

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

SERVICE MANUAL

ISSUED MARCH 2021

TP1HPO-SM-0321



© 2021 Heil Environmental



Environmental Solutions Group 201 W. Main Street, Ste 300 Chattanooga, TN 37408 Heil Customer Care: 866.275.4345

IF INCORRECTLY USED, THIS EQUIPMENT CAN CAUSE SEVERE INJURY. THOSE WHO USE AND MAINTAIN THE EQUIPMENT SHOULD BE TRAINED IN ITS PROPER USE, WARNED OF ITS DANGERS, AND SHOULD READ AND FULLY UNDERSTAND THIS ENTIRE MANUAL BEFORE ATTEMPTING TO SET UP, OPERATE, ADJUST OR SERVICE THE EQUIPMENT. KEEP THIS MANUAL FOR FUTURE REFERENCE

IMPORTANT SAFETY NOTICE

Proper service and repair are important to the safe, reliable operation of Heil Co.'s products. Service procedures recommended by Heil are described in this service manual and are effective for performing service operations. Some of these service operations may require the use of tools or blocking devices specially designed for the purpose. Special tools should be used when and as recommended. It is important to note that some warnings against the use of specific methods that can damage the product or render it unsafe are stated in the service manual. It is also important to understand these warnings are not exhaustive. Heil could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each method. Consequently, Heil has not undertaken any such broad evaluations. Accordingly, anyone who uses service procedures or tools which are not recommended by Heil must first satisfy himself thoroughly that neither his safety nor the product safety will be jeopardized by the method he selects.

"Heil Environmental, as manufacturer of the equipment that is covered by this manual, is providing a product to the user who has acknowledged to have superior knowledge of the conditions of the use to which the product will be put. Heil Environmental relies upon the user's superior knowledge in specifying any changes or modifications including, but not limited to, the inclusion or non inclusion of options that are required by the user and the Heil product, and for the particular application of the user relative to the Heil product."

General Information

Introduction	4
Service/Parts Assistance	5
Recommended Spare Parts	6
Electronic Parts Catalog (EPC)	8
Precautionary Statements	11
Lock-Out/Tag-Out Procedures	15
Storing Refuse in Container	16
Maintenance/Lubrication Information	16
Grease Lubrication Recommendation	16
Oil Lubricant Recommendation	16
Hydraulic Oil Specifications	16
Cold Weather Warmup Procedure	17
Battery Disconnect Switch	17
Proximity Switch Troubleshooting	18
Decals on the Unit	
Decal Care	
Hydraulic Symbols	24
Electrical Symbols	
Pump	
Pump Nomeclature	
Pump Compensator	
Hydraulic Stand-By Pressure	
Direction of Hydraulic Oil Flow	
Pump Inspection	
Pump Maintenance	
Pump Repair	
Pump Start-Up Procedure	
Troubleshooting Pump	
Troubleshooting Hotshift PTO	35
Body and Tailgate	
Body Nomenclature	
Tailgate Nomenclature	
Propping the Body of a Service Hoist Unit	40
Propping the Body of a Service Lift (Serviceable Eject) Unit	43
Tailgate Support Props	47
Side Access Door	48
Side Access Door Proximity Switch	
Main Underbody Valve	50
Body Valve to Curotto and Tailgate Valves	51
Instructions of Inspection for Over-Packing	52
Welding and Electronic Devices / Electrical Lubricants	54
Maintenance and Adjustment	
Body Daily Checklist	
Body Preventive Maintenance Chart	57

Body Lubrication Guide	59
Curotto-Can Lubrication Guide	60
Curotto-Can Optional Single Point Lubrication Guide	61
Packer/Ejector Cylinders Maintenance	62
Packer/Ejector Panel Adjustment	62
Cylinder Sensors	63
In-Cylinder Proximity Sensor Installation	63
In-Cylinder Proximity Sensor Troubleshooting	64
Cold Weather Warm-Up Procedure	65
Preparing the Unit to Check the Oil Level	66
Check Oil Level	67
When to Change Oil Filter Element	67
Change Hydraulic Oil Filter	67
Drain and Clean the Hydraulic Oil Tank	68
Pressure Adjustment Procedures	70
Clamp-On Arm Bolts Maintenance	75
Cracked Weld Joints	76
Inspect Proximity Switches	76
Clean and Inspect the Tailgate Seal	76
Troubleshooting Main Control Valve	77
Troubleshooting Electrical	78
Troubleshooting Display Network	79
Troubleshooting Heil Network J1939-1	80
Troubleshooting Heil Network J1939-2	81
Troubleshooting Chassis Network J1939-2	82
Body Controller Hardware	
Can Network	84
Cortex Controller [™] and Module (Node) Locations	84
Residential Half/Pack (featuring Odyssey Controls) Cortex Controller™ and Module Components	86
Commercial Half/Pack (featuring Odyssey Controls) Cortex Controller™ and Module Components	88
Cortex Controller™ and Module Functions	90
Cortex Controller™ Programming	90
InSight Diagnostic Display	91
Home Screen	
Camera Screen and System (if Equipped)	93
Counters Screen	96
Service Mode	96
Depressurizing Curotto-Can Hydraulics	97
Heil Autonomous Lift Option (H.A.L.O.) Controls Options	
Service Screens	100
Calibration Screen	103
Maintenance Screen	
Cortex Controller™ 80 I/O Assembly	107
Cortex Controller™ 80 I/O Illustrations	108
Pin Number Diagram	109
Cortex Controller™ 80 I/O 55-Pole Cable Assembly	110

Body Controller Software

Residential Half/Pack (featuring Odyssey Controls) Cortex Controller Program 109-0351	116
Commercial Half/Pack (featuring Odyssey Controls) Cortex Controller Program 109-0350	196
Schematics	
Cab to Body Schematic Mack MRU Non RP170 - 701-9340-001	
Cab to Body Schematic RP170 - 701-9340-002	
Cab to Body Peterbilt Schematic - 701-9340-003	
Cab to Body Econic Schematic - 701-9340-004	
P01 Cab Harness Autocar ACX (RP170) - 263-1907-100	
P01 Chassis Harness - 263-1907-101	
Body Front Schematic - 701-9341-001	270
Body Front Schematic - 701-9341-021	271
Body Schematic - 701-9341-003	272
Arm Node Schematic - 701-9341-007	273
Pivot Arms Schematic - 701-9341-005	274
Tailgate Node/Valve Schematic - 701-9341-010	275
Tailgate Schematic - 701-9214-004	276
Tailgate Upper Cluster Harness - 263-1890-003	277
Tailgate Middle Cluster Harness - 263-1890-002	278
Tailgate Lower Cluster Harness - 263-1890-001	279
Oil Tank Schematic - 701-9341-011	280
Controller Schematic - 701-9341-002	281
Cab Control Panels Schematic - 701-9287-017	
CNrG Control System with Solenoid Valve Option Schematic - 701-9229-001	
Hydraulic Schematics	
Odyssey Hydraulic Schematic - 701-9149	286
Odyssey Hydraulic Flow Chart - System at Idle - 701-9149-001	
Odyssey Hydraulic Flow Chart - Curotto Slide Out - 701-9149-002	
Odyssey Hydraulic Flow Chart - Curotto Gripper Close - 701-9149-003	289
Odyssey Hydraulic Flow Chart - Curotto Lift Raise - 701-9149-004	290
Odyssey Hydraulic Flow Chart - Curotto Lift Lower - 701-9149-005	291
Odyssey Hydraulic Flow Chart - Curotto Gripper Open - 701-9149-006	292
Odyssey Hydraulic Flow Chart - Curotto Slide In - 701-9149-007	293
Odyssey Hydraulic Flow Chart - Curotto Lift Raise and Slide In - 701-9149-008	294
Odyssey Hydraulic Flow Chart - Curotto Lift Lower and Slide Out - 701-9149-009	295
Odyssey Hydraulic Flow Chart - Half/Pack Arm Raise - 701-9149-010	296
Odyssey Hydraulic Flow Chart - Half/Pack Fork Raise - 701-9149-011	297
Odyssey Hydraulic Flow Chart - Half/Pack Arm Lower - 701-9149-012	298
Odyssey Hydraulic Flow Chart - Half/Pack Fork Lower - 701-9149-013	299
Odyssey Hydraulic Flow Chart - Half/Pack Arm and Fork Raise - 701-9149-014	
Odyssey Hydraulic Flow Chart - Half/Pack Arm and Fork Lower - 701-9149-015	301
Odyssey Hydraulic Flow Chart - Half/Pack Packer Extend - 701-9149-016	
Odyssey Hydraulic Flow Chart - Half/Pack Packer Retract - 701-9149-017	
Odyssey Hydraulic Flow Chart - Tailgate Unlock - 701-9149-018	
Odyssey Hydraulic Flow Chart - Tailgate Raise - 701-9149-019	
Odyssey Hydraulic Flow Chart - Tailgate Lower - 701-9149-020	

Index	313
Odyssey Hydraulic Flow Chart - Slide Out and Pack Retract - 701-9149-025	
Odyssey Hydraulic Flow Chart - Slide Out and Pack Extend - 701-9149-024	
Odyssey Hydraulic Flow Chart - Top Door Open - 701-9149-023	
Odyssey Hydraulic Flow Chart - Top Door Close - 701-9149-022	
Odyssey Hydraulic Flow Chart - Tailgate Unlock - 701-9149-021	

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

SERVICE MANUAL ISSUED MARCH 2021 TP1HPO-SM-0321

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) NOTES

SECTION 1 GENERAL INFORMATION

INTRODUCTION

The following sections are a guide for maintenance and service of the Heil unit. The sections cover preventive maintenance, adjustment, and troubleshooting hints. Before performing maintenance, check the work area carefully to find all the hazards present and make sure all necessary safeguards or safety devices are used to protect all persons and equipment involved. In order to diagnose a problem quickly and effectively, a service person must be thoroughly familiar with the machine.

This section explains the system and its major components. Diagrams and schematics of the electrical and hydraulic systems are in the Service Manual Schematics section.



IMPORTANT!

- Before starting any maintenance, study this section of the manual.
- Read all hazard warnings and decals on the unit.
- Clear the area of other persons before performing any maintenance.
- Know and understand safe use of all controls.
- It is your responsibility to understand and follow manufacturer's instructions on equipment and care.

SERVICE/PARTS ASSISTANCE

Assistance in troubleshooting repair and service is available by contacting the authorized Heil Dealer in your area. Parts are available at your Heil Dealer or through Heil. Heil personnel are trained to give prompt, professional assistance.

ALWAYS give the unit serial number in all correspondence relating to the equipment.

See the back cover of this manual for Heil contact information.

RECOMMENDED SPARE PARTS			
PART NO.	DESCRIPTION	QTY	
BODY AND TAILO	ATE ASSEMBLIES		
022-3509	SEAL, TAILGATE	1	
022-3924-001	SEAL, SUMP DOOR	1	
019-1242	SPRING, 1" OD X 6"	4	
014-2112	PAD, ARM STOP	2	
003-4013	BEARING, ARM, SAE	2	
003-5142	TAILGATE LOCK BUSHING	2	
HYDRAULICS			
001-7138	CYLINDER W/SENSOR, CAN TILT, GEN 3	1	
001-7139	CYLINDER WITHOUT SENSOR, CAN TILT, GEN 3	1	
001-7141	CYLINDER WITHOUT SENSOR, CAN FORK, GEN 3	1	
001-7142	CYLINDER W/SENSOR, CAN FORK, GEN 3	1	
001-7145	CYLINDER, ARM, W/SENSOR	1	
001-7146	CYLINDER, ARM, W/O SENSOR	1	
001-6966	CYLINDER, FORK, FULL TUCK	1	
001-7057 CYLINDER, ARM, CUSHIONED, FEL 1			
001-7179 CYLINDER, TOP DOOR 1		1	
001-7149 CYLINDER, W/ IN CYLINDER PROX PORT, T/G RAISE 2		2	
001-7148	CYLINDER, W/ IN CYLINDER PROX PORT, T/G LOCK	2	
001-7158	CYLINDER, PACKER, DA TELESCOPIC, 28 YARD	2	
001-7095	CYLINDER, PACKER, DA TELESCOPIC, 28 YARD	2	
001-7189	CYLINDER, PACKER, DA TELESCOPIC, 32 YARD	2	
001-6910	CYLINDER, PACKER, DA TELESCOPIC	2	
001-7157	CYLINDER, PACKER, DA TELESCOPIC, 23 YARD	2	
001-7096	CYLINDER, PACKER, DA TELESCOPIC, 23 YARD	2	
001-6919	CYLINDER, PACKER, DA TELESCOPIC, 32 YARD	2	
001-6920	CYLINDER, PACKER, DA TELESCOPIC, 28 YARD	2	
001-7159	PACK/EJECT 189 STRK	2	
001-6921	CYLINDER, PACKER, DA TELESCOPIC, 23 YARD	2	
031-6444	ASSEMBLY, VALVE	1	
031-6553 VALVE, TAILGATE 1		1	
063-0145	063-0145 TRANSDUCER, 3000 PSI PRESSURE 1		
063-0146 SENSOR, TEMP 1			
063-0151	MAGNETIC SENSOR	2	
075-0896	STRAINER, SUCTION, 100 MESH	1	
075-0578	STRAINER, SUCTION	1	
075-0959-001	STRAINER, SUCTION, 100 MESH, 3" (IF EQUIPPED)	1	
075-0953	FILTER, RETURN LINE	1	

RECOMMENDED SPARE PARTS		
PART NO.	DESCRIPTION	QTY
075-0712	FILTER, BREATHER	1
ELECTRICAL		
063-0122	SWITCH, PROXIMITY, 18 MM	1
063-0123	SWITCH, PROXIMITY, 30 MM	1
063-0141	SENSOR, CAN ARC	1
063-0151	SENSOR, MAGNETIC	4
108-8458	RELAY, POWER MODULE	1
263-1816	HARNESS, J1939 SENSOR PIGTAIL VARIOUS	1
CONTROLS		
108-8631	ELECTRIC JOYSTICK	1
031-5724-012	AIR SOLENOID VALVE, 3 WAY 12V	8
108-8630	JOYSTICK, ELECTRIC, CS	1

ELECTRONIC PARTS CATALOG (EPC)

The Parts Central EPC includes electronic versions of the Heil Parts Manuals, specific to a Customer's truck configuration and options. After registering and logging in, the user can search by **Keyword(s) or Part Number** and/or **Heil Body Serial Number** to quickly identify a spare part or browse a custom parts catalog.

<u>Note</u>: This tool is currently for reference use only and the cart functionality is disabled. Please contact your local Heil Dealer for parts quoting and ordering.

Registration and Login

Register online to gain access: https://epc.partscentral.com. Upon registration, you will receive an email notification confirming registration. Within 24 hours, your registration will be approved and you can log in using the login page.

	PARTS CENTRAL	I
	💄 User name / Email	_
	Password	
	Remember me	
Are you a new user? Click here to register		
2019 © interactive SP ares™		

PARTSCENTRAL		
A Name	A Last name	
Password	Email	
Company	📞 Phone	
Address		
≁ Town	✓ Postcode	
Select a country	~	
Language		
🔎 Select a language	~	
	SAVE	
2019 © interactiveSPares™		

Search by Part Keyword(s) or Part Number in Body Serial Number

After login, you will land on the User Dashboard. At the top right of the Dashboard, there will be two search fields, as shown in the image below.



You can search by **Keyword(s) or Part Number** within a specific Heil Body **Serial Number**. For example, if you are looking for a **proximity switch** for Body Serial Number **HPS4959991**, you can enter this information into these two fields and the search results will include all parts within the **HPS4959991** body that contain the keywords **proximity** and **switch** within their part descriptions. See the image below.

From the search results list, you can select the right arrow icon to view the part within its associated assembly/kit, helping you identify the needed part. Alternatively, you can select the eye icon on the right to see part specifics (including any notes) and quickly add to cart (although this functionality is not yet turned on in the Parts Central EPC).

PAR	TSCENTRAL			5 📻 🖪 Bi	rand å Chris
🏦 Da	ashboard 🛛 🖻 Catalogues 🗸		proximity switch	Q in HP	54959991 Q
Searc	ch : proximity switch in HPS49	959991			
Code	Description	Catalogue			
035- 3712	GUARD, switch , proximity , TAILGATE LOCK	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BC	DDY	<	۰ >
063- 0122	switch, proximity, SOURCING, 18 MM	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BC	DDY	<	•
063- 0123	switch, proximity, 30 MM.	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / INSTALLATION, E	LECTRICAL, STEEL, TOP DOC	DR (• +
063- 0123	switch, proximity, 30 MM.	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BC	DDY	<	•
212- 2228	DECAL, proximity switch , ADJUSTMENT	Half/Pack, Odyssey and Factor AFL / BODY AND TAILGATE / KIT, DEG WITH CNRG TAILGATE	TAL & TRIM, STANDARD, 28 Y	YD.,	۰ >
234- 3317	PLATE, STRIKER, proximity switch , TAILGATE LOCK, 1"	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BC	DDY	<	•
311- 3954	BRACKET, proximity switch , 30MM, LOADER	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BC	DDY	<	۰ >
311- 6253	BRACKET, 30 MM, proximity switch , TAILGATE LOCK	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BC	DDY	<	• •

Search by Body Serial Number

If you want to view an entire parts catalog for a particular Heil unit, you can search by only the Heil Body **Serial Number**, leaving the **Keyword(s)** / **Part Number** field blank. The search result will then be the Body Serial Number-specific parts catalog with familiar catalog sections that you can browse. You can navigate through the catalog using the section/topic menu in the left panel and then adjust an assembly/kit illustration size in the right panel with the mouse center scroll wheel. Additionally in the right panel, you can drag the image when holding down the left mouse button. See the image below.



For each assembly/kit, you can click on the interactive part callout reference numbers to highlight the corresponding part in the parts list, or you can click on a parts list line item to highlight its position on the illustration. See the image below.



PRECAUTIONARY STATEMENTS

Listed below are the definitions for the various levels of hazards. It is important that the operators of this equipment and people who service units read and understand all warnings as they relate to this equipment operation.

- **DANGER** indicates a hazardous situation, which if not avoided WILL result in DEATH or SERIOUS INJURY if you do not follow proper instructions.
- WARNING indicates a hazardous situation, which if not avoided COULD result in DEATH OR SERIOUS INJURY if you do not follow proper instructions.
- **CAUTION** indicates a hazardous situation, which if not avoided COULD result in MINOR to MODERATE INJURY if you do not follow proper instructions.
- NOTICE addresses practices not related to personal injury, such as property damage or damage to the equipment.

The following warnings are generally in the Operator's Manual for each specific unit or are generic safety messages if an Operator's Manual does not have these safety messages. Other safety alert messages may be in other sections of the Parts and Service Manual or in an Operator's Manual. You must read and obey all safety alert messages in any manual produced by Heil to support your unit.

Failure to follow all instructions and safety precautions in this manual, in the Service Manual, in other manufacturer's 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 the Operation Manual, the Parts Service Manual for this unit, other applicable manufacturer's 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.

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

A DANGER

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

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

A DANGER

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

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

A DANGER

The packer and crusher panels are dangerous. They can cause death or serious injury if a person is inside the hopper. Make sure no one is inside the hopper before you begin a packer or crusher function. Put the unit in the Lock-Out/Tag-Out mode if it is necessary to enter the hopper area.

A 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

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

A DANGER

A full or partially full load of refuse is dangerous while you lower the body with inoperative controls. Refuse in the body can make the unit unstable and cause it to overturn. Serious injury or death can occur if the unit overturns due to instability caused by the loaded refuse. REMOVE the refuse before you block the body.

🚹 DANGER

Lifting equipment that does not have sufficient lifting capability is dangerous. Equipment can fail and cause death or serious injury to the operator or bystanders. Make sure the lifting equipment has sufficient lifting capability and clear ALL persons not involved with the procedure away from the area.

\Lambda DANGER

The lifting equipment can fail. Serious injury or death can occur if the lifting equipment breaks and the body falls or the unit rolls over. Do not place your body or limbs between the unit's body and chassis while you remove the body-supporting timbers. Be attentive and prepared to move quickly away from the unit in the event there is an equipment failure.

A DANGER

Contact of the unit with overhead electric lines is dangerous. Death or serious injury can occur. Make sure there is adequate overhead clearance before you raise the container. If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives..

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. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb in or on the body or on equipment can cause death or serious injury.

A WARNING

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

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

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 death or serious injury.

The hydraulic fluid can be under pressure and can spray while you open the connection. Hydraulic fluid can cause damage to your eyes, hands or skin. Wear protective eye glasses, gloves and other clothing as necessary to protect you from the hydraulic fluid.

A WARNING

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

Improper dumping of the refuse can cause the unit to tip or rollover. Death or serious injury can occur if the unit rolls or tips over. Empty as much refuse as you can with the packer panel before you raise the body.

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

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.

A container that is not locked to the container lift mechanism is dangerous. The container can fall off the container lift mechanism and cause death or serious injury. Make sure you engage and lock the container latch bars before you lift the container.

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

NOTICE

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

NOTICE

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand the instructions in this manual. Failure to do so can result in damage to the unit or other property. 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 the Operator's Manual or Service Manual for contact information.

NOTICE

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

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 ESG Technical Service if you have any questions about Lock-Out/Tag-Out procedures.

NOTICE

You can order Lock-Out/Tag-Out Tags through your Heil Dealer or through Heil.

LOCK-OUT/TAG-OUT PROCEDURES

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.

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

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

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



Figure 1. Lock-Out/Tag-Out (Do Not Operate) Tag

Follow These Steps:

- 1. APPLY the brakes. MAKE SURE the brakes do not let the unit move and they work properly.
- 2. Chock all wheels.
- 3. SET the tailgate props when you raise the tailgate for service, maintenance or cleaning.
- 4. SET the body props when you raise the body for service, maintenance or cleaning.
- 5. 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.
- 6. When there are no in-cab controls, move the outside control levers to relieve the pressure in the cylinders.
- 7. Put a LOCK-OUT/TAG-OUT Tag onto the steering wheel.
- 8. Remove the ignition key from the cab, lock the vehicle, and put the key in a secure location.
- 9. You can order Lock-Out/Tag-Out Tags (Part Number 212-1586) through your Heil Dealer or through Heil.

STORING REFUSE IN THE BODY

Heil does not recommend storing refuse in the body overnight. The different types of debris and corrosive elements usually collected can cause severe corrosion inside the body decreasing the life of your body. This corrosion can affect unloading and decrease the structural life of the body. In addition, storing refuse in the body overnight can increase the risk of fire.

MAINTENANCE/LUBRICATION INFORMATION

Before performing maintenance, check the work area carefully to find all the hazards present and make sure all safe guards or safety devices are in place to protect all persons and equipment involved.

GREASE LUBRICANT RECOMMENDATION

Use a grease gun. Before engaging grease gun, clean the fitting. Always pump enough grease to purge the joint of contaminated grease and wipe off the excess. Lubricate a unit as given on the lubrication decal on the unit and in the **Body Lubrication Guide** paragraph of this section.

Use grade NLG1000 grease or equivalent.

OIL LUBRICANT RECOMMENDATION

Use only non-detergent engine oil to lubricate all moveable mechanical parts not furnished with grease fittings. Apply sufficient oil to give good lubrication, but do not bathe parts in oil. Always wipe off excess oil.

HYDRAULIC OIL SPECIFICATIONS

Hydraulic fluid is one of the most important component in hydraulic system. It transmits power, provides lubrication and cooling function and has following features:

- High viscosity index
- Long service life
- Outstanding cold temperature flow properties
- Fast water separation
- Excellent anti-wear performance
- · Long term oxidation stability
- Superior rust and corrosion protection
- · Exceptional shear stability / filterability
- · Excellent thermal and hydrolytic stability
- Anti-foam characteristics
- High performance of air release characteristics

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.

The following oils can be used on Heil products if Heil standard hydraulic oil (Shell Tellus S2 VX 32) is not available. But system performance and/or oil service life may be compromised.

- Castrol Dual Range HV 32
- Chevron Rando HDZ 32
- Mobil DTE 10 Excel 32

COLD WEATHER WARMUP PROCEDURE

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

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

Follow the steps below to warm up the hydraulic oil.

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

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.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) General Information

PROXIMITY SWITCH TROUBLESHOOTING

When one or more of a unit's functions do not operate properly and there are proximity switches in the circuits of the unit for these functions, refer to the following table as a guide to find the problem(s).

NOTICE

Heil proximity switches have a Light Emitting Diode (LED) on the switch to indicate that the switch is sensing metal. The light changes color when the switch senses metal. Green indicates the switch is ON. Yellow indicates the switch senses metal. Some proximity switches only have the yellow light.

Proximity Switch Troubleshooting Table		
Probable Cause	Remedy	
Loose or corroded electrical connections.	Replace the electrical connections.	
 Damaged Switch A. Cracked Ferrite core causing the fine internal wire to break. B. Cracked Ferrite core – but wire is not broken – the sensitivity of switch will increase which causes sensing distance to increase or switch work intermittently as the temperature changes. 	 DO NOT strike switch to make it work. DO NOT damage the switch when you adjust it. DO NOT adjust switch too close to the metal it is sensing. 	
Voltage spikes from truck chassis electrical system will break down the internal electronics of the proximity switch.	 Make sure the power source from the chassis manufacturer is clean. The body electrical system is protected from voltage spikes. 	
Improper Sensing Range	Adjust proximity switches to sense metal as follows: PROX. SWITCH METAL 18 MM — MAX. 3/16" SENSING DISTANCE 30 MM — MAX. 3/8" SENSING DISTANCE	
If the controller input light stays on when a switch is unplugged (the signal wire is carrying +12V DC)	Check the proximity switch electrical circuits for the source of the problem.	
If proximity switch LED light is NOT ON.	 Check the fuse relay block (Half/Packs with IFM controllers). The fuse/relay box is located in the cab. Or Check the in-line fuses (Side Loaders with IFM controllers). The in-line fuses are located in the cab. Unplug proximity switch. Check the power wire (terminal C) for +12 VDC with a multi-meter. Check ground signal with multi-meter for continuity to chassis ground. Check the signal wire for continuity to appropriate controller input terminal. See Service Manual. If all three (3) wires are good, replace the proximity switch. 	

PROXIMITY SWITCH TROUBLESHOOTING (CONTINUED)





PROXIMITY SWITCH TROUBLESHOOTING (CONTINUED)

Testing Prox Switches Using Your Controller



PROXIMITY SWITCH TROUBLESHOOTING (CONTINUED)



DECALS ON THE UNIT

Make sure you can read all hazard and instruction decals. Clean decals if you cannot read the words. See for directions on cleaning decals.

Replace any decal that is damaged, missing, or is not readable.

When you replace a part that has a decal, make sure a new decal is installed on the new part. See the Parts and Service manual for a complete decal kit and individual decals. Order the decal kit or individual decals from your Heil Dealer or from Heil.

DECAL CARE

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.

A. General Instructions

Following these instructions helps the decals adhere longer.

- 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.
- **B. 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.

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 (do not use sharp angles this can lift the decals from the unit)
- Distance of nozzle to decal: 38 cm minimum
- Water pressure: <= 5.5 MPa
- Length of time: not more than 30 sec.
- NEVER use a "turbo pressure nozzle".

C. Remove Difficult Debris

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

- · 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 Support.

General Information

22

DECAL CARE (CONTINUED)



INCORRECT TECHNIQUE Figure 3. Incorrect Technique

HYDRAULIC SYMBOLS



HYDRAULIC SYMBOLS (CONTINUED)



ELECTRICAL SYMBOLS

SYMBOL DEFINITIONS



SECTION 2 PUMP

HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) Pump

LOAD SENSE PISTON PUMP (219-2426) NOMENCLATURE



LOAD SENSE PISTON PUMP (219-2426) NOMENCLATURE (CONTINUED)



LOAD SENSE PISTON PUMP (219-2426) COMPENSATOR

The Compensator regulates the hydraulic pressure and is preset at the factory. It is set to signal the pump to provide and maintain Stand-By Pressure (500 psi). Also, it limits the working pressure to 2500 psi. It also acts as a variable flow switch for the pump. The more pressure we provide to the load sense line from the valve, the more flow the pump provides the valve and cylinders we are using.

Please call Heil Technical Services at 866-310-4345 BEFORE attempting any adjustments. It is rare for this to be out of adjustment.



HALF/PACK® (FEATURING ODYSSEY® CONTROLS)

Pump

HYDRAULIC STAND-BY PRESSURE

With the engine running, pump ON and NO function has been initiated, the pressure hose should have 500 psi. This can be checked with a gauge on the gauge port at the Body Valve. This is called The Stand-By Pressure.

If there is no pressure on the gauge with the engine running and pump on, there may be a problem with the compensator located on the pump.



DIRECTION OF HYDRAULIC OIL FLOW


HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Pump

PUMP INSPECTION

Important Inspection Tasks

- Check pressure fluid level in tank.
- Check cleanliness/condition of the hydraulic fluid.

NOTICE

A check of the hydraulic fluid can be regarded only as a rough indicator for the fluid condition (milky/black appearance, gumming, sludge at the tank bottom, or smell of burnt oil).

- Check filter clogging indicators/difference pressure switches (when apparent) while system is in operation.
- Check persistent fluid temperature while system is in operation (usually <140 degrees F, maximum 176 degrees F).
- · Check operation pressure levels and operation speeds.
- Check for external leaks.
- · Check tubes and hoses for proper mounting and indications of rubbing.

NOTICE

Damaged tubes and hoses should be replaced immediately!

- Check visually the hydraulic accumulators.
- Check visually all electrical connections of motor, solenoids, sensors, and pressure switches.

PUMP MAINTENANCE

Important Inspection Tasks

Hydraulic Fluid

The service life of hydraulic fluids is highly dependent on the operation temperature and the conditions. The maximum operation temperature usually is 80°C, an increase of 10°C will reduce the service life by 50%.

NOTICE

Different kinds of pressure fluids should not be mixed as this might cause sludge or gumming. It is recommended to flush the system prior to any change of the fluid type and to contact the fluid manufacturer.

- The fluid should be drained while the system is warm. Used oil should be disposed professionally.
- Heavily aged or contaminated fluid can't be improved by simply adding fresh fluid.
- The hydraulic fluid has to be filled-in via the system filter or via a mobile filtration system. The absolute filter rating for this initial filtration must be at least as high as the rating of the system filter.
- Fluid samples have to taken and tested for contamination kind, size, and level with the results being documented.

PUMP MAINTENANCE (CONTINUED)



The complete hydraulic system has to be depressurized prior to any works at accumulators. No soldering, welding, or machining is allowed at hydraulic accumulators! Incompetent handling may cause severe accidents!

- Check the setting of system and control pressure.
- Any pressure re-adjustments should be documented, as this may be a sign of wear.
- When repeated readjustment of the pressure valve becomes necessary to achieve the specified setting, it indicates wear of the pressure valve.
- Check the tubes and hoses for external leaks.

NOTICE

It is most important that the system is completely depressurized prior to removal of fittings, hoses or other components. Leaks at joints sealed via soft-iron rings, O-rings or other contoured seals cannot be solved by simply re-tightening of the joint (observe the perm. torque) as the seal material has hardened or is otherwise damaged. Seals should always be replaced and not reused.

• Check the function of control and monitoring devices (pressure gauges and pressure switches).

PUMP REPAIR

Important Inspection Tasks

A. Troubleshooting

- A successful troubleshooting of hydraulic systems requires a detailed knowledge about the hydraulic system and understanding of the layout, operation, and ensemble acting of the individual components. All documentation required should be at hand. Understanding usually requires the ability to read hydraulic and electrical circuit plans.
- Suited test devices include a temperature gauge, pressure gauge, multimeter, stop watch, and rev. counter.

B. Repair

NOTICE

Minor repairs should only be undertaken by qualified personnel. Major repairs and overhauls should only be undertaken by the manufacturer.

- Cleanliness is mandatory when working on hydraulic systems! This is especially true with systems with an Axial Pumps. All surfaces where joints are to be separated should be cleaned prior to disassembly. All ports should be plugged to prevent contaminants to enter an open system.
- Defective devices should not be repaired on site because the tools and cleanliness required for professional repairs is not present. It is better to replace only the complete unit or at least sub-assemblies, which can be tested individually, on site. This way standstill periods and fluid losses are minimized as well as repairs are made more easily.
- It is important to take into account whether the malfunction of the repaired component may have caused malfunction of other components, for example by migrating debris or even fragments within the hydraulic system.
- After repair of the component, one should look for and solve the basic cause for this malfunction, for example unsuitable filtration level, elapsed preventive service maintenance.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS)

PUMP START-UP PROCEDURE

NOTICE

When installing a new pump, you MUST prime (fill) the new pump with hydraulic fluid BEFORE operating, otherwise damage WILL occur.

When replacing or re-installing the hydraulic pump after repairs, the housing of the pump must be filled with hydraulic fluid through the case drain port, either before or after mounting the transmission.

- 1. Attach case drain hose between the pump connection and the reservoir.
- 2. Connect the inlet hose to the rear of the pump and reservoir. After filling reservoir, loosen top adapter screws on the inlet and rotate hose adapter down, cracking the top of the adapter away from the pump.
- 3. Open the tank shut-off valve to purge as much air as possible out of the hose, filling the inlet hose with oil.
- 4. Tighten the inlet retainer screws, top off fluid level of the reservoir if necessary.



Figure 4. Case Drain Port

TROUBLESHOOTING PUMP



HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) Pump

TROUBLESHOOTING HOTSHIFT PTO



HALF/PACK® (FEATURING ODYSSEY® CONTROLS) NOTES

SECTION 3 BODY AND TAILGATE

BODY NOMENCLATURE

The figure below shows the major components and their typical locations on the unit.



Figure 5. Body 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 LIFT CYLINDER
4	PACKER/EJECTOR PANEL & CYLINDERS	8	HOPPER	12	BODY	16	TAILGATE

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body and Tailgate

TAILGATE NOMENCLATURE

The figure below shows the major tailgate components and their locations on the unit.



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.

A 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.

\Lambda 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.

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

Never drive the unit with the body propped.

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)

The factory-supplied body props are located on both sides under the body and forward of the rear wheels. Refer to the figure to the right and carefully follow the body propping procedures below.

☑ Follow These Steps to Raise 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 the unit.
- 5. Remove the bolts and springs from the chassis mounting brackets.



Figure 7. Removing Bolts and Springs from Chassis Mounting Brackets

- 6. If equipped with quick disconnects, uncouple prior to raising the body.
- 7. 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.
- 8. Observe and obey the DANGER labels for an elevated chassis.
- 9. PRESS and HOLD the UP button to RAISE the body.
- 10.RELEASE the UP button when the body is at the height you want.
- 11.Release the prop handles and LOWER the body props, then PRESS the DOWN button to lower the body onto the lugs.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body and Tailgate

PROPPING THE BODY OF A SERVICE HOIST UNIT (CONTINUED)

- 12.NEVER open the override valve when the body is elevated.
- 13.Perform the maintenance or service procedures.



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.

A 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.

\Lambda 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.

A DANGER

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

A WARNING

Never drive the unit with the body propped.

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)

The factory-supplied body props are located on both sides under the body and forward of the rear wheels. Refer to the figure to the right and carefully follow the body propping procedures below.

☑ Follow These Steps to Raise 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 15 the unit.
- 4. Remove the bolts and springs from the chassis mounting brackets. See the figure below.



Figure 9. Removing Bolts and Springs from Chassis Mounting Brackets

- 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.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body and Tailgate

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

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



10. Front Body Chain Hook Lugs

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



Figure 11. Release and Lower Factory Body Props

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

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.



12. Release and Lower Factory Body Props

11.Perform the maintenance or service procedures.

☑ Follow These Steps to Lower 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 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.
- 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.

TAILGATE SUPPORT PROPS

Two support props are on the unit and must be used whenever the tailgate is opened for service or maintenance. Both props must be used.

A DANGER

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

A CAUTION

Two props are installed on the unit. Both props must be used!

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) and **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 15 mode.

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.



SIDE ACCESS DOOR

A hinged access door is located on the street side of the unit and provides access to the body area for cleanout purposes. Never enter the door unless the truck engine is stopped, the ignition key is removed, and the unit is in **Lock-Out/Tag-Out mode** 15. See the figure below.

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. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb in or on the body or on equipment can cause serious injury or death.



Figure 14. Side Access Door

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body and Tailgate

SIDE ACCESS DOOR PROXIMITY SWITCH

One 18mm sourcing or sinking proximity switch located by the side access door. This switch is adjusted properly when the sensing gap between switch and target is 1/8". See the figure below.

NOTICE

Side door must be closed and latched prior to adjustment of the side door proximity switch.



Figure 15. Side Door Proximity Switch

MAIN UNDERBODY VALVE

The Under Body Valve is a Proportional Control Valve. We can control how much hydraulic oil goes to these circuits by shifting the valve spools small or large amounts. This is done with Pulse Width Modulation (PWM). Instead of just 12v turning on and off a valve coil, with PWM we can control what the coil receives so we can adjust speeds and cushion the cylinders.

The 8 valve coils on the Main Under Body Valve are controlled by output signals from the Cortex Controller and can be viewed with the **In-Sight™ Diagnostic Display** in the cab.

On the Output section of this document we see outputs that showed PWM %. This is only used for signals going to the Under Body Valve for Pack Extend and Retract, Arms Up and Down, Forks Up and Down, and Carry Can/Tailgate sections.

A test light is the best tool to see If you are getting the signal to the valve.



BODY VALVE TO CUROTTO AND TAILGATE VALVES



Main Body Valve 💻

INSTRUCTIONS OF INSPECTION FOR OVER-PACKING

Use the instructions that follow and perform the inspections necessary and any necessary actions due to damage to the unit from over-packing.

Note: These instructions are for the Freedom body only.

A. Prepare the Unit for Inspection of Cracks

- 1. Before performing the inspections, you must set up the unit.
- 2. Clear the area around the unit of all unnecessary people and equipment.
- 3. Start the engine and let the hydraulic oil warm up to at least 100° F. Monitor the temperature sight gauge for the temperature of the hydraulic oil. When the unit is in a cold-weather climate and the ambient air temperature is below 0° F, follow the procedures in the Operator's and Service for **Cold Weather Warm-Up Procedure**

A DANGER

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

\Lambda DANGER

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

- 4. After the hydraulic oil is warm, MOVE the TAILGATE LOCK/UNLOCK switch to the UNLOCK position.
- 5. MOVE the TAILGATE RAISE/LOWER switch to the RAISE position and RAISE the tailgate sufficiently to use the tailgate props.
- 6. SET the tailgate props.

A DANGER

Make sure no one is in the hopper and body before you operate the packer. Serious injury or death can occur if a person is in the hopper or body while the packer moves. Make sure there is no equipment in the hopper and body. Equipment in the hopper or body can damage the unit when the packer moves.

- 7. Make sure the packer is in the fully RETRACTED position. If it is not, PRESS the PACKER RETRACT button and fully RETRACT the PACKER.
- 8. Turn the engine OFF.
- 9. After you set up the unit, you must put the unit in a Lock-Out/Tag-Out mode.

B. Lock-Out/Tag-Out

Put the unit in a Lock-Out/Tag-Out condition. See Service Manual Section 1 for Lock-Out/Tag-Out information.

NOTICE

If your employer or company has Lock-Out/Tag-Out procedures that are different from the following procedures, use your employer's or company's procedures. If your employer or company does not have Lock-Out/Tag-Out procedures, use the procedures that follow. Contact your supervisor if you have any questions about Lock-Out/Tag-Out procedures. If your supervisor has any questions, that person can contact ESG Technical Service.

INSTRUCTIONS OF INSPECTION FOR OVER-PACKING (CONTINUED)

C. Over-Packing Inspections

- 1. Thoroughly clean the inside and outside of the body before you inspect the unit for cracks.
- 2. Inspect for cracks in the metal of the unit as shown in the following illustrations. (The red dots indicate the inspection points.) Check both sides of the body.
 - a. For Point 1, check inside of body where the Packer track meets front hopper head.
 - b. For Points 2 and 3, check underneath the body:
 - (1) For Point 2, check the top edge of cross shaft lug attachment to floor sheet
 - (2) For Point 3, check the longmember to front subframe crossmember corner.
 - c. For Points 4 and 5, check:
 - (1) For Point 4, check the lower joint at which the three bolsters shown meet
 - (2) For Point 5, check around the boss for the pin to attach the arm cylinder.
 - d. For Point 6, check the upper joint at which the three bolsters shown meet.
 - e. For Point 7, check the body side at the center of the body and the bend in the body side sheet.
 - f. For Point 8, check the end of the bolster on the body side.
 - g. For Point 9, with the tailgate open, check the back surface of the rear body bolster.
 - h. For Point 10, check the body roof sheet in the corner. See the figure on the next page.



Half Pack Freedom Body Inspection Check Points

Figure 16. Front Loaders Body Inspection Check Points

INSTRUCTIONS OF INSPECTION FOR OVER-PACKING (CONTINUED)

- C. Over-Packing Inspections (Continued)
 - 3. If cracks are visible, contact your Heil dealer or Heil for recommended countermeasures. Continued operation of a vehicle with cracks can lead to detrimental damage to the structure that may or may not be repairable.
 - 4. If consistent over-packing is suspected, do the following.
 - (a) Inspect for cracks in the metal of the body as given above on a monthly (200 hours) basis.
 - (b) Give additional operator training on proper allowable payloads.
 - (c) Recalibrate the HOPS.
 - (d) Confirm proper pressure settings in the body. Refer to Paragraph A.
 - 5. If no metals cracks are found, keep the unit in the Lock-Out/Tag-Out mode and go to Paragraph 4.

WELDING AND ELECTRONIC DEVICES / ELECTRICAL LUBRICANTS

Before welding on any unit with electronic devices like the Cortex Controller™ and proximity switches, complete the following procedures.

Never weld on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas. See Service Manual Section 1.

- Disconnect all battery connections.
- Place welding ground as close as possible to the area that is being repaired.
- Disconnect the Cortex Controller.
- If welding within 24 inches of a proximity switch, remove the switch from the unit.

NOTICE

Failure to follow these procedures may cause damage to the devices. The damage comes from the inability of the devices to withstand the amperage, open circuit voltage and magnetic flux a welder can produce.

Electrical Anti-Corrosion Lubricant

It is very important that all packard connectors are properly lubricated. The following compounds, by brand name or functional equivalents, are approved for use.

- Truck-Lite Corrosion Preventive Compound
- GB ox-gard, anti-oxidant compound
- Burndy Penetrox A electrical joint compound.

These lubricants may be obtained at an electrical supply store.

SECTION 4 MAINTENANCE AND ADJUSTMENT

BODY DAILY CHECKLIST

Make sure you perform a daily check of the unit. Refer to the Operator's Manual for the Daily Checklist. Many checks in the Daily Checklist are maintenance related, such as checking tire pressures and hoses for wear and damage.

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.				
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	90 PSI, typically located at front of body.				
Operation	Operate All Functions to make sure all functions work correctly.				

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Maintenance and Adjustment

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 checked and serviced. Severe use or adverse conditions may require more frequent maintenance.

BODY PREVENTIVE MAINTENANCE CHART							
*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(s) 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(s). Change oil when oil sample shows to change oil.	
	When the hydraulic oil analysis shows the oil has expired			Drain, flush, and refill the hydraulic oil. 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.	
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	

BODY PREVENTIVE MAINTENANCE CHART						
*HOURS OF OPERATION						
COMPONENT/SYSTEM	8	40	200	1000	2000	CHECK/SERVICE
						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 Lubrication Guide 59.
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						Calibrate cylinder sensors. See Service Manual, Cylinder Sensors Calibration 104.
Tailgate Seal Integrity						
Packer/Ejector Cylinder Preventive Maintenance						See Packer/Ejector Cylinder Preventive Maintenance.
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.						

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.



CUROTTO-CAN® 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.

The Curotto-Can[®] comes standard with a multiple point lubrication system or with an optional single point lubrication system.



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.

The Curotto-Can[®] comes standard with a multiple point lubrication system or with an optional single point lubrication system.

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 the block flow of grease to the entire system. Repair any damaged lines or system components immediately.



PACKER/EJECTOR CYLINDERS PREVENTIVE MAINTENANCE

It is critical to follow the guidelines of the **Body Preventive Maintenance Chart** and **Body Lubrication Guide** found in this section of this Service Manual and the Body Lubrication Guide decal on the unit. Failure to follow stated routine preventive maintenance can lead to premature cylinder failure that is not covered by your warranty.

Make sure that the unit is in Lock-Out/Tag-Out mode before you perform maintenance/service procedures, or when you enter or climb on the hopper/body/related assemblies. Equipment is operational when the unit is not in Lock-Out/Tag-Out mode. Equipment operated while you do maintenance or service procedures can cause serious injury or death so also make sure to clear the area around the unit of all bystanders.

Failure to follow these instructions can result in damage to the Heil body, truck chassis or can cause personal injury!

HEIL PACKER/EJECTOR CYLINDERS PREVENTIVE MAINTENANCE CHART								
DAILY	WEEKLY	MONTHLY						
 Using a plastic bladed shovel, clean behind the packer panel and pockets around sphericals. DO NOT damage cylinder rods by striking with any metal object. Visually inspect that lube lines (if equipped) are connected and not damaged or leaking. Visually inspect packer tracks and hopper floor for excessive wear or damage. Repair or replace if 	 Grease Packer/Ejector cylinder spherical bearings/pins Inspect packer/ejector cylinder bearings/pins (both ends) for wear, rust or damage and replace if necessary. 	Perform the operational "Checks and Inspections" found in the Operation Manual. If unit recalibration is required, refer to Cylinder Sensors / Arc Sensor Calibration 104 in Service Manual.						

Side Loading and Premature Cylinder Failure can be caused by:

- Inadequate greasing intervals
 - o causing increased friction at spherical bearings
 - o potentially resulting in seizing of spherical bearings
- Packing into the second stage of a multistage cylinder
- Binding of components caused by debris (see figure to right)

PACKER/EJECTOR PANEL ADJUSTMENT

Follow this procedure and refer to the figure below to adjust the Packer/Ejector for Autopack units.

NOTICE

Failure to maintain proper adjustment may affect payloads and/or cause structural damage to the unit.

Packer/Ejector Panel adjustment may be needed when the arc sensor for the packer is changed or is needed to be recalibrated. Calibration should be performed ONLY by authorized service personnel. See **Cylinder Sensors / Arc Sensor Calibration** 104 for more information.



CYLINDER SENSORS

Half/Pack (featuring Odyssey Controls) uses linear position sensors inside the street side arm and fork cylinders to transmit arm/fork positional data to the Cortex Controller[™]. These cylinder sensors cannot be replaced in the field. It is recommended to calibrate these sensors annually to compensate for mechanical drifting of components. See **Unit Calibration** 104.

Additionally, the unit uses high pressure proximity sensors (Part Number 063-0151) inside the tailgate lock cylinders (QTY 2), tailgate raise cylinder (QTY 1), and top door cylinder (QTY 1). See **In-Cylinder Proximity Sensors Replacement** 63.

IN-CYLINDER PROXIMITY SENSOR REPLACEMENT

Heil Half/Pack units use high-pressure In-Cylinder Proximity Sensors (Part Number 063-0151) to communicate piston positioning of the tailgate lock cylinders (QTY 2), tailgate raise cylinder (QTY 1), and top door cylinder (QTY 1) to the Cortex Controller[™]. Only properly trained and authorized service personnel should attempt any type of hydraulic system work.

DO NOT operate cylinder with proximity sensor removed. The sensor port is wet port (hydraulic pressurized port). The unit must be in Lock-Out/Tag-Out Mode BEFORE you remove the proximity sensor.

- 1. Position the cylinder so that the cylinder piston is aligned with the sensor port. This position is fully collapsed on Tailgate Raise and Top Door cylinders and fully extended on Tailgate Lock cylinders. See the figures below.
- 2. Place the unit in Lock-Out/Tag-Out Mode 15.
- 3. Remove faulty sensor. Replace with new sensor (Part Number 063-0151) by gently turning the new sensor into the port clockwise until it makes contact with the cylinder piston, then turn counterclockwise 1/2 turn and tighten the jam nut to lock the sensor in place. For confirmation of a successful installation, make sure at least two threads of the sensor are protruding out of the lock nut.
- 4. Take the unit out of Lock-Out/Tag-Out Mode 15.





Figure 18. Tailgate Lock Cylinder Fully Extended

Figure 17. Tailgate Raise or Top Door Cylinder Fully Collapsed

IN-CYLINDER PROXIMITY SENSOR TROUBLESHOOTING

Wire colors in the figure below represent the Heil harness side of connections.

- 1. Make sure the 12 V supply is good at Pin-C.
- 2. Make sure the ground is good at Pin-A.
- 3. When the cylinder piston is in front of the proximity sensor, you should see 12 V at Pin-B. When the piston is not in front of the proximity sensor, there should be 0v on Pin-B.



Figure 19. Wire Colors Above Represent Heil Harness Side of Connections

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.

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.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Maintenance and Adjustment

PREPARING THE UNIT TO CHECK THE OIL LEVEL

Before checking the oil level or adding oil, make sure 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

The oil tank is mounted behind the chassis cab. The oil level in the standard tank must be kept between the low and full marks as indicated on the sight gauge. See the figure below.




CHECK OIL LEVEL

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

<u>Important</u>: 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.

WHEN TO CHANGE OIL FILTER ELEMENT

Change the filter more often under certain conditions such as an extremely dusty atmosphere or area. Use only Heil replacement filters. Purchase the filter element from your local Heil distributor.

Change the filter element when oil analysis shows the oil has expired.

CHANGE HYDRAULIC OIL FILTER ELEMENT

Watch the Service Shack Video online at www.Heil.com/Heil-Service-Shack and selecting Changing Filters.

Replace the hydraulic filter element after first 30 days of operation, then every 6 months or 1000 hours of operation OR when filter bypass light is ON. To change the hydraulic oil filter, refer to the figure below and follow these steps:

- 1. Using a 1/2" wrench, remove the four (4) nuts from the filter cover located on the hydraulic oil tank.
- 2. Set the nuts aside for reuse and then remove the filter cover.
- 3. Remove the filter element with the by-pass assembly and responsibly discard as required.
- 4. Clean the housing with a clean, lint-free cloth.
- 5. Check the o-ring and gasket. Replace them if necessary.
- 6. Lubricate all o-rings and gaskets.
- 7. Install new element.
- 8. Reinstall cover with nuts. Torque nuts to 13 ft-lbs.



Figure 21. Hydraulic Oil Filter

DRAIN AND CLEAN THE HYDRAULIC OIL TANK

Change the hydraulic oil when the oil sample shows to change it.

Remember that almost all hydraulic system malfunctions can be traced to dirt in the fluid. When working with the hydraulic system, the hands, tools, working area and parts must be as clean as possible.

Wear proper eye protection when you are working on or around hydraulic lines or components. Wear proper eye protection and avoid contact with hydraulic oil if possible. Never check for oil leaks with your hands.

To drain and clean the hydraulic oil tank, follow these steps:

1. Disengage the pump, shut off the engine and remove the ignition key.

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. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb in or on the body or on equipment can cause serious injury or death.

NOTICE

If your employer or company has Lock-Out/Tag-Out procedures that are different from the following procedures, use your employer's or company's procedures. If your employer or company does not have Lock-Out/Tag-Out procedures, use the procedures that follow.

- 2. Contact your supervisor if you have any questions about Lock-Out/Tag-Out procedures. If your supervisor has any questions, that person can contact ESG Technical Service. Perform the Lock Out/Tag Out procedures 15.
- 3. Remove the fill cap from the top of the tank.
- 4. Remove the drain plug from the bottom of the tank so that the oil drains into a container.
- 5. While fluid is draining from the tank, remove and replace the filter/breather assembly. Change the assembly every time the in-tank filter is replaced.
- 6. To drain the entire hydraulic system, disconnect all hoses at the adapter and drain the hoses into a container.
- 7. Remove and replace the in-tank filter as described in Change the Hydraulic Oil Filter.
- 8. Remove the outlet flange and 100 mesh suction strainer to gain access to the tank inside.
- 9. Remove sediment from the tank bottom.
- 10. Install the outlet flange with a new gasket and the 100 mesh suction strainer into the tank.
- 11.Install the drain plug in the tank bottom.
- 12. Reconnect and tighten all hose connections that were disconnected.

DRAIN AND CLEAN THE HYDRAULIC OIL TANK (CONTINUED)

NOTICE

Before filling the tank be sure the funnel is clean and 200 mesh (or finer) screen is used to strain the hydraulic oil.

- 13. Fill tank with recommended oil, checking the sight gauge as you fill. Refer to Hydraulic Oil Specifications 16.
- 14. Check the entire system to make sure all connections are tight and no leaks are found.
- 15. Start the truck's engine and engage the pump.

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

- 16. Operate the packing panel through 10 cycles to be sure all air is out of the circuits.
- 17. Operate the automated container lift mechanism.
- 18.Operate tailgate full up and full down.
- 19. Operate body raise (dump units) full up and full down.
- 20.With the packing panel in the retracted position and lift in the in-transit position, check tank oil level. If necessary, add recommended as described under Check Oil Level 67.

PRESSURE ADJUSTMENT PROCEDURES

A. Unit Preparation

Follow these unit preparation steps prior to making any pressure adjustments listed in this section. Reliefs must be set at idle.

- 1. Make sure area around unit is clear to enable arm and fork operation
- 2. Place wheel chocks on both sides of driver side rear wheel
- 3. Make sure parking brake is set
- 4. Notify anyone in area that the arms and forks will be operated during this procedure
- 5. Make sure unit is full of hydraulic oil
- 6. Make sure hydraulic oil is at least 100 degrees F before beginning any pressure checks or adjustments.
 - a. If unit oil is not at desired temperature, engage the hydraulic pump.
 - b. Activate and hold the tailgate lock function for two minutes.
 - c. After two minutes release tailgate lock function and cycle the packer/ejector circuit to mix the hot oil.
 - d. Repeat steps (b) and (c) until oil is at desired temperature.

NOTICE

The unit must remain in neutral during all pressure setting procedures. Make sure that the work area is clear of uninvolved people and that the parking brake is fully applied and wheels fully chocked.

B. Required Tools

These are the tools required to make pressure adjustments.

Quantity	ТооІ
1	1/8" open end wrench
1	Ratchet with screwdriver attachment
1	0-5000 PSI hydraulic pressure gauge

C. Valve Locations

The hydraulic control valves are located on the street side of the body. The main body valve that controls the packer, arms, forks, and auxiliary (Curotto-Can[®] valve and tailgate valve flow diverter) hydraulic circuits is located beneath the body and behind a steel cover as seen in the left figure below, at the arrow location. The tailgate valve that controls the tailgate lock/unlock, tailgate open/close, and top door open/close hydraulic circuits is located behind a steel cover as seen in the right figure below.



Figure 22. Main Body Valve with Cover

Figure 23. Tailgate Valve with Cover

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Maintenance and Adjustment

PRESSURE ADJUSTMENT PROCEDURES (CONTINUED)

D. Pressures and Cycle Times

			Commercial Half/Pack [®] (fe (Standard 4)	aturing Odyssey [®] Controls) .5" Cylinders)
			Diesel	CNG
	MAIN RELIEF @1200 ENGINE RPM	2800 PSI	2800 PSI	
		PACKER EXTEND	STANDARD: 2650 PSI SIERRA/FREEDOM: 2000 PSI	STANDARD: 2650 PSI SIERRA/FREEDOM: 2000 PSI
		PACKER RETRACT	2650 PSI	2650 PSI
		ARMS UP	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
	VALVE	ARMS DOWN 8000# ARMS	1250 PSI	1250 PSI
		FORKS UP	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
		FORKS DOWN	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
HYDRAULIC PRESSURE		AUXILIARY SECTION- TAILGATE VALVE SUPPLY	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000
		AUXILIARY SECTION- OPTION VALVE SUPPLY - SEE NOTE 3	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000
		PRESSURE REDUCING SECTION	500 PSI	500 PSI
		TOP DOOR CLOSE	750 PSI	750 PSI
		TOP DOOR OPEN	500 PSI	500 PSI
	TAILGATE VALVE	TAILGATE OPEN	1300 PSI	1300 PSI
		TAILGATE CLOSE	1300 PSI	1300 PSI
		TAILGATE UNLOCK	2000 PSI	2000 PSI
		TAILGATE LOCK	2000 PSI	2000 PSI
		AUTOPACK CYCLE TIME @ 45 GPM	18-22 sec	18-22 sec
FUNCTION	CYCLE TIMES	ARM ONLY CYCLE TIME - 8000# ARMS @ ENGINE IDLE	RAISE 10-13 SEC LOWER 16-19 SEC	RAISE 10-13 SEC LOWER 16-19 SEC
		TAILGATE	RAISE 16-20 SEC LOWER 14-18 SEC	RAISE 16-20 SEC LOWER 14-18 SEC
		TOP DOOR CYCLE TIME	OPEN 26-30 SEC CLOSE 15-19 SEC	OPEN 26-30 SEC CLOSE 15-19 SEC

PRESSURE ADJUSTMENT PROCEDURES (CONTINUED)

			Residential Half/Pack [®] (fea (Standard 4)	aturing Odyssey [®] Controls) 5" Cylinders)
			Diesel	CNG
		MAIN RELIEF @1200 ENGINE RPM	2800 PSI	2800 PSI
		PACKER EXTEND	STANDARD: 2650 PSI SIERRA/FREEDOM: 2000 PSI	STANDARD: 2650 PSI SIERRA/FREEDOM: 2000 PSI
		PACKER RETRACT	2650 PSI	2650 PSI
		ARMS UP	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
	VALVE	ARMS DOWN 8000# ARMS	1250 PSI	1250 PSI
		FORKS UP	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
		FORKS DOWN	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
HYDRAULIC PRESSURE		AUXILIARY SECTION- TAILGATE VALVE SUPPLY	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000
		AUXILIARY SECTION- OPTION VALVE SUPPLY - SEE NOTE 3	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000
		PRESSURE REDUCING SECTION	500 PSI	500 PSI
		TOP DOOR CLOSE	750 PSI	750 PSI
		TOP DOOR OPEN	500 PSI	500 PSI
	TAILGATE VALVE	TAILGATE OPEN	1300 PSI	1300 PSI
		TAILGATE CLOSE	1300 PSI	1300 PSI
		TAILGATE UNLOCK	2000 PSI	2000 PSI
		TAILGATE LOCK	2000 PSI	2000 PSI
		AUTOPACK CYCLE TIME @ 45 GPM	18-22 sec	18-22 sec
		ARM ONLY CYCLE TIME - 8000# ARMS @ ENGINE IDLE	RAISE 10-13 SEC LOWER 16-19 SEC	RAISE 10-13 SEC LOWER 16-19 SEC
FUNCTION	CYCLE TIMES	ARM AUTOLIFT CYCLE TIME - 8000# ARMS @ 45 GPM	RAISE 6-10 SEC LOWER 10-14 SEC	RAISE 6-10 SEC LOWER 10-14 SEC
		TAILGATE	RAISE 16-20 SEC LOWER 14-18 SEC	RAISE 16-20 SEC LOWER 14-18 SEC
		TOP DOOR CYCLE TIME	OPEN 26-30 SEC CLOSE 15-19 SEC	OPEN 26-30 SEC CLOSE 15-19 SEC

PRESSURE ADJUSTMENT PROCEDURES (CONTINUED)

			Residential Half/Pack [®] (fea (Lightning)	aturing Odyssey [®] Controls) 4" Cylinders)
			Diesel	CNG
		MAIN RELIEF @1200 ENGINE RPM	2800 PSI	2800 PSI
		PACKER EXTEND	STANDARD: 2650 PSI SIERRA/FREEDOM: 2000 PSI	STANDARD: 2650 PSI SIERRA/FREEDOM: 2000 PSI
		PACKER RETRACT	2650 PSI	2650 PSI
		ARMS UP	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
	VALVE	ARMS DOWN	1250 PSI	1250 PSI
		FORKS UP	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
		FORKS DOWN	NO CIRCUIT RELIEF	NO CIRCUIT RELIEF
HYDRAULIC PRESSURE		AUXILIARY SECTION- TAILGATE VALVE SUPPLY	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000
		AUXILIARY SECTION- OPTION VALVE SUPPLY - SEE NOTE 3	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000	PORT RELIEF - 2400 PSI LOAD SENSE RELIEF - 2000
		PRESSURE REDUCING SECTION	500 PSI	500 PSI
		TOP DOOR CLOSE	750 PSI	750 PSI
	TAILGATE	TOP DOOR OPEN	500 PSI	500 PSI
	VALVE (PARKER)	TAILGATE OPEN	1300 PSI	1300 PSI
		TAILGATE CLOSE	1300 PSI	1300 PSI
		TAILGATE UNLOCK	2000 PSI	2000 PSI
		TAILGATE LOCK	2000 PSI	2000 PSI
		AUTOPACK CYCLE TIME @ 45 GPM	18-22 sec	18-22 sec
		ARM ONLY CYCLE TIME - 5500# ARMS @ ENGINE IDLE	RAISE 10-13 SEC LOWER 16-19 SEC	RAISE 10-13 SEC LOWER 16-19 SEC
FUNCTION	CYCLE TIMES	ARM AUTOLIFT CYCLE TIME - 5500# ARMS @ 45 GPM	RAISE 5-9 SEC LOWER 9-13 SEC	RAISE 5-9 SEC LOWER 9-13 SEC
		TAILGATE	RAISE 16-20 SEC LOWER 14-18 SEC	RAISE 16-20 SEC LOWER 14-18 SEC
		TOP DOOR CYCLE TIME	OPEN 26-30 SEC CLOSE 15-19 SEC	OPEN 26-30 SEC CLOSE 15-19 SEC

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Maintenance and Adjustment

PRESSURE ADJUSTMENT PROCEDURES (CONTINUED)

	1: Main Pressure settings have a tolerance range of +/- 50 p.s.i. and are to be set at operating speed.
	 Port Relief Pressure settings have a tolerance range of +/- 100 p.s.i. and are to be set at operating speed.
NOTES:	3: Options include: Carry Can Hydraulic Supply, Commercial Gripper, Adjustable Forks, Hydraulic Cab Shield
	4: Throttle Advance set to 1250 rpm
	5: Unless noted, all pressures are good for Standard, Sierra, and Freedom units.
	6: Cycle Times based on 700 RPM at idle.

E. Contact Heil Technical Services at 866-310-4345 for help with pressure adjustments.

CLAMP-ON ARM BOLTS MAINTENANCE

Check clamp-on arm bolts for tightness monthly. See the figure below.

NOTICE

Do not use an impact wrench as thread damage might occur.

NOTICE

If bolts are removed, the bolts MUST be replaced. Contact your local Heil Dealer or Parts Central for parts.

Torque as follows:

- 1. Lubricate threads with anti-seize compound.
- 2. Torque the lock nut to 600 ft. lbs. using a torque wrench.



Figure 24. Clamp-on Arm Bolts Maintenance

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Maintenance and Adjustment

REPAIRING CRACKED WELD JOINTS

Repair all cracked weld joints immediately after finding cracked weld joints. If you are unsure of the proper repair procedure, call Heil Technical Services at 866-310-4345.

INSPECT PROXIMITY SWITCHES

See **Proximity Switch Troubleshooting** 18 for recommended procedures for inspecting proximity switches.

CLEAN AND INSPECT THE TAILGATE SEAL

Periodically check the tailgate seal to make sure it mates properly with the body and inspect for possible wear, damage or leaking. Replace the seal as necessary. See the figure below.



Figure 25. Tailgate Seal

TROUBLESHOOTING MAIN CONTROL VALVE



TROUBLESHOOTING ELECTRICAL



TROUBLESHOOTING DISPLAY NETWORK



Copyright 2021, Heil Environmental Printed in the U.S.A.

TROUBLESHOOTING HEIL NETWORK J1939-1



HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Maintenance and Adjustment

TROUBLESHOOTING HEIL NETWORK J1939-2



Copyright 2021, Heil Environmental

Printed in the U.S.A.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Maintenance and Adjustment

TROUBLESHOOTING CHASSIS NETWORK-J1939-2

Corrupt or missing Chassis data on display (RPM-Road Speed-ETC..)

Disconnect D-1 connector or if equipped- RP170 to chassis connector- chassis network wires labeled J1939-2H and J1939-2L Check resistance in both directions on pins 21 and 22 when disconnected with power off there should be 120 ohms +/- 10% in both directions. Network issue will be in the direction of open or corrupt resistance.



SECTION 5 BODY CONTROLLER HARDWARE

CAN NETWORK



J1939-1 - HMI NETWORK (J1939 BASED - 250Kb Baud Rate) J1939-2 - CHASSIS NETWORK (J1939 BASED - 250Kb Baud Rate) J1939-3 - CONTROLLER INTERFACE NETWORK (J1939 BASED - 250Kb Baud Rate)

CORTEX CONTROLLER™ AND MODULE (NODE) LOCATIONS

Residential units: Main Controller, Tailgate Node, Arm Node, and Cab Node

Commercial units: Main Controller, Tailgate Node, and Cab Node

The 80 I/O Cortex Controller is located midway within the street side of the body behind a steel cover. See the image below and on the next page.



Figure 26. 80 I/O Cortex Controller

701-9341-016

CORTEX CONTROLLER™ AND MODULE (NODE) LOCATIONS (CONTINUED)



Figure 27. Cortex Controller Location

A 32 I/O Cortex Controller Module (Node) is located on the street side of the body behind a steel cover, left of the tailgate valve. See the images below.



Figure 28. 32 I/O Cortex Controller

Figure 29. Cortex Controller Module Location

A second 32 I/O Cortex Controller Module (Node) is located in the cab, typically behind the street side seat.

RESIDENTIAL HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) CORTEX CONTROLLER™ AND MODULE COMPONENTS

For residential, detachable Curotto-Can[®] units, refer to the image below and component descriptions on the next page.



RESIDENTIAL HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) CORTEX CONTROLLER™ AND MODULE COMPONENTS (CONTINUED)

Refer to image on previous page.

REF	PART NUMBER	DESCRIPTION	QTY
1	047-2151-011	4IN-14X1IN LG TEK SCREW #3	2
2	047-2621-375	SCREW, BUTTON HEAD CAP	12
3	054-5449_A	O.D. BLACK AIR LINE	1
4	054-8470-004	LINE CONNECTOR ELBOW	2
5	075-0721	FILTER/REGULATOR W/GAUGE	1
6	108-7691	ROCKER SW, MAINTAINED, DPST	1
7	108-8502	BLOCK, FUSE AND RELAY, 60 WAY	1
8	108-8626-241	SWITCH ACTUATOR, DUAL CONTROLS	1
9	211-9967	FILTER/REGULATOR BRK'T	1
10	234-3374-001	PLATE, RAIN SHIELD T/G CONTROLLER	1
11	254-4897	CONTROLLER, IFM, 80 IO, 32 BIT	1
12	254-4912	CONTROLLER, CORTEX REMOTE MODULE	2
13	263-1908-002	HARNESS, CONROLLER	1
14	263-1908-005	HARNESS, ARM MAIN	1
15	263-1908-007	HARNESS, ARM NODE	1
16	263-1908-012	HARNESS, ODYSSEY BODY VALVE	1
17	311-5666	BRACKET, MOUNTING, FUSE BLOCK	1
18	311-6304	BRACKET, CONTROLLER BODY SIDE	1
19	311-6852	PANEL, CONTROLLER MOUNT	1
20	FSP230400	LOCKNUT, #10 UNC GR5, PLATED	8
21	FSP320700	NUT, 1/4" UNC GR8, PLATED	2
22	FSP420711	MACH. SCREW 1/4-20 NC X 1/2, PLATED	2
23	FSP510400	WASHER, FLAT, #10 STD , PLATED	8
24	FSP510700	WASHER, FLAT, 1/4" STD , PLATED	2
25	FSP550700	LOCK WASHER, PLT	4
26	FSS230700	LOCKNUT, 1/4" UNC STAINLESS STEEL	10

COMMERCIAL HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) CORTEX CONTROLLER™ AND MODULE COMPONENTS

For commercial Half/Pack[®] (featuring Odyssey[®] Controls) units, refer to the image below and component descriptions on the next page.



COMMERCIAL HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) CORTEX CONTROLLER™ AND MODULE COMPONENTS (CONTINUED)

Refer to image on previous page.

REF	PART NUMBER	DESCRIPTION	QTY
1	047-2621-375	SCREW, BUTTON HEAD CAP	8
2	234-3374-001	PLATE, RAIN SHIELD, TAILGATE CONTROLLER	1
3	254-4897	CONTROLLER, IFM 80 I/O, 32 BIT	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1908-002	HARNESS, CONTROLLER	1
6	263-1908-004	HARNESS, ARM	1
7	263-1908-012	HARNESS, ODYSSEY BODY VALVE	1
8	311-5666	BRACKET, MOUNTING FUSE BLOCK	1
9	311-6304	BRACKET, CONTROLLER BODY SIDE	1
10	311-6852	PANEL, CONTROLLER MOUNT	1
11	FSP230400	LOCKNUT, #10 UNC GRADE 5, PLATED	8
12	FSP320700	NUT, 1/4" UNC GRADE 8, PLATED	2
13	FSP420711	MACH. SCREW, 1/4/2020, NC X	2
14	FSP510400	WASHER, FLAT #10 STD PLATED	8
15	FSP510700	WASHER, FLAT 1/4" STD PLATED	2
16	FSS230700	LOCKNUT, 1/4" UNC STAINLESS STEEL	10

CORTEX CONTROLLER™ AND MODULE FUNCTIONS

For residential units, remote controller nodes reduce wiring in the body harness and decrease troubleshooting time, i.e. if power ground and signal are going to node, then the Service Technician knows the issue is between node and valve.



CORTEX CONTROLLER™ PROGRAMMING

Contact Heil Environmental for re-programming of the Cortex Controller.

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) Commercial Cortex Controller[™] Program 109-0307 or Half/Pack (featuring Odyssey Controls) Detachable Can Cortex Controller[™] Program 109-0306 in the Body Controller Software Institute Body Controller Software section of this 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.

<u>Note</u>: To toggle from Camera Mode to Home Screen: Hold right top button for 5 seconds. To toggle from Home Screen to Camera Mode: Hold left top button for 5 seconds (or power cycle truck ignition). While in Camera Mode, you can temporarily view any message on the display by holding down the right arrow on the display. See **Camera System** 93.



INSIGHT™ DIAGNOSTIC DISPLAY

The Half/Pack (featuring Odyssey Controls) comes standard with a 7" InSight Diagnostic Display or optionally with a 12" InSight Diagnostic Display. Contact Heil for re-programming of the display.

HOME SCREEN

The Half/Pack (featuring Odyssey Controls) comes standard with a 7" InSight Diagnostic Display or optionally with a 12" InSight Diagnostic Display. Contact Heil for re-programming of the display.

When the truck key switch is on (for trucks without an integrated camera system) or after you toggle from Camera Mode to Home Screen (for trucks with an integrated camera system), the home screen will be displayed. This screen will show the operator button menu icons, diagnostic display messages and 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.

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 **Body Controller Software Section** Its 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.

CAMERA SCREEN AND SYSTEM (IF EQUIPPED)

Depending on unit option configuration, your unit can be equipped with multiple cameras that are viewable on the InSight™ Diagnostic Display.

Toggle Camera / Home Screen Modes

For trucks equipped with a camera system, when the truck key switch is first tuned ON, the camera views will be shown on the display. You can temporarily view any message on the display by holding down the right arrow on the display. Release the right arrow to return to the camera view. You can also toggle from Camera Mode to the Heil Home Screen by following the instructions below.

- 1. 2018 models with 109-0309-20180509 revision of display code or later:
 - a. Toggle from Camera Mode to Home Screen: Hold right top button for 5 seconds.
 - b. Toggle from Home Screen to Camera Mode: Hold left top button for 5 seconds (or power cycle truck ignition).
- 2. 2018 models with 109-0309-20180416 revision of display code:
 - a. Toggle from Camera Mode to Home Screen: Hold OK button + right top button for 5 seconds.
 - b. Toggle from Home Screen to Camera Mode: Hold OK button + left top button for 5 seconds (or power cycle truck ignition).

3rd Eye Remote

- 1. Red Power Button: turns power on/off to the video box.
- 2. The "JUMP" Button: cycles through the different input configurations for the camera view, i.e. you can select whether you want to see 1,2,3 or 4 different cameras at one time.
- 3. The "SOURCE" Button: cycles through the different camera views, i.e. once you have the input configuration selected using the "JUMP" button, the "SOURCE" button determines what camera view you see.
- 4. The "MIRROR" Button: changes the camera view to a mirrored image of the previous view.

Camera Boot Up Process

If the video box gets turned off, the following steps need to be performed:

- 1. Make sure the key switch is ON for the unit.
- 2. On the 3rd Eye Remote, press the red power button on the top right.
- 3. Turn the key switch OFF and then turn the key switch back ON (i.e. power cycle truck ignition).

You should now have the camera box turned on and the camera views (if configured) will be visible on the display.

CAMERA SCREEN AND SYSTEM (IF EQUIPPED)

Camera System Configuration

The camera system will be configured in the InSight[™] Diagnostic Display when you receive the Heil unit. However, if you install or uninstall cameras or install a new display on the unit, follow these steps to turn the cameras installed on your unit ON or OFF.

1. Select the Camera Config button (3rd button from the top on the left of the display). See the image below.



- 2. Type in the Camera Configuration password. Contact Heil Technical Service at 866-310-4345 to get the password.
- 3. Check the unit sales order to find what cameras are to be installed on the unit. On the camera configuration screen, scroll and select using the "OK" button the corresponding cameras per the sales order. ONLY CONFIGURE THE CAMERAS LISTED ON THE SALES ORDER. See the image below.



4. Cycle the power to the display and the cameras will be correctly configured.

CAMERA SCREEN AND SYSTEM (IF EQUIPPED)

Camera System Configuration (Continued)

5. In the event that you need to turn off the camera view and go back to the control screen, press and hold the top right button on the display for 5 seconds. If a trigger is active (Reverse, L Turn, or R Turn), you will not be able to turn off the camera view. See the image below.



6. To turn the cameras back on, press and hold the top left button on the display for 5 seconds OR cycle the power to the display. See the image below.



COUNTERS SCREEN

The Counters Screen allows you to monitor daily and total arm cycles, daily and total pack cycles, maintenance hours, pump hours and filter bypass hours.

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 on Half/Pack with Odyssey controls and Packer Sensor on all other Half/Packs, 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.

Watch the Service Shack Video online at www.Heil.com/Heil-Service-Shack by selecting Entering Service Mode.



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, enter Maintenance Mode and scroll to Service Mode press the OK button for 3 seconds to turn on Service Mode.
 - b. The password screen will appear on the display.
 - c. Enter the service password 4 3 2 1 and press OK.
 - d. Select Service Mode with the arrows, then press OK button down for 3 seconds to enter service mode.
 - 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.

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).

Rome (Öptions
1			*
Counters	Curotto Count	0	Service
	Arm Count	0	
~	Packer Count	0	
1	Maintenance Hours	0.0	1 I I I I I I I I I I I I I I I I I I I
Camera	Service Mode	[OFF]	Calibration
Config	Depressurize Curotto Hydraulics	[OFF]	
Reset ALL			Maintenance
ی Brightness			

HEIL® AUTONOMOUS LIFT OPTION (H.A.L.O.) CONTROLS OPTIONS

A. Set the H.A.L.O. Controls Options

There are various options that can be set on the InSight[™] Diagnostic Display for the H.A.L.O. Controls. See Figure below and carefully follow the instructions below . These instructions should be used in conjunction with the H.A.L.O. Semi-Autonomous Controls video on the Heil Service Shack.



FROM THE HOME SCREEN, PRESS THE DOWN ARROW

Figure 30. InSight™ Diagnostic Display: Semi-Autonomous Controls Screen

- 1. First, press and hold the top right button on the display to exit the camera monitor mode and return to the Heil Home screen. Then press the down arrow to access the Semi-Autonomous Controls screen.
- The second from the top button on the left will adjust the amount of time the Semi-Autonomous Lift will pause at the hopper to dump the container from 0 seconds to 15 seconds. One press of the button will add a second to the pause time.
- 3. The middle button on the left will adjust the offset angle from the full tuck position for the forks from 0 degrees to 45 degrees. Each press of the button will increase the angle by 5 degrees.
- 4. The second from the top button on the right will adjust the arms Transit Position between the over-height position or to the Full Up position against the arm pads.
- 5. The button on the top right will adjust the Work Position between the following settings: No container, 4-yard container, 6-yard container, or 8-yard container.

NOTE: Your containers may not line up with our factory set calibration. If needed, recalibrate your Semi-Autonomous Controls to your specific route requirements. You can recalibrate the controls for ANSI compliant 2 and 3-yard containers.

B. Calibrate the H.A.L.O. Controls Options

Carefully follow the instructions below to calibrate the Semi-Autonomous Controls settings. These instructions should be used in conjunction with the H.A.L.O. Semi-Autonomous Controls video on the Heil Service Shack.

1. First, press the calibration button on the monitor, enter the password, and press the OK button. After entering the password, you will enter Calibration Mode and can begin the calibration process.

NOTE: If you need the password, please contact Heil Technical Service.

- 2. To begin, move the arms to the Full Down position, the forks to the Full Up position, and then fully retract the packer. When these are in the correct position, press the OK button. Then press OK again to zero the Arm/Packer positions.
- 3. Next, move the forks to the Full Down position. To achieve this, you will have to raise your arms slightly so that the forks can be fully extended down without contacting the ground. The minimum recommended setting is 100°. When the forks are in the correct position, press the OK button.
- 4. Move the arms to your route's 4-yard container height and forks level position and press the OK button.

NOTE: Alternatively, this setting can be set to your route's 2-yard or 3-yard container height and forks level position.

- 5. Move the arms to your route's 6-yard container height and forks level position and press the OK button.
- 6. Move the arms to your route's 8-yard container height and forks level position and press the OK button.
- 7. Move the arms to the over-height position and level the forks. This position is when the fork tube is just at the top of the windshield or just above the driver's line of vision.

IMPORTANT NOTE: Setting the forks to a level position is critical. If you go below level, a container could slide off the forks. If you go too far above level, spillage may occur. The maximum over-height setting is 55°, and the Forks Level position must be between 100° and 120°. When you are in the correct position, press the OK button.

- Now you will need to move the arms to the Forks Roll Position. This position is where the forks start rolling into the hopper at the last few inches of the arm up travel. The minimum setting is 75°. When in the correct position, press the OK button.
- 9. Then move the arms to the Full Up position. This position is when the arms are fully resting against the arm pads. When you have done this, press the OK button.
- 10.Next, move the packer to the Full Pack position. This is the end of the first stage of the telescopic packer cylinders, or 81" of packer travel. If the second stage is showing, retract until the second stage is collapsed. When the packer is in this position, press the OK button.

NOTICE

Cylinder damage will occur if set incorrectly.

- 11. Finally, move the packer to the Transit position. This moves the packer a little further than the Full Pack Position and will close off the body area. Once the packer is in this position, press the OK button.
- 12. The next screen you see will be the HOME screen. This means that you have completed the calibration.
- 13.Test all functions and cameras.

SERVICE SCREENS

By pressing the service button you can toggle through several different screens in the display. These screens can be viewed anytime the key switch is on or the truck is running. Nothing on these screens can be adjusted and are view only. Input and Output Screens have several components. To see them all, you may need to press the down directional button to scroll down the list.

- Inputs
- Inputs Ext
- Multiplex
 Inputs
- Remote Inputs
- Setpoints
- Outputs
- Outputs Ext
- Remote
 Outputs
- Control Power



INPUTS / OUTPUTS

A. Inputs

Inputs are signals the controller receives from sensors or switches. Examples being: Prox switch signals, fork cylinder sensors, arm cylinder sensors, packer position sensor, pump on/off push button, system power button, packer extend or retract push buttons and so on. Any switch or sensor that sends signals to the controller are called INPUTS. All inputs can be viewed on the Cortex Controller InSight Diagnostic Display. These screens will show the state of all inputs. Once you are on an input screen, you may need to scroll down to see all inputs on that screen.

Example Input:

Side Door Proximity Switch is CLOSED: the signal from the Side Door Proximity Switch will travel to the Cortex Controller. When this happens, the InSight Diagnostic Display will show the Input to be ON. See the figure below.



INPUTS / OUTPUTS (CONTINUED)

B. Outputs

Outputs are signals sent out of the Cortex Controller to turn something ON or to make something happen. Any signal that is sent out of the controller is an output. Output examples are: Signals sent to valve coils that move a valve spool or to turn on a light. See the figure below.

Example Output:

Hopper Lights are ON: Turning the HOPPER LIGHT switch ON sends an Input signal from the switch to the controller and the controller sends an Output signal to the light to turn the light ON.

Output signals send power to:

- Coils/Solenoids
- Lights
- Body Valve Coils/Pulse Width Modulation (PWM)
 - Packer Extend PWM
 - Packer Retract PWM
 - Forks Up PWM
 - o Forks Down PWM
 - o Arms Up PWM
 - o Arms Down PWM
 - o Tailgate Flow PWM
 - Curotto-Can Flow PWM
- Curotto-Can Valve Coils/SOL
- Tailgate Valve Coils/SOL
- Screen readouts



THE DISPLAY WILL SHOW THE OUTPUT EITHER ON OR OFF
CALIBRATION SCREEN

The Calibration Screen allows you to calibrate various sensors dependent on how the unit is configured.

UNIT CALIBRATION

Calibration may be needed when the arm or fork cylinders are replaced, the linear position sensors inside the street side arm and fork cylinders are replaced or the arc sensor for the packer is changed and needs to be re-calibrated. Calibration should also be performed on an annual basis, and ONLY by properly trained and authorized service personnel. This procedure requires a password to place the unit in Calibration Mode. This password can be provided to authorized service personnel by contacting Heil Technical Services at 866-310-4345.



NOTICE

The unit does NOT have to be placed in Service Mode prior to being placed in Calibration Mode.

- 1. Remove any carry cans (Curotto or Bayne or any other can) from the forks. The forks have to be empty when doing the calibration. Refer to the Carry Can Manufacturer Operation and Service Manual.
- 2. Place the unit in Calibration Mode
 - a. On the InSight™ Diagnostic Display, press and release the Calibration button. See image above.
 - b. The password screen will appear on the display.
 - c. Enter the Calibration Password provided by Heil Technical Services and press OK. Contact Heil Technical Services for the Calibration Password.
 - d. The display will now walk the Authorized Service Person through the calibration routine with prompts on the display.
 - e. The Authorized Service Person can cancel the calibration routine at any point or skip a section by selection ESC or SKIP from the menu.

UNIT CALIBRATION (CONTINUED)

NOTICE

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

- 3. Perform the calibration steps below.
 - a. Place Arms all the way DOWN, Forks Fully Tucked (UP), and fully retract the Packer Blade press OK (the display will move to the next screen)
 - b. Press OK to Zero Arm/Pack Positions.
 - c. Move Forks to Clear Position: forks fully down and parallel to the ground (load position, 82°) press OK
 - d. Move Arms to Over Height Position: fork tube just below the top of the windshield press OK (this is the arms interlock position, 47°)
 - e. Move Arms to Forks Roll Position (as shown on the display, 74°) press OK
 - f. Move Arms to Full Up Position press OK (this is the arms fully raised position with arms against arm pads) press OK
 - g. Fully lower the Arms.
 - h. Move Packer to Full Pack Position: extend the packer manually to the end of the first stage of the cylinder Press OK (this is the packer fully extended position)
 - i. Move Packer to Travel Position: extend the packer to just inside the body press OK
 - j. At this point the truck is calibrated and pressing OK finishes the sequence.

MAINTENANCE SCREEN

The Half/Pack (featuring Odyssey Controls) unit has a Maintenance Mode within its Cortex Controller[™] programming initiated on the InSight[™] Diagnostic Display. Maintenance 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. Maintenance Mode can also be used to move the functions while servicing a failed Cylinder Sensor.



NOTICE

Maintenance Mode is to be used ONLY by authorized service personnel. Unauthorized use of Maintenance 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 Maintenance Mode.
 - a. On the InSight™ Diagnostic Display, enter Maintenance Mode and then 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.

CORTEX CONTROLLER™ 80 I/O ASSEMBLY

CORTEX CONTROLLER™ 80 I/O ASSEMBLY

There are no serviceable parts within the Cortex Controller[™] housing. Refer to the figure below. Do not open the Cortex Controller[™] housing. Send the Cortex Controller[™] to Heil Environmental for repair or programming.









CORTEX CONTROLLER™ PIN NUMBER DIAGRAM

Refer to the figure below for the Cortex Controller[™] male pin locations. Controller pin numbers are located on the black plastic for pin numbers 1 and 19 (top row left to top row right), 20 and 37 (middle row left to middle row right), and 38 and 55 (bottom row left and bottom row right).



Figure 32. Controller Pin Number Locations (For 80 I/O, Same for Both Controller Sides)

CORTEX CONTROLLER™ 55-POLE CABLE ASSEMBLY

Follow these steps to assemble the Cortex Controller Cable.

A. Cable and Controller Parts Identification

See the figure below to identify the 55-Pole Cable Connector parts.



Figure 33. Cable Controller Plastic Male Hinge Pins and Controller Female Slot Connectors

CORTEX CONTROLLER™ 55-POLE CABLE ASSEMBLY (CONTINUED)

B. Female Controller Connector Close-Up View

See the figure below to identify the controller female connector.



Figure 34. Female Controller Connector Slots

CORTEX CONTROLLER™ 55-POLE CABLE ASSEMBLY (CONTINUED)

C. Connecting the 55-Pole Cable Connector

Refer to the figure below and then slide cable male connectors into controller female connectors.



Figure 35. Cable Connector Pivoting on Controller

CORTEX CONTROLLER™ 55-POLE CABLE ASSEMBLY (CONTINUED)

D. Pivot Cable Connector and Latch

1. While keeping left side of cable connector seated, carefully pivot cable connector until flush with controller. See the figure below.



Figure 36. Slowly Press Down While Keeping Left Cable Connector Pivot Point in Place



2. Latch cable to controller until latch is secure and flush with rear of cable connector. See the figure below.

Figure 37. Latch Controller to Cable Connector

- 3. Repeat steps 1 through 5 to attach the second cable connector to the reverse side of the controller.
- 4. To remove cable from controller, reverse above process.

SECTION BODY CONTROLLER SOFTWARE

RESIDENTIAL HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) CORTEX CONTROLLER™ PROGRAM 109-0351

Odyssey[™] Cortex32 Controller[™] Program 109-0351 (Rev.

Section 1: CORTEX32 Controller Hardware

1.01: CORTEX32 Controller Indicator Lights

The 2018 Odyssey Removable Can vehicle control system consists of 3 CORTEX32 Controllers. The "MAIN" CORTEX32 Controller is an Extended Controller consisting of 80 Inputs / Outputs, the Remote Tailgate CORTEX32 Controller ("RTG") and the Remote Can CORTEX32 Controller ("RCN")* is a Standard Controller consisting of 32 Inputs / Outputs. The CORTEX32 controllers operates with a voltage ranging from (8 to 32) Volt DC. Each CORTEX32 Controller has a three-color LED (Red / Green / Blue) which indicates the current status of the Controller. The LED operating status identifications are detailed in the table below.

Note*: The Remote Can CORTEX32 Controller ("RCN") is a Standard Controller consisting of 32 Inputs / Outputs which is used as a DEDICATED remote Can controller on Residential units.

CORTEX32 CONTROLLER DETAILS

Controller No.	Controller Type	Controller Location	Controller Name
1.	CORTEX32 CR0233	StreetSide Body Side Skirt (Middle)	(Main) Main Controller
2.	CORTEX32 CR2530	StreetSide Body Side Skirt (Rear)	(RTG) Remote Tailgate Controller
3.	CORTEX32 CR2530	Arm Street Side (Pass Through)	(RCN) Remote Can Controller
4.	CORTEX32 CR2530	Cab (Behind Driver Seat)	(CAB) Cab Controller

LED Color	Status	Description
OFF	OFF	No Operating Voltage
Yellow	1 x ON	Initialization or Reset Checks
Orange	ON	Error in start-up phase
Green	5.0 Hz	No Operating System Loaded
Green	2.0 Hz ON	Run Stop
Red	2.0 Hz ON	Run with Error Fatal Error or Stop with Error
Red ³	5.0 Hz ON	Application Stopped due to under Voltage. Fatal Error System fault
Blue ^{1,2}	2.0 Hz*	Communication OK between 2 Controllers (for 80 I/O CORTEX32 Controller) ¹ . Communication OK between Main, RCN and RTG Controllers (for 32 I/O CORTEX32 Controller Only) ²

Note¹: LED will flash Blue when there is a good communication between the 2 halves of the Controller. This condition is applicable only for 80 I/O CORTEX32 Controllers.

Note²: LED will flash Blue when there is a good communication between the MAIN, RTG and RCN Controllers. This condition is applicable only for 32 I/O CORTEX32 Controllers.

Note³: Applicable only for Remote Tailgate CORTEX32 Controller ("RTG") and the Remote Can CORTEX32 Controller ("RCN").

1.02: Inputs

The CORTEX32 Controller Inputs are activated by positive +12 volt signals and some Ground signals (some chassis signals). All Switches, Proximity, Pressure, Toggle, Push buttons, etc., used as input devices to the Controller, supply a +12 volt signal to a CORTEX32 Extended Controller input to turn the Input ON unless otherwise specified. With an Input ON, the corresponding Input field (with Description and Address) shown on the INSIGHT display will also be ON.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

1.03: Outputs

During each cycle the CPU will analyze the status of the inputs, and based upon the logic of the programming, will produce the appropriate +12 volt DC outputs.

Pulse Width Modulation (P.W.M):

- a. The primary use of a PWM signal is to allow the control of the power, supplied to electrical devices.
- b. The Average value of Voltage (and Current) fed to the load is controlled by turning the switch between supply and load ON and OFF at a fast pace. The longer the switch is ON compared to the OFF periods, the higher the power supplied to the load is.
- c. The main advantage of PWM is that power loss in the switching devices is very low. When a switch is OFF there is practically no current, and when switch is ON, there is almost no voltage drop across the switch. Refer figure below for PWM output signals and Waveforms.
- d. To test a PWM output use an Incandescent test light and the brightness will vary with the Voltage level.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.





Figure: Pulse Width Modulation (PWM) Output Waveforms

1.04: Communication Ports

There are 4-CAN and 1-RS-232 communication port in the 80 I/O CORTEX32 Controller which will be utilized for the programming and communication purposes. The Serial port (RS-232) in the ST side will be utilized to download user programs via CORTEX Download tool (Downloader 32) and CAN ports in the ST side for communication between Controller and field devices. See Note below.

The Remote Tailgate (RTG) and Remote Can (RCN) 32 I/O CORTEX32 controllers consists of 2-CAN communication ports each. One of these ports will be used for communicating with the "MAIN" controller. The second CAN port in both Remote Tailgate "RTG" and the Remote Can ("RCN") controller will not be used.

Note: Communication ports from both Controllers should not be used for downloading or uploading programs in parallel as it may lead to malfunctioning or shutdown of the system. Only the communication ports assigned to the Master control unit needs to be used for Programming and communication purpose.

1.05: Diagnostic Display

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

1.06: CORTEX32 - Connector Pin Details

The table below gives connection details between CORTEX32 Controller Input/output and Connector Pins.

MAIN CONTROLLER				
109-0350, 109-0351, and 109-0352				
Program Number:	109- 035X			
Revision Number:	2020xxx x	I/O ADDRESS	CONNECTOR PINOUT	
ODYSSEY 80 I/O COMMERCIAL				
IGNITION 2F		-	E2 PIN 1	
PLUGGED		%QX128.8	E2 PIN 2	

MAIN CONTROLLER			
PLUGGED	%QX128.9	E2 PIN 3	
HOPPER FLOOD LIGHTS	%QX128.10	E2 PIN 4	
CONTAINER LIGHT	%QX128.11	E2 PIN 5	
BACKUP ALARM	%QX128.12	E2 PIN 6	
AUX LIGHT	%QX128.13	E2 PIN 7	
STROBE LIGHT 1	%QX128.14	E2 PIN 8	
STROBE LIGHT 2	%QX128.15	E2 PIN 9	
PLUGGED	-	E2 PIN 10	
PLUGGED	%QX128.7	E2 PIN 11	
PLUGGED	%QX128.6	E2 PIN 12	
PLUGGED	%QX128.5	E2 PIN 13	
PLUGGED	%QX128.4	E2 PIN 14	
PLUGGED	%QX128.3	E2 PIN 15	
PLUGGED	%QX128.2	E2 PIN 16	
PLUGGED	%QX128.1	E2 PIN 17	
CAB FLOOD LIGHTS	%QX128.0	E2 PIN 18	
IGNITION 2F	-	E2 PIN 19	
GROUND 2	-	E2 PIN 20	
PLUGGED	%IX128.14	E2 PIN 21	
PLUGGED	%IX128.12	E2 PIN 22	
PLUGGED	%IX128.10	E2 PIN 23	
PLUGGED	%IX128.8	E2 PIN 24	
PLUGGED	-	E2 PIN 25	
PLUGGED	-	E2 PIN 26	
PLUGGED	-	E2 PIN 27	
PLUGGED	-	E2 PIN 28	
GRAB/FORKS IN	%QX128.20	E2 PIN 29	
RELEASE/FORKS OUT	%QX128.21	E2 PIN 30	
PLUGGED	%QX128.22	E2 PIN 31	
OUTPUT POWER 2	-	E2 PIN 32	

MAIN CO	NTROLLER		
PLUGGED		%IX128.7	E2 PIN 33
PLUGGED			E2 PIN 34
PLUGGED		%IX128.3	E2 PIN 35
PLUGGED		%IX128.1	E2 PIN 36
GROUND 2		-	E2 PIN 37
PLUGGED		%IX128.15	E2 PIN 38
PLUGGED		%IX128.13	E2 PIN 39
PLUGGED		%IX128.11	E2 PIN 40
PLUGGED		%IX128.9	E2 PIN 41
PLUGGED		%IX128.16	E2 PIN 42
PLUGGED		%IX128.17	E2 PIN 43
PLUGGED		%IX128.18	E2 PIN 44
PLUGGED		%IX128.19	E2 PIN 45
PLUGGED		%IX128.20	E2 PIN 46
PLUGGED		%IX128.21	E2 PIN 47
PLUGGED		%IX128.22	E2 PIN 48
PLUGGED		%IX128.23	E2 PIN 49
PLUGGED		%QX128.23	E2 PIN 50
IGNITION 2F		-	E2 PIN 51
PLUGGED		%IX128.6	E2 PIN 52
HIGH PRESSURE FILTER		%IX128.4	E2 PIN 53
PLUGGED		%IX128.2	E2 PIN 54
PLUGGED		%IX128.0	E2 PIN 55
Program Number: 109- 035X			
Revision Number: x		I/O ADDRESS	CONNECTOR PINOUT
ODYSSEY 80 I/O COMMERCIAL	-		
OUTPUT POWER 1		-	E1 PIN 1
PTO 1 SOLENOID		%QX0.8	E1 PIN 2

MAIN CONTROLLER			
PTO 2 SOLENOID	%QX0.9	E1 PIN 3	
PLUGGED	%QX0.10	E1 PIN 4	
PLUGGED	%QX0.11	E1 PIN 5	
PACKER EXTEND	%QX0.12	E1 PIN 6	
PACKER RETRACT	%QX0.13	E1 PIN 7	
TAILGATE FLOW	%QX0.14	E1 PIN 8	
CARRY CAN FLOW	%QX0.15	E1 PIN 9	
IGNITION 1F	-	E1 PIN 10	
FORKS DOWN	%QX0.7	E1 PIN 11	
FORKS RAISE	%QX0.6	E1 PIN 12	
ARMS RAISE	%QX0.5	E1 PIN 13	
ARMS DOWN	%QX0.4	E1 PIN 14	
CAB PROTECTOR RAISE	%QX0.3	E1 PIN 15	
CAB PROTECTOR LOWER	%QX0.2	E1 PIN 16	
PLUGGED	%QX0.1	E1 PIN 17	
PTO ENABLE	%QX0.0	E1 PIN 18	
OUTPUT POWER 1	-	E1 PIN 19	
GROUND 1	-	E1 PIN 20	
CAB PROTECTOR PROX	%IX0.14	E1 PIN 21	
OIL TEMPERATURE	%IX0.12	E1 PIN 22	
PLUGGED	%IX0.10	E1 PIN 23	
SYSTEM POWER SWITCH	%IX0.8	E1 PIN 24	
RS232 RECEIVE	-	E1 PIN 25	
J1939 3 L	-	E1 PIN 26	
J1939 2 L	-	E1 PIN 27	
J1939 1 L	-	E1 PIN 28	
CAN 1 L	-	E1 PIN 29	
PLUGGED	-	E1 PIN 30	
PLUGGED	-	E1 PIN 31	
IGNITION 1F	-	E1 PIN 32	

MAIN CONTROLLER			
LOW OIL SWITCH	%IX0.7	E1 PIN 33	
ARMS UP PROX	%IX0.5	E1 PIN 34	
FORKS TUCKED PROX	%IX0.3	E1 PIN 35	
OVERHEIGHT PROX	%IX0.1	E1 PIN 36	
GROUND 1	-	E1 PIN 37	
PLUGGED	%IX0.15	E1 PIN 38	
LEFT TURN SIGNAL	%IX0.13	E1 PIN 39	
RIGHT TURN SIGNAL	%IX0.11	E1 PIN 40	
PTO PRESSURE SWITCH	%IX0.9	E1 PIN 41	
GROUND 1	-	E1 PIN 42	
RS232 TRANSMIT	-	E1 PIN 43	
J1939 3 H	-	E1 PIN 44	
J1939 2 H	-	E1 PIN 45	
J1939 1 H	-	E1 PIN 46	
CAN 1 H	-	E1 PIN 47	
PLUGGED	-	E1 PIN 48	
PLUGGED	-	E1 PIN 49	
IGNITION 1F	-	E1 PIN 50	
PLUGGED	-	E1 PIN 51	

CAB CONTROLLER				
109-0350, 109-0351, and 109-0352				
Program Number:	109-0353			
Revision Number:	2020xxxx			
ODYSSEY 80 I/O COMMERCIAL		I/U ADDRESS	CONNECTOR PINOUT	
OUTPUT POWER 1	-	E1 PIN 1		
CARRY CAN COVER UP		%QX0.8	E1 PIN 2	
CARRY CAN COVER DOWN		%QX0.9	E1 PIN 3	

CAB CONTROLLER			
SPARE OUTPUT	%QX0.10	E1 PIN 4	
AUX AIR SUPPLY	%QX0.11	E1 PIN 5	
WARBLE ALARM	%QX0.12	E1 PIN 6	
CAB ALARM	%QX0.13	E1 PIN 7	
AIR SUPPLY	%QX0.14	E1 PIN 8	
FUSED IGNITION 2F	%QX0.15	E1 PIN 9	
RIGHT TURN CAMERA TRIGGER	-	E1 PIN 10	
LEFT TURN CAMERA TRIGGER	%QX0.7	E1 PIN 11	
FREIGHTLINER BRAKE LOCKOUT	%QX0.6	E1 PIN 12	
HOPPER CAMERA TRIGGER	%QX0.5	E1 PIN 13	
REVERSE CAMERA TRIGGER	%QX0.4	E1 PIN 14	
OUT OF DIMENSION	%QX0.3	E1 PIN 15	
THROTTLE LIMIT	%QX0.2	E1 PIN 16	
THROTTLE ADVANCE	%QX0.1	E1 PIN 17	
PLUGGED	%QX0.0	E1 PIN 18	
IGNITION 2F	-	E1 PIN 19	
SPARE INPUT	-	E1 PIN 20	
SPARE INPUT	%IX0.14	E1 PIN 21	
SPARE INPUT	%IX0.12	E1 PIN 22	
PLUGGED	%IX0.10	E1 PIN 23	
PLUGGED	%IX0.8	E1 PIN 24	
PLUGGED	-	E1 PIN 25	
PLUGGED	-	E1 PIN 26	
PLUGGED	-	E1 PIN 27	
PLUGGED	-	E1 PIN 28	
J1939 3 L	-	E1 PIN 29	
PLUGGED	-	E1 PIN 30	
PLUGGED	-	E1 PIN 31	
PANEL SELECT	-	E1 PIN 32	
PLUGGED	%IX0.7	E1 PIN 33	

CAB CONTROLLER				
CHASSIS NEUTRAL	%IX0.5	E1 PIN 34		
TRANSMISSION SUMP TEMP	%IX0.3	E1 PIN 35		
GROUND 1	%IX0.1	E1 PIN 36		
SPARE INPUT	-	E1 PIN 37		
EXTERNAL THROTTLE ADVANCE	%IX0.15	E1 PIN 38		
PLUGGED	%IX0.13	E1 PIN 39		
PLUGGED	%IX0.11	E1 PIN 40		
PLUGGED	%IX0.9	E1 PIN 41		
GROUND 1	-	E1 PIN 42		
PLUGGED	-	E1 PIN 43		
PLUGGED	-	E1 PIN 44		
PLUGGED	-	E1 PIN 45		
PLUGGED	-	E1 PIN 46		
J1939 3 H	-	E1 PIN 47		
PLUGGED	-	E1 PIN 48		
PLUGGED	-	E1 PIN 49		
PLUGGED	-	E1 PIN 50		
PLUGGED	-	E1 PIN 51		
PLUGGED	%IX0.6	E1 PIN 52		
PLUGGED	%IX0.4	E1 PIN 53		
SCALE ALARM 2	%IX0.2	E1 PIN 54		
SCALE ALARM 1	%IX0.0	E1 PIN 55		

TAILGATE CONTROLLER				
109-0350, 109-0351, and 109-0352				
Program Number:	109-0317			
Revision Number: 2020xxxx				
ODYSSEY 80 I/O COMMERCIAL		I/O ADDRESS		
IGNITION 2F		-	E1 PIN 1	

TAILGATE CONTROLLER				
PLUGGED	%QX0.8	E1 PIN 2		
PLUGGED	%QX0.9	E1 PIN 3		
PLUGGED	%QX0.10	E1 PIN 4		
PLUGGED	%QX0.11	E1 PIN 5		
PLUGGED	%QX0.12	E1 PIN 6		
PLUGGED	%QX0.13	E1 PIN 7		
PLUGGED	%QX0.14	E1 PIN 8		
PLUGGED	%QX0.15	E1 PIN 9		
IGNITION 2F	-	E1 PIN 10		
TAILGATE UNLOCK	%QX0.7	E1 PIN 11		
TOP DOOR CLOSE	%QX0.6	E1 PIN 12		
TOP DOOR OPEN	%QX0.5	E1 PIN 13		
TAILGATE LOCK	%QX0.4	E1 PIN 14		
TAILGATE DOWN	%QX0.3	E1 PIN 15		
TAILGATE RAISE	%QX0.2	E1 PIN 16		
PLUGGED	%QX0.1	E1 PIN 17		
PLUGGED	%QX0.0	E1 PIN 18		
IGNITION 2F	-	E1 PIN 19		
GROUND 1	-	E1 PIN 20		
NODE ID	%IX0.14	E1 PIN 21		
PLUGGED	%IX0.12	E1 PIN 22		
PLUGGED	%IX0.10	E1 PIN 23		
PLUGGED	%IX0.8	E1 PIN 24		
PLUGGED	-	E1 PIN 25		
PLUGGED	-	E1 PIN 26		
PLUGGED	-	E1 PIN 27		
PLUGGED	-	E1 PIN 28		
J1939 3 L	-	E1 PIN 29		
PLUGGED	-	E1 PIN 30		
PLUGGED	-	E1 PIN 31		

TAILGATE CONTROLLER			
PLUGGED	-	E1 PIN 32	
PLUGGED	%IX0.7	E1 PIN 33	
PLUGGED	%IX0.5	E1 PIN 34	
TAILGATE LOCK PROX SS	%IX0.3	E1 PIN 35	
TOP DOOR OPEN PROX	%IX0.1	E1 PIN 36	
GROUND 1	-	E1 PIN 37	
PLUGGED	%IX0.15	E1 PIN 38	
PLUGGED	%IX0.13	E1 PIN 39	
PLUGGED	%IX0.11	E1 PIN 40	
PLUGGED	%IX0.9	E1 PIN 41	
GROUND 1	-	E1 PIN 42	
PLUGGED	-	E1 PIN 43	
PLUGGED	-	E1 PIN 44	
PLUGGED	-	E1 PIN 45	
PLUGGED	-	E1 PIN 46	
J1939 3 H	-	E1 PIN 47	
PLUGGED	-	E1 PIN 48	
PLUGGED	-	E1 PIN 49	
PLUGGED	-	E1 PIN 50	
PLUGGED	-	E1 PIN 51	
PLUGGED	%IX0.6	E1 PIN 52	
PLUGGED	%IX0.4	E1 PIN 53	
TAILGATE LOCK PROX CS	%IX0.2	E1 PIN 54	
TAILGATE CLOSED PROX	%IX0.0	E1 PIN 55	

ARM CONTROLLER			
109-0351			
Program Number:	109-0317		
Revision Number:	2020xxxx	I/O ADDRESS	CONNECTOR PINOUT
ODYSSEY 80 I/O COMMERCIAL			

	7	54 D.N. 4
IGNITION 2F	-	E1 PIN 1
PLUGGED	%QX0.8	E1 PIN 2
PLUGGED	%QX0.9	E1 PIN 3
CARRY CAN LIGHTS	%QX0.10	E1 PIN 4
PLUGGED	%QX0.11	E1 PIN 5
PLUGGED	%QX0.12	E1 PIN 6
PLUGGED	%QX0.13	E1 PIN 7
PLUGGED	%QX0.14	E1 PIN 8
PLUGGED	%QX0.15	E1 PIN 9
IGNITION 2F	-	E1 PIN 10
CARRY CAN RELEASE	%QX0.7	E1 PIN 11
CARRY CAN RAISE	%QX0.6	E1 PIN 12
CARRY CAN DOWN	%QX0.5	E1 PIN 13
CARRY CAN IN	%QX0.4	E1 PIN 14
CARRY CAN OUT	%QX0.3	E1 PIN 15
CARRY CAN GRAB	%QX0.2	E1 PIN 16
PLUGGED	%QX0.1	E1 PIN 17
PLUGGED	%QX0.0	E1 PIN 18
IGNITION 2F	-	E1 PIN 19
GROUND 1	-	E1 PIN 20
PLUGGED	%IX0.14	E1 PIN 21
PLUGGED	%IX0.12	E1 PIN 22
PLUGGED	%IX0.10	E1 PIN 23
PLUGGED	%IX0.8	E1 PIN 24
PLUGGED	-	E1 PIN 25
PLUGGED	-	E1 PIN 26
PLUGGED	-	E1 PIN 27
PLUGGED	-	E1 PIN 28
J1939 3 L	-	E1 PIN 29
PLUGGED	-	E1 PIN 30
PLUGGED	-	E1 PIN 31

PLUGGED	-	E1 PIN 32
BAYNE CAN UP	%IX0.7	E1 PIN 33
PLUGGED	%IX0.5	E1 PIN 34
PLUGGED	%IX0.3	E1 PIN 35
PLUGGED	%IX0.1	E1 PIN 36
GROUND 1	-	E1 PIN 37
NODE ID	%IX0.15	E1 PIN 38
PLUGGED	%IX0.13	E1 PIN 39
PLUGGED	%IX0.11	E1 PIN 40
PLUGGED	%IX0.9	E1 PIN 41
GROUND 1	-	E1 PIN 42
PLUGGED	-	E1 PIN 43
PLUGGED	-	E1 PIN 44
PLUGGED	-	E1 PIN 45
PLUGGED	-	E1 PIN 46
J1939 3 H	-	E1 PIN 47
PLUGGED	-	E1 PIN 48
PLUGGED	-	E1 PIN 49
PLUGGED	-	E1 PIN 50
PLUGGED	-	E1 PIN 51
BAYNE CAN DOWN	%IX0.6	E1 PIN 52
PLUGGED	%IX0.4	E1 PIN 53
PLUGGED	%IX0.2	E1 PIN 54
PLUGGED	%IX0.0	E1 PIN 55

Section 2: J1939 Details

The Engine information is directly read through the SAE J1939 standard. SAE J1939 is the vehicle bus standard used for communication and diagnostics among vehicle components, like heavy duty truck industry. J1939 is used in heavy vehicles for on-street and off-road operations and works on the physical layer with CAN-high speed according to ISO11898. J1939 is a multi-master system with decentralized network management without channel-based communication.

J1939 can provide information's like Engine RPM, Transmission Gear info, Parking Brake Info, and Road Speed.

Section 3: Default Parameters

3.01 Program 109-0351 Parameter Defaults

SI. No.	Parameter	Default Setting
А	Start Filter Warning	5 Hours
В	Start Filter Shutdown	6 Hours
С	Packer Extend Auto Pack Time Out	35 Seconds
D	Packer Auto Retract Time Out	35 Seconds
E	Engine Over speed	1800 RPM
F	Engine ON	Engine Speed > 400 RPM
G	Bypass Time Reset	15 minutes
Н	Pump Bypass Run Time	180 Seconds
1	Bypass Beep Time	60 Seconds
J	Road Speed Ok	< 5mph
к	Curotto Can Demo Time	3 Seconds
L	Carry Can Stow Time	2 Seconds
М	Throttle Advance	1350 RPM
N	Throttle Limit	1500 RPM
0	Hydraulic Oil Operating Temp	70°F - 190°F

Section 4: I/O Functions

The following sheets detail the functionality of the Input and Output functions provided through the CORTEX32 Controller.

Note: Status of all the Inputs / Outputs can be monitored using the Insight In-Cab display. Refer section 5.04 for more details about Diagnostic display options and INSIGHT display.

4.01: Standard In-Cab Input Functions

A01 Input Function -- System Power Switch (In Cab Input %IX0.08)

This circuit monitors the ON/OFF status of the system power switch ("mushroom button").

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
System Power Switch	Activated	%IX0.08	ON

A02 Input Function – Chassis Neutral Signal (In Cab Input %IX0.10)

This circuit monitors the transmission Neutral circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Chassis Transmission	In Neutral	%IX0.10	ON

A03 Input Function – Panel Selector Switch Enable (In Cab Input %IX0.09)

This signal is used for switching between Street Side and Curb Side Joysticks and panels.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Panel Selector Switch Enable Circuit	Activated	%IX0.09	ON

A04 Input Function – Left Turn Signal Enabled (In Cab Input %IX0.13)

This circuit monitors the status of the Left Turn Signal circuit. This circuit is used for enabling and disabling Front / Rear strobe circuits.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Turn Signal Enable Circuit	Activated	%IX0.13	ON

A05 Input Function – Right Turn Signal Enabled (In Cab Input %IX0.11)

This circuit monitors the status of the Right Turn Signal circuit. This circuit is used for enabling and disabling Front / Rear strobe circuits.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Turn Signal Enable Circuit	Activated	%IX0.11	ON

A06 Input Function – Transmission Temperature Signal Switch (In Cab Input %IX0.15)

This circuit monitors the status of the Transmission Oil Temperature. The input is ON when the Temperature of the Transmission Oil is OK.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Transmission Temperature Switch Circuit	Activated	%IX0.15	ON

A07 Input Function Scale Alarm-1 (In Cab Input %IX128.00)

This circuit monitors the ON/OFF status of the Scale Alarm-1 condition. This Scale Input goes High (ON) when approaching maximum weight on the scale system.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Scale Alarm-1	Activated	%IX128.00	ON

A08 Input Function Scale Alarm-2 (In Cab Input %IX128.02)

This circuit monitors the ON/OFF status of the Scale Alarm-2 condition. This Scale Input goes Low (OFF) during overweight condition.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Scale Alarm-2	Activated	%IX128.02	OFF

4.02: Standard In-Cab Output Functions

B01 Output Function – In-Cab Alarm (In Cab Output %QX128.08)

This output function controls the In-Cab Alarm. See Section 6.04 for a complete explanation of the Diagnostic Messages associated with this unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
Δ	Arms Full Up Position	Deactivated	N/A	OFF
~	or Forks Full Tucked Position	Deactivated	N/A	OFF
В	Lift below Transit Position	Deactivated	N/A	OFF
С	Chassis Neutral	Deactivated	%IX0.10	OFF
D	Tailgate Closed Prox. Switch	Deactivated	%IX0.00	OFF
E	Active Diagnostic message	Activated	N/A	ON (Refer Section 6.04)

Note: With (A AND B AND C) OR condition (D OR E) true will activate the In-Cab Alarm output.

B02 Output Function – Throttle Advance Signal (In Cab Output %QX0.10)

This output function controls the Throttle Advance signal transmitted to the vehicles Engine.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Packer Extend PWM	Activated	%QX0.12	ON
A	or Packer Retract PWM	Activated	%QX0.13	ON
В	Auto Lift Enable Switch	Activated	CAN	ON
	Auto Lift Down cycle	Activated	N/A	ON
C	or Auto Lift Up cycle	Activated	N/A	ON
D	Neutral Signal	Activated	%IX0.10	ON

Note: With condition 'D' true, condition (A OR (B AND C)) will activate the Throttle Advance output. Throttle advance output is disabled in Service mode or Calibration mode.

B03 Output Function – Throttle Limit (In Cab Output %QX0.11)

This output function controls the Throttle Limit command sent to the Engine.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Pump On	Activated	N/A	ON
В	Neutral Signal	Activated	%IX0.10	ON (See Note Below)
С	Throttle Advance Output	Deactivated	%QX0.10	OFF

Note: With condition 'A' true, Condition (B AND C) will activate the Throttle Limit output.

B04 Output Function – WARBLE Alarm (In Cab Output %QX128.09)

This output function controls the Warble Alarm.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Tailgate Closed Prox. Switch	Deactivated	%IX0.00	OFF

Note: Condition 'A' true will activate the Warble Alarm output.

B05 Output Function – Hopper Flood Light (In Cab Output %QX128.10)

This output function controls the Hopper Flood Light. Here CAN control is used to turn ON/OFF the Hopper Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Hopper Light Switch	Activated	CAN	ON

Note: With condition (A) true the Hopper Flood Light output will activate.

4.03: Standard Body Input Functions

C01 Input Function – Oil Filter Pressure Switch (Body Input %IX0.06)

This circuit monitors the ON/OFF status of the Oil Filter Pressure Switch. The input is OFF when the filter is in bypass. The input is ON when the filter is in normal operation i.e. not in bypass.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Filter Pressure Switch	Activated	%IX0.06	ON

C02 Input Function -- Side Door Closed Proximity Switch (Body Input %IX0.04)

This circuit monitors the ON/OFF status of the Side Door Closed Proximity Switch. The input is ON when the side door is closed.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Side Door Proximity Switch	Activated	%IX0.04	ON

C03 Input Function -- Tailgate Closed Proximity Switch (Body Input %IX0.00)

This circuit monitors the ON/OFF status of the Tailgate Closed Proximity Switch. The input is ON when the Tailgate is closed.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Closed Proximity Switch	Activated	%IX0.00	ON

C04 Input Function – Lift Below Transit Proximity Switch (Body Input %IX0.01)

This circuit monitors the ON/OFF status of the Lift Below Transit Proximity Switch. The input is ON when the arm is in the Lowered position. NOT USED.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
NOT USED. FUTURE EXPANSION	١		

C05 Input Function – Forks Tucked Proximity Switch (Body Input %IX0.03)

This circuit monitors the ON/OFF status of the Forks Tucked Proximity Switch. The input is ON when the Forks are fully tucked position. NOT USED.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
NOT USED. FUTURE EXPANSION	١		

C06 Input Function – Arms Up Proximity Switch (Body Input %IX0.03)

This circuit monitors the ON/OFF status of the Arms Up Proximity Switch. The input is ON when the Arms are in raised position. NOT USED.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
NOT USED. FUTURE EXPANSION			

4.04: Standard Body Output Functions

D01 Output Function – Tailgate Up Solenoid (Body Output %QX0.02)

This output function controls the Tailgate Up output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Raise Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
С	Road Speed OK	Activated	N/A	ON (see Note below)
D	and Pump On	Activated	N/A	ON
E	Tailgate Locked Prox.	Deactivated	%IX0.02	OFF

Note: This signal is energized using a CAN based control by energizing the Tailgate Raise switch either from Street side or from Curb side panel. With Conditions (A AND B AND C AND D) true, function 'E' will activate the Tailgate Up Solenoid output.

For condition 'C' to be true, Road Speed value should be less than '5' mph.

D02 Output Function – Tailgate Down Solenoid (Body Output %QX0.03)

This output function controls the Tailgate Down output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Lower Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
С	Road Speed OK	Activated	N/A	ON (see Note below)
D	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Tailgate Lower switch either from Street side or from Curb side panel.

If Conditions (A AND B AND C AND D) are true, will activate the Tailgate Down Solenoid output. For condition 'C' to be true, Road Speed value should be less than '5' mph.

D03 Output Function – Tailgate Lock Solenoid (Body Output %QX0.04)

This output function controls the Tailgate Lock output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Lock Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
С	Road Speed OK	Activated	N/A	ON (see Note below)
D	Tailgate Locked Prox.	Deactivated	%IX0.02	OFF
E	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Tailgate Lock switch either from Street side or from Curb side panel. With ((A AND B AND C AND D)) true, Condition 'E' will activate the Tailgate Lock output. For condition 'C' to be true, Road Speed value should be less than '5' mph.

D04 Output Function – Tailgate Unlock Solenoid (Body Output %QX0.07)

This output function controls the Tailgate Unlock output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Un Lock Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
	or Tailgate Down	Activated	%QX0.03	ON (see Note below)
C	and Tailgate Closed Prox.	Deactivated	%IX0.00	OFF
D	Tailgate Locked Prox.	Activated	N/A	ON (see Note below)
E	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Tailgate Unlock switch either from Street side or from Curb side panel. With conditions ((A AND B) OR C) true, function (D AND E) will activate the Tailgate Unlock output. For condition 'D' to be true, Road Speed value should be less than '5' mph.

D05 Output Function – Back Up Alarm (Body Output %QX128.12)

This output function controls the Back Up Alarm output.

Condition	Modifiable Parameters	Default Setting

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Closed Prox.	Deactivated	%IX0.00	ON

Note: If Tailgate is not closed, then Back Up Alarm is activated.

D06 Output Function – Arms Up PWM control (Body Output %QX0.05)

This output function controls the Arms up PWM Control output circuit. The Arms up PWM control circuit either with the Auto Lift signal (fixed speed) or with the Manual lift signal (variable speed) will control the speed of Arm Up movement when operated.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Auto Lift Enable Switch	Activated	N/A	ON
В	Pump On	Activated	N/A	ON
С	Arms up Interlock	Deactivated	N/A	OFF
D	Aux Controls Enable	Activated	N/A	ON (Manual Control – Var. speed)
E	Aux Arms Raise	Activated	N/A	ON (Manual Control – Var. speed)
F	Sensor Failure	Deactivated	N/A	OFF
G	Raise Arms	Activated	N/A	ON

Note: The Arms Valve PWM output provides flow to the hydraulic hoses on the arms cylinder. This flow, when combined with the activation of Arms up function, will move the Arms up (with fixed or variable speed). The flow setting of this valve is adjustable using the Insight diagnostic display.

D07 Output Function – Arms Down PWM control (Body Output %QX0.04)

This output function controls the Arms down PWM Control output circuit. The Arms down PWM control circuit either with the Auto Lift signal (fixed speed) or with the Manual lift signal (variable speed) will control the speed of Arm down movement when operated.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Auto Lift Enable Switch	Activated	N/A	ON
В	Pump On	Activated	N/A	ON
С	Arms Down Interlock	Deactivated	N/A	OFF

Condition	Function or Component	Status	I/O Address	Status
D	Aux Controls Enable	Activated	N/A	ON (Manual Control – Var. speed)
E	Aux Arms Lower	Activated	N/A	ON (Manual Control – Var. speed)
F	Sensor Failure	Deactivated	N/A	OFF
G	Lower Arms	Activated	N/A	ON

Note: The Arms Valve PWM output provides flow to the hydraulic hoses on the arms cylinder. This flow, when combined with the activation of arms down function, will move the Arms down (with fixed or variable speed). The flow setting of this valve is adjustable using the Insight diagnostic display.

D08 Output Function – Cab Protector Up Control (Body Output %QX0.03)

This function controls the Cab Protector up output. Not used.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
NOT USED				

D09 Output Function – Cab Protector Down Control (Body Output %QX0.02)

This function controls the Cab Protector Down output. Not used.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
NOT USED				

D10 Output Function – Allison PTO Enabled (Body Output %QX0.00)

This output function controls the Allison Power Take Off (PTO).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Pump Enable Push Button	Activated	CAN	ON
	System Power Switch	Activated	%IX0.8	ON
	Side Door Prox. Switch	Activated	%IX0.4	ON
В	Road Speed	Activated	N/A	ON (see Note below)
Condition	Function or Component	Status	I/O Address	Status
-----------	------------------------	-------------	-------------	---------------------
С	Engine Speed	Activated	N/A	ON (see Note below)
D	Filter Bypass	Deactivated	N/A	OFF
E	Filter Pressure Switch	Activated	%IX0.6	ON
F	Low Oil Level Switch	Activated	%IX0.7	ON (see Note Below)

Note: With condition (A AND B AND C AND F) true, Condition (D OR E) will activate the Allison PTO pump. For condition 'B' to be true, Road Speed value should be less than '15' mph. For condition 'C' to be true, Engine Speed value should be less than '900' RPM. Condition 'F' Low Oil Switch will be considered only during Calibration mode.

D11 Output Function – PTO-2 Pump (Body Output %QX0.09)

This output function controls the Power Take Off (PTO) Pump-2 output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Pump Enable Push Button	Activated	CAN	ON
А	System Power Switch	Activated	%IX0.8	ON
	Side Door Prox. Switch	Activated	%IX0.4	ON
В	Road Speed	Activated	N/A	ON (see Note below)
С	Engine Speed	Activated	N/A	ON (see Note below)
D	Filter Bypass	Deactivated	N/A	OFF
E	Filter Pressure Switch	Activated	%IX0.6	ON
F	Low Oil Level Switch	Activated	%IX0.7	ON (see Note Below)

Note: With condition (A AND B AND C AND F) true, Condition (D OR E) will activate the PTO-2 pump. For condition 'B' to be true, Road Speed value should be less than '15' mph. For condition 'C' to be true, Engine Speed value should be less than '900' RPM. Condition 'F' Low Oil Switch will be considered only during Calibration mode.

D12 Output Function – PTO-1 Pump (Body Output %QX0.08)

This output function controls the Power Take Off (PTO) Pump-1 output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Pump Enable Push Button	Activated	CAN	ON
	System Power Switch	Activated	%IX0.8	ON

Condition	Function or Component	Status	I/O Address	Status
	Side Door Prox. Switch	Activated	%IX0.4	ON
В	Road Speed	Activated	N/A	ON (see Note below)
С	Engine Speed	Activated	N/A	ON (see Note below)
D	Filter Bypass	Deactivated	N/A	OFF
E	Filter Pressure Switch	Activated	%IX0.6	ON
F	Low Oil Level Switch	Activated	%IX0.7	ON (see Note Below)

Note: With condition (A AND B AND C AND F) true, Condition (D OR E) will activate the PTO-1 pump. For condition 'B' to be true, Road Speed value should be less than '15' mph. For condition 'C' to be true, Engine Speed value should be less than '900' RPM.

Condition 'F' Low Oil Switch will be considered only during Calibration mode.

D13 Output Function – Carry Can Cover Close (Body Output %QX128.20)

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	NC	DT USED		

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
NOT USED				

D14 Output Function – Carry Can Cover Open (Body Output %QX128.21)

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
NOT USED				

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	NC	DT USED		

D15 Output Function – Curotto - Carry Can Up (Body Output %QX0.06)

This function controls the Curotto - Carry Can Up signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Panel Selector Switch	Activated	%IX0.09	ON
A	and Carry Can Auxiliary Enable Switch	Deactivated	CAN	OFF
D	Carry Can Up	Activated	CAN	ON (Refer Sec. I26)
В	and Carry Can Auxiliary Enable Switch	Activated	CAN	ON
	and Autolift Enable Switch	Activated	CAN	ON
	Commercial Grab Enable Switch	Deactivated	CAN	OFF
D	Bayne Up	Activated	N/A	ON
E	and Scale Alarm 2	Deactivated	%IX128.2	OFF (See Section A04)
F	Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Carry Can Up switch either from Street side or from Curb side panel.

The Curotto system is operated in Carry Can mode with Arm below 25 Deg. and Scale Alarm 2 is deactivated i.e. Over Weight condition is not present or if Bayne Up control is enabled.

With Conditions ((A OR B) AND 'C') true OR 'D' true, condition (E AND F) will activate the Carry Can Up Output signal either from Auxiliary control mode or from Non-Auxiliary control mode.

D16 Output Function – Curotto - Carry Can Down (Body Output %QX0.05)

This function controls the Curotto - Carry Can Down signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Panel Selector Switch	Activated	%IX0.09	ON
A	and Carry Can Auxiliary Enable Switch	Deactivated	CAN	OFF
D	Carry Can Down	Activated	CAN	ON (Refer Sec. I27)
В	and Carry Can Auxiliary Enable Switch	Activated	CAN	ON
	Autolift Enable Switch	Activated	CAN	ON
	and Scale Alarm 2	Deactivated	%IX128.2	OFF (See Section A04)
	and Pump On	Activated	N/A	ON
	Commercial Grab Enable Switch	Deactivated	CAN	OFF
D	Bayne Down	Activated	N/A	ON
	Pump On	Activated	N/A	ON

E Stow Can	Activated	N/A	ON
------------	-----------	-----	----

Note: This signal is energized using a CAN based control by energizing the Carry Can Down switch either from Street side or from Curb side panel.

The Curotto system is operated in Carry Can mode with Arm below 25 Deg. and Scale Alarm 2 is deactivated i.e. Over Weight condition is not present or if Bayne Down control is enabled.

With Conditions (A OR B) true, Condition (C OR D OR E) true will activate the Carry Can Down Output either from Auxiliary control mode or from Non-Auxiliary control mode.

D17 Output Function – Curotto - Carry Can In (Body Output %QX0.04)

This function controls the Curotto - Carry Can In signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Panel Selector Switch	Activated	%IX0.09	ON
A	and Carry Can Auxiliary Enable Switch	Deactivated	CAN	OFF
D	Carry Can In	Activated	CAN	ON
D	and Carry Can Auxiliary Enable Switch	Activated	CAN	ON
С	and Autolift Enable Switch	Activated	CAN	ON
D	and Scale Alarm 2	Deactivated	%IX128.2	OFF (See Section A04)
E	and Pump On	Activated	N/A	ON
F	and Commercial Grab Enable Switch	Deactivated	CAN	OFF
	Pump On	Activated	N/A	ON
6	and Stow Can	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Carry Can In switch either from Street side or from Curb side panel.

The Curotto system is operated in Carry Can mode with Arm below 25 Deg. and Scale Alarm 2 is deactivated i.e. Over Weight condition is not present.

With Conditions (A OR B) true, Condition (C AND D AND E AND F) true will activate the Curotto Carry Can In signal either from Auxiliary control mode or from Non-Auxiliary control mode.

The Carry Can In signal is also activated with Condition 'G' true, which is a Stow Can signal.

D18 Output Function – Curotto - Carry Can Out (Body Output %QX0.03)

This function controls the Curotto - Carry Can out signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Panel Selector Switch	Activated	%IX0.09	ON

	and Carry Can Auxiliary Enable Switch	Deactivated	CAN	OFF
D	Carry Can Out	Activated	CAN	ON
В	and Carry Can Auxiliary Enable Switch	Activated	CAN	ON
С	and Autolift Enable Switch	Activated	CAN	ON
D	and Pump On	Activated	N/A	ON
E	and Scale Alarm 2	Deactivated	%IX128.2	OFF (See Section A04)
F	and Commercial Grab Enable Switch	Deactivated	CAN	OFF

Note: This signal is energized using a CAN based control by energizing the Carry Can Out switch either from Street side or from Curb side panel.

The Curotto system is operated in Carry Can mode with Arm below 25 Deg. and Scale Alarm 2 is deactivated i.e. Over Weight condition is not present.

With Condition (A OR B) true, Condition (C AND D AND E AND F) true will activate the Curotto Carry Can Out signal in either Auxiliary control mode or Non-Auxiliary control mode.

D19 Output Function – Curotto - Carry Can Grab (Body Output %QX0.02)

This function controls the Curotto - Carry Can Grabber signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	and Pump On	Activated	N/A	ON
A	and Scale Alarm 2	Deactivated	%IX128.4	OFF (See Section A04)
	Carry Can Auxiliary Enable Switch	Deactivated	CAN	ON
	and Joystick Right Button	Activated	JOYSTICK	ON
	Carry Can Auxiliary Enable Switch	Activated	CAN	ON
	and Carry Can Grab	Activated	CAN	ON (Refer Sec. I24)
	Autolift Enable Switch	Activated	CAN	ON
	and Commercial Grab Enable Switch	Deactivated	CAN	OFF
	Autolift Enable Switch	Deactivated	CAN	ON
E	and Commercial Grab Enable Switch	Activated	CAN	ON
	Panel Selector Switch	Deactivated	%IX0.09	OFF

Note: This signal is energized using a CAN based control by energizing the Carry Can Grab switch.

The Curotto system is operated in Carry Can mode with Arm below 25 Deg. and Scale Alarm 2 is deactivated i.e. Over Weight condition is not present.

With Condition 'A' true, condition ((B OR C) AND D) true OR condition (B AND E) true, will activate the Carry Can Grabber output either from Auxiliary control mode or from Non-Auxiliary control mode.

D20 Output Function – Curotto - Carry Can Release (Body Output %QX0.01)

This function controls the Curotto - Carry Can Release signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	and Pump On	Activated	N/A	ON
A	and Scale Alarm 2	Deactivated	%IX128.4	OFF (See Section A04)
D	Carry Can Auxiliary Enable Switch	Deactivated	CAN	ON
D	and Joystick Left Button	Activated	JOYSTICK	ON
	Carry Can Auxiliary Enable Switch	Activated	CAN	ON
	and Carry Can Release	Activated	CAN	ON (Refer Sec. I25)
	Autolift Enable Switch	Activated	CAN	ON
	and Commercial Grab Enable Switch	Deactivated	CAN	OFF
	Autolift Enable Switch	Deactivated	CAN	ON
E	and Commercial Grab Enable Switch	Activated	CAN	ON
	Panel Selector Switch	Deactivated	%IX0.09	OFF
	Pump On	Activated	N/A	ON
	Stow Can	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Carry Can Release switch either from Street side or from Curb side panel.

The Curotto system is operated in Carry Can mode with Arm below 25 Deg. and Scale Alarm 2 is deactivated i.e. Over Weight condition is not present.

With Condition 'A' true, condition ((B OR C) AND D) true OR condition (B AND E) true, will activate the Carry Can Release output either from Auxiliary control mode or from Non-Auxiliary control mode.

The Carry Can Release signal is also activated with Condition 'F' true, which is a Stow Can signal.

D21 Output Function – Tailgate Enable PWM control (Body Output %QX0.14)

This output function controls the Tailgate PWM control output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Tailgate Down	Activated	%QX0.03	ON
	or Tailgate Up	Activated	%QX0.02	ON

Condition	Function or Component	Status	I/O Address	Status
	or Tailgate Lock	Activated	%QX0.04	ON
	or Tailgate Unlock	Activated	%QX0.07	ON
	or Top Door Open	Activated	%QX0.05	ON
	or Top Door Close	Activated	%QX0.06	ON
В	and Pump On	Activated	N/A	ON

Note: The Tailgate PWM output provides flow to the Tailgate hydraulic valve assembly. This flow, when combined with activation of a Tailgate function, will move the Tailgate Up, Down, Lock, Unlock, Top Door Open or Top Door Close. With condition 'B' true, Tailgate Valve PWM output will activate any of the output in condition 'A'.

4.05: Optional In-Cab Input Functions

FUTURE EXPANSION

4.06: Optional In-Cab Output Functions

E01 Output Function (Option) – CAB Flood light control (In Cab Output %QX128.00)

This output function controls the Cab Flood Light output. Here CAN control is used to turn ON/OFF the In-Cabinet Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Cab Flood Switch	Activated	CAN	ON

4.07: Optional Body Input Functions

F01 Input Function – High Pressure Filter Switch (Body Input %IX128.4)

This circuit monitors the ON/OFF status of the High Pressure Filter Switch.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
High Pressure Filter Switch	Activated	%IX128.4	ON

F02 Input Function – Bayne Can Down Switch (Body Input %IX0.06)

This input circuit monitors the status of a Bayne Carry can down button (if installed). The input is ON when the Down button is pressed. This circuit is used for controlling the Bayne Carry Can tipper.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Bayne Can Down Switch	Activated	%IX0.07	ON

F03 Input Function – Bayne Can Up Switch (Body Input %IX0.07)

This input circuit monitors the status of a Bayne Carry can up button (if installed). The input is ON when the Up button is pressed. This circuit is used for controlling the Bayne Can tipper.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Bayne Can Up Switch	Activated	%IX0.06	ON

F04 Input Function – Cab Protector Down Proximity Switch (Body Input %IX0.14)

This circuit monitors the ON/OFF status of the Cab Protector Down Proximity Switch. The input is ON when the Cab Protector is down. This circuit is used to interlock the arms when the aluminum cab protector is raised.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Protector Down Prox. Switch	Activated	%IX0.14	ON

F05 Input Function -- Tailgate Locked Proximity Switch (Body Input %IX0.02)

This circuit monitors the ON/OFF status of the Tailgate Locked Proximity Switch i.e. it indicates the position of the Tailgate lock cylinders. The input is ON when the Tailgate cylinder is locked.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Locked Proximity Switch	Activated	%IX0.02	ON

F06 Input Function – Top Door Fully Open Proximity Switch (Body Input %IX0.01)

This circuit monitors the ON/OFF status of the Top Door Open Proximity Switch. The input is ON when the top door is fully open.

146

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Top Door Proximity Switch	Activated	%IX0.01	ON

<u>F07 Input Function – Oil Level Switch (Body Input %IX0.07)</u> This circuit monitors the status of the Hydraulic Oil Level. The input is ON when the Hydraulic Oil Level in the tank is sufficient. This function is used for activating the Pump.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Oil Level Switch	Activated	%IX0.07	ON

F08 Input Function – External Throttle Advance Switch (Body Input %IX128.06)

This circuit monitors the status of the External Throttle advance switch. This input is USED FOR FUTURE EXPANSION

Condition	Modifiable Parameters	Default Setting
ι	USED FOR FUTURE EXPANSION	

Function Logic:

Input Device	Status	I/O Address	Status
External Throttle Advance Switch	Activated	%IX128.06	ON

4.08: Optional Body Output Functions

G01 Output Function - Curotto - Carry Can Cover Up (Body Output %QX0.10)

This function controls the Curotto - Carry Can Cover Up signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Cover Open function	Activated	N/A	ON(See Note below)
В	or Cover Open Push Button	Activated	CAN	ON
С	and Pump On	Activated	N/A	ON

Note: With Condition 'C' true, Condition (A OR B) will activate the Carry Can Cover Up output. Cover Open function will activate automatically for 2 seconds when arms travel below 15 degrees.

G02 Output Function – Curotto - Carry Can Cover Down (Body Output %QX0.11)

This function controls the Curotto - Carry Can Cover Down signal.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Cover Close function	Activated	N/A	ON(See Note below)
В	or Cover Close Push Button	Activated	CAN	ON
С	and Pump On	Activated	N/A	ON

Note: If Condition (A OR B) is true, will activate the Carry Can Cover Down output. Cover Open function will activate automatically for 2 seconds when arms travel above 15 degrees.

G03 Output Function – Tailgate Camera Output (Body Output %QX128.03)

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status

G04 Output Function – Hopper Camera Output (Body Output %QX128.02)

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status

G05 Output Function – Strobe Light 1 Circuit (In Cab Output %QX128.14)

This circuit operates the Strobe light circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Strobe Switch Enabled	Activated	CAN	ON
В	Pump On	Activated	N/A	ON
С	Reverse	Activated	N/A	ON
D	Turn Signal	Deactivated	N/A	OFF

Note: The Strobe light circuit-1 can be turned ON in following conditions:

With Pump ON or Reverse signal activated or Strobe switch ON

If the unit is configured with Whelen strobes, the strobes are ON in the above conditions with Turn signal being deactivated.

G06 Output Function – Strobe Light 2 Circuit (In Cab Output %QX128.15)

This circuit operates the Strobe light circuit -2.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Strobe Switch Enabled	Activated	CAN	ON
В	Pump On	Activated	N/A	ON
С	Reverse	Activated	N/A	ON
D	Turn Signal	Deactivated	N/A	OFF

Note: The Strobe light circuit-2 can be turned ON in following conditions: With Pump ON or Reverse signal activated or Strobe switch ON If the unit is configured with Whelen strobes, the strobes are ON in the above conditions

with Turn signal being deactivated.

G07 Output Function -- Top Door Close (Body Output %QX0.06)

This output function controls the Top Door Close output.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Top Door Close Push Button	Activated	CAN	ON
В	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Top Door Open switch either from Street side or from Curb side panel. With Conditions (A AND B) true, will activate the Top Door Close output.

G08 Output Function -- Top Door Open (Body Output %QX0.05)

This output function controls the Top Door Open output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Top Door Open Push Button	Activated	CAN	ON
В	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Top Door Open switch either from Street side or from Curb side panel. With condition (A AND B) true, will activate the Top Door Open output signal.

G09 Output Function – Container Light Circuit (In Cab Output %QX128.11)

This circuit operates the Container light circuit. Here CAN control is used to turn ON/OFF the Container Light Circuit either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Container Light Switch	Activated	CAN	ON

Note: With condition 'A' true, will activate the Container Light Output signal either from Street side or from Curb Side of the dual control panel unit.

<u>G10 Output Function (Option) – Curotto - Carry Can Light (In Cab Output %QX0.07)</u> This output function controls the Curotto - Carry Can Light output. Here CAN control is used to turn

This output function controls the Curotto - Carry Can Light output. Here CAN control is used to turn ON/OFF the Curotto Can – Light, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Can Light Switch	Activated	CAN	ON

Note: With condition 'A' true, the Curotto Can Lights will activate.

G11 Output Function – Auxiliary Backup Light Circuit (In Cab Output %QX128.13)

This circuit operates the Auxiliary Backup light circuit. Here Reverse and Switch control is used to turn ON/OFF the Auxiliary Backup Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Reverse	Activated	CAN	ON
В	Auxiliary Light Switch	Activated	CAN	ON

Note: With condition 'A' or 'B' true, the Auxiliary Backup Light Output will activate.

4.09: Analog Input Functions

H01 Input Function – Packer Position (Analog Input %IW02)

This circuit measures the value of Packer Position.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Position	Activated	%IW02	VOLTAGE

H02 Input Function – Oil Tank Temperature (Analog Input %IW14)

This circuit measures the Hydraulic Oil Temperature.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Oil Temperature	Activated	%IW14	VOLTAGE

H03 Input Function – Body Valve Pressure (Analog Input %IW0)

This circuit is used to measure the Body Valve pressure.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
Body Valve pressure	Activated	%IW0	VOLTAGE

4.10: CAN In-Cab Input Functions

101 Input Function -- Hydraulic Pump Enable Push Button (CAN - In Cab Input)

This CAN control button is used to turn ON the Hydraulic Pump, either from Street side or from the Curb side of dual control panel unit.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Hydraulic Pump Enable Input	Activated	CAN	ON (CAN Control)

102 Input Function -- Packer Extend Input (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Packer Extend control either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Extend Input	Activated	CAN	ON (CAN Control)

103 Input Function -- Packer Retract Input (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Packer Retract control either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Retract Input	Activated	CAN	ON (CAN Control)

104 Input Function -- Packer Over-height Override Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Packer Over-height Override control either from Street side or from the Curb side of a dual control panel unit. This switch is for future expansion if needed, and currently interrupts a pack cycle in progress.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Over-height Override Input	Activated	CAN	ON (CAN Control)

105 Input Function – Select-O-Pack Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Select-O-Pack control either from Street side or from the Curb side of a dual control panel unit. This circuit monitors the ON/OFF status of the Select-O-Pack Switch. This circuit enables Auto Pack and Auto Retract action.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Select-O-Pack Input	Activated	CAN	ON (CAN Control)

106 Input Function – CAB Cover Raise Switch Circuit (CAN - In Cab Input)

This CAN control is used to raise the Cab protector shield, either from Street side or from the Curb side of a dual control panel unit. Future Expansion.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Cover Raise Input	Activated	CAN	ON (CAN Control)

107 Input Function – CAB Cover Lower Switch Circuit (CAN - In Cab Input)

This CAN control is used to lower the Cab protector shield, either from Street side or from the Curb side of a dual control panel unit. Future Expansion.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Cover Lower Input	Activated	CAN	ON (CAN Control)

108 Input Function - Tailgate Raise Switch (CAN - In Cab Input)

This CAN control is used to raise the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Raise Input	Activated	CAN	ON (CAN Control)

109 Input Function – Tailgate Lower Switch (CAN - In Cab Input)

This CAN control is used to lower the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Lower Input	Activated	CAN	ON (CAN Control)

I10 Input Function – Tailgate Lock Switch (CAN - In Cab Input)

This CAN control is used to lock the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Lock Input	Activated	CAN	ON (CAN Control)

I11 Input Function – Tailgate Unlock Switch (CAN - In Cab Input)

This CAN control is used to unlock the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Unlock Input	Activated	CAN	ON (CAN Control)

I12 Input Function – Commercial Grabber Enable Switch (CAN - In Cab Input)

This CAN control is used to enable the Grabber control in commercial mode.

Condition Modifiable Parameters Default Setting

A None	N/A
--------	-----

Function Logic:

Input Device	Status	I/O Address	Status
Commercial Grabber Enable Switch	Activated	CAN	ON (CAN Control)

113 Input Function – Auto Lift Enable Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Auto Lift Enable Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auto Lift Up Enable Circuit	Activated	CAN	ON (CAN Control)

4.11: MULTI FUNCTION JOYSTICK CONTROL INPUT FUNCTIONS

The Multifunction Joystick control can operate in 2 modes:

- 1. Carry Can mode: If the Autolift switch is enabled (turned ON), then the Joystick is used for controlling the carry can operations. If the Mode button is pressed, the joystick controls the Arms / Forks in Auto lift mode.
- 2. Manual mode: If the Autolift switch is disabled (turned OFF), then Joystick controls only the Arms/Forks.

J01 Input Function – Joystick – Rocker (GRAB) Switch (CAN – Cab Input)

Here the Rocker switch GRAB position is used to Grab / Hold the Can.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
. Curotto Can – Grabber Enable	Activated	CAN	ON (CAN Control)

J02 Input Function – Joystick – Rocker (RELEASE) Switch (CAN – Cab Input)

Here the Rocker switch RELEASE position is used to release the Can from Gripper.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Input Device	Status	I/O Address	Status
Curotto Can – Release Enable	Activated	CAN	ON (CAN Control)

J03 Input Function – Joystick – Y-AXIS (Negative Direction) (CAN – Cab Input)

- 1. Carry Can mode: Pulling back the Joystick (Y-axis in Negative direction) performs the Curotto can Dump operation.
- 2. Manual mode: Pulling back the Joystick (Y-axis in Negative direction) performs the Arms up operation.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Y-Axis Negative direction	Activated	CAN	ON (CAN Control)

J04 Input Function – Joystick – Y-POS. (Positive Direction) (CAN – Cab Input)

- 1. Carry Can mode: Pushing the Joystick forward (Y-axis in Positive Direction) performs the Curotto can Un-dump operation.
- 2. Manual mode: Pushing the Joystick forward (Y-axis in Positive Direction) performs the Arms Down operation.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Y-Axis Positive direction	Activated	CAN	ON (CAN Control)

J05 Input Function – Joystick – X-AXIS (Negative Direction) (CAN – Cab Input)

- 1. Carry Can mode: Moving the Joystick Left (X-axis in Negative direction) makes the Curotto can Arm retract.
- 2. Manual mode: Moving the Joystick Left (X-axis in Negative direction) performs the Forks up operation.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
X-Axis Negative direction	Activated	CAN	ON (CAN Control)

<u>J06 Input Function – Joystick – X-AXIS (Positive Direction) (CAN – Cab Input)</u>

- 1. Carry Can mode: Moving the Joystick Right (X-axis in Positive direction) makes the Curotto can Arm extend.
- 2. Manual mode: Moving the Joystick Right (X-axis in Positive direction) performs the Forks down operation

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
X-Axis Positive direction	Activated	CAN	ON (CAN Control)

J07 Input Function – Joystick –Autolift Mode Button (CAN – Cab Input)

When the Auto Lift switch is ON and the Auto lift mode button (Red) is pressed it activates the Auto lift option i.e. press and hold the Auto lift mode button (Red) and pull back the Joystick (Y- axis Negative direction), this lifts the Curotto can and completes the Auto dump cycle.

Press and hold the Auto lift mode button (Red) and push the Joystick forward (Y- axis Positive direction), this makes the Curotto can roll out of the Hopper and brings the Arms to down position.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auto lift Mode Button	Activated	CAN	ON (CAN Control)

J08 Input Function – Joystick – Operator presence (CAN – Cab Input)

Joystick operator presence input is a capacitive sensor embedded in the Multi-function joysticks that is activated when the operators hand is placed around the joystick handle.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Joystick Operator Presence	Activated	CAN	ON (CAN Control)

4.12: OPTION CAN Auxiliary-Cab Input Functions

K01 Input Function – Auxiliary Arms/Forks Control Enable Switch (CAN - In Cab Input)

This is used to turn ON the - Auxiliary Arms/Forks control Enable switch that Enables or Disables the control for operating the Auxiliary Arms/Forks control.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Arms/Forks Control Enable	Activated	CAN	ON (CAN Control)

K02 Input Function – Auxiliary Arms Raise Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Arms Raise switch using Auxiliary control. This input is operative only if

Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Arms Raise	Activated	CAN	ON (CAN Control)

K03 Input Function – Auxiliary Arms Lower Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Arms Lower switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Arms Lower	Activated	CAN	ON (CAN Control)

K04 Input Function – Auxiliary Forks Raise Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Forks Raise switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Forks Raise	Activated	CAN	ON (CAN Control)

K05 Input Function – Auxiliary Forks Lower Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Forks Lower switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Forks Lower	Activated	CAN	ON (CAN Control)

K06 Input Function – Auxiliary Packer Extend (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Packer Extend switch using Auxiliary control. This input is operative only

if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Packer Extend	Activated	CAN	ON (CAN Control)

K07 Input Function – Auxiliary Packer Retract (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Packer Retract switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Packer Retract	Activated	CAN	ON (CAN Control)

K08 Input Function – Auxiliary Curotto Control Enable Switch (CAN - In Cab Input)

This is used to turn ON the Auxiliary Curotto Control Enable switch that Enables or Disables the control for operating the Auxiliary Curotto control.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Controls Enable Switch	Activated	CAN	ON (CAN Control)

K09 Input Function – Auxiliary Curotto (GRAB) Switch (CAN - In Cab Input)

Here the Auxiliary Curotto control (GRAB) switch is used to Grab / Hold the Can. This input will be active only if Auxiliary Curotto Control Enable Switch is ON (Refer K08).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Curotto (Grab) Switch	Activated	CAN	ON (CAN Control)

K10 Input Function – Auxiliary Curotto (RELEASE) Switch (CAN - In Cab Input)

Here the Auxiliary Curotto control (RELEASE) is used to release the Can from Gripper. This input will be

active only if Auxiliary Curotto Control Enable Switch is ON (Refer K08).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Curotto (Release) Switch	Activated	CAN	ON (CAN Control)

K11 Input Function – Auxiliary Curotto (DUMP) Switch (CAN - In Cab Input)

Here the Auxiliary Curotto control (DUMP) switch performs the Curotto Can Dump. This input will be active only if Auxiliary Curotto Control Enable Switch is ON (Refer K08).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Curotto (Dump) Switch	Activated	CAN	ON (CAN Control)

K12 Input Function – Auxiliary Curotto (UNDUMP) Switch (CAN - In Cab Input)

Here the Auxiliary Curotto control (UNDUMP) switch performs the Curotto Can Undump. This input will be active only if Auxiliary Curotto Control Enable Switch is ON (Refer K08).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Curotto (Undump) Switch	Activated	CAN	ON (CAN Control)

K13 Input Function – Auxiliary Curotto (IN) Switch (CAN - In Cab Input)

Here the Auxiliary Curotto control (IN) switch makes the Curotto Can Arm retract. This input will be active only if Auxiliary Curotto Control Enable Switch is ON (Refer K08).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Curotto (IN) Switch	Activated	CAN	ON (CAN Control)

K14 Input Function – Auxiliary Curotto (OUT) Switch (CAN - In Cab Input)

Here the Auxiliary Curotto control (OUT) switch makes the Curotto Can Arm extend. This input will

be active only if Auxiliary Curotto Control Enable Switch is ON (Refer K08).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Curotto (OUT) Switch	Activated	CAN	ON (CAN Control)

4.13: OPTION CAN In-Cab Input Functions

L01 Input Function – Travel Position Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Travel position Signal of the Packer, either from Street side or from the Curb side of a dual control panel unit. This switch is used to move the Packer to the travel position when there is no top door.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Travel Position Switch	Activated	CAN	ON (CAN Control)

L02 Input Function – Top Door Open Switch (CAN - In Cab Input)

This CAN control is used to open the Top Door, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Top Door Open Switch	Activated	CAN	ON (CAN Control)

L03 Input Function – Top Door Close Switch (CAN - In Cab Input)

This CAN control is used to close the Top Door during the Travel position Signal of the Packer, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
Top Door Close Switch	Activated	CAN	ON (CAN Control)

L04 Input Function – Strobe Light Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Strobe Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Strobe Light Circuit Switch	Activated	CAN	ON (CAN Control)

L05 Input Function – Hopper Light Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Hopper Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Hopper Light Circuit Switch	Activated	CAN	ON (CAN Control)

L06 Input Function – Auxiliary Light Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Auxiliary Backup Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Backup Light Circuit Switch	Activated	CAN	ON (CAN Control)

L07 Input Function – Container Light Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Container Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
Container Light Circuit Switch	Activated	CAN	ON (CAN Control)

L08 Input Function – CAB Light Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the forward facing Cab Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Light Circuit Switch	Activated	CAN	ON (CAN Control)

L09 Input Function – Curotto Can – Cover Open Switch (CAN - In Cab Input)

This CAN control is used to open the Curotto Can – Auto Cover, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Curotto Can – Cover Open	Activated	CAN	ON (CAN Control)

L10 Input Function – Curotto Can – Cover Close Switch (CAN - In Cab Input)

This CAN control is used to close the Curotto Can – Auto Cover, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Curotto Can – Cover Close	Activated	CAN	ON (CAN Control)

L11 Input Function – Curotto Can – Light Enable Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Curotto Can – Light, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
Curotto Can – Light	Activated	CAN	ON (CAN Control)

Section 5: Special Features

5.01: Auto Pack Mode

Auto Pack is a standard feature on all CORTEX controlled FEL (Front End Loader) products. While in Auto Pack the Packer will complete its cycle automatically with a momentary activation of the Packer Extend push button.

5.02: Select-O-Pack

Select-O-Pack is an option for Commercial FEL products and is standard on Residential FEL products.

If the Select-O-Pack switch is enabled, then an Auto pack cycle will begin when the Arms reach a pre-defined position during a lower action.

For Commercial or Non-Curotto Can units that predefined location is when the Arms above Height proximity switch activates during a down motion, while on Curotto Can units it activates when the Arms read the bottom of the cycle.

5.03: Travel Position

When the Travel position switch is enabled pressing Packer Extend will Extend Packer to Travel position and stop. The indication will flash while moving and turn solid when at the Travel position. To return to the home turn OFF Travel position switch and hold retract. Travel position functionality is available only in manual mode

5.04: INSIGHT Display Functionality

CORTEX32 Controller uses a hand held device (INSIGHT) for displaying the current status of Input / Output, Engine speed, Temperatures etc., and can be used to SET / RESET any particular Input / Output bit. This can also be used for configuring or selecting different options in CORTEX32 controller.

This display has provision of connecting 1-Input (Digital or Analog), 1-Ouput terminal to it. Also, a Analog video input which supports PAL/NTSC standard can also be connected to it.

Other features of this display are, it has an Integrated Buzzer and 2 sensors which can be used to monitor the Temperature inside the housing.

There are 2 types of INSIGHT display devices used here for performing various operations as mentioned below:

- A. INSIGHT Display (7")
- B. INSIGHT Display (12")

5.04.01A: INSIGHT Display (7") Operating Elements

INSIGHT Display (7") :- Consists of 9 backlit function keys, Analogue video input, and a INSIGHT (Graphic) display terminal as shown below:



Fig.: 7" INSIGHT Display Unit

The display is fitted with the following operating elements:

- 1.9 Function Keys
- 2. 4 Directional Arrows (Up / Down / Right / Left)
- 3. OK Push Button
- 4. INSIGHT Display.

<u>1. Function Keys</u>: There will be 9 backlit freely programmable function keys available in INSIGHT. The Function Keys primary use is to allow transition between operations screens. They also change to password protection keys if a password protected screen is activated (for Ex: Left side keys Top to Bottom "1 - 2 - 3 - 4" and Right side keys Top to Bottom "5 - 6 - 7 - 8").

<u>2. Directional Arrows:</u> The Directional Arrows may be used for cursor movement function (Up / Down / Right / Left). This can be used for cursor location purposes from within Input, Output, Maintenance or Options Screens.

3. OK Push Button:

Note: For example: When a particular Input / Output bit is selected using Direction Arrows, the OK Push Button can be used to turn ON / OFF that particular bit. Once a particular bit is turned ON / OFF, the respective bit color will be changed from Gray to Green or vice versa, which will be displayed on the INSIGHT terminal.

<u>4. INSIGHT Display:</u> This is used for displaying the current status of the Input / Output, Engine Run Speed, Temperature, Auto/Manual mode etc. This can be programmed for graphically representing a process. This can also be used for changing the set points for Analog values.

5.04.01B: INSIGHT Display (12") Operating Elements

INSIGHT Display (12"):- Consists of 13 backlit function keys, Analogue video input, and a INSIGHT (Graphic) display terminal as shown below:



Fig.: 12" INSIGHT Display Unit

The display is fitted with the following operating elements:

- 1. 13 Function Keys
- 2. 4 Directional Arrows (Up / Down / Right / Left)
- 3. OK Push Button 4. INSIGHT Display.

<u>1. Function Keys</u>: There will be 13 backlit freely programmable function keys available in INSIGHT. The Function Keys primary use is to allow transition between operations screens. They also change to password protection keys if a password protected screen is activated (for Ex: Left side keys Top to Bottom "1 - 2 - 3 - 4" and Right side keys Top to Bottom "5 - 6 - 7 - 8").

<u>2. Directional Arrows</u>: The Directional Arrows may be used for cursor movement function (Up / Down / Right / Left). This can be used for cursor location purposes from within Input, Output, Maintenance or Options Screens.

3. OK Push Button:

Note: For example: When a particular Input / Output bit is selected using Direction Arrows, the OK Push Button can be used to turn ON / OFF that particular bit. Once a particular bit is turned ON / OFF, the respective bit color will be changed from Gray to Green or vice versa, which will be displayed on the INSIGHT terminal.

<u>4. INSIGHT Display:</u> This is used for displaying the current status of the Input / Output, Engine Run Speed, Temperature, Auto/Manual mode etc. This can be programmed for graphically representing a process. This can also be used for changing the set points for Analog values.

5.04.02: Display Operating States:

Colour	Status	Description
-	permanently off	no operating voltage
green	5 Hz	boot process application
	2 Hz	application running (RUN) or set-up running
	permanently on	application has stopped (STOP) or no project available
red	2 Hz	application is running with an error (RUN with error)
	permanently on	system error (fatal error), device is in reset (e.g. internal voltage error)
red/orange	2 Hz colour change	overtemperature/undertemperature, device is in reset until temperature in normal range
orange	5 Hz	boot process system recovery/update
	2 Hz	system recovery/update running
	briefly on	System reset

5.04.03:Rear Panel Housing connection:

Table below provides Wiring details for the Interface cable of INSIGHT (7" and 12") display units:-



- 1: Service cover for USB connection, battery and watchdog reset
- 2: Locator for RAM® mount system and mounting frame
- 3: M12 connector (fig. shows max. number of connectors)

1	2, 5, 6, 7, 8	3	4
Connector A-coded, 5 poles	Socket A-coded, 5 poles	Socket B-coded, 5 poles	Socket D-coded, 4 poles
5 3 4	5-0°°° 4 3	$5 \frac{1}{4} \frac{2}{3}$	



5.04.04:Interface details:

<u>1. Ethernet Interface:</u> Use a Shielded CAT5 cable (Shielded Twisted Pair - STP) for connection with maximum lebgth of 25 mts.

2. Ethernet Camera: The device supports Ethernet cameras.

<u>3. USB Interface:</u> The USB interfaces are used for temporary connection of an external keyboard, mouse or a USB memory stick during servicing or maintenance. The USB device is connected to the display unit using a M12 connector. **NOTE:** They are not intended for actual operation (Remove the USB device after their use).



USB connection via M12 connector

- 1: Dialogue module
- 2: USB connector, for example in the control panel or in the dashboard
- 3: USB keyboard, mouse or memory stick



- Permanent connection: Dialogue module USB connector
- Use prewired cable.
 - (e.g. art. no. EC2099, M12 connector, B-coded on USB socket, type A, watertight, cable length 1.5 m, wires twisted and screened)
- Use only cables with twisted and screened wires for individual wiring. Keep length "A" as short as possible and position the USB connector in immediate vicinity to the dialogue module. The length "A" considerably influences the quality of the USB data transmission.
- B Temporary connection: USB connector USB device
 - Use a connection cable with the designation "Full Speed/High Speed" (= USB connection cable with twisted and screened cores).
 - Do not make a connection using several USB connection cables.
 - Remove connection cable after the programming or service works.

5.05: Odyssey Interlock Functionality

5.05.01: Residential Mode

A. Curb Side Control

- 1. Manual mode:
 - The angle of the Forks are limited and the location in the arm arc where the Forks can be adjusted is limited to below the Overheight position.
 - This Fork angle adjustment range will be 10 degrees up and down from the level position.
- 2. Carry Can mode: The unit is limited to Residential Can functions at all time.
- 3. AutoLift mode: In this mode full range of interlocks such as:
 - Cab/Fork interlocks below the windshield where the forks cannot be feathered into the cab.
 - Forks cannot be feathered above the windshield at all. The only way to rolls the forks is via the prescribed roll-in position during AutoLift and even then only when the Engine speed is > 1000 RPM and the AutoLift is started below the windshield height.
 - Arms cannot be lowered unless the forks clear position (can is fully outside of the hopper) has been reached.

- The AutoLift cycle can be stopped or started from any position. If the cycle is started above the windshield then regardless of the state of the Engine speed the forks will not roll until the arms are fully raised.
- If the packer is away from home the arms will interlock at the top of the windshield (or at the more accurately labeled "interlock position" since this position is adjustable.) Also the packer will not be able to move if the arms are above the interlock position.
 - If the top door, if any, is not fully open the arms will interlock at the interlock position.
 - If the top door is not fully open the arms and forks will not be allowed to move above Overheight position.

B. Street Side Control

- 1. Manual mode:
 - The angle of the Forks are limited and the location in the arm arc where the Forks can be adjusted is limited to below the Overheight position.
 - This Fork angle adjustment range will be 10 degrees up and down from the level position.
- 2. Carry Can mode: The unit is limited to Residential Can functions at all time.
- 3. AutoLift mode: In this mode full range of interlocks such as:
 - Cab/Fork interlocks below the windshield where the forks cannot be feathered into the cab.
 - Forks cannot be feathered above the windshield at all. The only way to rolls the forks is via the prescribed roll-in position during AutoLift and even then only when the Engine speed is > 1000 RPM and the AutoLift is started below the windshield height.
 - Arms cannot be lowered unless the forks clear position (can is fully outside of the hopper) has been reached.
 - The AutoLift cycle can be stopped or started from any position. If the cycle is started above the windshield then regardless of the state of the Engine speed the forks will not roll until the arms are fully raised.
 - If the packer is away from home the arms will interlock at the top of the windshield (or at the more accurately labeled "interlock position" since this position is adjustable.) Also the packer will not be able to move if the arms are above the interlock position.
 - If the top door, if any, is not fully open the arms will interlock at the interlock position.
 - If the top door is not fully open the arms and forks will not be allowed to move above Overheight position.

Note: In Carry Can mode, all interlocks are active on the street side even with knob or 2-lever joysticks installed. Autolift function is not available with knob or 2-lever joystick. 5.05.02: Commercial Mode

A. Curb Side Control

- 1. Manual mode:
 - The angle of the Forks are limited and the location in the arm arc where the Forks can be adjusted is limited to below the Overheight position.
 - This Fork angle adjustment range will be 10 degrees up and down from the level position.
- 2. Carry Can mode: The unit is limited to Residential Can functions at all time.
- 3. AutoLift mode: In this mode full range of interlocks such as:
 - Cab/Fork interlocks below the windshield where the forks cannot be feathered into the cab.
 - Forks cannot be feathered above the windshield at all. The only way to rolls the forks is via the prescribed roll-in position during AutoLift and even then only when the Engine speed is > 1000 RPM and the AutoLift is started below the windshield height.
 - Arms cannot be lowered unless the forks clear position (can is fully outside of the hopper) has been reached.
 - The AutoLift cycle can be stopped or started from any position. If the cycle is started above the windshield then regardless of the state of the Engine speed the forks will not roll until the arms are fully raised.
 - If the packer is away from home the arms will interlock at the top of the windshield (or at the more accurately

labeled "interlock position" since this position is adjustable.) Also the packer will not be able to move if the arms are above the interlock position.

- If the top door, if any, is not fully open the arms will interlock at the interlock position.
- If the top door is not fully open the arms and forks will not be allowed to move above Overheight position.
- C. Street Side Control:

WARNING: Operator can roll the forks to Full Tuck with or without a can present. If a can is present and the operator rolls the forks to far, damage to the cab, cab protector, can and operator may occur.

- No Curotto controls available
- All standard commercial control interlocks.
- No fork interlock
- No Autolift available

Section 6: Diagnostic Messages and Alarms

6.01: Testing I/O Voltage

To test the voltage at an input or output terminal a Digital Multi Meter is always the best tool. Incandescent test lights cannot be used to test inputs from certain electronic input devices, the amperage required to light an incandescent tester may exceed the maximum output of the device. If using a test light it must be an LED type tester.

PWM Signal: PWM Controls amount of power, supplied to electrical devices. Main advantage of PWM is that power loss in the switching devices is very low.

The Average value of Voltage (and Current) fed to the load is controlled by turning the switch between supply and load ON and OFF at a fast pace. The longer the switch is ON compared to the OFF periods, the higher the power supplied to the load is. Refer figure below for PWM waveforms:

Voltage can be measured for a PWM signal by using the following equation: Voltage_Multimeter = (12V * T_High + 0V * T_Low) / PWM_Period Where PWM_Period = T_High + T_Low (Seconds)

For Ex: T_Low = Test Bulb OFF Time. T_High = Test Bulb ON Time



172

HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) Body Controller Software

$$\begin{split} D &= \frac{T_{on}}{\left(T_{on} + T_{off}\right)} = \frac{T_{on}}{T_{total}} \\ & \text{Where;} \\ D &= \text{Duty Cycle.} \\ Ton &= T_High; Toff = T_Low; \\ Thotal (PWM_Period) &= T_High + T_Low; \end{split}$$

Figures: PWM Output signal Waveforms

6.02: Monitoring Input Status

With an Input ON, the corresponding Input field (with Description and Address) located in INSIGHT display will also be ON.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

6.03: Monitoring Output Status

With an Output ON, the corresponding Output field (with Description and Address) located in INSIGHT display will also be ON.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

6.04: Diagnostic Display Messages

When a fault has been set 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.

Top Door Open and Auto Pack Interlock (standard equipment)

If Top door is not fully open with Top door configuration bit is ON and Residential Curotto Configuration bit ON and Select-O-Pack option enabled and Travel position switch enabled or Packer Extend Push Button pressed, Top Door Open diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON.

- B. Residential Curotto Configuration bit is ON..
- C. Top Door Configuration bit is ON.
- D. Select-O-Pack bit is ON
- E. Packer Extend Push Button pressed.
- F. Travel Position Switch ON.

Disabled Functions: Packer.

Fault Reset: Open the top door fully. Check top door, Packer Extend prox. Select-O-Pack switch for proper operation

<u>Auto Lift Enabled and Overweight Alarm Active (standard equipment)</u>

If Auto lift enable switch is turned ON from either street side or from the curb side of the dual control panel for Bank-2 Switch-6 and Bank-4 Switch-6 and Scale Alarm-2 is enabled due to Overweight / PTO-1 or PTO-2 pump is ON, the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Scale Alarm-2 ON due to Overweight. B. PTO-1 and PTO-2 pump Active signal ON.

Disabled Functions: Arms Up interlock and Forks raise Interlock

Fault Reset: Check Auto Lift Enable switch and check for Overweight condition for proper operation.

• <u>Cab Protector Down with Arms Lowered Interlock and Arms Active and Arms up Interlock</u> (standard equipment)

The arms have been lowered when the top door is not fully open or the Arm position angle is greater than the Fork roll position value (765) and Arms Up position in less than (910) and the Packer/ Cab protector switch has not been enabled and the Fork position is greater than Feather Up range (710) and Arms up PWM Value less than (800) and Cab Protector Down configuration bit is ON and Top door configuration bit is ON and Residential configuration bit is ON, the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



- Indication: A. Top Door Open light ON.
 - B. Residential Configuration bit is ON.
 - C. Top Door Configuration bit is ON.
 - D. Cab Protector Down Configuration bit is ON.

Disabled Functions: Forks will not Lowered.

<u>Fault Reset</u>: Open the top door fully. Check top door, Cab protector down prox., Lift below Transit prox., Forks position and Arms position for proper operation.

<u>Cab Protector Down with Forks Untuck and Arms Lowered Docked Interlock (standard equipment)</u>

The arms have been lowered when the top door is not fully open and Forks Untuck position is '113' and Arm Angle position is lesser than '110', the diagnostic message will be displayed in the Insight display.

Insight Display Illustration: BEEP CODE 19-2


Indication: A. Top Door Open light ON.

- B. Residential Configuration bit is ON.
- C. Top Door Configuration bit is ON.
- D. Cab Protector Down Configuration bit is ON.

Disabled Functions: Forks will not be Lowered.

<u>Fault Reset</u>: Open the top door fully. Check top door, Cab protector down prox., Lift below Transit prox., Forks position and Arms position for proper operation.

• Top Door Open and Arms Lowered Interlock (standard equipment)

If arms have been lowered when the top door is not fully or the Arm position angle is greater than the Fork roll position value (765) and the Fork position is greater than Feather Up range (710) and the Top door configuration bit is ON and Residential configuration bit is ON, the diagnostic message will be displayed in the Insight display.



Indication: A. Top Door Open light ON.

B. Residential Configuration bit is ON. C. Top Door Configuration bit is ON.

Disabled Functions: Forks will not lowered.

Fault Reset: Open the top door fully. Check top door, Lift below Transit prox., Forks position and Arms position for proper operation.

Cab Protector Raised and Arms Lowered Interlock (standard equipment)

The arms have been lowered when the Arm position angle is greater than the Fork roll position value (765) and the Packer/ Cab protector switch has been enabled and the Fork position is greater than Feather Up range (710) and Cab Protector Down configuration bit is ON and Residential configuration bit is ON, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON. B. Residential Configuration bit is ON. C. Cab Protector Up Configuration bit is ON.

Disabled Functions: Forks will not Lowered.

<u>Fault Reset</u>: Open the top door fully. Check Cab protector down prox., Lift below Transit prox., Forks position and Arms position for proper operation.

Travel Position Not Allowed Interlock Active (standard equipment)

If Auto lift enable switch is turned ON from either street side or from the curb side of the dual control panel and Travel position switch is activated while the Packer Extend/Retract push button has been pressed or Packer extend/retract Auxiliary controls are activated, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Packer Retract push button pressed.

- B. Packer Extend push button pressed.
- C. Travel Position switch ON
- D. Auto Lift Enable Switch ON

Disabled Functions: NONE.

<u>Fault Reset</u>: Turn OFF Auto Lift Enable Switch and Travel Position switch. Turn OFF the Packer extend/ retract Auxiliary controls to manually move the packer.

<u>Tailgate Closed While Ejecting (standard equipment)</u>

If Packer has reached the fully extended proximity switch while the tailgate is closed for at least 2 Seconds, then the diagnostic message will be displayed in the Insight display.



Indications: Packer Fully Extended and Tailgate Closed inputs are lit.

Disabled Functions: None.

Fault Reset: Manually retract the packer or open the tailgate.

• Packer Retract Pressed While Retracted (standard equipment)

If the packer is fully retracted but the packer return push button is still pressed or the Packer retract Auxiliary controls were activated, then the diagnostic message will be displayed in the Insight display.



Insight Display Illustration:

Indications: The packer was manually returned and the retract button was not released.

Disabled Functions: None.

<u>Fault Reset</u>: Release the packer retract button and Packer retract Auxiliary controls or check that the packer return proximity switch is properly placed.

<u>Auto-Pack Has Timed-Out (standard equipment)</u>

The CORTEX Controller has a timer to monitor packer extend and packer retract operations. If the packer extend time exceeds 35 seconds before the extend prox. switch is activated, this beep code will activate. In Auto Pack, the packer will automatically retract. Packer extend may time out when the body is full or when operated at Engine idle (low hydraulic pump flow.)

Insight Display Illustration:



<u>Indications</u>: Diagnostic message will be displayed in the Insight display. Packer extend prox. is not activated 35 seconds after start of extend cycle.

Disabled Functions: Packer Extend

Fault Reset: Check packer extend prox. switch for proper operation and adjustment. Operate packer above Engine idle.

Arms Raised Interlock Active (standard equipment)

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Packer/ Cab protector switch has not been enabled / Scale Alarm-2 is enabled due to Overweight / PTO-1 or PTO-2 pump is ON, the diagnostic message will be displayed in the Insight display.





- C. Scale Alarm-2 ON due to Overweight.
- D. PTO-1 and PTO-2 pump Active signal ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and Packer retract prox. switches for proper operation.

Packer Extend Interlock Active (standard equipment)

If the Packer extend push button was pressed or the Packer extend Auxiliary controls were activated while the Arms were raised and the Packer/Overheight Over-ride switch was not enabled, then the diagnostic message will be displayed in the Insight display.

Hvd Oil Pump Ø %5 On OK %5 Auto Lift Off * 6 %5 9/06 E 3 %5 THE WHEELS ARE ALWAYS TURNING %5 Packer Extend Interlock

Insight Display Illustration:

Indication: A. Arms are raised

- B. Packer Extend push button pressed.
- C. Packer Override switch OFF.

Disabled Functions: Packer will not extend.

<u>Fault Reset</u>: Lower the arms until the Arms Raised light goes out. Turn OFF the Packer extend Auxiliary controls. Turn the Packer/Overheight Over-ride switch ON to manually move the packer.

Packer Extend PB with System Power OFF (standard equipment)

If the Packer extend push button pressed or the Packer extend Auxiliary controls were enabled with the system power turned OFF, the diagnostic message will be displayed in the Insight display.



Indication: A. System Power input is not lit. B. Packer does not move.

Disabled Functions: PTO-1 pump and PTO-2 pump

Fault Reset: Turn the system power ON before utilizing Packer push buttons.

• Side Door Open (standard equipment)

If the side door was opened during a packing operation or the pump enable switch was turned ON or the Auxiliary control for Packer Extend / Retract was enabled while the side door was open, the diagnostic message will be displayed in the Insight display.



Insight Display Illustration:

Indication: A. Pump turns OFF unexpectedly.

- B. Packer does not pack.
- C. Pump will not turn ON.

Disabled Functions: Pump and all packer functions.

Fault Reset: Close the side door or repair faulty side door proximity switch.

• Packer Extend PB held when fully extended (standard equipment)

If the Packer extend pushbutton was pressed (or was being pressed) or the Packer Auxiliary controls were activated after the packer extended proximity switch is turned ON.

Insight Display Illustration:



Indication: The diagnostic message will be displayed in the Insight display.

Disabled Functions: None

Fault Reset: Release the Packer extend push button or Turn OFF the Auxiliary Controls.

Packer Retract Has Timed Out (standard equipment)

The CORTEX Controller has a timer to monitor packer extend and packer retract operations. If the packer extend time exceeds 35 seconds before the extend prox. switch is activated, this beep code will activate. Packer retract may time out when the packer cannot fully retract due to the accumulation of material behind the packer panel.

Insight Display Illustration:



<u>Indication</u>: The diagnostic message will be displayed in the Insight display. Packer retract prox switch is not activated 35 seconds after the start of the retract cycle.

Disabled Functions: Packer retract.

<u>Fault Reset</u>: Check packer retract prox switch for proper operation and adjustment. Remove accumulated material from behind packer panel.

Packer Retract And Extend At Same Time (standard equipment)

If the Packer retract and extend push buttons have been pressed at the same time, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: The packer does not move.

Disabled Functions: Packer will not move.

Fault Reset: Determine why pack extend and retract buttons are active at the same time.

Packer Extend w/o Pump ON (standard equipment)

If the packer extend push button was pressed without the pump being ON, the diagnostic message will be displayed in the Insight display.



Indication: The packer does not move.

Disabled Functions: Packer extend.

Fault Reset: Turn ON the pump.

Hydraulic Filter Is In Bypass (standard equipment)

If the hydraulic filter has been in bypass for more than 11 hours, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: The Pump will only work for 3 minutes.

Disabled Functions: Pump

Fault Reset: Replace hydraulic oil filter.

Arms Raised Interlock and Overweight Alarm Active (standard equipment)

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Packer/ Cab protector switch has not been enabled / Scale Alarm-2 is enabled due to Overweight / PTO-1 or PTO-2 pump is ON, then the diagnostic message will be displayed in the Insight display.



Indication: A. Arms Overheight light ON.

- B. Top Door Open light ON.
- C. Scale Alarm-2 ON due to Overweight.
- D. PTO-1 and PTO-2 pump Active signal ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and packer retract prox. switches and Auto Lift Enable switch for proper operation. Check for Overweight condition for proper operation.

• Top Door Open and Arms Raised Interlock (standard equipment)

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Packer/ Cab protector switch has not been enabled / Scale Alarm-2 is enabled due to Overweight and Auto Lift Switch is Disabled / PTO-1 or PTO-2 pump is ON and Top Door Open Configuration bit is ON then the diagnostic message will be displayed in the Insight display.

Over Pumn Hvd Oil o $\hat{\mathbf{n}}$ On OK %5 Auto Lift Off × ļ, %5 %5 %5 %5 THE WHEELS ARE ALWAYS TURNING °-2 %5 %5 Arms Up Interlock Top Door Not Fully Open



- B. Top Door Open light ON.
- C. Scale Alarm-2 ON due to Overweight.

- D. PTO-1 and PTO-2 pump Active signal ON.
- E. Top Door Open Configuration bit is ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and packer retract prox. switches and Auto Lift Enable switch for proper operation.

<u>Cab Protector Raised and Arms Raised Interlock (standard equipment)</u>

If the arms have been raised when the packer is not fully retracted and the Packer/Cab protector switch has been enabled / Scale Alarm-2 is enabled due to Overweight and Auto Lift Switch is Disabled / Packer Extend or Packer Retract bit is ON/ PTO-1 or PTO-2 pump is ON, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON.

- B. Arms Overheight light ON.
- C. Scale Alarm-2 ON due to Overweight.
- D. PTO-1 and PTO-2 pump Active signal ON.
- E. Cab Protector Up Configuration bit is ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check Packer Retract prox. Switches, Cab protector down prox. Switches and Auto Lift Enable switch for proper operation.

Packer Sensor Fault (standard equipment)

The Packer position value is less than 100 during the Packing operation the diagnostic message will be displayed in the Insight display. (Refer section 4.09 – H04 – Packer Position for details).



Indication: A. Packer Sensor faulty B. Sensor failure ON

Disabled Functions: Packer functions and Fork function.

<u>Fault Reset</u>: Check for the Faulty sensor or Sensor mounting position or calibrate the faulty sensor and also check Packer Cylinder for proper operation.

• Fork Sensor Fault (standard equipment)

The Fork position value is less than '-100' during the operation then the diagnostic message will be displayed in the Insight display. Also the value is not within the High or Low limit (Refer section 4.09 – H03 – Fork Position for details).



Insight Display Illustration:

Indication: A. Fork Sensor faulty B. Sensor failure ON

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Check for the Faulty sensor or Sensor mounting position or calibrate the faulty sensor and check Cab protector prox. switches for proper operation.

<u>Arm Sensor Fault (standard equipment)</u>

The Arm position value is greater than '1100' during the operation then the diagnostic message will be displayed in the Insight display. Also the value is not within the High or Low limit (Refer section 4.09 – H02 – Arm Position for details).

Insight Display Illustration:



Indication: A. Arm Sensor faulty B. Sensor failure ON

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Check for the Faulty sensor or Sensor mounting position or calibrate the faulty sensor for proper operation.

<u>Arms Raised Interlock with Forks Untuck and Arms Raised Docked Interlock (standard equipment)</u>

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Forks Untuck position is '113' and Arm Angle position is greater than '450', the diagnostic message will be displayed in the Insight display.



Indication: A. Top Door Open light ON.

B. Top Door Open light ON.

C. PTO-1 and PTO-2 pump Active signal ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and Packer retract prox. switches for proper operation.

Side Door Interlock Fault (standard equipment)

If the Side door is opened with either pump enabled, the diagnostic message will be displayed on the Insight display.

Insight Display Illustration:



Indication: A. Pump turns OFF unexpectedly.

- B. Packer does not pack.
- C. Pump will not turn ON.

Disabled Functions: Pumps.

Fault Reset: Close the Side door or repair faulty Side door proximity switch.

Low Oil Level Fault (standard equipment)

The hydraulic oil level has dropped below a safe operating level during operation then the diagnostic message will be displayed in the Insight display.



Indication: Low Hydraulic Oil Level

A. <u>Disabled Functions</u>: Hydraulic Pump

Fault Reset: Refill hydraulic oil tank.

• Oil Over Temperature Shutdown Fault (standard equipment)

If the Hydraulic Oil temperature is greater than 190° F, then the diagnostic message will be displayed in the Insight display. This is recognized as a fault because the Oil temperature should always be within the specified limit (Less than 190 ° F) for the system to function properly.



Insight Display Illustration:

Indication: A. Hydraulic Oil over temperature shutdown.

Disabled Functions: Hydraulic Pump

Fault Reset: Reduce temperature before operation.

• High Temperature Fault (standard equipment)

If the Hydraulic Oil temperature is greater than 180° F, then the diagnostic message will be displayed on the Insight

Insight Display Illustration:

display.



<u>Indication:</u> A. Hydraulic Oil over temperature warning B. Operating Temperature Approaching Shutdown set point (180 Deg. F) <u>Disabled Functions:</u> None

Fault Reset: Reduce temperature before operation.

• Pump Enable PB with System Power disabled Interlock (standard equipment)

With System Power turned OFF and if the Pump Enable push button presses either from street side or from the curb side of the dual control panel for Bank-1 Switch-1 and Bank-3 Switch-1, the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. System Power input is not lit.

B. Pump does not turn ON

Disabled Functions: Body pump and Lift pump

Fault Reset: Turn the system power ON before utilizing Pump push button.

Tailgate Open Indicator and Road Speed limit fault (standard equipment)

If the Tailgate is open when the Road speed is greater than 10mph i.e. if the Tailgate is open when the unit is in motion, the diagnostic message will be displayed on the Insight display.

NOTE: Tailgate operation can be performed only when the Road speed is less than 5mph.

Insight Display Illustration:



Indication: Tailgate open.

Disabled Functions: None

<u>Fault Reset:</u> Close and Lock the Tailgate or repair the faulty Tailgate open proximity switch to proceed further.

Tailgate Unlocked and Road Speed High Interlock (standard equipment)

If the Tailgate is unlocked when the Road speed is greater than 10mph i.e. if the Tailgate is unlocked when the unit is in motion, the diagnostic message will be displayed on the Insight display.

NOTE: Tailgate operation can be performed only when the Road speed is less than 5mph.

Insight Display Illustration:

192



Indication: A. Tailgate Unlocked.

Disabled Functions: None.

Fault Reset: Close and Lock the Tailgate or repair the faulty Tailgate Locked proximity switch to proceed

further.

Filter Bypass Switch Fault (standard equipment)

If the CORTEX Controller has lost the signal from the filter pressure switch while neither hydraulic pump was in operation the diagnostic message will be displayed in the Insight display. This is recognized as a fault because there should be no hydraulic pressure to bypass the filter under this condition.



Insight Display Illustration:

Indication: A. The filter bypass pressure switch has been disconnected.

- B. An open has occurred in the filter bypass input circuit.
- C. The filter pressure switch has failed to open.

Disabled Functions: None.

Fault Reset: Cycle System Power Switch or Restore filter pressure switch input to CORTEX Controller.

Note: This fault is applicable on dry valve pump units only.

<u>Temperature Sensor Fault (standard equipment)</u>

The CORTEX32 Controller has received a signal from the Temperature sensor switch indicating that the Hydraulic Oil temperature is out of specified limit i.e. Oil temperature value is less than '-100' or exceeds '4000'. This is recognized as a fault because Hydraulic Oil temperature should be within specified limit for proper operation of the system.

Insight Display Illustration:



Indication: Oil temperature Sensor fault

Disabled Functions: None

<u>Fault Reset:</u> When the Temperature returns to defined limit (i.e. within -100 to 4000), the switch will reset. If the switch does not reset, there is a possible problem with the Temperature switch or the harnessing.

No Voltage on Extended Controller side Fault (Standard equipment)

If the Voltage measured across VBB1_E, VBB2_E, VBB3_E, and VBB_RELAYIS_VOLTAGE terminal (i.e. Connector-2 Pin-19, Pin-1, Pin-32, and Pin-51) is less than 8 Volts, then this is recognized as a fault.



Indication: A. No Voltage on Extended side controller.

Disabled Functions: CORTEX32 Extended Controller.

<u>Fault Reset:</u> When the Voltage (greater than 8 VDC) is available at these VBB terminals (VBB1_E and VBB2_E and VBB3_E and VBB_RELAYIS_VOLTAGE), CORTEX32 extended controller will turn ON and start functioning normally. If the extended controller doesn't start, there is a possible problem with the CORTEX32 Extended controller or 55-Pin connector connection or the harnessing.

• No Ignition Voltage on Extended Controller side Fault (Standard equipment)

If the Voltage measured across VBB2_E and VBB_RELAYIS_VOLTAGE terminal (i.e. Connector-2 Pin-19 and Pin-51) is less than 8 Volts, then this is recognized as a fault.



Insight Display Illustration:

Indication: A. No Ignition Voltage on Extended side controller.

Disabled Functions: CORTEX32 Extended Controller.

<u>Fault Reset:</u> When the Voltage (greater than 8 VDC) is available at these VBB terminals (VBB2_E and VBB_RELAYIS_VOLTAGE), CORTEX32 extended controller will turn ON and start functioning normally. If the extended controller doesn't start, there is a possible problem with the CORTEX32 Extended controller or 55-Pin connector connection or the harnessing.

Under OperatingTemperature Warning (Optional equipment)

If the Hydraulic Oil temperature is less than 70° F, then the diagnostic message will be displayed in the Insight display.



Indication: Hydraulic Oil temperature under Operating range

Disabled Functions: None

Fault Reset: Preheat Oil before route.

COMMERCIAL HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS) CORTEX CONTROLLER™ PROGRAM 109-0350

Odyssey[™] Cortex32 Controller[™] Program 109-0350 (Rev.)

Section 1: CORTEX32 Controller Hardware

1.01: CORTEX32 Controller Indicator Lights

The 2018 Commercial Odyssey vehicle control system consists of 2 CORTEX32 Controllers. The "MAIN" CORTEX32 Controller is an Extended Controller consisting of 80 Inputs / Outputs and the Remote Tailgate CORTEX32 Controller ("RTG") is a Standard Controller consisting of 32 Inputs / Outputs. The CORTEX32 controllers operates with a voltage ranging from (8 to 32) Volt DC. Each CORTEX32 Controller has a three-color LED (Red / Green / Blue) which indicates the current status of the Controller. The LED operating status identifications are detailed in the table below.

CORTEX32 CONTROLLER DETAILS					
Controller No.	Controller Type	Controller Location	Controller Name		
1.	CORTEX32 CR0233	StreetSide Body Side Skirt (Middle)	(Main) Main Controller		
2.	CORTEX32 CR2530	StreetSide Body Side Skirt (Rear)	(RTG) Remote Tailgate Controller		
3.	CORTEX32 CR2530	Cab (Behind Driver Seat)	(CAB) Cab Controller		

LED Color	Status	Description
OFF	OFF	No Operating Voltage
Yellow	1 x ON	Initialization or Reset Checks
Orange	ON	Error in start-up phase
Green	5.0 Hz	No Operating System Loaded

Green	2.0 Hz ON	Run Stop
Red	2.0 Hz ON	Run with Error Fatal Error or Stop with Error
Red ³	5.0 Hz ON	Application Stopped due to under Voltage. Fatal Error System fault
Blue ^{1,2}	2.0 Hz*	Communication OK between 2 Controllers (for 80 I/O CORTEX32 Controller) ¹ . Communication OK between Main and RTG Controller (for 32 I/O CORTEX32 Controller Only) ²

Note¹: LED will flash Blue when there is a good communication between the 2 halves of the Controller. This condition is applicable only for 80 I/O CORTEX32 Controllers.

Note²: LED will flash Blue when there is a good communication between the MAIN, RTG and RCN Controllers. This condition is applicable only for 32 I/O CORTEX32 Controllers.

Note^{3:} Applicable only for Remote Tailgate CORTEX32 Controller ("RTG").

1.02: Inputs

The CORTEX32 Controller Inputs are activated by positive +12 volt signals and some Ground signals (some chassis signals). All Switches, Proximity, Pressure, Toggle, Push buttons, etc., used as input devices to the Controller, supply a +12 volt signal to a CORTEX32 Extended Controller input to turn the Input ON unless otherwise specified.

With an Input ON, the corresponding Input field (with Description and Address) shown on the INSIGHT display will also be ON.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

1.03: Outputs

During each cycle, the CPU will analyze the status of the inputs, and based upon the logic of the programming, will produce the appropriate +12 volt DC outputs.

Pulse Width Modulation (P.W.M):

- a. The primary use of a PWM signal is to allow the control of the power, supplied to electrical devices.
- b. The Average value of Voltage (and Current) fed to the load is controlled by turning the switch between supply and load ON and OFF at a fast pace. The longer the switch is ON compared to the OFF periods, the higher the power supplied to the load is.
- c. The main advantage of PWM is that power loss in the switching devices is very low. When a switch is OFF there is practically no current, and when switch is ON, there is almost no voltage drop across the switch. Refer figure below for PWM output signals and Waveforms.
- d. To test a PWM output use an Incandescent test light and the brightness will vary with the Voltage level.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.



Figure: Pulse Width Modulation (PWM) Output Waveforms

<u>1.04: Communication Ports</u>

There are 4-CAN and 1-RS-232 communication port in the 80 I/O CORTEX32 Controller which will be utilized for the programming and communication purposes. The Serial port (RS-232) in the ST side will be utilized to download user programs via CORTEX Download tool (Downloader 32) and CAN ports in the ST side for communication between Controller and field devices. See Note below.

The Remote Tailgate "RTG" 32 I/O CORTEX32 controller consist of 2-CAN communication ports. One of these ports will be used for communications between the "MAIN" and "RTG" controllers. The second CAN port will not be used.

Note: Communication ports from both Controllers should not be used for downloading or uploading programs in parallel as it may lead to malfunctioning or shutdown of the system. Only the communication ports assigned to the Master control unit needs to be used for Programming and communication purpose.

1.05: Diagnostic Display

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

1.06: CORTEX32 - Connector Pin Details

The table below gives connection details between CORTEX32 Controller Input/output and Connector Pins.

MAIN CONTROLLER			
109-0350, 109-0351, and 109-0352			
Program Number:	109- 035X		
Revision Number:	2020xxx x	I/O ADDRESS	CONNECTOR PINOUT
ODYSSEY 80 I/O COMMERCIAL			
IGNITION 2F		-	E2 PIN 1
PLUGGED		%QX128.8	E2 PIN 2
PLUGGED		%QX128.9	E2 PIN 3
HOPPER FLOOD LIGHTS		%QX128.10	E2 PIN 4
CONTAINER LIGHT		%QX128.11	E2 PIN 5
BACKUP ALARM		%QX128.12	E2 PIN 6
AUX LIGHT		%QX128.13	E2 PIN 7
STROBE LIGHT 1		%QX128.14	E2 PIN 8
STROBE LIGHT 2		%QX128.15	E2 PIN 9
PLUGGED		-	E2 PIN 10
PLUGGED		%QX128.7	E2 PIN 11
PLUGGED		%QX128.6	E2 PIN 12
PLUGGED		%QX128.5	E2 PIN 13
PLUGGED		%QX128.4	E2 PIN 14
PLUGGED		%QX128.3	E2 PIN 15
PLUGGED		%QX128.2	E2 PIN 16
PLUGGED		%QX128.1	E2 PIN 17
CAB FLOOD LIGHTS		%QX128.0	E2 PIN 18
IGNITION 2F		-	E2 PIN 19
GROUND 2		-	E2 PIN 20
PLUGGED		%IX128.14	E2 PIN 21
PLUGGED		%IX128.12	E2 PIN 22
PLUGGED		%IX128.10	E2 PIN 23

MAIN CONTROLLER			
PLUGGED	%IX128.8	E2 PIN 24	
PLUGGED	-	E2 PIN 25	
PLUGGED	-	E2 PIN 26	
PLUGGED	-	E2 PIN 27	
PLUGGED	-	E2 PIN 28	
GRAB/FORKS IN	%QX128.20	E2 PIN 29	
RELEASE/FORKS OUT	%QX128.21	E2 PIN 30	
PLUGGED	%QX128.22	E2 PIN 31	
OUTPUT POWER 2	-	E2 PIN 32	
PLUGGED	%IX128.7	E2 PIN 33	
PLUGGED	%IX128.5	E2 PIN 34	
PLUGGED	%IX128.3	E2 PIN 35	
PLUGGED	%IX128.1	E2 PIN 36	
GROUND 2	-	E2 PIN 37	
PLUGGED	%IX128.15	E2 PIN 38	
PLUGGED	%IX128.13	E2 PIN 39	
PLUGGED	%IX128.11	E2 PIN 40	
PLUGGED	%IX128.9	E2 PIN 41	
PLUGGED	%IX128.16	E2 PIN 42	
PLUGGED	%IX128.17	E2 PIN 43	
PLUGGED	%IX128.18	E2 PIN 44	
PLUGGED	%IX128.19	E2 PIN 45	
PLUGGED	%IX128.20	E2 PIN 46	
PLUGGED	%IX128.21	E2 PIN 47	
PLUGGED	%IX128.22	E2 PIN 48	
PLUGGED	%IX128.23	E2 PIN 49	
PLUGGED	%QX128.23	E2 PIN 50	
IGNITION 2F	-	E2 PIN 51	
PLUGGED	%IX128.6	E2 PIN 52	
HIGH PRESSURE FILTER	%IX128.4	E2 PIN 53	

MAIN CONTROLLER				
PLUGGED		%IX128.2	E2 PIN 54	
PLUGGED		%IX128.0	E2 PIN 55	
Program Number:	109- 035X			
Revision Number:	Revision Number: 2020xxx x		CONNECTOR PINOUT	
ODYSSEY 80 I/O COMMERCIAL				
OUTPUT POWER 1		-	E1 PIN 1	
PTO 1 SOLENOID		%QX0.8	E1 PIN 2	
PTO 2 SOLENOID		%QX0.9	E1 PIN 3	
PLUGGED		%QX0.10	E1 PIN 4	
PLUGGED		%QX0.11	E1 PIN 5	
PACKER EXTEND		%QX0.12	E1 PIN 6	
PACKER RETRACT		%QX0.13	E1 PIN 7	
TAILGATE FLOW		%QX0.14	E1 PIN 8	
CARRY CAN FLOW		%QX0.15	E1 PIN 9	
IGNITION 1F		-	E1 PIN 10	
FORKS DOWN		%QX0.7	E1 PIN 11	
FORKS RAISE		%QX0.6	E1 PIN 12	
ARMS RAISE		%QX0.5	E1 PIN 13	
ARMS DOWN		%QX0.4	E1 PIN 14	
CAB PROTECTOR RAISE		%QX0.3	E1 PIN 15	
CAB PROTECTOR LOWER		%QX0.2	E1 PIN 16	
PLUGGED		%QX0.1	E1 PIN 17	
PTO ENABLE		%QX0.0	E1 PIN 18	
OUTPUT POWER 1		-	E1 PIN 19	
GROUND 1		-	E1 PIN 20	
CAB PROTECTOR PROX		%IX0.14	E1 PIN 21	
OIL TEMPERATURE		%IX0.12	E1 PIN 22	
PLUGGED		%IX0.10	E1 PIN 23	

MAIN CONTROLLER				
SYSTEM POWER SWITCH	%IX0.8	E1 PIN 24		
RS232 RECEIVE	-	E1 PIN 25		
J1939 3 L	-	E1 PIN 26		
J1939 2 L	-	E1 PIN 27		
J1939 1 L	-	E1 PIN 28		
CAN 1 L	-	E1 PIN 29		
PLUGGED	-	E1 PIN 30		
PLUGGED	-	E1 PIN 31		
IGNITION 1F	-	E1 PIN 32		
LOW OIL SWITCH	%IX0.7	E1 PIN 33		
ARMS UP PROX	%IX0.5	E1 PIN 34		
FORKS TUCKED PROX	%IX0.3	E1 PIN 35		
OVERHEIGHT PROX	%IX0.1	E1 PIN 36		
GROUND 1	-	E1 PIN 37		
PLUGGED	%IX0.15	E1 PIN 38		
LEFT TURN SIGNAL	%IX0.13	E1 PIN 39		
RIGHT TURN SIGNAL	%IX0.11	E1 PIN 40		
PTO PRESSURE SWITCH	%IX0.9	E1 PIN 41		
GROUND 1	-	E1 PIN 42		
RS232 TRANSMIT	-	E1 PIN 43		
J1939 3 H	-	E1 PIN 44		
J1939 2 H	-	E1 PIN 45		
J1939 1 H	-	E1 PIN 46		
CAN 1 H	-	E1 PIN 47		
PLUGGED	-	E1 PIN 48		
PLUGGED	-	E1 PIN 49		
IGNITION 1F	-	E1 PIN 50		
PLUGGED	-	E1 PIN 51		

CAB CONTROLLER				
	109-0350, 109-035	1, and 109-0352		
Program Number:	109-0353			
Revision Number:	2020xxxx			
ODYSSEY 80 I/O COMMERCIAL		I/O ADDRESS	CONNECTOR PINOUT	
]		
OUTPUT POWER 1		-	E1 PIN 1	
CARRY CAN COVER UP		%QX0.8	E1 PIN 2	
CARRY CAN COVER DOWN		%QX0.9	E1 PIN 3	
SPARE OUTPUT		%QX0.10	E1 PIN 4	
AUX AIR SUPPLY		%QX0.11	E1 PIN 5	
WARBLE ALARM		%QX0.12	E1 PIN 6	
CAB ALARM		%QX0.13	E1 PIN 7	
AIR SUPPLY		%QX0.14	E1 PIN 8	
FUSED IGNITION 2F		%QX0.15	E1 PIN 9	
RIGHT TURN CAMERA TRIGGER		-	E1 PIN 10	
LEFT TURN CAMERA TRIGGER		%QX0.7	E1 PIN 11	
FREIGHTLINER BRAKE LOCKOUT		%QX0.6	E1 PIN 12	
HOPPER CAMERA TRIGGER		%QX0.5	E1 PIN 13	
REVERSE CAMERA TRIGGER		%QX0.4	E1 PIN 14	
OUT OF DIMENSION		%QX0.3	E1 PIN 15	
THROTTLE LIMIT		%QX0.2	E1 PIN 16	
THROTTLE ADVANCE		%QX0.1	E1 PIN 17	
PLUGGED		%QX0.0	E1 PIN 18	
IGNITION 2F		-	E1 PIN 19	
SPARE INPUT		-	E1 PIN 20	
SPARE INPUT		%IX0.14	E1 PIN 21	
SPARE INPUT		%IX0.12	E1 PIN 22	
PLUGGED		%IX0.10	E1 PIN 23	
PLUGGED		%IX0.8	E1 PIN 24	
PLUGGED		-	E1 PIN 25	

Copyright 2021, Heil Environmental Printed in the U.S.A.

CAB CONTROLLER			
PLUGGED	-	E1 PIN 26	
PLUGGED	-	E1 PIN 27	
PLUGGED	-	E1 PIN 28	
J1939 3 L	-	E1 PIN 29	
PLUGGED	-	E1 PIN 30	
PLUGGED	-	E1 PIN 31	
PANEL SELECT	-	E1 PIN 32	
PLUGGED	%IX0.7	E1 PIN 33	
CHASSIS NEUTRAL	%IX0.5	E1 PIN 34	
TRANSMISSION SUMP TEMP	%IX0.3	E1 PIN 35	
GROUND 1	%IX0.1	E1 PIN 36	
SPARE INPUT	-	E1 PIN 37	
EXTERNAL THROTTLE ADVANCE	%IX0.15	E1 PIN 38	
PLUGGED	%IX0.13	E1 PIN 39	
PLUGGED	%IX0.11	E1 PIN 40	
PLUGGED	%IX0.9	E1 PIN 41	
GROUND 1	-	E1 PIN 42	
PLUGGED	-	E1 PIN 43	
PLUGGED	-	E1 PIN 44	
PLUGGED	-	E1 PIN 45	
PLUGGED	-	E1 PIN 46	
J1939 3 H	-	E1 PIN 47	
PLUGGED	-	E1 PIN 48	
PLUGGED	-	E1 PIN 49	
PLUGGED	-	E1 PIN 50	
PLUGGED	-	E1 PIN 51	
PLUGGED	%IX0.6	E1 PIN 52	
PLUGGED	%IX0.4	E1 PIN 53	
SCALE ALARM 2	%IX0.2	E1 PIN 54	
SCALE ALARM 1	%IX0.0	E1 PIN 55	

TAILGATE CONTROLLER			
109-	-0350, 109-0351	l, and 109-0352	
Program Number:	109-0317		
Revision Number:	2020xxxx		
ODYSSEY 80 I/O COMMERCIAL		I/O ADDRESS	CONNECTOR PINOUT
IGNITION 2F		-	E1 PIN 1
PLUGGED		%QX0.8	E1 PIN 2
PLUGGED		%QX0.9	E1 PIN 3
PLUGGED		%QX0.10	E1 PIN 4
PLUGGED		%QX0.11	E1 PIN 5
PLUGGED		%QX0.12	E1 PIN 6
PLUGGED		%QX0.13	E1 PIN 7
PLUGGED		%QX0.14	E1 PIN 8
PLUGGED		%QX0.15	E1 PIN 9
IGNITION 2F		-	E1 PIN 10
TAILGATE UNLOCK		%QX0.7	E1 PIN 11
TOP DOOR CLOSE		%QX0.6	E1 PIN 12
TOP DOOR OPEN		%QX0.5	E1 PIN 13
TAILGATE LOCK		%QX0.4	E1 PIN 14
TAILGATE DOWN		%QX0.3	E1 PIN 15
TAILGATE RAISE		%QX0.2	E1 PIN 16
PLUGGED		%QX0.1	E1 PIN 17
PLUGGED		%QX0.0	E1 PIN 18
IGNITION 2F		-	E1 PIN 19
GROUND 1		-	E1 PIN 20
NODE ID		%IX0.14	E1 PIN 21
PLUGGED		%IX0.12	E1 PIN 22
PLUGGED		%IX0.10	E1 PIN 23
PLUGGED		%IX0.8	E1 PIN 24

TAILGATE CONTROLLER			
PLUGGED	-	E1 PIN 25	
PLUGGED	-	E1 PIN 26	
PLUGGED	-	E1 PIN 27	
PLUGGED	-	E1 PIN 28	
J1939 3 L	-	E1 PIN 29	
PLUGGED	-	E1 PIN 30	
PLUGGED	-	E1 PIN 31	
PLUGGED	-	E1 PIN 32	
PLUGGED	%IX0.7	E1 PIN 33	
PLUGGED	%IX0.5	E1 PIN 34	
TAILGATE LOCK PROX SS	%IX0.3	E1 PIN 35	
TOP DOOR OPEN PROX	%IX0.1	E1 PIN 36	
GROUND 1	-	E1 PIN 37	
PLUGGED	%IX0.15	E1 PIN 38	
PLUGGED	%IX0.13	E1 PIN 39	
PLUGGED	%IX0.11	E1 PIN 40	
PLUGGED	%IX0.9	E1 PIN 41	
GROUND 1	-	E1 PIN 42	
PLUGGED	-	E1 PIN 43	
PLUGGED	-	E1 PIN 44	
PLUGGED	-	E1 PIN 45	
PLUGGED	-	E1 PIN 46	
J1939 3 H	-	E1 PIN 47	
PLUGGED	-	E1 PIN 48	
PLUGGED	-	E1 PIN 49	
PLUGGED	-	E1 PIN 50	
PLUGGED	-	E1 PIN 51	
PLUGGED	%IX0.6	E1 PIN 52	
PLUGGED	%IX0.4	E1 PIN 53	
TAILGATE LOCK PROX CS	%IX0.2	E1 PIN 54	

 TAILGATE CONTROLLER

 TAILGATE CLOSED PROX
 %IX0.0
 E1 PIN 55

Section 2: J1939 Details

The Engine information is directly read through the SAE J1939 standard. SAE J1939 is the vehicle bus standard used for communication and diagnostics among vehicle components, like heavy duty truck industry. J1939 is used in heavy vehicles for on-street and off-road operations and works on the physical layer with CAN-high speed according to ISO11898. J1939 is a multi-master system with decentralized network management without channel-based communication.

J1939 can provide information's like Engine RPM, Transmission Gear info, Parking Brake Info, and Road Speed.

Section 3: Default Parameters

3.01 Program 109-0350 Parameter Defaults

SI. No.	Parameter	Default Setting
А	Start Filter Warning	5 Hours
В	Start Filter Shutdown	6 Hours
С	Packer Extend Auto Pack Time Out	35 Seconds
D	Packer Auto Retract Time Out	35 Seconds
E	Engine Over speed	1800 RPM
F	Engine ON	Engine Speed > 400 RPM
G	Bypass Time Reset	15 minutes
н	Pump Bypass Run Time	180 Seconds
I	Bypass Beep Time	60 Seconds
J	Road Speed Ok	< 5mph
М	Throttle Advance	1350 RPM
N	Throttle Limit	1500 RPM
0	Hydraulic Oil Operating Temp	70°F - 190°F

Section 4: I/O Functions

The following sheets detail the functionality of the Input and Output functions provided through the CORTEX32 Controller.

Note: Status of all the Inputs / Outputs can be monitored using the Insight In-Cab display. Refer section 5.04 for more details about Diagnostic display options and INSIGHT display.

4.01: Standard In-Cab Input Functions

A01 Input Function -- System Power Switch (In Cab Input %IX0.08)

This circuit monitors the ON/OFF status of the system power switch ("mushroom button").

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
System Power Switch	Activated	%IX0.08	ON

A02 Input Function – Chassis Neutral Signal (In Cab Input %IX0.10) This circuit monitors the transmission Neutral circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Chassis Transmission	In Neutral	%IX0.10	ON

A03 Input Function – Panel Selector Switch Enable (In Cab Input %IX0.09)

This signal is used for switching between Street Side and Curb Side Joysticks and panels.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Panel Selector Switch Enable Circuit	Activated	%IX0.09	ON

A04 Input Function – Left Turn Signal Enabled (In Cab Input %IX0.13)

This circuit monitors the status of the Left Turn Signal circuit. This circuit is used for enabling and disabling Front / Rear strobe circuits.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Turn Signal Enable Circuit	Activated	%IX0.13	ON

A05 Input Function – Right Turn Signal Enabled (In Cab Input %IX0.11)

This circuit monitors the status of the Right Turn Signal circuit. This circuit is used for enabling and disabling Front / Rear strobe circuits.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Turn Signal Enable Circuit	Activated	%IX0.11	ON

A06 Input Function – Transmission Temperature Signal Switch (In Cab Input %IX0.15)

This circuit monitors the status of the Transmission Oil Temperature. The input is ON when the Temperature of the Transmission Oil is OK.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Transmission Temperature Switch Circuit	Activated	%IX0.15	ON

A07 Input Function Scale Alarm-1 (In Cab Input %IX128.00)

This circuit monitors the ON/OFF status of the Scale Alarm-1 condition. This Scale Input goes High (ON) when approaching maximum weight on the scale system.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Scale Alarm-1	Activated	%IX128.00	ON

A08 Input Function Scale Alarm-2 (In Cab Input %IX128.02)

This circuit monitors the ON/OFF status of the Scale Alarm-2 condition. This Scale Input goes Low (OFF) during overweight condition.

Condition	Modifiable Parameters	Default Setting	
А	None	N/A	

Function Logic:

Input Device	Status	I/O Address	Status
Scale Alarm-2	Activated	%IX128.02	OFF

4.02: Standard In-Cab Output Functions

B01 Output Function – In-Cab Alarm (In Cab Output %QX128.08)

This output function controls the In-Cab Alarm. See Section 6.04 for a complete explanation of the Diagnostic Messages associated with this unit.

Condition	Modifiable Parameters	Default Setting	
А	None	N/A	

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Arms Full Up Position	Deactivated	N/A	OFF
	or Forks Full Tucked Position	Deactivated	N/A	OFF
В	Lift below Transit Position	Deactivated	N/A	OFF
С	Chassis Neutral	Deactivated	%IX0.10	OFF
D	Tailgate Closed Prox. Switch	Deactivated	%IX0.00	OFF
E	Active Diagnostic message	Activated	N/A	ON (Refer Section 6.04)

Note: With (A AND B AND C) OR condition (D OR E) true will activate the In-Cab Alarm output.

B02 Output Function – Throttle Advance Signal (In Cab Output %QX0.10)

This output function controls the Throttle Advance signal transmitted to the vehicles Engine.

Condition	Modifiable Parameters	Default Setting	
А	None	N/A	

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Packer Extend PWM	Activated	%QX0.12	ON
В	or Packer Retract PWM	Activated	%QX0.13	ON
С	Neutral Signal	Activated	%IX0.10	ON

Note: With condition 'C' true, condition (A OR B) will activate the Throttle Advance output. Throttle advance output is disabled in Service mode or Calibration mode.

B03 Output Function – Throttle Limit (In Cab Output %QX0.11)

This output function controls the Throttle Limit command sent to the Engine.

Condition	Modifiable Parameters	Default Setting	
А	None	N/A	

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Pump On	Activated	N/A	ON
В	Neutral Signal	Activated	%IX0.10	ON (See Note Below)
С	Throttle Advance Output	Deactivated	%QX0.10	OFF
Note: With condition 'A' true, Condition (B AND C) will activate the Throttle Limit output.

B04 Output Function – WARBLE Alarm (In Cab Output %QX128.09)

This output function controls the Warble Alarm.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit::

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Closed Prox. Switch	Deactivated	%IX0.00	OFF

Note: Condition 'A' true will activate the Warble Alarm output.

B05 Output Function – Hopper Flood Light (In Cab Output %QX128.10)

This output function controls the Hopper Flood Light. Here CAN control is used to turn ON/OFF the Hopper Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Hopper Light Switch	Activated	CAN	ON

Note: With condition (A) true the Hopper Flood Light output will activate.

4.03: Standard Body Input Functions

C01 Input Function – Oil Filter Pressure Switch (Body Input %IX0.06)

This circuit monitors the ON/OFF status of the Oil Filter Pressure Switch. The input is OFF when the filter is in bypass. The input is ON when the filter is in normal operation i.e. not in bypass.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
Filter Pressure Switch	Activated	%IX0.06	ON

C02 Input Function -- Side Door Closed Proximity Switch (Body Input %IX0.04)

This circuit monitors the ON/OFF status of the Side Door Closed Proximity Switch. The input is ON when the side door is closed.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Side Door Proximity Switch	Activated	%IX0.04	ON

C03 Input Function -- Tailgate Closed Proximity Switch (Body Input %IX0.00)

This circuit monitors the ON/OFF status of the Tailgate Closed Proximity Switch. The input is ON when the Tailgate is closed.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Closed Proximity Switch	Activated	%IX0.00	ON

C04 Input Function – Arms Up Proximity Switch (Body Input %IX0.05)

This circuit monitors the ON/OFF status of the Arms Up Proximity Switch. The input is ON when the arms are up.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Arms Up Proximity Switch	Activated	%IX0.05	ON

C05 Input Function – Forks Tucked Proximity Switch (Body Input %IX0.03)

This circuit monitors the ON/OFF status of the Forks Tucked Proximity Switch. The input is ON when the forks are tucked.

Condition	Modifiable Parameters	Default Setting	
А	None	N/A	

HALF/PACK® (FEATURING ODYSSEY® CONTROLS)

Body Controller Software

Forks Tucked Proximity Switch Active	ated %IX0.03 C	NC
--------------------------------------	----------------	----

C06 Input Function – Lift Below Transit Proximity Switch (Body Input %IX0.01)

This circuit monitors the ON/OFF status of the Lift Below Transit Proximity Switch. The input is ON when the lift is below transit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Lift Below Transit Proximity Switch	Activated	%IX0.01	ON

4.04: Standard Body Output Functions

D01 Output Function – Tailgate Up Solenoid (Body Output %QX0.02)

This output function controls the Tailgate Up output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Raise Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
с	Road Speed OK	Activated	N/A	ON (see Note below)
D	and Pump On	Activated	N/A	ON
E	Tailgate Locked Prox. Curb Side	Deactivated	%IX0.02	OFF
F	Tailgate Locked Prox. Street Side	Deactivated	%IX0.03	OFF

Note: This signal is energized using a CAN based control by energizing the Tailgate Raise switch either from Street side or from Curb side panel. With Conditions (A AND B AND C AND D) true, function (E AND F) will activate the Tailgate Up Solenoid output.

For condition 'C' to be true, Road Speed value should be less than '5' mph.

D02 Output Function – Tailgate Down Solenoid (Body Output %QX0.03)

This output function controls the Tailgate Down output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Lower Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
С	Road Speed OK	Activated	N/A	ON (see Note below)
D	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Tailgate Lower switch either from Street side or from Curb side panel.

If Conditions (A AND B AND C AND D) are true, will activate the Tailgate Down Solenoid output. For condition 'C' to be true, Road Speed value should be less than '5' mph.

D03 Output Function – Tailgate Lock Solenoid (Body Output %QX0.04)

This output function controls the Tailgate Lock output circuit.

Condition	Modifiable Parameters	Default Setting	
A	None	N/A	

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Lock Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
С	Road Speed OK	Activated	N/A	ON (see Note below)
D	Tailgate Locked Prox.	Deactivated	%IX0.02	OFF
E	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Tailgate Lock switch either from Street side or from Curb side panel. With ((A AND B AND C AND D)) true, Condition 'E' will activate the Tailgate Lock output. For condition 'C' to be true, Road Speed value should be less than '5' mph.

D04 Output Function – Tailgate Unlock Solenoid (Body Output %QX0.07)

This output function controls the Tailgate Unlock output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Condition	Function or Component	Status	I/O Address	Status
А	Tailgate Un Lock Push Button	Activated	CAN	ON
В	Panel Selector Switch	Activated	%IX0.09	ON
с	or Tailgate Down	Activated	%QX0.03	ON (see Note below)
	and Tailgate Closed Prox.	Deactivated	%IX0.00	OFF
D	Tailgate Locked Prox.	Activated	N/A	ON (see Note below)
E	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Tailgate Unlock switch either from Street side or from Curb side panel. With conditions ((A AND B) OR C) true, function (D AND E) will activate the Tailgate Unlock output. For condition 'D' to be true, Road Speed value should be less than '5' mph.

D05 Output Function – Back Up Alarm (Body Output %QX128.12)

This output function controls the Back Up Alarm output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Tailgate Closed Prox.	Deactivated	%IX0.00	ON

Note: If Tailgate is not closed, then Back Up Alarm is activated.

D06 Output Function – Packer Extend PWM control (Body Output %QX0.12)

This output function controls the Packer Extend PWM control output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Packer Extend Push Button	Activated	CAN	ON
В	Pump On	Activated	N/A	ON
С	Side Door Proximity Switch	Activated	%IX0.04	ON
D	Arms Below Over Height	Activated	N/A	ON
E	Top Door Proximity Switch	Activated	%IX0.01	ON
F	System Power Switch	Activated	%IX0.08	ON

D07 Output Function – Packer Retract PWM control (Body Output %QX0.13)

This output function controls the Packer Retract PWM control output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Condition	Function or Component	Status	I/O Address	Status
А	Packer Retract	Activated	N/A	ON
В	Pump On	Activated	N/A	ON
С	Side Door Proximity Switch	Activated	%IX0.04	ON

Condition	Function or Component	Status	I/O Address	Status
D	Arms Below Over Height	Activated	N/A	ON
E	System Power Switch	Activated	%IX0.08	ON

D09 Output Function – Arms Up PWM control (Body Output %QX0.04)

This output function controls the Arms up PWM Control output circuit. The Arms up PWM control circuit either with the Auto Lift signal (fixed speed) or with the Manual lift signal (variable speed) will control the speed of Arm Up movement when operated.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Auto Lift Enable Switch	Activated	N/A	ON
В	Pump On	Activated	N/A	ON
С	Arms up Interlock	Deactivated	N/A	OFF
D	Aux Controls Enable	Activated	N/A	ON (Manual Control – Var. speed)
E	Aux Arms Raise	Activated	N/A	ON (Manual Control – Var. speed)
F	Sensor Failure	Deactivated	N/A	OFF

Note: The Arms Valve PWM output provides flow to the hydraulic hoses on the arms cylinder. This flow, when combined with the activation of Arms up function, will move the Arms up (with fixed or variable speed). The flow setting of this valve is adjustable using the Insight diagnostic display.

D10 Output Function – Arms Down PWM control (Body Output %QX0.05)

This output function controls the Arms down PWM Control output circuit. The Arms down PWM control circuit either with the Auto Lift signal (fixed speed) or with the Manual lift signal (variable speed) will control the speed of Arm down movement when operated.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Condition	Function or Component	Status	I/O Address	Status
А	Auto Lift Enable Switch	Activated	N/A	ON
В	Pump On	Activated	N/A	ON
С	Arms Down Interlock	Deactivated	N/A	OFF
D	Aux Controls Enable	Activated	N/A	ON (Manual Control – Var. speed)
E	Aux Arms Lower	Activated	N/A	ON (Manual Control – Var. speed)
F	Sensor Failure	Deactivated	N/A	OFF
G	Lower Arms	Activated	N/A	ON

Note: The Arms Valve PWM output provides flow to the hydraulic hoses on the arms cylinder. This flow, when combined with the activation of arms down function, will move the Arms down (with fixed or variable speed). The flow setting of this valve is adjustable using the Insight diagnostic display.

D11 Output Function – Cab Protector Up Control (Body Output %QX0.03)

This function controls the Cab Protector up output. Not used.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Cab Cover Raise Push Button	Activated	CAN	ON
В	Pump On	Activated	N/A	ON
С	Lift Below Transit Prox. Switch	Activated	N/A	ON

Note: With Condition (A AND B) true, function 'C' will activate the Cab Protector Up control. For condition 'C' to be true, the Arms angle should be less than a value 550. Refer section D09 & D10 for details about Arm cylinder flow control.

D12 Output Function – Cab Protector Down Control (Body Output %QX0.02)

This function controls the Cab Protector down output. Not used.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Cab Cover Lower Push Button	Activated	CAN	ON
В	Pump On	Activated	N/A	ON
С	Lift Below Transit Prox. Switch	Activated	N/A	ON

Note: With Condition (A AND B) true, function 'C' will activate the Cab Protector Down control. For condition 'C' to be true, the Arms angle should be less than a value 550. Refer section D09 & D10 for details about Arm cylinder flow control.

D13 Output Function – Allison PTO Enabled (Body Output %QX0.00)

This output function controls the Allison Power Take Off (PTO).

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Condition	Function or Component	Status	I/O Address	Status
	Pump Enable Push Button	Activated	CAN	ON
А	System Power Switch	Activated	%IX0.8	ON
	Side Door Prox. Switch	Activated	%IX0.4	ON

Condition	Function or Component	Status	I/O Address	Status
В	Road Speed	Activated	N/A	ON (see Note below)
С	Engine Speed	Activated	N/A	ON (see Note below)
D	Filter Bypass	Deactivated	N/A	OFF
E	Filter Pressure Switch	Activated	%IX0.6	ON
F	Low Oil Level Switch	Activated	%IX0.7	ON (see Note Below)

Note: With condition (A AND B AND C AND F) true, Condition (D OR E) will activate the Allison PTO pump. For condition 'B' to be true, Road Speed value should be less than '15' mph. For condition 'C' to be true, Engine Speed value should be less than '900' RPM.

Condition 'F' Low Oil Switch will be considered only during Calibration mode.

D14 Output Function – PTO-2 Pump (Body Output %QX0.09)

This output function controls the Power Take Off (PTO) Pump-2 output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Pump Enable Push Button	Activated	CAN	ON
А	System Power Switch	Activated	%IX0.8	ON
	Side Door Prox. Switch	Activated	%IX0.4	ON
В	Road Speed	Activated	N/A	ON (see Note below)
С	Engine Speed	Activated	N/A	ON (see Note below)
D	Filter Bypass	Deactivated	N/A	OFF
E	Filter Pressure Switch	Activated	%IX0.6	ON
F	Low Oil Level Switch	Activated	%IX0.7	ON (see Note Below)

Note: With condition (A AND B AND C AND F) true, Condition (D OR E) will activate the PTO-2 pump. For condition 'B' to be true, Road Speed value should be less than '15' mph. For condition 'C' to be true, Engine Speed value should be less than '900' RPM. Condition 'F' Low Oil Switch will be considered only during Calibration mode.

D15 Output Function – PTO-1 Pump (Body Output %QX0.08)

This output function controls the Power Take Off (PTO) Pump-1 output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Condition	Function or Component	Status	I/O Address	Status
A	Pump Enable Push Button	Activated	CAN	ON

Condition	Function or Component	Status	I/O Address	Status
	System Power Switch	Activated	%IX0.8	ON
	Side Door Prox. Switch	Activated	%IX0.4	ON
В	Road Speed	Activated	N/A	ON (see Note below)
С	Engine Speed	Activated	N/A	ON (see Note below)
D	Filter Bypass	Deactivated	N/A	OFF
E	Filter Pressure Switch	Activated	%IX0.6	ON
F	Low Oil Level Switch	Activated	%IX0.7	ON (see Note Below)

Note: With condition (A AND B AND C AND F) true, Condition (D OR E) will activate the PTO-1 pump.

For condition 'B' to be true, Road Speed value should be less than '15' mph.

For condition 'C' to be true, Engine Speed value should be less than '900' RPM.

Condition 'F' Low Oil Switch will be considered only during Calibration mode.

Condition 'G' –When vehicle is in Neutral condition and Engine speed condition 'C' is less than 1700 RPM, along with other interlocks the PTO-1 pump will be activated.

D18 Output Function – Tailgate Enable PWM control (Body Output %QX0.14)

This output function controls the Tailgate PWM control output circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
	Tailgate Down	Activated	%QX0.03	ON
	or Tailgate Up	Activated	%QX0.02	ON
A	or Tailgate Lock	Activated	%QX0.04	ON
	or Tailgate Unlock	Activated	%QX0.07	ON
	or Top Door Open	Activated	%QX0.05	ON
	or Top Door Close	Activated	%QX0.06	ON
В	and Pump On	Activated	N/A	ON

Note: The Tailgate PWM output provides flow to the Tailgate hydraulic valve assembly. This flow, when combined with activation of a Tailgate function, will move the Tailgate Up, Down, Lock, Unlock, Top Door Open or Top Door Close. With condition 'B' true, Tailgate Valve PWM output will activate any of the output in condition 'A'.

4.05: Optional In-Cab Input Functions

FUTURE EXPANSION

4.06: Optional In-Cab Output Functions

E01 Output Function (Option) – CAB Flood light control (In Cab Output %QX128.00)

This output function controls the Cab Flood Light output. Here CAN control is used to turn ON/OFF the

In-Cabinet Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Cab Flood Switch	Activated	CAN	ON

4.07: Optional Body Input Functions

F01 Input Function – High Pressure Filter Switch (Body Input %IX128.4)

This circuit monitors the ON/OFF status of the High Pressure Filter Switch.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
High Pressure Filter Switch	Activated	%IX128.4	ON

F02 Input Function – Cab Protector Down Proximity Switch (Body Input %IX0.14)

This circuit monitors the ON/OFF status of the Cab Protector Down Proximity Switch. The input is ON when the Cab Protector is down. This circuit is used to interlock the arms when the aluminum cab protector is raised.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Protector Down Prox. Switch	Activated	%IX0.14	ON

F03 Input Function -- Tailgate Locked Proximity Switch Curb Side (Body Input %IX0.02)

This circuit monitors the ON/OFF status of the Curb side Tailgate Locked Proximity Switch i.e. it indicates the position of the Tailgate lock cylinders on the Curb side. The input is ON when the Curb Side Tailgate cylinder is locked.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
Tailgate Locked Proximity Switch Curb Side	Activated	%IX0.02	ON

F04 Input Function -- Tailgate Locked Proximity Switch Street Side (Body Input %IX0.03)

This circuit monitors the ON/OFF status of the Street side Tailgate Locked Proximity Switch i.e. it indicates the position of the Tailgate lock cylinders on the Street side. The input is ON when the Street Side Tailgate cylinder is locked.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Locked Proximity Switch Street Side	Activated	%IX0.03	ON

F05 Input Function – Top Door Fully Open Proximity Switch (Body Input %IX0.01)

This circuit monitors the ON/OFF status of the Top Door Open Proximity Switch. The input is ON when the top door is fully open.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Top Door Proximity Switch	Activated	%IX0.01	ON

F06 Input Function – Oil Level Switch (Body Input %IX0.07)

This circuit monitors the status of the Hydraulic Oil Level. The input is ON when the Hydraulic Oil Level in the tank is sufficient. This function is used for activating the Pump.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Oil Level Switch	Activated	%IX0.07	ON

F07 Input Function – External Throttle Advance Switch (Body Input %IX128.06)

This circuit monitors the status of the External Throttle advance switch. This input is USED FOR FUTURE EXPANSION

Condition	Modifiable Parameters	Default Setting
USED FOR FUTURE EXPANSION		

Input Device	Status	I/O Address	Status
External Throttle Advance Switch	Activated	%IX128.06	ON

4.08: Optional Body Output Functions

G01 Output Function – Tailgate Camera Output (Body Output %QX128.03)

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
NOT USED. FUTURE EXPANSION				

G02 Output Function – Hopper Camera Output (Body Output %QX128.02)

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Forks Tucked	Deactivated	N/A	OFF (See Note below)

When the Fork is not in Tucked position and Arm Angle is more than 10 Deg., Hopper camera output is turned ON.

G03 Output Function – Strobe Light 1 Circuit (In Cab Output %QX128.14)

This circuit operates the Strobe light circuit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Strobe Switch Enabled	Activated	CAN	ON
В	Pump On	Activated	N/A	ON
С	Reverse	Activated	N/A	ON
D	Turn Signal	Deactivated	N/A	OFF

Note: The Strobe light circuit-1 can be turned ON in following conditions:

With Pump ON or Reverse signal activated or Strobe switch ON

If the unit is configured with Whelen strobes, the strobes are ON in the above conditions with Turn signal being deactivated.

G04 Output Function – Strobe Light 2 Circuit (In Cab Output %QX128.15)

This circuit operates the Strobe light circuit -2.

222

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Strobe Switch Enabled	Activated	CAN	ON
В	Pump On	Activated	N/A	ON
С	Reverse	Activated	N/A	ON
D	Turn Signal	Deactivated	N/A	OFF

Note: The Strobe light circuit21 can be turned ON in following conditions:

With Pump ON or Reverse signal activated or Strobe switch ON

If the unit is configured with Whelen strobes, the strobes are ON in the above conditions with Turn signal being deactivated.

G05 Output Function -- Top Door Close (Body Output %QX0.06)

This output function controls the Top Door Close output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Top Door Close Push Button	Activated	CAN	ON
В	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Top Door Open switch either from Street side or from Curb side panel. With Conditions (A AND B) true, will activate the Top Door Close output.

G06 Output Function -- Top Door Open (Body Output %QX0.05)

This output function controls the Top Door Open output.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Top Door Open Push Button	Activated	CAN	ON
В	and Pump On	Activated	N/A	ON

Note: This signal is energized using a CAN based control by energizing the Top Door Open switch either from Street side or from Curb side panel. With condition (A AND B) true, will activate the Top Door Open output signal.

G07 Output Function – Container Light Circuit (In Cab Output %QX128.11)

This circuit operates the Container light circuit. Here CAN control is used to turn ON/OFF the Container Light Circuit either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
A	Container Light Switch	Activated	CAN	ON

Note: With condition 'A' true, will activate the Container Light Output signal either from Street side or from Curb Side of the dual control panel unit.

G08 Output Function – Auxiliary Backup Light Circuit (In Cab Output %QX128.13)

This circuit operates the Auxiliary Backup light circuit. Here Reverse and Switch control is used to turn ON/OFF the Auxiliary Backup Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Conditions Necessary to activate the circuit:

Condition	Function or Component	Status	I/O Address	Status
А	Reverse	Activated	CAN	ON
В	Auxiliary Light Switch	Activated	CAN	ON

Note: With condition 'A' or 'B' true, the Auxiliary Backup Light Output will activate.

4.09: Analog Input Functions

H01 Input Function – Packer Position (Analog Input %IW02)

This circuit measures the value of Packer Position.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Position	Activated	%IW02	VOLTAGE

H02 Input Function – Oil Temperature (Analog Input %IW14)

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Oil Temperature measure	Activated	%IW14	VOLTAGE

H03 Input Function – Body Valve Pressure (Analog Input %IW0)

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Body Valve pressure	Activated	%IW0	VOLTAGE

4.10: CAN In-Cab Input Functions

101 Input Function -- Hydraulic Pump Enable Push Button (CAN - In Cab Input)

This CAN control button is used to turn ON the Hydraulic Pump, either from Street side or from the Curb side of dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Hydraulic Pump Enable Input	Activated	CAN	ON (CAN Control)

102 Input Function -- Packer Extend Input (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Packer Extend control either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Extend Input	Activated	CAN	ON (CAN Control)

103 Input Function -- Packer Retract Input (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Packer Retract control either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Retract Input	Activated	CAN	ON (CAN Control)

104 Input Function -- Packer Over-height Override Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Packer Over-height Override control either from Street side or from the Curb side of a dual control panel unit. This switch is for future expansion if needed, and currently interrupts a pack cycle in progress.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Packer Over-height Override Input	Activated	CAN	ON (CAN Control)

105 Input Function - Select-O-Pack Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Select-O-Pack control either from Street side or from the Curb side of a dual control panel unit. This circuit monitors the ON/OFF status of the Select-O-Pack Switch. This circuit enables Auto Pack and Auto Retract action.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Select-O-Pack Input	Activated	CAN	ON (CAN Control)

106 Input Function – Commercial Grabber Enable Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the commercial Grabber control, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status

107 Input Function – CAB Cover Raise Switch Circuit (CAN - In Cab Input)

This CAN control is used to raise the Cab protector shield, either from Street side or from the Curb side of a dual control panel unit. Future Expansion.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Cover Raise Input	Activated	CAN	ON (CAN Control)

108 Input Function – CAB Cover Lower Switch Circuit (CAN - In Cab Input)

This CAN control is used to lower the Cab protector shield, either from Street side or from the Curb side of a dual control panel unit. Future Expansion.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Cover Lower Input	Activated	CAN	ON (CAN Control)

109 Input Function - Tailgate Raise Switch (CAN - In Cab Input)

This CAN control is used to raise the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Raise Input	Activated	CAN	ON (CAN Control)

I10 Input Function – Tailgate Lower Switch (CAN - In Cab Input)

This CAN control is used to lower the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Lower Input	Activated	CAN	ON (CAN Control)

I11 Input Function – Tailgate Lock Switch (CAN - In Cab Input)

This CAN control is used to lock the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Lock Input	Activated	CAN	ON (CAN Control)

I12 Input Function – Tailgate Unlock Switch (CAN - In Cab Input)

This CAN control is used to unlock the Tailgate, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Tailgate Unlock Input	Activated	CAN	ON (CAN Control)

4.11: 2-Axis JOYSTICK CONTROL INPUT FUNCTIONS

The joystick controls only the Arms/Forks.

J03 Input Function – Joystick – Y-AXIS (Negative Direction) (CAN – Cab Input)

Pulling back the Joystick (Y-axis in Negative direction) performs the Arms up operation.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Y-Axis Negative direction	Activated	CAN	ON (CAN Control)

J04 Input Function – Joystick – Y-POS. (Positive Direction) (CAN – Cab Input)

Pushing the Joystick forward (Y-axis in Positive Direction) performs the Arms Down operation.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
Y-Axis Positive direction	Activated	CAN	ON (CAN Control)

J05 Input Function – Joystick – X-AXIS (Negative Direction) (CAN – Cab Input)

Moving the Joystick Left (X-axis in Negative direction) performs the Forks up operation.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
X-Axis Negative direction	Activated	CAN	ON (CAN Control)

J06 Input Function – Joystick – X-AXIS (Positive Direction) (CAN – Cab Input)

Moving the Joystick Right (X-axis in Positive direction) performs the Forks down operation

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
X-Axis Positive direction	Activated	CAN	ON (CAN Control)

4.12: OPTION CAN Auxiliary-Cab Input Functions

K01 Input Function – Auxiliary Arms/Forks Control Enable Switch (CAN - In Cab Input)

This is used to turn ON the - Auxiliary Arms/Forks control Enable switch that Enables or Disables the control for operating the Auxiliary Arms/Forks control.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Arms/Forks Control Enable	Activated	CAN	ON (CAN Control)

K02 Input Function – Auxiliary Arms Raise Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Arms Raise switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
--------------	--------	-------------	--------

HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS)

Body Controller Software

Auxiliary Arms Raise A	Activated	CAN	ON (CAN Control)
------------------------	-----------	-----	------------------

K03 Input Function – Auxiliary Arms Lower Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Arms Lower switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Arms Lower	Activated	CAN	ON (CAN Control)

K04 Input Function – Auxiliary Forks Raise Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Forks Raise switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Forks Raise	Activated	CAN	ON (CAN Control)

K05 Input Function – Auxiliary Forks Lower Switch (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Forks Lower switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Forks Lower	Activated	CAN	ON (CAN Control)

K06 Input Function – Auxiliary Packer Extend (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Packer Extend switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Input Device	Status	I/O Address	Status
--------------	--------	-------------	--------

HALF/PACK[®] (FEATURING ODYSSEY[®] CONTROLS)

Body Controller Software

Auxiliary Packer Extend	Activated	CAN	ON (CAN Control)
-------------------------	-----------	-----	------------------

K07 Input Function – Auxiliary Packer Retract (CAN - In Cab Input)

This Auxiliary CAN control is used to turn ON the - Packer Retract switch using Auxiliary control. This input is operative only if Auxiliary Controls Enable Switch is ON (Refer K01).

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Packer Retract	Activated	CAN	ON (CAN Control)

4.13: OPTION CAN In-Cab Input Functions

L01 Input Function – Travel Position Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Travel position Signal of the Packer, either from Street side or from the Curb side of a dual control panel unit. This switch is used to move the Packer to the travel position when there is no top door.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Travel Position Switch	Activated	CAN	ON (CAN Control)

L02 Input Function – Strobe Light Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Strobe Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Strobe Light Circuit Switch	Activated	CAN	ON (CAN Control)

L03 Input Function – Top Door Open Switch (CAN - In Cab Input)

This CAN control is used to open the Top Door, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Top Door Open Switch	Activated	CAN	ON (CAN Control)

L04 Input Function – Top Door Close Switch (CAN - In Cab Input)

This CAN control is used to close the Top Door during the Travel position Signal of the Packer, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Top Door Close Switch	Activated	CAN	ON (CAN Control)

L05 Input Function – Hopper Light Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Hopper Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Hopper Light Circuit Switch	Activated	CAN	ON (CAN Control)

L06 Input Function – Auxiliary Light Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Auxiliary Backup Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Auxiliary Backup Light Circuit Switch	Activated	CAN	ON (CAN Control)

L07 Input Function – Container Light Switch Circuit (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the Container Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
A	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Container Light Circuit Switch	Activated	CAN	ON (CAN Control)

L08 Input Function – CAB Light Switch (CAN - In Cab Input)

This CAN control is used to turn ON/OFF the forward facing Cab Light Circuit, either from Street side or from the Curb side of a dual control panel unit.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Cab Light Circuit Switch	Activated	CAN	ON (CAN Control)

L12 Input Function – Forks In Switch (CAN - In Cab Input)

This CAN control is used to Raise / Retract the Forks, either from Street side or from the Curb side of a dual control panel unit.

This control is used only in Commercial units.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Forks In switch	Activated	CAN	ON (CAN Control)

L13 Input Function – Forks Out Switch (CAN - In Cab Input)

This CAN control is used to Lower / Extend the Forks, either from Street side or from the Curb side of a dual control panel unit.

This control is used only in Commercial units.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device Status		I/O Address	Status	
Forks Out switch	Activated	CAN	ON (CAN Control)	

L14 Input Function – Commercial Grabber Close Switch (CAN - In Cab Input)

This CAN control is used to Close the Grabber, either from Street side or from the Curb side of a dual control panel unit. This control is used only in Commercial units.

Condition	Modifiable Parameters	Default Setting	
А	None	N/A	

Function Logic:

Input Device	Status	I/O Address	Status
Commercial Grabber Close Switch	Activated	CAN	ON (CAN Control)

L15 Input Function – Commercial Grabber Open Switch (CAN - In Cab Input)

This CAN control is used to Open the grabber, either from Street side or from the Curb side of a dual control panel unit. This control is used only in Commercial units.

Condition	Modifiable Parameters	Default Setting
А	None	N/A

Function Logic:

Input Device	Status	I/O Address	Status
Commercial Grabber Open Switch	Activated	CAN	ON (CAN Control)

Section 5: Special Features

5.01: Auto Pack Mode

Auto Pack is a standard feature on all CORTEX controlled FEL (Front End Loader) products. While in Auto Pack the Packer will complete its cycle automatically with a momentary activation of the Packer Extend push button.

5.02: Select-O-Pack

Select-O-Pack is an option for Commercial FEL products.

If the Select-O-Pack switch is enabled, then an Auto pack cycle will begin when the Arms reach a pre-defined position during a lower action.

That predefined location is when the Arms above Height proximity switch activates during a down motion.

5.03: Travel Position

When the Travel position switch is enabled pressing Packer Extend will Extend Packer to Travel position and stop. The indication will flash while moving and turn solid when at the Travel position. To return to the home turn OFF Travel position switch and hold retract. Travel position functionality is available only in manual mode

5.04: INSIGHT Display Functionality

There are 2 types of INSIGHT display devices used here for performing various operations as mentioned below:-

A. INSIGHT Display (7")

B. INSIGHT Display (12")

5.04.01: Operating Elements

5.04.01A: INSIGHT Display (7") Operating Elements

INSIGHT Display (7"): - Consists of 9 backlit function keys, Analogue video input, and a INSIGHT (Graphic) display terminal as shown below:

234



Fig.: 7" INSIGHT Display Unit

The display is fitted with the following operating elements:

- 1. 9 Function Keys
- 2. 4 Directional Arrows (Up / Down / Right / Left)
- 3. OK Push Button
- 4. INSIGHT Display.

<u>1. Function Keys</u>: There will be 9 backlit function keys available in INSIGHT. These can be used as password protection keys (for Ex: key on left side can be considered as "1 - 2 - 3 - 4 - 5 or A - B - C - D - E" and key on right side can be considered as "6 - 7 - 8 - 9 or F - G - H - I") or these function keys can be assigned specific function / Operation.

<u>2. Directional Arrows</u>: The Directional Arrows may be used for cursor movement function (Up / Down / Right / Left). This can be used for cursor location purposes from within Input, Output, Maintenance or Options Screens.

3. OK Push Button:

Note: For example: When a particular Input / Output bit is selected using Direction Arrows, the OK Push Button can be used to turn ON / OFF that particular bit. Once a particular bit is turned ON / OFF, the respective bit color will be changed from Gray to Green or vice versa, which will be displayed on the INSIGHT terminal.

<u>4. INSIGHT Display:</u> This is used for displaying the current status of the Input / Output, Engine Run Speed, Temperature, Auto/Manual mode etc. This can be programmed for graphically representing a process. This can also be used for changing the set points for Analog values.

<u>6. Photoelectric Sensor</u>: The device is equipped with a Light sensor. It is used for automatic brightness adaptation of the display and the operating elements to the ambient brightness. **NOTE:** Do not cover up the light sensor.

5.04.01B: INSIGHT Display (12") Operating Elements

INSIGHT Display (12"):- Consists of 13 backlit function keys, Analogue video input, and a H.M.I (Graphic) display terminal as shown below:



Fig.: 12" INSIGHT Display Unit

The display is fitted with the following operating elements:

- 1. 13 Function Keys
- 2. 4 Directional Arrows (Up / Down / Right / Left)
- 3. OK Push Button
- 4. INSIGHT Display.

<u>1. Function Keys</u>: There will be 13 backlit freely programmable function keys available in INSIGHT. The Function Keys primary use is to allow transition between operations screens. They also change to password protection keys if a password protected screen is activated (for Ex: Left side keys Top to Bottom "1 - 2 - 3 - 4" and Right side keys Top to Bottom "5 - 6 - 7 - 8").

<u>2. Directional Arrows:</u> The Directional Arrows may be used for cursor movement function (Up / Down / Right / Left). This can be used for cursor location purposes from within Input, Output, Maintenance or Options Screens.

3. OK Push Button:

Note: For example: When a particular Input / Output bit is selected using Direction Arrows, the OK Push Button can be used to turn ON / OFF that particular bit. Once a particular bit is turned ON / OFF, the respective bit color will be changed from Gray to Green or vice versa, which will be displayed on the INSIGHT terminal.

<u>4. INSIGHT Display:</u> This is used for displaying the current status of the Input / Output, Engine Run Speed, Temperature, Auto/Manual mode etc. This can be programmed for graphically representing a process. This can also be used for changing the set points for Analog values.

5.04.02: Display Operating States:

Colour	Status	Description		
-	permanently off	no operating voltage		
green	5 Hz	boot process application		
	2 Hz	application running (RUN) or set-up running		
	permanently on	application has stopped (STOP) or no project available		
red	2 Hz	application is running with an error (RUN with error)		
	permanently on	system error (fatal error), device is in reset (e.g. internal voltage error)		
red/orange	2 Hz colour change	overtemperature/undertemperature, device is in reset until temperature in normal range		
orange	5 Hz	boot process system recovery/update		
	2 Hz	system recovery/update running		
	briefly on	System reset		

5.04.03:Rear Panel Housing connection:

Table below provides Wiring details for the Interface cable of INSIGHT (7" and 12") display units:-



- 1: Service cover for USB connection, battery and watchdog reset
- 2: Locator for RAM® mount system and mounting frame
- 3: M12 connector (fig. shows max. number of connectors)

1	2, 5, 6, 7, 8	3		4
Connector A-coded, 5 poles	Socket A-coded, 5 poles	Socket B-coded, 5 poles		Socket D-coded, 4 poles
5 <u>3</u> 4	1 5 6 0 0 3			
(1) Supply, 1 10 2 IN 3 GNU 4 OUT 5 10	nput/output 32 V DC (clamp 30) (IN) 0 (clamp 31) (IN) 32 V DC (clamp 15) (IN)	(2) CAN1 1 Shield 2 VBB _c (OUT) 3 CAN1_GND (O 4 CAN1_H 5 CAN1_L		UT)
(3) USB 1 +5 V DC 2 -Data 3 +Data 4 ID 5 GND		(4) Ethernet 1 TxD+ 2 RxD+ 3 TxD- 4 RxD- Housing = screen		en
(5) CAN2 1 Shie 2 VBE 3 CAN 4 CAN 5 CAN	Id ₀ (OUT) I2_GND (OUT) I2_H I2_L	(6) CA 1 2 3 4 5	AN3/4 CAN3_H CAN3_L CAN3/4_GND (CAN4_H CAN4_L	OUT)
(7) Analogu 1 Shie 2 GNU 3 GNU 4 FBA 5 FBA	e video input Id) (video 2)) (video 1) S1 (video 1) S2 (video 2)	(8) N/ 1 2 3 4 5	A	

5.04.04:Interface details:

<u>1. Ethernet Interface</u>: Use a Shielded CAT5 cable (Shielded Twisted Pair - STP) for connection with maximum length of 25 meters.

2. Ethernet Camera: The device supports Ethernet cameras.

<u>3. USB Interface:</u> The USB interfaces are used for temporary connection of an external keyboard, mouse or a USB memory stick during servicing or maintenance. The USB device is connected to the display unit using a M12 connector. **NOTE:** They are not intended for actual operation (Remove the USB device after their use).



USB connection via M12 connector

- 1: Dialogue module
- 2: USB connector, for example in the control panel or in the dashboard
- 3: USB keyboard, mouse or memory stick



- Permanent connection: Dialogue module USB connector
- Use prewired cable.
 - (e.g. art. no. EC2099, M12 connector, B-coded on USB socket, type A, watertight, cable length 1.5 m, wires twisted and screened)
- Use only cables with twisted and screened wires for individual wiring. Keep length "A" as short as possible and position the USB connector in immediate vicinity to the dialogue module. The length "A" considerably influences the quality of the USB data transmission.
- B Temporary connection: USB connector USB device
 - Use a connection cable with the designation "Full Speed/High Speed" (= USB connection cable with twisted and screened cores).
 - Do not make a connection using several USB connection cables.
 - Remove connection cable after the programming or service works.

5.05: Odyssey Interlock Functionality

5.05.02: Commercial Mode

A. Curb Side Control:

- All standard commercial control interlocks.
- No fork interlock
- No Autolift available

B. Street Side Control:

- All standard commercial control interlocks.
- No fork interlock
- No Autolift available

Section 6: Diagnostic Messages and Alarms

6.01: Testing I/O Voltage

To test the voltage at an input or output terminal a Digital Multi Meter is always the best tool. Incandescent test lights cannot be used to test inputs from certain electronic input devices, the amperage required to light an incandescent tester may exceed the maximum output of the device. If using a test light, it must be an LED type tester.

PWM Signal: PWM Controls amount of power, supplied to electrical devices. Main advantage of PWM is that power loss in the switching devices is very low.

The Average value of Voltage (and Current) fed to the load is controlled by turning the switch between supply and load ON and OFF at a fast pace. The longer the switch is ON compared to the OFF periods, the higher the power supplied to the load is. Refer figure below for PWM waveforms:

Voltage can be measured for a PWM signal by using the following equation: Voltage_Multimeter = (12V * T_High + 0V * T_Low) / PWM_Period Where PWM_Period = T_High + T_Low (Seconds)



For Ex: T Low = Test Bulb OFF Time. T High = Test Bulb ON Time

Figures: PWM Output signal Waveforms

6.02: Monitoring Input Status

With an Input ON, the corresponding Input field (with Description and Address) located in INSIGHT display will also be ON.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

6.03: Monitoring Output Status

With an Output ON, the corresponding Output field (with Description and Address) located in INSIGHT display will also be ON.

Refer section 5.04 for more details about Diagnostic display options and INSIGHT display tool.

6.04: Diagnostic Display Messages

When a fault has been set 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.

• Top Door Open and Auto Pack Interlock (standard equipment)

If Top door is not fully open with Top door configuration bit is ON and Select-O-Pack option enabled and Travel position switch enabled or Packer Extend Push Button pressed, Top Door Open diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON.

- B. Top Door Configuration bit is ON.
- C. Select-O-Pack bit is ON
- D. Packer Extend Push Button pressed.
- E. Travel Position Switch ON.

Disabled Functions: Packer.

Fault Reset: Open the top door fully. Check top door, Packer Extend prox. Select-O-Pack switch for proper operation

<u>Cab Protector Down with Arms Lowered Interlock and Arms Active and Arms up Interlock</u> (standard equipment)

The arms have been lowered when the top door is not fully open or the Arm position angle is greater than the Fork roll position value (700) and Arms Up position is less than (1000) and the Packer/ Cab protector switch has not been enabled and the Fork position is greater than Feather Up range (610) and Arms up PWM Value less than (800) and Cab Protector Down configuration bit is ON and Top door configuration bit is ON, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON.

- B. Top Door Configuration bit is ON.
- C. Cab Protector Down Configuration bit is ON.

Disabled Functions: Forks will not be Lowered.

<u>Fault Reset</u>: Open the top door fully. Check top door, Cab protector down prox., Lift below Transit prox., Forks position and Arms position for proper operation.

<u>Cab Protector Down with Forks Untuck and Arms Lowered Docked Interlock (standard equipment)</u>

The arms have been lowered when the top door is not fully open and Forks Untuck position is '113' and Arm Angle position is lesser than '110', the diagnostic message will be displayed in the Insight display.



Insight Display Illustration: BEEP CODE 19-2

Indication: A. Top Door Open light ON.

- B. Top Door Configuration bit is ON.
- C. Cab Protector Down Configuration bit is ON.

Disabled Functions: Forks will not be Lowered.

<u>Fault Reset</u>: Open the top door fully. Check top door, Cab protector down prox., Lift below Transit prox., Forks position and Arms position for proper operation.

• Top Door Open and Arms Lowered Interlock (standard equipment)

If arms have been lowered when the top door is not fully open or the Arm position angle is greater than the Fork roll position value (700) and the Fork position is greater than Feather Up range (610) and the Top door configuration bit is ON, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON. B. Top Door Configuration bit is ON.

Disabled Functions: Forks will not lower.

<u>Fault Reset</u>: Open the top door fully. Check top door, Lift below Transit prox., Forks position and Arms position for proper operation.

• Cab Protector Raised and Arms Lowered Interlock (standard equipment)

The arms have been lowered when the Arm position angle is greater than the Fork roll position value (700) and the Packer/ Cab protector switch has been enabled and the Fork position is greater than Feather Up range (610) and Cab Protector Down configuration bit is ON, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON. B. Cab Protector Up Configuration bit is ON.

Disabled Functions: Forks will not Lower.

<u>Fault Reset</u>: Open the top door fully. Check Cab protector down prox., Lift below Transit prox., Forks position and Arms position for proper operation.

• Tailgate Closed While Ejecting (standard equipment)

If Packer has reached the fully extended proximity switch while the tailgate is closed for at least 2 Seconds, then the diagnostic message will be displayed in the Insight display.



Insight Display Illustration:

.

Indications: Packer Fully Extended and Tailgate Closed inputs are lit.

Disabled Functions: None.

Fault Reset: Manually retract the packer or open the tailgate.

• Packer Retract Pressed While Retracted (standard equipment)

If the packer is fully retracted but the packer return push button is still pressed or the Packer retract Auxiliary controls were activated, then the diagnostic message will be displayed in the Insight display.

Hyd Oil o * -965 * Ç, 1646 4 16.0 THE WHEELS ARE ALWAYS TURNING 0 965 Packer Fully Retracted

Insight Display Illustration:

Indications: The packer was manually returned and the retract button was not released.

Disabled Functions: None.

<u>Fault Reset</u>: Release the packer retract button and Packer retract Auxiliary controls or check that the packer return proximity switch is properly placed.

Auto-Pack Has Timed-Out (standard equipment)

The CORTEX Controller has a timer to monitor packer extend and packer retract operations. If the packer extend time exceeds 35 seconds before the extend prox. switch is activated, this beep code will activate. In Auto Pack, the packer will automatically retract. Packer extend may time out when the body is full or when operated at Engine idle (low hydraulic pump flow.)

Insight Display Illustration:



Indications: Diagnostic message will be displayed in the Insight display. Packer extend prox. is not

Copyright 2021, Heil Environmental Printed in the U.S.A.

activated 35 seconds after start of extend cycle.

Disabled Functions: Packer Extend

Fault Reset: Check packer extend prox. switch for proper operation and adjustment. Operate packer above Engine idle.

<u>Arms Raised Interlock Active (standard equipment)</u>

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Packer/ Cab protector switch has not been enabled / Scale Alarm-2 is enabled due to Overweight / PTO-1 or PTO-2 pump is ON, the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Arms Overheight light ON.

- B. Top Door Open light ON.
- C. Scale Alarm-2 ON due to Overweight.
- D. PTO-1 and PTO-2 pump Active signal ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and Packer retract prox. switches for proper operation.

Packer Extend Interlock Active (standard equipment)

If the Packer extend push button was pressed or the Packer extend Auxiliary controls were activated while the Arms were raised and the Packer/Overheight Over-ride switch was not enabled, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:


Indication: A. Arms are raised

- B. Packer Extend push button pressed.
 - C. Packer Override switch OFF.

Disabled Functions: Packer will not extend.

<u>Fault Reset</u>: Lower the arms until the Arms Raised light goes out. Turn OFF the Packer extend Auxiliary controls. Turn the Packer/Overheight Over-ride switch ON to manually move the packer.

Packer Extend PB with System Power OFF (standard equipment)

If the Packer extend push button pressed or the Packer extend Auxiliary controls were enabled with the system power turned OFF, the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. System Power input is not lit. B. Packer does not move.

Disabled Functions: PTO-1 pump and PTO-2 pump

Fault Reset: Turn the system power ON before utilizing Packer push buttons.

Side Door Open (standard equipment)

If the side door was opened during a packing operation or the pump enable switch was turned ON or the Auxiliary control for Packer Extend / Retract was enabled while the side door was open, the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Pump turns OFF unexpectedly.

- B. Packer does not pack.
- C. Pump will not turn ON.

Disabled Functions: Pump and all packer functions.

Fault Reset: Close the side door or repair faulty side door proximity switch.

• Packer Extend PB held when fully extended (standard equipment)

If the Packer extend pushbutton was pressed (or was being pressed) or the Packer Auxiliary controls were activated after the packer extended proximity switch is turned ON.



Insight Display Illustration:

Indication: The diagnostic message will be displayed in the Insight display.

Disabled Functions: None

Fault Reset: Release the Packer extend push button or Turn OFF the Auxiliary Controls.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body Controller Software

• Packer Retract Has Timed Out (standard equipment)

The CORTEX Controller has a timer to monitor packer extend and packer retract operations. If the packer extend time exceeds 35 seconds before the extend prox. switch is activated, this beep code will activate. Packer retract may time out when the packer cannot fully retract due to the accumulation of material behind the packer panel.



Insight Display Illustration:

<u>Indication</u>: The diagnostic message will be displayed in the Insight display. Packer retract prox switch is not activated 35 seconds after the start of the retract cycle.

Disabled Functions: Packer retract.

<u>Fault Reset</u>: Check packer retract prox switch for proper operation and adjustment. Remove accumulated material from behind packer panel.

Packer Retract And Extend At Same Time (standard equipment)

If the Packer retract and extend push buttons have been pressed at the same time, then the diagnostic message will be displayed in the Insight display.



Indication: The packer does not move.

Disabled Functions: Packer will not move.

Fault Reset: Determine why pack extend and retract buttons are active at the same time.

Packer Extend w/o Pump ON (standard equipment)

If the packer extend push button was pressed without the pump being ON, the diagnostic message will be displayed in the Insight display.



Indication: The packer does not move.

Disabled Functions: Packer extend.

Fault Reset: Turn ON the pump.

Hydraulic Filter Is In Bypass (standard equipment)

If the hydraulic filter has been in bypass for more than 11 hours, then the diagnostic message will be displayed in the Insight display.



Indication: The Pump will only work for 3 minutes.

Disabled Functions: Pump

Fault Reset: Replace hydraulic oil filter.

Arms Raised Interlock and Overweight Alarm Active (standard equipment)

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Packer/ Cab protector switch has not been enabled / Scale Alarm-2 is enabled due to Overweight / PTO-1 or PTO-2 pump is ON, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Arms Overheight light ON.

- B. Top Door Open light ON.
- C. Scale Alarm-2 ON due to Overweight.
- D. PTO-1 and PTO-2 pump Active signal ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and packer retract prox. switches and Auto Lift Enable switch for proper operation. Check for Overweight condition for proper operation.

Top Door Open and Arms Raised Interlock (standard equipment)

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Packer/ Cab protector switch has not been enabled / Scale Alarm-2 is enabled due to Overweight and Auto Lift Switch is Disabled / PTO-1 or PTO-2 pump is ON and Top Door Open Configuration bit is ON then the diagnostic message will be displayed in the Insight display.



Indication: A. Arms Overheight light ON.

- B. Top Door Open light ON.
- C. Scale Alarm-2 ON due to Overweight.
- D. PTO-1 and PTO-2 pump Active signal ON.
- E. Top Door Open Configuration bit is ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and packer retract prox. switches and Auto Lift Enable switch for proper operation.

<u>Cab Protector Raised and Arms Raised Interlock (standard equipment)</u>

If the arms have been raised when the packer is not fully retracted and the Packer/Cab protector switch has been enabled / Scale Alarm-2 is enabled due to Overweight and Auto Lift Switch is Disabled / Packer Extend or Packer Retract bit is ON/ PTO-1 or PTO-2 pump is ON, then the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Top Door Open light ON.

- B. Arms Overheight light ON.
- C. Scale Alarm-2 ON due to Overweight.
- D. PTO-1 and PTO-2 pump Active signal ON.
- E. Cab Protector Up Configuration bit is ON.

Disabled Functions: Forks will not raise above windshield.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body Controller Software

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check Packer Retract prox. Switches, Cab protector down prox. Switches and Auto Lift Enable switch for proper operation.

• Packer Sensor Fault (standard equipment)

The Packer position value is less than '100' or greater than '4600' during the Packing operation the diagnostic message will be displayed in the Insight display. (Refer section 4.09 – H01 – Packer Position for details).

Insight Display Illustration:



Indication: A. Packer Sensor faulty B. Sensor failure ON

Disabled Functions: Packer functions and Fork function.

<u>Fault Reset</u>: Check for the Faulty sensor or Sensor mounting position or calibrate the faulty sensor and also check Packer Cylinder for proper operation.

• Fork Sensor Fault (standard equipment)

The Fork position value is less than '-100' or greater than '1400' during the operation then the diagnostic message will be displayed in the Insight display. Also the value is not within the High or Low limit (Refer section 4.09 – H03 – Fork Position for details).



Indication: A. Fork Sensor faulty B. Sensor failure ON

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Check for the Faulty sensor or Sensor mounting position or calibrate the faulty sensor and check Cab protector prox. switches for proper operation.

<u>Arm Sensor Fault (standard equipment)</u>

The Arm position value is greater than '1100' or less than '-100' during the operation then the diagnostic message will be displayed in the Insight display. Also the value is not within the High or Low limit (Refer section 4.09 – H02 – Arm Position for details).



Insight Display Illustration:

Indication: A. Arm Sensor faulty B. Sensor failure ON

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Check for the Faulty sensor or Sensor mounting position or calibrate the faulty sensor for proper operation.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body Controller Software

• <u>Arms Raised Interlock with Forks Untuck and Arms Raised Docked Interlock (standard equipment)</u>

If the arms have been raised when the top door is not fully open or the packer is not fully retracted and the Forks Untuck position is '113' and Arm Angle position is greater than '450', the diagnostic message will be displayed in the Insight display.

Insight Display Illustration:



Indication: A. Arms Overheight light ON. B. Top Door Open light ON. C. PTO-1 and PTO-2 pump Active signal ON.

Disabled Functions: Forks will not raise above windshield.

<u>Fault Reset</u>: Open the top door fully. Restart packer panel. Check top door and Packer retract prox. switches for proper operation.

Side Door Interlock Fault (standard equipment)

If the Side door is opened with either pump enabled, the diagnostic message will be displayed on the Insight display.



Indication: A. Pump turns OFF unexpectedly.

- B. Packer does not pack.
- C. Pump will not turn ON.

Disabled Functions: Pumps.

Fault Reset: Close the Side door or repair faulty Side door proximity switch.

• Low Oil Level Fault (standard equipment)

The hydraulic oil level has dropped below a safe operating level during operation then the diagnostic message will be displayed in the Insight display.



Insight Display Illustration:

Indication: Low Hydraulic Oil Level

A. <u>Disabled Functions</u>: Hydraulic Pump

Fault Reset: Refill hydraulic oil tank.

• Oil Over Temperature Shutdown Fault (standard equipment)

If the Hydraulic Oil temperature is greater than 190° F, then the diagnostic message will be displayed in the Insight display. This is recognized as a fault because the Oil temperature should always be within the specified limit (Less than 190 ° F) for the system to function properly.

Insight Display Illustration:



Indication: A. Hydraulic Oil over temperature shutdown.

Disabled Functions: Hydraulic Pump

Fault Reset: Reduce temperature before operation.

• High Temperature Fault (standard equipment)

If the Hydraulic Oil temperature is greater than 180° F, then the diagnostic message will be displayed on the Insight display.



Insight Display Illustration:

<u>Indication:</u> A. Hydraulic Oil over temperature warning B. Operating Temperature Approaching Shutdown set point (180 Deg. F) <u>Disabled Functions:</u> None

Fault Reset: Reduce temperature before operation.

• Pump Enable PB with System Power disabled Interlock (standard equipment)

With System Power turned OFF and if the Pump Enable push button presses either from street side or from the curb side of the dual control panel for Bank-1 Switch-1 and Bank-3 Switch-1, the diagnostic message will be displayed in the

Insight display.

Insight Display Illustration:



Indication: A. System Power input is not lit.

B. Pump does not turn ON

Disabled Functions: Body pump and Lift pump

Fault Reset: Turn the system power ON before utilizing Pump push button.

• Tailgate Open Indicator and Road Speed limit fault (standard equipment)

If the Tailgate is open when the Road speed is greater than 10mph i.e. if the Tailgate is open when the unit is in motion, the diagnostic message will be displayed on the Insight display.

NOTE: Tailgate operation can be performed only when the Road speed is less than 5mph.

Insight Display Illustration:



Indication: Tailgate open.

Disabled Functions: None

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body Controller Software

Fault Reset: Close and Lock the Tailgate or repair the faulty Tailgate open proximity switch to proceed

further.

<u>Tailgate Unlocked and Road Speed High Interlock (standard equipment)</u>

If the Tailgate is unlocked when the Road speed is greater than 10mph i.e. if the Tailgate is unlocked when the unit is in motion, the diagnostic message will be displayed on the Insight display.

NOTE: Tailgate operation can be performed only when the Road speed is less than 5mph.

Insight Display Illustration:



Indication: A. Tailgate Unlocked.

Disabled Functions: None.

Fault Reset: Close and Lock the Tailgate or repair the faulty Tailgate Locked proximity switch to proceed

further.

• Filter Bypass Switch Fault (standard equipment)

If the CORTEX Controller has lost the signal from the filter pressure switch while neither hydraulic pump was in operation the diagnostic message will be displayed in the Insight display. This is recognized as a fault because there should be no hydraulic pressure to bypass the filter under this condition.



Indication:___A. The filter bypass pressure switch has been disconnected.

- B. An open has occurred in the filter bypass input circuit.
 - C. The filter pressure switch has failed to open.

Disabled Functions: None.

Fault Reset: Cycle System Power Switch or Restore filter pressure switch input to CORTEX Controller.

Note: This fault is applicable on dry valve pump units only.

• Temperature Sensor Fault (standard equipment)

The CORTEX32 Controller has received a signal from the Temperature sensor switch indicating that the Hydraulic Oil temperature is out of specified limit i.e. Oil temperature value is less than '-100' or exceeds '4000'. This is recognized as a fault because Hydraulic Oil temperature should be within specified limit for proper operation of the system.



Insight Display Illustration:

Indication: Oil temperature Sensor fault?

Disabled Functions: None

<u>Fault Reset:</u> When the Temperature returns to defined limit (i.e. within -100 to 4000), the switch will reset. If the switch does not reset, there is a possible problem with the Temperature switch or the harnessing.

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) Body Controller Software

• <u>No Voltage on Extended Controller side Fault (Standard equipment)</u>

If the Voltage measured across VBB1_E, VBB2_E, VBB3_E, and VBB_RELAYIS_VOLTAGE terminal (i.e. Connector-2 Pin-19, Pin-1, Pin-32, and Pin-51) is less than 8 Volts, then this is recognized as a fault.



Insight Display Illustration:

Indication: A. No Voltage on Extended side controller.

Disabled Functions: CORTEX32 Extended Controller.

<u>Fault Reset:</u> When the Voltage (greater than 8 VDC) is available at these VBB terminals (VBB1_E and VBB2_E and VBB3_E and VBB_RELAYIS_VOLTAGE), CORTEX32 extended controller will turn ON and start functioning normally. If the extended controller doesn't start, there is a possible problem with the CORTEX32 Extended controller or 55-Pin connector connection or the harnessing.

No Ignition Voltage on Extended Controller side Fault (Standard equipment)

If the Voltage measured across VBB2_E and VBB_RELAYIS_VOLTAGE terminal (i.e. Connector-2 Pin-19 and Pin-51) is less than 8 Volts, then this is recognized as a fault.



Indication: A. No Ignition Voltage on Extended side controller.

Disabled Functions: CORTEX32 Extended Controller.

<u>Fault Reset:</u> When the Voltage (greater than 8 VDC) is available at these VBB terminals (VBB2_E and VBB_RELAYIS_VOLTAGE), CORTEX32 extended controller will turn ON and start functioning normally. If the extended controller doesn't start, there is a possible problem with the CORTEX32 Extended controller or 55-Pin connector connection or the harnessing.

Under OperatingTemperature Warning (Optional equipment)

If the Hydraulic Oil temperature is less than 70° F, then the diagnostic message will be displayed in the Insight display.



Insight Display Illustration:

Indication: Hydraulic Oil temperature under Operating range

Disabled Functions: None

Fault Reset: Preheat Oil before route.

SECTION 9 SCHEMATICS



701-9340-001



SCHEMATIC, CAB TO BODY 2021 HP REFRESH, RP170 701-9340-002





'PTO	
V-1	
V-2	
√-3	
√-4	
√-5	
V-6	

' CAN		
N-1 N-2 N-3 N-4 N-5 N-6 N-7	GOLD GOLD GOLD GOLD GOLD GOLD	
<u>и—о</u>		

701-9340-003

SCHEMATIC, CAB TO BODY PETERBILT 520 **2021 HP REFRESH, RP170**

701-9340-003



701-9340-004

SCHEMATIC, CAB TO BODY, ECONIC 2021 HP REFRESH, RP170

701-9340-004



REF.	PART No.	DESCRIPTION	QTY.
1	. 069-0032	ASSY, MICRO RELAY	REF
2	. 108–2648	DIODE, SILICON RECTIFIER, 6 AMPS	REF
3	. 108-4815-022	CONNECTOR, 19 POS RECEPT.	REF
4	. 108-4815-024	CONNECTOR, 23 POS RECEPT.	REF
5	. 108-4815-207	CONNECTOR, 31 POS PLUG (RP170 D-1)	REF
6	. 108-4815-209	CONNECTOR, 8 POS PLUG (RP170 D-1A)	REF
7	. 108-6461-128	CONNECTOR, 12 POS PLUG, GRAY	REF
8	. 108-6461-301	CONNECTOR, 3 POS RECEPTACLE, BLACK	REF
9	. 108-6461-311	CONNECTOR, 3 POS PLUG, BLACK	REF
10	. 108-6461-601	CONNECTOR, 6 POS RECEPTACLE, BLACK	REF
11	. 108-6461-611	CONNECTOR, 6 POS PLUG, BLACK	REF
12	. 108-6461-801	CONNECTOR, 8 POS RECEPTACLE, GRAY	REF
13	. 108-6461-811	CONNECTOR, 8 POS PLUG, GRAY	REF
14	. 108-8411-04P	DTP 4 WAY PLUG	REF
15	. 108-8572-001	IFM 55 POS CONNECTOR	REF
16	. 108-8588-200	ATM 2 PIN 120 OHM RESISTOR	REF
17	. ATO4-4P-SR02BLU	AT 4 WAY RECEPTACLE, BLUE	REF
18	. ATO4-4P-SR02BRN	AT 4 WAY RECEPTACLE, BROWN	REF
19	. ATO6-4S-SR02BLU	AT 4 WAY PLUG, BLUE	REF
20	. ATO6-4S-SR02BRN	AT 4 WAY PLUG, BROWN	REF
21	. ATO6-6S-SR02YEL	CONNECTOR, 6 POS PLUG, YELLOW	REF
22	. ATM04-2P-SR01YL	ATM 2 WAY RECEPTACLE, YELLOW	REF
23	. ATM06—2S—SR01YL	ATM 2 WAY PLUG, YELLOW	REF
24	. ATM06-6S-SR01YL	ATM 6 WAY PLUG, YELLOW	REF



HARNESS, P01 CAB 2021 HP REFRESH AUTOCAR ACX (RP170)

263-1907-100



BDY	CAN
GREEN "CAN 1 L" A PIN	<u>√−1</u> C
Y YELLOW "CAN 1 H" U PIN	1-2 C
(1) GREEN_"J1939 1 L" PIN	1-3 G
YELLOW "J1939 1 H" V PIN	1-4 G
GRED J1939 3 L PIN	
YELLOW "11939 2 H" V	1-8 C

REF.	PART No.	DESCRIPTION	QTY.
1	. 108-4815-023	CONNECTOR, 19 POS PLUG	REF
2	. 108-4815-025	CONNECTOR, 23 POS PLUG	REF
3	. 108-4815-188	COMPRESSION BACKSHELL	REF
4	. 108-4815-189	COMPRESSION NUT	REF
5	. 108-4815-205	CONNECTOR, 14 POS PLUG (RP170 D-2)	REF
6	. 108–6461–203	CONNECTOR, 2 POS RECEPTACLE (RED)	REF
7	. 108-6461-213	CONNECTOR, 2 POS PLUG (RED)	REF
8	. 108–6461–301	CONNECTOR, 3 POS RECEPTACLE, BLACK	REF
9	. 108-6461-311	CONNECTOR, 3 POS PLUG, BLACK	REF
10	. 108-6461-401	CONNECTOR, 4 POS RECEPTACLE, BLACK	REF
11	. 108-6461-411	CONNECTOR, 4 POS PLUG, BLACK	REF
12	. 108–6461–601	CONNECTOR, 6 POS RECEPTACLE, BLACK	REF
13	. 108-6461-611	CONNECTOR, 6 POS PLUG, BLACK	REF
14	. 108-6461-801	CONNECTOR, 8 POS RECEPTACLE, GRAY	REF
15	. 108-8411-007	ATP 6 WAY RECEPT.	REF
16	. ATO6-08SA-SR2YL	CONNECTOR, 8 POS PLUG, YELLOW	REF
17	. ATO6-6S-SRO1BLK	AT 6 WAY PLUG, BLACK	REF
18	. AT06-6S-SR02GRY	AT 6 WAY PLUG, GRAY	REF
19	. ATPO6-6S-MM01	ATP 6 WAY PLUG, GREY, END CAP	REF

263-1907-101

GOLD PIN GOLD PIN

HARNESS, P01 CHASSIS 2021 HP REFRESH AUTOCAR ACX (RP170)

263-1907-101

NOTE:

1) "PACKER POSITION SENSOR" AND "BODY VALVE PRESSURE" CABLE TO BE TWISTED PAIR, FOUR CONDUCTOR WITH SHIELD CABLE SUCH AS HELUKABLE #17050 2) "OIL TANK TEMP SENSOR" TO BE A SINGLE

TWISTED PAIR CABLE WITH SHIELD SUCH AS GENERAL CABLE C2534A.

3) J1939 WIRING MUST BE J1939/1802-0 CABLE







OIL
PIN-1 WHITE "OIL TEMP CND"
PIN-6 ORANGE "HIGH PRESSURE FILTER INDICATOR"
PIN-7
PIN-11 PLUGGED
PIN-12 PLUGGED



701-9341-001

2021 HP REFRESH

SCHEMATIC, BODY FRONT



BDY PWR	
PIN-1 PIN-2 PIN-3 PIN-4 PIN-5 PIN-6	WHITE "GROUND 1" (10 AWG) WHITE "GROUND 2" (10 AWG) BLACK "IGNITION 1" (12 AWG) BLACK "IGNITION 2" (12 AWG) ORANGE "OUTPUT PWR 1" (14 AWG) ORANGE "OUTPUT PWR 2" (14 AWG)
BDY LT PIN-1 PIN-2 PIN-3 PIN-4 PIN-5 PIN-6	——————————————————————————————————————

BDY PTO	
PIN-1	RED "PTO 1"
PIN-2 PIN-3	
PIN-4	RED "CAB FLOOD LIGHT"
PIN-5	ORANGE "PTO PSW"

	BDY CAN	
GOLD PIN	PIN-1	GREEN "CAN 1 L"
GOLD PIN	PIN-2	YELLOW "CAN 1 H"
GOLD PIN	PIN-3	└────────────────────────────────────
GOLD PIN	PIN-4	YELLOW "J1939 1 H"
GOLD PIN	PIN-5	GREEN "J1939 3 L"
GOLD PIN	PIN-6	YFLLDW "J1939 3 H"
GOLD PIN	PIN-7	GREEN "11939 2 1"
GOLD PIN	PIN-8	YELLOW "J1939 2 H"



IX SOL				
PIN-C	 ELEASE/FO	RKS	оот"—	
	CAP	A	RM1-P	
	PIN-1		PIN-1	
	PIN-1			
	PIN-2 PIN-3		PIN-2 PIN-3	
	PIN-4		PIN-4	

701-9341-021

SCHEMATIC, BODY FRONT GROTE 2021 HP REFRESH



T-1
 PIN-1 PIN-2 PIN-3 PIN-4 PIN-5 PIN-5 PIN-5 PIN-7 PIN-3 PIN-3 PIN-12 PIN-11 PIN-12
· · · · · ·

SCHEMATIC, BODY 2021 HP REFRESH





SCHEMATIC, ARM NODE 2021 HP REFRESH



SCHEMATIC, PIVOT ARMS 2021 HP REFRESH

Gold Pin PIN-1 - Yellow "J1939 3 H, Heil Network 2" Gold Pin PIN-2 - Green "J1939 3 L, Heil Network 2"-

701-9341-010

SCHEMATIC, TG NODE/VALVE 2021 HP REFRESH

			_
REF.	PART No.	DESCRIPTION	QTY.
1	. 108–6461–003	AT 4 POS PLUG KIT	1
2	. 108–6461–004	AT 4 POS RECEPTACLE KIT	1
3	. 108–6461–009	AT 12 POS PLUG KIT	3
4	. 108-6461-010	AT 12 POS RECEPTACLE KIT	3
5	. 108–6461–011	AT 2 POS PLUG KIT	2
6	. 108-6461-012	AT 2 POS RECEPTACLE KIT	2
7	. 108-8411-002	2 WAY PLUG	2
8	. 108-8493-001	SUPER SEAL 1 WAY PLUG HOUSING	2
9	. 108-8721-005	OVERMOLDED PLUG, 2 WIRE, 90°	2
10	. 108–8493–101	SUPER SEAL 1 WAY CAP HOUSING	2
11	٠		
12	, 108-8721-001	OVERMOLDED TERM, FEMALE 0.18 BULLET	7
13	, 108-8721-004	OVERMOLDED PLUG, 3 WIRE, 90°	4
14	. 108-8721-006	3 WIRE CAP	4
			-

263-1890-003

HARNESS, TAILGATE UPPER CLUSTER, GROTE

263-1890-003

0.	DESCRIPTION	QTY.
)11	2-WAY PLUG	2
401	4-WAY RECEPTACLE	1

HARNESS, TAILGATE MIDDLE CLUSTER, GROTE CAMERA FLOOD LIGHTS HP 2018

263-1890-002

REF.	PART No.	DESCRIPTION	QTY.
1	. 108-4827-003	2 WAY MALE CONNECTOR	
2	. 108-4827-006	3 WAY FEMALE CONNECTOR	
3	. 108-6461-010	12 PIN DEUTSCH RECEPTACLE	
4	. 108-6461-011	2 PIN DEUTSCH PLUG	2
5	. 108-6461-012	DT 2 WAY RECEPTACLE	2
6	. 108-8411-001	2 WAY RECEPTACLE	1
7	. 108-8493-001	SUPER SEAL 1 WAY PLUG HOUSING	2
8	. 108–8493–101	SUPER SEAL 1 WAY CAP HOUSING	2
9	. 108-8721-001	OVERMOLDED TERM, FEMALE 0.18 BULLET	2
10	. 108-8721-004	OVERMOLDED PLUG, 3 WIRE, 90°	4
11	. 108-8721-006	3 WIRE CAP	2
12	. 108-8721-005	OVERMOLDED PLUG, 2 WIRE, 90°	5

З

263-1890-001

12 PIN CONNECTOR DEUTSCH DT RECEPTACLE P/N: 108-6461-12R

	T-2
PLUGGED PLUGGED "BACKUP ALARM" STROBE 1 OUT" STROBE 2 OUT" PLUGGED -(REVERSE) OWN-(TAIL) OWN-(TAIL) C-(CLEARANCE) DW-(LH TURN) N-(RH TURN)	PIN-12 PIN-11 PIN-9 PIN-9 PIN-8 PIN-7 PIN-6 PIN-5 PIN-5 PIN-4 PIN-3 PIN-2 PIN-1
GND—1" (10 AWG)— GND—2" (10 AWG)—	BG2 PIN-1 PIN-2

HARNESS, TAILGATE LOWER CLUSTER, GROTE

263-1890-001

263-1908-011

SCHEMATIC, OIL TANK 2021 HP REFRESH

701-9341-011

HPFL		CAP	
PIN-A	GOLD PIN	PIN-A	PLUGGED
PIN-B		PIN-B	PLUGGED
PIN-C		PIN-C	PLUGGED

OIL		
PIN-A		
PIN-B		
PIN-C	GOLD	

D

С

CREEN "L. TURN" (14 AWG) PIN-5 CREEN "R. TURN" (14 AWG) PIN-6 REED "CAB FLOOD LIGHT" PIN-7 RED "CAB FLOOD LIGHT" PIN-8	CNTE WHITE "CND 1" (10 AWG) WHITE "CND 1" (10 AWG) WHITE "CND 2" (10 AWG) PIN-A BLACK "IGNTION 1" (12 AWG) PIN-C BLACK "IGNTION 1" (12 AWG) PIN-C ORANGE "OUTPUT PWR 1" (14 AWG) PIN-C ORANGE "OUTPUT PWR 2" (14 AWG) PIN-C	RED "ALISON PTO ENABLE" PIN-1 RED "PTO 1 SOU" PIN-1 RED "PTO 1 SOU" PIN-3 ORANGE "PTO 2 SOU" PIN-4 BLACK "OLI TEMP PIN" PIN-7 ORANGE "OLI TEMP SHELD" PIN-7 ORANGE "OLI TANK FILE" PIN-7 ORANGE "OLI TANK FILE" PIN-6 DRANGE "OLI TANK FILE" PIN-7 ORANGE "OLI TANK FILE" PIN-7 DRANGE "OLI TANK FILE" PIN-7 DRANGE "OLI TANK FILE" PIN-7 DRANGE "OLI TANK FILE" PIN-7 PIN-6 PIN-7 PIN-7 PIN-7 DRANGE "OLI TANK FILE" PIN-7 PIN-7 PIN-7 PIN-7 PIN-7 PIN-7 PIN-7	CNTL HROWN "PACKER SENSOR PWR" WHITE "PACKER SENSOR PWR" WHITE "PACKER SENSOR PWR" PIN-3 COLD PINS PIN-4 COLD PINS PIN-4 COLD PINS PIN-4 PIN-7 PIN-6 COLD PINS PIN-6 COLD PINS PIN-7 PIN-7 PIN-7 PIN-7 PIN-7 PIN-10 PIN-10 PIN-10 PIN-10 PIN-11 PIN-11 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-12 PIN-
			Image: Sector
	CNTL STD PIN-1 ORANGE "OUTPUT PWR 1" PIN-2 RED "PTO 1 SOL" PIN-3 RED "PTO 2 SOL" PIN-4 PLUGGED PIN-7 PURPLE "PACKER EXTEND" PIN-8 GRAY "TAILGATE FLOW" PIN-9 GRAY "CARRY CAN FLOW" PIN-10 BLCK "GINITION 1F MODULE" PIN-11 PURPLE "FORKS DOWN" PIN-12 PURPLE "ARMS UP" PIN-13 PURPLE "ARMS DOWN" PIN-14 PURPLE "ARMS DOWN" PIN-15 PURPLE "ARMS DOWN"		
	PIN-16 PURPLE "CAB PROT DOWN" PIN-17 PLUGGED "ALLISON PTO ENABLE" PIN-18 RED "ALLISON PTO ENABLE" PIN-19 OCRANGE "OUTPUT PWR 1" PIN-20 WHITE "GND 1" " PIN-21 ORANGE "CAB PROTECTOR PROX" PIN-22 BLACK "OIL TANK TEMP" " PIN-23 PLUGGED PIN-24 DK BLUE "SYS POWER OUT" PIN-24 DK BLUE "SYS POWER OUT" " PIN-25 RED "RS232 RxD" " PIN-26 GREEN "J1939 3 L, HEIL NETWORK 2" " PIN-27 GREEN "J1939 1 L, HEIL NETWORK 1" " PIN-28 GREEN "CAN 1 L, DISPLAY (CANOPEN)" " PIN-30 PLUGGED PIN-31 PLUGGED PIN-31 PLUGGED PIN-33 ORANGE "ARMS UP PROX" " PIN-35 ORANGE "IT BELOW TRANSIT PROX" " " " PIN-36 ORANGE "IT BELOW TRANSIT PROX" " " "		

SCHEMATIC, CONTROLLER 2021 HP REFRESH

PANEL SPLITTER HARNESS

_____ _____

SCHEMATIC, CAB CONTROL PANELS COMMAND-SST



INTENTIONALLY LEFT BLANK

Issued March 2021 Schematics

HYDRAULIC SCHEMATICS



22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ITEM	PART DESCRIPTION

HYDRAULIC SCHEMATIC FOR DDYSSEY, AUTOMATED FRONT LOADER

701-9149

DDYSSEY UNIT, SYSTEM AT IDLE



24-SEP-2014

22	
22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ITEM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN SYSTEM AT IDLE 701-9149-001

DDYSSEY UNIT, CURDTTD SLIDE DUT



22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ITEM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN CURDITO SLIDE DUT

701-9149-002

DDYSSEY UNIT, CURDTTD GRIPPER CLOSE



24-SEP-2014

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ГЕМ	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN CURDITO GRIPPER CLOSE 701-9149-003

DDYSSEY UNIT, CURDTTD LIFT RAISE



T/G RAISE CYL. TOP DOOR CYL. T/G LOCK CYL. (OPTION) \square (19) **⊢**≱ ⇇ (17) (18) (18) low Con (16) PG 2 B1 A1 B2 A2 В3 A3 725 psi ≨ ₽ 1300 psi <u>چ</u> و (21) 1300 ps 580 psi <mark>₽</u></mark> Т b1 2≤ b2 500 ps b3 2≦ _ Top Door Tailgate Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
	TAILGAGE VALVE ASSEMBLY
(FLOW CONTROL VALVE, METER-IN
1	TOP DOOR CYLINDER, OPTION
	TAILGATE RAISE CYLINDER
,	TAILGATE LOCK CYLINER
	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
;	ARM CYLINDER WITHOUT SENSOR, STANDARD
	ARM CYLINDER WITH SENSOR
	FORK CYLINDER WITHOUT SENSOR, STANDARD
	FORK CYLINDER WITH SENSOR
	DAMP VALVE, PO CHECK VAVLE
)	PACK TELESCOPIC CYLINDER
	CUROTTO CAN, GRIPPER CYLINDER
	CUROTTO CAN, LIFT CYLINDER
	CUROTTO CAN, SLIDE CYLINDER
	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
	HYDRAULIC RESERVOIR ASSEMBLY
	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
М	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN CURDTTD LIFT RAISE

DDYSSEY UNIT, CURDTTD LIFT LOWER



24-SEP-2014

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ЕM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN CURDTTD LIFT LOWER 701-9149-005

DDYSSEY UNIT, CURDTTD GRIPPER DPEN



24-SEP-2014

22	
22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
9	TOP DOOR CYLINDER, OPTION
8	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
6	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
5	ARM CYLINDER WITHOUT SENSOR, STANDARD
4	ARM CYLINDER WITH SENSOR
3	FORK CYLINDER WITHOUT SENSOR, STANDARD
2	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
0	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
EM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN CURDITO GRIPPER OPEN 701-9149-006

DDYSSEY UNIT, CURDTTD SLIDE IN



24-SEP-2014

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ТЕМ	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN CURDITO SLIDE IN 701-9149-007

DDYSSEY UNIT, CURDTTD LIFT RAISE AND SLIDE IN



24-SEP-2014

22	PROPORTIONAL VALVE ASSEMBLY & SECTIONS
22	TAU OLOS VALVE ASSEMBLI, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
TEM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN CURDITO LIFT RAISE AND SLIDE IN 701-9149-008

DDYSSEY UNIT, CURDTTO LIFT LOWER AND SLIDE OUT



701-9149-009

DDYSSEY UNITS W/CURDTTD CAN CURDTTO LIFT LOWER AND SLIDE OUT

	TAILGATE VALVE ASSEMBLY
22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ТЕМ	PART DESCRIPTION

DDYSSEY UNIT, HALF-PACK ARM RAISE



24-SEP-2014

T/G RAISE CYL. TOP DOOR CYL. T/G LOCK CYL. (OPTION) 17 பு பி F ŧ 18 (17) ow Contr (18) 20 (16) PG 2 B1 A1 B2 A2 **B**3 A3 725 psi ≨ ↓ ↓ 1300 psi 21 11 580 psi 1300 psi 500 psi b1 <u>√</u> b2 🛃 b3 🛃 Â [™] Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ITEM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN HALF-PACK ARM RAISE

DDYSSEY UNIT, HALF-PACK FORK RAISE



TOP DOOR CYL. T/G RAISE CYL. T/G LOCK CYL. (OPTION) (17) III (19 F ŧ 18 (17) ow Contr (18) (16) PG 2 B1 A1 B2 A2 **B**3 A3 725 psi ≨ ↓ 1300 psi 21 11 580 psi 1300 psi 500 psi b1 <u>√</u> b2 🛃 b3 🛃 Â Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
8	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
4	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
0	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ΈM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN HALF-PACK FORK RAISE

DDYSSEY UNIT, HALF-PACK ARM LOWER



T/G RAISE CYL. TOP DOOR CYL. T/G LOCK CYL. (OPTION) 1119 17 F ŧ 18 (17) ow Contr (18) 20 (16) PG 2 B1 A1 B2 A2 B3 A3 1300 psi 725 psi 21 11 580 psi 1300 psi 500 psi b1 <u>√</u> b2 🛃 b3 🛃 Â [™] Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ТЕМ	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN HALF-PACK ARM LDWER

DDYSSEY UNIT, HALF-PACK FORK LOWER



24-SEP-2014

701-9149-013

DDYSSEY UNITS W/CURDTTD CAN HALF-PACK FORK LOWER

	Tailgate Lock Tailgate Top Door Lock / Unlock Lower / Raise Open / Close
	TAILGATE VALVE ASSEMBLY
2	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
1	TAILGAGE VALVE ASSEMBLY
2	FLOW CONTROL VALVE, METER-IN
)	TOP DOOR CYLINDER, OPTION
3	TAILGATE RAISE CYLINDER
7	TAILGATE LOCK CYLINER
6	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
5	ARM CYLINDER WITHOUT SENSOR, STANDARD
1	ARM CYLINDER WITH SENSOR
3	FORK CYLINDER WITHOUT SENSOR, STANDARD
2	FORK CYLINDER WITH SENSOR
1	DAMP VALVE, PO CHECK VAVLE
כ	PACK TELESCOPIC CYLINDER
	CUROTTO CAN, GRIPPER CYLINDER
	CUROTTO CAN, LIFT CYLINDER
	CUROTTO CAN, SLIDE CYLINDER
	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
	HYDRAULIC RESERVOIR ASSEMBLY
	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
M	PART DESCRIPTION

DDYSSEY UNIT, HALF-PACK ARM AND FORK RAISE



24-SEP-2014

701-9149-014

DDYSSEY UNITS W/CURDTTD CAN HALF-PACK ARM AND FORK RAISE

	Tailgate Lock Tailgate Top Door Lock / Unlock Lower / Raise Open / Close
	TAILGATE VALVE ASSEMBLY
_	
4	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
, ,	FLOW CONTROL VALVE, METER-IN
,	TOP DOOR CYLINDER, OPTION
2	
,	TAILGATE LOCK CYLINER
)	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
)	ARM CYLINDER WITHOUT SENSOR, STANDARD
•	ARM CYLINDER WITH SENSOR
5	FORK CYLINDER WITHOUT SENSOR, STANDARD
2	FORK CYLINDER WITH SENSOR
1	DAMP VALVE, PO CHECK VAVLE
)	PACK TELESCOPIC CYLINDER
	CUROTTO CAN, GRIPPER CYLINDER
	CUROTTO CAN, LIFT CYLINDER
	CUROTTO CAN, SLIDE CYLINDER
	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
	HYDRAULIC RESERVOIR ASSEMBLY
	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
M	PART DESCRIPTION

DDYSSEY UNIT, HALF-PACK ARM AND FORK LOWER



24-SEP-2014

701-9149-015

DDYSSEY UNITS W/CURDTTD CAN HALF-PACK, ARM AND FORK LOWER

	Lock / Unlock Lower / Raise Open / Close
	TATI GATE VALVE ASSEMBLY
2	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
9	TOP DOOR CYLINDER, OPTION
8	TAILGATE RAISE CYLINDER
7	TAILGATE LOCK CYLINER
6	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
5	ARM CYLINDER WITHOUT SENSOR, STANDARD
4	ARM CYLINDER WITH SENSOR
3	FORK CYLINDER WITHOUT SENSOR, STANDARD
2	FORK CYLINDER WITH SENSOR
1	DAMP VALVE, PO CHECK VAVLE
0	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
В	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
EM	PART DESCRIPTION

DDYSSEY UNIT, HALF-PACK PACKER EXTEND



701-9149-016

HALF-PACK PACKER EXTEND

F	
	Tailgate Lock Tailgate Top Door Lock / Unlock Lower / Raise Open / Close
	TAILGATE VALVE ASSEMBLY
:	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
	TAILGAGE VALVE ASSEMBLY
	FLOW CONTROL VALVE, METER-IN
	TOP DOOR CYLINDER, OPTION
	TAILGATE RAISE CYLINDER
	TAILGATE LOCK CYLINER
	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
	ARM CYLINDER WITHOUT SENSOR, STANDARD
	ARM CYLINDER WITH SENSOR
	FORK CYLINDER WITHOUT SENSOR, STANDARD
	FORK CYLINDER WITH SENSOR
	DAMP VALVE, PO CHECK VAVLE
	PACK TELESCOPIC CYLINDER
	CUROTTO CAN, GRIPPER CYLINDER
	CUROTTO CAN, LIFT CYLINDER
	CUROTTO CAN, SLIDE CYLINDER
	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
	HYDRAULIC RESERVOIR ASSEMBLY
	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
. T	DADT, DECODIDITION

DDYSSEY UNIT, HALF-PACK PACKER RETRACT



T/G LOCK CYL. T/G RAISE CYL. TOP DOOR CYL. (OPTION) 17 ᠴ᠋᠋᠑ F ŧ 18 (17) ow Contr (18) (16) PG 2 B1 A1 B2 A2 B3 A3 725 psi ≨ 1300 psi 21 11 580 psi 1300 psi 500 psi b1 <u>√</u> b2 🛃 b3 🛃 Â [™] Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ITEM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN HALF-PACK PACKER RETRACT

DDYSSEY UNIT, TAILGATE UNLOCK



T/G RAISE CYL. TOP DOOR CYL. T/G LOCK CYL. (OPTION) F ŧ 18 ow Contr (17) (18) 20 (16) PG 2 B1 A1 B2 A2 B3 A3 725 psi ≨ ↓ ↓ 1300 psi 21 11 580 psi ≤ ↓ ↓ ↓ 1300 psi 500 psi b2 🖌 b3 <u>√</u>≤ b1<u>||≤</u> Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
TEM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN TAILGATE UNLDCK

DDYSSEY UNIT, TAILGATE RAISE



DDYSSEY UNITS W/CURDTTD CAN TAILGATE RAISE

 P	
I	Tailgate Lock Tailgate Top Door Lock / Unlock Lower / Raise Open / Close
	TAILGATE VALVE ASSEMBLY
2	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
0	FLOW CONTROL VALVE, METER-IN
9	TOP DOOR CYLINDER, OPTION
8	TAILGATE RAISE CYLINDER
7	TAILGATE LOCK CYLINER
6	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
5	ARM CYLINDER WITHOUT SENSOR, STANDARD
4	ARM CYLINDER WITH SENSOR
3	FORK CYLINDER WITHOUT SENSOR, STANDARD
2	FORK CYLINDER WITH SENSOR
1	DAMP VALVE, PO CHECK VAVLE
0	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	DISTON DUMP LOAD SENSE CONTROL AND DESSURE LIMITATION

DDYSSEY UNIT, TAILGATE LOWER



24-SEP-2014

T/G RAISE CYL. TOP DOOR CYL. T/G LOCK CYL. (OPTION) ون الل (17) (17) (18) ow Conti (18) (16) PG 2 B1 A1 B2 A2 **B**3 A3 725 psi ≨ ↓ ↓ 1300 psi 21 11 580 psi ≤ ↓ ↓ 1300 psi 500 psi b1 4 b3 <u>√</u>≤ Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

2	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
9	TOP DOOR CYLINDER, OPTION
8	TAILGATE RAISE CYLINDER
7	TAILGATE LOCK CYLINER
6	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
5	ARM CYLINDER WITHOUT SENSOR, STANDARD
4	ARM CYLINDER WITH SENSOR
3	FORK CYLINDER WITHOUT SENSOR, STANDARD
2	FORK CYLINDER WITH SENSOR
1	DAMP VALVE, PO CHECK VAVLE
0	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ЕМ	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN TAILGATE LDWER

DDYSSEY UNIT, TAILGATE LOCK



22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ГЕM	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN TAILGATE LOCK

DDYSSEY UNIT, TOP-DOOR CLOSE



T/G RAISE CYL. TOP DOOR CYL. T/G LOCK CYL. (OPTION) 17 (19) F ŧ 18 low Contr (17) (18) <u>i</u> 20 (16) PG 2 B1 A1 B2 A2 B3 A3 725 psi 1300 psi 21 580 psi 1300 psi 500 psi b1 🙀 b2 🛃 Â b3 🛛 ≤ _ Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ГЕМ	PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN TOP-DOOR CLOSE

DDYSSEY UNIT, TOP-DOOR OPEN



TOP-DOOR OPEN

	TATI GATE VALVE ASSEMBLY
2	PROPORTIONAL VALVE ASSEMBLY & SECTIONS
21	TAIL GAGE VALVE ASSEMBLY
0	
9	
8	
7	
6	PRESSURE GAUGE PORT. QUICK DISCONNECTOR
5	ARM CYLINDER WITHOUT SENSOR, STANDARD
4	ARM CYLINDER WITH SENSOR
3	FORK CYLINDER WITHOUT SENSOR, STANDARD
2	FORK CYLINDER WITH SENSOR
1	DAMP VALVE, PO CHECK VAVLE
0	PACK TELESCOPIC CYLINDER
Э	CUROTTO CAN, GRIPPER CYLINDER
3	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
ЕМ	PART DESCRIPTION

DDYSSEY UNIT, SLIDE DUT AND PACK EXTEND



(OPTION) <u>∃</u>∏19 17 F ŧ 18 (17) ow Contr (18) (16) PG 2 B1 A1 B2 A2 **B**3 A3 725 psi 1300 psi 21 11 580 psi 1300 psi 500 psi b1 <u>√</u> b2 🖌 b3 🛃 Â <u>AXI</u> Tailgate Top Door Tailgate Lock Lower / Raise Open / Close Lock / Unlock TAILGATE VALVE ASSEMBLY

T/G RAISE CYL.

T/G LOCK CYL.

TOP DOOR CYL.

PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
TAILGAGE VALVE ASSEMBLY
FLOW CONTROL VALVE, METER-IN
TOP DOOR CYLINDER, OPTION
TAILGATE RAISE CYLINDER
TAILGATE LOCK CYLINER
PRESSURE GAUGE PORT, QUICK DISCONNECTOR
ARM CYLINDER WITHOUT SENSOR, STANDARD
ARM CYLINDER WITH SENSOR
FORK CYLINDER WITHOUT SENSOR, STANDARD
FORK CYLINDER WITH SENSOR
DAMP VALVE, PO CHECK VAVLE
PACK TELESCOPIC CYLINDER
CUROTTO CAN, GRIPPER CYLINDER
CUROTTO CAN, LIFT CYLINDER
CUROTTO CAN, SLIDE CYLINDER
CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
HYDRAULIC RESERVOIR ASSEMBLY
RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
PART DESCRIPTION

DDYSSEY UNITS W/CURDTTD CAN SLIDE DUT AND PACK EXTEND

DDYSSEY UNIT, SLIDE DUT AND PACK RETRACT



24-SEP-2014

701-9149-025

DDYSSEY UNITS W/CURDTTD CAN SLIDE DUT AND PACK RETRACT

	Tailgate Lock Tailgate Top Door Lock / Unlock Lower / Raise Open / Close
	TAILGATE VALVE ASSEMBLY
22	PROPORTIONAL VALVE ASSEMBLY, 4 SECTIONS
21	TAILGAGE VALVE ASSEMBLY
20	FLOW CONTROL VALVE, METER-IN
19	TOP DOOR CYLINDER, OPTION
18	TAILGATE RAISE CYLINDER
17	TAILGATE LOCK CYLINER
16	PRESSURE GAUGE PORT, QUICK DISCONNECTOR
15	ARM CYLINDER WITHOUT SENSOR, STANDARD
14	ARM CYLINDER WITH SENSOR
13	FORK CYLINDER WITHOUT SENSOR, STANDARD
12	FORK CYLINDER WITH SENSOR
11	DAMP VALVE, PO CHECK VAVLE
10	PACK TELESCOPIC CYLINDER
9	CUROTTO CAN, GRIPPER CYLINDER
8	CUROTTO CAN, LIFT CYLINDER
7	CUROTTO CAN, SLIDE CYLINDER
6	CUROTTO CAN, VALVE ASSEMBLY, 3-SECTION
5	PISTON PUMP, LOAD SENSE CONTROL AND PRESSURE LIMITATION
4	ELECTRICAL INDICATOR FOR PRESSURE FILTER, OPTION
3	PRESSURE FILTER ASSEMBLY WITH VISUAL INDICATOR, STANDARD
2	HYDRAULIC RESERVOIR ASSEMBLY
1	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
TEM	PART DESCRIPTION

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) NOTES

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) INDEX

A

arc sensor calibration 104

В

battery disconnect switch 17 body daily checklist 56 body lubrication guide 59 body nomenclature 38 body preventive maintenance chart 57 body valve to Curotto and tailgate valves 51

С

cab control conditions 92 calibration mode 104 can network 84 caution 11 change hydraulic oil filter element 67 check oil level 67 clamp-on arm bolts maintenance 75 clean and inspect the tailgate seal 76 cold weather warm-up procedure 17.65 Cortex Controller™ 90 Cortex Controller™ 80 I/O 55-pole cable assembly 110 Cortex Controller™ 80 I/O illustration 108 Cortex Controller[™] components 86.88 Cortex Controller[™] location 84 Cortex Controller[™] module (node) location 84 Cortex Controller[™] module components 86.88 Cortex Controller™ pin number diagram 109 Cortex Controller[™] Re-programming 90 Curotto-Can lubrication guide 60 Curotto-Can module functions 90 Curotto-Can node 90 Curotto-Can optional single point lubrication guide 61 cylinder sensors 63 cylinder sensors calibration 104

D

danger 11 decal care 22 decals on the unit 22 depressurizing Curotto-Can hydraulics 97 diagnostic display messages 92 direction of hydraulic oil flow 30 drain and clean the hydraulic oil tank 68

Ε

electrical anti-corrosion lubricants 54 electrical symbols 26 electronic controls lubricants 54 Electronic Parts Catalog (EPC) registration and login 8 search by body serial number 8 search by part keyword in body serial number 8

G

grease lubrication recommendation 16

Η

hazard symbols and definitions 11 Heil Autonomous Lift Options (H.A.L.O.) controls options calibrate the H.A.L.O. controls options 98 set the H.A.L.O. controls options 98 hydraulic oil specifications 16 70 hydraulic pressure settings hydraulic stand-by pressure 30 hydraulic symbols 24

in-cylinder proximity sensor replacement 63 in-cylinder proximity sensor troubleshooting 64 InSight Diagnostic Display 3rd Eve remote 93 calibration screen 103 camera boot up process 93 camera screen and system 93 camera system configuration 93 counters screen 96 home screen 92 inputs/outputs 101 maintenance screen 106 service screens 100 toggle camera/home screen modes 91, 93 inspect proximity switches 76 inspection for over-packing 52 introduction 4

load sense piston pump (219-2426) nomenclature 28

HALF/PACK® (FEATURING ODYSSEY® CONTROLS) INDEX

lock-out/tag-out procedures lock-out tags 15

Μ

main underbody valve 50 maintenance mode 106 maintenance/lubrication information 16

Ν

notice 11

0

oil lubrication recommendation 16

Ρ

packer/ejector cylinder preventive maintenance 62 packer/ejector panel adjustment 62, 104 precautionary statements 11 preparing unit to check oil level 66 pressure adjustment procedure 70 Propping the Body of a Service Hoist Unit 40 propping the body of a service lift (serviceable eject) unit 43 proximity switch troubleshooting 18 pump compensator 29 pump inspection 31 31 pump maintenance pump repair 32 pump start-up procedure 33

R

recommended spare parts 6 repairing cracked weld joints 76

S

service mode 96 service/parts assistance 5 side access door proximity switch 49 side access doors 48 storing refuse in the body 16

T

tailgate module functions90tailgate node90tailgate nomenclature39tailgate support props47

Issued March 2021 Index troubleshooting chassis network J1939-2 82 display network 79 Heil network J1939-1 78 Heil network J1939-2 81 hotshift PTO 35 main control valve 77 pump 34

W

warm up the hydraulic oil 65 warming up the hydraulic oil 17 warning 11 welding and electronic devices 54 welding procedures 54 when to change oil filter element 67



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 Heilapproved, 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



WE NEVER STOP WORKING FOR YOU

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