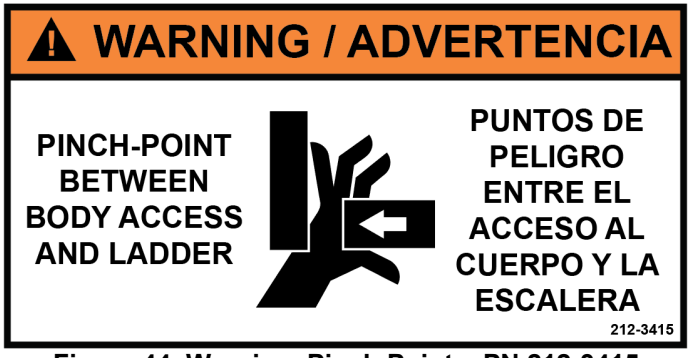


Figure 44. Warning, Pinch Points, PN 212-3415

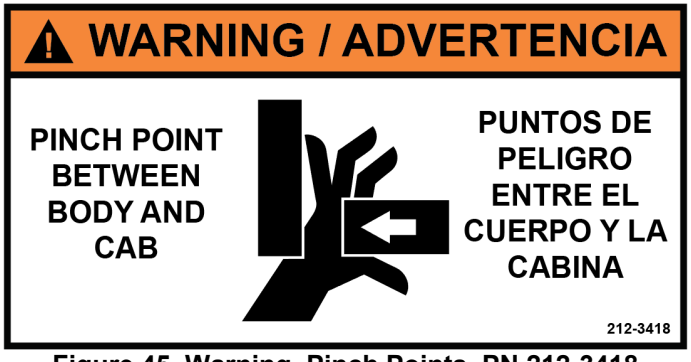


Figure 45. Warning, Pinch Points, PN 212-3418

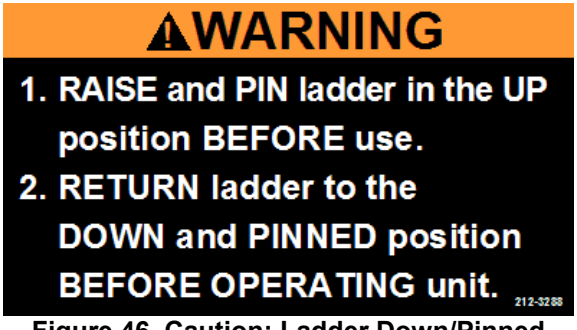


Figure 46. Caution: Ladder Down/Pinned Before Operating, PN 212-3288

DECAL IMAGES (CONTINUED)

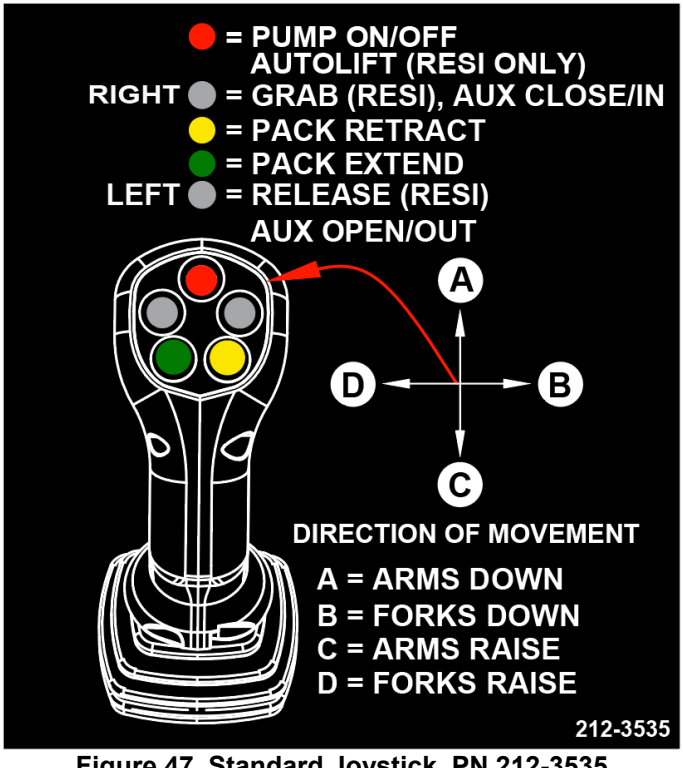


Figure 47. Standard Joystick, PN 212-3535

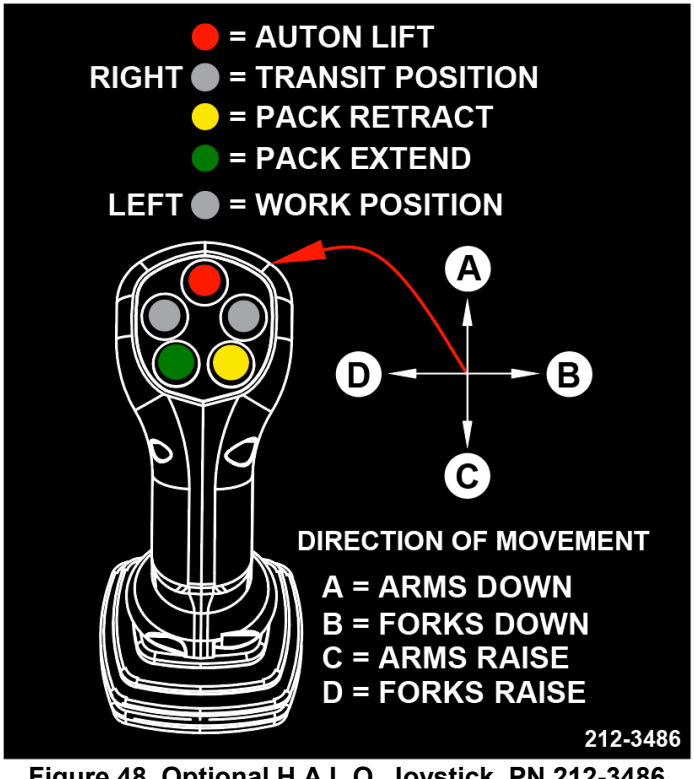
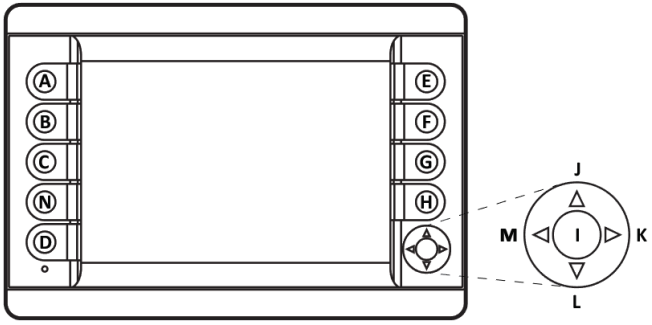


Figure 48. Optional H.A.L.O. Joystick, PN 212-3486

DECAL IMAGES (CONTINUED)

HEIL INSIGHT™ DIAGNOSTIC DISPLAY FUNCTIONS



A = HOME
1. RETURNS TO HOME SCREEN
2. TURNS ON CAMERA INPUT (IF OFF) - PRESS AND HOLD 5 SECONDS

B = COUNTERS
1. DISPLAYS COUNTERS/HOURS FOR CERTAIN FUNCTIONS WHILE IN SERVICE SCREEN
2. ACTIVATES CAN SHAKE FEATURE IF IN SERVICE SCREEN

C = CAMERA CONFIG
DISPLAYS CAMERA CONFIGURATION SCREEN

D = BRIGHTNESS
CHANGES BRIGHTNESS OF DISPLAY FOR NIGHT/DAY OPERATION

E = OPTIONS
1. DISPLAYS OPTIONS SCREEN TO CONFIGURE UNIT OPTIONS
2. TURNS OFF CAMERA INPUT (IF ON) - PRESS AND HOLD 5 SECONDS

F = SERVICE
DISPLAYS SERVICE SCREEN TO VIEW INPUTS/OUTPUTS FOR TROUBLESHOOTING

G = CALIBRATION
DISPLAYS CALIBRATION SCREEN TO CALIBRATE UNIT SETPOINTS

H = MAINTENANCE
1. DISPLAYS MAINTENANCE SCREEN TO ACTIVE SERVICE MODE
2. DEPRESSURIZES CUROTTO HYDRAULICS

I = OK
SELECTS ITEMS ON THE DISPLAY

J = UP ARROW
SCROLLS UP WHILE IN MENU SCREEN

K = RIGHT ARROW
MOMENTARILY TOGGLES TO DISPLAY CONTROLS SCREEN WHILE CAMERA VIEW IS ACTIVE

L = DOWN ARROW
SCROLLS DOWN WHILE IN MENU SCREEN

M = LEFT ARROW
BACKSPACE WHILE IN PASSWORD SCREEN

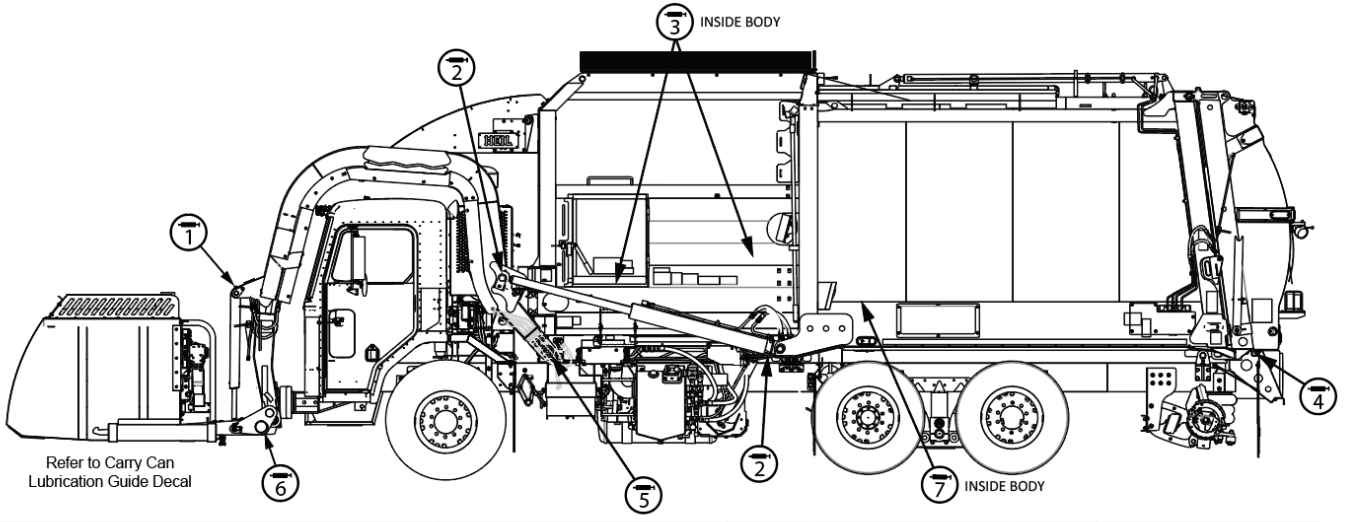
N = COUNTERS RESET
RESETS ALL COUNTERS IN MAINTENANCE SCREEN

212-3456

Figure 49. Heil InSight Diagnostic Display Functions

DECAL IMAGES (CONTINUED)

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) BODY LUBRICATION GUIDE



REF NO.	DESCRIPTION	QTY.	FREQUENCY	REF NO.	DESCRIPTION	QTY.	FREQUENCY
1	FORK CYLINDERS	4	WEEKLY/EVERY 50 HOURS	5	ARM CROSS SHAFT	4	WEEKLY/EVERY 50 HOURS
2	ARM CYLINDERS	4	WEEKLY/EVERY 50 HOURS	6	FORK CROSS SHAFT	2	WEEKLY/EVERY 50 HOURS
3	PACKER/EJECTOR CYLINDERS	4	WEEKLY/EVERY 50 HOURS	7	PACKER PANEL TRACKS	2	MONTHLY/EVERY 200 HOURS
4	SHUR-LOCK TAILGATE CYLINDER BRACKET	2	WEEKLY/EVERY 50 HOURS				

Use No. 1 pressure gun grease. Clean fittings before applying grease and always pump enough grease to remove old grease. Wipe off excess.

Lubricate moveable mechanical parts without fittings every 60 days with non-detergent engine oil.

212-3352

Figure 50. Lube Chart, PN 212-3352

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.

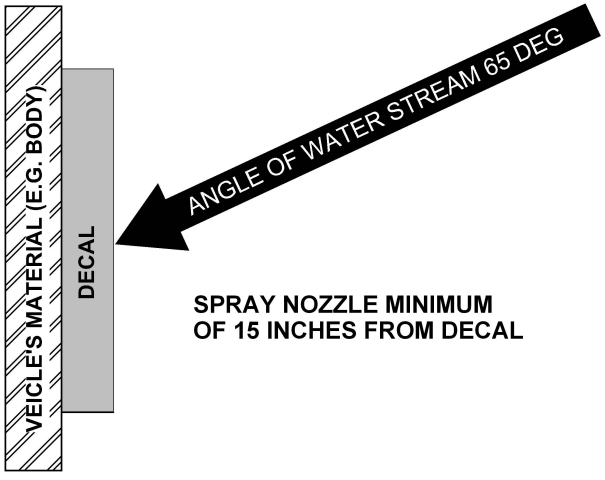
General Instructions

- 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

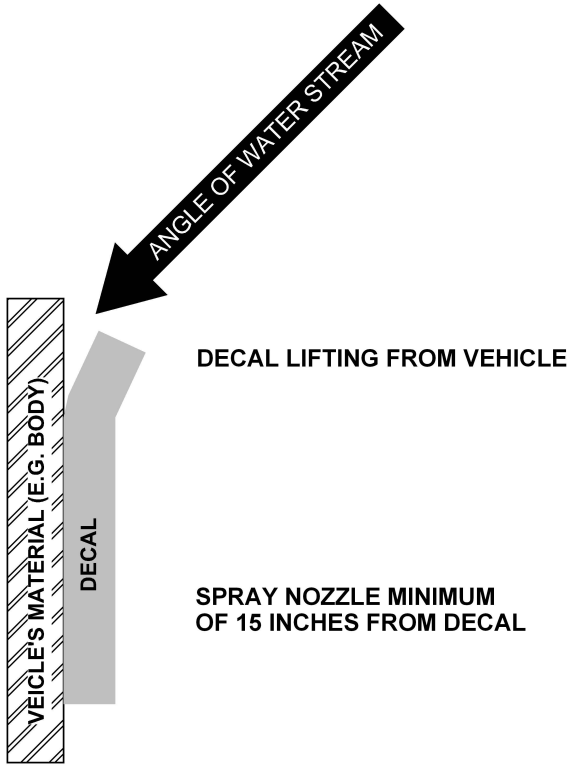
- Pressure washing can cause damage to decals. It can cause the edges of the decals to lift and peel the decal away from the unit. Over time, the decal can fade, crack or chip away.
- See the following figures for correct and incorrect methods of pressure washing.
- Use pressure washing only when other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

PRESSURE WASHER TECHNIQUE



RECOMMENDED TECHNIQUE

Figure 51. Recommended Technique



INCORRECT TECHNIQUE

Figure 52. Incorrect Technique

ALTERNATIVE CLEANING PROCEDURE

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

⚠ WARNING

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.

SECTION 3
LOCK-OUT/TAG-OUT PROCEDURE

PREVIEW

Read this section to learn about the proper Lock-Out/Tag-Out procedures.

You MUST Lock-Out/Tag-Out a unit BEFORE:

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

LOCK-OUT/TAG-OUT PROCEDURE

NOTICE

Always use your employer's Lock-Out/Tag-Out procedures. If your employer does not have Lock-Out/Tag-Out procedures, use the procedures that follow. Contact your supervisor or Heil Technical Service if you have any questions about Lock-Out/Tag-Out procedures.

Put the unit in a Lock-Out/Tag-Out mode:

- BEFORE you enter the unit's body.
- BEFORE you perform maintenance, repair, or cleaning procedures on the unit.

☑ Follow These Steps:

1. LOWER the arms and forks FULLY DOWN to the ground or RAISE the arms FULLY UP against the arm stops.
2. APPLY the brakes. MAKE SURE the brakes do not let the unit move and they work properly.
3. Chock all wheels.
4. **SET the tailgate props** 101 when you raise the tailgate for service, maintenance or cleaning.
5. If equipped, **SET the body props** 96 when you raise the body for service, maintenance or cleaning.
6. When there are in-cab controls, turn the ignition switch to ON, then:
   a. Move the switches of the hydraulic controls. This relieves the pressure in the cylinders.
   b. Turn the ignition switch to OFF.
7. When there are no in-cab controls, move the outside control levers to relieve the pressure in the cylinders.
8. Put a LOCK-OUT/TAG-OUT tag onto the steering wheel.
9. Remove the ignition key from the cab, lock the vehicle, and put the key in a secure location.

Figure 53. Lock-Out/Tag-Out Tag (Do Not Operate Tag)

NOTICE

You can order Lock-Out/Tag-Out tags (Part No. 212-1586) through your Heil dealer or through Heil.

NOTES:

SECTION 4
FEATURES, CONTROLS, SWITCHES, AND INDICATOR LIGHTS

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

FEATURES

InSight™ Diagnostic Display

The Cortex Controller™ uses the Insight Diagnostic Display for displaying the current status of inputs/outputs, engine speed, temperatures, and other information. This can also be used for configuring or selecting different options in the Cortex Controller.

For more information see **InSight Diagnostic Display** 70, **Cortex Controller** 159 and **Residential Half/Pack (featuring Odyssey® Controls) Cortex Controller™ Program 109-0351**, or **Commercial Half/Pack (featuring Odyssey® Controls) Cortex Controller™ Program 109-0350** in the Body Controller Software section of the Half/Pack (featuring Odyssey Controls) Service Manual.

Residential In-Cab AutoLift™ System

The AutoLift feature is standard on Residential Half/Pack (featuring Odyssey Controls) and is not available on Commercial Half/Pack (featuring Odyssey Controls) models. The system automatically controls lifting and lowering the container with the arms of the unit. The AutoLift system has the ability to modify and store the start position of the arms.

AutoPack™

The AutoPack Feature is a hydraulic system that is standard on all units and provides automatic pack/return of the packer panel when you compact the load. The system is always ON for Residential Half/Pack (featuring Odyssey Controls). The system is always ON for Commercial units until you use the packer override switch and use the packer manually.

AutoPack™ (Continued)

- The tailgate must be closed for AutoPack to operate. When the tailgate is open, AutoPack does not operate, and the operator must PRESS and HOLD the PACKER EXTEND and PACKER RETRACT switches to extend or retract the packer panel.
- The packer will not function when the operator raises or lowers a Carry Can so that hydraulic flow is available for the lift arms.
- For Residential Half/Pack (featuring Odyssey Controls) units, the Override Switch has no effect on the packer operation.
- When the packer extends, the PACKER EXTEND notification indicator is green on the InSight™ Diagnostic Display.
- You can manually retract the packer at any time by pressing the PACKER RETRACT switch.
- When the packer retracts, the PACKER RETRACT notification indicator is yellow or blank on the InSight Diagnostic Display.

In the auto mode, when you PRESS the PACKER EXTEND button, the packer extends to the end of the first cylinder stage and retracts automatically to the FULLY RETRACTED POSITION, ready for the next cycle.

For more information, see **AutoPack** 138 in the **On-Route Operation Procedures section** 129.

FEATURES (CONTINUED)

The packer retracts automatically when:

- It reaches its travel limit with the tailgate closed
- It reaches its maximum cycle time

The tailgate must be closed for AutoPack to operate. When the tailgate is open, AutoPack does not operate, and the operator must PRESS and HOLD the PACKER EXTEND and PACKER RETRACT switches to extend or retract the packer panel. Refer to **AutoPack** 138 in the **On-Route Operation Procedure section** 129 for more information.

Travel Position Operation

For units without a Top Door, the Travel Position rocker switch in the cab will, when enabled and when the packer extend push button is pressed, extend the packer to clear the hopper of refuse and hold it in the body for vehicle travel.

1. Turn ON the TRAVEL POSITION ROCKER SWITCH.
2. PRESS the PACKER EXTEND BUTTON. The packer will extend until the packer is just inside the body and will stop.
3. While the packer is extending, the Travel Position indicator will flash. If the packer turns off before getting to the Travel Position inside the body the indicator will continue to flash until the packer is retracted (for example when there is too much refuse and the packer times out). Once the packer gets to the Travel Position proximity switch, the Travel Position indicator will remain on, only turning off when the Travel Position switch is turned off.

Travel Position Operation (Continued)

4. The packer will not retract until the Travel Position Switch is turned off.
5. Turning off the Travel Position switch and pressing Packer Retract will automatically bring the packer back to the Fully Extended position ONLY. To return to the front head, the operator has to continually hold the packer retract button down. This is a safety feature.

Select-O-Pack™

The Select-O-Pack feature is standard and Residential Half/Pack (featuring Odyssey Controls) units and is optional on Commercial units. For Residential Half/Pack units and Commercial units, a Select-O-Pack Switch is installed in the dash. On Residential Half/Pack (featuring Odyssey Controls) units, the signal is hard-wired into the harnessing.

The Select-O-Pack feature automatically initiates the pack cycle. When the pack cycle is automatically initiated by this feature depends on the type of unit. For Residential Half/Pack (featuring Odyssey Controls) units, the automatic pack cycle is initiated at the bottom of the arm cycle. For Commercial Half/Pack units, the automatic pack cycle is initiated when the arms go below transit height (at which point the "Arms below Height Light" comes on).

Select-O-Pack can be set on the control panel to: OFF (blue), one pack cycle (yellow), or two pack cycles (green).

IN-CAB MAIN CONTROL PANEL

The In-Cab Main Control Panel can vary with different models of truck chassis and configuration. See the figure to the right for an illustration of a typical Heil Push Button Controls. The control panels have labels or markings that identify each function and its operations. 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, the figure below shows a portion of a panel that includes the TAILGATE function and its RAISE operation. The marking identifies the function (T/G RAISE) and its operation (RAISE). When you want to raise the tailgate, for example, you PUSH and HOLD T/G RAISE push button until the tailgate is at the position you want, and then RELEASE the push button.

Figure 54. In-Cab Main Control Panel

Heil Push Buttons and Indicator Lights

Use the push buttons and indicator lights described below to operate the unit's hydraulic functions.

⚠ WARNING

After the System Power push button is pressed and motion of components has appeared to stop, additional movement can occur.

IN-CAB MAIN CONTROL PANEL (CONTINUED)

Push buttons operate functions, some of which are described in the following paragraphs. Your control panel may have different functions. Become familiar with the control panel and its push buttons in your unit.

Most Push buttons have an ON and OFF position. Press the button to activate a function and press the button again to deactivate a function. Some buttons have lighted notification status colors around them. See the descriptions to the right and on the next pages.

The Pump button is an ON/OFF momentary switch.

The functions controlled by the push buttons include:

1. Operation of optional lights for when you work in minimal light or darkness.

   These lights include:

   - Strobe Light
   - Hopper Light
   - AUX Light
   - Container Light
   - Cab Light
   - Can Light

Use the switches described below to operate the unit's hydraulic functions.

⚠ WARNING

After the System Power switch is pressed and motion of components has appeared to stop, additional movement can occur.

NOTICE

The packer panel can be stopped at any position by pushing switch to OFF/STOP position.

2. SYSTEM POWER ON and OFF/STOP SWITCH (RED) - Must be in the ON position for any function of the pack mechanism to operate. Side door must be closed.
   a. PULL for ON position.
   b. PUSH for OFF/STOP position.
3. PUMP BUTTON
   a. PUSH to turn hydraulic pump ON. The lighted ring around the switch light comes ON.
   b. PUSH again to turn hydraulic pump OFF. The lighted ring around the switch light goes OFF.

IN-CAB MAIN CONTROL PANEL (CONTINUED)

4. PACK EXT / RET BUTTONS - Controls extending and retracting the packer. The lighted ring around the PACK RET button will be RED if packer is not retracted to the full retract position.
   a. PUSH to PACK EXT button to EXTEND packer.
   b. PUSH to PACK RET position to RETRACT packer.

⚠ DANGER

Place the unit in Lock-Out/Tag-Out mode before **Cleaning Behind the Packer Panel** 151. Refer to the **Lock-Out/ Tag-Out Procedure** 57. Turn the ignition key to the OFF position and remove the ignition key.

5. OVHGT OVERIDE BUTTON – Optional on Commercial units only (button has no effect on packer in Residential Odyssey units), use this rocker switch to override the packer logic on a unit when you want to use the packer with the arms above the cab protector.

   The lighted ring around the OVHGT OVERIDE button will flash RED if arms are above height and forks are not tucked OR if commercial grippers/adjustable forks are over height.

5. OVHGT OVERIDE BUTTON (CONTINUED) -

   This allows an operator:

   - to manually operate the packer with the arms raised.
   - to extend the packer and clean behind the packer on Commercial units.

6. AUTOLIFT BUTTON - On Residential units only, controls turning **AutoLift** ON or OFF.
   a. PUSH to turn AutoLift ON.
   b. PUSH again to turn AutoLift OFF.
7. TP DR OPEN / DR CLOSE BUTTONS - Controls opening and closing of the top door (hopper cover). The lighted ring around the TP DR CLOSE button will be RED if top door is not fully open.
   a. PUSH and HOLD TP DR OPEN button to OPEN top door.
   b. PUSH and HOLD TP DR CLOSE button to CLOSE top door.
7. T/G RAISE / LOWER BUTTONS - Controls raising and lowering of the tailgate. The lighted ring around the T/G RAISE button will be RED when the tailgate is not fully lowered to the closed position or magenta if data collection procedure is enabled.

   Note: You must first PUSH and HOLD T/G UNLOCK and T/G RAISE at the same time to unlock the tailgate. Then release and:

   a. PUSH and HOLD to T/G RAISE to RAISE tailgate.
   b. PUSH and HOLD to T/G LOWER to LOWER

tailgate.

IN-CAB MAIN CONTROL PANEL (CONTINUED)

9. T/G LOCK / UNLOCK BUTTONS - Controls locking and unlocking of the tailgate. The lighted ring around the T/G UNLOCK button will be RED if the tailgate is unlocked.
   a. PUSH and HOLD T/G UNLOCK and T/G RAISE at the same time to unlock the tailgate
   b. PUSH the T/G LOCK button to LOCK the tailgate.
10. TRAVEL POSITION BUTTON - For units without a Top Door, enables **Travel Position** 64 operation.
   a. PUSH to turn Travel Position ON.
   b. PUSH again to turn Travel Position OFF.
11. SEL O PACK BUTTON - Enables Select-O-Pack function.
   a. PUSH to turn Select-O-Pack ON with one pack cycle (lighted ring turns YELLOW).
   c. PUSH again to turn Select-O-Pack ON with two pack cycles (lighted ring turns GREEN).
   d. PUSH again to turn Select-O-Pack OFF (lighted ring turns BLUE).

PUSH BUTTON STATUS COLORS	
TP DR CLOSE	RED IF TOP DOOR IS NOT FULLY OPEN
T/G UNLOCK	RED IF TAILGATE IS UNLOCKED MAGENTA IF DATA COLLECTION PROCEDURE IS ENABLED
T/G RAISE	RED IF TAILGATE IS NOT FULLY CLOSED
PACK RET	RED IF PACKER IS NOT FULLY RETRACTED
OVHGT OVERIDE	FLASHES RED IF ARMS OVER HEIGHT AND FORKS NOT TUCKED, OR IF COMMERCIAL GRIPPERS / ADJUSTABLE FORKS ARE OVER HEIGHT
PUMP	RED IF OFF, YELLOW IF OIL WARM IS ACTIVE, GREEN IF ON
SEL O PACK 212-3539	BLUE IF OFF, YELLOW IF ONE PACK CYCLE, GREEN IF TWO PACK CYCLES

Figure 55. Push Button Notifications Decal, PN

INSIGHT™ DIAGNOSTIC DISPLAY

The Heil InSight Diagnostic Display is the information center for the operator and troubleshooting tool for the service mechanic. The next few pages cover basic functionality. For additional information, see **Half/Pack (featuring Odyssey Controls) Detachable Can Cortex Controller™ Program 109-0306** or **Half/Pack (featuring Odyssey Controls) Commercial Cortex Controller Program 109-0307** in the Body Controller Software section of the Half/Pack (featuring Odyssey Controls) Service Manual.

For the operator, it shows operation warnings and explains why the system may prevent a function so the operator can correct and operate in a safe and productive manner.

For the service technician, it displays information regarding sensor failures, and with proper training, can be used to test sensors and other inputs and output functions.

When the truck key switch is on, the home screen below will be displayed. This screen will show the operator various cab control conditions, including if:

- Pump is ON/OFF,
- Side Door is CLOSED,
- Tailgate is CLOSED,
- Tailgate is LOCKED,
- Select-O-Pack ON/OFF,
- Forks TUCKED,
- Hydraulic Oil LOW/OK,
- Filter Pressure OK.

INSIGHT™ DIAGNOSTIC DISPLAY (CONTINUED)

Below are the button functions for the InSight Diagnostic Display.

HOME
Press this button anytime you want to return to the home screen

COUNTERS
Press to enter counter screen

CAMERA
If cameras are wired into this display, press this button to enter camera mode

BRIGHTNESS
Press to change brightness of screen

NAVIGATION / ENTER BUTTON
Press UP, DOWN, LEFT and RIGHT to scroll through Inputs, Outputs or other data. Press center button for OK, to confirm selection.

OPTIONS
Press to enter option configuration screen

SERVICE
Press to view Inputs, Outputs, Setpoints and Power screens

CALIBRATION
Press to enter Calibration Mode

MAINTENANCE
Press to enter maintenance mode used to Reset Counters and enter Service Mode

DIAGNOSTIC DISPLAY MESSAGES

When a fault occurs, the In-Cab Alarm will sound and a diagnostic message will be displayed with the status of respective Input / Output in the Insight display unit. See the figure below.

See the **Half/Pack (featuring Odyssey Controls) Service Manual, Body Controller Software Section** for for display screen shots of potential diagnostic messages, listed disabled functions and instructions for fault reset.

DIAGNOSTIC DISPLAY MESSAGES

When a fault occurs, the In-Cab Alarm will sound and a Diagnostic Message will be displayed.

DEPRESSURIZING CUROTTO-CAN HYDRAULICS

When removing a Curotto-Can from a Residential Half/Pack (featuring Odyssey Controls) unit, you must depressurize the Curotto-Can hydraulics. For instructions on how to remove the Curotto-Can, refer to the Curotto-Can Operation and Service Manual.

- For post-2018 Heil Half/Pack (featuring Odyssey Controls) units, Turn ON the Depressurize Curotto Hydraulics function on the in-cab display.
- For pre-2018 Heil Half/Pack (featuring Odyssey Controls) units and non-Heil units, turn OFF the truck engine and reset the key to IGNITION only. Make sure the Pump Switch is ON. TOGGLE the Curotto-Can joystick back and forth through each of the Curotto-Can functions (this will relieve any hydraulic pressure in the lines).

AUTOLIFT™ ARMS START POSITION

⚠ WARNING

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

⚠ WARNING

Clear all people of the area before you lift a refuse container. Make sure the refuse is secure in the refuse container before you lift the container. Loose refuse can fall and cause serious injury or death.

To adjust the start position of the arms:

1. Turn off the AutoLift Enable switch.
2. Re-position the arms up or down to the desired start position (within 10 degrees of fully down).
3. Turn on the AutoLift Enable switch.
4. This becomes the new start position for the AutoLift cycle and the arms will return to this position until changed again or until the truck is turned off.

NOTES:

RESIDENTIAL HALF/PACK (FEATURING ODYSSEY CONTROLS) IN-CAB AUTOLIFT™ SYSTEM

The figure below shows the in-cab Multi-Function Joystick with its buttons and switches that operate the AutoLift system. A typical Residential Half/Pack (featuring Odyssey Controls) unit has two of these Multi-Function Joysticks, one on the street side and one on the curb side inside the cab.

There is an option to add a Commercial style 2-axis joystick or 2-lever controls on the street side of the unit.

- AutoLift Enable Button – On the control panel, PUSH this button to activate and PUSH this button again to de-activate the AutoLift system. When you PRESS the switch to ON, the green AutoLift light turns ON. When you PRESS the switch to OFF, the light turns OFF.
- With the thumb switch (the red button on the Multi-Function Joystick) is depressed, the joystick functions in AutoLift Mode.

Figure 56. Multi-Function Joystick

- Multi-Function Joystick – After you enable the AutoLift feature:
  a. With the thumb switch (the red button on the Multi-Function Joystick) depressed, position the arms and forks so that the AUTOLIFT START POSITION indicator light will turn ON. This occurs with the arms all the way down and forks on the Forks Level/Clear Proximity Switch on the fork cross-shaft.
  b. Should the operator move the forks up or down and get them OFF of the Forks Level/Clear Proximity Switch, then the operator uses the Override Switch to move the forks back on the proximity switch. This is the only time that the Override Switch is useable with Odyssey.
  c. Move the Multi-Function Joystick to the RAISE direction to start the automatic raise operation. The lift arms rise until you release the joystick.
  d. Move the Multi-Function Joystick to the LOWER direction to start the lower operation. Release the joystick when the container is on the ground.
  e. AutoLift Start Notification Indicator - This indicator on the InSight™ Diagnostic Display is green when the arms are in the Auto-Lift start position and the pump is on.
  f. Forks Tucked Notification Indicator - This indicator on the InSight™ Diagnostic Display is green when the arms are above height with the forks tucked into a travel position.

RESIDENTIAL HALF/PACK (FEATURING ODYSSEY CONTROLS) IN-CAB CONTROLS

NOTICE

This Operation Manual must be used in conjunction with Curotto-Can, Bayne Can, or other Can Manufacturer Manuals that will be used with this unit. For additional information on the Curotto-Can, refer to the Curotto-Can Operation, Service, and Parts Manual that is supplied with the Curotto-Can.

Heil Multi-function Joystick

The following instructions are for the Heil Multi-Function Joystick installed on a Residential Half/Pack (featuring Odyssey Controls) unit. Also refer to the decal in the cab of the unit (shown on next page).

A. Manual Mode

With the AutoLift Switch OFF (located on the Control Panel), the unit is in Manual Mode. In this mode, the Front Loader AutoLift function is OFF. Use Manual Mode to manually control the Front Loader Arm and Fork functions.

- Red Button = Pump ON/OFF
- Right Gray Button = Inactive
- Left Gray Button = Inactive
- Joystick FORWARD = Arms DOWN
- Joystick BACKWARD = Arms UP
- Joystick RIGHT = Forks DOWN
- Joystick LEFT = Forks UP

B. Carry Can Mode

With the AutoLift Switch ON, **Carry Can Mode is active when the Thumb Switch Button is NOT depressed**. Use Carry Can Mode to control the Carry Can Arm Extend/Retract and Carry Can Arm Raise/Lower functions to dump customer cans into the Curotto-Can.

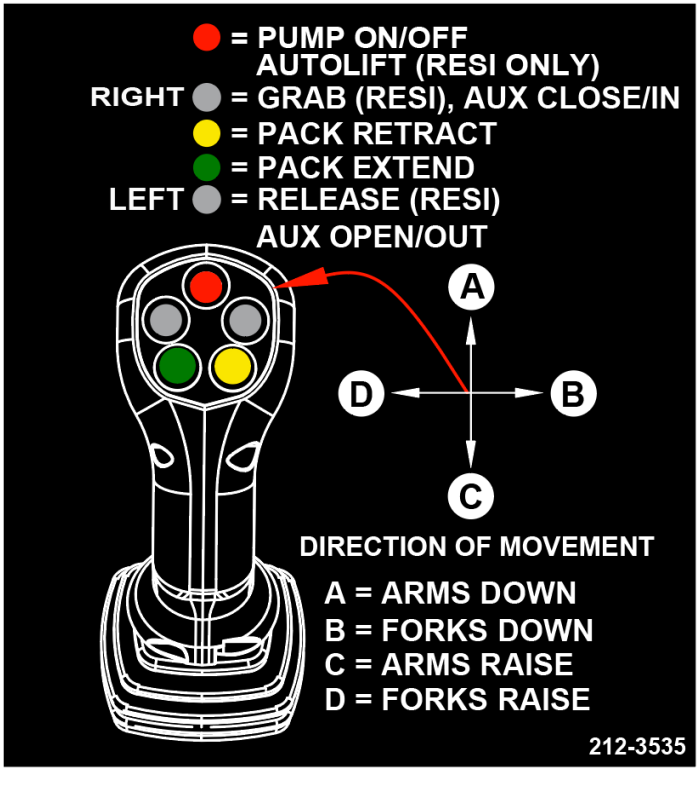
- Red Button = AutoLift Mode inactive when NOT depressed
- Right Gray Button = GRAB (Residential)
- Left Gray Button = RELEASE (Residential)
- Joystick FORWARD = Curotto-Can Arm LOWER
- Joystick BACKWARD = Curotto-Can Arm RAISE
- Joystick RIGHT = Curotto-Can Arm EXTEND
- Joystick LEFT = Curotto-Can Arm RETRACT

C. AutoLift™ Mode

With the Red AutoLift Button is depressed, **AutoLift Mode is active**. Use AutoLift Mode to control the automated Front Loader Arms and Forks functions. This mode automatically tucks/untucks the forks as it dumps the Curotto-Can into the Front Loader hopper.

- Red Button = AutoLift Mode active when depressed
- Joystick FORWARD = AutoLift Arms DOWN
- Joystick BACKWARD = AutoLift Arms UP
- Joystick RIGHT = Forks DOWN
- Joystick LEFT = Forks UP

RESIDENTIAL HALF/PACK (FEATURING ODYSSEY CONTROLS) IN-CAB CONTROLS (CONTINUED)



RESIDENTIAL HALF/PACK (FEATURING ODYSSEY CONTROLS) OPTIONAL OUTSIDE CUROTTO-CAN CONTROLS

⚠ WARNING

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

Listed below are the switches and functions on the Outside Control Panel. See the figure on the next page.

- Curotto-Can Enable: On/Off
- Curotto-Can Arm: In/Out
- Curotto-Can Grabber: Grab/Release
- Curotto-Can Arm: Dump/Undump (to raise residential container into Curotto-Can and dump/lower arm)

RESIDENTIAL ODYSSEY OPTIONAL OUTSIDE CUROTTO-CAN CONTROLS (CONTINUED)

Figure 57. Optional Outside Curotto-Can Controls

NOTICE

Residential Half/Pack (featuring Odyssey Controls) is equipped with an Auto-Retract function that retracts all Curotto-Can cylinders when ARMS UP or FORK EXTEND function is engaged. If the Auto-Retract function does not work, have the unit repaired immediately to prevent damage of the Curotto-Can components as the can enters the hopper.

COMMERCIAL HALF/PACK (FEATURING ODYSSEY CONTROLS) IN-CAB CONTROLS

The Commercial Half/Pack (featuring Odyssey Controls) has the option of one Multi-Function Joystick or one In-Cab Joystick or 2-Lever Air Controls for the lift arms and forks functions. The joystick control or 2-lever control can be located in various areas of the cab, either as a separate control or attached to a main control panel.

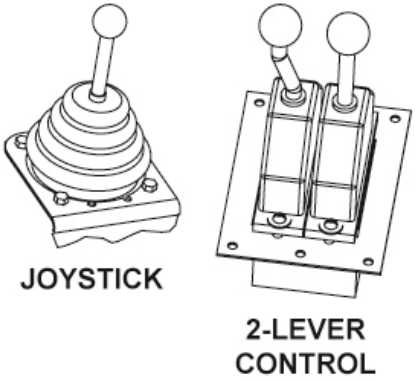


Figure 58. Joystick and 2-Lever Controls

Joystick Air Controls

The joystick controls the operation of two components – the lift arms and the forks - in two directions – up (raise) or down (lower). The joystick has decals that show you where to push/pull (move) the joystick for each function and direction. The operation 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 joystick can control both the arms and the forks by moving the joystick halfway between functions. This action reduces the speed of the operations, as the hydraulic flow is divided between both functions.

For example, if you want to raise the lift arms, you move the joystick to the ARMS RAISE position and hold it there until the lift arms are at the height you need, then release the lever.

⚠ WARNING

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

A. Raise and Lower Arms:

- MOVE the joystick towards the ARMS RAISE position to raise the lift arms.
- MOVE the joystick towards the ARMS LOWER position to lower the lift arms.

B. Raise and Lower Forks:

- MOVE the joystick towards the FORKS RAISE position to raise the forks.
- MOVE the joystick towards the FORKS LOWER position to lower the forks.

COMMERCIAL ODYSSEY IN-CAB CONTROLS (CONTINUED)

2-Lever Air Controls

Each lever controls the operation of one component – the lift arms or the forks - in two directions – up (raise) or down (lower). You must move a lever back to the center or neutral position or let go of the lever (each is self-centering) before you can go in a different direction with the same function. As with the joystick, you can operate both levers at the same time, operating both the lift arm and the forks, but the speed is slower.

The lever closest to the driver controls the arms and the other lever controls the forks. Make sure you are familiar with the function of each lever in your unit.

For example, when you select the ARMS lever and PUSH the lever towards the LOWER position, the arms will continue to lower until you release the lever.

⚠ WARNING

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

A. Arms Raise and Lower – Controls raising and lowering of the lift arms:

- MOVE the lever towards the ARMS RAISE position to RAISE the lift arms.
- MOVE lever to towards the ARMS LOWER position to LOWER the lift arms.

B. Forks Raise and Lower – Controls raising and lowering of the forks:

- MOVE the lever towards the FORKS RAISE position to RAISE the forks.
- MOVE the lever towards the FORKS LOWER position to LOWER the forks.

COMMERCIAL ODYSSEY IN-CAB CONTROLS (CONTINUED)

Multi-Function Joystick

The joystick controls the operation of two components – the lift arms and the forks - in two directions – up (raise) or down (lower). The joystick has decals that show you where to push/pull (move) the joystick for each function and direction. The operation 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 joystick can control both the arms and the forks by moving the joystick halfway between functions. This action reduces the speed of the operations, as the hydraulic flow is divided between both functions.

For example, if you want to raise the lift arms, you move the joystick to the ARMS RAISE position and hold it there until the lift arms are at the height you need, then release the lever.

⚠ WARNING

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

A. Raise and Lower Arms:

- MOVE the joystick towards the ARMS RAISE position to raise the lift arms.
- MOVE the joystick towards the ARMS LOWER position to lower the lift arms.

B. Raise and Lower Forks:

- MOVE the joystick towards the FORKS RAISE position to raise the forks.
- MOVE the joystick towards the FORKS LOWER position to lower the forks.

HALF/PACK COMMERCIAL (FEATURING ODYSSEY CONTROLS) OPTIONAL ADJUSTABLE FORKS SWITCH

This switch is optional for Commercial Half/Pack and Commercial Half/Pack (featuring Odyssey Controls) Units. See the figure to the right. If the unit has this option, the operator can adjust the width of the forks with this switch. You will find the control in the unit's cab. The switch controls the IN and OUT movement of the forks for various size refuse containers.

⚠ WARNING

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

To operate the adjustable forks switch:

- MOVE the toggle switch to OUT, which moves the forks outward. MOVE the switch back to the center position to stop movement of the forks.
- MOVE the toggle switch to IN, which moves the forks inward. MOVE the switch back to the center position to stop the movement of the forks.

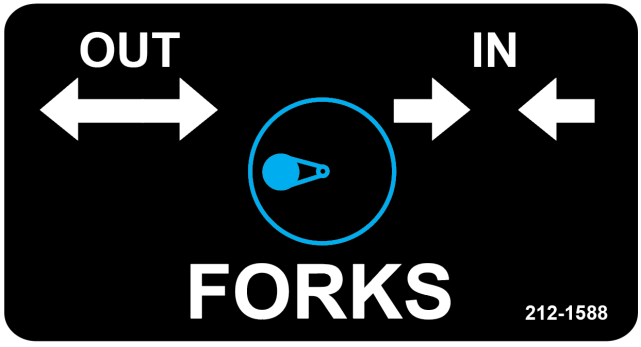


Figure 59. Optional Adjustable Forks Switch

HEIL AUTONOMOUS LIFT OPTION (H.A.L.O.) OPERATION (CONTINUED)

The instructions below should be used in conjunction with the H.A.L.O. Semi-Autonomous Controls video on the Heil Service Shack. Refer to Figure on the right.

⚠ WARNING

The H.A.L.O. Controls are programmed to only pick up ANSI compliant containers. Serious damage or injury can occur if you try to use this feature with any other containers. In case of an emergency, fully release the joystick and button to cease all operations.

A. Semi-Autonomous Joystick Controls

1. Red Button (top): Semi-Autonomous Lift

   This will allow you to complete a full dump cycle with one push of a button.

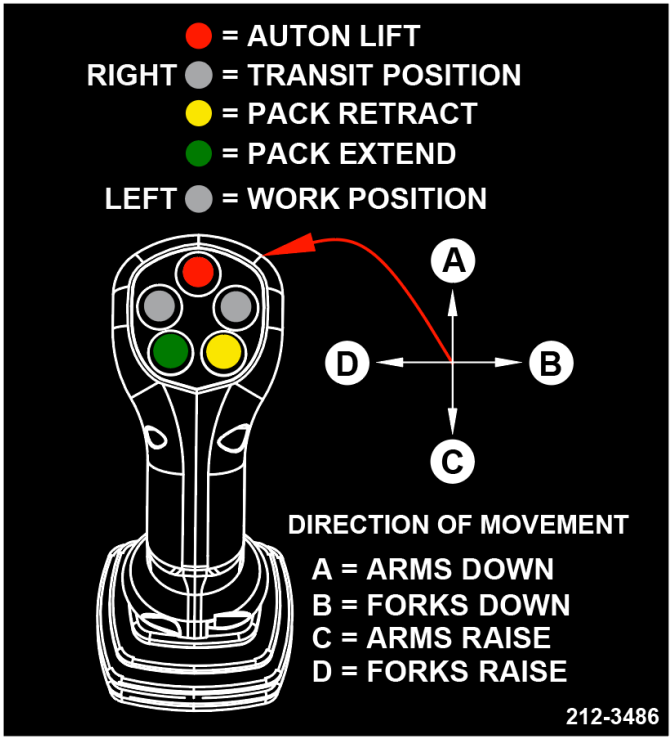
2. Gray Button (left): Work Position

   Press and hold this button to automatically move the arms and forks into your preset work position.

3. Gray Button (right): Transit Position

   Press and hold this button to automatically move the arms and forks into the transit position.

4. Green Button (bottom left): Packer Extend
5. Yellow Button (bottom right): Packer Retract



HEIL AUTONOMOUS LIFT OPTION (H.A.L.O.) OPERATION (CONTINUED)

B. On-Route Operation

⚠ DANGER

Always check for overhead lines or obstacles before operating the arms.

⚠ DANGER

Make sure the area around the unit is clear before beginning operation. Follow all safety precautions on the unit decals and in your Operation Manual.

1. When you first arrive at your customer's site, press and hold the left gray semi-autonomous button to move your arms and forks to the work position. The arms will automatically lower, and the forks will automatically untuck when you reach the over-height position.

   NOTE: You may have to manually level your forks and arms to line them up with the container pick-up sleeves.

2. Once the container is fully seated on the forks, place the unit into Neutral, apply the parking brake, and press and hold the red semi-autonomous button. Throttle advance will engage and the forks will tilt slightly upward to prevent the container from sliding off the forks. The arms will then raise, and the forks will automatically level.

   NOTE: If the forks are not level, the arms will interlock at the over-height position. The semi-autonomous process will resume when the forks are level.

   The forks will automatically roll into the hopper at the set forks roll position. The forks will "pause" for a period of time, then they will untuck to the forks clear position, and the arms will lower.

   NOTE: You must continue holding the red semi-autonomous button to complete the dump cycle. If you release the red button for any reason, simply press and hold it to resume the semi-autonomous process.

   The arms and forks will automatically return to the position that the "Semi-Autonomous Lift" was initiated.

   NOTE: The forks will stop slightly higher to prevent damage to the container. Manually lower the container gently to the ground and remove the forks to complete the cycle.

3. If you need to perform a can shake, release the red semi-autonomous button after the forks have rolled into the hopper at the forks roll position. Then manually roll the forks back and forth to remove any stubborn refuse that may be stuck in the container. When you have completed the can shake, press and hold the red autonomous button to resume the cycle.

   NOTE: If you have your system setup with a 0-15 second delay for when the container is in the hopper, you will experience the same "pause" when you press and hold the red semi-autonomous button to resume the cycle.

HEIL AUTONOMOUS LIFT OPTION (H.A.L.O.) OPERATION (CONTINUED)

4. When your forks are clear of the container pick-up sleeves, press the right gray semi-autonomous button to return to the Transit position. The arms will either raise to your preset over-height position or to the fully retracted position against the arm pads. This is dependent on your setup.
5. When you are ready to pack, press and release the green button to begin the auto pack cycle. If you need to retract the packer panel at any time, press and hold the yellow button.

   NOTE: If you have to turn off your unit during the semi-autonomous lift cycle, then you will have to manually lower your container back to the ground before you can resume the semi-autonomous process again.

NOTES:

ECONIC ADJUSTABLE LIFT ARMS

Heil bodies mounted on Econic chassis require Econic Lift Arms. The arms are a pivoting design with in-cylinder sensors in each actuating cylinder to assure clearances and timing. The motion allows the clearances for the Econic European style cab (approximately 18” longer) while will collapse so it is not over height when stowed in the hopper for transport.

The Econic Lift Arms can be used in both Commercial and Residential applications, with Heil Autonomous Lift Option (H.A.L.O.) as an available option for Commercial units.

- Adjustable Arms option must be turned ON in the **InSight™ Diagnostic Display** 70.
- Adjustable Arms can be controlled manually by using the buttons on the keypad OR by the joystick.
- To extend the Adjustable Arms press the OUT button or push the joystick forward.
- To retract the Adjustable Arms press the IN button or pull the joystick back.
- The Adjustable Arms can only be retracted at the arms full UP position.
- If at any time the Adjustable Arms are not fully extended, the arms will interlock.
- While raising the arms, if the operator continues to command arms up with the joystick for 2 seconds after reaching the full UP position, the Adjustable Arms will retract.
- While lowering the arms if the operator commands arm down the booms will automatically extend before the arms lower.

SERVICE MODE

The Half/Pack (featuring Odyssey Controls) units have a Service Mode within their Cortex Controller™ programming initiated on the InSight™ Diagnostic Display. Service Mode is to be used ONLY by authorized service personnel in the event of a Cylinder or Packer Sensor failure on route to recover to a safe arms and forks position. Service Mode can also be used to move the functions while servicing a failed Cylinder Sensor.

NOTICE

Service Mode is to be used ONLY by authorized service personnel. Unauthorized use of Service Mode can result in extensive damage to the unit.

NOTICE

The arms, forks and packer will move very, very slowly due to the unit being in Service Mode.

1. Place the unit in **Service Mode**.
   a. On the InSight™ Diagnostic Display, hold the OK button down for 5 seconds and release.
   b. The password screen will appear on the display.
   c. Enter the service password 4 3 2 1 and press OK.
   d. The bottom option should be Service Mode. Select it with the arrows and then press OK making sure that option changes from OFF to ON.
   e. Press ESC to exit.
2. When service is complete, go back to the maintenance screen and turn off Service Mode. See Step 1 above. Service Mode also resets if power to the unit is cycled.

OPTIONAL AUTOPACK™ OUTSIDE CONTROLS

If included on your Residential or Commercial unit, optional outside controls are on the street side of the unit. The optional outside controls include a control assembly for the AutoPack™ feature and controls for the lift arms and forks. They are mounted on or near the chassis fender or behind the chassis cab.

Outside Control Box - AutoPack

Refer to the figure on the right for the control box.

A. Ignition Key – The key controls the power to the control box.

- Put the key in the ignition switch when you are ready to operate the controls outside of the cab.
- Turn the key to on to operate the outside controls.
- Turn the key to off and remove the key when you complete the outside-of-cab operation of the controls.

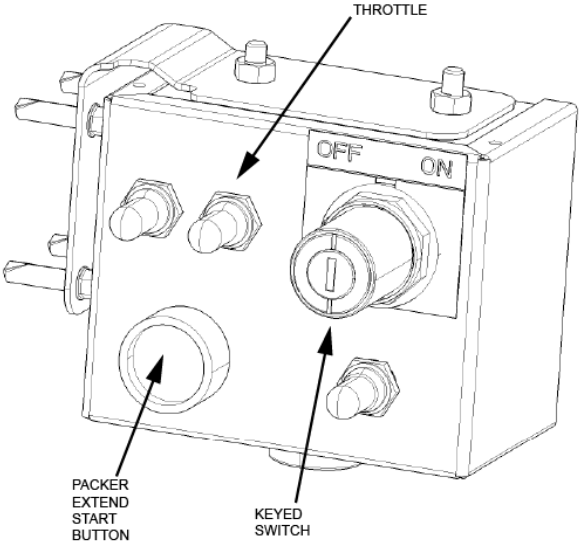


Figure 60. Optional AutoPack Outside

OPTIONAL AUTOPACK™ OUTSIDE CONTROLS (CONTINUED)

⚠ WARNING

The packer/eject mechanism is dangerous when a person is inside the hopper or body. Serious injury or death may occur if a person is inside the body or hopper. The side door must be closed before you start a packer operation. Make sure no one is inside the hopper or body before you operate a packer function.

NOTICE

You can cause damage to the unit and/or container when the Carry Can container is in the hopper while you extend the packer. Do not extend the packer when the container or Carry Can is in the hopper.

A. Packer Start/Extend Switch – Use this green switch to control extending the packer panel:

- PRESS and RELEASE the switch to extend the packer panel to the end of the cylinder first stage.
- The panel extends to compact the load, then automatically returns to the FULLY RETRACTED POSITION and stops.

B. Throttle Advance Toggle Switch – This switch controls the engine's governor speed. Use this switch when you use the packer, arms and forks functions.

- You MOVE this switch to ON to control the engine's governor speed.
- MOVE the switch to OFF when you do not need the hydraulic functions.

Note: For both Residential and Commercial units in neutral, when the Throttle Advance Toggle Switch is ON, throttle advance is ON until toggled OFF.

COMMERCIAL ODYSSEY OUTSIDE CONTROLS – LIFT ARMS AND FORKS

There are two versions or types of Commercial outside controls – Joystick and 2-Lever Controls – for the operation of the lift arms and forks, similar to the in-cab arms and forks controls. They operate the same as the In-Cab Joystick and 2-Lever Controls. Refer to **Commercial Odyssey In-Cab Controls** 79.

The Joystick and 2-Lever Controls work with the outside control box for AutoPack™ functions.

NOTES:

SERVICE HOIST

The Service Hoist model has an outside control assembly that controls the raising and lowering of the body for service and maintenance operations by service personnel only.

The control is part of the service hoist pump. See the figure to the right and refer to **Propping the Body (Service Hoist Units)** 95 in the next section for Service Hoist and Factory Body Props operation procedures and additional safety notices.

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

⚠ DANGER

Keep all parts of your body out from underneath the unit's body and away from the cylinders when raising or lowering the body. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Always use the body props when you must leave the body raised for maintenance or cleaning operations.

⚠ 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.

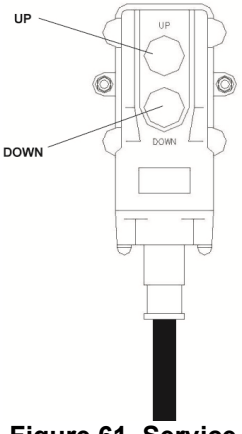


Figure 61. Service Hoist Controls

Figure 62. Typical Service Hoist Controls Location

NOTES:

SECTION 5
BODY AND TAILGATE PROPS

PREVIEW

Read this section to learn about:

- Using the body props
- Using the tailgate props

PROPPING THE BODY OF A SERVICE HOIST UNIT

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.

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

⚠ DANGER

Keep all parts of your body out from underneath the unit's body and away from the cylinders when raising or lowering the body. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body.

⚠ 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.

⚠ WARNING

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

⚠ WARNING

Never drive the unit with the body propped.

⚠ WARNING

The extra weight from the refuse or Carry Can is dangerous while you work around the unit with the body raised. The extra weight can make the unit unstable. Serious injury or death or damage to the unit can occur if you do not remove the extra weight. Do not leave refuse or the Carry Can in the body while you prop the body. Remove the refuse and/or the Carry Can from the body before you raise the body.

NOTICE

Empty body of all refuse before using body props.

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.

PROPPING THE BODY OF A SERVICE HOIST UNIT (CONTINUED)

Factory Body Props

The factory-supplied body props are located on both sides under the body and forward of the rear wheels. Carefully follow the body propping procedures below.

☑ Follow These Steps:

Raising the Body

1. Empty body of all refuse.
2. Make sure that body is on firm, level ground with the Parking Brake engaged and holding and place chocks on the wheels.
3. CLOSE the manual override valve on the power unit – PUSH the knob IN and turn it CLOCKWISE.
4. **Lock-Out/Tag-Out** 57 the unit.
5. Remove the bolts and springs from the chassis mounting brackets. See the figure below.

Figure 63. Removing Bolts and Springs from Chassis Mounting Brackets

Raising the Body (Continued)

1. If equipped with quick disconnects, uncouple prior to raising the body.
2. Make sure there is adequate slack in hoses that do not have disconnects. If there is not adequate slack in hoses that do not have disconnects, remove those hose clamps.
3. Observe and obey the DANGER labels for an elevated chassis.
4. PRESS and HOLD the UP button to RAISE the body.
5. RELEASE the UP button when the body is at the height you want.
6. Release the prop handles and LOWER the body props, then PRESS the DOWN button to lower the body onto the lugs. See the figure below.

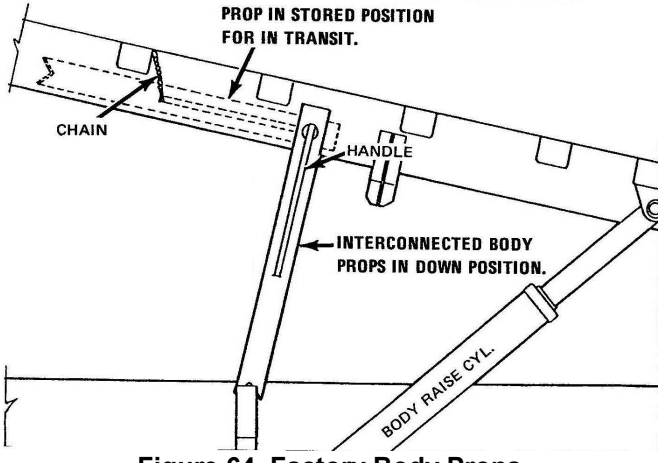


Figure 64. Factory Body Props

PROPPING THE BODY OF A SERVICE HOIST UNIT (CONTINUED)

Raising the Body (Continued)

7. NEVER open the override valve when the body is elevated.
8. Perform the maintenance or service procedures.

Lowering the Body

1. PRESS the UP button until the body is not resting on the body props.
2. RAISE the body props and store the handles.
3. Press and hold the DOWN button to lower the body.
4. Release the DOWN button when the body is completely down and resting on the chassis.
5. OPEN the manual override valve – PUSH the knob IN and turn it COUNTER-CLOCKWISE.
6. Make sure the manual override valve is open – PUSH the service hoist UP button. The body will not raise.
7. If any hose clamps were removed to create adequate slack during body raise, then re-install those hose clamps.
8. If equipped with quick disconnects, reattach the quick disconnects.
9. Install the bolts and springs to the chassis mounting brackets.

NOTES:

PROPPING THE BODY OF A SERVICE LIFT (SERVICEABLE EJECT) UNIT

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.

Observe and obey the following DANGER and WARNING notices while you use a service lift to raise the body.

⚠ DANGER

Keep all parts of your body out from underneath the unit's body and away from the cylinders when raising or lowering the body. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body.

⚠ 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.

⚠ DANGER

All cranes, chains and cables used MUST be of adequate lift rating.

⚠ WARNING

Never drive the unit with the body propped.

⚠ WARNING

The extra weight from the refuse or Carry Can is dangerous while you work around the unit with the body raised. The extra weight can make the unit unstable. Serious injury or death or damage to the unit can occur if you do not remove the extra weight. Do not leave refuse or the Carry Can in the body while you lift the body of a service lift unit.

NOTICE

Empty body of all refuse before raising the body with a service lift.

PROPPING THE BODY OF A SERVICE LIFT (SERVICEABLE EJECT) UNIT (CONTINUED)

Factory Body Props

The factory-supplied body props are located on both sides under the body and forward of the rear wheels. Carefully follow the body propping procedures below.

☑ Follow These Steps:

Raising the Body

1. Empty body of all refuse.
2. Make sure that body is on firm, level ground with the Parking Brake engaged and holding and place chocks on the wheels.
3. **Lock-Out/Tag-Out** 57 the unit.
4. Remove the bolts and springs from the chassis mounting brackets. See the figure below.

Figure 65. Removing Bolts and Springs from Chassis Mounting Brackets

Raising the Body (Continued)

5. Disconnect all wire harnesses, hydraulic hoses, and air lines that would prevent the body from raising or be damaged by the body raising.
6. Observe and obey the DANGER labels for an elevated chassis.
7. Connect a chain or cable sling with hooks from the front body chain hook lugs to an overhead crane, truck crane or other lifting device having adequate capacity to safely lift the body. See the figure below.

Figure 66. Front Body Chain Hook Lugs

8. Using the lifting device, slowly lift the body in a controlled manner high enough to lower the factory body props.

PROPPING THE BODY OF A SERVICE LIFT (SERVICEABLE EJECT) UNIT (CONTINUED)

Raising the Body (Continued)

9. RELEASE the prop handles and LOWER the body props. See the figure below.

Figure 67. Release and Lower Factory Body Props

10. Using the lifting device, slowly lower the body in a controlled manner until the body is resting on the prop stands. See the figure below.

Figure 68. Lower Body onto Factory Body Props

11. Perform the maintenance or service procedures.

Lowering the Body

1. Observe and obey the DANGER labels for an elevated chassis.
2. Connect a chain or cable sling with hooks from the front body chain hook lugs (each side) to an overhead crane, truck crane or other lifting device having adequate capacity to safely lift the body.
3. Using the lifting device, slowly lift the body in a controlled manner high enough to raise (store) the factory body props. See the figure to the left.
4. Using the lifting device, slowly lower the body in a controlled manner until it is resting on the chassis frame.
5. With the body completely down and resting on the chassis, remove the cable or chain.
6. Reconnect all wire harnesses, hydraulic hoses, and air lines that were disconnected.
7. Install the bolts and springs to the chassis mounting brackets.

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.

⚠ DANGER

A tailgate is dangerous while you raise or lower it. A prop may fail and cause the tailgate to close suddenly which can result in serious injury or death if you become trapped between the tailgate and the body. Do not walk under or go between the body and the tailgate when the tailgate is in motion, while you prop the tailgate or while the tailgate is propped.

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.

Refer to the figure on the next page and carefully follow the tailgate propping procedures below.

☑ Follow These Steps:

A. How to Use the Tailgate Props

1. Set unit on flat, stable ground, apply the parking brake, and chock the wheels.
2. Make sure the area around the tailgate is clear of all people.
3. UNLOCK the tailgate. Make sure the tailgate unlock flags are down (if equipped).
4. Use the tailgate raise lever or rocker switch in the cab (if equipped) to RAISE the tailgate enough to RELEASE and ROTATE the props so that you can SECURE each prop on its prop pin on each side of the tailgate.
5. LOWER the tailgate until you can SECURE each PROP on its pin.
6. Turn OFF the engine and REMOVE the ignition key.
7. Put the unit in the Lock-Out/Tag-Out mode. Refer to **Lock-Out/Tag-Out Procedure** 57.

PROPPING THE TAILGATE (CONTINUED)

B. How to Store the Tailgate Props

1. When you finish using the props, take the unit out of the Lock-Out/Tag-Out mode, insert the ignition key, and start the engine.
2. RAISE the tailgate enough so that you can REMOVE each prop bar from its pin, then ROTATE each prop so that you can put the props in the stored position.
3. SECURE each prop with a pin.
4. LOWER the tailgate until it is completely CLOSED.
5. LOCK the tailgate.

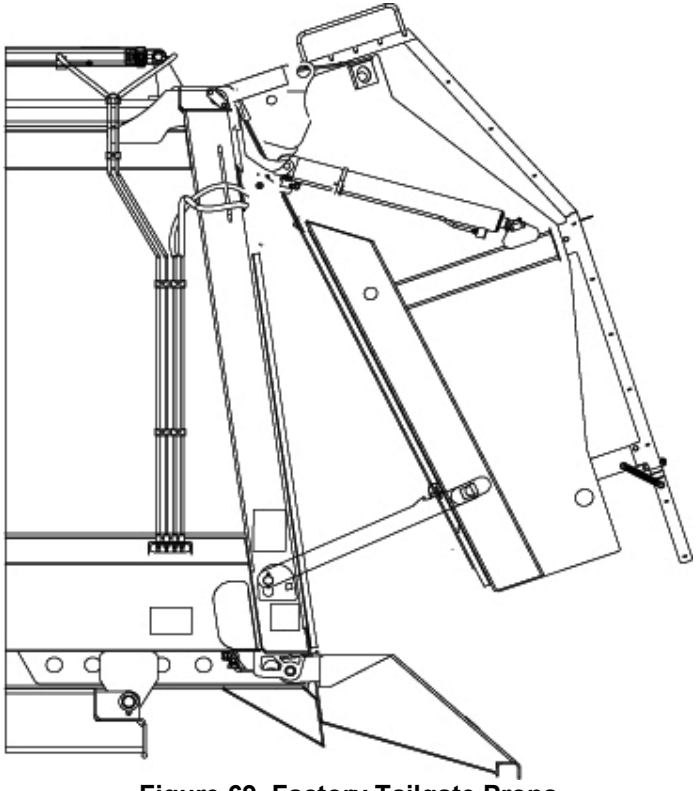


Figure 69. Factory Tailgate Props

SECTION 6
DAILY CHECKLIST

DAILY CHECKLIST

Make sure you perform a daily check of the unit. Make copies of the **Refuse Vehicle Daily Inspection** 106 on 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
Damaged tailgate seal	Replace seal

DAILY CHECKLIST MAINTENANCE ITEMS	
Item	**Required Action**
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 DAILY INSPECTION

DATE: _____/_____/_____

UNIT NO. _____

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

Use a √ 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:

_____

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** 163 and **Lubrication Guide** 167 for additional information and requirements.

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
INSPECT PER APPLICABLE MANUFACTURER MANUAL	
Cab/Drive	
Wheels and Tires	
Tractor and Chassis Electrical	
Chassis	
Engine & Transmission & Fluid Levels	
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 forks and lift arms for damage and wear.	
Inspect pump for leaks.	
Inspect pump for damage or loose hardware.	
Inspect lift arm cylinders, mounts and pins for damage and leaks.	
Inspect decals on forks, lift arms for damage and readability.	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Check forks and lift arms for:	
Play	
Cylinder and hose leaks	
Sufficient lubrication	
Hose damage or wear	
Cracks or other damage to welds	
Loose lift arm clamp hardware	
Inspect condition of cab protector for damage. Remove all refuse on or about the cab protector.	
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	
Sump door is closed and latched.	
Inspect decals on curb side body for damage and readability.	
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 lift arm pad for damage.	
Inspect level of hydraulic oil if tank is mounted on curb side. It must be full. **Add recommended oil as necessary.**	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
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	
Cylinder, hoses and fittings for leaks	
Hoses for wear and damage	
Cylinder for damage	
Loose or missing mounting hardware	
Make sure tailgate is locked	
TAILGATE AND TOP ACCESS DOOR	
Inspect decals on tailgate and underride bumper for damage and readability	
Inspect access ladder for loose rails and steps	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Make sure access ladder steps and rails are clean and safe	
Inspect tailgate seal does not have visible damage	
Make sure top access door is closed	
Top access door components	
Cylinder, hoses and fittings for leaks	
Hoses for wear and damage	
Cylinder for damage	
Loose or missing mounting hardware	
Damage to top door and rails	
Inspect underride bumper for damage and loose components.	
BODY AND CHASSIS STREET SIDE INSPECTION	
Make sure tailgate is locked.	
Inspect tailgate lock components.	
Cylinder, hoses and fittings for leaks	
Hoses for wear and damage	
Cylinder for damage	
Loose or missing mounting hardware	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
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.	
Inspect decals on body prop for damage and readability.	
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 lift arm pad for damage.	
Inspect level of hydraulic oil if tank is mounted on streetside. It must be full. **Add recommended oil as necessary.**	
Make sure sump door is closed and latched.	
Battery disconnect switch is turned to OFF then:	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
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***	
NOTE: Always test Safety Interlocks WITHOUT a Carry Can installed on the unit.	
Make sure the air tank drain valve is closed.	
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 operates only in neutral.	
Check all cab, body and tailgate lights for proper operation.	
Make sure the backup alarm and light operate.	
Make sure all people not necessary and any hazards are clear of the area and then:	
Pull the System Power knob – the switch's red light is ON.	
Press the packer extend button and before the packer fully extends:	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Press the packer retract button.	
The packer should stop extending.	
Press the packer extend button and before the packer fully extends:	
Press the packer retract button.	
The packer should stop extending.	
Press the packer extend button and before the packer fully extends.	
Press the packer retract button and fully retract the packer.	
Open the side access door.	
The side access door light is ON.	
Try to start the packer with AutoPack - it should not operate.	
Close and latch the side access door – the side door light is OFF.	
Set the lift arms and forks so that the forks cross shaft is over the cab (not in transit position) - the arms above transit light is ON.	
Start an AutoPack mode – the packer should not operate.	
Return the lift arms and forks to the transit position. The lift arms above transit light is OFF.	
If the body does not have refuse:	
Unlock the tailgate and open the tailgate.	
The tailgate light and alarm are ON with the tailgate open.	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Set the tailgate props.	
Inspect the tailgate seal for damage.	
Inspect the packer tracks and hopper floor for excessive wear or damage. Report wear and damage.	
Remove the tailgate props and raise the tailgate completely.	
Close the tailgate.	
The tailgate open light is OFF and the alarm is OFF.	
Lock the tailgate.	
Open the top access door. The door open light is ON.	
Close the top access door. The door open light is OFF.	
Test Arms Up Interlock – Start with arms fully lowered for each test.	
Fully extend packer.	
Raise Arms.	
Arms should stop at top of windshield.	
Close Top Door (If Equipped).	
Raise arms.	
Arms should stop at top of windshield.	
Raise Cab Protector (If Equipped).	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
Raise arms.	
Arms should stop at top of windshield.	
Test Arms Down Interlock – Start with arms fully raised for each test.	
Fully Raise Forks.	
Lower arms.	
Arms should not move.	
Close Top Door (If Equipped).	
Lower arms.	
Arms should not move.	
Raise Cab Protector (If Equipped).	
Lower arms.	
Arms should not move.	
Test Top Door Interlock (If Equipped).	
Close Top Door.	
Packer extend not allowed (we will allow packer retract with top door closed).	
For Residential units, test AutoLift functionality.	
For units equipped with a Curotto-Can, test Curotto-Can in-cab controls and (if equipped) outside controls.	

CHECKS AND INSPECTIONS	INSPECTION RESULTS CODE (√/R/N)
IN-CAB INSPECTION	
Inspect all in-cab decals for damage and readability.	
Make sure the following lights are OFF:	
Tailgate Open	
Top Door Open	
Arms Above Transit	
Make sure the following lights are OFF:	
Filter Bypass	
If 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

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

BEFORE STARTING A ROUTE

Before you start a route, do the following:

- ☐ Perform an inspection of the unit with the **Daily Checklist** 103.
- ☐ Check the **Hydraulic Oil Level** 122.
- ☐ Cycle all **Hydraulic Functions** 123.
- ☐ If equipped, close the **Side Access Door** 123.
- ☐ If equipped, close the **Sliding Top Door (Hopper Cover)** 124.
- ☐ Check the **"In-transit" Settings** 125.

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** 103. Make sure you complete the inspections on the checklist and you make all entries, including your signature.

NOTES:

COLD WEATHER WARM-UP PROCEDURE

Good performance of the electro-proportional and load sensing system on your Half/Pack (featuring Odyssey Controls) unit is highly dependent on the hydraulic fluid condition. Oil viscosity plays an important role.

Oil viscosity will vary greatly with temperature. The colder it gets, the higher the viscosity is (thicker the oil).

When ambient air temperature is cold (below 32° 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.

Please be aware that reduced performance is to be expected with the oil temperature between 50°F to 90°F. Avoid running the engine at higher RPM, when possible, if the oil is below 50°F. Functions may run slower and respond differently. Using Heil ISO 32 oil is a must.

We recommend no pump operation with the hydraulic fluid below -35°F and no start below -40°F.

⚠ WARNING

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 twenty (20) cycles while the engine idles. See the Operator's Manual for operation instructions.
6. Make sure the oil temperature on the in-cab display (or sight gauge) is above 50°F. If not, repeat step 5.
7. Operate all functions 5 times and verify functions work properly. Monitor the oil temperature again. If temperature has cooled down below 50°F repeat step 5.
8. Check for fluid leaks. Repair if necessary.

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
- Tailgate and Body – fully down and locked
- Packer Panel – at the front of the body
- Forks – fully tucked
- Lift Arms – fully raised
- Top Door – fully open

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.

☑ Follow These Steps:

1. Operate the lift arm, fork, top door (if equipped), packing panel, body and tailgate functions two or three times each. See **Section 4** 129 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

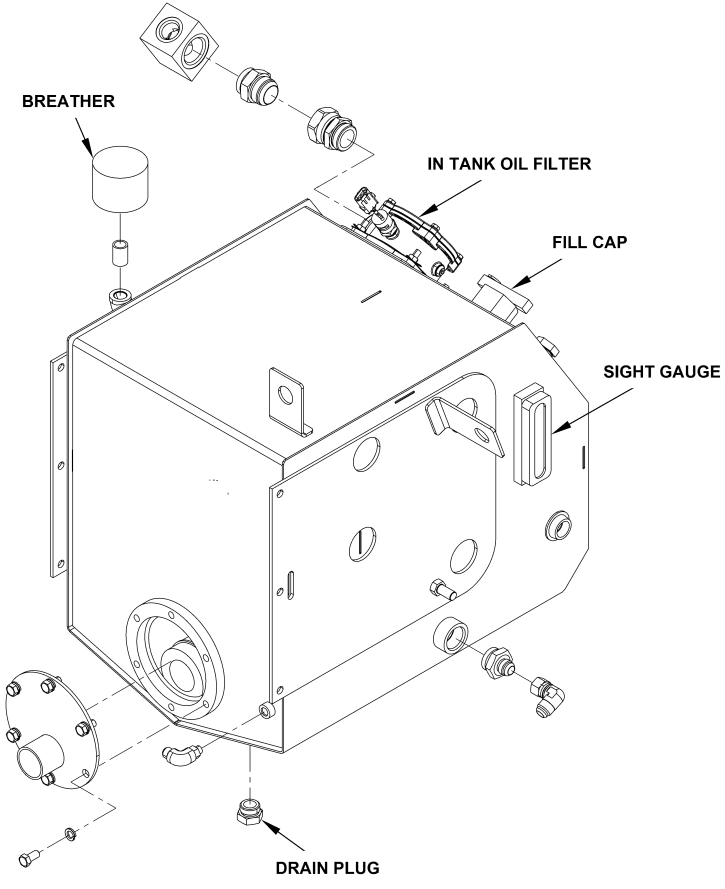


Figure 70. Hydraulic Oil Tank with Sight Gauge

CYCLE ALL HYDRAULIC FUNCTIONS

Check the operation of all hydraulic controls on the unit. See **Controls, Switches, and Indicator Lights** 61 for proper operation of controls.

☑ Follow These Steps:

1. Top Door Cycle (if Equipped)

   OPEN and CLOSE the Top Door several times.

2. Lift Arm and Fork Cycles

   Do several LOAD and UNLOAD cycles.

3. Packing Cycle

   Perform several EXTEND and RETRACT cycles of the packer panel.

4. Tailgate Raise Cycle

   If the body is empty, do several tailgate RAISE and LOWER cycles, DO NOT Raise the tailgate with refuse in the body.

5. Tailgate Lock Cycle

   Do several tailgate LOCK and UNLOCK cycles.

6. AutoLift™ Cycle (standard on Residential Odyssey and if equipped on Residential Half/Pack® Units)

   Do an AutoLift cycle to ensure that the Carry Can is rolling in the correct location and that the interlocks are in place.

CLOSE THE SIDE ACCESS DOOR

A side access door is on the street side of the body. See the figure below. Use this door as the **ONLY** access to the hopper area. **MAKE SURE** the door is closed and latched when you are not in the body.

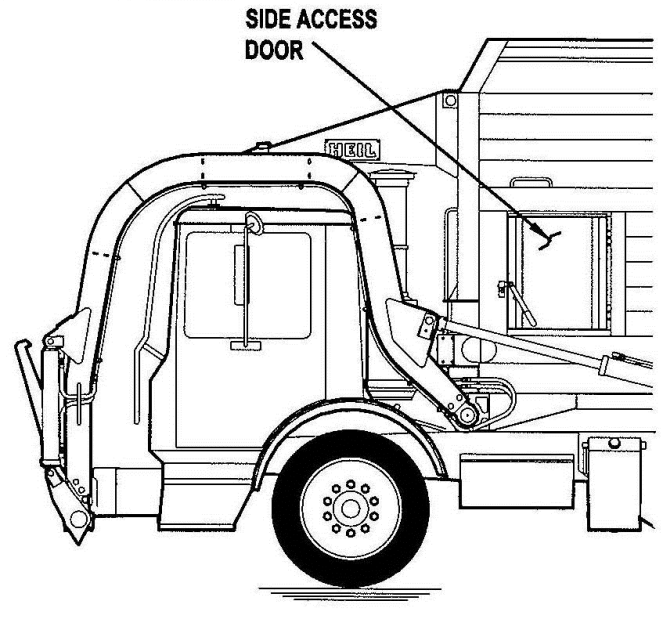


Figure 71. Close the Side Access Door

OPTIONAL TOP DOOR

MAKE SURE you **CLOSE** the Top Door before you go on a route. See the figure to the right. See **Controls, Switches, and Indicator Lights** 61 for proper operation of the controls. Keep the Top Door CLOSED until the first stop on your route, and then OPEN the Top Door. Keep the Top Door CLOSED except when on route picking up refuse.

NOTICE

The Top Door is not designed to be closed while packing the load. You may cause damage to the unit if you operate the packer with the Top Door closed. Never pack the load with the Top Door closed. Do not close the Top Door until you have completed your route or you are ready to empty the load.

When you are on your refuse collection route, leave the Top Door OPEN until the unit is full or you have completed your route and you are ready to empty your load.

For Commercial Odyssey and Commercial Half/Pack® units with a full body or before leaving collection route to empty load, CLOSE the Top Door. A closed Top Door prevents refuse from “flying” out of the body.

For Residential Odyssey Carry Can units with a full body or before leaving collection route to empty load, with the Top Door OPEN, place the Carry Can into the hopper.

For additional information, refer to **Check the Traveling or "In-transit" Position** 125.

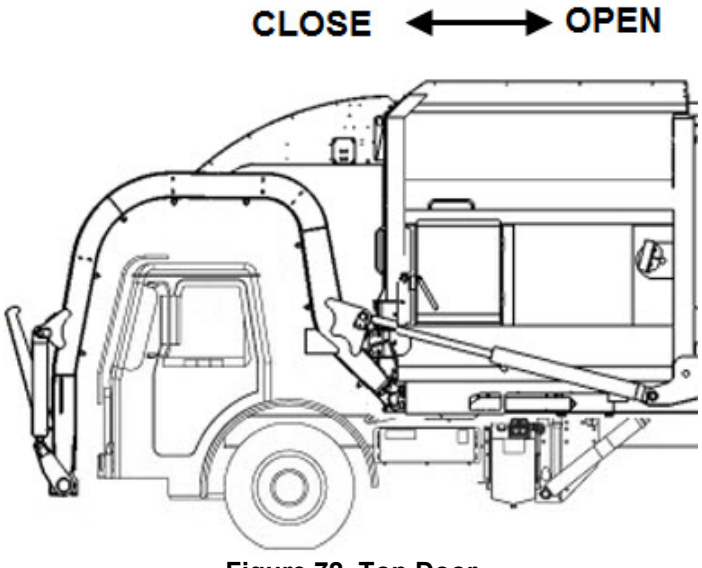


Figure 72. Top Door

CHECK THE TRAVELING OR "IN-TRANSIT" POSITION

Before you travel to and from the landfill, transfer station, or recycle center make sure the unit is in the "in-transit" position as follows (see the figure to the right):

Commercial Half/Pack (featuring Odyssey Controls) Units:

- The Body is fully LOWERED.
- The Tailgate is DOWN and LOCKED.
- The Top Door is CLOSED.
- The Packer Panel is:
  - For an empty unit, at the front of body/hopper.
  - For a unit with refuse in the body, up tight against refuse.
- SET the fork crosshaft in a position slightly ABOVE the cab windshield.

Residential Half/Pack (featuring Odyssey Controls) Units:

- The Body is fully LOWERED.
- The Tailgate is DOWN and LOCKED.
- The Packer Panel is at the front of the body.
- With the Top Door OPEN, put the Carry Can into the hopper.

Commercial and Residential Units:

- The Pump Switch is OFF.
- The PTO is DISENGAGED.
- The Mirrors are properly adjusted and clean.
- The Side Access Door is CLOSED and LATCHED.
- All outside lights operate properly.

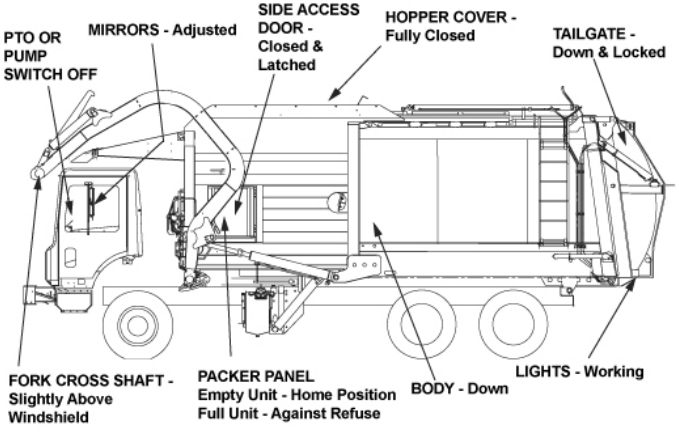


Figure 73. In-Transit Position without Carry Can

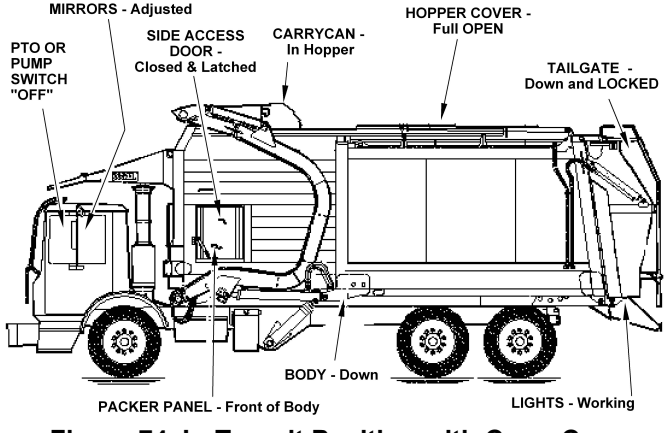


Figure 74. In-Transit Position with Carry Can

TILTING THE CHASSIS CAB

NOTICE

Do not tilt the cab before you raise the hinged cab protector. The hinged cab protector in its normal position is in the way of tilting the cab for service or maintenance. You may cause damage to the unit if you tilt the cab with the hinged cab protector in its normal position. Always move the hinged cab protector to the UP position before you tilt the cab.

BEFORE you tilt the chassis cab to get at the engine and related parts, **MAKE SURE** you:

- On standard Half/Pack Freedom (featuring Odyssey Controls) and Half/Pack Sierra (featuring Odyssey Controls) units, the cab protector is raised by air cylinders with a switch on the body.
- For standard Half/Pack (featuring Odyssey Controls) units, use a ladder to access the turnbuckles. Make sure you keep two hands and a foot or one hand and two feet firmly in place at all times.
- LOOSEN the cab protector turnbuckles and SWING the hinged cab protector extension up and out of the way to allow clearance of the tilting chassis cab.
- TIGHTEN the turnbuckles.

TILTING THE CHASSIS CAB (CONTINUED)

- AFTER you tilt the cab back to its normal position, LOOSEN the turnbuckles, LOWER the cab protector and TIGHTEN the turnbuckles.

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.

NOTES:

NOTES:

SECTION 8
ON-ROUTE OPERATION PROCEDURES

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
- Washout system
- Setting up the unit for the landfill or transfer station

DRIVING TO PICK-UP LOCATIONS

Whenever you drive the Half/Pack® (featuring Odyssey Controls) 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 is fully LOWERED.
2. The Tailgate is DOWN and LOCKED.
3. Put the arms and forks in the TRANSIT POSITION. See **Check the Traveling or "In-transit" Position** 125.
4. The Top Door (Hopper Cover) is:
   - For a Commercial unit before it is on-route – CLOSED
   - For an on-route unit – OPEN
   - For a full Commercial unit or a not on-route unit – CLOSED
   - The arms will interlock if the Top Door (if equipped) is not fully open.
5. The packer panel is:
   - For an EMPTY Commercial Unit – FULLY retracted position (front of body/hopper)
   - For a FULL Commercial Unit – up tight against refuse
6. The Pump Switch is OFF.
7. The PTO is DISENGAGED (manual transmissions).
8. The Mirrors are properly adjusted and clean.
9. The Side Access Door and Sump Door (if equipped) is CLOSED and LATCHED.
10. All Outside Lights operate properly.

COMMERCIAL LOADING/UNLOADING SEQUENCE QUICK REFERENCE

The following six steps show the basic procedures to pick up a commercial refuse container, dump it into the hopper, set the container back down and compact the load. See the figure below.

Use these quick-reference illustrations for overview purposes only. Each operator must be properly trained and qualified, and must read and understand this entire section of the manual before the operator actually operates the or Commercial Half/Pack (featuring Odyssey Controls) unit.

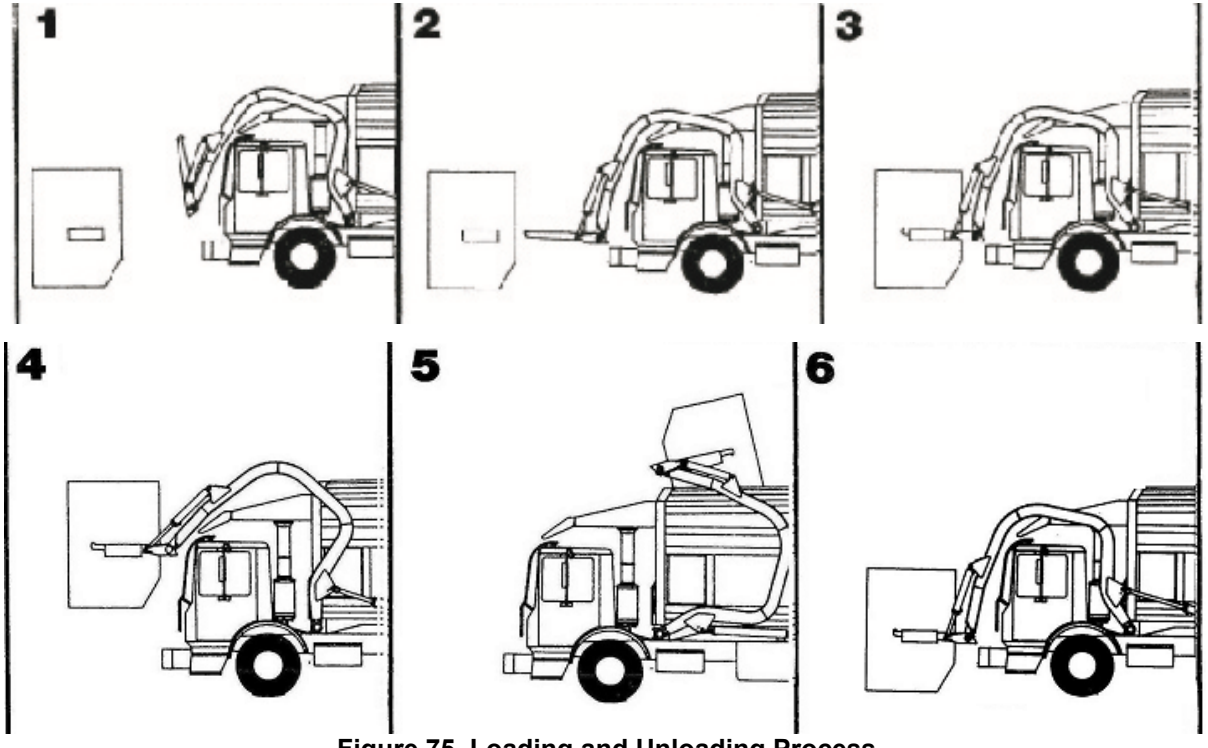


Figure 75. Loading and Unloading Process

COMMERCIAL LIFTING AND LOADING REFUSE

Use the following procedure at each stop along the route to load refuse into the unit. Observe all **DANGER and WARNING notices**.

☑ Follow These Steps:

1. Approach the container squarely and stop a few feet from the container. If the hydraulic system is not activated, pull the System Power switch UP to the ON position.
2. Make sure the Side Door is CLOSED.

NOTICE

Loading refuse with the top door (hopper cover) CLOSED will cause damage to the unit. Make sure the hopper cover is OPEN before you load refuse.

3. MAKE SURE the Top Door is OPEN.
4. Use the lift arm control and LOWER the arms to the same height as the pick-up sleeves on the container then RELEASE the control. See the figure on the next page.
5. Use the fork control and ROTATE the forks to a horizontal position then RELEASE the control.

Refer to **Controls, Switches, and Indicator Lights** 61 for more information.

NOTES:

COMMERCIAL LIFTING AND LOADING REFUSE (CONTINUED)

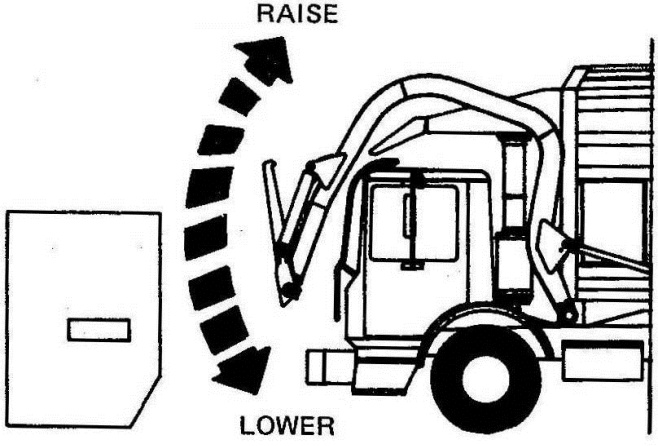


Figure 76. Lower Lift Arms

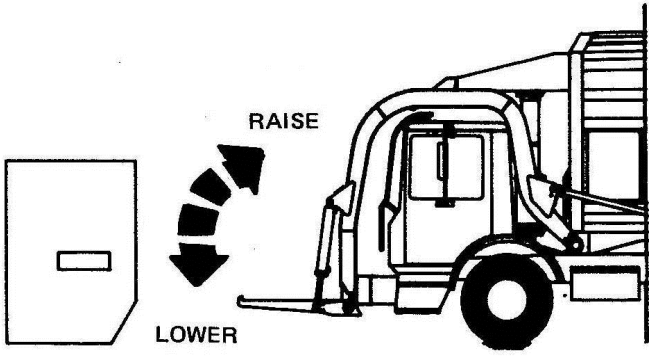


Figure 77. Rotate Forks to Horizontal Position

6. Move the unit forward SLOWLY until both forks are in the container pick-up sleeves. After the forks are fully inserted, use the arm control and cradle the container on the forks and arms. Release the control. See the figure below.

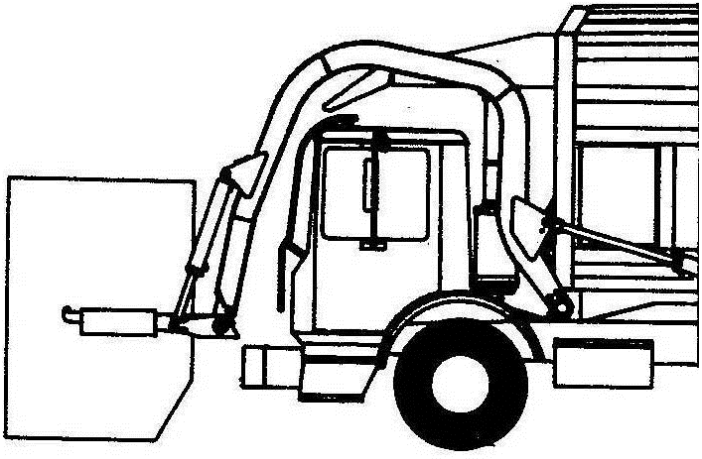


Figure 78. Fully Insert Forks into Container Pick-up Sleeves

⚠ 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 **Tables 1 and 2. Overhead Clearances** 27. If the unit does make contact with overhead electric lines do not touch metal in the cab. Stay in the unit until help arrives.

COMMERCIAL LIFTING AND LOADING REFUSE (CONTINUED)

NOTICE

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

7. Adjust the container spot mirror for best overhead vision of the hopper cover area while you raise container.

⚠ WARNING

Be careful when raising an over-filled container or a container with refuse protruding from the top or side. This may cause the refuse to fall while lifting or dumping the refuse. Falling refuse is dangerous and may cause injury or death or damage to the unit. Keep your hands and arms inside the cab and clear the area of all unnecessary people while you raise a container.

NOTICE

If the arms will not raise the container, the container may exceed the lifting capacity of the unit. Contact your supervisor for instructions before you try to lift the container again. You may cause damage to the unit.

8. If the unit does not have the AutoLevel™ feature, raise the container, alternating operation of the lift arm and fork controls to keep container level to the ground while you raise the lift arms over the cab. ONLY trained and experienced operators should level the forks during an ARM RAISE operation. See the figure below.

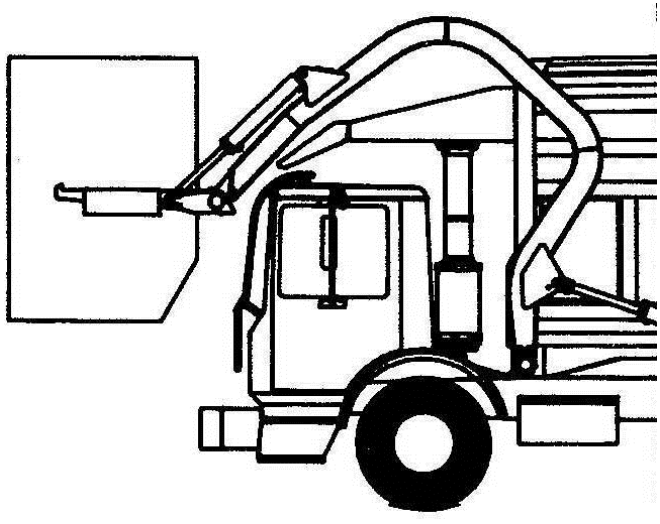


Figure 79. Raise Container with Arm and Fork Controls

9. When the lift arms make contact with the arm stops, use the fork control lever and rotate the container to its full dump position. See the figure on the next page.

COMMERCIAL LIFTING AND LOADING REFUSE (CONTINUED)

Figure 80. Dump Container into Hopper

10. Release the lever and allow all refuse to drop out of the container.
11. When the container is empty, use the fork control lever and rotate the container to its full vertical position. Release the lever.
12. Set the container gently on the ground with partial movements of the arm control lever. See the figure to the right.

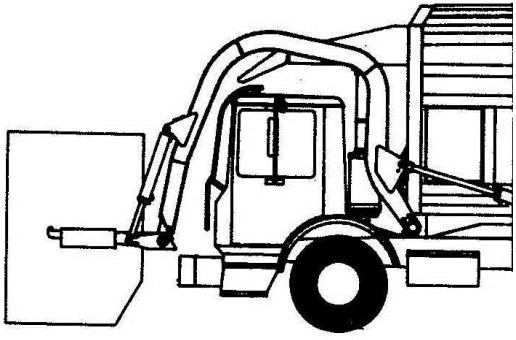


Figure 81. Rotate Container Back before Lowering

Manual Packer Override

NOTICE

Operation of the packer while you dump refuse in the hopper can cause damage to the unit. Do not use the packer override switch for the manual packer when you dump the refuse from the container into the hopper. Use the packer override switch only when the refuse container is not in the hopper.

Use the manual override when you need to pack the refuse while the lift arms are raised.

1. MAKE SURE the refuse container IS NOT in the hopper, then PRESS the Manual Override Switch to ON.
2. Cycle the packer.
3. Move the manual override switch to OFF, then dump more refuse into the hopper.

COMPACTING THE LOAD

When there is an appropriate amount of refuse in the hopper, use the packer panel and compact the load into the body of the unit. See the figure below.

Many factors affect how often you need to compact the load, including the experience of the operator.

See **Achieving Packing Payloads** 139 for helpful information and guidelines to be followed.

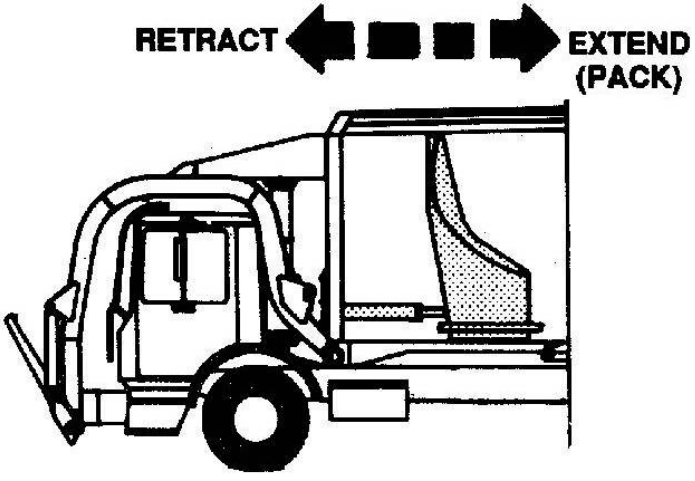


Figure 82. Compact the Load

AUTOPACK™

Use the following procedure to compact the load with the unit's AutoPack function.

NOTICE

To attain maximum efficiency in loading and unloading, the unit should have a packing cycle time (empty body) between 18 and 23 seconds.

☑ Follow These Steps:

1. The lift arms must be lowered or in the transit position.
2. If the hydraulic system is not activated, turn the system ON.
3. PRESS and RELEASE the start/extend button of the packing mechanism.

   The panel will extend approximately 81" to move the refuse into the body and clear the hopper and automatically return to the front of the hopper.
4. When the auto-cycle is completed, the packer panel will be in position for the next load.
5. If you want to do another cycle, PRESS and RELEASE the start/extend button again.

NOTES:

PACKING ON-THE-MOVE

Heil Odyssey 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.

Achieving Packing Payloads

Read this section for advice and tips on how to pack the most efficient loads with your Odyssey 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, 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.

The Odyssey is designed to pack material into the body with a relatively short packer panel movement – “half pack.” The packing stroke of the multi-stage cylinder in eject models is set to extend on the first stage. (Dump models have single stage packing cylinders.) The first stage of the cylinder develops the most force and thus packs the densest load. The "extra” stages are used to eject the load at the landfill or transfer station.

BASIC PACKING TECHNIQUES

Follow these techniques to attain greater efficiency in packing the load in your Odyssey unit:

1. After you load the first two or three bins, move the material from the hopper into the body by cycling the packer panel. Very little packing occurs until the body starts to fill.

If you are loading small bins (2–3 cubic yard capacity), you can empty two bins in the hopper at this stage and effectively move the refuse back into the body. If you are loading large bins (8–10 yard), you must cycle the packer after you empty every bin.

2. 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 is retracted. This is normal. Cycle the panel again to move this material back into the body.
3. The packer panel is shaped with a vertical lower surface and a sloping, curved top portion. See the figure on the next page. You can see this by looking into the back of the body with the tailgate up.

While the curved portion does some packing, you should think of this section as a "spill shield". The most effective packing is done by the vertical lower portion of the panel.

BASIC PACKING TECHNIQUES (CONTINUED)

The lower portion of the packer panel travels further into the body on the packing stroke. With the shape of the panel, it is easy to see how material can fall back into the hopper as the panel retracts. Again, this is normal. Cycle the panel again to move this material back into the body.

4. For approximately the first half of the load, cycle the packer panel AT LEAST TWO TIMES after you empty each bin to effectively clear the hopper of the fall-back material. Larger bins (8–10 yards) may require additional packer cycles.
5. **VERY IMPORTANT.** After you load a bin into the hopper, it is important to watch the packer panel as it moves rearward and compacts the material. Watch for material that may be 'boiling up' or about to spill over the top of the packer panel. When you see this happening, reverse the packer panel all the way using the auto retract and allow the material to "fall back" into the hopper. Then start the packer cycle again.

In some cases you may have to cycle the panel three or four times to clear the hopper of material that falls back into the hopper.

Material that "boils up" can get jammed between the top of the packer panel and body roof and cause extensive damage to your unit. It can also spill over the top and get trapped behind the packer blade which will require you to remove it at the landfill. The larger capacity bin you unload, the more likely this is to happen.

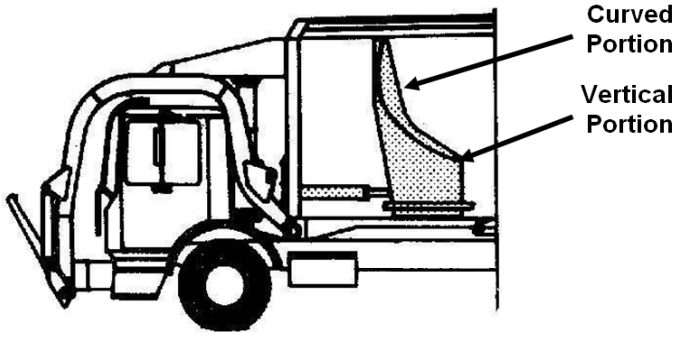


Figure 83. Packer Panel Surfaces

As the body fills, it is more and more important to watch for the 'boiling up' of material. With large bins, it may be necessary to cycle the packer a foot or two, reverse it, cycle it a few feet, reverse it, partially cycle it, reverse it, etc., until the material is effectively packed.

As the body fills, even if you don't see the material "boiling up", it is good practice to cycle the packer two or three times to repack any fall back material which might occur.

When the body begins to fill, a condition called "bridging" can occur. Bridging is the build-up of compacted material in the bottom of the body. The material at the top of the body may still be relatively un-compacted. See the figure on the next page.

BASIC PACKING TECHNIQUES (CONTINUED)

When bridging occurs, the packer panel will not complete its automatic stroke cycle. That is, the panel may stop before it automatically reverses. In many cases, you do not have a full load at this time.

6. To break the bridge, cycle the panel repeatedly until it completes a full cycle. See the figure to the right. This will usually break the bridge and allow you to load considerably more material. It is important to attempt to break the bridge as soon as the panel cannot complete the automatic cycle.

This helps to pack any fall back material and compact more effectively.

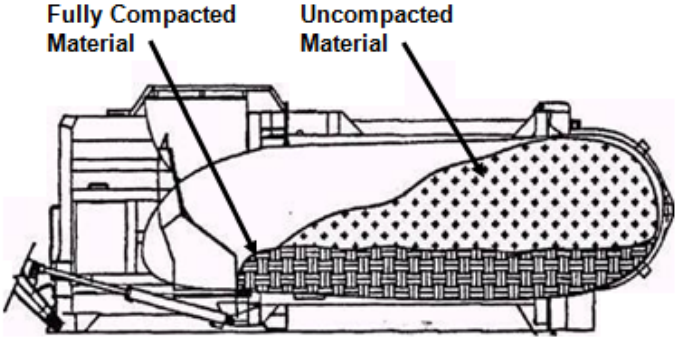


Figure 84. Occurance of "Bridging" Condition

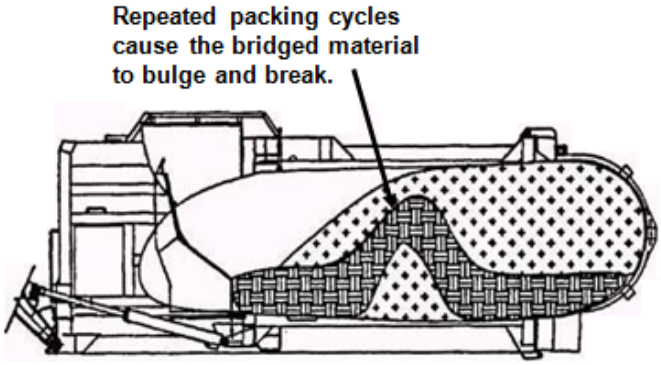


Figure 85. Breaking a "Bridge"

7. As the body fills, it is very important that you cycle the packer more often to keep the hopper clear.

With experience on a given route, you will soon develop a feel for the load and material to determine when you have a full load or if bridging is occurring. You can help develop this skill by observing the number of bins loaded, noting how full the bins are and the type of material in the bins.

8. 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.

BASIC PACKING TECHNIQUES (CONTINUED)

As the body gets very full, the material in the hopper is more likely to “boil up” as you pack it. You will have to decide at what point loading another bin before you go to the landfill is worth the additional packer cycling that will be required to pack the material. It has been observed that some operators load one or two smaller bins (2 to 3 yard size) at this point to make packing easier. Again, if the route permits, select heavier, wet bins to load after the smaller bins, as this can significantly add to the payload capacity.

NOTICE

Packing the load with the hopper cover closed can cause damage to the unit. Keep the hopper cover open until you have completed your route or are to ready drive to the landfill or transport station.

The top door is not designed to assist in packing. It is a closure for traveling long distances, and it must be kept open throughout the loading and packing process.

A key operation to get effective payloads is pack, pack, pack and pack again – especially as the body fills. Always watch for material “boiling up” to prevent spillage over the packer panel and possible jamming of the packer panel.

All units have a standard packer override switch. When you MOVE the Packer Override switch to ON, it lets you manually operate the packer panel with the packer extend and retract buttons when the container is in the hopper.

Under certain circumstances, you can use this feature very effectively. For instance, there may not be enough room in the hopper to empty an overfull, very large bin into the hopper or if the hopper has not been totally cleared before you empty the bin.

Normally, the bin must be lowered to use the AutoPack™ button. Lowering a partly empty bin can spill material on the cab protector, etc.

An alternate procedure is to rotate the forks and level the bin to make sure it is out of the hopper, then use the override switch and operate in the manual packer mode to partially pack the material already in the hopper creating enough room to load more refuse.

Watch the top of the packer panel and make sure material does not fall from the bin and go behind the panel or the material in the hopper does not “boil over” the top. Cycle the packer panel back and forth with the Extend and Retract push buttons to move material rearward and make more room in the hopper.

When you have made enough room and the packer is fully retracted, you can try to empty the bin again. Make sure that you have made enough room to prevent fouling of bin lids. Another caution is that the bin can be “kicked off” the forks if the bin lids hit material already in the hopper or the packer panel if it is not fully retracted.

BASIC PACKING TECHNIQUES (CONTINUED)

NOTICE

Remember the machine has been designed to pack full loads as a "Half Pack".

NOTICE

The current production Heil Half/Pack® and Odyssey units have a timer in the Cortex Controller™ that individually times the duration of the packer extend and packer retract cycle. If a pack cycle is more than 24 seconds, the packer panel will return to the FULLY RETRACTED POSITION and the InSight™ Diagnostic Display will display a warning that the AutoPack™ has timed out and will beep.

NOTES:

SUMMARY OF PACKING TECHNIQUES

1. With the first half of the load, cycle the packer panel twice for each bin loaded. When loading large bins (8–10 yards) a third pack may be necessary.
2. Always watch the packer panel for material “boiling up” which could cause jamming or spillage. If this occurs, reverse the panel all the way and pack again. Repeat as necessary.
3. As the body fills, you may need to perform additional packing cycles to clear the “fall-back” material and effectively clear the hopper.
4. If “bridging” occurs, the packer will not automatically complete its cycle. Repeatedly cycle the packer manually to break the bridge. When the automatic cycle returns, you can load more bins. By breaking the bridging material, you can significantly increase payloads.
5. As the body fills, pack more often to keep the hopper clear of fall back material and pack more effectively.
6. The key to achieving effective payloads is pack, pack, pack!
7. Always operate your machine safely and wisely.

LEAVING THE ROUTE FOR THE LANDFILL/TRANSFER STATION/RECYCLE CENTER

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

1. The Body is fully LOWERED.
2. The Tailgate is DOWN and LOCKED.
3. Put the arms and forks in the TRANSIT POSITION. See **Check the Traveling or "In-transit" Position** 125.
4. The Top Door (Hopper Cover) is:
   - For a Commercial unit before it is on-route – CLOSED
   - For a Residential unit before it is on-route – OPEN with Carry Can in hopper
   - For an on-route unit – OPEN
   - For a FULL Commercial unit or a not on-route unit – CLOSED
   - For a FULL Residential unit or a not on-route unit – OPEN with Carry Can in hopper
   - The arms will interlock if the Top Door (if equipped) is not fully open
5. The packer panel is:
   - For an EMPTY Commercial Unit – FULLY retracted position (front of body/hopper)
   - For a FULL Commercial Unit – up tight against refuse
   - For an EMPTY Residential Unit – FULLY retracted position (front of body/hopper)
   - For a full Residential Unit – up tight against refuse
6. The Pump Switch is OFF.
7. The PTO is DISENGAGED (manual transmissions).
8. The Mirrors are properly adjusted and clean.
9. The Side Access Door and Sump Door (if equipped) is CLOSED and LATCHED.
10. All Outside Lights operate properly.

NOTES:

SECTION 9
LANDFILL/TRANSFER STATION/ RECYCLE CENTER PROCEDURES

PREVIEW

Read this section to learn about:

- Setup conditions to eject the refuse
- Unloading the refuse
- Using the sump and (optional) washout system
- Preparing the unit to return to route

SETTING UP THE UNIT FOR EJECTING THE REFUSE

After you position the unit on firm and level ground at the landfill in preparation for ejecting the refuse, follow this procedure.

☑ Follow These Steps:

1. Shift the transmission to NEUTRAL.
2. APPLY the parking brake and make sure it is holds.
3. For manual transmission, engage the PTO and MOVE the Pump Switch to ON. For automatic transmissions just MOVE the pump switch to ON.

Unlocking and Raising the Tailgate

Unlocking the Tailgate

NOTICE

The tailgate system restricts the tailgate from unlocking or opening when the unit is moving in excess of 5mph.

⚠ 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 tailgate. Refer to **Tables 1 and 2. Overhead Clearances** 27. If the unit does make contact with overhead electric lines do not touch metal in the cab. Stay in the unit until help arrives.

Heil's patented **Shur-Lock™** system uses tailgate lock cylinders to UNLOCK the tailgate before you RAISE the tailgate and to LOCK the tailgate after you LOWER the tailgate.

☑ Follow These Steps:

1. MOVE the tailgate electric control switch to the UNLATCH position.
2. RELEASE the tailgate electric toggle switch.
3. MOVE the tailgate raise electric toggle switch to RAISE and HOLD the toggle switch until the tailgate is COMPLETELY raised, which is 30º above the body. See the figure to the below.
4. RELEASE the switch.

NOTICE

The tailgate OPEN light turns ON and the in-cab alarm will sound to indicate the tailgate is raised.

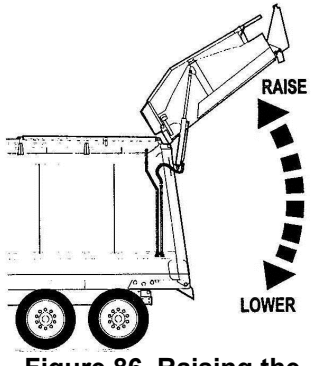


Figure 86. Raising the Tailgate

UNLOADING REFUSE

A. Commercial Half/Pack (featuring Odyssey Controls) Eject and Service Hoist Models

1. Set the unit in position for ejecting the refuse.
2. UNLOCK and RAISE the tailgate.
3. EJECT (remove) the refuse by fully extending the eject panel.
4. RETRACT the ejector after you unload the refuse.
5. Perform **Prop the Tailgate and Clean and Inspect the Tailgate Seal** 151 procedure on the next page.

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 unit.

B. Residential Half/Pack (featuring Odyssey Controls) Eject and Service Hoist Models

NOTICE

A Carry Can in the hopper while you EXTEND the packer can cause damage to the unit. Do not operate the packer before you lower the Carry Can below the cab windshield. Remove the Carry Can from the hopper and lower it to a position below the cab windshield.

B. Residential Half/Pack and Residential Half/P)ack (featuring Odyssey Controls) Eject and Service Hoist Models (Continued)

1. Set the unit in position for ejecting the refuse.
2. Use the joystick or 2-lever control and LOWER the forks with the Carry Can BELOW the cab windshield.
3. EJECT (remove) the refuse by fully extending the eject panel.
4. RETRACT the ejector after you unload the refuse.
5. Perform **Prop the Tailgate and Clean and Inspect the Tailgate Seal** 151 procedure on the next page.

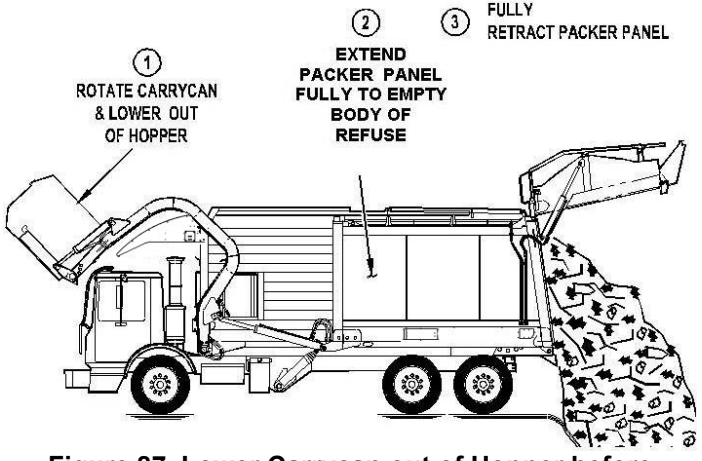


Figure 87. Lower Carrycan out of Hopper before Ejecting the Refuse

Clean and Inspect the Tailgate Seal (Continued)

⚠ 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 people before you lower the tailgate.

1. PUSH the TAILGATE RAISE/LOWER switch to the RAISE position and RAISE the tailgate sufficiently to rotate the props out of the prop pockets.
2. STORE the tailgate props.
3. PRESS and HOLD the TAILGATE RAISE/LOWER switch to the LOWER position and fully LOWER the tailgate, then RELEASE the switch.

Lock the Tailgate

You **MUST LOCK** the tailgate after you lower it.

1. MOVE the tailgate lock electric toggle switch to the LATCH position.
2. HOLD the switch until both sides of the tailgate locked indicators are UP to indicate the tailgate is locked, then RELEASE the switch.

CLEAN BEHIND THE PACKER PANEL

After you remove refuse from the body at the landfill or transfer station, REMOVE refuse and other materials that may be behind the packer panel BEFORE you leave the landfill or transfer station.

⚠ DANGER

Place the unit in Lock-Out/Tag-Out mode before **Cleaning Behind the Packer Panel** 151. Refer to the **Lock-Out/Tag-Out Procedure** 57. Turn the ignition key to the OFF position and remove the ignition key.

1. PRESS and RELEASE the PACKER EXTEND switch and EXTEND the packer panel FULLY to the rear of the hopper area.
2. For Residential units, use the joystick or 2-lever controls and LOWER the arms and forks to the full DOWN position.

   For Commercial units, use the joystick or 2-lever controls and RAISE the arms and forks to the full UP position.
3. PRESS and RELEASE the pump switch to turn the pump OFF.
4. Place the unit in Lock-Out/Tag-Out mode. Refer to the **Lock-Out/Tag-Out Procedure** 57. Turn the ignition key to the OFF position and remove the ignition key.
5. OPEN the access door and clean behind the packer panel. You can push refuse into the sump and then remove the refuse through the sump doors. Be careful and do not cause damage to the packer cylinder rods by standing on them or hitting them with the cleanout tool. A plastic cleanout shovel is recommended and is offered by Heil.

CLEAN BEHIND THE PACKER PANEL (CONTINUED)

6. INSPECT the packer panels and hopper floor for excessive wear or possible damage. If there is excessive wear or other damage, report the wear or damage to your supervisor and get the damage repaired or parts replaced as soon as possible.
7. Exit the body, close and latch the side access door, close and latch the sump door(s).
8. Start the vehicle's engine engage the PTO (if equipped) then PULL the System Power switch UP and PRESS and RELEASE the PUMP ON button.
9. PRESS and RELEASE the packer retract switch and retract the packer panel fully to the front of the body to the FULLY RETRACTED POSITION.
10. MAKE SURE the packer panel is at the FULLY RETRACTED POSITION.
11. Use the packer switches and do one more cycle of extend and retract. Make sure the packer travels fully forward during the extend operation and travels fully to the FULLY RETRACTED POSITION during the retract operation.
12. CLOSE and LATCH the access door.

REMOVE REFUSE FROM THE ENGINE AND EXHAUST AREAS

⚠ WARNING

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

SUMP AND WASHOUT SYSTEMS

Sump Compartment

A sump compartment with a door is on both sides of the FULLY RETRACTED POSITION of the unit.

The sump compartment is below the hopper area and collects liquids that drain out of the collected and compacted refuse that is inside the unit body. See the figures on the next page.

You can open the door and clean out the sump compartment. Keep the sump doors closed at all times except when you clean out the compartment.

SUMP AND WASHOUT SYSTEMS (CONTINUED)

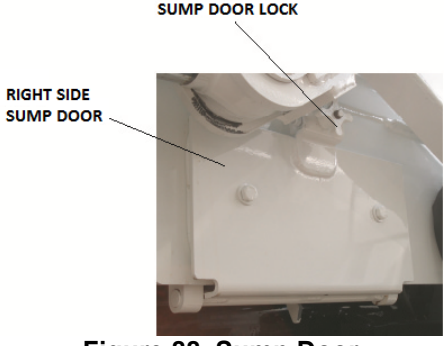


Figure 88. Sump Door

Figure 89. Inside Sump Door

Washout System

If your unit has an optional washout system, use it to clean out the sump area, the hopper or body interior, or the outside of the unit. This is typically done at the end of a work day.

PREPARING TO RETURN TO ROUTE

MAKE SURE before you leave the landfill or transfer station:

1. The body is fully DOWN.
2. On an empty unit, the packer panel is in the FULLY RETRACTED POSITION to the front of the body.
3. If for some reason you leave the transfer station or landfill with refuse in the body, the packer panel is EXTENDED up tight against the refuse.
4. The tailgate is DOWN and LOCKED.
5. For a Standard (Commercial) unit, the Top Door (hopper cover) is closed. For a Residential unit, the optional Top Door is OPEN.
6. The fork cross shaft is in the correct **"In-transit" Position** 125:
   - For a Standard Commercial unit, put the fork cross shaft slightly ABOVE the cab windshield.
   - For a Residential Odyssey unit, put the Carry Can in the hopper.
7. CLOSE and LATCH the side access door.
8. The body lights function and turn ON and OFF properly.
9. You DISENGAGE the PTO (manual transmissions).
10. MOVE the pump switch to OFF.
11. You properly ADJUST and CLEAN the mirrors.
12. MAKE SURE the sump doors are CLOSED.

NOTES:

SECTION 10
END OF DAY PROCEDURES

PREVIEW

Read this section to learn about:

- Parking the Unit
- Washout System
- 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.

Washout System

If the unit has a washout system and you did not use it at the landfill/transfer station, you should clean the body and hopper, unless your employer has a different policy. If your employer's policy is different from this manual, follow their policy.

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 and arm raise 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** 59.
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
CORTEX CONTROLLER™

PREVIEW

Read this section to learn about:

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

CORTEX CONTROLLER™ INSIGHT™ DIAGNOSTIC DISPLAY MESSAGES

When a fault has been set the In-Cab Alarm will sound a number of beeps that indicate which fault has occurred. See **Diagnostic Display Messages** 72, the decal in the cab, and **Residential Half/Pack (featuring Odyssey Controls) Cortex Controller™ Program 109-0351** or **Commercial Half/Pack (featuring Odyssey Controls) Cortex Controller Program 109-0351** in the Service Manual 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.

1. 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. 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.
3. 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

1. 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 11
PREVENTIVE MAINTENANCE CHART

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.
				☑		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		☑				Lubricate as shown on Body Lube Chart.
Body Undercoating					☑	Inspect body undercoating and repair as necessary.
Fork Bearing Block Bolts			☑			Each of the four fork bearing block bolt torques should be 460 Ft-Lbs.
Calibrate Cylinder Sensors					☑	For Odyssey models only, calibrate cylinder sensors. See Service Manual - Cylinder Sensors / Arc Sensor Calibration.
Tailgate Seal Integrity	☑					

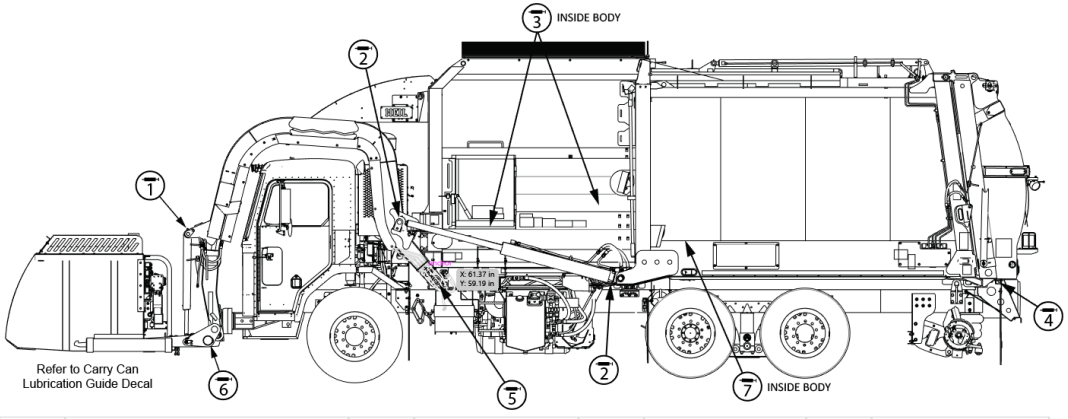
*HOURS OF OPERATION						
COMPONENT/SYSTEM	**8**	**40**	**200**	**1000**	**2000**	**CHECK/SERVICE**
Packer/Ejector Cylinder Preventive Maintenance	☑	☑	☑			See **Packer/Ejector Cylinder Preventive Maintenance** in Service Manual.
Packer/Ejector Panel Bolt-in Cylinder Mount Bolts			☑			Check for tightness. Bolt torques should be 192 Ft-Lbs. (lubricated threads)
*** Daily = 8 hrs. Weekly = 40 hrs. Monthly = 200 hrs. 6 Months = 1000 hrs. Yearly = 2000 hrs.**						

SECTION 12
LUBRICATION GUIDE

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.

HALFPACK (FEATURING ODYSSEY CONTROLS) BODY LUBRICATION GUIDE



REF NO.	DESCRIPTION	QTY.	FREQUENCY	REF NO.	DESCRIPTION	QTY.	FREQUENCY
1	FORK CYLINDERS	4	WEEKLY/EVERY 50 HOURS	5	ARM CROSS SHAFT	4	WEEKLY/EVERY 50 HOURS
2	ARM CYLINDERS	4	WEEKLY/EVERY 50 HOURS	6	FORK CROSS SHAFT	2	WEEKLY/EVERY 50 HOURS
3	PACKER/EJECTOR CYLINDERS	4	WEEKLY/EVERY 50 HOURS	7	PACKER PANEL TRACKS	2	MONTHLY/EVERY 200 HOURS
4	SHUR-LOCK TAILGATE CYLINDER BRACKET	2	WEEKLY/EVERY 50 HOURS				

Use No. 1 pressure gun grease. Clean fittings before applying grease and always pump enough grease to remove old grease. Wipe off excess.

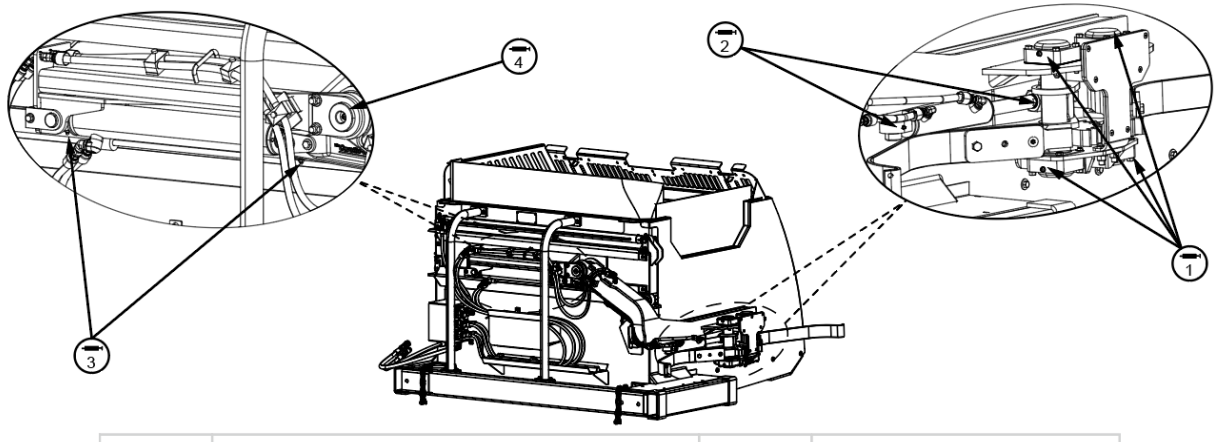
Lubricate moveable mechanical parts without fittings every 60 days with non-detergent engine oil.

212-3352

CUROTTO-CAN STANDARD 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.

CUROTTO-CAN® LUBRICATION GUIDE



REF NO.	DESCRIPTION	QTY.	FREQUENCY
1	BEARING CAPS 4 PLACES	4	WEEKLY/EVERY 40 HOURS
2	GRIPPER CYLINDER	2	WEEKLY/EVERY 40 HOURS
3	LIFT CYLINDER	2	WEEKLY/EVERY 40 HOURS
4	MAIN PIVOT PIN	1	WEEKLY/EVERY 40 HOURS

Use No. 1 pressure gun grease. Clean fittings before applying grease and always pump enough grease to remove old grease. Wipe off excess.

Lubricate moveable mechanical parts without fittings every 60 days with non-detergent engine oil.

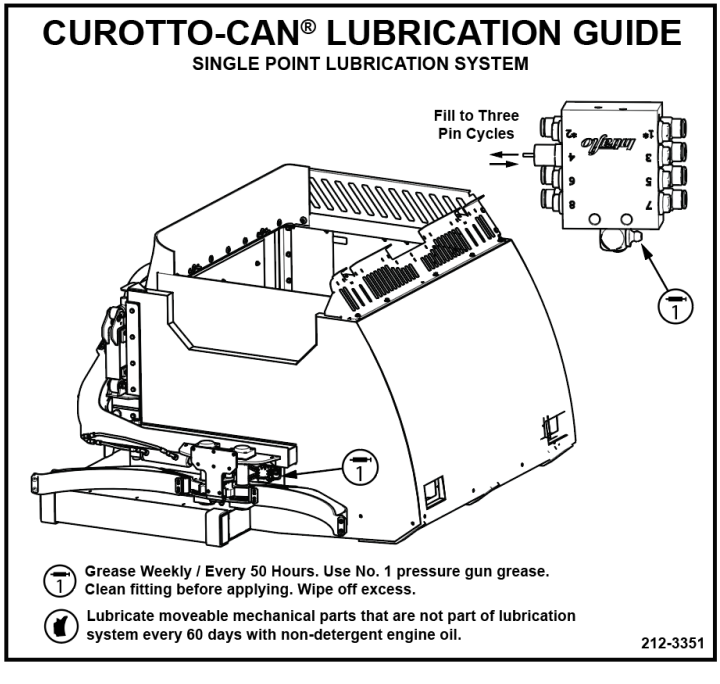
212-3412

CUROTTO-CAN OPTIONAL SINGLE POINT 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.

For the Single Point Lubrication System:

- Both the grease and the fittings MUST be clean
- There MUST not be any blocked lines or ports due to its series operation. NEVER cap or block any of the lubrication lines as this will block the flow of grease to the entire system. Repair any damaged lines or system components immediately.



SECTION 13
COMPRESSED NATURAL GAS (CNG) OPTION

IMPORTANT SAFETY INFORMATION

NOTICE

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

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

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

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

IMPORTANT SAFETY INFORMATION (CONTINUED)

A. Safety Notices

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

For supplemental information, refer to the following codes:

- United States: NFPA 52, State and Local Regulations
- Canada: CAN/CGA B109, CAN/CSA B108, FMVSS 304

⚠ DANGER

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

⚠ DANGER

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

⚠ DANGER

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

⚠ WARNING

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

IMPORTANT SAFETY INFORMATION (CONTINUED)

⚠ WARNING

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

⚠ WARNING

Never weld or perform any type of "hot work" on any part of a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas.

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ CAUTION

Keep the compressed natural gas equipment area well ventilated.

⚠ CAUTION

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

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** 180. 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

   The high pressure gauge indicates the fuel pressure in the fuel system. The gauge has a range of 0 to 5000 psi. When cylinder(s) are full and the cylinder Manual Shut-Off Valve is open, the pressure reading should read approximately 3600 psi.

3. Low Pressure Gauge

   The low pressure gauge indicates the fuel pressure sent to the engine.

   Momentum FMM (CNrG® Tailgate): The gauge has a range 0 to 150 psi. Normal engine operating pressure is 70-100 psi for these Cummins CNG engines:

   - 8.9 L ISL G (2007+)
   - 11.9 L ISX12 G (2013-2018)
   - 8.9 L L9N (2018+)
   - 11.9 L ISX 12N (2019+)

   Agility FMM (Top of Body and Back of Cab): The gauge has a range 0 to 150 psi. Normal engine operating pressure is 60-100 psi for Cummins Westport ISX 12N engines and 70-140 psi for all other engines.

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)

B. Fuel Management Module Components (Continued)

5. Fast Fill/HD Bus Fuel Receptacle

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

6. Slow Fill/NGV1 Fuel Receptacle

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

7. Defuel Port

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

8. Defuel Valve

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

9. Door Sensor

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

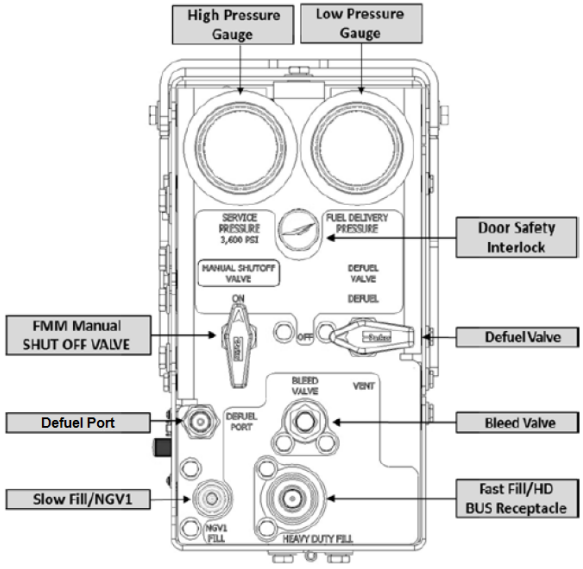


Figure 90. Manual Shut-Off Valve

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 NGV2b-2012 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.

CNG FUEL SYSTEM COMPONENTS (CONTINUED)

C. CNG Fuel System Components (Continued)

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

   The high pressure coalescing filter is used to remove contaminants and oil from the fuel prior to it entering the low pressure portion of the fuel system.

5. Low Pressure Filter

   The low pressure filter is located on the frame near the engine. The low pressure filter is used to remove contaminants and oil from the fuel prior to it entering the engine. See to the engine manufacturer's recommended instructions for maintenance and replacement.

6. Pressure Regulator

   The pressure regulator reduces the pressure of fuel in the system from high pressure (3,600 psi) to low pressure (70-100 psi for the Momentum FMM) for the engine to use. Coolant from the engine circulates through the regulator to keep it from freezing. Also see **High Pressure Gauge** 176 and **Low Pressure Gauge** 176.

7. Solenoid Valve

   The solenoid valve allows pressure to flow from the regulator inlet port to the outlet port when the ignition is on.

8. Bleed Valve

   The bleed valve vents residual pressure in the FMM portion of the system to allow for maintenance procedures and purging. The bleed valve is the only fitting that it is safe to open while under pressure.

⚠ WARNING

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

CNG FUEL SYSTEM COMPONENTS (CONTINUED)

C. CNG Fuel System Components (Continued)

9. Pressure Relief Devices

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

NOTES:

FUEL SYSTEM SHUT DOWN PROCEDURE

1. Turn OFF the Fuel Management Module (FMM) Manual Shut-Off Valve.
2. Turn OFF the Fuel Cylinder Manual Shut-Off Valve on EACH tank.

CNG VEHICLE OPERATOR EMERGENCY RESPONSE

⚠ WARNING

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

Emergency Response for Gas Leaks

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

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

Vehicle Fire Procedures

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

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

CNG VEHICLE OPERATOR EMERGENCY RESPONSE (CONTINUED)

CNG Vehicle Emergency Shut Down Procedure

⚠ WARNING

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

Complete the following steps to shut down the CNG system:

1. Turn OFF Ignition and Electrical System.
2. Turn OFF Fuel Management Module Manual Shut-Off Valve.
3. Turn OFF the Fuel Cylinder Manual Shut-Off Valve on EACH tank.
4. Call Technical Services at 866-310-4345 for further assistance.

Emergency Venting/Defueling Procedure

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

1. Ensure that an electrical ground connection has been established between the cylinders, the vent system, and earth ground.
2. Connect the on-board defueling connection to the vent system using a conductive high pressure defueling hose.
3. Slowly open the hand valve to achieve a slow and steady flow to prevent freezing. No gas flow may indicate a normally closed solenoid valve on the cylinder. Consult the vehicle manufacturer for information on opening electronic solenoids.
4. Allow the on-board storage system to vent completely.
5. When completed, disconnect the on-board defueling connection from the vent system and disconnect the earth ground.

STARTING VEHICLE

NOTICE

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

1. Make sure that the system has been properly leak tested and that no leaks exist.
2. Make sure that plastic caps are installed on all exposed vent lines. For tailgate mounted CNG, vent lines route to the top of the tailgate. If the plastic caps are missing, contact Heil Parts Central for replacement caps (Part Number 042-2078 for 3/8" and 042-2079 for 1/2") 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. 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.
5. Start the engine.
6. 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

A. CNG Fueling Steps

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

⚠ WARNING

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

The steps include:

1. For the CNrG® Solenoid System only, engage **Fuel Fill Mode** on the in-cab InSight™ Diagnostic Display. For more information, see **Fuel Fill Mode** 219.
2. 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.
3. Remove the dust cover on the fill receptacle.
4. Remove fueling nozzle from the CNG dispenser holder.
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.

FUELING PROCEDURE (CONTINUED)

B. Types of Fueling Hoses

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

1. Type 1:

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

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

   b. Once the hose 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 hose. This indicates that the hose fueling nozzle is properly seated onto the receptacle.

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

   d. When fueling is complete, release the nozzle connection. Holding the nozzle in one hand, use the other hand to turn the nozzle so that arrows again 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 91. Type 1 Fueling Hoses

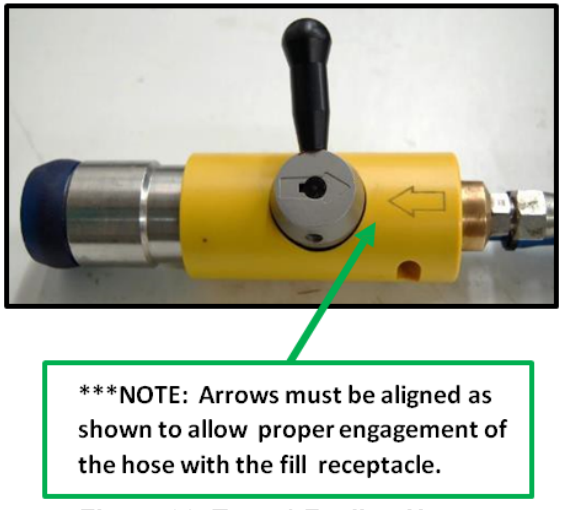


Figure 92. Type 1 Fueling Hoses

FUELING PROCEDURE (CONTINUED)

B. Types of Fueling Hoses (Continued)

1. Type 1 (Continued):

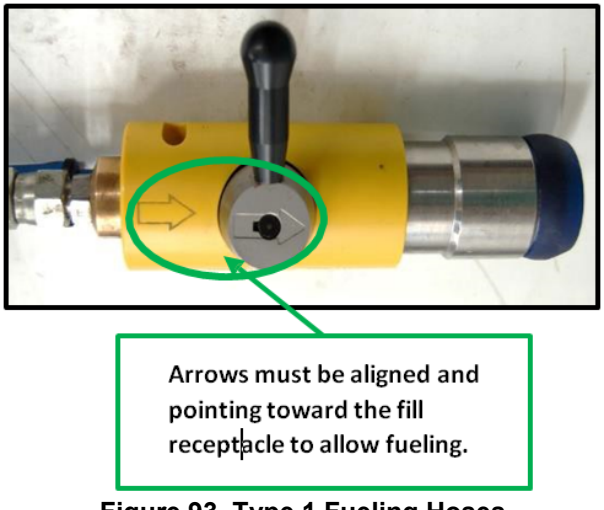


Figure 93. Type 1 Fueling Hoses

2. Type 2:

   This fueling hose 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 94. Type 2 Fueling Hose

FUELING PROCEDURE (CONTINUED)

3. Type 3:

   To utilize this hose:

   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.

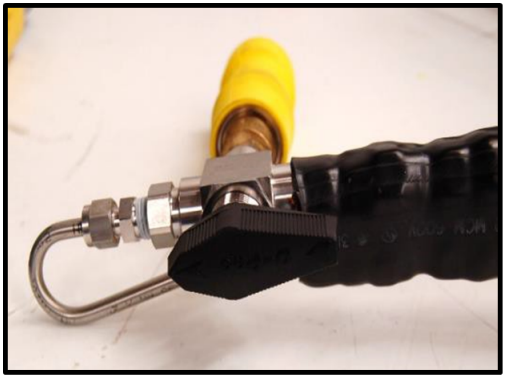


Figure 95. Type 3 Fueling Hose

TRANSFER FUELING (DEFUELING) PROCEDURES

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

⚠ WARNING

Never weld on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas.

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

Before attempting to defuel a CNG vehicle, read and understand **National Fire Protection Association (NFPA) 52 sections 6.14.1 - 6.14.4.4** as they provide a detailed list of requirements to be followed when performing defueling. Also read and understand all of the safety alert messages and procedures in the **Momentum or Agility CNG Fuel System Operation and Maintenance Manual** and the **Agility (or equipped fuel cylinder manufacturer) CNG Fuel Cylinder Inspection Manual**.

CNG FUEL SYSTEM MAINTENANCE

Routine maintenance of the compressed natural gas system in accordance with the **CNG Fuel System Inspections Section** 193 will ensure that the system and components are functioning properly. Refer to your Heil Service Manual for CNG fuel system schematics.

⚠ WARNING

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

⚠ WARNING

Never weld on any part of a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas.

⚠ WARNING

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

⚠ CAUTION

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

MAINTENANCE PART NUMBERS

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

PART NUMBER	DESCRIPTION
151-4773-107	High-Pressure Coalescing Filter Element Kit
Refer to Engine OEM	Low-Pressure Fuel Filter Element
151-4773-126	Fast-Fill Fuel Receptacle O-Ring
To be supplied	#6 O-Ring Face Seal – O-Ring
151-4773-123	#8 O-Ring Face Seal – O-Ring
151-4773-124	#6 O-Ring Boss – O-Ring
151-4773-121	#8 O-Ring Boss – O-Ring
151-4773-125	#4 O-Ring Boss – O-Ring (Transducer O-Ring)

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

Register online to gain access to the EPC:
https://epc.partscentral.com

Google Chrome web browser is recommended.

NOTES:

DEPRESSURIZING PROCEDURE

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, including draining or changing the high-pressure filter. Use the following procedure to remove fuel pressure from the lines connected to the high-pressure filter assembly.

⚠ WARNING

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

⚠ WARNING

Never weld on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas.

1. Make sure that the ignition is turned OFF.

DEPRESSURIZING PROCEDURE (CONTINUED)

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.

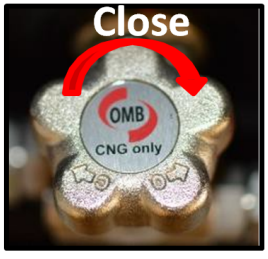


Figure 96. Cylinder Manual Shut-Off Valve

3. Verify that the FMM Manual Shut-Off Valve is in the ON position.
4. Start the vehicle and let the engine run until it stops.
5. Turn the vehicle ignition switch OFF. Follow the manufacturer's recommended vehicle lock-out procedures. Remove the ignition key.
6. Make sure the high pressure gauge on the FMM reads 0 psi.
7. Remove the FMM access panel.
8. Slowly open the bleed valve to relieve the remaining pressure.

DEPRESSURIZING PROCEDURE (CONTINUED)

9. Turn OFF the power supply if an electrical component of the system requires service.
10. Perform any maintenance ONLY after completing these instructions.

Once this process is complete, the system will be fully depressurized up to the primary solenoid lock-off valve. Pressure may still remain downstream of the solenoid valve, including inside the fuel cylinder(s). Use care when loosening fittings for the first time. Be aware that it is normal for a small amount of gas to leak out of any fitting downstream of the solenoid lock-off valve.

RE-PRESSURIZING PROCEDURE

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

1. Make sure that the vehicle is OFF. Take the keys out of the ignition.
2. Close the bleed valve and torque the fitting to 4-5 FT-LBS.
3. Check that the filter bowl and the drain plug are installed and tightened.
4. Check that the FMM Manual Shut-Off Valve is in the ON position.
5. On each cylinder, slowly turn the cylinder Manual Shut-Off Valve by turning the valve counter-clockwise to the ON position.
6. Re-install the fill panel cover (if removed).
7. Insert the ignition key and start the engine.

HIGH PRESSURE FILTER DRAIN PROCEDURE

1. Remove the excess fuel in the filter per the **Depressurizing Procedure** 188.
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. Confirm the bleed valve is closed.
8. Slowly open the FMM Manual Shut-Off Valve.
9. Check the high pressure gauge to ensure the fuel pressure has been returned in the system.

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. Verify that the bleed valve is closed.
10. Slowly open the FMM Manual Shut-Off Valve.
11. Check the high pressure gauge to ensure fuel pressure has returned in the system.

WELDING AND HOT WORK PROCEDURES

⚠ WARNING

Never weld on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas.

⚠ DANGER

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

If any welding or 'hot work' (i.e., any work that involves burning or use of tools that produce a spark, flame, or source of ignition) is required on a CNG fuel vehicle excluding the CNG fuel system, you must perform the following procedures:

1. Conduct work in a well-ventilated area.
2. Shut off every cylinder in the fuel system by turning the valve clockwise to OFF.
3. Ensure the FMM Manual Shut-Off Valve is in the ON position.
4. Start the vehicle and let it run until the engine stops.
5. Turn the ignition key OFF and remove the key.
6. Check the gauges on the FMM to ensure all pressure is at ZERO.

WELDING AND HOT WORK PROCEDURES (CONTINUED)

7. Slowly relieve excess pressure by turning the bleed valve cap counter-clockwise until a hissing sound is heard. Close the bleed valve when the hissing stops.
8. Purge the CNG fuel system with inert gas, including the tanks. See **Purging with an Inert Gas Prior to Welding or Major Repairs**.
9. Use a welding blanket to protect the fuel system from slag and sparks produced from welding and hot work operations.

LIFTING THE VEHICLE

⚠ WARNING

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

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

TOWING THE VEHICLE

⚠ WARNING

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

Before towing the vehicle, close the Manual Shut-Off Valves on the FMM and all fuel cylinders using the **Fuel System Shut Down Procedure** 180.

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

NOTES:

PRE-TRIP INSPECTION

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

1. Verify the Manual Shut-Off Valve on the FMM is in the ON position.
2. Check the high-pressure gauge on the FMM to ensure it is operating and reading in a range consistent with the fuel gauge on the dash board. The fuel system maximum pressure is 3,600 psi.

   NOTE: Pressure of less than 250 psi could make the engine run rough.
3. Check the vent ports and vent caps for any signs the PRDs have been activated. Verify the vent ports and vent caps are clear of debris or damage.
4. Check the entire fuel system for any signs of damage or wear. Include checks for:

   a. Gas leaks – Smell for gas, look for frost or ice, and listen for hissing noises at joints and components.

   b. Look for external damage to housings and covers.
5. Drain the low pressure filters per the engine manufacturer's recommendation.
6. Turn the ignition key to ON and check that the low pressure gauge reading is approximately 125 psi.
7. Verify the dashboard fuel gauge is functioning properly.
5. 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 CSA-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** 195 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 blue vent cap is missing)
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
* To be completed by a qualified and trained person.	

CNG FUEL CYLINDER AND SYSTEM INSPECTION

⚠ WARNING

If a CNG-fueled vehicle has been involved in an accident or fire, the system and cylinders must be inspected by a certified CNG fuel system inspector.

NOTICE

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

1. Based on cylinder manufacturer recommendations and industry standard practices, visual CNG cylinder inspections should be performed at a frequency of 3 years or 36,000 miles, whichever occurs first.
2. In addition, Heil recommends a daily walk-around or pre-trip and post-trip visual inspection be performed.

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 about 125 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.
8. If any system components or structural parts are damaged, perform a detailed inspection.

If everything checks out good, the vehicle is cleared for operation. If anything is wrong, a qualified CNG system technician should make the necessary repairs.

For instructions on how to perform a detailed CNrG® fuel system inspection, see **Detailed CNrG® Fuel System Inspection** 196.

DAILY CNrG® FUEL SYSTEM INSPECTION

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

1. Check all CNrG® Tailgate guards and covers for damage.
2. Remove the Oblong Access Covers fastened with Thumbscrews.

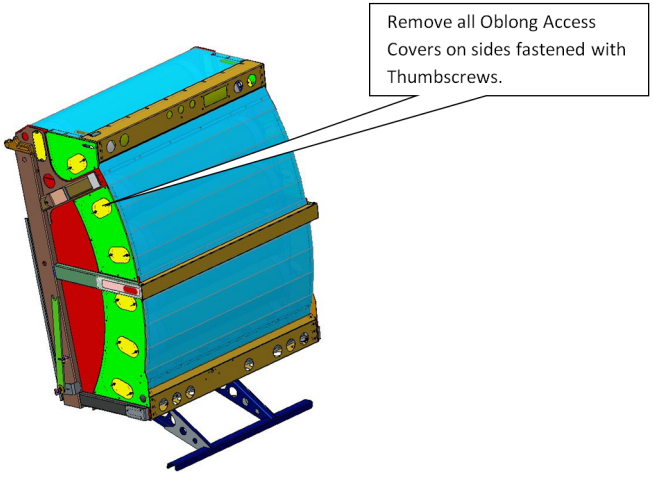


Figure 97. Tailgate Access Covers

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

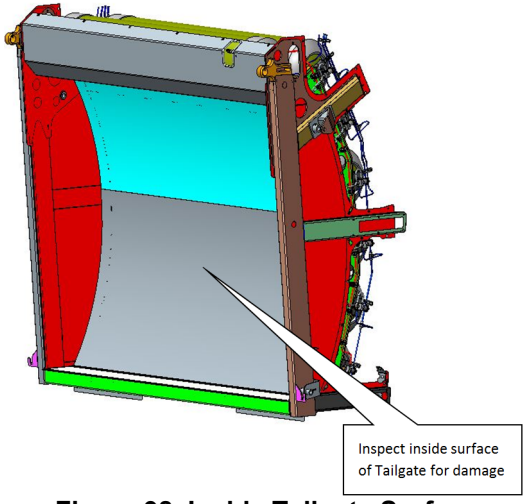


Figure 98. Inside Tailgate Surface

4. Verify cylinder labels are in place and for each cylinder, make sure cylinder service life has not expired.
5. Inspect cylinder valves and PRDs for leaks and damage.
6. Inspect all plumbing tubes, hoses and fuel flow components for leaks. A CNG Gas Leak Detector is recommended.
7. Examine all cylinders for damage using the cylinder manufacturer’s guidelines. Inspection records should be kept with vehicle records, and the system label should be updated to reflect the current inspection status.
8. Check condition of tailgate to body hose connection and guards.

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

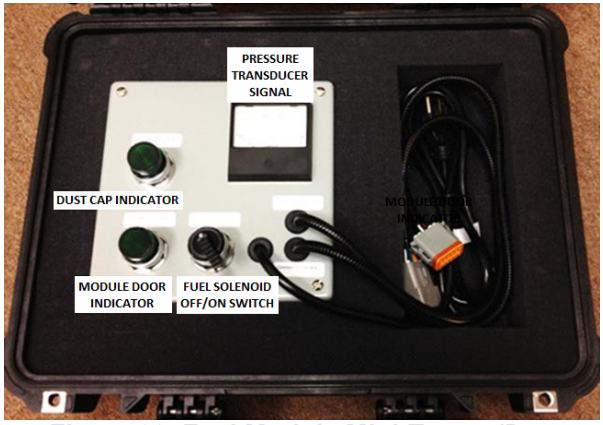


Figure 99. Fuel Module Mini-Tester (Part Number 044-0488)

CNG FUEL SYSTEM TROUBLESHOOTING (CONTINUED)

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

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

CNG FUEL SYSTEM TROUBLESHOOTING (CONTINUED)

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

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

CNG FUEL SYSTEM TROUBLESHOOTING (CONTINUED)

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

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

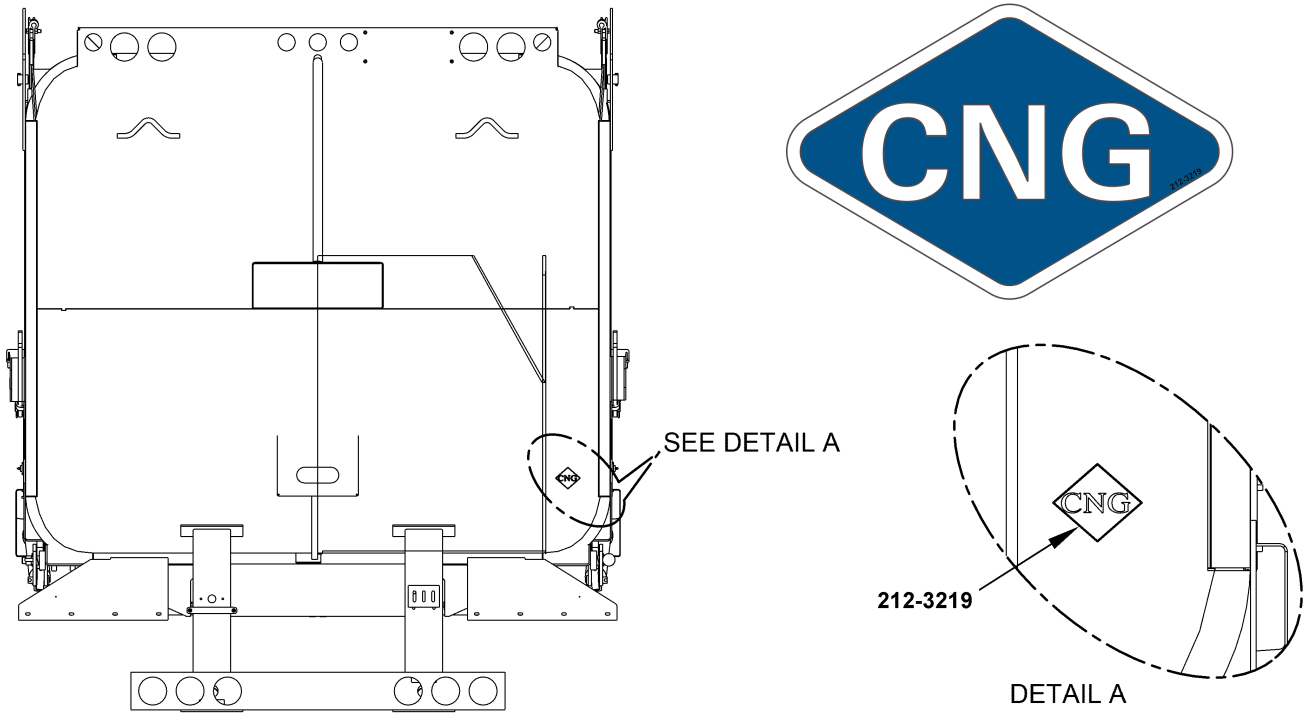
CNG FUEL SYSTEM TROUBLESHOOTING (CONTINUED)

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

PROBLEM OBSERVED	POSSIBLE CAUSES	CORRECTIVE/DIAGNOSTIC ACTIONS	RESULTS AND OTHER ACTIONS
Heil CNrG™ Tailgate Solenoid System Option: In-cab Cortex Display does not indicate the fuel level correctly or an alarm is activated on the Cortex 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 Cortex Display or the Cortex Controller. *If the problem cannot be resolved, call **866-310-4345** for technical assistance.

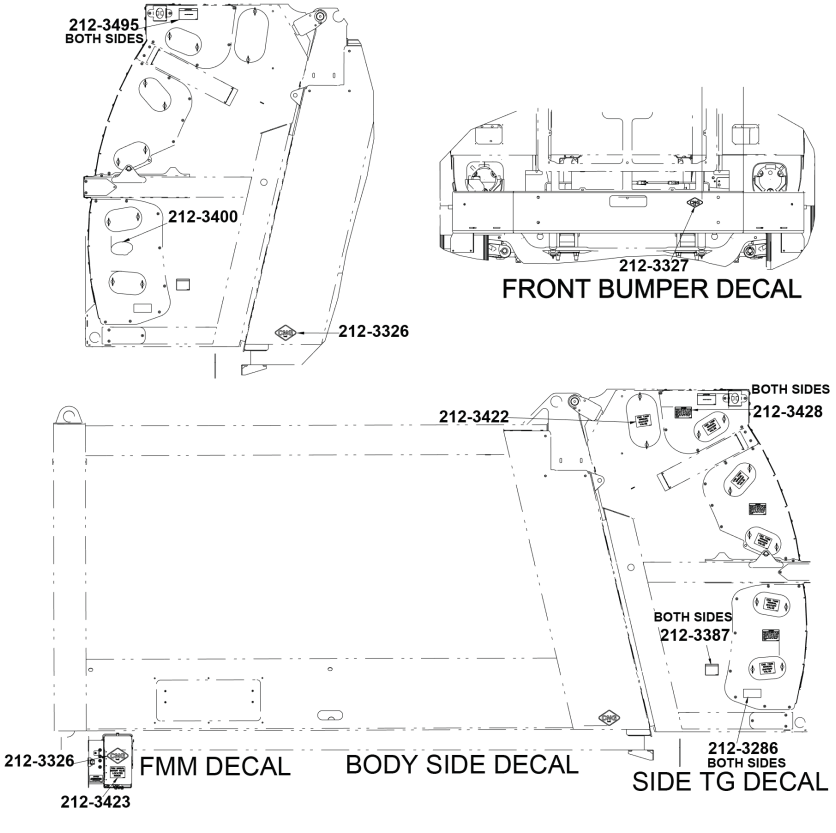
CNG FRONT OF BODY / TOP OF BODY DECAL PLACEMENT

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.

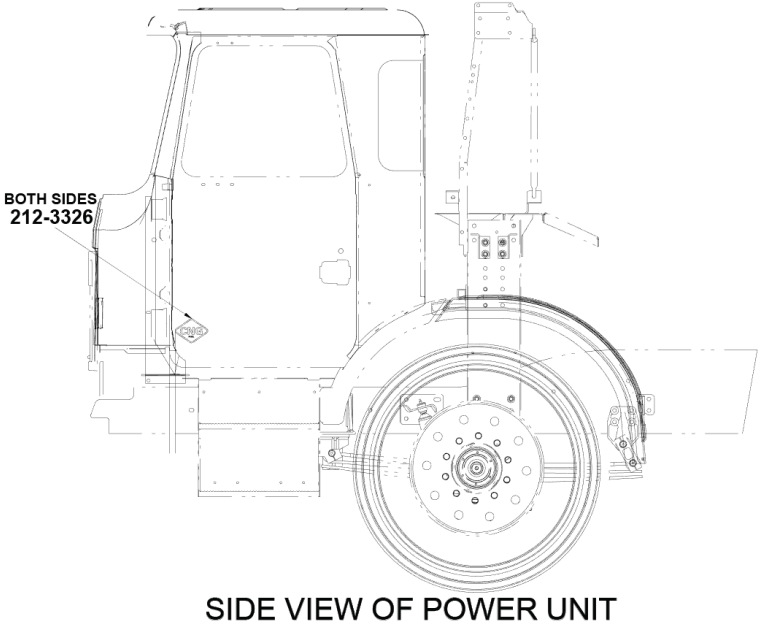


CNrG® TAILGATE DECAL PLACEMENT

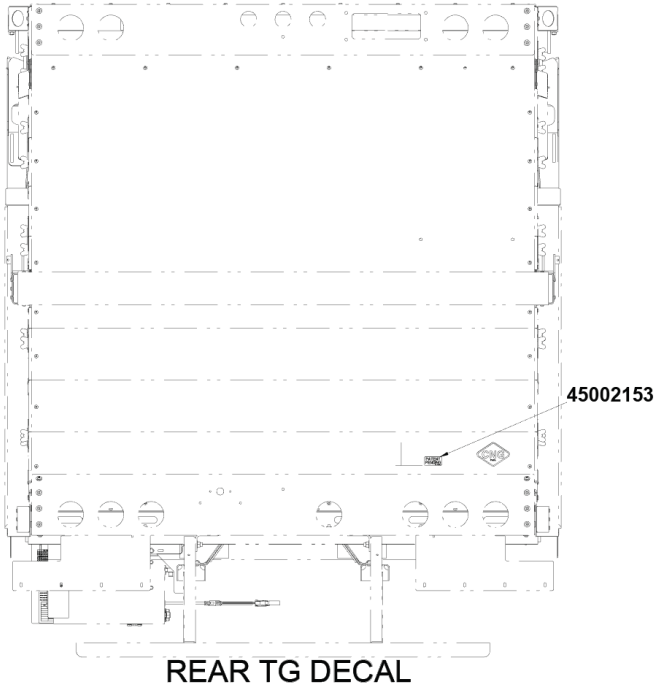
In addition to the decals shown below, there may be other decals placed on the Fuel Management Module (FMM), tank compartments or elsewhere on the CNG system components. Refer to the CNG System Manufacturer's Operation and Maintenance Manuals for replacement decal part numbers.



CNrG® TAILGATE DECAL PLACEMENT (CONTINUED)



SIDE VIEW OF POWER UNIT



REAR TG DECAL

CNrG® TAILGATE DECAL IMAGES

Figure 100.CNG Fuel (5.88" x 3.88"), PN 212-3326

Figure 101.CNG Fuel (4.25" x 2.63"), PN 212-3327

Figure 102. Warning: Vehicle uses CNG fuel, PN 212-3387

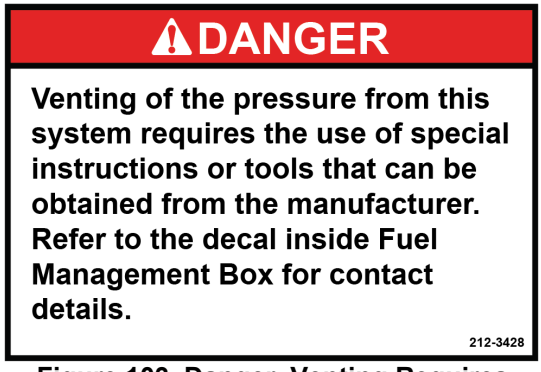


Figure 103. Danger, Venting Requires Special Instructions/Tools, PN 212-3428

CNrG® TAILGATE DECAL IMAGES

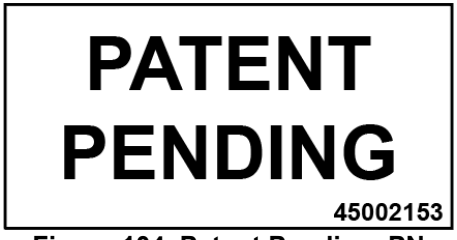


Figure 104. Patent Pending, PN 45002153

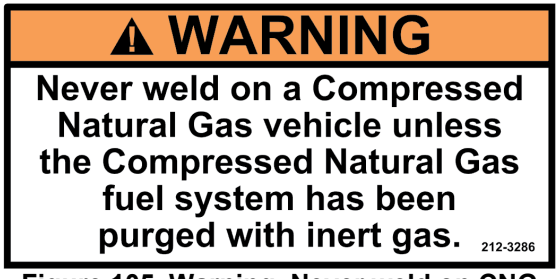


Figure 105. Warning, Never weld on CNG vehicle unless purged, PN 212-3286

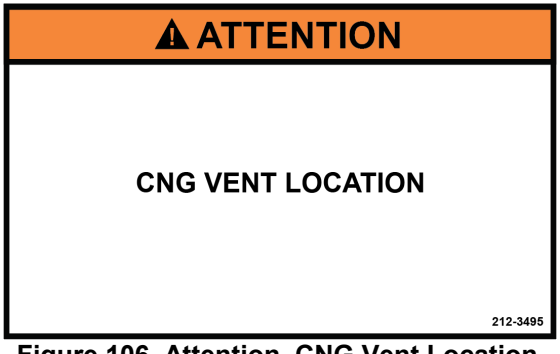


Figure 106. Attention, CNG Vent Location, PN 212-3495

Figure 107. Warning, CNrG Solenoid System, CNG tank empty before removing transducer, PN 212-3388

CNrG® TAILGATE DECAL IMAGES

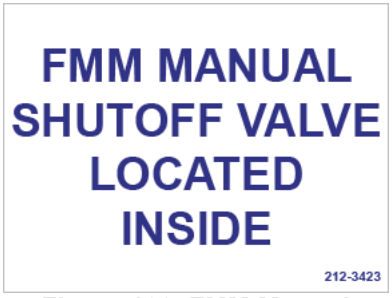


Figure 108. FMM Manual Shutoff Located Inside, PN 212-3423

Figure 109. CNG Tank Manual Shutoff Valve, PN 212-3422

Figure 110. Notice, CNrG Solenoid System, Transducers MUST be functioning, PN 212-3389

Figure 111. Notice, CNrG Solenoid System, Fuel Fill Mode MUST Be Engaged, PN 212-3429

CNrG® TAILGATE DECAL IMAGES

Figure 112. Heil CNrG Tailgate Fuel Delivery System, PN 212-3400

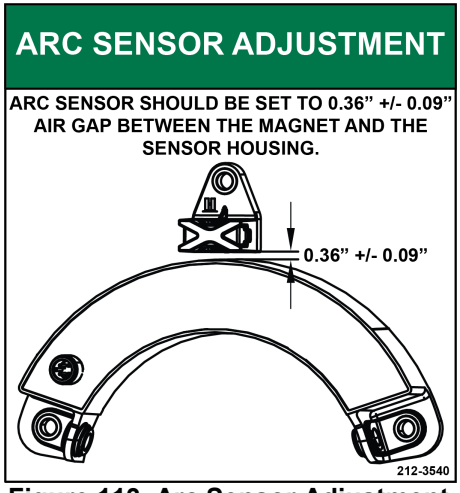


Figure 113. Arc Sensor Adjustment, PN 212-3540

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.

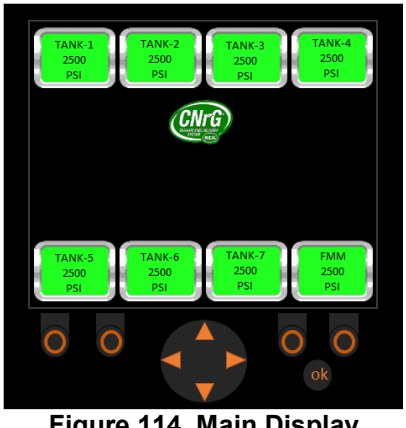


Figure 114. Main Display Screen

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

⚠ WARNING

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

⚠ WARNING

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.

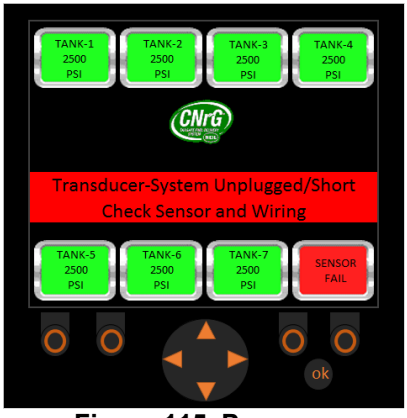


Figure 115. Pressure Transducer Sensor behind FMM Unplugged/Faulty

Figure 116. 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.

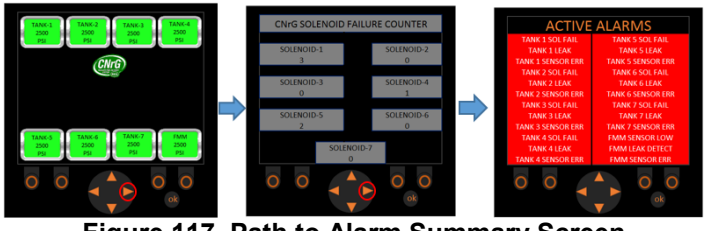


Figure 117. Path to Alarm Summary Screen

Figure 118. 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.

⚠ WARNING

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.

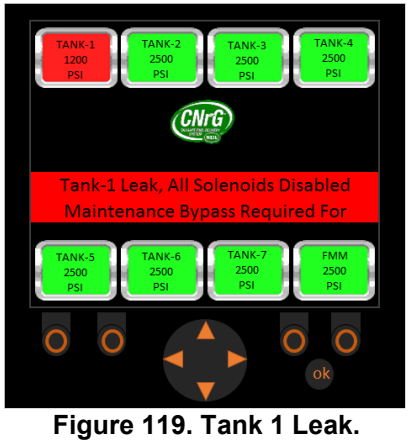


Figure 119. Tank 1 Leak. Maintenance Bypass Required.

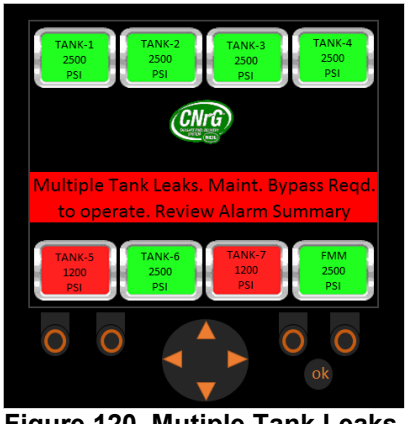


Figure 120. Mutiple Tank Leaks. Maintenance Bypass Required.

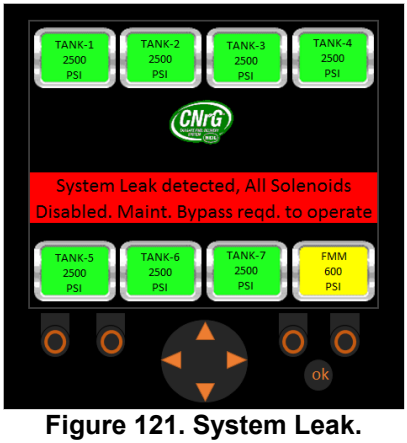


Figure 121. System Leak. Maintenance Bypass Required.

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** 212 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** 219 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.

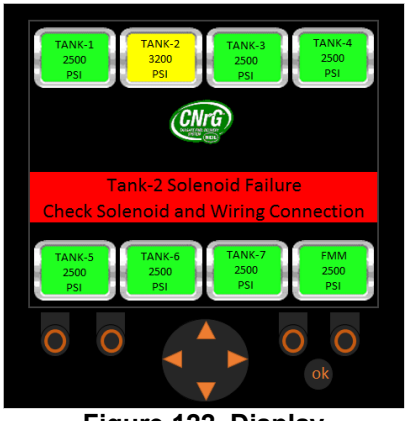


Figure 122. Display Screenshot: Tank 2 Solenoid

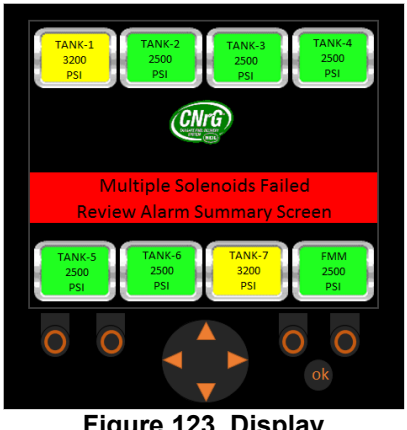


Figure 123. Display Screenshot: Multiple Solenoids

HEIL CNrG® 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:

⚠ WARNING

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.

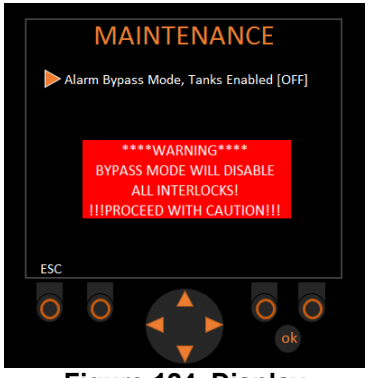


Figure 124. Display Screenshot: Maintenance Screen

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.
6. 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.

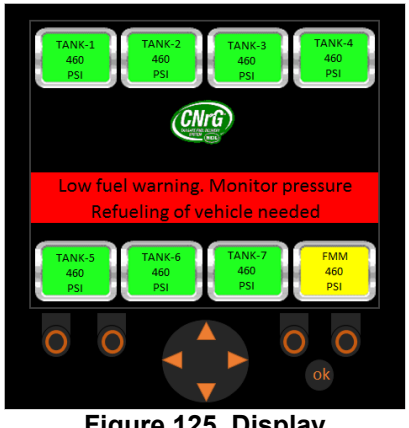


Figure 125. Display Screenshot: Low Fuel Warning

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.

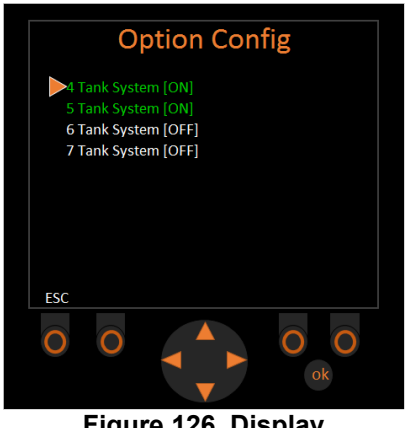


Figure 126. Display Screenshot: Tank Option

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 Cortex Controller™. It also provides the software revisions of the Cortex Display and Cortex Controller programs.

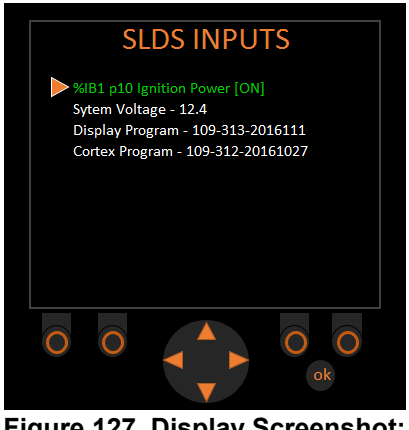


Figure 127. Display Screenshot: System Inputs

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 Cortex Controller.

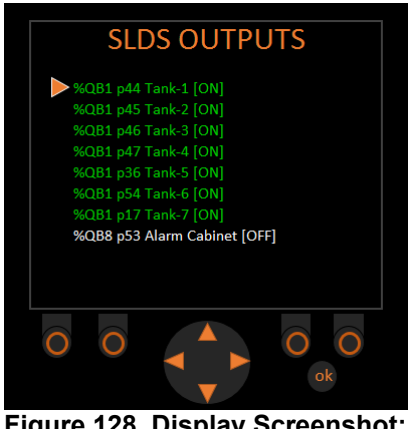


Figure 128. Display Screenshot: System Outputs

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 Cortex 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.

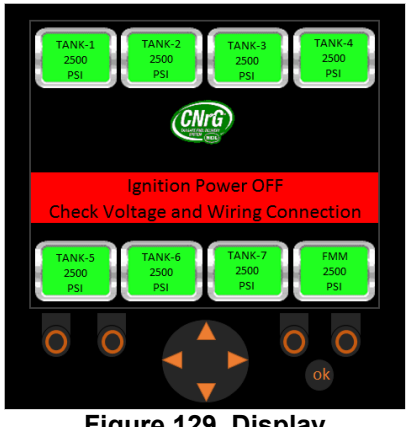


Figure 129. Display Screenshot: Ignition Power

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 Cortex Controller and Display.

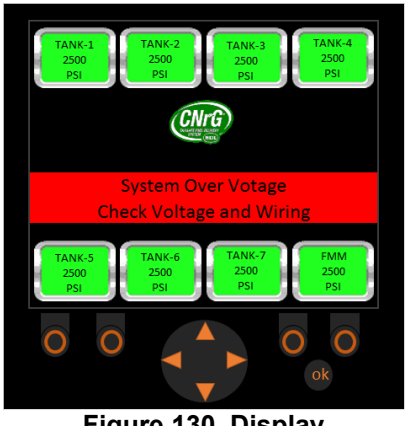


Figure 130. Display Screenshot: System Over

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 Cortex Controller and Display.

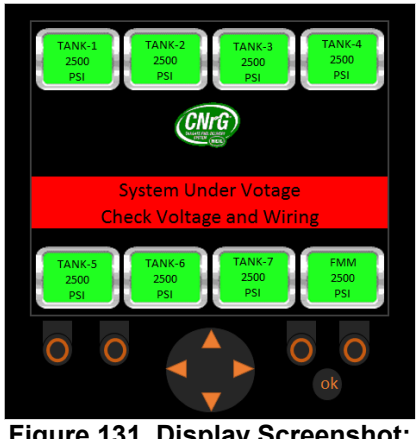


Figure 131. Display Screenshot: System Under Voltage

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.

⚠ WARNING

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

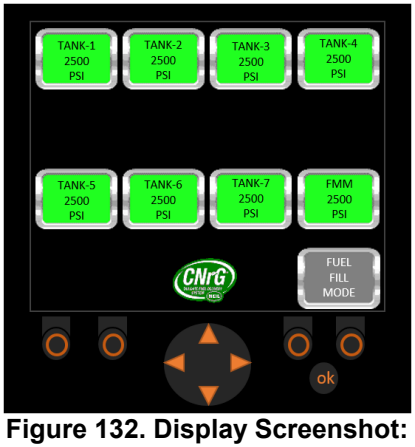


Figure 132. Display Screenshot: Fuel Fill Mode OFF

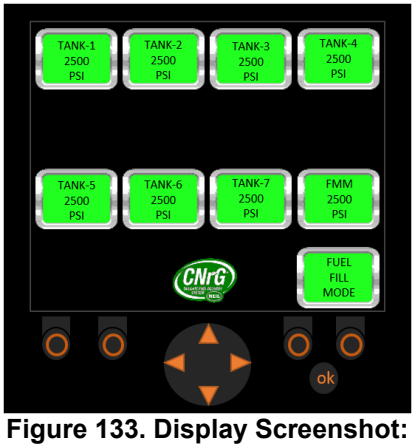


Figure 133. Display Screenshot: Fuel Fill Mode ON

NOTES:

2

A

B

C

D

E

F

G

H

I

S

T

U

W

NOTES:

HEIL ENVIRONMENTAL WARRANTY STATEMENT

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

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

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

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

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

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

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

Revised 1/2013

www.heil.com

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

Heil Environmental
4301 Gault Avenue North
Fort Payne, AL 35967-9984

Parts Central:
800-528-5308

Technical Service:
866-310-4345
TechSupport@DoverESG.com