PT1100 ™ US

HIGH-PERFORMANCE REAR LOADER

SERVICE MANUAL

ISSUED OCTOBER 2023

TP1PT11US-SM-1023

Environmental Solutions Group
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Chattanooga, TN 37408
Heil Customer Care: 866.275.4345

WARNING

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.

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SECTION 1
GENERAL INFORMATION

General Information

INTRODUCTION

The following sections are guides 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.

General Information

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.

⚠ WARNING

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.

⚠ 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.

⚠ DANGER

Do not walk under or go between the body and the tailgate when the tailgate is in motion, while you prop the tailgate or while the tailgate is propped. Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Serious injury or death may occur if any part of your body is between the tailgate and the body if the tailgate suddenly closes.

⚠ 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.

⚠ 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.

⚠ 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.

General Information

⚠ 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..

⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb in or on the body or on equipment. 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.

⚠ 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.

⚠ WARNING

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

⚠ WARNING

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.

⚠ 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

⚠ WARNING

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

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.

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.

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. 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.
5. When there are no in-cab controls, move the outside control levers to relieve the pressure in the cylinders.
6. Put a LOCK-OUT/TAG-OUT Tag onto the steering wheel.
7. Remove the ignition key from the cab, lock the vehicle, and put the key in a secure location.
8. You can order Lock-Out/Tag-Out Tags (Part Number 212-1586) through your Heil Dealer or through Heil.

General Information

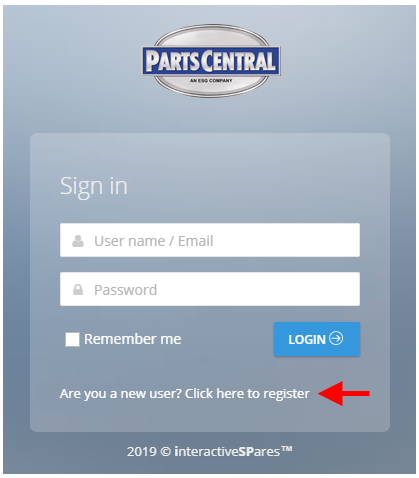
ELECTRONIC PARTS CATALOG (EPC)

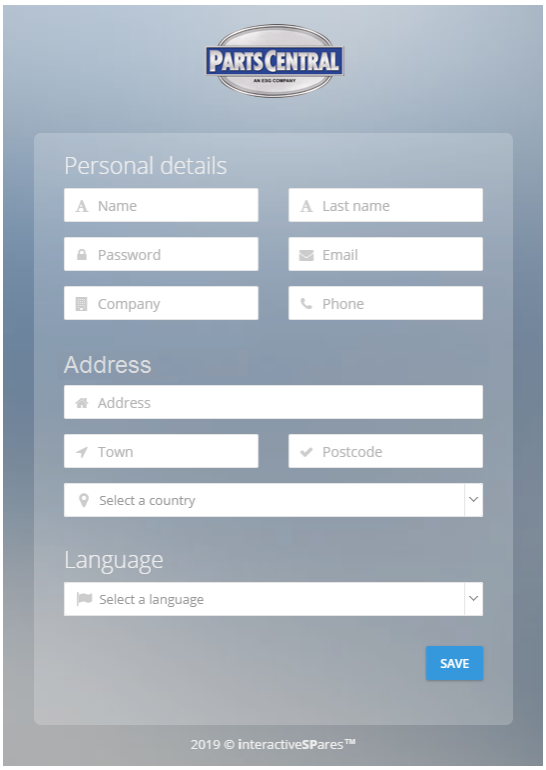
The Parts Central EPC includes electronic versions of the Heil Parts Manuals, specific to a Customer's truck configuration and options. After registering and logging in, the user can search by **Keyword(s) or Part Number** and/or **Heil Body Serial Number** to quickly identify a spare part or browse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

Note: 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**.

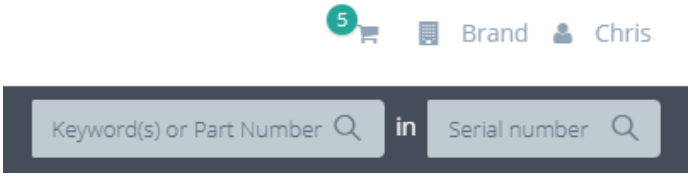




General Information

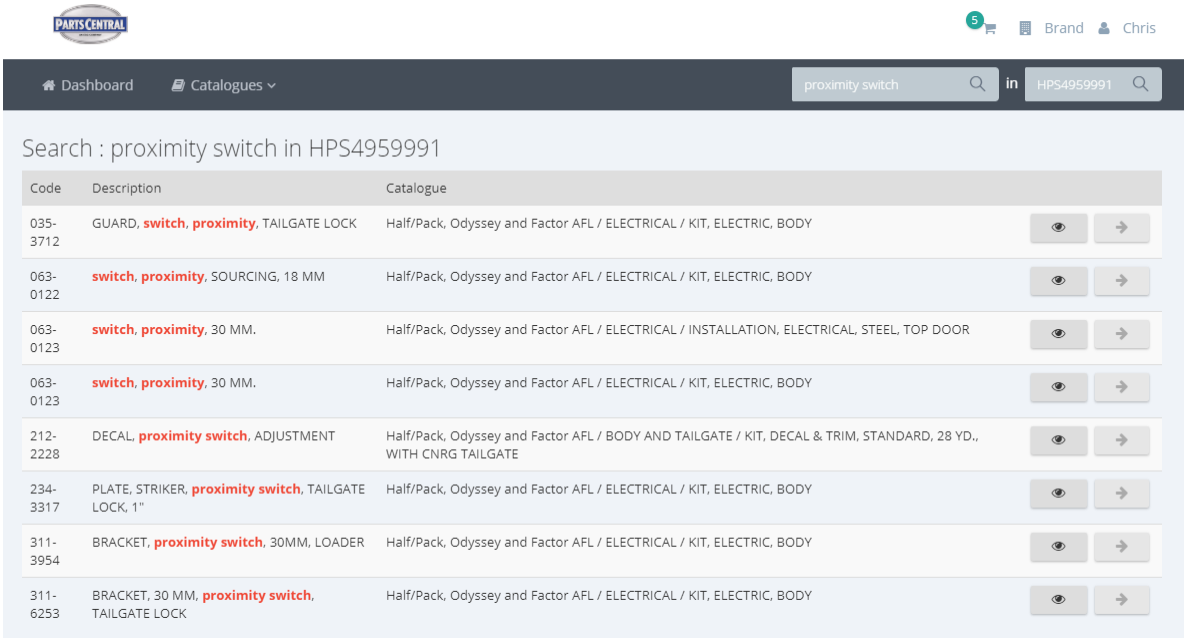
Search by Part Keyword(s) or Part Number in Body Serial Number

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.

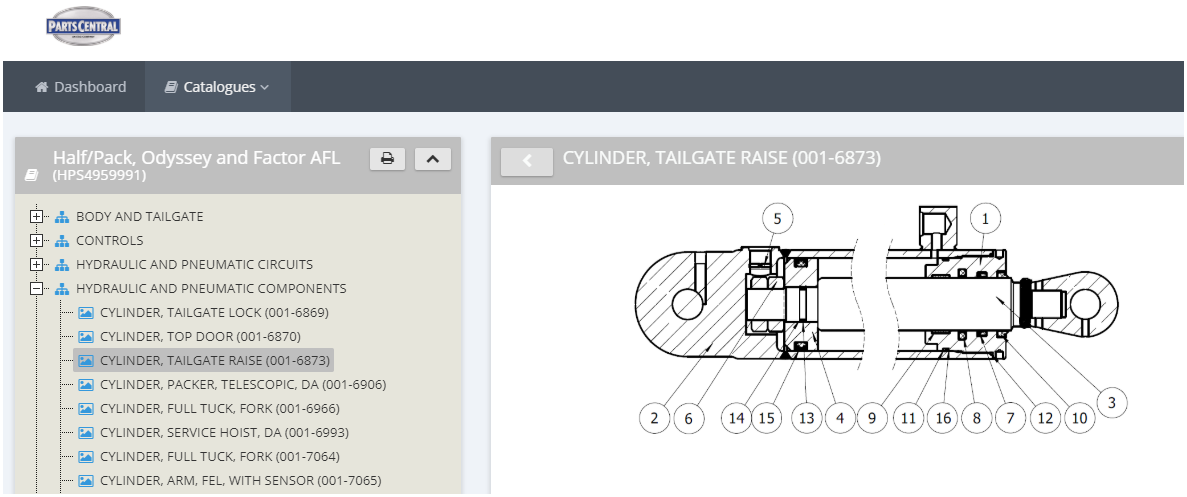
From the search results list, you can select the right arrow icon to view the part within its associated assembly/kit, helping you identify the needed part. Alternatively, you can select the eye icon on the right to see part specifics (including any notes) and quickly add to cart (although this functionality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



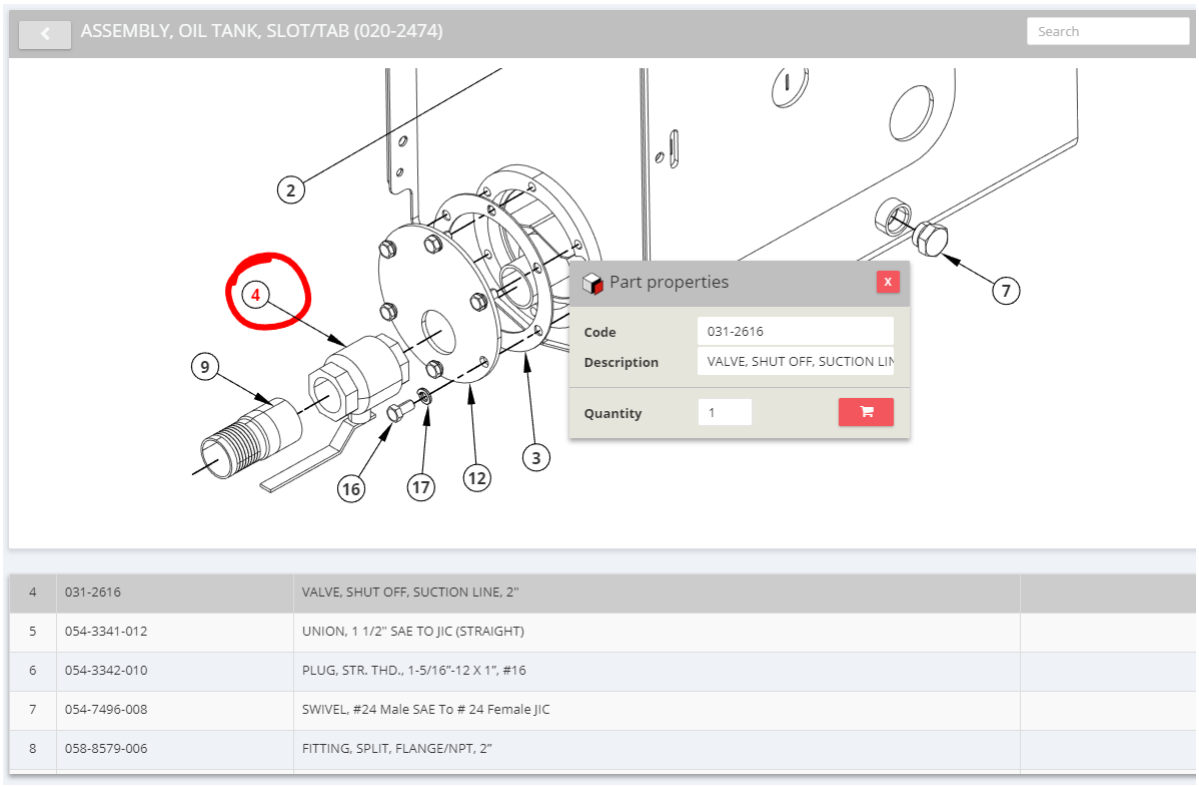
General Information

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.



General Information

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.

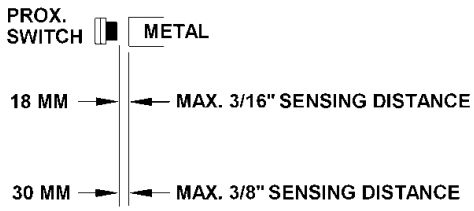
- Castrol Dual Range HV 32
- Chevron Rando HDZ 32
- Mobil DTE 10 Excel 32

PROXIMITY SWITCH TROUBLESHOOTING

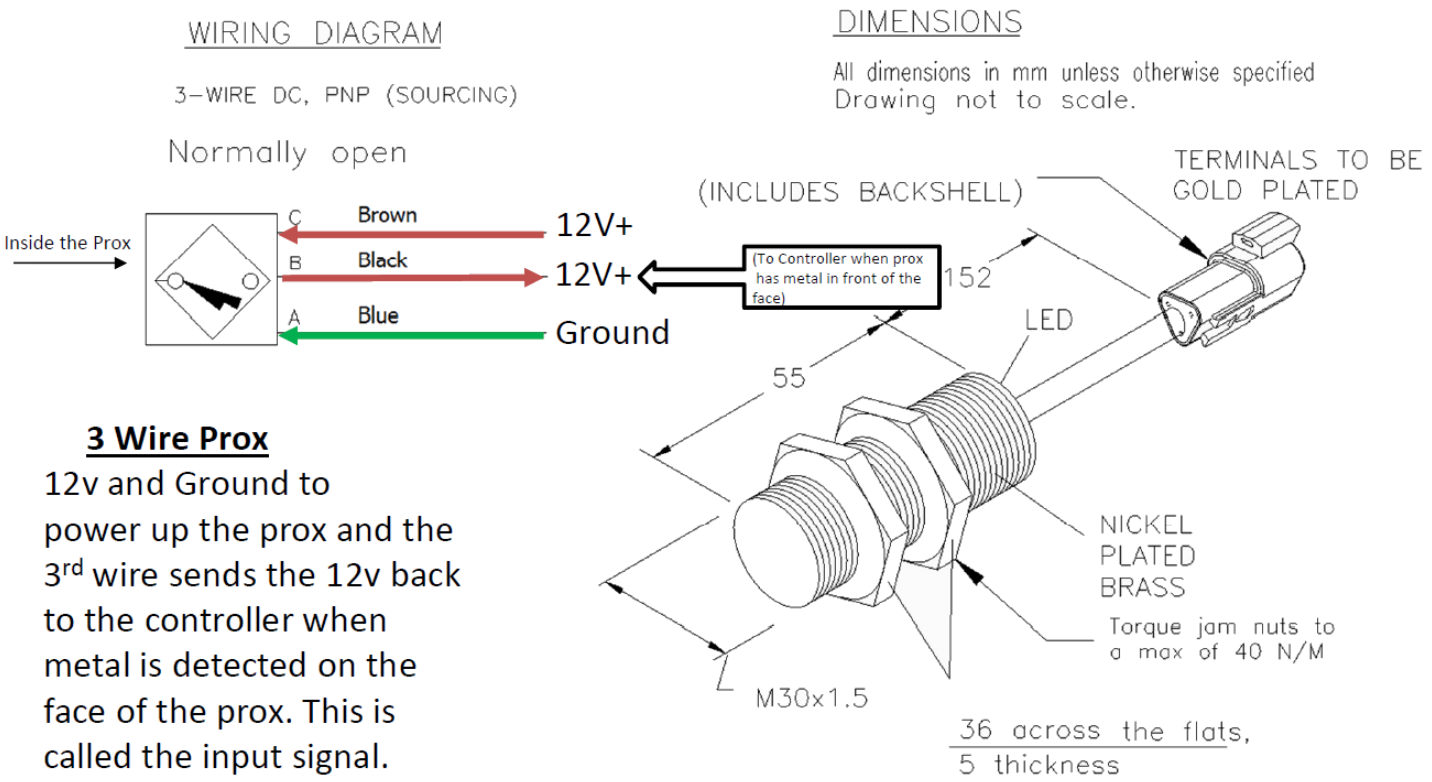
When one or more of a unit's functions do not operate properly and there are proximity switches in the circuits of the unit for these functions, refer to the following table as a guide to find the problem(s).

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.

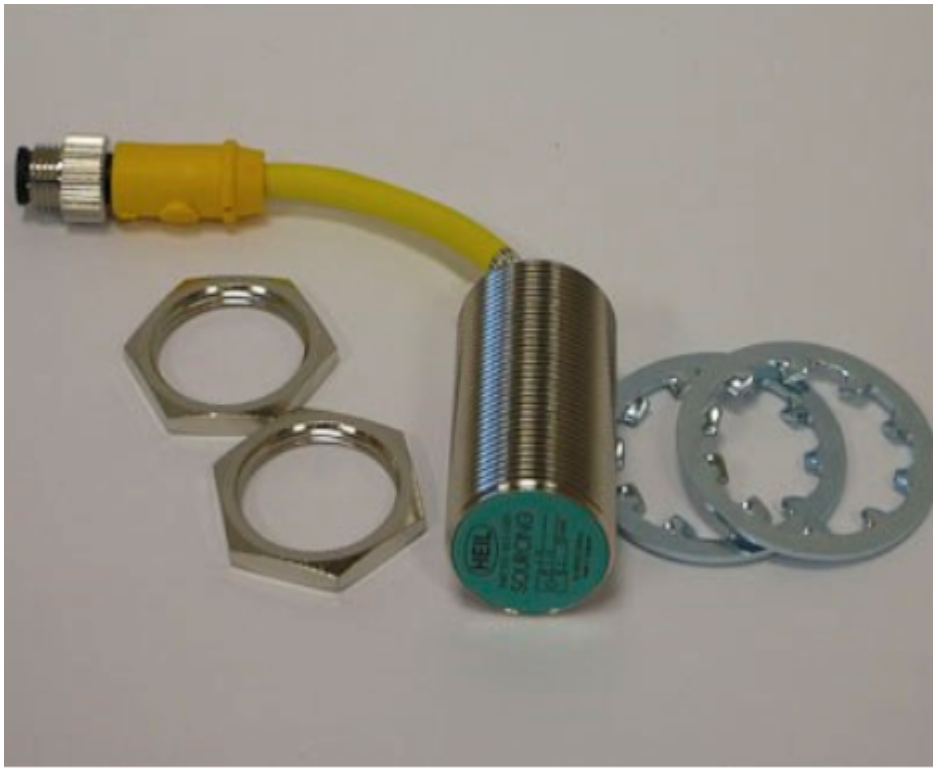
Proximity Switch Troubleshooting Table	
Probable Cause	Remedy
Loose or corroded electrical connections.	Replace the electrical connections.
Damaged Switch A. Cracked Ferrite core causing the fine internal wire to break. B. Cracked Ferrite core – but wire is not broken – the sensitivity of switch will 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.	1. Make sure the power source from the chassis manufacturer is clean. 2. The body electrical system is protected from voltage spikes.
Improper Sensing Range	Adjust proximity switches to sense metal as follows: 
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.	1. 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. 2. Unplug proximity switch. 3. Check the power wire (terminal C) for +12 VDC with a multi-meter. 4. Check ground signal with multi-meter for continuity to chassis ground. 5. Check the signal wire for continuity to appropriate controller input terminal. See Service Manual. 6. If all three (3) wires are good, replace the proximity switch.

PROXIMITY SWITCH TROUBLESHOOTING (CONTINUED)



3 Wire Prox

12v and Ground to power up the prox and the 3rd wire sends the 12v back to the controller when metal is detected on the face of the prox. This is called the input signal.



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.

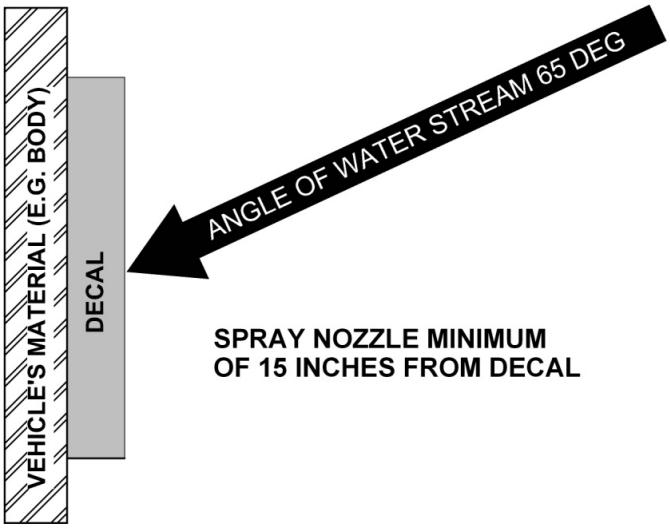
- Spray nozzle opening: 40° wide pattern
- Spray angle: 65° from vehicle’ s body (do not use sharp angles – this can lift the decals from the unit)
- Distance of nozzle to decal: 38 cm minimum
- Water pressure: <= 5.5 MPa
- Length of time: not more than 30 sec.
- NEVER use a “turbo pressure nozzle”.

C. Remove Difficult Debris

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

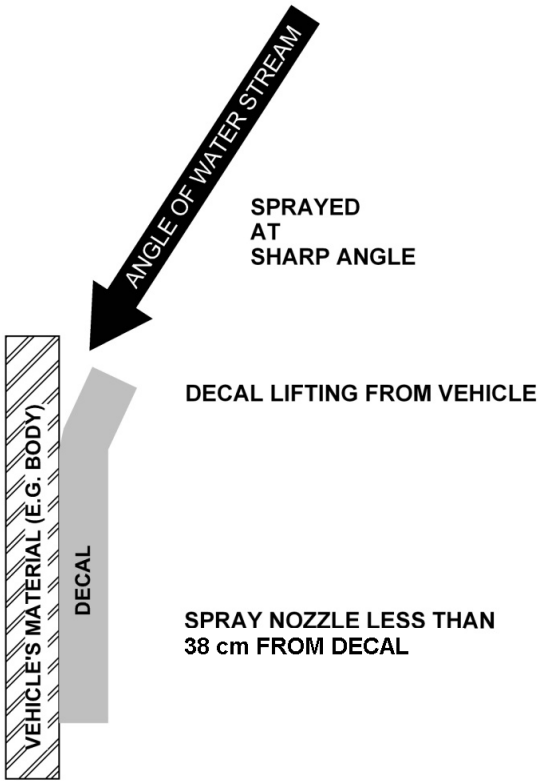
- Spot clean the decal with Isopropyl Alcohol and a micro-fiber cloth (rag)
- If these methods do not work on a problem area, call a Heil Dealer or Heil Customer Support.

DECAL CARE (CONTINUED)



RECOMMENDED TECHNIQUE

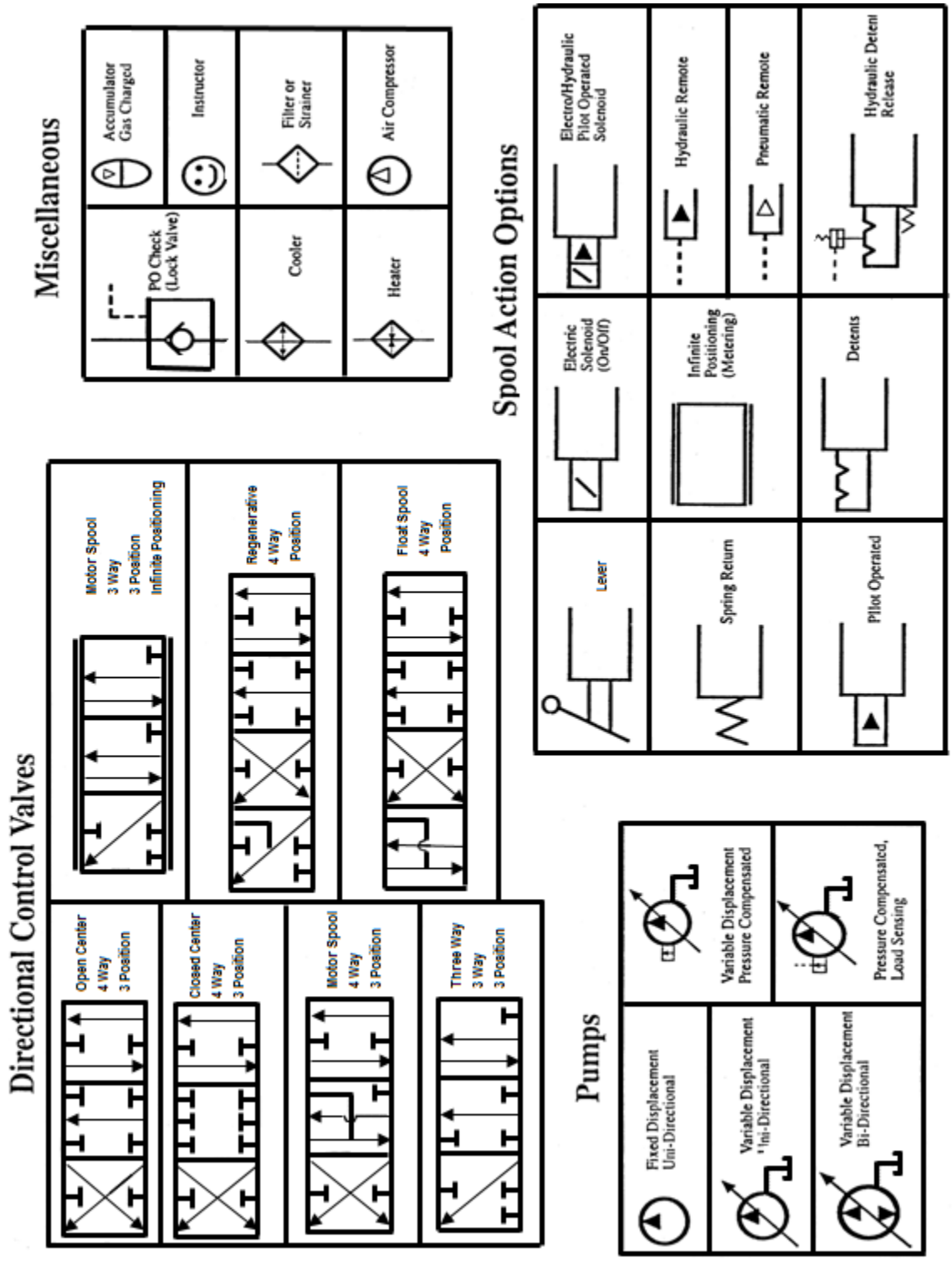
Figure 2. Recommended Technique



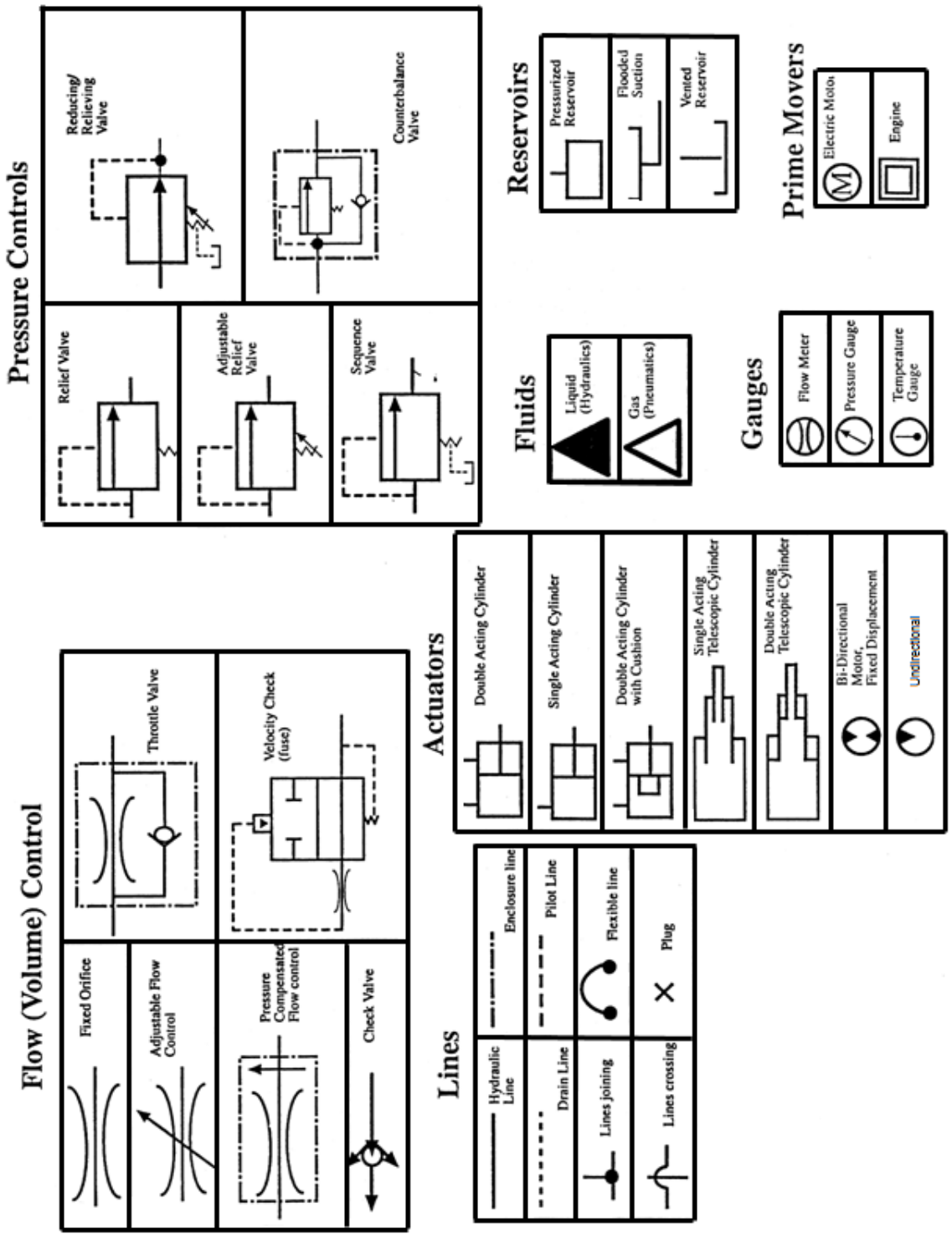
INCORRECT TECHNIQUE

Figure 3. Incorrect Technique

HYDRAULIC SYMBOLS

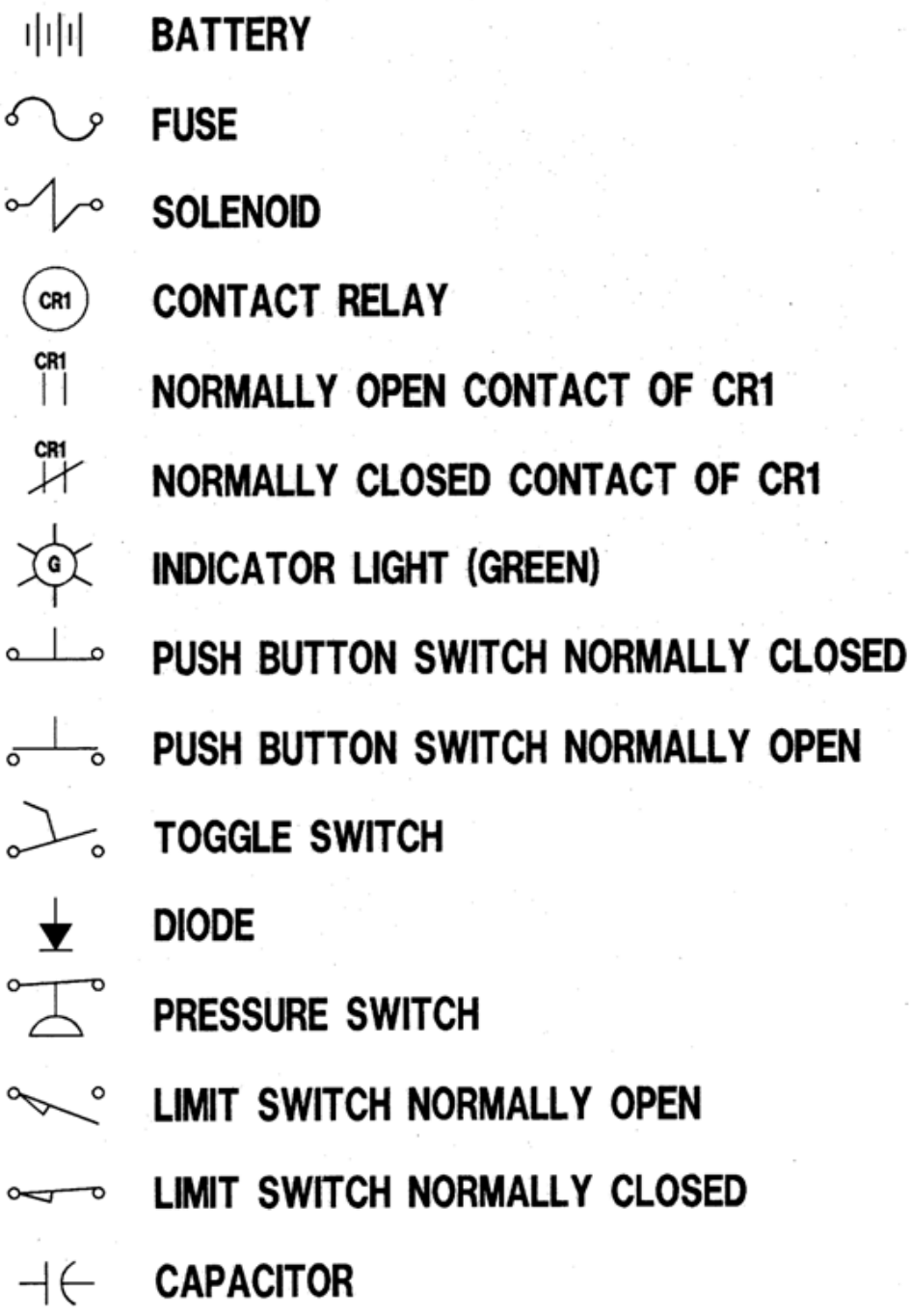


HYDRAULIC SYMBOLS (CONTINUED)



ELECTRICAL SYMBOLS

SYMBOL DEFINITIONS



SECTION 2
PUMP

Pump

HYDRAULIC DRIVE CONTROL

There are multiple hydraulic drive configurations available on the 2020 Rear End Loader. Each achieves the same goal utilizing different mechanisms and modes of operation.

A. Clutch Shift PTO

Listed in the display as Cab Controller Output, OUT02 p16 – PTO Sol.

1. Not equipped

   Applies to Constant Drive PTO or Crankshaft Driven Front Mount Pumps.

   Option Config

   Clutch Shift PTO, [OFF]

   Operation, PTO output is disabled.

2. Without Pump Manifold

   Transmission driven PTO utilizing either direct or remote mount hydraulic pump which is not equipped with a solenoid-controlled manifold.

   Option Config

   Clutch Shift PTO, W/O Pump Manifold: [ON]

   Operation - ON with System Enable, governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1000 RPM

   Maximum Engine Speed for PTO Operation: 1450 RPM

3. With Pump Manifold

   Transmission driven PTO utilizing either direct or remote mount hydraulic pump which is equipped with solenoid-controlled manifold.

   Option Config

   Clutch Shift PTO, W/Pump Manifold: [ON]

   Operation - ON with System Enable, governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1000 RPM

   Maximum Engine Speed for PTO Operation: 2700 RPM

B. Single Pump, Gear or Vane

Applies to all PTO or Crankshaft driven Pumps with solenoid-controlled manifolds or dry valves.

Listed in the display as Cab Controller Output, OUT03 p15 – Pump 1 Sol.

1. Clutch Shift PTO Driven

   Option Config

   Clutch Shift PTO, W/Pump Manifold [ON]

   Operation - ON with PTO Sol. after 500ms delay, governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1000 RPM

   Maximum Engine Speed for PTO Operation: 1450 RPM

2. Constant Drive PTO or Crankshaft Driven

   Option Config

   Clutch Shift PTO, [OFF]

   Operation - ON with System Enable, governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1000 RPM

HYDRAULIC DRIVE CONTROL (CONTINUED)

C. Tandem Vane Pump

Applies to Operate at Idle, PTO or Crankshaft driven Tandem Pumps.

Listed in the display as Cab Controller Output, OUT03 p15 – Pump 1 Sol.

And OUT04 p14 – Pump 2 Sol.

1. Clutch Shift PTO Driven

   Option Config

   Clutch Shift PTO, W/Pump Manifold: [ON]

   Operate at Idle: [ON] Arrow Right to adjust the Pump 1 Pressure Limit

   Operation

   Pump 1 is ON with the following:

   PTO Sol. on for 500ms delay

   AND main body pressure below Pump 1 Pressure Limit setpoint

   AND Throttle Advance Switch OR Slide Activated,

   governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1000 RPM

   Maximum Engine Speed for PTO Operation: 1000 RPM

   Pump 2 is ON with PTO Sol. after 500ms delay, governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1800 RPM

   Maximum Engine Speed for PTO Operation: 2000 RPM

2. Constant Drive PTO or Crankshaft Driven

   Option Config

   Clutch Shift PTO, [OFF]

   Operate at Idle: [ON]

   Operation

   Pump 1 is ON with the following:

   System Enable

   AND main body pressure below Pump 1 Pressure Limit setpoint

   AND Throttle Advance Switch OR Slide Activated,

   governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1000 RPM

   Maximum Engine Speed for PTO Operation: 1000 RPM

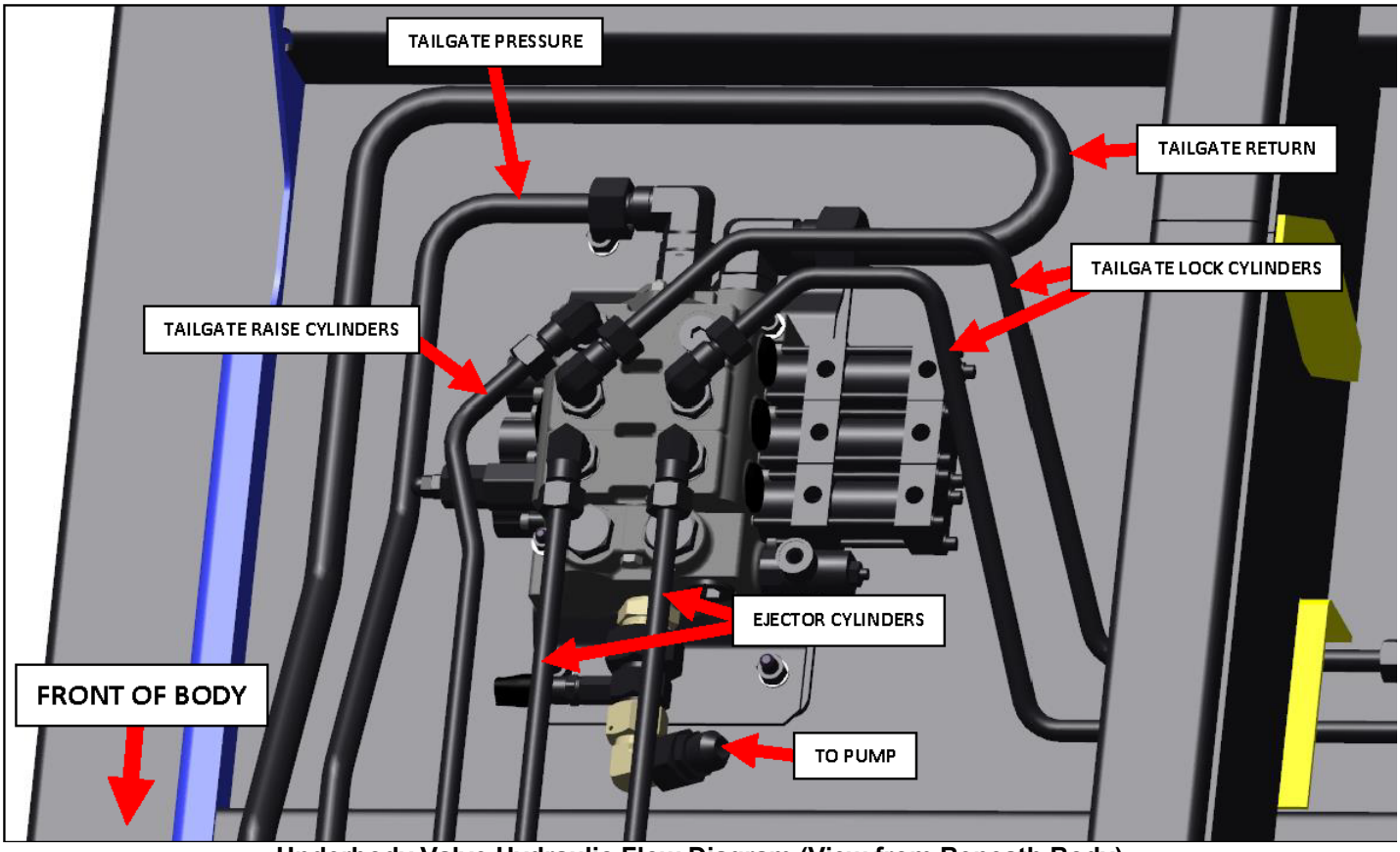
   Pump 2 is ON with PTO Sol. after 500ms delay, governed by the following EOS parameters.

   Maximum Engine Speed for PTO Engagement: 1800 RPM

   Maximum Engine Speed for PTO Operation: 2000 RPM

UNDERBODY VALVE HYDRAULIC FLOW

The underbody valve is located on the street side, beneath the body. The diagram below, viewed looking up at the underbody, shows the hydraulic oil flow to the valve from the pump and from the valve to the various body and tailgate cylinders.



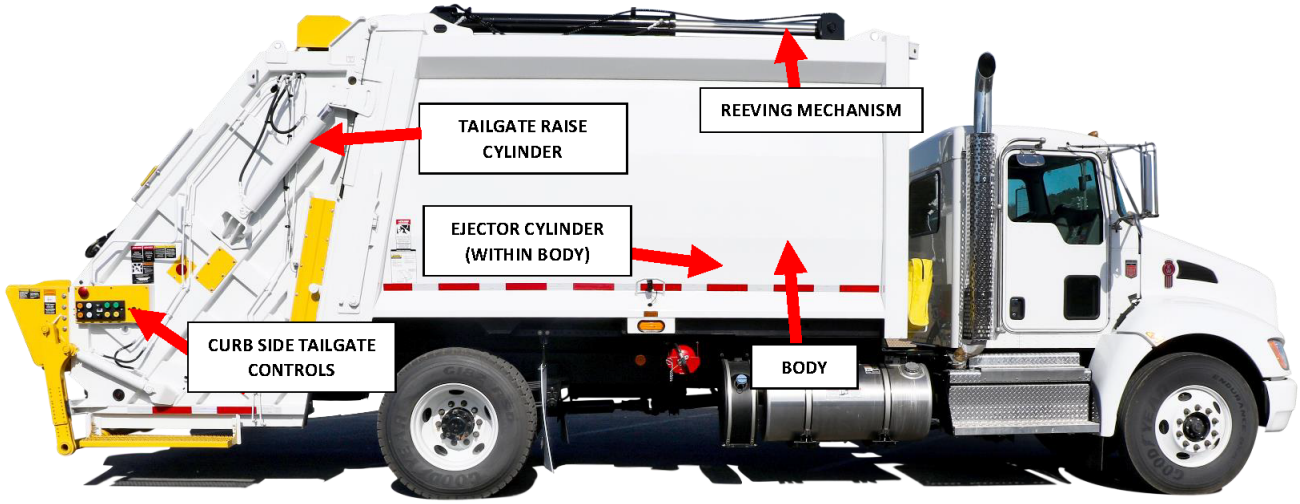
Underbody Valve Hydraulic Flow Diagram (View from Beneath Body)

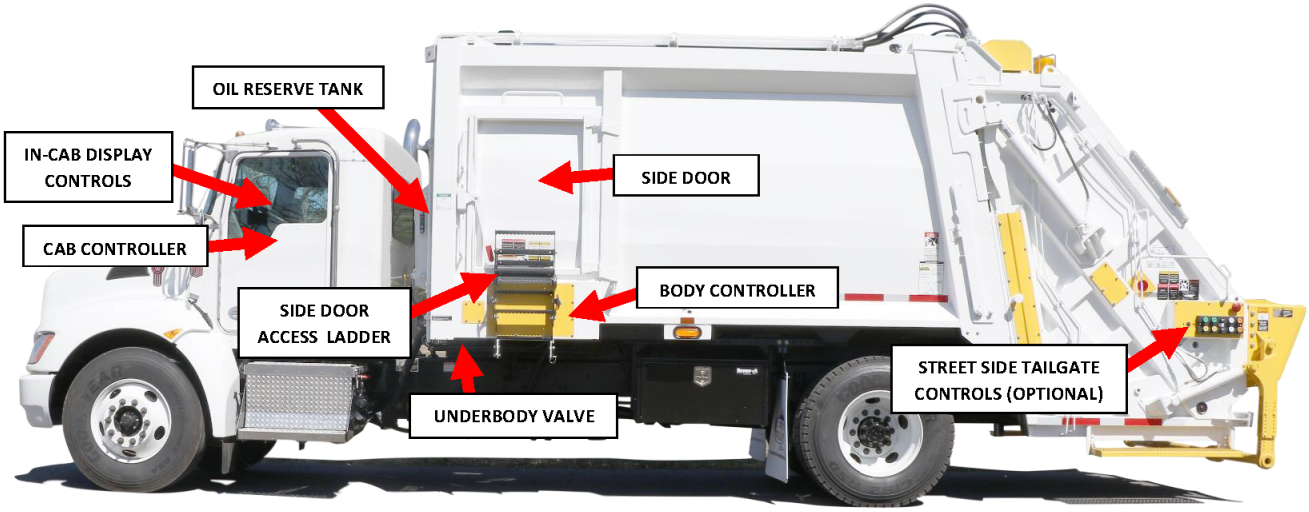
SECTION 3
BODY AND TAILGATE

Body and Tailgate

PRODUCT NOMENCLATURE

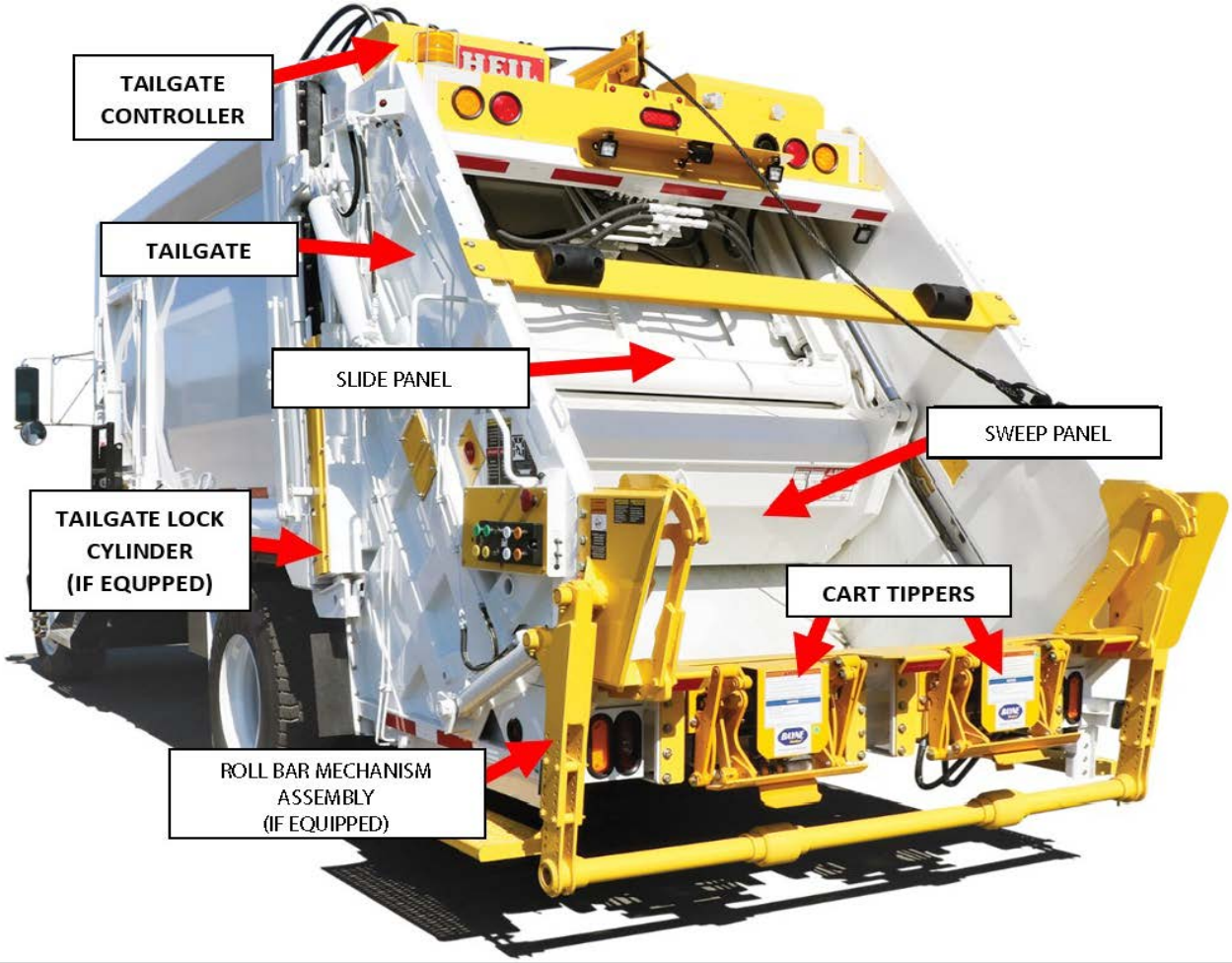
The figures below show the major body and tailgate components.





Body and Tailgate

PRODUCT NOMENCLATURE (CONTINUED)



Body and Tailgate

SIDE ACCESS DOOR

A side access door is installed on the street side of the body. This door will provide access to the hopper area for clean-out purposes. Be sure door is closed and latched properly at all times.

⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, when you go in the hopper, enter the side access door, or climb on the body or 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, enter the hopper or climb on the body or equipment can cause serious injury or death.

Figure 4. Street Side Access Door

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.

⚠ DANGER

Do not walk under or go between the body and the tailgate when the tailgate is in motion, while you prop the tailgate or while the tailgate is propped. Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Serious injury or death may occur if any part of your body is between the tailgate and the body if the tailgate suddenly closes.

⚠ CAUTION

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

A. How to Use the Tailgate Props

1. Set unit on level surface and apply parking brake.
2. Raise tailgate enough so that props can be rotated down from the side of the rear bolster. Remove the props wire locking pin and lower the prop to rest on the tailgate Stop.
3. Without stepping between body and tailgate, repeat the procedure on the opposite side of tailgate. See the figures below.

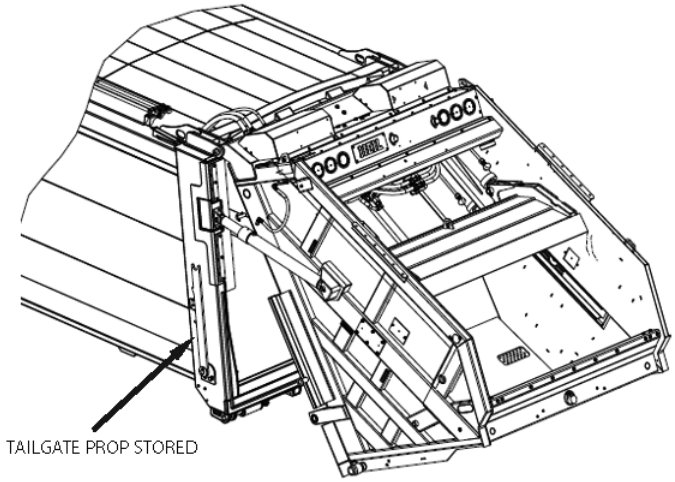


Figure 5. Tailgate Raised Enough to Lower the Props

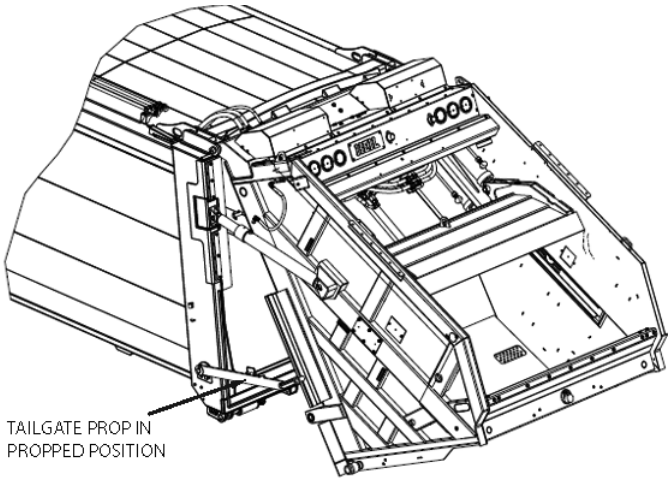


Figure 6. Lower Tailgate Support Props down to meet tailgate stops.

TAILGATE SUPPORT PROPS (CONTINUED)

⚠ CAUTION

Do not proceed to lower the tailgate until both props are in place.

4. Slowly LOWER tailgate until props mate with the tailgate Stop.

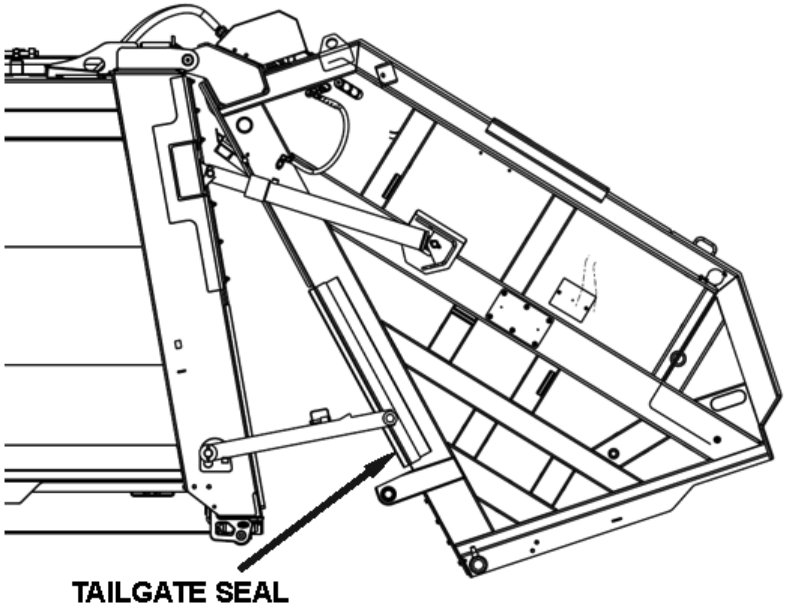


Figure 7. Tailgate Lowered onto Both Streetside and Curbside Props

5. TURN the ENGINE OFF and REMOVE the ignition KEY.
6. Put the unit in the **Lock-Out/Tag-Out mode** 7.

B. How to Store the Tailgate Props

⚠ DANGER

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

1. With all persons clear of the work area, take the unit out of **Lock-Out/Tag-Out mode** 7.
2. Raise tailgate enough so that props can be rotated into stored position and reinstall the pin wire lock.
3. LOWER the tailgate until it is completely CLOSED.
4. LOCK the tailgate.

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.

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 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. Change oil when oil sample shows to change oil.
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 female pilot of PTO as given may cause damage to the pump shaft. Greasing is NOT required on wet

Maintenance and Adjustment

BODY PREVENTIVE MAINTENANCE CHART						
*HOURS OF OPERATION						
COMPONENT/SYSTEM	**8**	**40**	**200**	**1000**	**2000**	**CHECK/SERVICE**
						spline PTOs such as the Chelsea 890/897 series.
Grease Fittings		☑				Lubricate as shown on Body Lube Chart.
Body Undercoating					☑	Inspect body undercoating and repair as necessary.
Tailgate Seal Integrity	☑					
Packer/Ejector Cylinder Preventive Maintenance	☑	☑				See **Packer/Ejector Cylinder Preventive Maintenance** 34.
PTO/Transmission Interface Inspection			☑			Check the torque on the PTO mounting screws and tighten to the proper torque specification
Slide assembly	☑					Clean refuse from the slide assembly hydraulic components
* Daily = 8 hrs. Weekly = 40 hrs. Monthly = 200 hrs. 6 Months = 1000 hrs. Yearly = 2000 hrs.						

PTO INSPECTION AND PREVENTIVE MAINTENANCE

Due to normal torsional vibrations of transmission mounted Power Take-Offs (PTOs), it is important that Service Technicians include the PTO/transmission interface in their standard inspection and maintenance schedules. If a PTO Inspection and Preventive Maintenance schedule is not followed, it is possible that the PTO mounting screws can come loose, resulting in transmission fluid leaks between the PTO and transmission and potential damage to the PTO or drive train

1. ACTIONS

The tools and materials necessary to perform the Inspection/Preventive Maintenance are shown in **Table below**.

Table . Tools and Materials

Item	Part Number	Application
Personal Protective Equipment	Commercially available	Safety protection as required by employer
Wrench/Socket Set	Commercially available	To tighten PTO mounting 10mm 12 pt. head screws
Torque Wrench	Commercially available	To properly tighten PTO mounting screws
Marker	Commercially available	To make witness marks on the PTO mounting flange

With the unit in Lock-Out/Tag-Out mode with the hydraulic pressure relieved, carefully follow the steps below.

A. PTO/Transmission Interface Inspection/Preventive Maintenance (MONTHLY/200 HOURS OF OPERATION)

(1) Inspect for transmission fluid leaking from the PTO/transmission interface. Thoroughly clean around this area.

(2) Using a torque wrench, check the PTO mounting screws. If they are set less than 45 FT-LBS, tighten to 45 FT-LBS.

(3) Using an oil-resistant marker, add a witness mark on each screw head and across the PTO mounting flange. For future inspections, this will help identify if the PTO mounting screws loosen over time. See Figure below.

Witness Marks on PTO Mounting Screws and Flange

(4) Take the unit out of Lock-Out/Tag-Out mode and operate unit functions.

(5) Check for transmission fluid leaks around the PTO/transmission interface. If there are leaks, contact Technical Services.

(6) When there are no transmission fluid leaks, place the unit back into service.

PACKER/EJECTOR CYLINDER PREVENTIVE MAINTENANCE

It is critical to follow the guidelines of the **Body Preventive Maintenance Chart** 31 and **Body Lubrication Guide** 35 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.

⚠ WARNING

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.

⚠ CAUTION

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

HEIL PACKER/EJECTOR CYLINDER PREVENTIVE MAINTENANCE CHART

DAILY	WEEKLY
• Using a plastic bladed shovel, clean behind the packer panel and pockets around spherical's. 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 necessary.	• Grease Packer/Ejector cylinder spherical bearings/pins • Inspect packer/ejector cylinder bearings/pins (both ends) for wear, rust or damage and replace if necessary.

Side Loading and Premature Cylinder Failure can be caused by:

- Inadequate greasing intervals
  - causing increased friction at spherical bearings
  - 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)

LUBRICATION GUIDE

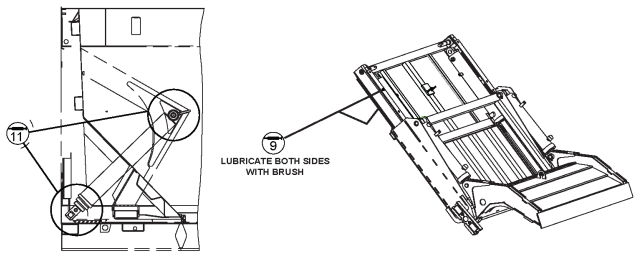
Use No. 1 pressure gun grease. Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess grease. For slide surfaces, use cloth or brush to coat. Lubricate moveable mechanical parts without fittings every 60 days with non-detergent engine oil. Refer to the image below and the table on the next page.

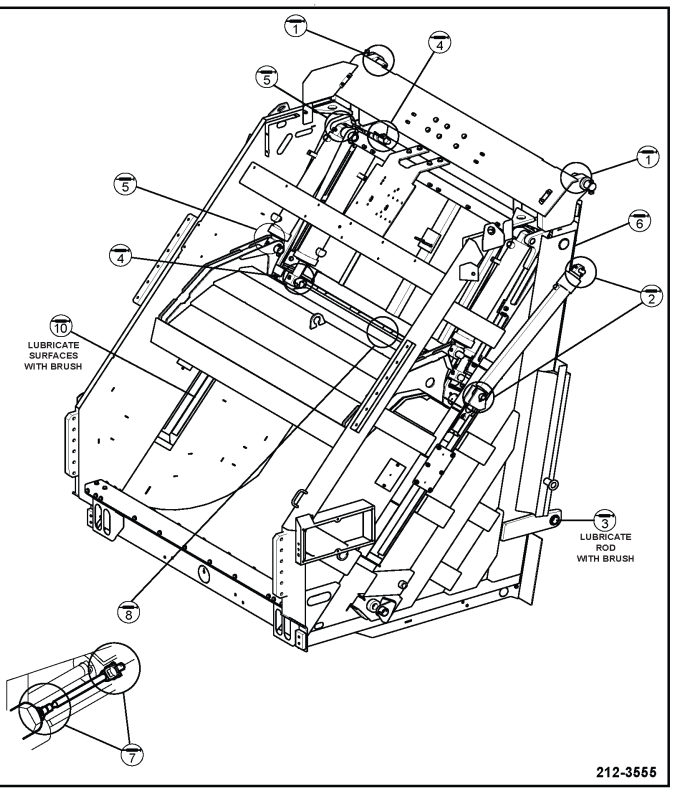
PT1100™ LUBRICATION GUIDE

OEM Parts are key to ensuring that units are covered by Heil's Warranty Program.

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

REF. NO.	LOCATION	QTY.	INTERVAL
1	Tailgate Hinge	2	Weekly/40 Hours
2	Tailgate Raise Cylinders (2/Cyl.)	4	Weekly/40 Hours
3	Tailgate Lock Cylinder Rod End	2	Weekly/40 Hours
4	Slide Cylinders (2/Cyl.)	4	Weekly/40 Hours
5	Blade Cylinders (2/Cyl.)	4	Weekly/40 Hours
6	Inner Slide Pivot	2	Weekly/40 Hours
7	PTO Drive Shaft	4	Weekly/40 Hours
8	Blade Pivot Bearing	2	Weekly/40 Hours
9	Inner Slide Bearing	4	Weekly/40 Hours
10	Slide Track	4	Weekly/40 Hours
11	Ejector Cylinder	2	Weekly/40 Hours





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.

⚠ WARNING

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

Follow the steps below to warm up the hydraulic oil.

1. START the TRUCK and let the engine idle.
2. APPLY the PARKING BRAKE and make sure it holds.
3. ENGAGE the HYDRAULIC PUMP for approximately five minutes.
4. MAKE SURE the AREA IS CLEAR of all unnecessary people BEFORE you operate the controls.
5. OPERATE the EJECTOR EXTEND and EJECTOR 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.

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
- Ejector Panel – at the front of the body
- Packer Panel – in the in-transit position with all cylinders retracted

The oil tank is mounted on the front head of the body, 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.

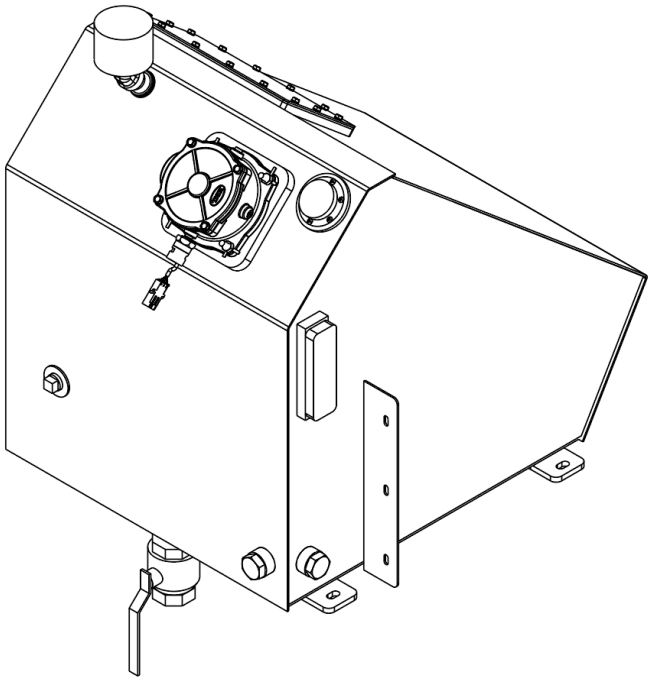


Figure 8. Hydraulic Oil Tank and Sight Gauge

Maintenance and Adjustment

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.

Important: 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 every 1000 hours or every six (6) months or when indicated by the filter monitor light located in the cab.

CHANGE HYDRAULIC OIL FILTER ELEMENT

To change the hydraulic oil filter, refer to the figure below and follow these steps:

1. Remove nuts and filter cover.
2. Remove the filter element with the by-pass assembly and discard as required.
3. Clean the housing with a clean, lint-free cloth.
4. Check the o-ring and gasket. Replace them if necessary.
5. Lubricate all o-rings and gaskets.
6. Install new element.
7. Reinstall cover with nuts. Torque nuts to 13 ftlbs.

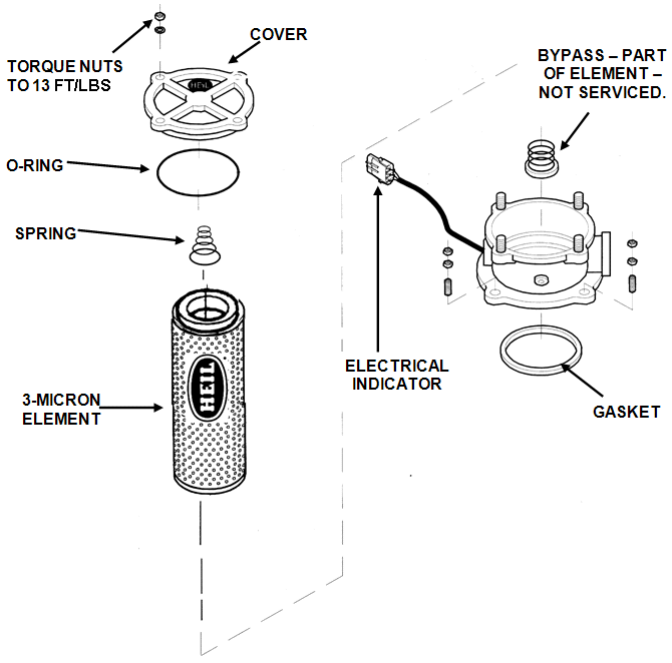


Figure 9. Hydraulic Oil Filter

DRAIN AND CLEAN THE HYDRAULIC OIL TANK

Change the hydraulic oil at least annually or every 2000 hours of operating time, whichever comes first.

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.

⚠ CAUTION

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.

⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb in or on the body or on equipment. 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 Heil Technical Service. Perform the **Lock Out/Tag Out procedures** 7.
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** 38.
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** 11.
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.

⚠ WARNING

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 automated container lift mechanism.
17. Operate tailgate – full up and full down.
18. Operate body raise (dump units) – full up and full down.
19. 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** 38.

PURGE THE HYDRAULIC SYSTEM

If the hydraulic system becomes contaminated because of component failure or some other reason, you must purge the hydraulic system.

To purge the system, follow these steps:

1. Extend the ejector cylinder to lower the oil level in the tank.
2. Remove and replace the in-tank oil filter element in the tank.
3. Engage the ejector controls and allow the oil to circulate through the new filter, cleaning the oil.

NOTICE

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

4. Repeat the procedure as necessary until the system is purged.

NOTICE

If contaminated hydraulic oil reaches the cylinders, the unit may need to be removed from service until the contamination is removed. For more information, contact the Heil Technical Services.

Maintenance and Adjustment

PRESSURE ADJUSTMENT SETTINGS

⚠ DANGER

Stand clear when packing mechanism is in motion. Standing close to the unit when it is in motion or operation may result in injury or death.

⚠ DANGER

Do not stand in the hopper or on the hopper sill while adjustments are being made on the packing mechanism with the unit running. Doing this may result in injury or death.

⚠ CAUTION

Always remove dirt and grease from around the main relief valve. Leaving a build up of dirt or grease may result in damage to the valve.

⚠ CAUTION

Be careful not to force the adjusting screw or it may deform the internal adjusting rod and make the valve inoperative.

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.

Install accurate 0-5000 PSI glycerin filled pressure gauge in the gauge port at the underbody valve.

A. Before Starting Adjustments

If hydraulic oil temperature is not a minimum of 100 degrees F, warm oil by:

1. Tailgate must be down and locked.
2. Hold throttle advance switch. Move ejector panel IN and OUT through 5 cycles.
3. Run tailgate packing mechanism through 10 cycles.
4. Repeat steps (2)–(4) until oil temperature reaches 100 degrees F.

B. Required Tools

These are the tools required to make pressure adjustments.

QUANTITY	TOOL
1	Open end wrench
1	Ratchet with screwdriver attachment
1	0-5000 PSI hydraulic pressure gauge

PRESSURE ADJUSTMENT SETTINGS (CONTINUED)

C. Valve Locations

The hydraulic control valves are located on the front head (street side) of the body and on the rear of the body above the hopper.

D. Pressures and Cycle Times

MODEL	MAIN RELIEF	EJECTOR BLADE DRIFT RELIEF (Note 3)	TAILGATE -BLADE BACK OFF RELIEF	TAILGATE VALVE PORT RELIEFS FOR ROLL BAR DUMPER	TAILGATE VALVE PORT RELIEFS FOR CART TIPPERS	TAILGATE VALVE PORT RELIEFS FOR REEVING MECH	TAILGATE VALVE PORT RELIEFS FOR QWIK-TIP	TAILGATE CYCLE TIME @28 GPM
PT 1100	2750 PSI	2000 PSI	3900 PSI	1500 PSI	2000 PSI	RET 2500 PSI EXT 2550 PSI	RET 1850 PSI	15 - 17 sec
EOS Setting		Disengage at 300 RPM above throttle advance RPM						
NOTES:	1: Main Pressure settings have a tolerance range of +/- 50 p.s.i. and are to be set at operating speed							
	2: Port Relief Pressure settings have a tolerance range of +/- 100 p.s.i. and are to be set at operating speed							
	3: Set this pressure with engine at idle							

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

SLIDE WEAR STRIPS

Slide wear strips on a standard model are bronze and should be greased weekly by applying a line of grease on the exposed portion of the wear bar when extended, both inside and outside. Refer to **Body Lubrication Guide** 35 and Lubrication Guide Decal on the unit. Replacement is necessary before the slide wear strips wear down to the button head cap-screws that secure them. Fully extend the slide and inspect the two outer wear strips from inside the tailgate. Inspect the underside wear strips from inside the body.

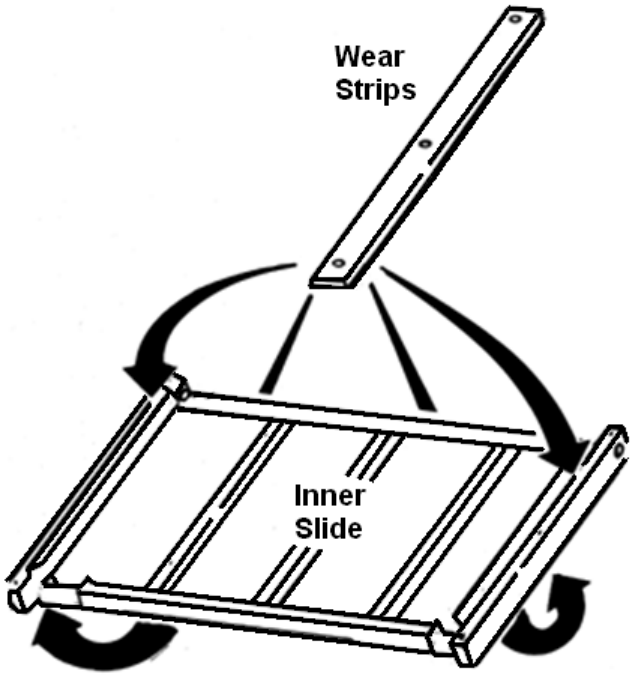


Figure 10. Slide Wear Strips

TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Load will not hold	1. Cylinder leaking or worn 2. Oil bypassing valve plunger 3. Port relief valve not holding	1. Check cylinders. 2. Replace valve. 3. Remove and clean.
Poor hydraulic system performance or failure	1. Defective pump 2. Dirt in relief valve 3. Relief valve defective 4. Worn cylinders 5. Load too heavy 6. Internal valve crack 7. Plunger not at full stroke 8. Reservoir low on oil 9. System filter clogged 10. Line restricted 11. Ejector cylinder leakage 12. Blade back off relief stuck open	1. Check pressure or replace. 2. Disassemble and clean. 3. Check as per instructions. 4. Repair or replace. 5. Check line pressure. 6. Replace valve. 7. Check movement and linkage. 8. Add oil. 9. Replace filter. 10. Check lines. 11. Check for internal bypassing and external leakage. 12. Replace relief cartridge. 13. Check pressure and adjust as specified.
Outer Slide Drifts down	1. Regenerative spool stuck 2. Slide Cylinder bypassing	1. Free spool or replace valve. 2. Inspect Slide Cylinder for bypass.
Excessive Heat	1. Control Valve spool partially shifted 2. Restriction in line or valve	1. Lubricate and free up linkage. 2. Remove restriction.

DOUBLE ACTING TELESCOPIC HYDRAULIC CYLINDER DISASSEMBLY AND ASSEMBLY

Step 1

The cylinder is best serviced when mounted in the vertical position, for both disassembly and assembly. Also, it is best located where a hoist can be used directly overhead of the cylinder for removing the plungers if complete disassembly is required. A typical stand is shown in Figure 15, made of angle welded to a base anchored to the floor and an adjustable wrap around chain to secure the cylinder to the stand. Because of oil spillage and safety, we recommend draining the cylinder of oil before disassembling. Figure 16 shows a typical sequence of disassembling of the cylinder plungers in steps which are further described in this manual.

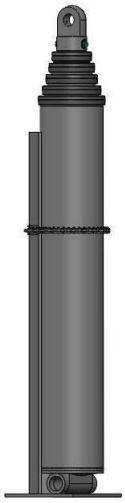


Figure 11.

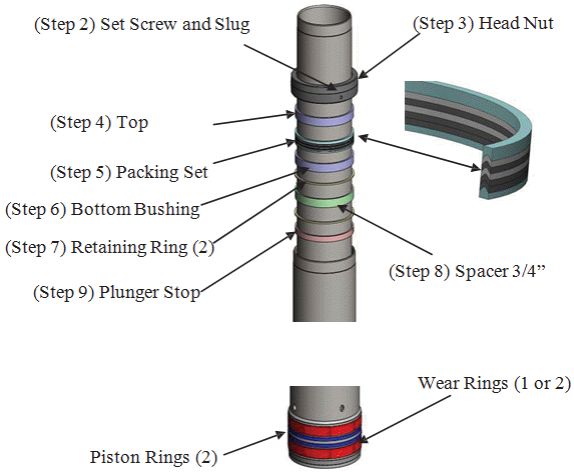


Figure 12.

Step 2 - Set Screws

All head nuts are secured to the plunger by a set screw. Under the set screw is a nylon slug to protect the plunger threads. To remove the head nut, the set screw must be loosened using an allen wrench. (Figure 17).

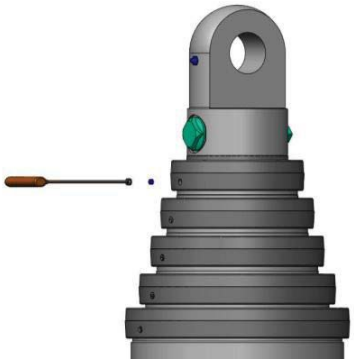


Figure 13.

DOUBLE ACTING TELESCOPIC HYDRAULIC CYLINDER DISASSEMBLY AND ASSEMBLY (CONTINUED)

Step 3 - Head Nuts

After the set screws have been loosened, tap head nut gently around its circumference and unscrew the head nut with a chain wrench, or an equivalent tool. Do not use a chisel, punch or weld any studs to the head nut to remove. (Figure 18).

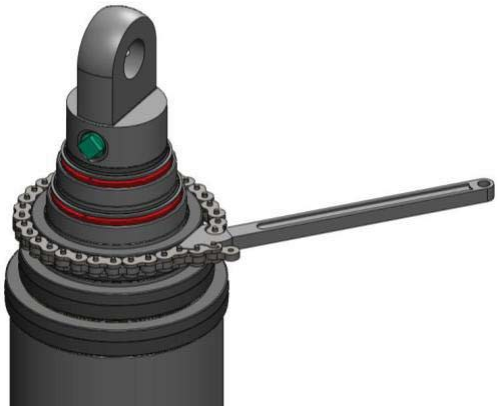


Figure 14.

Step 4 – Top Bushings

Using a bushing removal tool (Figure 19), Thread the ends into holes on top of bushings and lift the bushing upward.

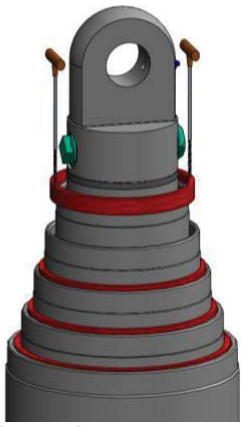


Figure 15.

DOUBLE ACTING TELESCOPIC HYDRAULIC CYLINDER DISASSEMBLY AND ASSEMBLY (CONTINUED)

Step 5 – Packing

To remove packing, pull the plunger up about one foot. Add tape to a clean area as shown in Figure 20. Push the plunger down past the packing then pull the plunger up. The packing will stick to the tape and be pulled out with the plunger. Repeat as needed.

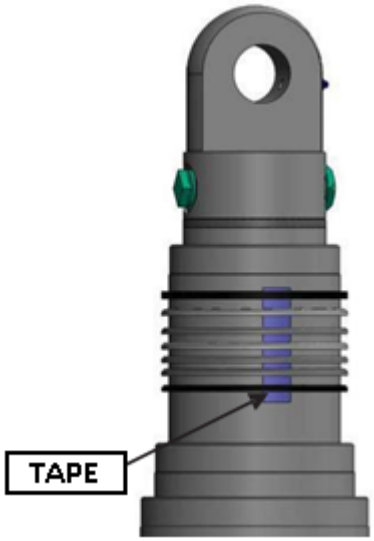


Figure 16.

Step 6 – Bottom Bushings

To remove the bottom bushing use tape applied in step 21. Push the plunger down past the bushing then pull the plunger up. The bushing will stick to the tape and be pulled out with the plunger. Repeat as needed.

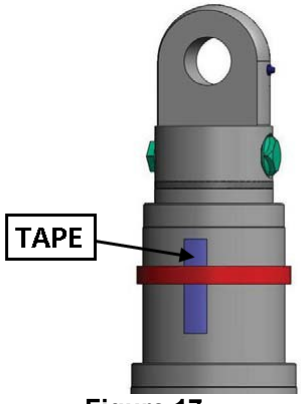


Figure 17.

DOUBLE ACTING TELESCOPIC HYDRAULIC CYLINDER DISASSEMBLY AND ASSEMBLY (CONTINUED)

Step 7 - Retainer Rings

Using a tool shown in Figure 22, insert the hooked end into the retaining ring slot. Force the retaining ring out of the groove and lift ring out of plunger.

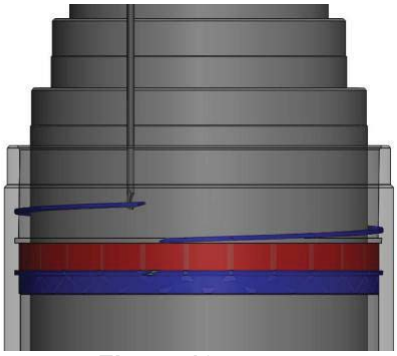


Figure 18.

Step 8 – Spacers

To remove spacer, pull the plunger up about one foot. Add a minimum of two layers of duct tape, to a clean area as shown in Figure 23. Push the plunger down past the spacer then pull the plunger up. The spacer will stick to the duct tape and be pulled out with the plunger. Repeat as needed.

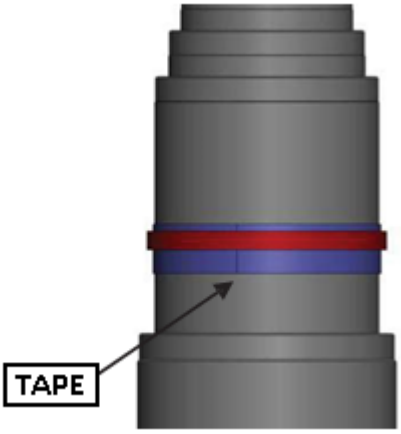


Figure 19.

DOUBLE ACTING TELESCOPIC HYDRAULIC CYLINDER DISASSEMBLY AND ASSEMBLY (CONTINUED)

Step 9 – Second Retaining Ring and Plunger Stop

Repeat Step 6 to remove second retaining ring. The plunger is now free to lift out. The plunger stop will come out with the plunger.

Figure 20.

Reassembly of Cylinder

All bores in the packing area and plunger outside diameters must be free of tool marks and scratches. Polish with a fine paper, crocus cloth or a Scotch Brite pad. All parts should be clean and free of any contamination. A complete Major Repair Kit is recommended. Install the piston rings. The guide ring may require a slight grind on the end for proper fit. The end gap should not exceed 1/8". Drop all plungers into the body in the vertical position. Assemble the remaining parts in the reverse sequence. The packing should be pre-soaked in oil (Do not use a detergent oil) before installing. Seat each lip individually, making sure packing is nestled uniformly. After the head nuts are tightened, make sure there is a nylon slug under the set screw. After installing the cylinder in the unit, cycle the cylinder several times to remove any entrapped air. Adjust the head-nuts if required for proper sequencing of all the rams. Make sure the head-nut lock screw is tight when finished.

DOUBLE ACTING TELESCOPIC HYDRAULIC CYLINDER DISASSEMBLY AND ASSEMBLY (CONTINUED)

Step 10 - Setting Head Nuts

Remove the small slug located opposite the set screw. Using an allen wrench (Figure 17), tighten the head-nut down until the hex wrench bottoms out on the top of the plunger. Remove the hex wrench and replace the slug. Install the set screw using a nylon slug to protect the threads.

Figure 21.

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.

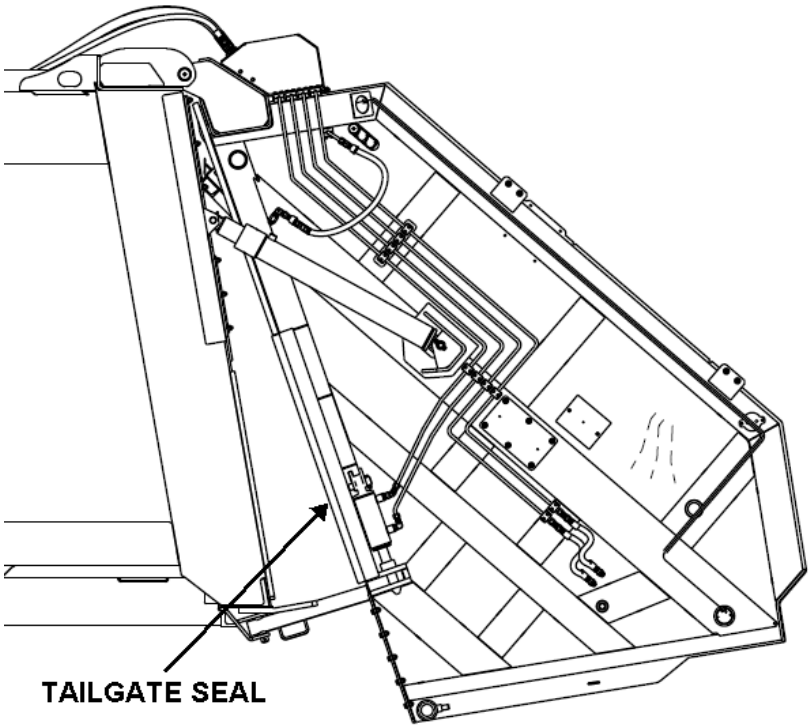


Figure 22. Tailgate Seal

NOTES

SECTION 5
BODY CONTROLLER HARDWARE

Body Controller Hardware

IN-CAB DISPLAY

Refer to the Heil PT 1100 Operation Manual for screens on the InSight™ Diagnostic Display related to operating the unit. The display also allows a qualified and authorized Service Technician to see detailed system information and make configuration changes based on option configuration.

Status LED

The Status LED on the bottom-right corner of the display indicates status of the display as described below.

- GREEN, 2Hz Flash – Application Running
- GREEN, 5Hz Flash – No Run time system loaded
- GREEN, Continuous – Application Stopped or No Application Loaded
- RED, 5Hz Flash – Application Stopped due to Low Voltage
- RED, 10Hz Flash – Application Stopped with error application is stopped
- RED, Continuous – Application Stopped with Fatal Error

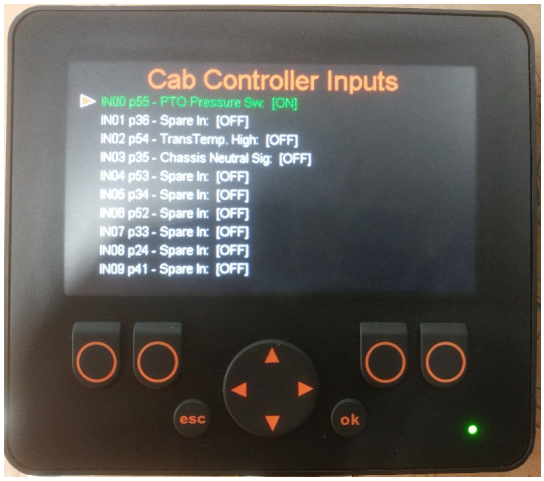
DISPLAY SCREEN

The Display Screen displays details about the display.

- Program number/revision date. Exp: 109-####-yyyymmdd
- Supply Voltage
- Internal Voltage
- Internal Temperature
- Maximum recorded operating temperature for the life of the display.
- CAN1 buss load percentage, the buss load for communications between the controllers and display.
- Current display program process time in microseconds.
- Maximum display program process time, in microseconds, during the current power cycle.

CAB CONTROLLER INPUTS SCREEN

This Cab Controller Inputs screen displays the status of Cab Controller inputs and parameters.

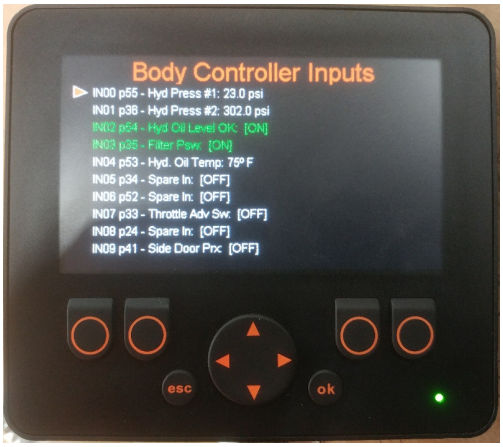


INPUT	PIN #	DESCRIPTION	FUNCTION
IN00	55	PTO Pressure Sw.	ON with PTO engaged
IN01	36	Low Torque PSW.	ON with O.A.I. LTPSW
IN02	54	Trans Temp. High	ON with Trans. Over temp. warning
IN03	35	Chassis Neutral Sig.	ON/OFF with chassis Neutral, Active high or low signal
IN04	53	Spare In	
IN05	34	Spare In	
IN06	52	Spare In	
IN07	33	Spare In	
IN08	24	Spare In	
IN09	41	Spare In	
IN10	23	Spare In	
IN11	40	Spare In	
IN12	22	Spare In	
IN13	39	Spare In	
IN14	21	Spare In	
IN15	38	Engine Tach Freq	R-Stator or Tach Sig. used with absence of J1939
VBBS	10	Supply Voltage	Controller Power, Ignition Feed
VBB1	19	Supply Voltage	Supply Voltage for Outputs 00-08, Ignition Feed
VBB2	1	Supply Voltage	Supply Voltage for Outputs 08-15, Ignition Feed
N/A	N/A	Controller Temp.	Current temp. of controller
N/A	N/A	Max. Controller Temp.	Highest recorded temp. life of unit
CAN1	29/47	Bus Load	Controller network
N/A	N/A	Cortex Program	Program Number, Revision 109-0329-yyyymmdd

Body Controller Hardware

BODY CONTROLLER INPUTS SCREEN

This Body Controller Inputs screen displays the status of Body Controller inputs and parameters.



INPUT	PIN#	DESCRIPTION	FUNCTION
IN00	55	Hyd. Press #1	Main body valve inlet pressure
IN01	36	Hyd. Press #2	CV valve pressure
IN02	54	Hyd. Oil Level	ON with hydraulic Oil Level Good
IN03	35	Filter Psw.	ON with hydraulic filter not in bypass
IN04	53	Hyd. Oil Temp.	Hydraulic Oil Temp. at tank
IN05	34	Spare In	
IN06	52	Spare In	
IN07	33	Throttle Adv Sw.	ON with body throttle advance switch
IN08	24	Spare In	
IN09	41	Side Door Prx.	ON with body side door closed and latched
IN10	23	Right Turn Sig.	ON with chassis Right turn signal
IN11	40	Left Turn Sig	ON with chassis Left turn signal
IN12	22	Reverse Light Sig	ON with chassis Back Up lights
IN13	39	Stop Light Sig	ON with chassis Brake lights
IN14	21	Tail Light Sig	ON with chassis Tail lights
IN15	38	Spare In	
VBBS	10	Supply Voltage	Controller Power, Battery Feed
VBB1	19	Supply Voltage	Supply Voltage for Outputs 00-08, Battery Feed
VBB2	1	Supply Voltage	Supply Voltage for Outputs 08-15, Ignition Feed
N/A	N/A	Controller Temp.	Current temp. of controller
N/A	N/A	Max. Controller Temp.	Highest recorded temp. life of unit
CAN1	29/47	Bus Load	Controller network
N/A	N/A	Cortex Program	Program Number, Revision 109-0330-yyyymmdd
CAN2	28/46	OSC 8 PB Switch Bank	CONNECTED when switch bank is communicating with controller

Body Controller Hardware

INPUT	PIN#	DESCRIPTION	FUNCTION
		Enable PB	
		System Enable PB	
		TG Open PB	
		TG Close PB	
		Ejector Ext PB	
		Ejector Ret PB	
		TG Unlock PB	
		TG Lock PB	

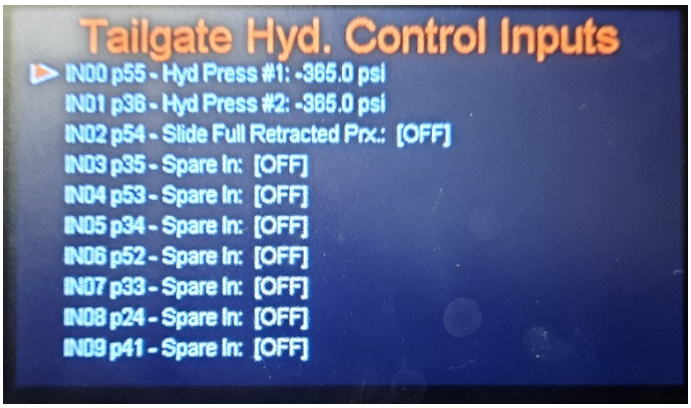
TAILGATE CONTROLLER INPUTS SCREEN

This Tailgate Controller Inputs screen displays the status of Tailgate Controller inputs and parameters.

INPUT	PIN#	DESCRIPTION	FUNCTION
IN00	55	Tipper Curb Side	ON with cart tipper activated, curb side
IN01	36	Tipper Street Side	ON with cart tipper activated, street side
IN02	54	Spare In	
IN03	35	Spare In	
IN04	53	Spare In	
IN05	34	Spare In	
IN06	52	Throttle Adv Sw.	ON with tailgate throttle advance switch
IN07	33	Buzzer Sw.	ON with tailgate buzzer switch
IN08	24	System PWR Street Side	ON with tailgate shutdown switch pulled out, street side
IN09	41	System PWR Curb Side	ON with tailgate shutdown switch pulled out, curb side
IN10	23	Work Light Sw.	ON with tailgate work lamp switch
IN11	40	Spare In	
IN12	22	Slide Active Prx.	ON with tailgate slide control lever activated
IN13	39	Blade Active Prx.	ON with tailgate blade control lever activated
IN14	21	Tailgate Lock Prx.	ON with tailgate locked, (optional)
IN15	38	Tailgate Close Prx.	ON with tailgate closed
VBBS	10	Supply Voltage	Controller Power, Battery Feed
VBB1	19	Supply Voltage	Supply Voltage for Outputs 00-08, Battery Feed
VBB2	1	Supply Voltage	Supply Voltage for Outputs 08-15, Ignition Feed
N/A	N/A	Controller Temp.	Current temp. of controller
N/A	N/A	Max. Controller Temp.	Highest recorded temp. life of unit
CAN1	29/47	Bus Load	Controller network
N/A	N/A	Cortex Program	Program Number, Revision 109-0331-yyyymmdd

TAILGATE HYDRAULIC CONTROL INPUTS SCREEN

This Tailgate Hydraulic Control Inputs screen (for units with electrically controlled tailgate valves) displays the status of Tailgate Ext. Controller inputs and parameters.



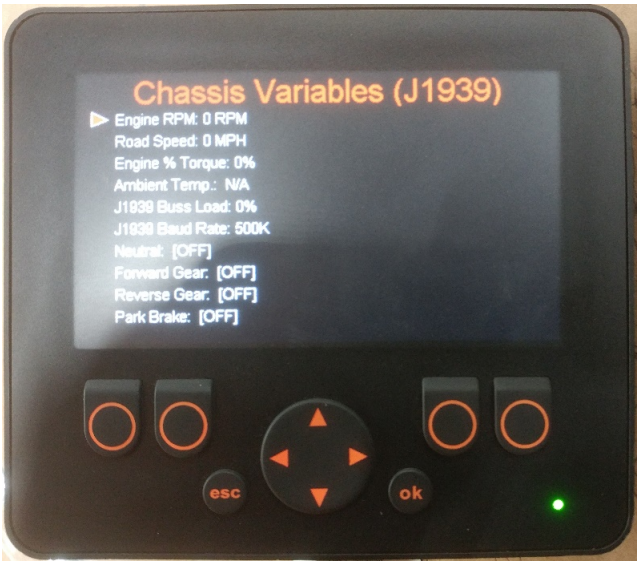
INPUT	PIN#	DESCRIPTION	FUNCTION
IN00	55	Tailgate Hyd. Press. #1	Main tailgate valve inlet pressure (Not Currently Used)
IN01	36	Tailgate Hyd. Press. #2	Not assigned
IN02	54	Slide Full Retracted Prox.	ON with Slide in Full Retract position. (Not Currently Used)
IN03	35	Spare in	
IN04	53	Spare in	
IN05	34	Spare in	
IN06	52	Spare in	
IN07	33	Spare in	
IN08	24	Spare in	
IN09	41	Spare in	
IN10	23	Spare in	
IN11	40	Spare in	
IN12	22	Spare in	
IN13	39	Spare in	
IN14	21	Spare in	
IN15	38	Spare in	
VBBS	10	Supply Voltage	Controller Power, Ignition Feed
VBB1	19	Supply Voltage	Supply Voltage for Outputs 00-08, Ignition Feed
VBB2	1	Supply Voltage	Supply Voltage for Outputs 08-15, Ignition Feed
N/A	N/A	Controller Temp.	Current temperature of controller
N/A	N/A	Max. Controller Temp.	Highest recorded temp. life of unit
CAN1	29/47	Bus Load	Controller network
N/A	N/A	Cortex Program	Program Number, Revision 109-0331-EXT-yyyymmdd
CAN2	28/46	CURB SIDE 10 PB	CONNECTED when switch bank is communicating with

Body Controller Hardware

INPUT	PIN#	DESCRIPTION	FUNCTION
		SWITCH BANK	controller
		Tipper #1 UP	ON with button pressed
		Tipper #1 DWN	ON with button pressed
		Roll Bar UP	ON with button pressed
		Roll Bar DWN	ON with button pressed
		Winch/Rev Mech. UP	ON with button pressed
		Winch/Rev Mech. DWN	ON with button pressed
		Slide UP	ON with button pressed
		Slide DWN	ON with button pressed
		Blade UP	ON with button pressed
		Blade DWN	ON with button pressed
CAN2	28/46	STREET SIDE 10 PB SWITCH BANK	CONNECTED when switch bank is communicating with controller
		Tipper #1 UP	ON with button pressed
		Tipper #1 DWN	ON with button pressed
		Roll Bar UP	ON with button pressed
		Roll Bar DWN	ON with button pressed
		Winch/Rev Mech. UP	ON with button pressed
		Winch/Rev Mech. DWN	ON with button pressed
		Slide UP	ON with button pressed
		Slide DWN	ON with button pressed
		Blade UP	ON with button pressed
		Blade DWN	ON with button pressed
CAN2	28/46	STREET SIDE 2 PB SWITCH BANK	CONNECTED when switch bank is communicating with controller
		Tipper #2 UP	ON with button pressed
		Tipper #2 DWN	ON with button pressed
CAN2	28/46	OPTION 2 PB SWITCH BANK	CONNECTED when switch bank is communicating with controller
		Option PB, UP	ON with button pressed
		Option PB, DWN	ON with button pressed

CHASSIS VARIABLES (J1939) SCREEN

This screen displays chassis variables which are received from the chassis J1939. Some variables are not available on all chassis, in which case the variable status will not update. On chassis where J1939 is not available, Engine RPM is derived from the alternator R Stator or tach. signal.

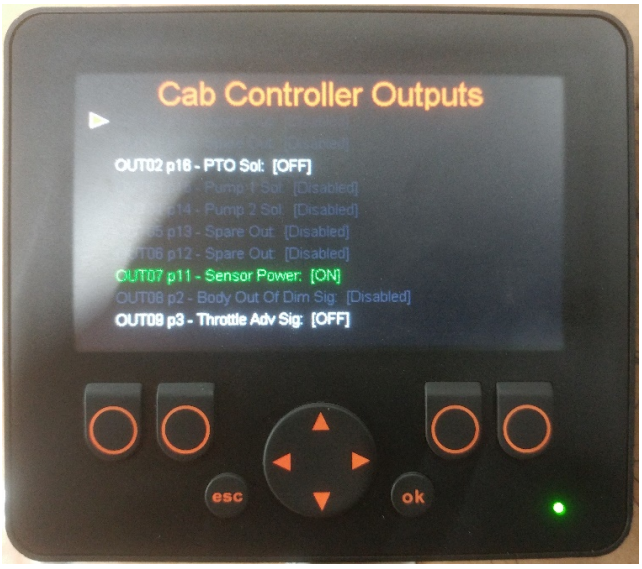


VARIABLE LIST	FUNCTION
Engine RPM	Engine RPM from J1939 or Tach Sig.
Road Speed	Vehicle MPH
Engine % Torque	Engine Percent Torque
Ambient Temp	Ambient temperature measured by chassis sensors
J1939 Bus Load	Chassis J1939 bus load
J1939 Baud Rate	Chassis J1939 baud rate
Neutral	ON = Transmission in neutral
Forward Gear	ON = Transmission in forward gear
Reverse Gear	ON = Transmission in reverse gear
Park Brake	ON = Park Brake set
Service Brake	ON = Service Brake applied
Brake Light Sig.	ON = Chassis Brake Lamps ON
Right Turn Sig.	ON = Chassis Right Turn Lamps ON
Left Turn Sig.	ON = Chassis Left Turn Lamps ON
Tail Lamp Sig.	ON = Chassis Tail Lamps ON
Back-Up Lamp Sig.	ON = Chassis Back Up Lamps ON

Body Controller Hardware

CAB CONTROLLER OUTPUTS SCREEN

This Cab Controller Outputs screen displays the status of Cab Controller outputs.



State of each output in brackets [ ].

All Outputs

[ON] - Output is On.

[OFF] - Output is Off.

Diagnostic features outputs 00 thru 07

[Disabled] - Output is disabled by option set or spare.

[Under Voltage on VBB] - Supply Voltage is too low.

[Over Voltage on VBB] - Supply Voltage is too high.

[Settings Invalid] - Program Error.

[Wire Break] - Open Circuits Detected

[Short Circuit] - Short Circuit Detected

[Over Current] - Overload on Circuit

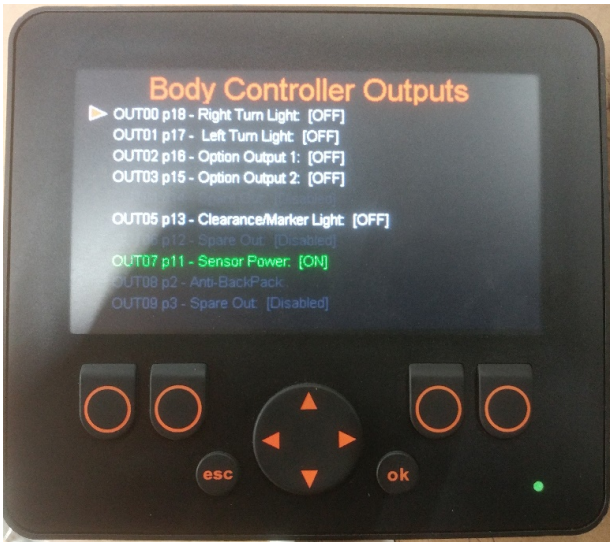
Diagnostic features outputs 08 thru 15

[Disabled] - Output is disabled by option set or spare.

OUTPUT	PIN#	DESCRIPTION	FUNCTION
OUT00	18	Spare Out	
OUT01	17	Spare Out	
OUT02	16	PTO Sol.	Power to Clutch shift PTO solenoid
OUT03	15	Pump 1 Sol.	Power to pump 1 solenoid
OUT04	14	Pump 2 Sol.	Power to pump 2 solenoid
OUT05	13	Spare Out	
OUT06	12	Spare Out	
OUT07	11	Sensor Power	Power supply to sensors, ON with Ignition
OUT08	2	Body Out of Dim Sig.	Power to engine control relay, road speed limit or accelerator interlock
OUT09	3	Throttle Adv Sig.	Power to engine control relay, throttle advance
OUT10	4	Camera Reverse Trigger	Power to camera input, Back up
OUT11	5	Spare Out	
OUT12	6	Spare Out	
OUT13	7	Spare Out	
OUT14	8	In Cab Alarm 1	Tailgate buzzer or Critical Fault
OUT15	9	In Cab Alarm 2	Tailgate Open or Operator Warning

BODY CONTROLLER OUTPUTS SCREEN

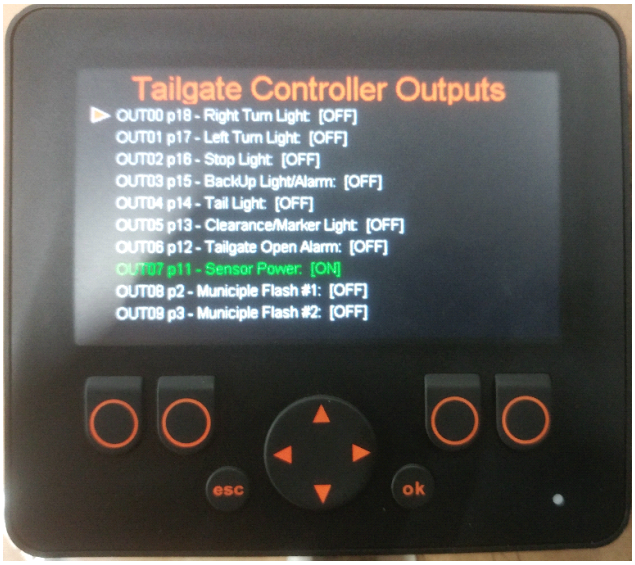
This Body Controller Outputs screen displays the status of Body Controller outputs.



OUTPUT	PIN#	DESCRIPTION	FUNCTION
OUT00	18	Right Turn Light	NOT USED, Power to mid body RH Turn lamp
OUT01	17	Left Turn Light	NOT USED, Power to mid body LH Turn lamp
OUT02	16	Option Output 1	Optional Output controlled by Display button
OUT03	15	Option Output 2	Optional Output controlled by Display button
OUT04	14	Spare Out	
OUT05	13	Clearance/Marker Light	NOT USED, Power to body Clear/Marker lamps
OUT06	12	Spare Out	
OUT07	11	Sensor Power	Power supply to sensors, ON with Ignition
OUT08	2	Anti-Back Pack	Power to anti-back pack relay
OUT09	3	Spare Out	
OUT10	4	Work Light #1	Power to front of body work light
OUT11	5	Reverse Flood Light	Power to Back-up assist lights
OUT12	6	Spare Out	
OUT13	7	Strobe 1	Power to front of body oval strobe lights
OUT14	8	Strobe 2	Power to front of body 360 strobe lights
OUT15	9	Spare Out	

TAILGATE CONTROLLER OUTPUTS SCREEN

This Tailgate Controller Outputs screen displays the status of Tailgate Controller outputs.



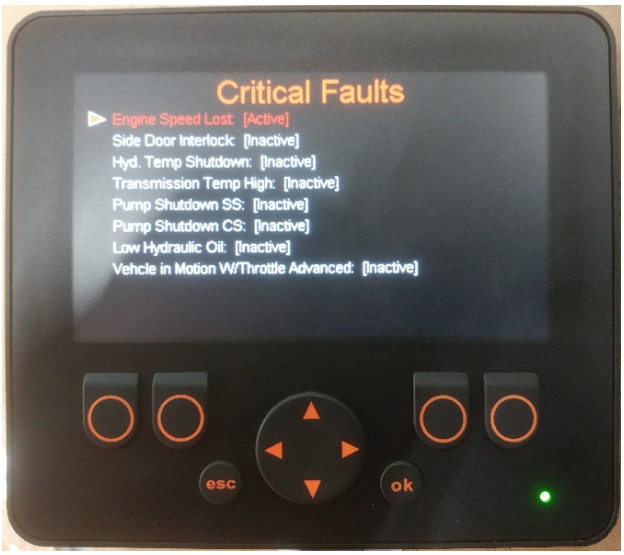
OUTPUT	PIN#	DESCRIPTION	FUNCTION
OUT00	18	Right Turn Light	RH Multi-Function Strobe
OUT01	17	Left Turn Light	LH Multi-Function Strobe
OUT02	16	Stop Light	NOT USED, Power to Stop lamps
OUT03	15	Back Up Light/Alarm	NOT USED, Power to Back Up lamps
OUT04	14	Tail Light	NOT USED, Power to Tail lamps
OUT05	13	Clearance/Marker Light	NOT USED, Power to Clearance lamps
OUT06	12	Tailgate Open Alarm	Power to Tailgate Open Audible Alarm
OUT07	11	Sensor Power	Power supply to sensors, ON with Ignition
OUT08	2	Municipal Flash #1	Power to 7” flashing lamp
OUT09	3	Municipal Flash #2	Power to 7” flashing lamp
OUT10	4	Work Light #1	Power to tailgate side lamp(s)
OUT11	5	Reverse Flood Light	Power to camera work lamps
OUT12	6	Work Light #2	Power to tailgate hopper lamp(s)
OUT13	7	Strobe 1	Power to oval strobe lights
OUT14	8	Strobe 2	Power to 360 strobe light(s)
OUT15	9	Spare Out	

FAULT SCREENS

Access fault screens from the Home screen by using the UP directional arrow.

CRITICAL FAULTS SCREEN

Critical faults result in disabled functions, allowing limited to no operation. These faults are displayed in the Home Screen Message Banner, which allows one message at a time based upon order of importance. This screen allows the user to view the status of all critical faults.



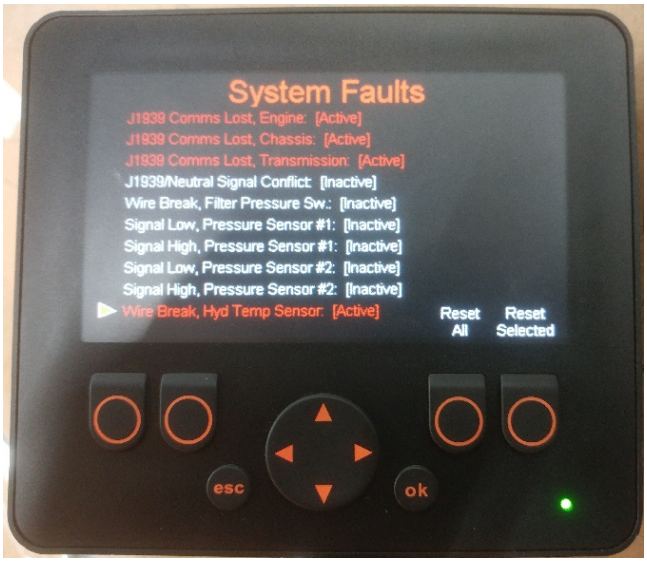
FAULT	CAUSE	EFFECT	RESET
Engine Speed Lost	System unable to determine engine RPM.	Pump shut down after 1 minute.	Cycle System Enable
Side Door Interlock	Input signal indicates side door has been opened.	Pump shut down immediately.	Cycle System Enable
Hyd. Temp Shutdown	Hyd. Temp. above 200° for 60 seconds.	Pump shut down after 1 minute.	Cycle System Enable
Transmission Temp High	Allison Trans. High Temp Warning is active.	Pump shut down after 1 minute.	Cycle System Enable
Pump Shutdown SS	Input signal indicates street side shutdown switch has been pressed.	Pump shut down immediately.	Cycle System Enable
Pump Shutdown CS	Input signal indicates curb side shutdown switch has been pressed.	Pump shut down immediately.	Cycle System Enable
Low Hydraulic Oil	Input signal indicates hydraulic Oil has fallen below a safe operating level.	Pump shut down immediately.	Cycle System Enable
Vehicle in Motion W/ Throttle Advanced	J1939 indicates Vehicle Wheel Speed greater than zero, with throttle advance active.	Throttle advance is interrupted.	Re-initiate Throttle Advance request

SYSTEM FAULTS SCREEN

Access this screen from the Critical Fault screen by using the LEFT directional arrow.

System faults occur with the loss of a signal or, when a signal is out of the normal operating range. These faults are retained through a power cycle and once active will remain active until reset.

The “Reset All” button will reset all active System Faults. The “Reset Selected” will reset only the selected fault.



FAULT	CAUSE
J1939 Comms Lost, Engine	System not receiving PGN 61444 from chassis. If J1939 is not available, disable this fault, by selecting it and hold both reset buttons for 10 seconds.
J1939 Comms Lost, Chassis	System not receiving PGN 61445 from chassis. If J1939 is not available, disable this fault, by selecting it and hold both reset buttons for 10 seconds.
J1939 Comms Lost, Transmission	System not receiving PGN 65265 from chassis. If J1939 is not available, disable this fault, by selecting it and hold both reset buttons for 10 seconds.
J1939/Neutral Signal Conflict	Hardwired neutral signal indicates transmissions is NOT in neutral while J1939 indicates transmission is in neutral. Hardwired neutral function must be verified.
Wire Break, Filter Pressure Sw.	Loss of filter bypass signal with engine OFF
Signal Low, Pressure Sensor #1	Input signal indicates the pressure reading is lower than the operating range of the sensor.
Signal High, Pressure Sensor #1	Input signal the pressure reading is higher than the operating range of the sensor.
Signal Low, Pressure Sensor #2	Input signal the pressure reading is lower than the operating range of the sensor.
Signal High, Pressure Sensor #2	Input signal the pressure reading is higher than the operating range of the sensor.
Wire Break, Hyd. Temp Sensor	Input signal resistance is high, temperature sensor disconnected.
Short to Ground, Hyd. Temp Sensor	Input signal resistance is low, temperature signal shorted to ground.

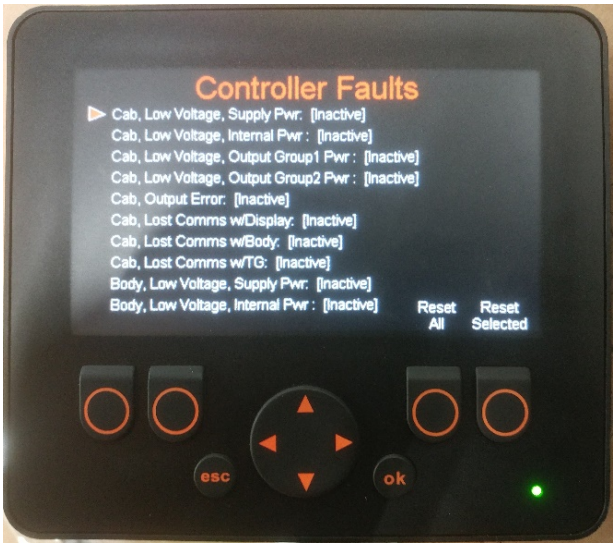
CONTROLLER FAULTS SCREEN

Access this screen from the Critical Fault screen by using the RIGHT directional arrow.

Controller faults occur with the following:

- Supply voltage to a controller is lost or low.
- A controller output has an error, short or open circuit etc.
- Loss of communications with or between two controllers.

These faults are retained through a power cycle and once active will remain active until reset. The “Reset All” button will reset all active System Faults. The “Reset Selected” will reset only the selected fault.



FAULT	CAUSE
Cab, Low Voltage, Supply Pwr.	VBBS Pin 10 - Supply Voltage < 10VDC
Cab, Low Voltage, Internal Pwr.	Controllers internal voltage low
Cab, Low Voltage, Output Group1 Pwr.	VBB1 Pin 19 - Supply Voltage < 10VDC
Cab, Low Voltage, Output Group2 Pwr.	VBB2 Pin 01 - Supply Voltage < 10VDC
Cab, Output Error	Error diagnostic on one or more outputs 00 thru 07
Cab, Lost Comms w/ Display	Controller lost comms with in-cab display.
Cab, Lost Comms w/ Body	Controller lost comms with Body controller.
'Cab, Lost Comms w/TG	Controller lost comms with Tailgate controller.
Body, Low Voltage, Supply Pwr.	VBBS Pin 10 - Supply Voltage < 10VDC
Body, Low Voltage, Internal Pwr.	Controllers internal voltage low
Body, Low Voltage, Output Group1 Pwr.	VBB1 Pin 19 - Supply Voltage < 10VDC
Body, Low Voltage, Output Group1 Pwr.	VBB2 Pin 01 - Supply Voltage < 10VDC

Body Controller Hardware

FAULT	CAUSE
Body, Output Error	Error diagnostic on one or more outputs 00 thru 07
Body, Lost Comms w/ Display	Controller lost comms with in-cab display.
Body, Lost Comms w/ Body	Controller lost comms with Body controller.
Body, Lost Comms w/ TG	Controller lost comms with Tailgate controller.
Tailgate, Low Voltage, Supply Pwr.	VBBS Pin 10 - Supply Voltage < 10VDC
Tailgate, Low Voltage, Internal Pwr.	Controllers internal voltage low
Tailgate, Low Voltage, Output Group1 Pwr.	VBB1 Pin 19 - Supply Voltage < 10VDC
Tailgate, Low Voltage, Output Group2 Pwr.	VBB2 Pin 01 - Supply Voltage < 10VDC
Tailgate, Output Error	Error diagnostic on one or more outputs 00 thru 07
Tailgate, Lost Comms w/ Display	Controller lost comms with in-cab display.
Tailgate, Lost Comms w/ Body	Controller lost comms with Body controller.
Tailgate, Lost Comms w/ TG	Controller lost comms with Tailgate controller.
Display, Low Voltage, Supply Pwr.	Display Supply Voltage < 10VDC

PASSWORD PROTECTED SCREENS

To access password protected screens press and hold the OK button for 3 seconds.

This will switch the view to the password screen. Enter the password and press OK.

PASSWORD PROTECTED SCREEN	PASSWORD
Maintenance	4321
Option Config	123412

OPTION CONFIG SCREEN

The Option Config screen is used to configure the system.

Press the OK button to turn the functions ON/OFF. Press ESC to exit screen.

Clutch Shift PTO

ON, enables the PTO Solenoid output and should be used when a Clutch shift PTO in installed.

Additionally, the hydraulic pump may or may not be configured with a solenoid controlled manifold block.

Select “W/Pump Manifold” or “W/O Pump Manifold” by pressing the RIGHT/LEFT arrows.

W/Pump Manifold enables Pump 1 Sol output and reconfigures the EOS to control Pump 1 instead of the PTO.

Operate at Idle

ON, enables Operate at Idle tandem pump outputs Pump 1 Solenoid and Pump 2 Solenoid.

It also configures the EOS for O.A.I. Pumps and enable Low Torque pressure functions to shutdown Pump 1 at the selected pressure setpoint.

There are two potential methods to achieve the pressure shutdown of Pump 1.

1. Hyd. Press #1 a transducer monitoring the inlet pressure on the body control valve, arrow RIGHT to adjust Pump 1 Pressure Limit.
2. Low Torque Pressure switch wired to the Cab Controller, adjust pressure switch setting as required.

Operate in Neutral Only

ON, prevents Pack on the Fly functionality by disengaging the hydraulic when the transmission is not in neutral.

No Side Door Interlock (Default OFF)

ON, disables side door interlock pump shutdown. Turn OFF when optional side access door pump shutdown is not installed.

Hyd. Tank Monitoring

ON, enables low hydraulic Oil and hydraulic oil temperature monitoring. Enables Hyd. Temp and Low Hydraulic Oil pump shutdown functions.

Body Controller Hardware

OPTION CONFIG SCREEN (CONTINUED)

Multi-Function Strobe

ON, enables a secondary use of the tailgate turn lamps. When not in use as turn signals, the lamps can be used as alternating strobe lights.

Option Switches

ON, enables two multiplexed body controller outputs to be used for optional functions.

Blunt cut wires RED "OPTION-02" and RED "OPTION-03" are controlled from the home screen Function Button F4.

Municipal Flashers

ON, enables two tailgate mounted alternating strobe/flashing lamps, typically 7” municipal flashers.

Out of Dimension

ON, enables the Out of Dimension circuit. The Out of Dimension Output turns on at set the MPH when tailgate is open, or side access door is not closed. Arrow RIGHT to adjust MPH

setpoint.

Active Low Neutral Sig.

Hardwired Neutral signals provided by the Chassis can be Active High (+12VDC) or Active Low (Grounding).

ON, configures the Cab controller Neutral input to function with an Active Low Neutral signal.

OFF, configures the Cab controller Neutral input to function with an Active High Neutral signal.

Tailgate Lock Indication

ON, enables tailgate lock/unlock indication.

Pump Shutdown Switches

ON, enables tailgate street and curb side Pump Shutdown switches.

Hyd. Pressure Monitoring

ON, enables Body controller hydraulic pressure transducer input 00.

Telematics

ON, enables Connected Truck broadcast on chassis J1939 network.

Engine Idle

Arrow RIGHT to adjust engine idle. This is required on chassis not equipped with J1939.

This uses the alternator R-Stator or Tach. signal, in place of J1939 messaging.

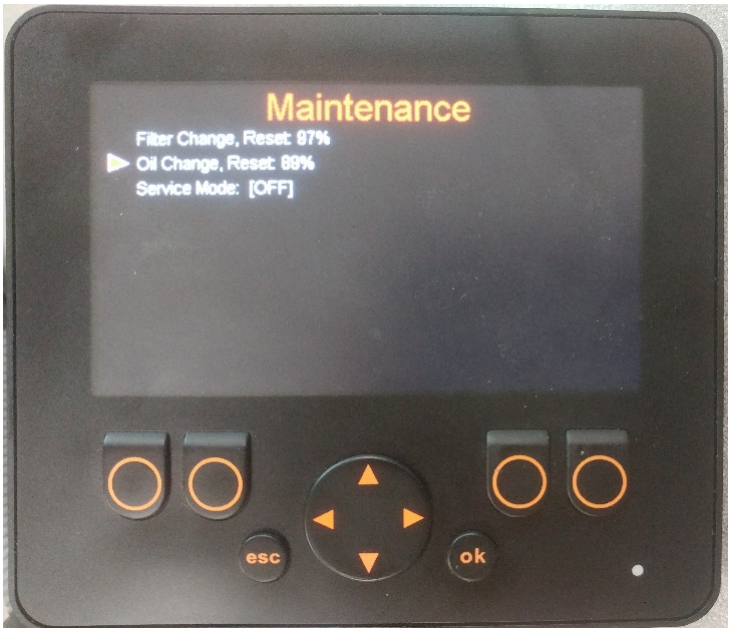
Body Controller Hardware

MAINTENANCE SCREEN

Filter Change Reset, press OK button to reset

Oil Change Reset, press OK button to reset

Service Mode, press OK button to activate. Service mode is strictly intended to allow pump operation while servicing or troubleshooting the unit.



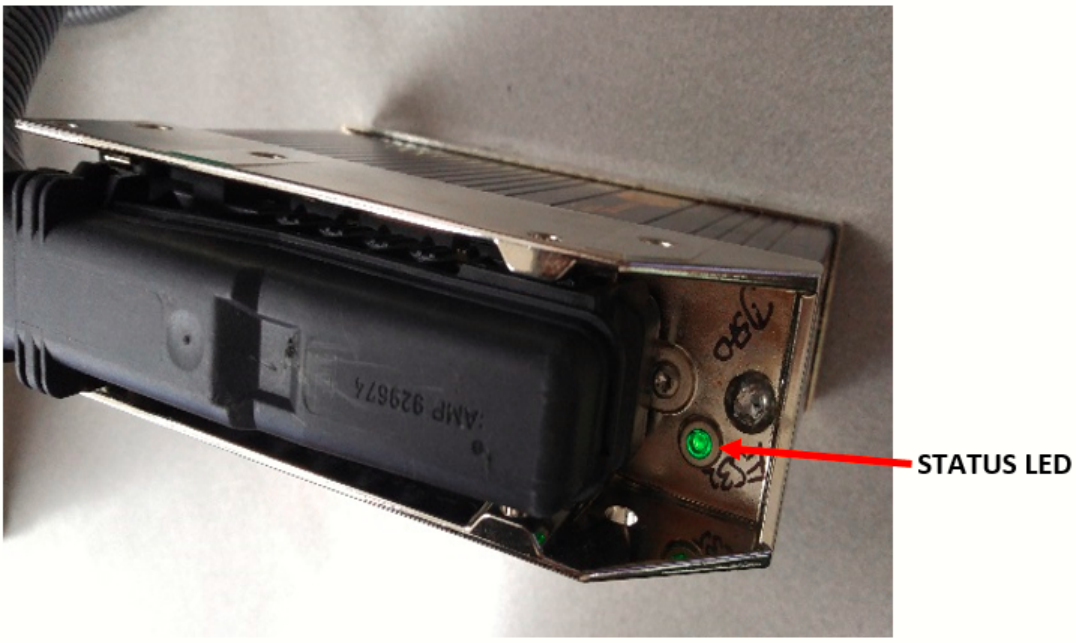
Body Controller Hardware

PROGRAMMABLE CONTROLLERS

Cortex Controllers

There are three 32 I/O Cortex Controllers in this system: Cab, Body and Tailgate. Each has a unique program with I/O shared between the three controllers and the In-Cab display.

Each controller is equipped with an LED Status indicator. If communications between the three controllers and the In-Cab display are communicating as expected a solid green LED will be displayed. However, if a controller losses communication with either of the other two or the In-Cab display a solid RED LED will be displayed.



LED COLOR	STATUS	DESCRIPTION
N/A	OFF	No Supply Voltage
Orange	1 Flash	Initialization
Green	Flash @ 5 Hz	No Operating System Loaded
Green	Continuous	Application Running (RUN MODE)
Red	Flash @ 5 Hz	Supply Voltage Low
Red	Continuous	Either a Fatal Error has occurred, or communication is lost between any of the 3 controllers or the display.
Yellow/Red	Flash @ 5 Hz	Communication Lost during current power cycle

Body Controller Hardware

PROGRAMMABLE CONTROLLERS (CONTINUED)

Cab Controller

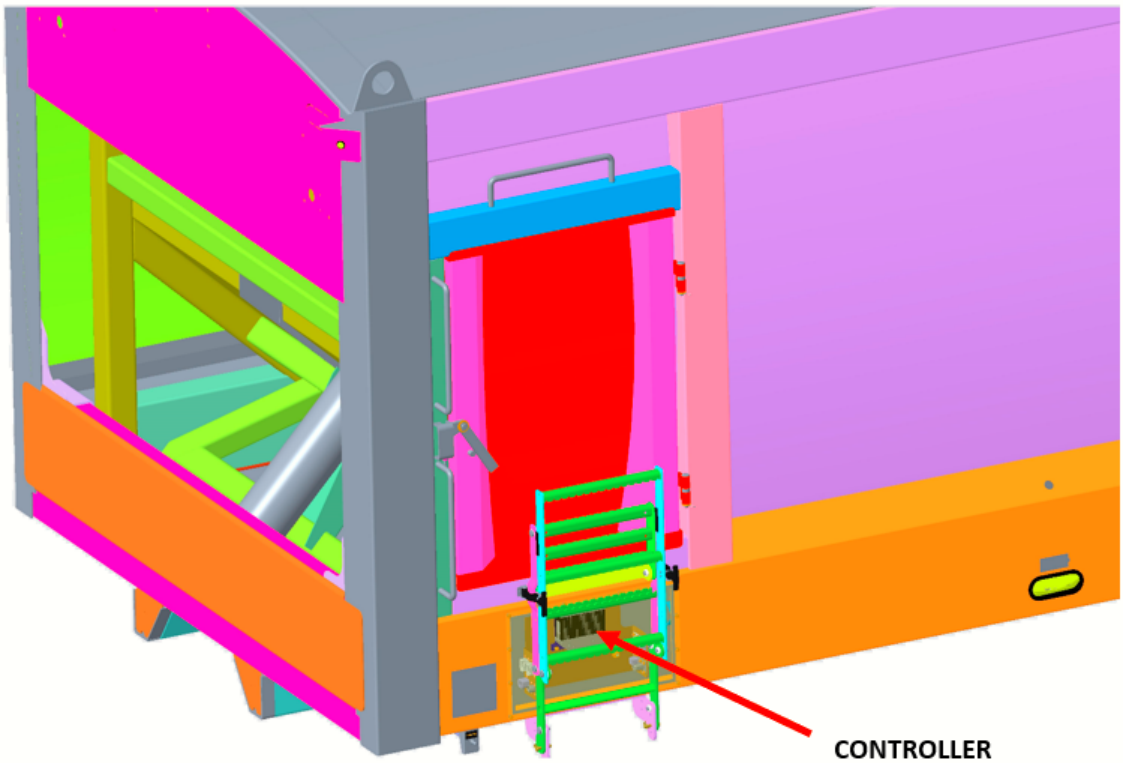
Typically mounted inside the cab, on a conventional cab this controller will be behind or under the seat. On a cab over engine it will be under the dog house cover. This controller manages most of the unit functionality, this includes:

- Chassis interface, including J1939 comms
- Hydraulic Pump Controls
- Option Configuration
- Audible Alarms
- Pump hour counts

Body Controller

Mounted behind access panel on the street side of the body, as shown below this controller manages circuits local to the body, including:

- Strobe Lights
- Work Lights
- Oil Tanks Circuits
- Chassis FMVSS light inputs

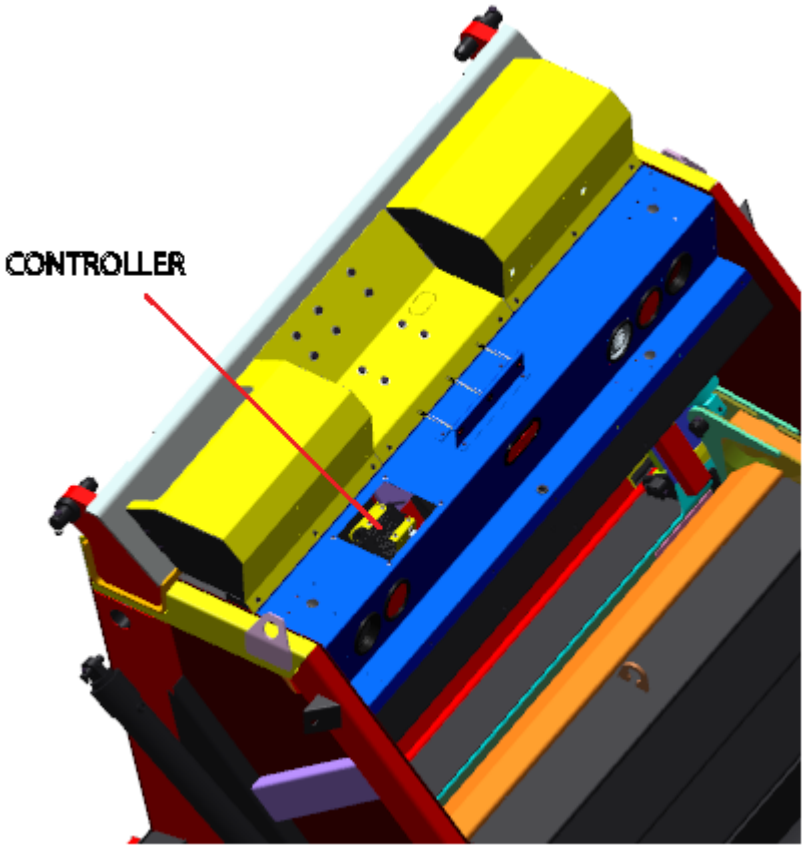


PROGRAMMABLE CONTROLLERS (CONTINUED)

Tailgate Controller

Mounted in the upper portion of the tailgate this controller manages circuits local to the tailgate, including:

- Strobe Lights
- Work Lights
- Tailgate controls



PT 1100 US

Body Controller Hardware

CONTROL FUSING

Control Fuses

The 2020 REL control system utilizes two fuses. Fuse #1 (F1) is powered by chassis ignition. Fuse #2 (F2) is battery powered by the cold side of the battery disconnect.

Fusing for RP170 Compliant Chassis

The below fuse holder is typically located within 8” of the RP170 Power and Ground connector.

On cab over chassis this should be under the dog house cover. On conventional cab chassis this should be behind the seat.

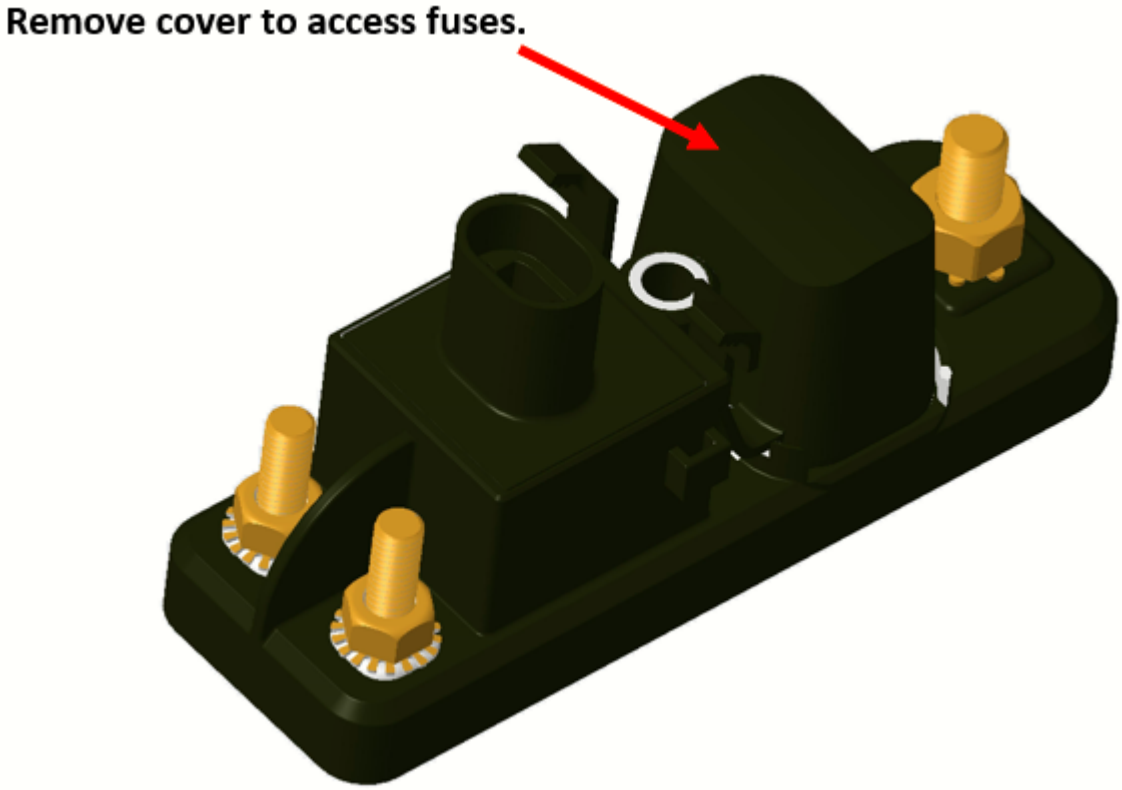
RP170 POWER AND GROUND	FUSE	CIRCUIT
Ignition Power	F1 (20amp)	Cab Controller (Pin 10, Controller power)
		Cab Controller (Pin 19, Outputs 00-07)
		Cab Controller (Pin 01, Outputs 08-15)
		Body Controller (Pin 01, Outputs 08-15)
		Tailgate Controller (Pin 01, Outputs 08-15)
		In-Cab Display
Battery Disconnect	F2 (20amp)	Body Controller (Pin 10, Controller power)
		Body Controller (Pin 19, Outputs 00-07)
		Tailgate Controller (Pin 10, Controller power)
		Tailgate Controller (Pin 19, Outputs 00-07)
Ignition Power	F3 (10amp)	Spare
	F4 (10amp)	Spare

Body Controller Hardware

CONTROL FUSING (CONTINUED)

Fusing for NON RP170 Compliant Chassis

Non RP170 chassis uses a Power Relay Module, pictured below, with two build-in 20-amp fuses. This module is typically located near the chassis battery disconnect switch.



SOURCE	FUSE	CIRCUIT
Ignition Power	F1 (20amp)	Cab Controller (Pin 10, Controller power)
		Cab Controller (Pin 19, Outputs 00-07)
		Cab Controller (Pin 01, Outputs 08-15)
		Body Controller (Pin 01, Outputs 08-15)
		Tailgate Controller (Pin 01, Outputs 08-15)
		In-Cab Display
Battery Disconnect	F2 (20amp)	Body Controller (Pin 10, Controller power)
		Body Controller (Pin 19, Outputs 00-07)
		Tailgate Controller (Pin 10, Controller power)
		Tailgate Controller (Pin 19, Outputs 00-07)

Body Controller Hardware

CONTROL AREA NETWORK

The control system for the 2020 Rear End Loader has multiple components that communicate over Control Area Networks or CAN.

a. In-Cab Display
b. Cab Controller (32 I/O Cortex Control Module)
c. Body Controller (32 I/O Cortex Control Module)
d. Tailgate Controller (32 I/O Cortex Control Module)
e. Tailgate Controller EXT (32 I/O Cortex Control Module), PT 1100 Only
f. Chassis J1939 interface.

There are two discrete networks in the system.

a. CAN1 Network

   Communications between the In-Cab Display, Cab, Body and Tailgate Controller.

b. CH-J1939 Network

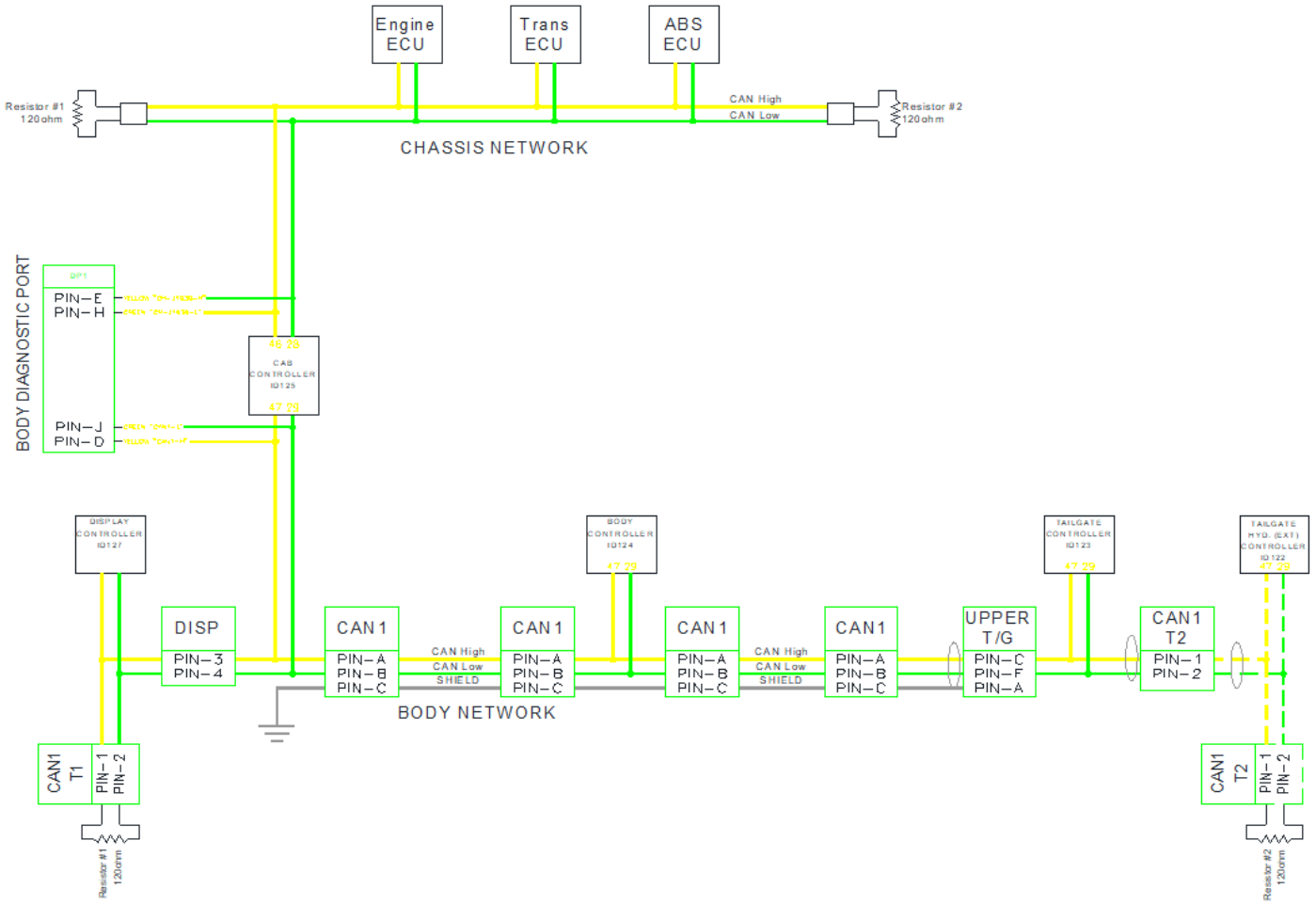
   Communications between the Cab Controller and the truck chassis J1939.

Chassis J1939 Baud Rate

The cab controller automatically detects and sets the baud rate to match the chassis J1939 baud rate. Upon power up, the controller attempts to receive messages from the chassis with the initial baud rate of 250k. If no messages are received within 3 seconds the controller changes the baud rate to 500K and continues. The controller continues to alternate baud rates every 3 seconds. If no messages are received within 15 seconds a fault is set, the baud rate will rest at 250K.

CONTROL AREA NETWORK (CONTINUED)

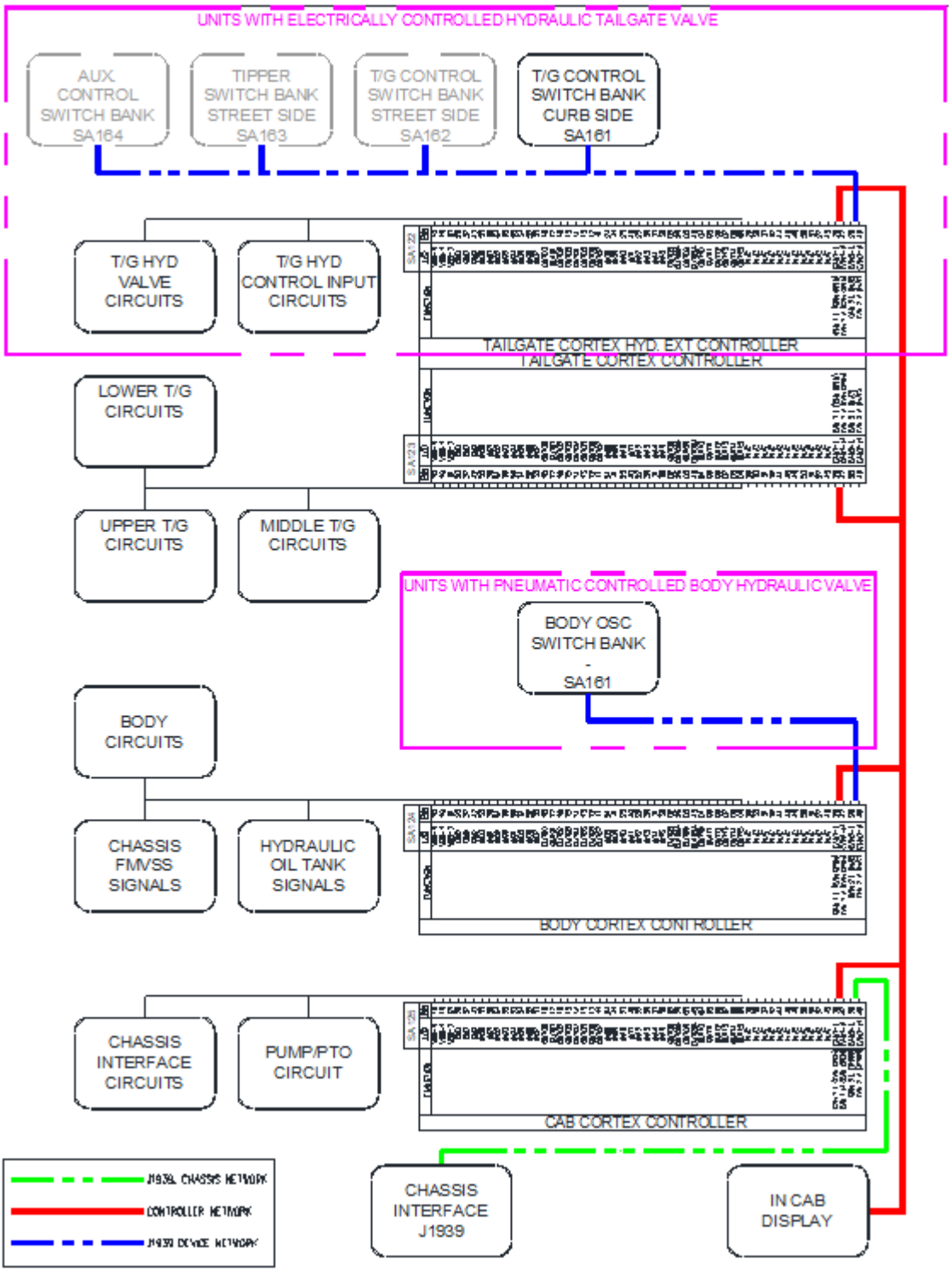
Network Schematic



Body Controller Hardware

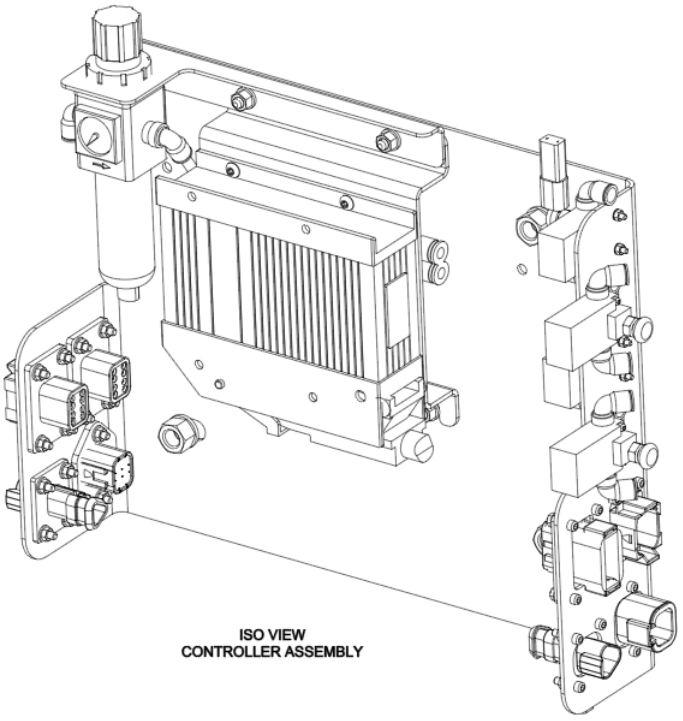
CONTROL AREA NETWORK (CONTINUED)

System Architecture

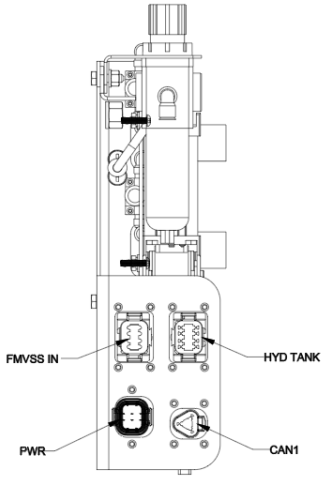


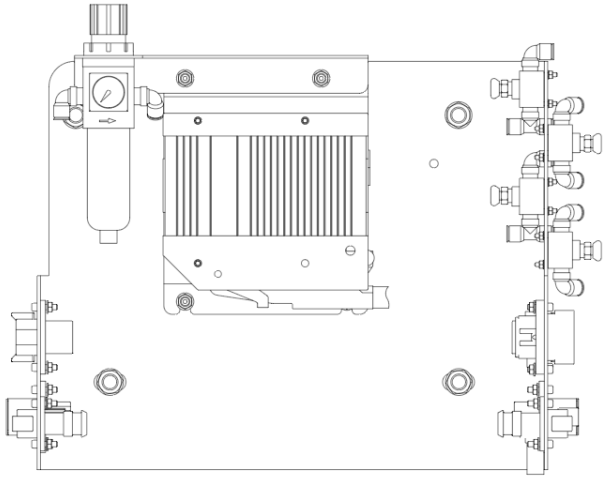
Body Controller Hardware

BODY ELECTRICAL KIT

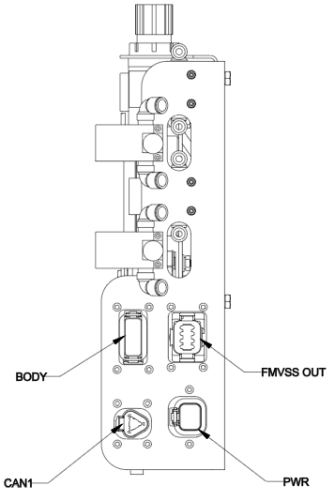


ISO VIEW
CONTROLLER ASSEMBLY



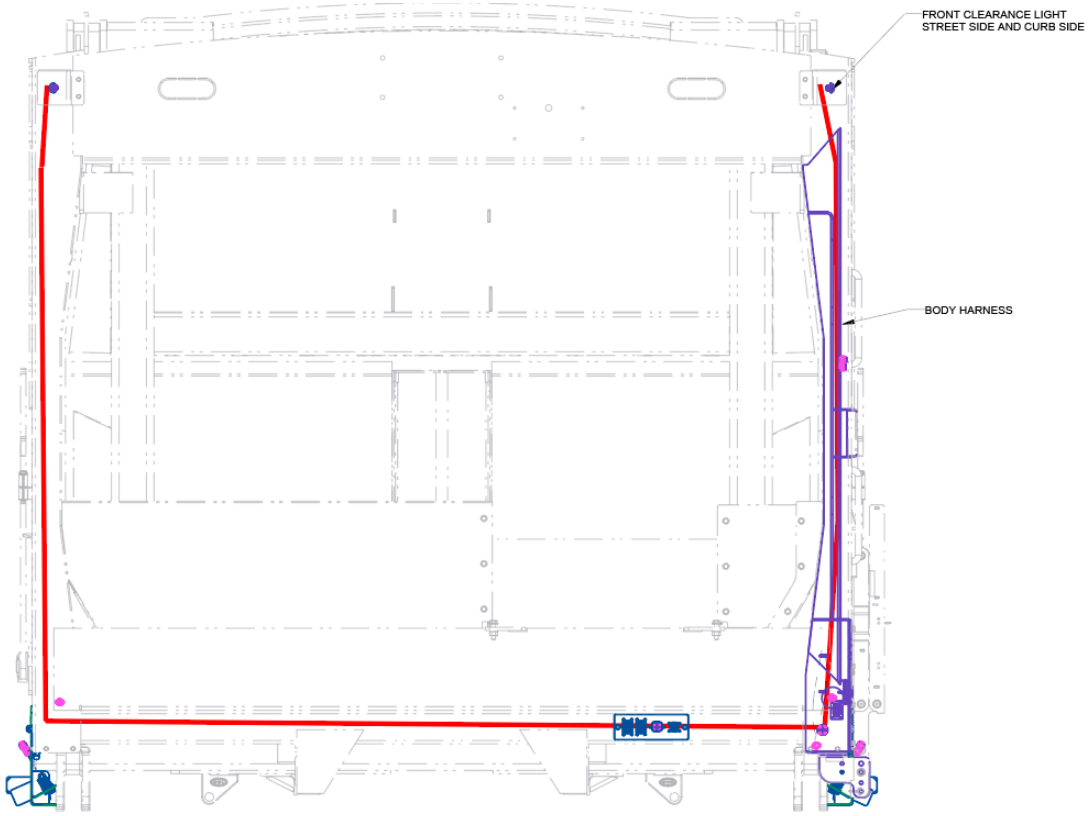


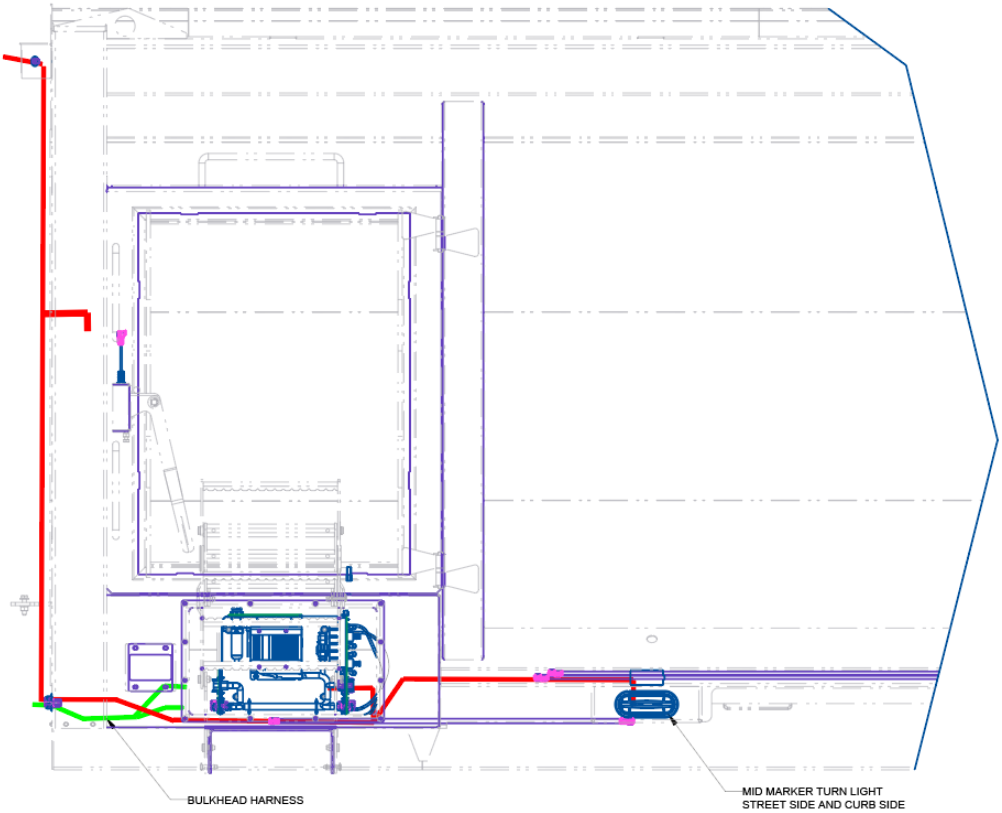
NOTE: REFERENCE SCHEMATIC 701-9307-002
FOR ELECTRICAL CONNECTIONS



Body Controller Hardware

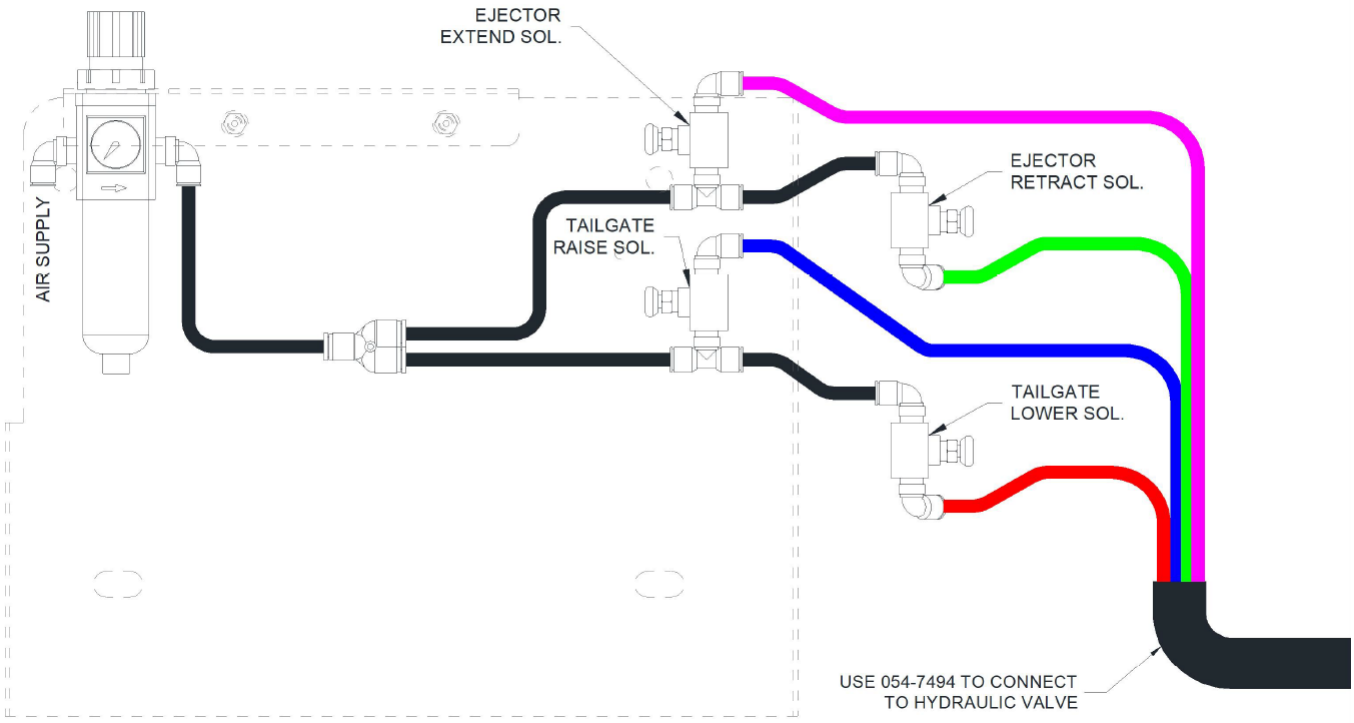
BODY HARNESS ROUTING





Body Controller Hardware

PNEUMATIC DIAGRAM



NOTES

SECTION 6
BODY CONTROLLER SOFTWARE

Body Controller Software

CONTROLLER PROGRAM DOCUMENTATION FOR 109-0329

PROGRAM: 109-0329 REVISION: 20201102 CONTROLLER REL-CAB (CR2530)		I/O ADDRESS	SIGNAL	PIN #	FUNCTION DESCRIPTION
INPUT FUNCTIONS					
A01	PTO Pressure Sw.	IN00	BINARY ACTIVE LOW	55	Activated by a Clutch Shift PTO pressure switch. ON indicates PTO engaged.
A02	Low Torque PSW.	IN01	BINARY ACTIVE HIGH	36	Utilized on Operate at Idle Hydraulic systems. Activated by the Low Torque Pressure Switch. ON when pressure switch setpoint is reached, it prevents engine stall by disengaging Pump 1.
A03	Trans Temp. High	IN02	BINARY ACTIVE LOW	54	Controlled by the Allison transmission, Sump/Retarder High temperature indicator output. This is an Active Low signal that turns ON when the transmission temperature is high.
A04	Chassis Neutral Sig.	IN03	BINARY ACTIVE HIGH/LOW	35	Connected to the chassis Neutral circuit. It can function as an Active High or Active Low input to accommodate either chassis circuit design. Active High input functionality is the default. Active Low neutral signal must be enabled in the Option Configuration.
A05	Spare In	IN04	N/A	53	
A06	Spare In	IN05	N/A	34	
A07	Spare In	IN06	N/A	52	
A08	Spare In	IN07	N/A	33	
A09	Spare In	IN08	N/A	24	
A10	Spare In	IN09	N/A	41	
A11	Spare In	IN10	N/A	23	
A12	Spare In	IN11	N/A	40	
A13	Spare In	IN12	N/A	22	
A14	Spare In	IN13	N/A	39	
A15	Spare In	IN14	N/A	21	
A16	Engine Tach Freq	IN15	FREQUENCY	38	Only used in the absence of a functioning J1939 chassis network. Circuit monitors the signal generated by the alternator “R” Stator. This signal is approximately -1.4V to +15V square wave, oscillating at a frequency relative to engine speed. Tach. Is calibrated by adjusting engine idle in the Option Configurations.

Body Controller Software

CORTEX CONTROLLER PROGRAM DOCUMENTATION FOR 109-0329 (CONTINUED)

OUTPUT FUNCTIONS					
B01	Spare Out	OUT00	N/A	18	
B02	Spare Out	OUT01	N/A	17	
B03	PTO Sol.	OUT02	BINARY ACTIVE HIGH	16	ON engages Clutch Shift PTO. Must be enabled in Option Configuration.
B04	Pump 1 Sol.	OUT03	BINARY ACTIVE HIGH	15	Controls Pump Solenoid (P1). See Pump Control documentation for operational details.
B05	Pump 2 Sol.	OUT04	BINARY ACTIVE HIGH	14	Utilized on Operate at Idle Hydraulic systems. Controls Pump Solenoid (P2). See Pump Control documentation for operational details.
B06	Spare Out	OUT05	N/A	13	
B07	Spare Out	OUT06	N/A	12	
B08	Sensor Power	OUT07	BINARY ACTIVE HIGH	11	Supplies power to input devices. See schematics for circuit details.
B09	Body Out of Dim Sig.	OUT08	BINARY ACTIVE HIGH	2	Indicates body component position potentially exceeds legal height or width for on highway travel.
B10	Throttle Adv Sig.	OUT09	BINARY ACTIVE HIGH	3	Controls engine throttle advance or engine speed up relay.
B11	Camera Reverse Trigger	OUT10	BINARY ACTIVE HIGH	4	On with transmission reverse, triggers reverse camera.
B12	Cab Strobe	OUT11	BINARY ACTIVE HIGH	5	On with Strobe Lights, Auto Strobe or Front Strobe enabled. Interrupted by chassis turn signal.
B13	Spare Out	OUT12	N/A	6	
B14	Spare Out	OUT13	N/A	7	
B15	In Cab Alarm 1	OUT14	BINARY ACTIVE HIGH	8	Operator Alert. Tailgate Buzzer Switch, Critical Fault

Body Controller Software

CONTROLLER PROGRAM DOCUMENTATION FOR 109-0330

PROGRAM: 109-0330 REVISION: 20201102 CONTROLLER REL-BODY (CR2530)		I/O ADDRESS	SIGNAL	PIN #	FUNCTION DESCRIPTION
INPUT FUNCTIONS					
C01	Hyd. Pressure #1	IN00	ANALOG	55	Hyd. Pressure Transducer. Main body valve inlet pressure. (0.50-4.50 VDC) = (0-3000 PSI)
C02	Hyd. Pressure #2	IN01	ANALOG	36	Hyd. Pressure Transducer. Unassigned. (0.50-4.50 VDC) = (0-3000 PSI)
C03	Hyd. Oil Level OK	IN02	BINARY ACTIVE HIGH	54	Hydraulic Tank Oil Sensor, ON when Oil is present.
C04	Hyd. Filter Bypass Press Sw.	IN03	BINARY ACTIVE HIGH	35	Hydraulic Tank Oil Filter Bypass Pressure Switch, ON when Filter is not bypassing oil.
C05	Hyd. Oil Temp.	IN04	Resistive	53	Hydraulic Tank Oil Temperature
C06	Spare In	IN05	N/A	34	
C07	SS TG Lock Prox.	IN06	BINARY ACTIVE HIGH	52	Input ON with street side Tailgate Locked secured
C08	Throttle Advance Sw.	IN07	BINARY ACTIVE HIGH	33	Throttle Advance Switch at Body control valve, street side front of body.
C09	CS TG Lock Prox.	IN08	N/A	24	Input ON with curb side Tailgate Locked secured
C10	Side Door Prox.	IN09	BINARY ACTIVE HIGH	41	Input ON with Side Door Closed
C11	Right Turn Sig.	IN10	BINARY ACTIVE HIGH	23	Chassis FMVSS lighting circuit
C12	Left Turn Sig.	IN11	BINARY ACTIVE HIGH	40	Chassis FMVSS lighting circuit
C13	Reverse Sig.	IN12	BINARY ACTIVE HIGH	22	Chassis FMVSS lighting circuit
C14	Stop Light Sig.	IN13	BINARY ACTIVE HIGH	39	Chassis FMVSS lighting circuit
C15	Taillight Sig.	IN14	BINARY ACTIVE HIGH	21	Chassis FMVSS lighting circuit
C16	Spare In	IN15	N/A	38	

CONTROLLER PROGRAM DOCUMENTATION FOR 109-0330 (CONTINUED)

OUTPUT FUNCTIONS					
D01	Tailgate Lock Sol	OUT00	BINARY ACTIVE HIGH	18	Actuates Tailgate lock Cylinder, for Pneumatically controlled Body Valve with independent tailgate lock cylinders only.
D02	Tailgate Unlock Sol	OUT01	BINARY ACTIVE HIGH	17	Actuates Tailgate unlock Cylinder, for Pneumatically controlled Body Valve with independent tailgate lock cylinders only.
D03	Ejector Extend Sol.	OUT02	BINARY ACTIVE HIGH	16	Moves Ejector Rearward, for Pneumatically controlled Body Valve only.
D04	Ejector Retract Sol.	OUT03	BINARY ACTIVE HIGH	15	Moves Ejector Forward, for Pneumatically controlled Body Valve **only**.
D05	Tailgate Raise Sol.	OUT04	BINARY ACTIVE HIGH	14	Raises Tailgate**,** for Pneumatically controlled Body Valve **only**.
D06	Clearance Lights	OUT05	BINARY ACTIVE HIGH	13	NOT USED
D07	Tailgate Lower Sol.	OUT06	BINARY ACTIVE HIGH	12	Lower Tailgate**,** for Pneumatically controlled Body Valve **only**.
D08	Sensor Power	OUT07	BINARY ACTIVE HIGH	11	Supplies power to input devices. See schematics for circuit details.
D09	Anti-Back Pack	OUT08	BINARY ACTIVE HIGH	2	Anti-Backpack relay DPF5000, PTC.
D10	Spare Out	OUT09	N/A	3	
D11	Work Light #1	OUT10	BINARY ACTIVE HIGH	4	Work Light Front of Body
D12	Side Reverse Floods	OUT11	BINARY ACTIVE HIGH	5	Backup Assist Lights
D13	Spare Out	OUT12	N/A	6	
D14	Strobe 1	OUT13	BINARY ACTIVE HIGH	7	Front Oval Strobe Lights
D15	Strobe 2	OUT14	BINARY ACTIVE HIGH	8	Front 360° Strobe
D16	Spare Out	OUT15	N/A	9	

Body Controller Software

CONTROLLER PROGRAM DOCUMENTATION FOR 109-0331

PROGRAM: 109-0331 REVISION: 20201102 CONTROLLER REL-TAILGATE (CR2530)		I/O ADDRESS	SIGNAL	PIN #	FUNCTION DESCRIPTION
INPUT FUNCTIONS					
E01	Curb Side Tipper	IN00	BINARY ACTIVE HIGH	55	Used to sense Tipper activation
E02	Street Side Tipper	IN01	BINARY ACTIVE HIGH	36	Used to sense Tipper activation
E03	Spare In	IN02	N/A	54	
E04	Spare In	IN03	N/A	35	
E05	Spare In	IN04	N/A	53	
E06	Spare In	IN05	N/A	34	
E07	Throttle Advance Sw.	IN06	BINARY ACTIVE HIGH	52	Throttle Advance Switch at Tailgate Side.
E08	Buzzer Sw.	IN07	BINARY ACTIVE HIGH	33	Buzzer Switch at Tailgate Side.
E09	Curb Side System Pwr. Sw.	IN08	BINARY ACTIVE HIGH	24	Curb Side Tailgate System Power Switch
E10	Street Side System Pwr. Sw.	IN09	BINARY ACTIVE HIGH	41	Street Side Tailgate System Power Switch
E11	Work Light Sw.	IN10	BINARY ACTIVE HIGH	23	Work Light Switch, Tailgate Side
E12	Spare In	IN11	N/A	40	
E13	Slide Active Prox.	IN12	BINARY ACTIVE HIGH	22	Slide Active Proximity Switch
E14	Blade Active Prox.	IN13	BINARY ACTIVE HIGH	39	Blade Active Proximity Switch
E15	Tailgate Locked Prox.	IN14	BINARY ACTIVE HIGH	21	Tailgate Closed Proximity Switch
E16	Tailgate Closed Prox.	IN15	BINARY ACTIVE HIGH	38	Tailgate Lock Proximity Switch

CONTROLLER PROGRAM DOCUMENTATION FOR 109-0331 (CONTINUED)

OUTPUT FUNCTIONS					
F01	Right Turn Sig.	OUT00	BINARY ACTIVE HIGH	18	NOT USED
F02	Left Turn Sig.	OUT01	BINARY ACTIVE HIGH	17	NOT USED
F03	Stop Lights	OUT02	BINARY ACTIVE HIGH	16	NOT USED
F04	Back-Up Light/ Alarm	OUT03	BINARY ACTIVE HIGH	15	NOT USED
F05	Taillights	OUT04	BINARY ACTIVE HIGH	14	NOT USED
F06	Clearance Lights	OUT05	BINARY ACTIVE HIGH	13	NOT USED
F07	Tailgate Open Alarm	OUT06	BINARY ACTIVE HIGH	12	Tailgate Open Signal for Dual Function Back Up Alarm
F08	Sensor Power	OUT07	BINARY ACTIVE HIGH	11	Supplies power to input devices. See schematics for circuit details.
F09	Muni Flasher #1	OUT08	BINARY ACTIVE HIGH	2	Municipal Alternating Flashing light #1
F10	Muni Flasher #2	OUT09	BINARY ACTIVE HIGH	3	Municipal Alternating Flashing light #2
F11	Work Light #1	OUT10	BINARY ACTIVE HIGH	4	Outside Hopper Lights
F12	Reverse Camera Work LT	OUT11	BINARY ACTIVE HIGH	5	Backup Camera Lights
F13	Work Light #2	OUT12	BINARY ACTIVE HIGH	6	Inside Hopper Light
F14	Strobe 1	OUT13	BINARY ACTIVE HIGH	7	Tailgate Oval Strobe Lights
F15	Strobe 2	OUT14	BINARY ACTIVE HIGH	8	Tailgate 360° Strobe
F16	Spare Out	OUT15	N/A	9	

Body Controller Software

CONTROLLER PROGRAM DOCUMENTATION FOR 109-0331-EXT

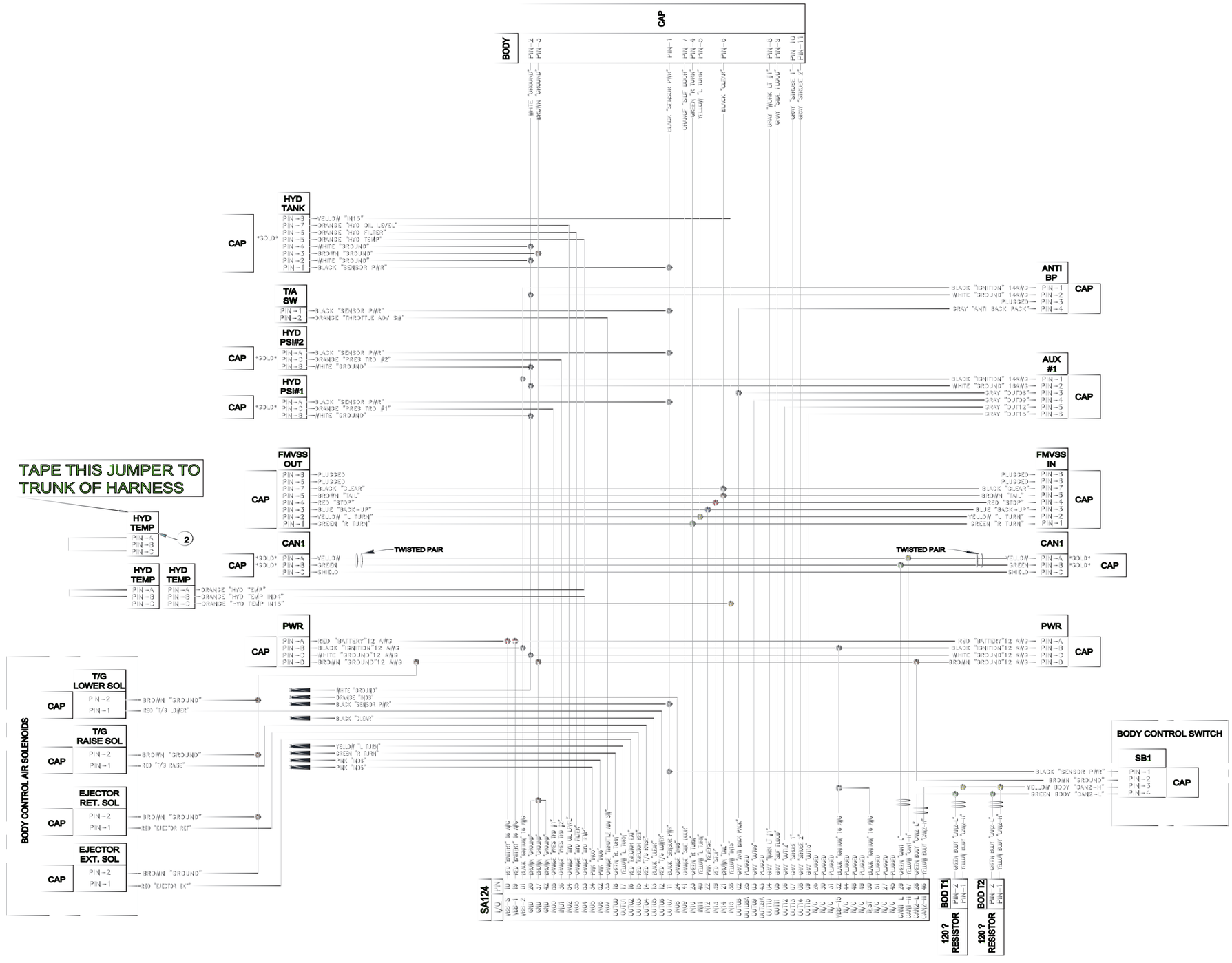
PROGRAM: 109-0331-EXT REVISION: 20201102 CONTROLLER REL-TAILGATE-EXT (HYD) (CR2530 EXT)		I/O ADDRESS	SIGNAL	PIN #	FUNCTION DESCRIPTION
INPUT FUNCTIONS					
G01	Tailgate Hyd. Press. #1	IN00	ANALOG	55	Hyd. Pressure Transducer. Main body valve inlet pressure. (0.50-4.50 VDC) = (0-3000 PSI)
G02	Tailgate Hyd. Press. #2	IN01	ANALOG	36	Hyd. Pressure Transducer. Main body valve inlet pressure. (0.50-4.50 VDC) = (0-3000 PSI)
G03	Slide Full Retracted Prox.	IN02	BINARY ACTIVE HIGH	54	Input ON with Slide in Full Retract position.
G04	Spare In	IN03	N/A	35	
G05	Spare In	IN04	N/A	53	
G06	Spare In	IN05	N/A	34	
G07	Spare In	IN06	N/A	52	
G08	Spare In	IN07	N/A	33	
G09	Spare In	IN08	N/A	24	
G10	Spare In	IN09	N/A	41	
G11	Spare In	IN10	N/A	23	
G12	Spare In	IN11	N/A	40	
G13	Spare In	IN12	N/A	22	
G14	Spare In	IN13	N/A	39	
G15	Spare In	IN14	N/A	21	
G16	Spare In	IN15	N/A	38	

CONTROLLER PROGRAM DOCUMENTATION FOR 109-0331-EXT (CONTINUED)

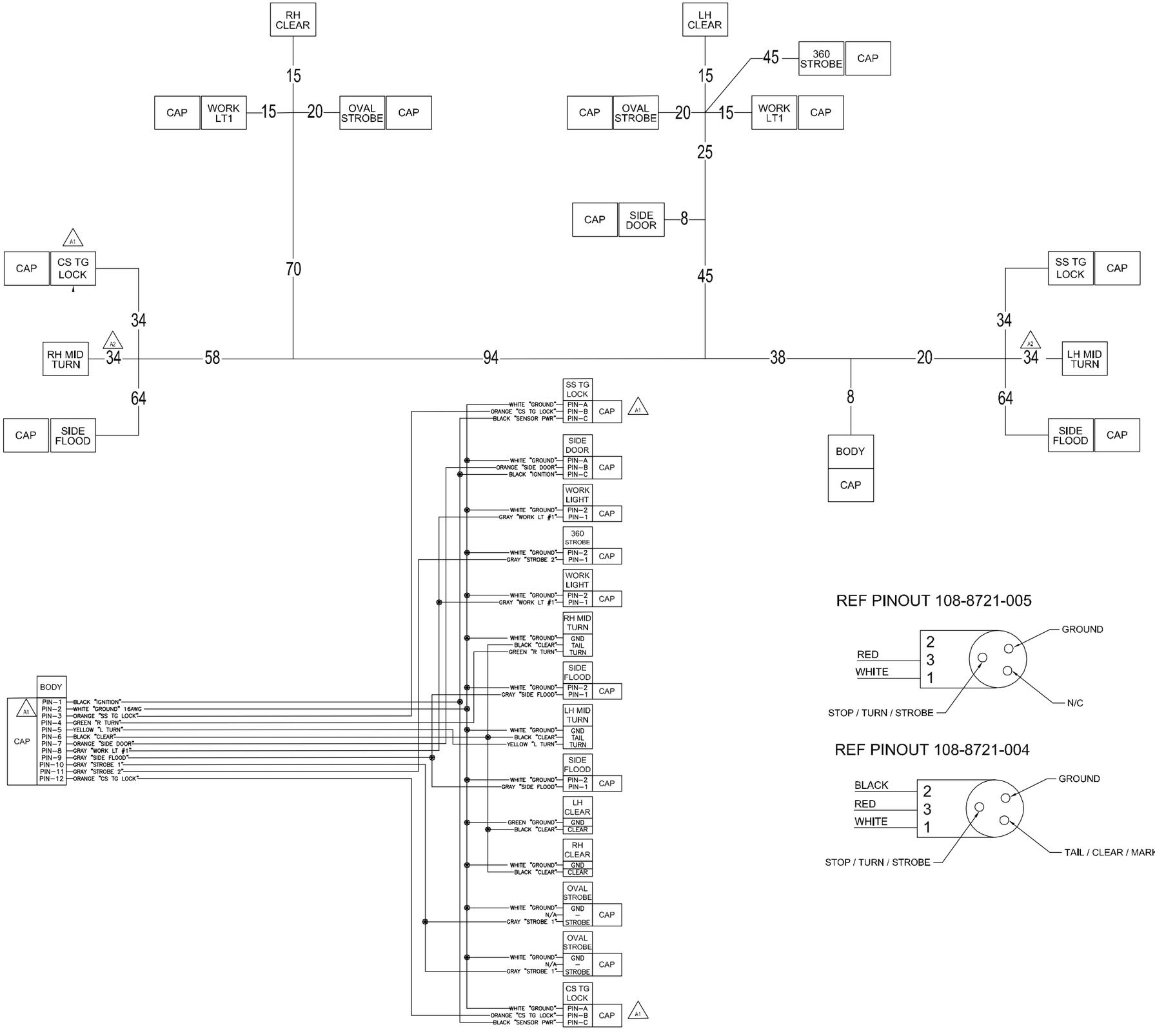
OUTPUT FUNCTIONS					
H01	Slide Up Sol.	OUT00	PWM	18	Moves Tailgate Packer Side Up
H02	Slide Down Sol.	OUT01	PWM	17	Moves Tailgate Packer Side Down
H03	Blade In Sol.	OUT02	PWM	16	Rotates Tailgate Packer Blade In
H04	Blade Out Sol.	OUT03	PWM	15	Rotates Packer Blade Out
H05	Tipper #1 Up Sol.	OUT04	PWM	14	Raises Single or Curb Side Tipper
H06	Tipper #1 Down Sol.	OUT05	PWM	13	Lowers Single or Curb Side Tipper
H07	Tipper #2 Up Sol.	OUT06	PWM	12	Raises Street Side Tipper
H08	Tipper #2 Down Sol.	OUT07	PWM	11	Lowers Street Side Tipper
H09	Roll Bar Up Sol.	OUT08	PWM	2	Raises Roll Bar
H10	Roll Bar Down Sol.	OUT09	PWM	3	Lowers Roll Bar
H11	Winch/Rev Retract Sol.	OUT10	PWM	4	Retracts Winch or Reeving Mech. Cable
H12	Winch/Rev Extend Sol.	OUT11	PWM	5	Extends Winch or Reeving Mech. Cable
H13	Build Up Sol.	OUT12	BINARY ACTIVE HIGH	6	Closes Valve drain port to create pressure build up
H14	Sensor Power	OUT13	BINARY ACTIVE HIGH	7	Supplies power to input devices. See schematics for circuit details.
H15	Spare Out	OUT14	N/A	8	
H16	Spare Out	OUT15	N/A	9	

NOTES

SECTION 7
SCHEMATICS



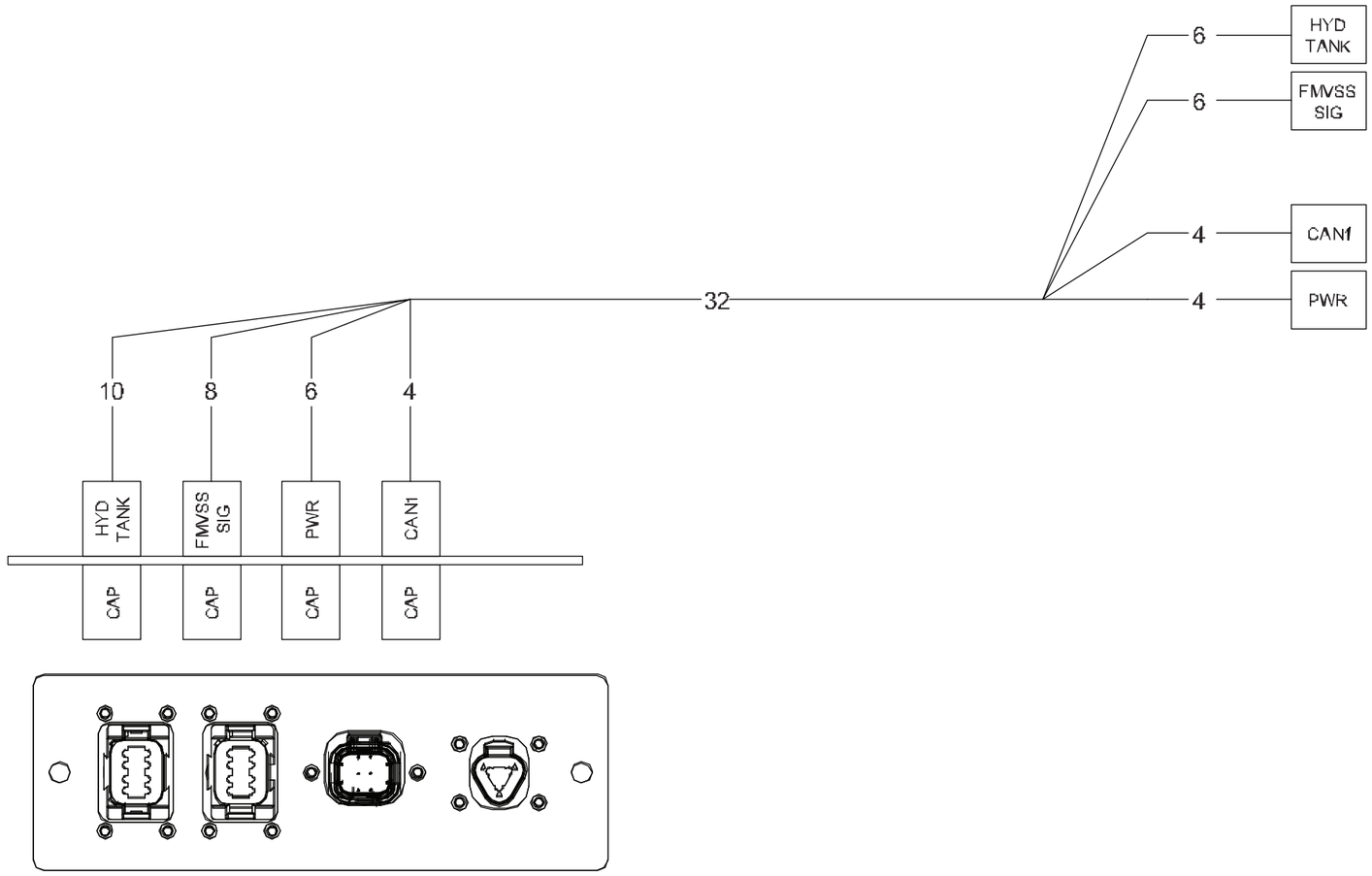
HARNESS, BODY CONTROLLER 2020 REL
263-1869-001
REV: C2
03/01/19

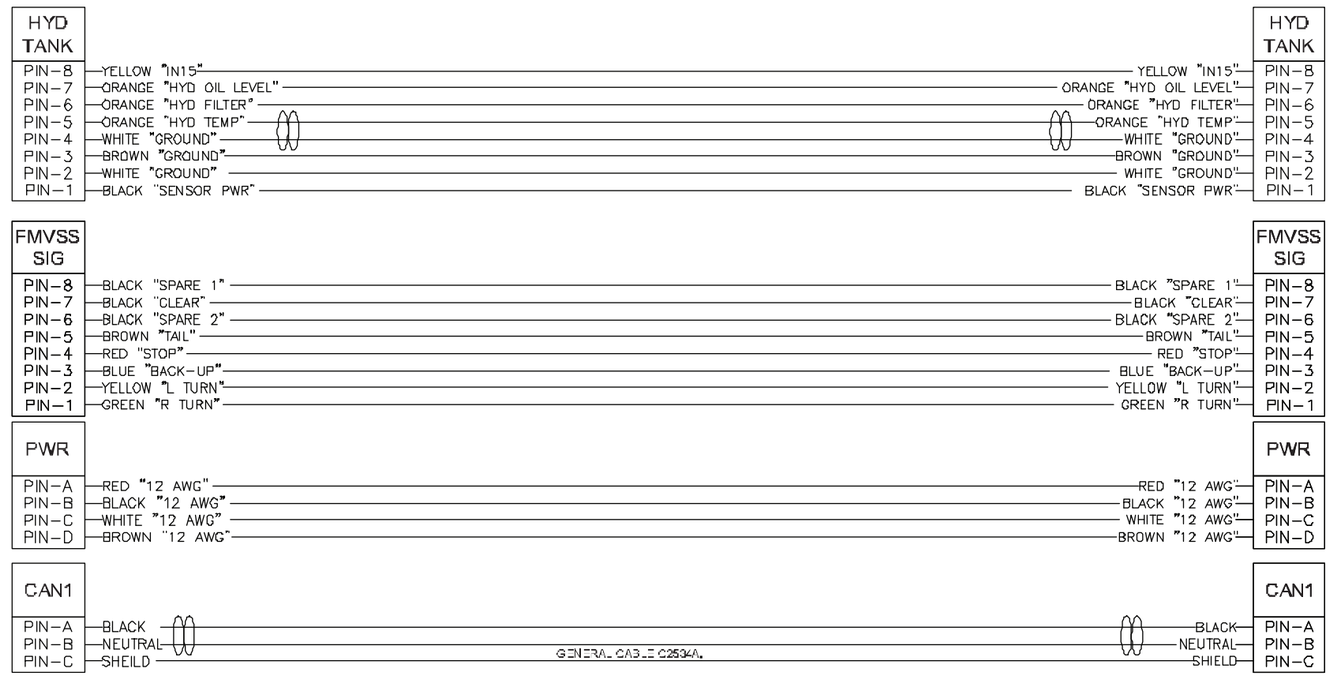


REF PINOUT 108-8721-005

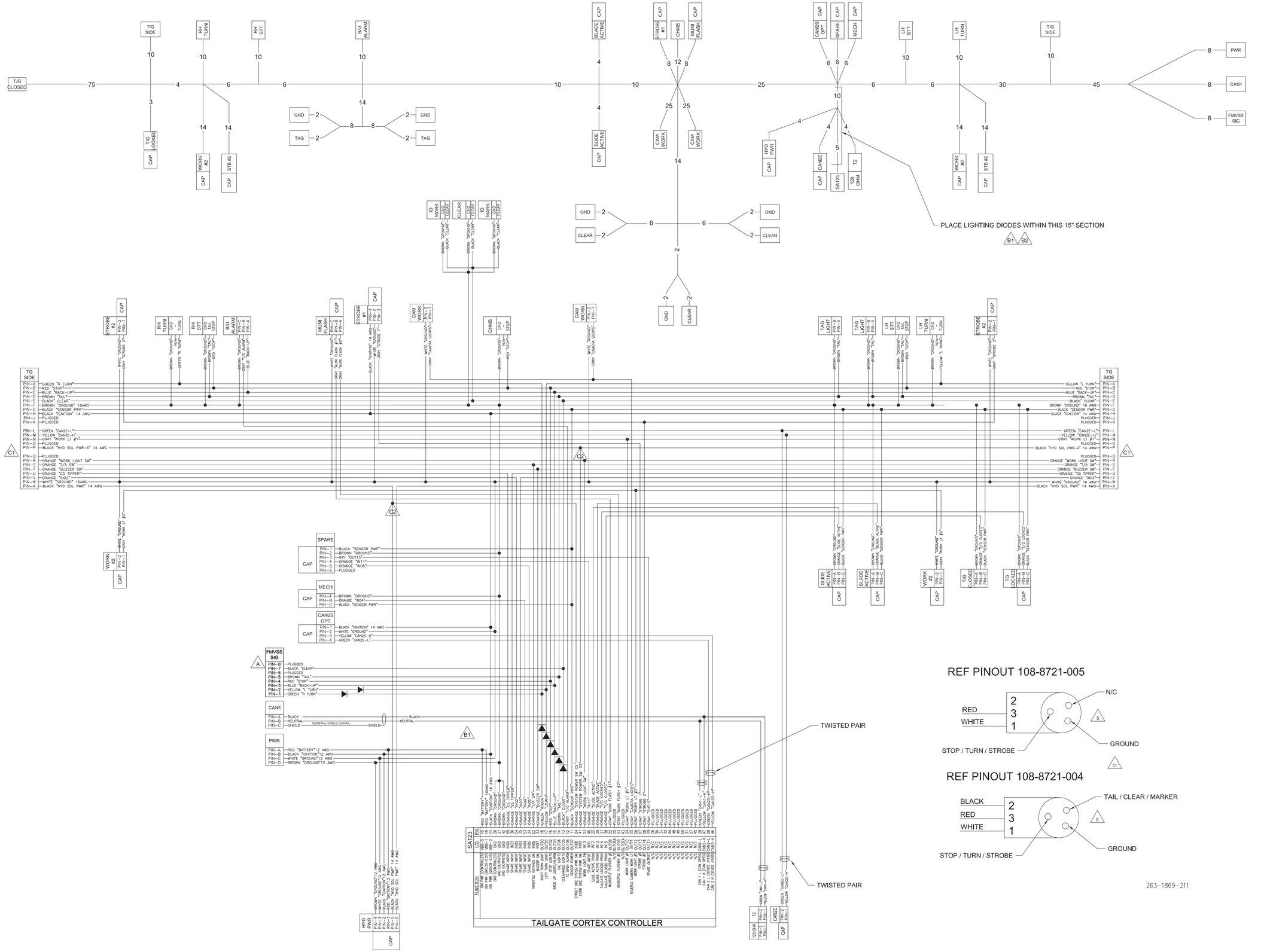
REF PINOUT 108-8721-004

HARNESS, BODY, 2020 REL
263-1869-003
REV: A3
RELEASE DATE: 04/09/20

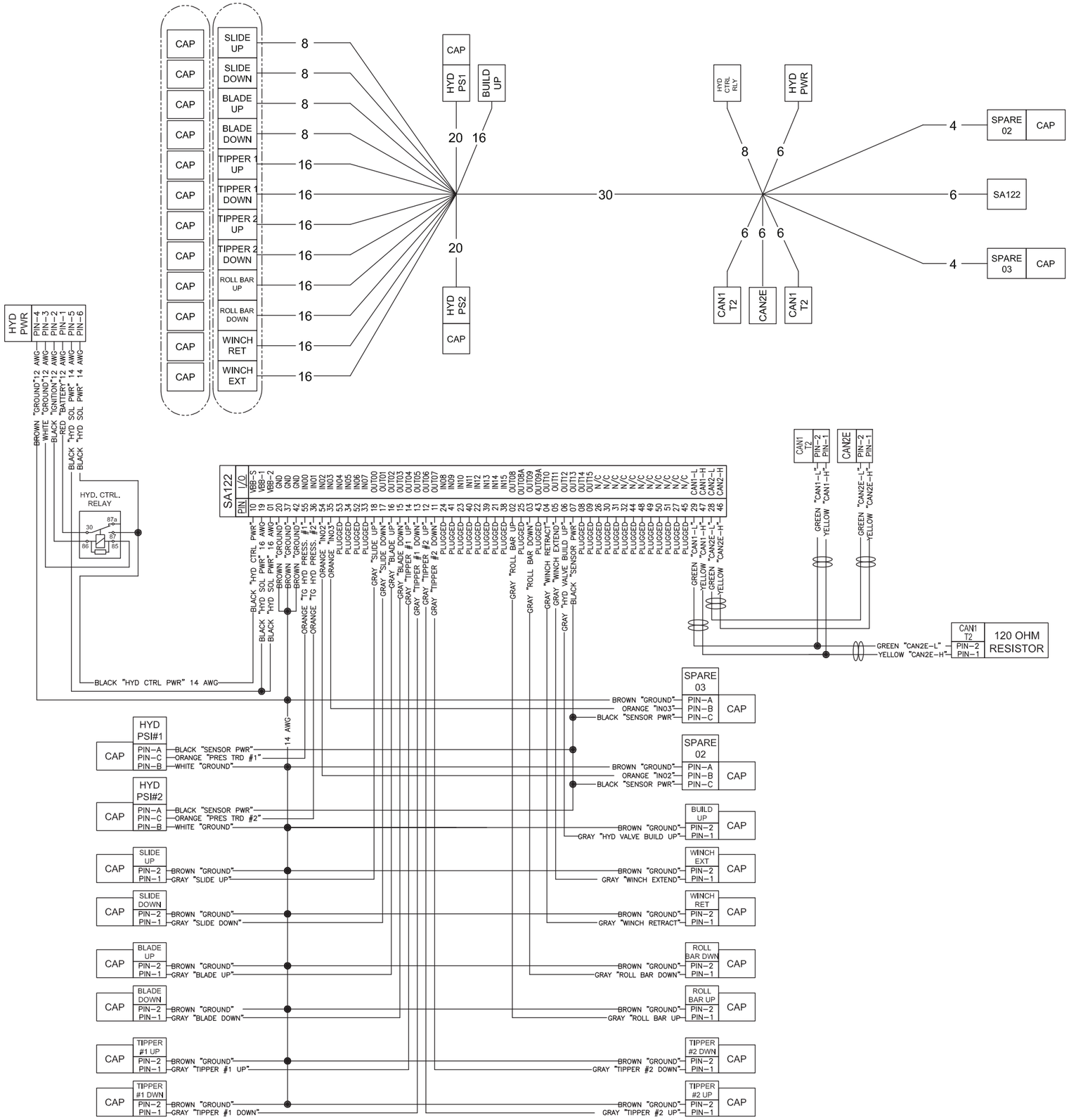




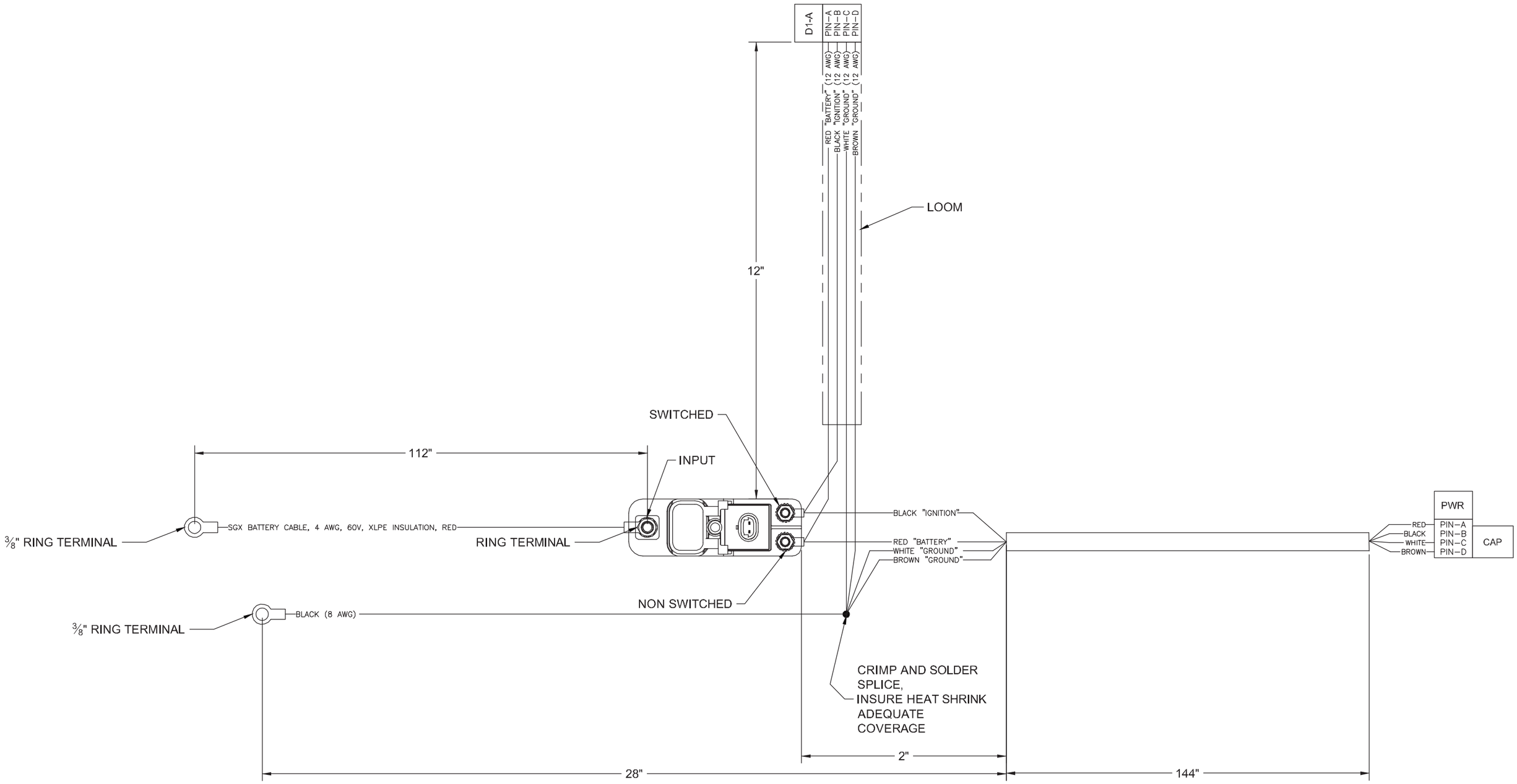
HARNESS, BODY BULKHEAD
263-1869-004
REV: A
RELEASE DATE: 04/27/20



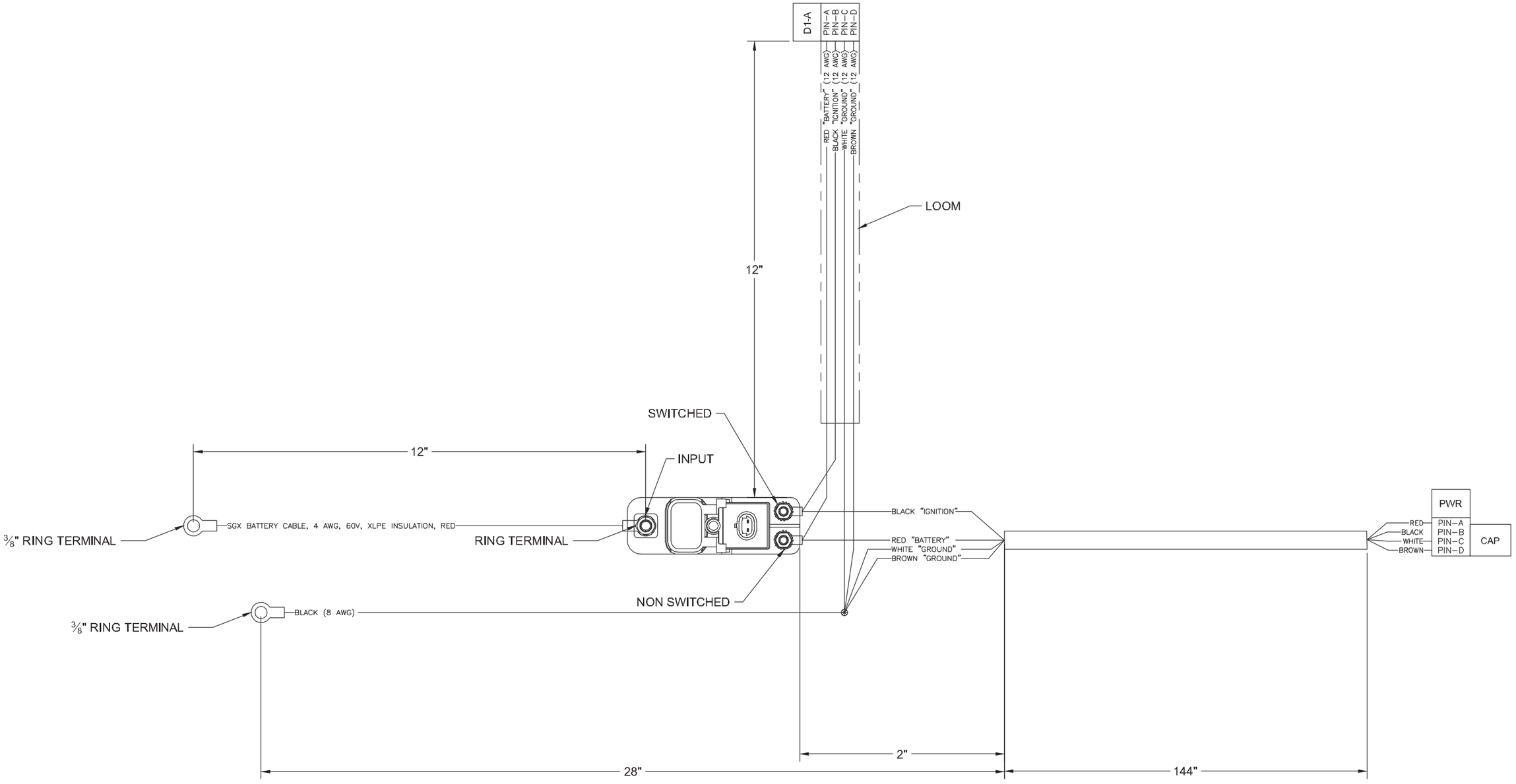
HARNESS, MID TAILGATE
LIGHT CLUSTER
263-1869-211
REV: C2
RELEASE DATE: 05/11/20



HARNESS, TAILGATE, HYD VALVE CONTROL
263-1869-212
REV: -
RELEASE DATE: 05/12/20



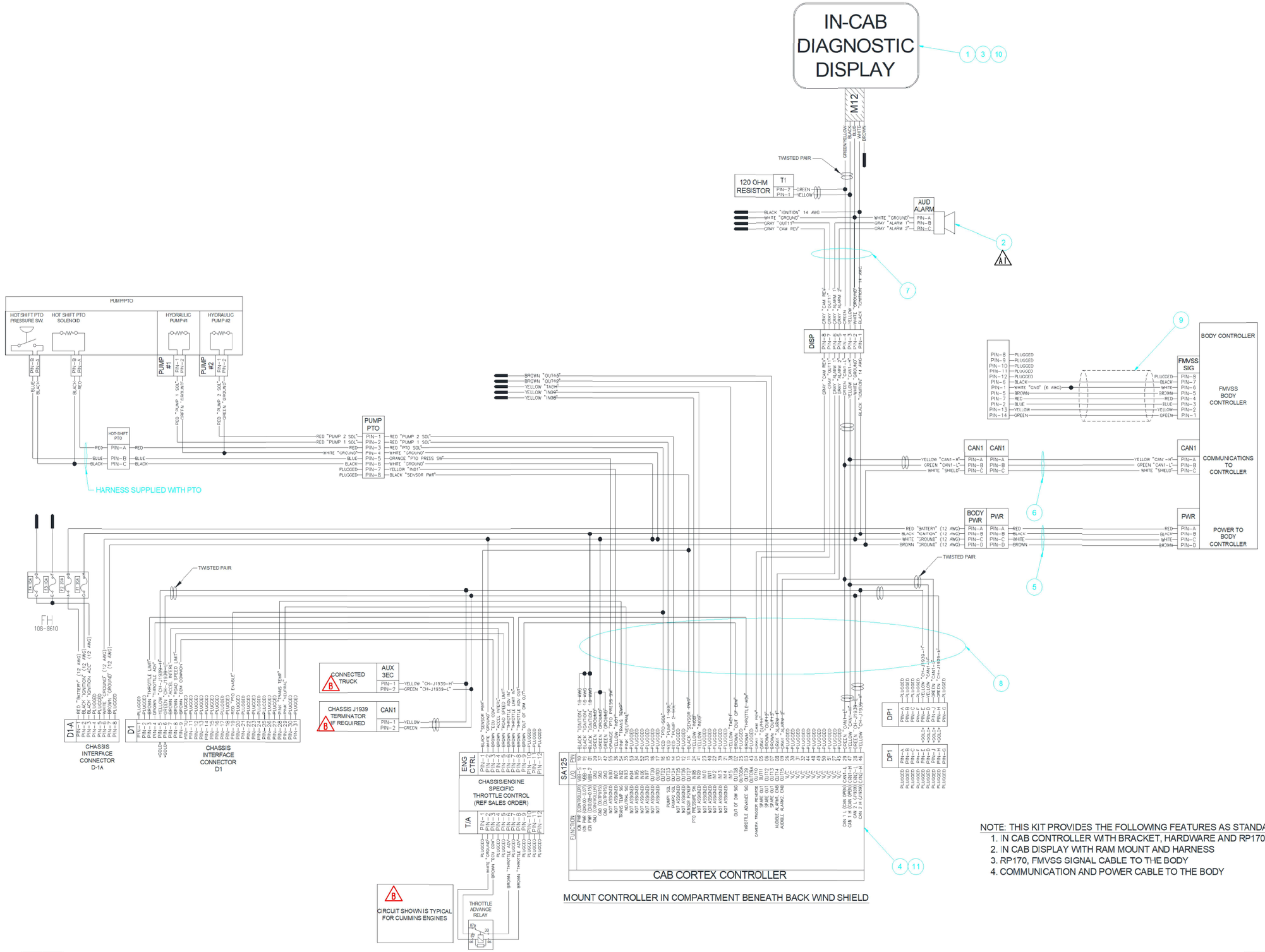
HARNESS, BATTERY POWER RELAY, NON-RP170
263-1880-001
REV: -
RELEASE DATE: 02/20/19



HARNESS, BATTERY RELAY, NON-RP170
263-1880-002
REV: -
RELEASE DATE: 09/24/19

DRAWING SIZE	D
MODEL VERSION	B.2
DRAWING VERSION	B.1
MODIFIED BY	Tony Coffey

REF	PART No.	DESCRIPTION	QTY
1	108-8594-100	RAM MOUNT, DISPLAY, IFM CR0451	1
2	108-8616-002	BUZZER, DUAL TONE	1
3	108-8663	DISPLAY, 4.3" INSIGHT DIAGNOTSTIC	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1872-086	CABLE, CONTROL MODULE PWR. 8.6M	1
6	263-1873-086	CABLE, CONTROL MODULE COMM. 8.6M	1
7	263-1874-001	HARNESS, DISPLAY/CONTROLS, CONV. CAB	1
8	263-1882-002	HARNESS, CHASSIS INTERFACE	1
9	263-1885-002	CABLE, FMVSS SIGNALS	1
10	311-5431	BRACKET, IFM CR0451 DISPLAY MNT	1
11	311-6304	BRACKET, CONTROLLER BODY SIDE	1



470-0027-002

NOTE: THIS KIT PROVIDES THE FOLLOWING FEATURES AS STANDARD TO BE INSTALLED ON A FREIGHTLINER ECONIC CHASSIS:

1. IN CAB CONTROLLER WITH BRACKET, HARDWARE AND RP170 INTERFACE HARNESS
2. IN CAB DISPLAY WITH RAM MOUNT AND HARNESS
3. RP170, FMVSS SIGNAL CABLE TO THE BODY
4. COMMUNICATION AND POWER CABLE TO THE BODY

REV.	NAS	DATE	ECO NO.
B	ADD NOTES	17-Dec-20	5F20019
A2	REVISE TITLE	26-Aug-20	5F20008
A1	ADDED 108-8616-002,QTY 1	26-Aug-20	5F20008
-	RELEASED	07-Apr-20	PT20006

SHEET 1 OF 1

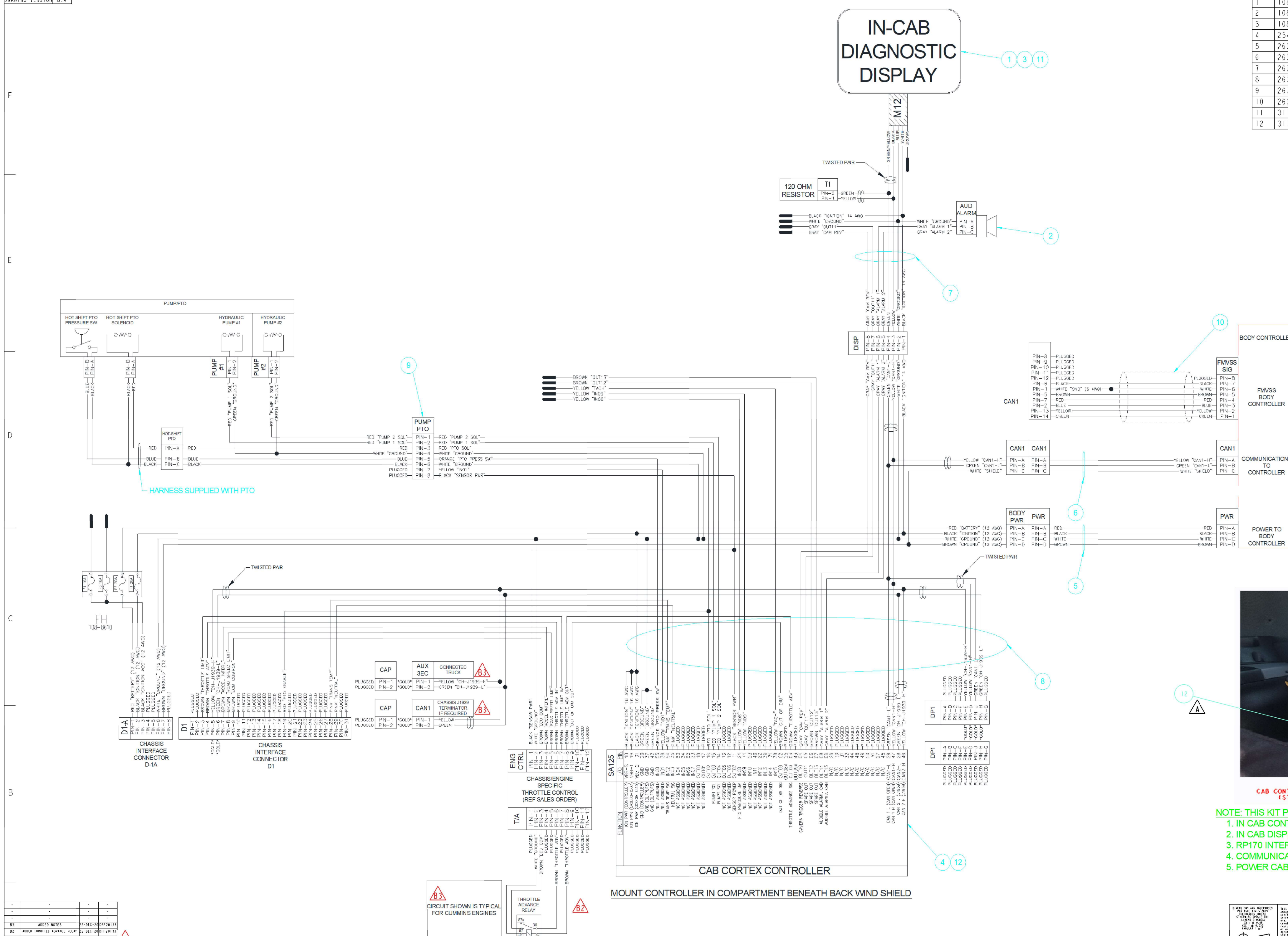
DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994 UNLESS OTHERWISE SPECIFIED: X ± 0.5 [0.02] XX ± 0.25 [0.01] XXX ± 0.127 [0.005] ANGULAR ± 1°

THE HEIL CO.

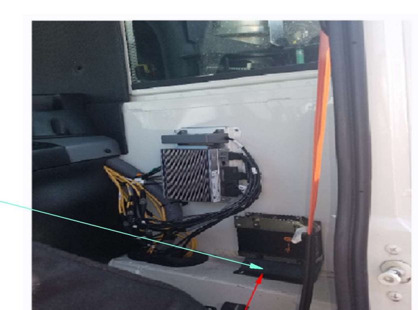
WEIGHT [LB]	
TYPE	ASSEM
DATE:	17-Dec-20
SCALE:	1:2
MATERIAL:	AS PER BOM
DRAWN BY:	CLG
PART No.	470-0027-002

TITLE: CAB CONTROL KIT, ECONIC (RP170), 2020 REL

DRAWING SIZE	D	MODIFIED BY	Chandra Behera
MODEL VERSION	B.4		
DRAWING VERSION	B.4		



REF	PART No.	DESCRIPTION	QTY
1	108-8594-100	RAM MOUNT, DISPLAY, IFM CR0451	1
2	108-8616-002	BUZZER, DUAL TONE	1
3	108-8663	DISPLAY, 4.3′ INSIGHT DIAGNOTSTIC	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1872-079	CABLE, CONTROL MODULE PWR. 7.9M	1
6	263-1873-079	CABLE, CONTROL MODULE COMM. 7.9M	1
7	263-1874-002	HARNESS, DISPLAY/CONTROLS, CAB OVER	1
8	263-1882-002	HARNESS, CHASSIS INTERFACE	1
9	263-1883-002	HARNESS, PUMP PTO SOL CAB OVER	1
10	263-1885-002	CABLE, FMVSS SIGNALS	1
11	311-5431	BRACKET, IFM CR0451 DISPLAY MNT	1
12	311-6696	BRACKET, CAB CONTROLLER	1



CAB CONTROLLER MOUNTING (STREET SIDE SEAT)

NOTE: THIS KIT PROVIDES THE FOLLOWING FEATURES AS STANDARD:

1. IN CAB CONTROLLER/BRACKET/HARDWARE/HARNESS
2. IN CAB DISPLAY/RAM MOUNT/HARNESS
3. RP170 INTERFACE HARNESS/FMVSS SIGNAL HARNESS
4. COMMUNICATION CABLE
5. POWER CABLE

REV.	WAS	DATE	ECO NO.
-	-	-	-
-	-	-	-
-	-	-	-
B3	ADDED NOTES	22-DEC-20	DPF20133
B2	ADDED THROTTLE ADVANCE RELAY	22-DEC-20	DPF20133
B1	ADDED 311-6696 AND REMOVED311-6304	15-DEC-20	DPF20133
A2	ADD 263-1883-002, QTY 1	01-Aug-20	5F20008
A1	ADDED 108-8616-002, QTY 1	26-AUG-20	5F20008
-	RELEASED	08-Apr-20	PT20006

SHEET 1 OF 1

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009 TOLERANCES UNLESS OTHERWISE SPECIFIED: LINEAR (INCHES) XX = ± 0.06 XXX = ± 0.030 ANGULAR = ±1°

WEIGHT: [.2] | TYPE: ASSEM | DATE: 18-Apr-20 | SCALE: 1:2

HEIL — THE HEIL CO.

TITLE: CAB CONTROL KIT, CAB OVER (RP170), 2020 REL

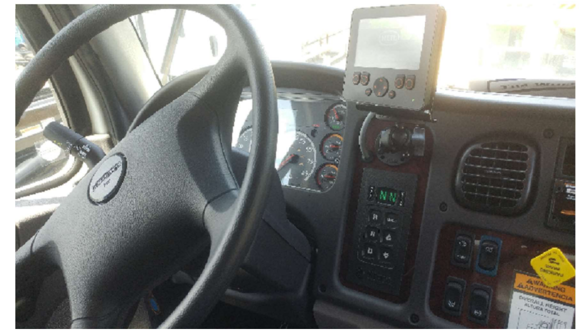
MATERIAL: AS PER BOM

DRAWN BY: CHANDRA

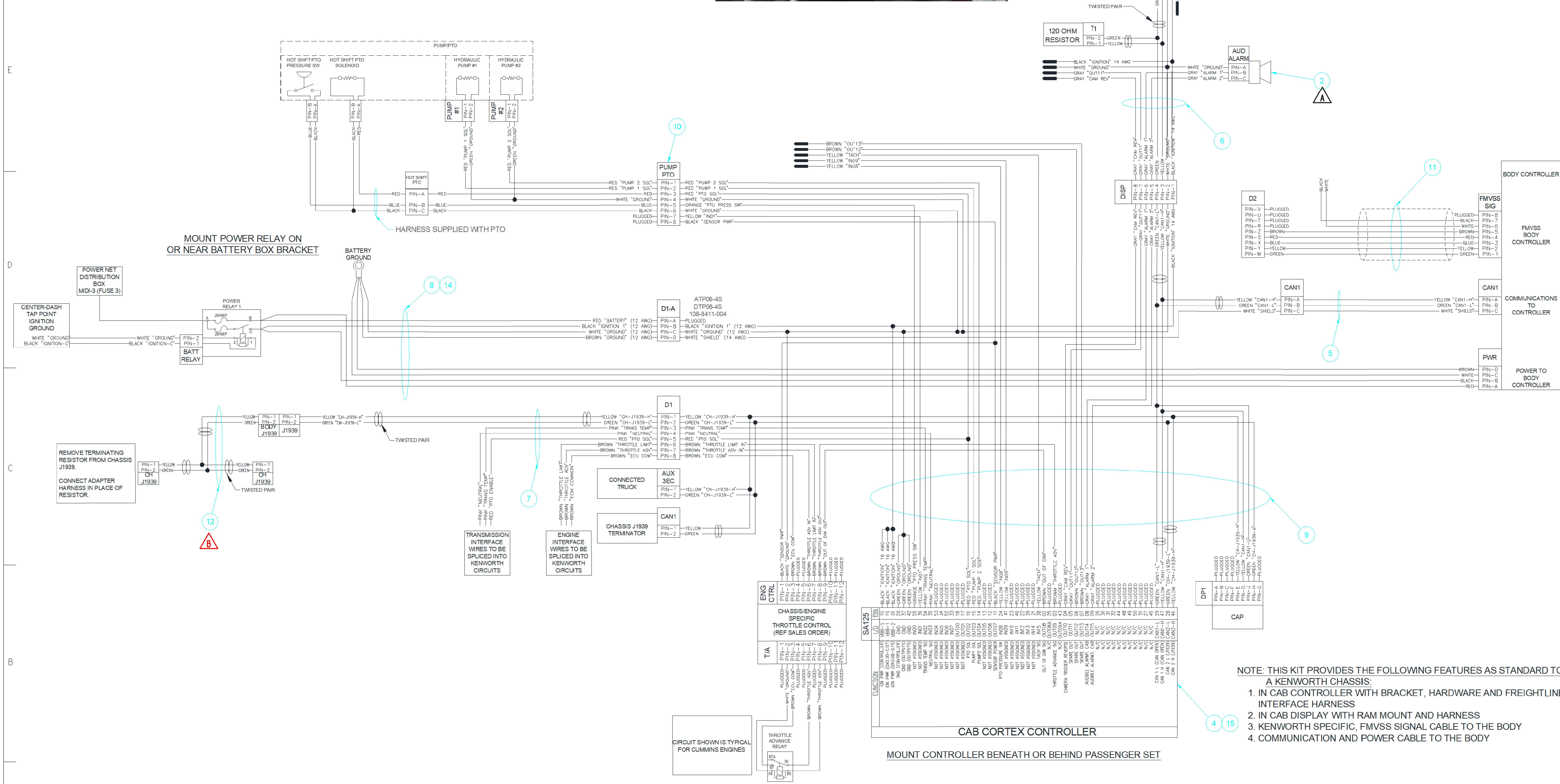
PART No. 470-0027-003

DRAWING SIZE	D	MODIFIED BY	Tony Coffey
MODEL VERSION	B.3		
DRAWING VERSION	B.4		

MOUNT DISPLAY ON DASH NEAR DRIVER IN LOCATION
THAT DOESN'T OBSTRUCT DRIVER'S VIEW.
(PICTURE FOR REFERENCE ONLY. PICTURED IS A FREIGHTLINER)



REF	PART No.	DESCRIPTION	QTY
1	108-8594-100	RAM MOUNT, DISPLAY, IFM CR0451	1
2	108-8616-002	BUZZER, DUAL TONE	1
3	108-8663	DISPLAY, 4.3" INSIGHT DIAGNOSTIC	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1873-031	CABLE, CONTROL MODULE COMM. 3.1M	1
6	263-1874-001	HARNESS, DISPLAY/CONTROLS, CONV. CAB	1
7	263-1879-003	HARNESS, CHASSIS INTERFACE	1
8	263-1880-002	HARNESS, BATT. POWER RELAY 2020 REL	1
9	263-1882-001	HARNESS, CHASSIS INTERFACE	1
10	263-1883-001	HARNESS, PUMP PTO SOL CONV. CAB	1
11	263-1885-003	CABLE, FMVSS SIGNALS	1
12	263-1916-002	HARNESS, J1939 ADAPTER	1
13	311-5431	BRACKET, IFM CR0451 DISPLAY MNT	1
14	311-6202	BRACKET, BATTERY BOX RELAY	1
15	311-6304	BRACKET, CONTROLLER BODY SIDE	1



IN-CAB DIAGNOSTIC DISPLAY
M12
TWISTED PAIR
120 OHM RESISTOR
AUD ALARM
PUMP/PTO
HOT SHIFT PTO PRESSURE SW.
HOT SHIFT PTO SOLENOID
HYDRAULIC PUMP #1
HYDRAULIC PUMP #2
PUMP PTO
HARNESS SUPPLIED WITH PTO
MOUNT POWER RELAY ON OR NEAR BATTERY BOX BRACKET
BATTERY GROUND
POWER NET DISTRIBUTION BOX MIDI-3 (FUSE 3)
CENTER-DASH TAP POINT IGNITION GROUND
POWER RELAY 1
BATT RELAY
D1-A
ATP06-4S
DTP06-4S
108-8411-004
D2
BODY CONTROLLER
FMVSS SIG
FMVSS BODY CONTROLLER
CAN1
COMMUNICATIONS TO CONTROLLER
PWR
POWER TO BODY CONTROLLER
470-0027-004
D1
REMOVE TERMINATING RESISTOR FROM CHASSIS J1939.
CONNECT ADAPTER HARNESS IN PLACE OF RESISTOR.
BODY J1939
CH J1939
TWISTED PAIR
CONNECTED TRUCK
AUX 3EC
CHASSIS J1939 TERMINATOR
TRANSMISSION INTERFACE WIRES TO BE SPLICED INTO KENWORTH CIRCUITS
ENGINE INTERFACE WIRES TO BE SPLICED INTO KENWORTH CIRCUITS
ENG CTRL
CHASSIS/ENGINE SPECIFIC THROTTLE CONTROL (REF SALES ORDER)
T/A
CIRCUIT SHOWN IS TYPICAL FOR CUMMINS ENGINES
THROTTLE ADVANCE RELAY
SA125
DISP
DP1
CAP
CAB CORTEX CONTROLLER
MOUNT CONTROLLER BENEATH OR BEHIND PASSENGER SET

NOTE: THIS KIT PROVIDES THE FOLLOWING FEATURES AS STANDARD TO BE INSTALLED ON A KENWORTH CHASSIS:

1. IN CAB CONTROLLER WITH BRACKET, HARDWARE AND FREIGHTLINER SPECIFIC INTERFACE HARNESS
2. IN CAB DISPLAY WITH RAM MOUNT AND HARNESS
3. KENWORTH SPECIFIC, FMVSS SIGNAL CABLE TO THE BODY
4. COMMUNICATION AND POWER CABLE TO THE BODY

REV.	WAS	DATE	ECO NO.
B	ADD 263-1916-002, QTY 1	16-Dec-20	SF20019
A	ADDED 108-8616-002, QTY 1	26-Aug-20	SF20008
-	RELEASED	16-Dec-20	PT20006

SHEET 1 OF 1

THE HEIL CO.

TITLE: CAB CONTROL KIT, KENWORTH (NON-RP170), 2020 REL

TYPE: ASSEM

DATE: 16-Dec-20

SCALE: 1:2

WEIGHT: 1.23

MATERIAL: AS PER BOM

DRAWN BY: CLG

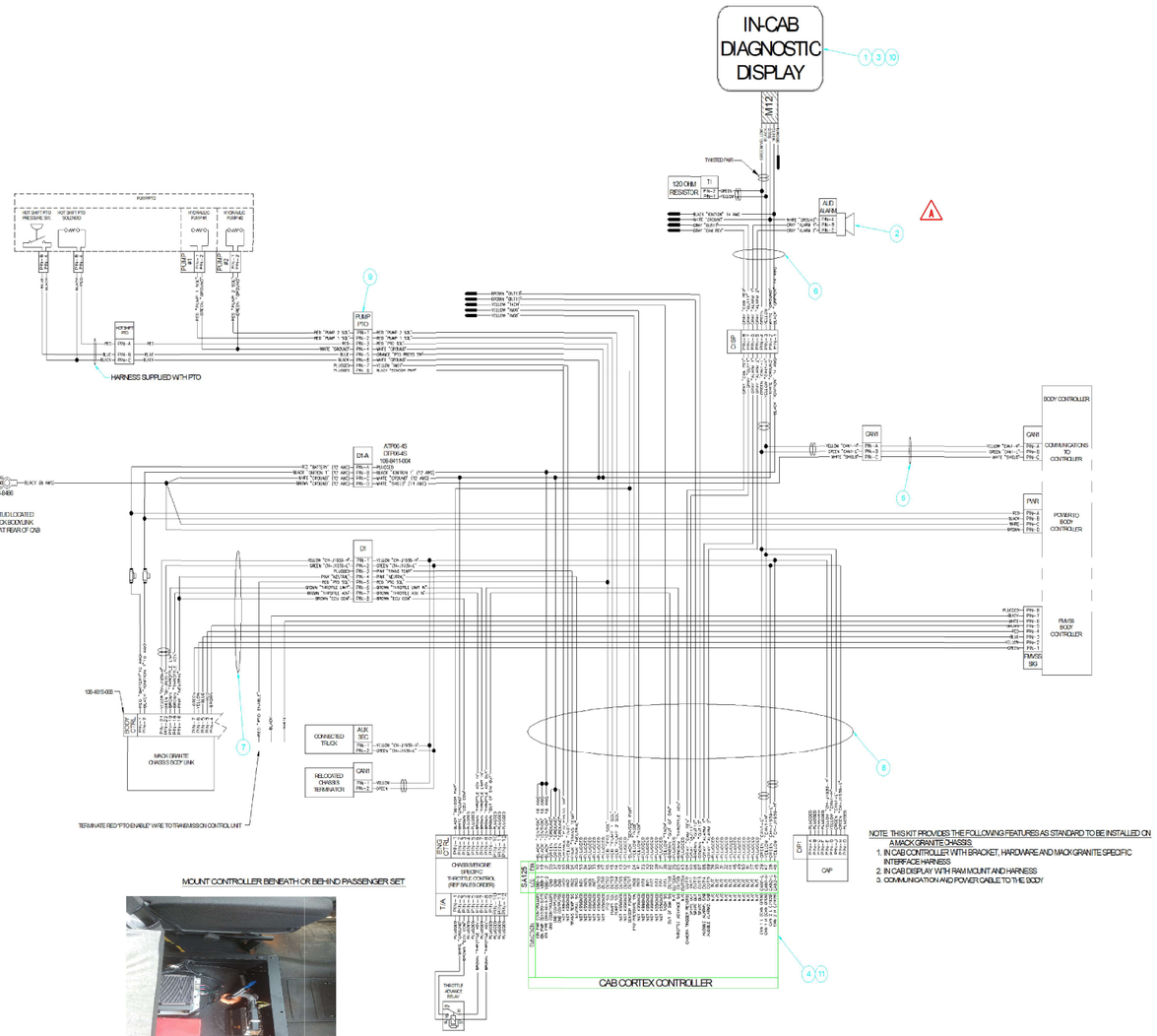
PART No. 470-0027-004

DRAWING SIZE	D
REVISION	A
ECO #	SF20008

REF	PART No.	DESCRIPTION	QTY
1	108-8594-100	RAM MOUNT, DISPLAY, 1FM C10451	1
2	108-8616-002	BUZZER, DUAL TONE	1
3	108-8663	DISPLAY, 4.3" INSIGHT DIAGNOTSTIC	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1873-03	CABLE, CONTROL MODULE COMM, 3.1M	1
6	263-1874-00	HARNESS, DISPLAY/CONTROLS, CONV. CAB	1
7	263-1879-002	HARNESS, CHASSIS INTERFACE, MACK GRANITE (NON-RP170)	1
8	263-1882-00	HARNESS, CHASSIS INTERFACE	1
9	263-1883-00	HARNESS, CHASSIS INTERFACE	2
10	311-5431	BRACKET, 1FM CR0451 DISPLAY MNT	1
11	311-6304	BRACKET, CONTROLLER BODY SIDE	1

MOUNT DISPLAY ON DASH

NOTE: PICTURES FOR REFERENCE ONLY



MOUNT CONTROLLER BENEATH OR BEHIND PASSENGER SET

NOTE: THIS KIT PROVIDES THE FOLLOWING FEATURES AS STANDARD TO BE INSTALLED ON A MACK GRANITE CHASSIS

1. IN CAB CONTROLLER WITH BRACKET, HARDWARE AND MACK GRANITE SPECIFIC INTERFACE HARNESS
2. IN CAB DISPLAY WITH RAM MOUNT AND HARNESS
3. COMMUNICATION AND POWER CABLE TO THE BODY

470-0027-005

REV.	DESCRIPTION	DATE	ECO NO.
A	ADDED 108-8616-002, QTY 1	26-AUG-20	SF20008
-	RELEASED	08-Apr-20	PT20000

WEIGHT	
TYPE	ASSEM
DATE:	08-Apr-20
SCALE:	1:2

THE HEIL CO.

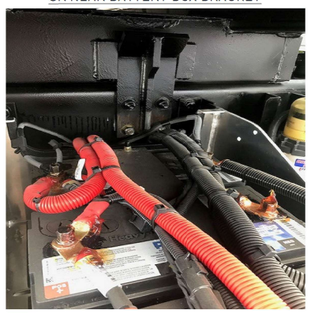
TITLE: CAB CONTROL KIT, MACK GRANITE (NON-RP170) 2020 REL

MATERIAL:	DRAWN BY:	PART No.
PER BOM	CLG	470-0027-005

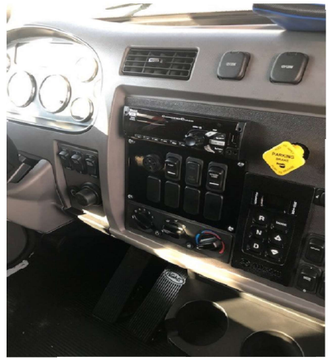
DRAWING SIZE	D
MODEL VERSION	B.2
DRAWING VERSION	B.2
MODIFIED BY	Tony Coffey

REF	PART No.	DESCRIPTION	QTY
1	108-8594-100	RAM MOUNT, DISPLAY, IFM CR0451	1
2	108-8616-002	BUZZER, DUAL TONE	1
3	108-8663	DISPLAY, 4.3" INSIGHT DIAGNOTSTIC	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1873-031	CABLE, CONTROL MODULE COMM. 3.1M	1
6	263-1874-001	HARNESS, DISPLAY/CONTROLS, CONV. CAB	1
7	263-1879-003	HARNESS, CHASSIS INTERFACE	1
8	263-1880-002	HARNESS, BATT. POWER RELAY 2020 REL	1
9	263-1882-001	HARNESS, CHASSIS INTERFACE	1
10	263-1883-001	HARNESS, PUMP PTO SOL CONV. CAB	1
11	263-1885-004	CABLE, FMVSS SIGNALS	1
12	263-1916-002	HARNESS, J1939 ADAPTER	1
13	311-5431	BRACKET, IFM CR0451 DISPLAY MNT	1
14	311-6202	BRACKET, BATTERY BOX RELAY	1
15	311-6304	BRACKET, CONTROLLER BODY SIDE	1

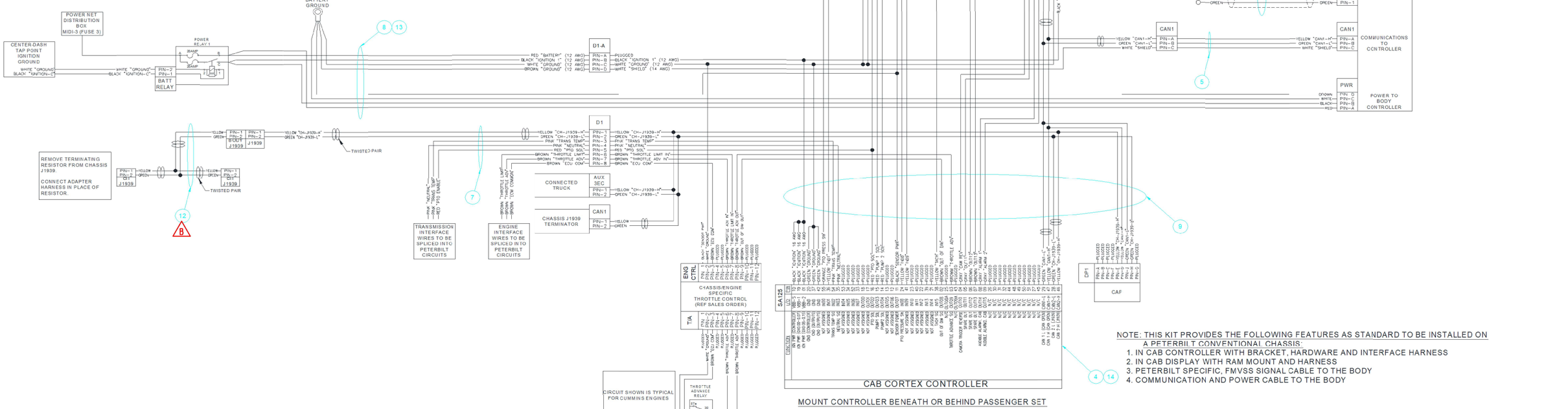
MOUNT POWER RELAY ON
OR NEAR BATTERY BOX BRACKET



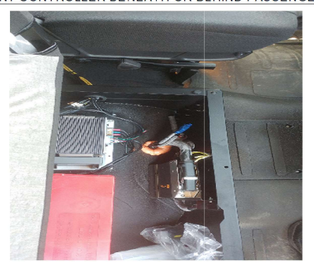
MOUNT DISPLAY ON DASH NEAR DRIVER IN LOCATION
THAT DOESN'T OBSTRUCT DRIVER'S VIEW.
(PICTURE FOR REFERENCE ONLY. DISPLAY WILL REPLACE SWITCH
PANEL PICTURED BELOW.



FMVSS LIGHTING JUNCTION BOX LOCATED EITHER BEHIND THE CAB
OR AT THE END OF FRAME RAIL.



MOUNT CONTROLLER BENEATH OR BEHIND PASSENGER SET



NOTE: THIS KIT PROVIDES THE FOLLOWING FEATURES AS STANDARD TO BE INSTALLED ON A PETERBILT CONVENTIONAL CHASSIS:

1. IN CAB CONTROLLER WITH BRACKET, HARDWARE AND INTERFACE HARNESS
2. IN CAB DISPLAY WITH RAM MOUNT AND HARNESS
3. PETERBILT SPECIFIC, FMVSS SIGNAL CABLE TO THE BODY
4. COMMUNICATION AND POWER CABLE TO THE BODY

470-0027-006

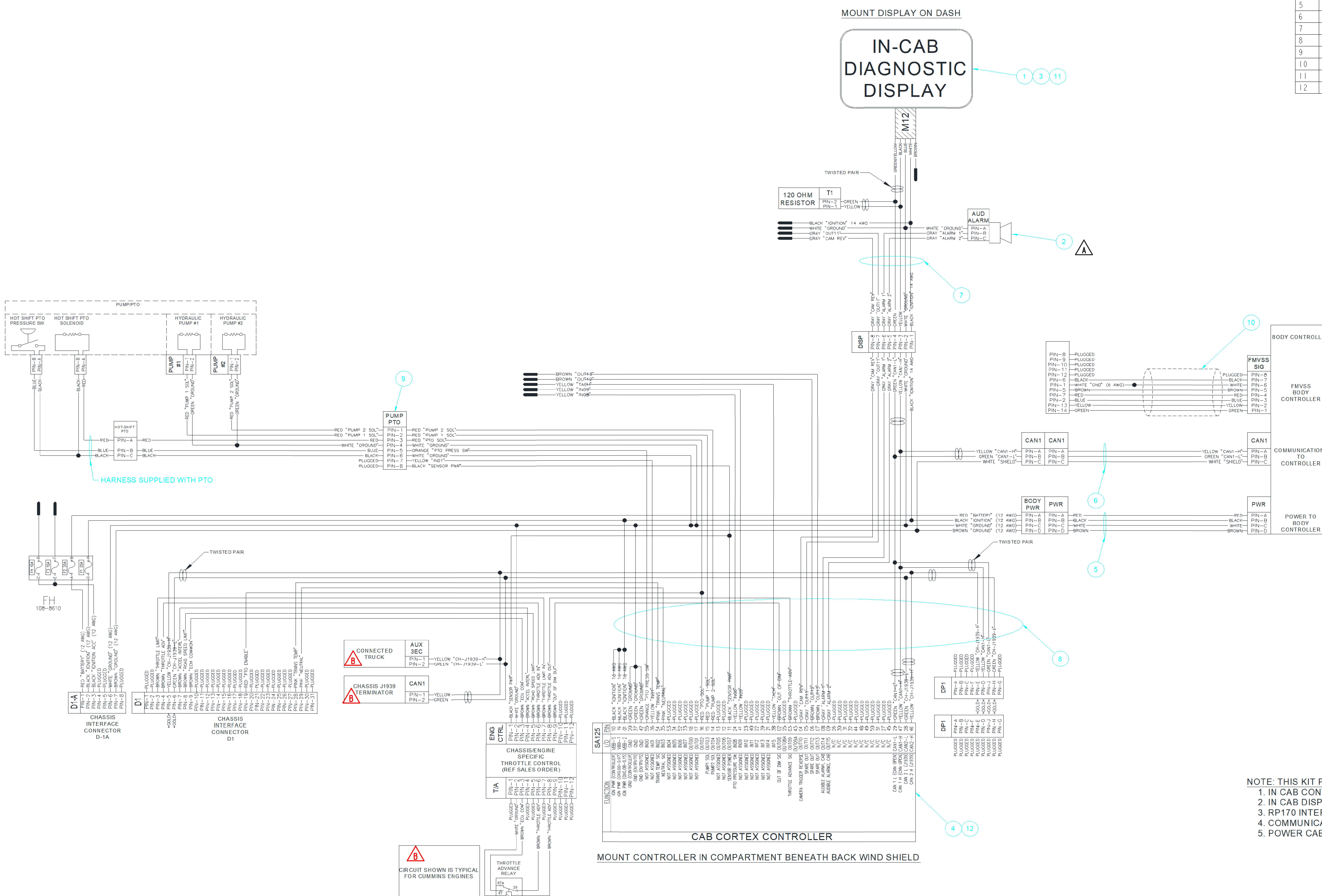
REV.	WAS	DATE	ECO NO.
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
B	ADD 263-1916-002, QTY 1	16-Dec-20	SF20019
A	ADDED 108-8616-002, QTY 1	26-Aug-20	SF20008
-	RELEASED	30-Apr-20	PT20006

SHEET 1 OF 1

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009 TOLERANCES UNLESS OTHERWISE SPECIFIED: LINEAR FRACTIONS: .XX = ± 0.05 .XXX = ± 0.02 ANGLES = ± 2°	This drawing and all of the information and rights embodied and contained herein, constitutes confidential, proprietary information and trade secrets of The Heil Co. You are prohibited from using, distributing, transmitting, or otherwise create derivative works from or otherwise reproduce this drawing in whole or in part except as authorized in writing, by The Heil Co. Upon request we will return this drawing and any copies or reproductions thereof upon request by The Heil Co.	WEIGHT (LB):	THE HEIL CO.
		TYPE: ASSEM	
	DATE: 16-Dec-20	SCALE: 1:2	TITLE: CAB CONTROL KIT, PETERBILT CONV (NON-RP170), 2020 REL
	MATERIAL: AS PER BOM	DRAWN BY: CLG	PART No. 470-0027-006

DRAWING SIZE	D	MODIFIED BY	Tony Coffey
MODEL VERSION	B.3		
DRAWING VERSION	B.1		

REF	PART No.	DESCRIPTION	QTY
1	108-8594-100	RAM MOUNT, DISPLAY, IFM CR0451	1
2	108-8616-002	BUZZER, DUAL TONE	1
3	108-8663	DISPLAY, 4.3" INSIGHT DIAGNOTSTIC	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1872-031	CABLE, CONTROL MODULE PWR. 3.1M	1
6	263-1873-031	CABLE, CONTROL MODULE COMM. 3.1M	1
7	263-1874-001	HARNESS, DISPLAY/CONTROLS, CONV. CAB	1
8	263-1882-002	HARNESS, CHASSIS INTERFACE	1
9	263-1883-002	HARNESS, PUMP PTO SOL CAB OVER	1
10	263-1885-002	CABLE, FMVSS SIGNALS	1
11	311-5431	BRACKET, IFM CR0451 DISPLAY MNT	1
12	311-6304	BRACKET, CONTROLLER BODY SIDE	1



470-0027-007

NOTE: THIS KIT PROVIDES THE FOLLOWING FEATURES AS STANDARD:
1. IN CAB CONTROLLER/BRACKET/HARDWARE/HARNESS
2. IN CAB DISPLAY/RAM MOUNT/HARNESS
3. RP170 INTERFACE HARNESS/FMVSS SIGNAL HARNESS
4. COMMUNICATION CABLE
5. POWER CABLE

REV.	WAS	DATE	ECO NO.
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
B	ADD NOTES	17-Dec-20	5F20019
A	ADDED 108-8616-002, QTY 1	26-Aug-20	5F20008
-	RELEASED	09-Apr-20	PT20006

SHEET 1 OF 1

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT: [.2]
TYPE: ASSEM
DATE: 17-Dec-20
SCALE: 1:2

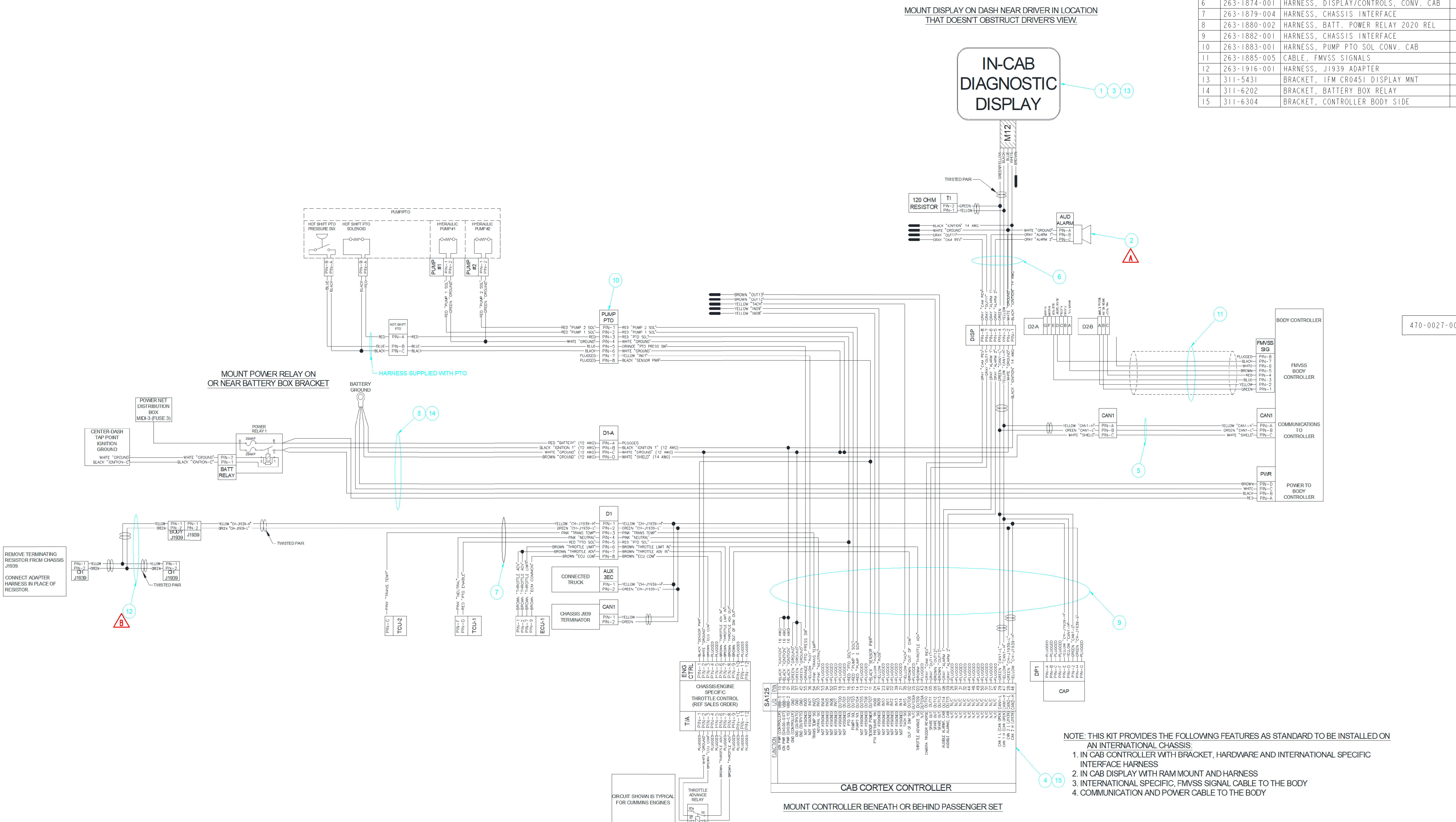
HEIL — THE HEIL CO.

TITLE: CAB CONTROL KIT, CONV CAB (RP170), 2020 REL

MATERIAL: AS PER BOM
DRAWN BY: CLG
PART No. 470-0027-007

DRAWING SIZE	D	MODIFIED BY	Tony Coffey
MODEL VERSION	B.2		
DRAWING VERSION	B.2		

REF	PART No.	DESCRIPTION	QTY
1	108-8594-100	RAM MOUNT, DISPLAY, IFM CR0451	1
2	108-8616-002	BUZZER, DUAL TONE	1
3	108-8663	DISPLAY, 4.3′ INSIGHT DIAGNOTSTIC	1
4	254-4912	CONTROLLER, CORTEX REMOTE MODULE	1
5	263-1873-031	CABLE, CONTROL MODULE COMM. 3.1M	1
6	263-1874-001	HARNESS, DISPLAY/CONTROLS, CONV. CAB	1
7	263-1879-004	HARNESS, CHASSIS INTERFACE	1
8	263-1880-002	HARNESS, BATT. POWER RELAY 2020 REL	1
9	263-1882-001	HARNESS, CHASSIS INTERFACE	1
10	263-1883-001	HARNESS, PUMP PTO SOL CONV. CAB	1
11	263-1885-005	CABLE, FMVSS SIGNALS	1
12	263-1916-001	HARNESS, J1939 ADAPTER	1
13	311-5431	BRACKET, IFM CR0451 DISPLAY MNT	1
14	311-6202	BRACKET, BATTERY BOX RELAY	1
15	311-6304	BRACKET, CONTROLLER BODY SIDE	1



NOTE: THIS KIT PROVIDES THE FOLLOWING FEATURES AS STANDARD TO BE INSTALLED ON AN INTERNATIONAL CHASSIS:

1. IN CAB CONTROLLER WITH BRACKET, HARDWARE AND INTERNATIONAL SPECIFIC INTERFACE HARNESS
2. IN CAB DISPLAY WITH RAM MOUNT AND HARNESS
3. INTERNATIONAL SPECIFIC, FMVSS SIGNAL CABLE TO THE BODY
4. COMMUNICATION AND POWER CABLE TO THE BODY

REV.	WAS	DATE	ECO NO.
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
B	ADDED 263-1916-001, QTY 1	16-Dec-20	5F20019
A	ADDED 108-8616-002, QTY 1	26-Aug-20	5F20008
-	RELEASED	09-Apr-20	PT20006

SHEET 1 OF 1

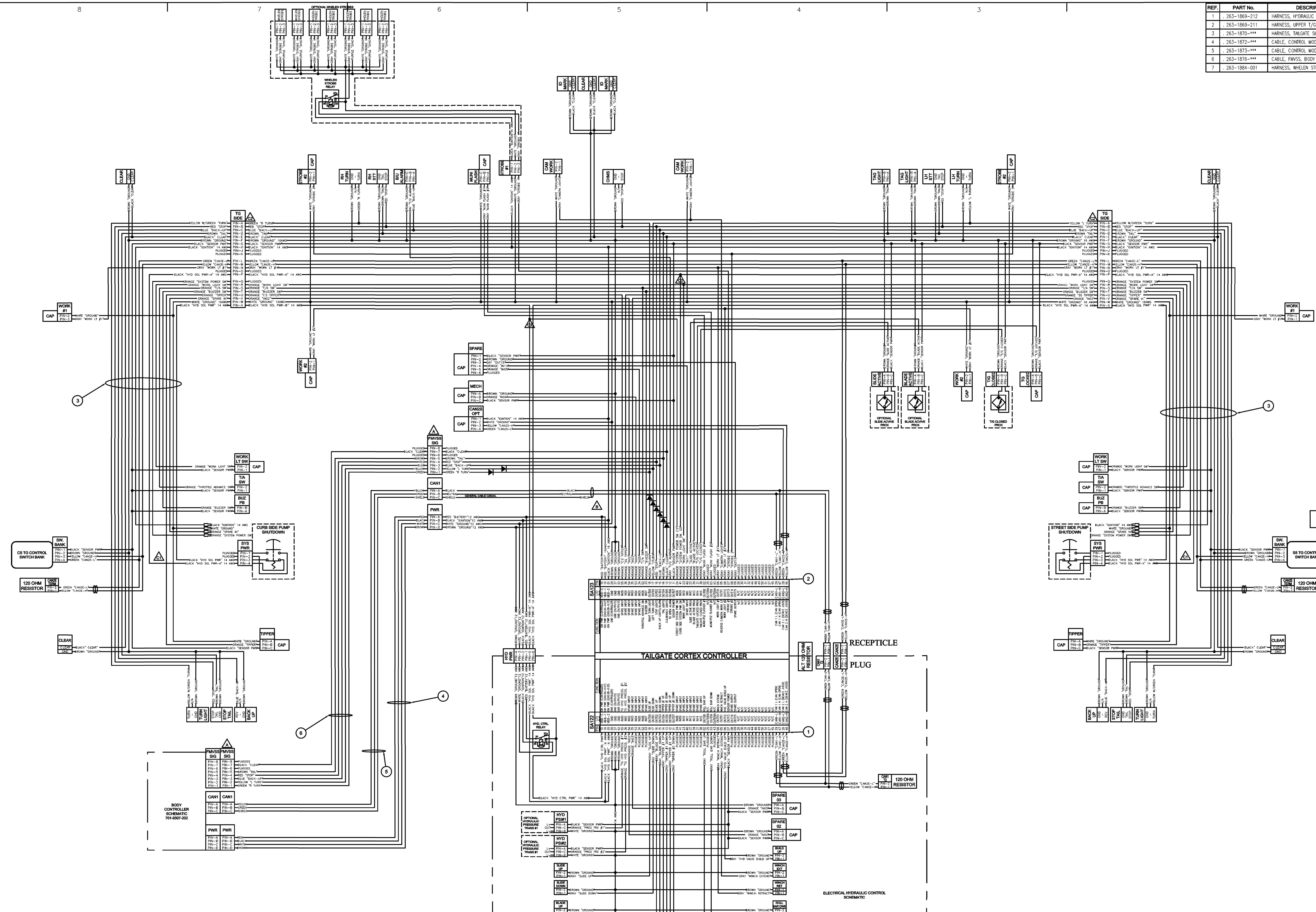
DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT: [.2]
TYPE: ASSEM
DATE: 16-Dec-20
SCALE: 1:2

HEIL — THE HEIL CO.

TITLE: CAB CONTROL KIT, INTERNATIONAL (NON-RP170), 2020 REL

MATERIAL: AS PER BOM
DRAWN BY: CLG
PART No. 470-0027-008



REF.	PART No.	DESCRIPTION	QTY.
1	. 263-1869-212	HARNESS, HYDRAULIC VALVE	REF
2	. 263-1869-211	HARNESS, UPPER T/G LIGHT CUSTER	REF
3	. 263-1870-***	HARNESS, TAILGATE SIDE	REF
4	. 263-1872-***	CABLE, CONTROL MODULE PWR.	REF
5	. 263-1873-***	CABLE, CONTROL MODULE COMM.	REF
6	. 263-1876-***	CABLE, FMVSS, BODY TO TG.	REF
7	. 263-1884-001	HARNESS, WHELEN STROBE	REF

REV.	WAS	DATE	ECO No.	ZONE
C3	ADD SPLICE	02/10/21	PT21005	
C2	REMOVE WIRE FROM PIN Q	02/10/21	PT21005	
C1	REMOVE SPLICE	02/08/21	PT21005	
B	ADD DIODES TO FMVSS SIGS	10/28/20	5F20016	
A	MOVE BLACK "CLEAR"	–	–	
–	FROM PIN 6 TO PIN 7	08/28/20	5F20008	
–	RELEASE	05/01/20	PT20011	

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

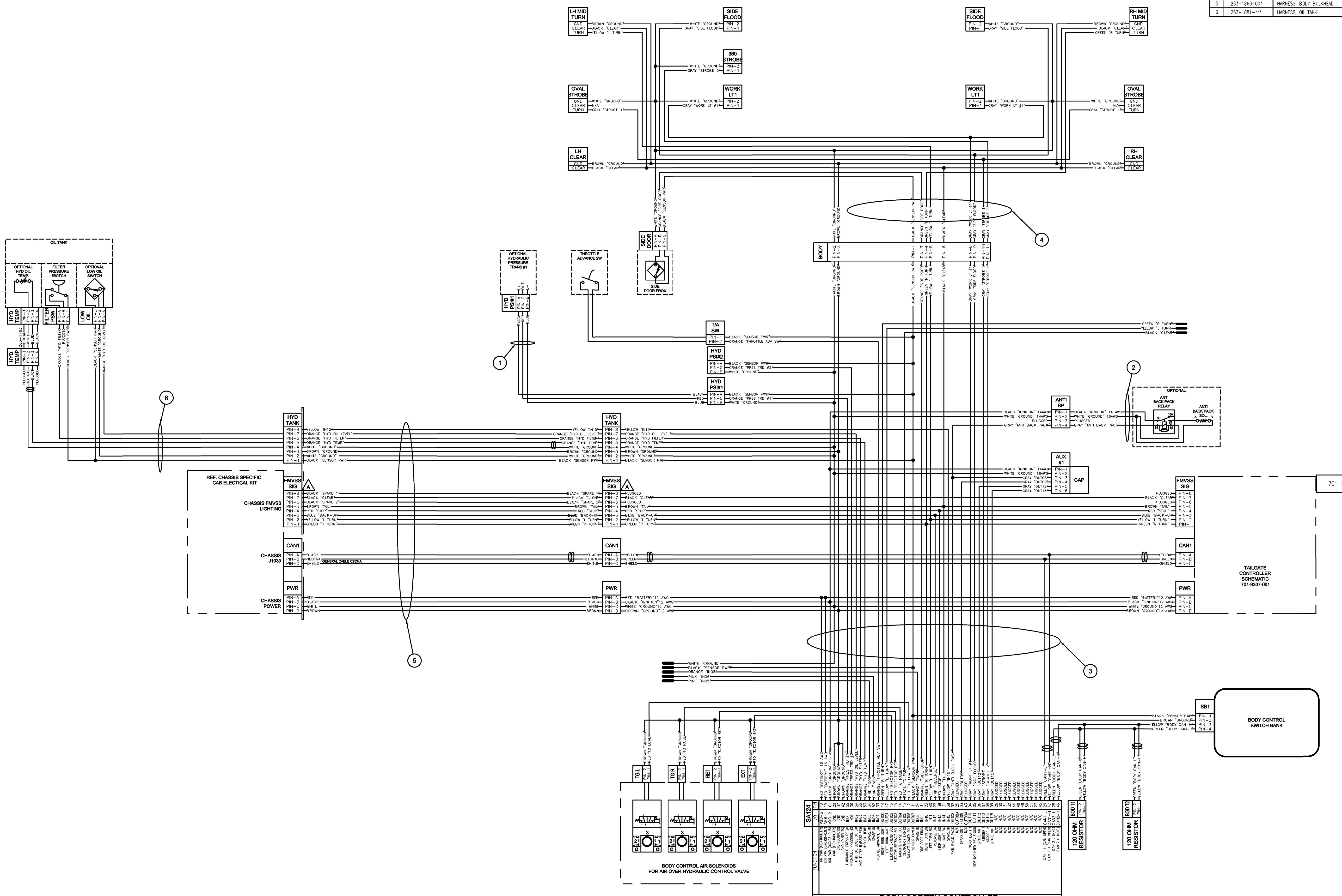
DIVISION: 42C
CODE: M
DATE: 05/01/20
SCALE: 1=1.25

THE HEIL CO.
FORT PAYNE, AL

TITLE: ELECTRICAL SCHEMATIC, TAILGATE REL 2020, PT1100 US

MATERIAL: N/A
DRAWN BY: TLC
PART No. 701-9307-201

REF.	PART No.	DESCRIPTION	QTY.
1	. 263-1146-***	CABLE, INPUT DEVICE	REF
2	. 263-1591-001	HARNESS, ANTI-BACKPACK	REF
3	. 263-1869-001	HARNESS, BODY CONTROLLER	REF
4	. 263-1869-002	HARNESS, FRONT OF BODY	REF
5	. 263-1869-004	HARNESS, BODY BULKHEAD	REF
6	. 263-1881-***	HARNESS, OIL TANK	REF



REV.	WAS	DATE	ECO No.	ZONE
A	MOVE BLACK "CLEAR"	-	-	
-	FROM PIN 6 TO PIN 7	08/28/20	5F20008	
-	RELEASE	05/01/20	PT20006	

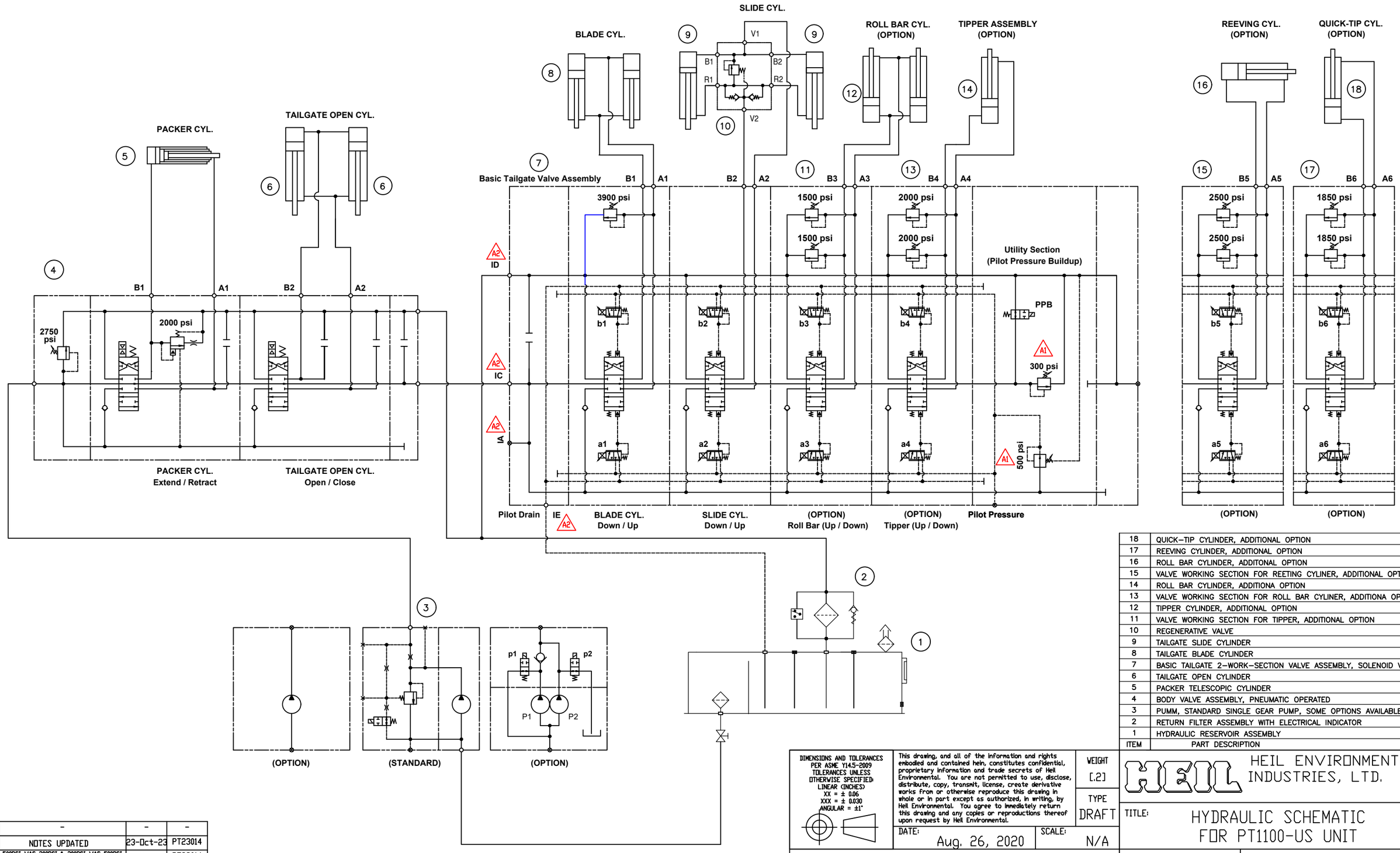
DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

DIVISION: 42C
CODE: M
DATE: 05/01/20
SCALE: 1=1
MATERIAL: N/A

THE HEIL CO.
FORT PAYNE, AL

TITLE: SCHEMATIC, BODY ELECTRICAL 2020 REL

DRAWN BY: TLC
PART No. 701-9307-202



ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

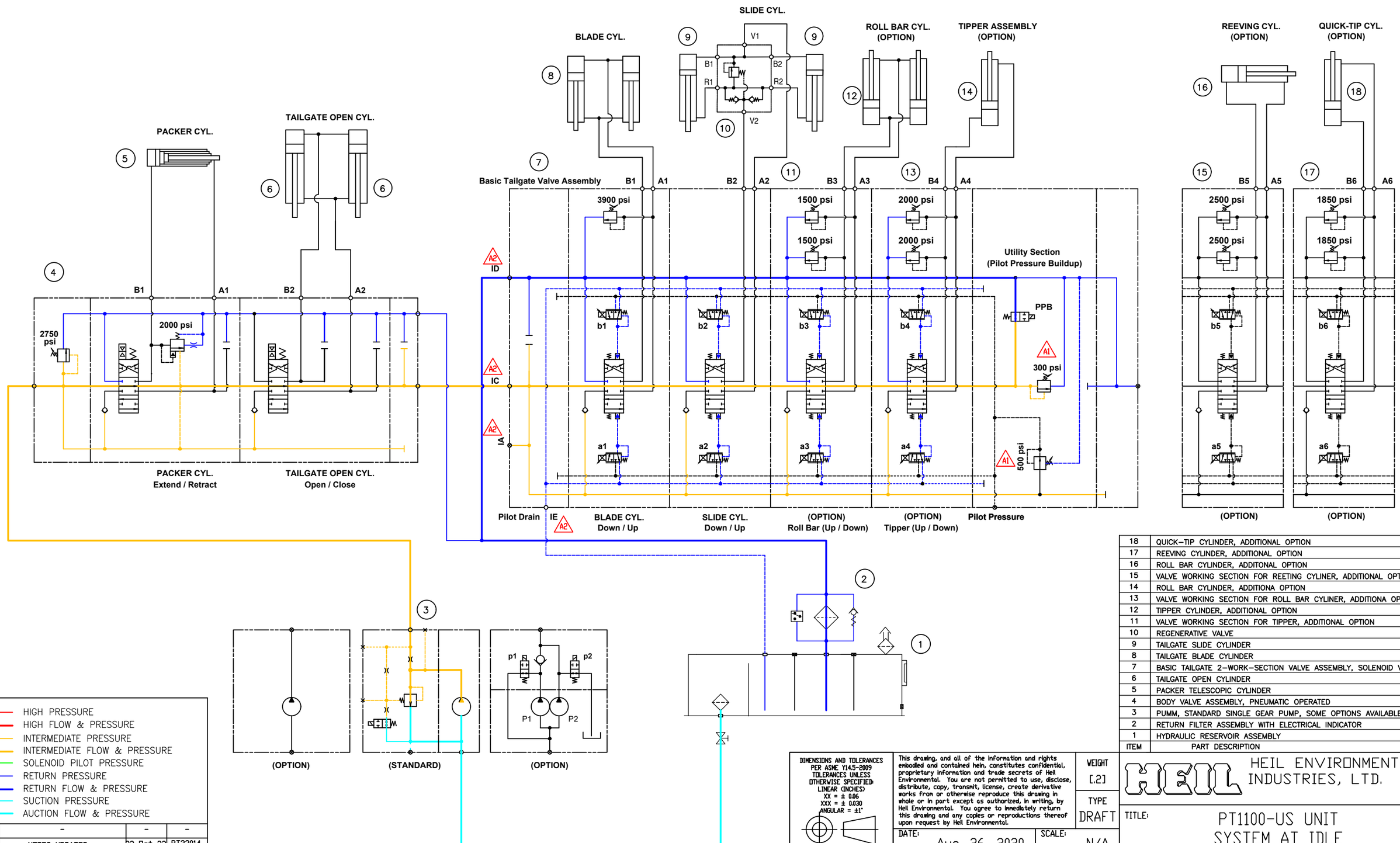
WEIGHT: [.2]
TYPE: DRAFT
DATE: Aug. 26, 2020
SCALE: N/A
MATERIAL:

HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: HYDRAULIC SCHEMATIC FOR PT1100-US UNIT

DRAWN BY: AJ
PART No. 701-9342

SYSTEM AT IDLE



	HIGH PRESSURE
	HIGH FLOW & PRESSURE
	INTERMEDIATE PRESSURE
	INTERMEDIATE FLOW & PRESSURE
	SOLENOID PILOT PRESSURE
	RETURN PRESSURE
	RETURN FLOW & PRESSURE
	SUCTION PRESSURE
	AUCTION FLOW & PRESSURE

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

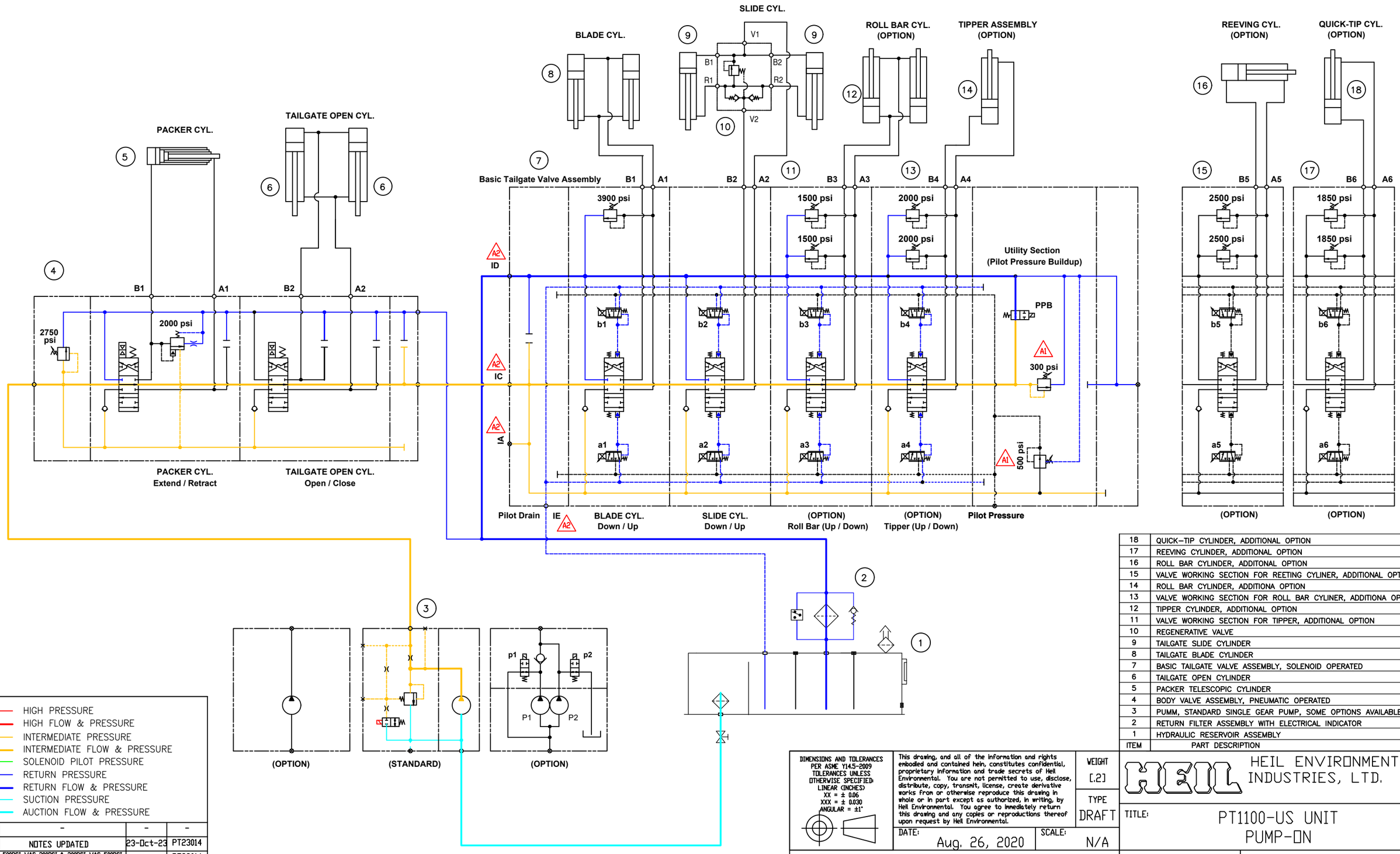
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT
SYSTEM AT IDLE

DRAWN BY: AJ

PART No. 701-9342-001

PUM- ON



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE VALVE ASSEMBLY, SOLENOID OPERATED
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

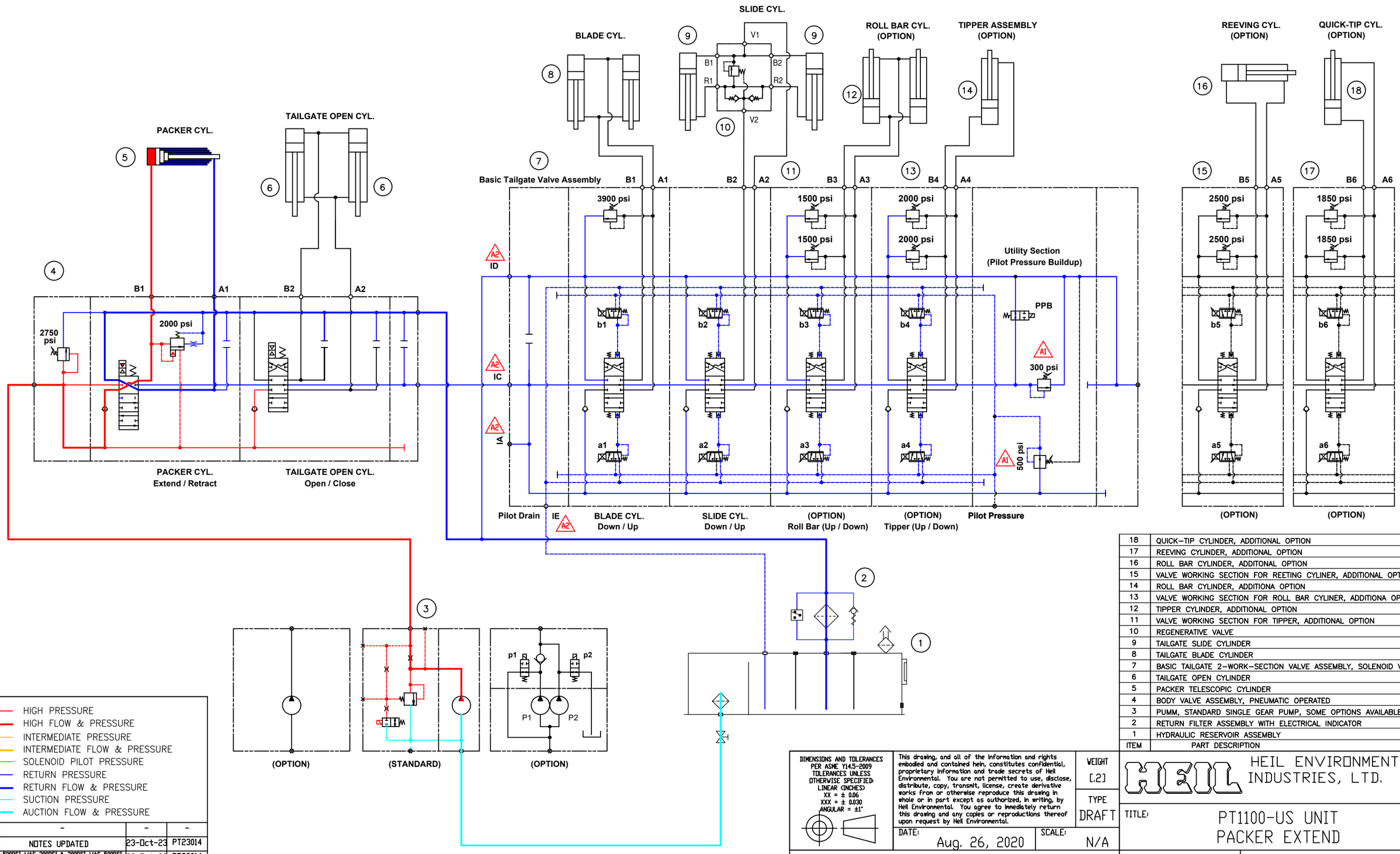
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT PUMP-ON

DRAWN BY: AJ

PART No. 701-9342-002

PACKER EXTENDING



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

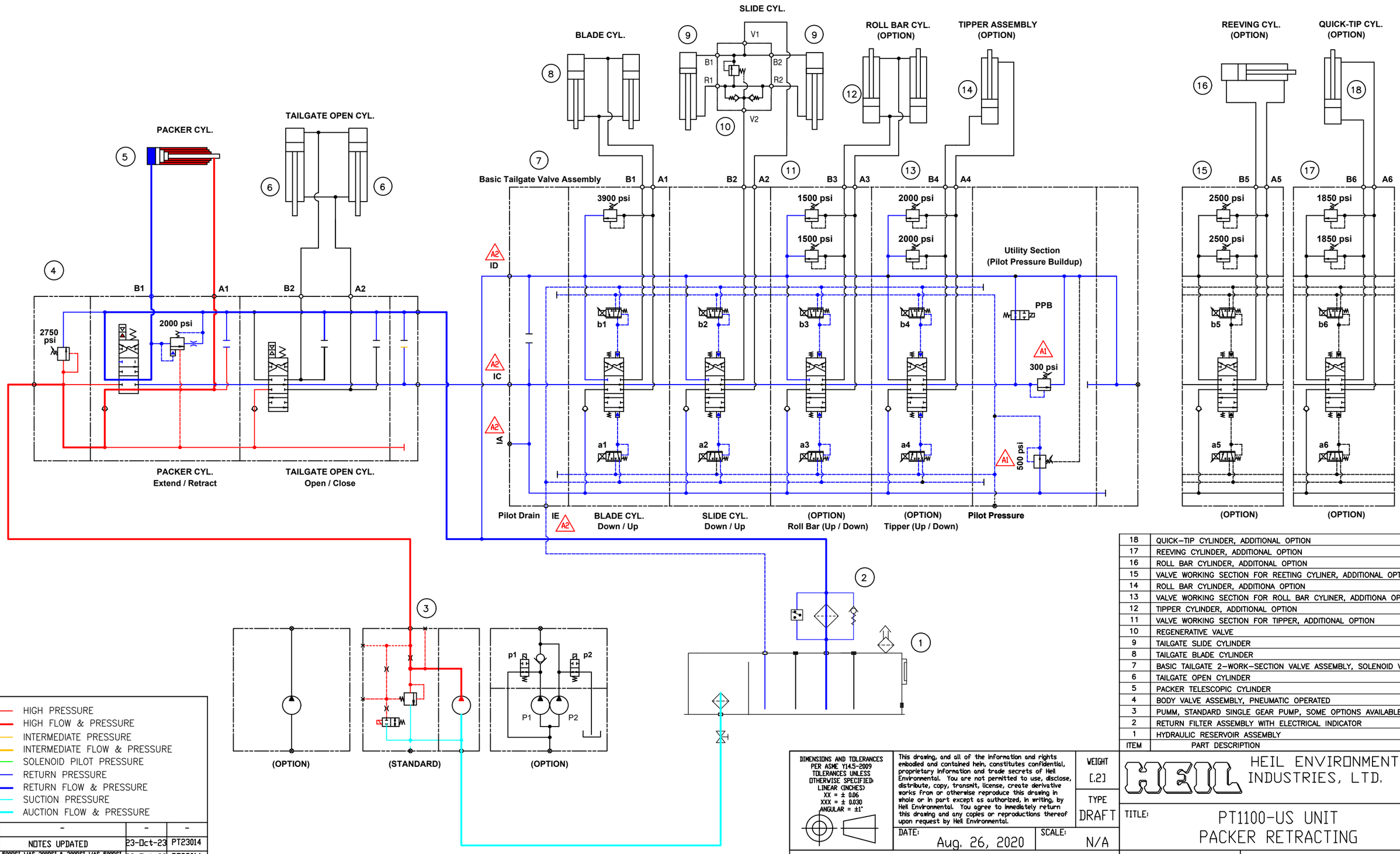
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT PACKER EXTEND

DRAWN BY: AJ

PART No. 701-9342-003

PACKER RETRACTING



ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
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13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

- HIGH PRESSURE
- HIGH FLOW & PRESSURE
- INTERMEDIATE PRESSURE
- INTERMEDIATE FLOW & PRESSURE
- SOLENOID PILOT PRESSURE
- RETURN PRESSURE
- RETURN FLOW & PRESSURE
- SUCTION PRESSURE
- AUCTION FLOW & PRESSURE

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

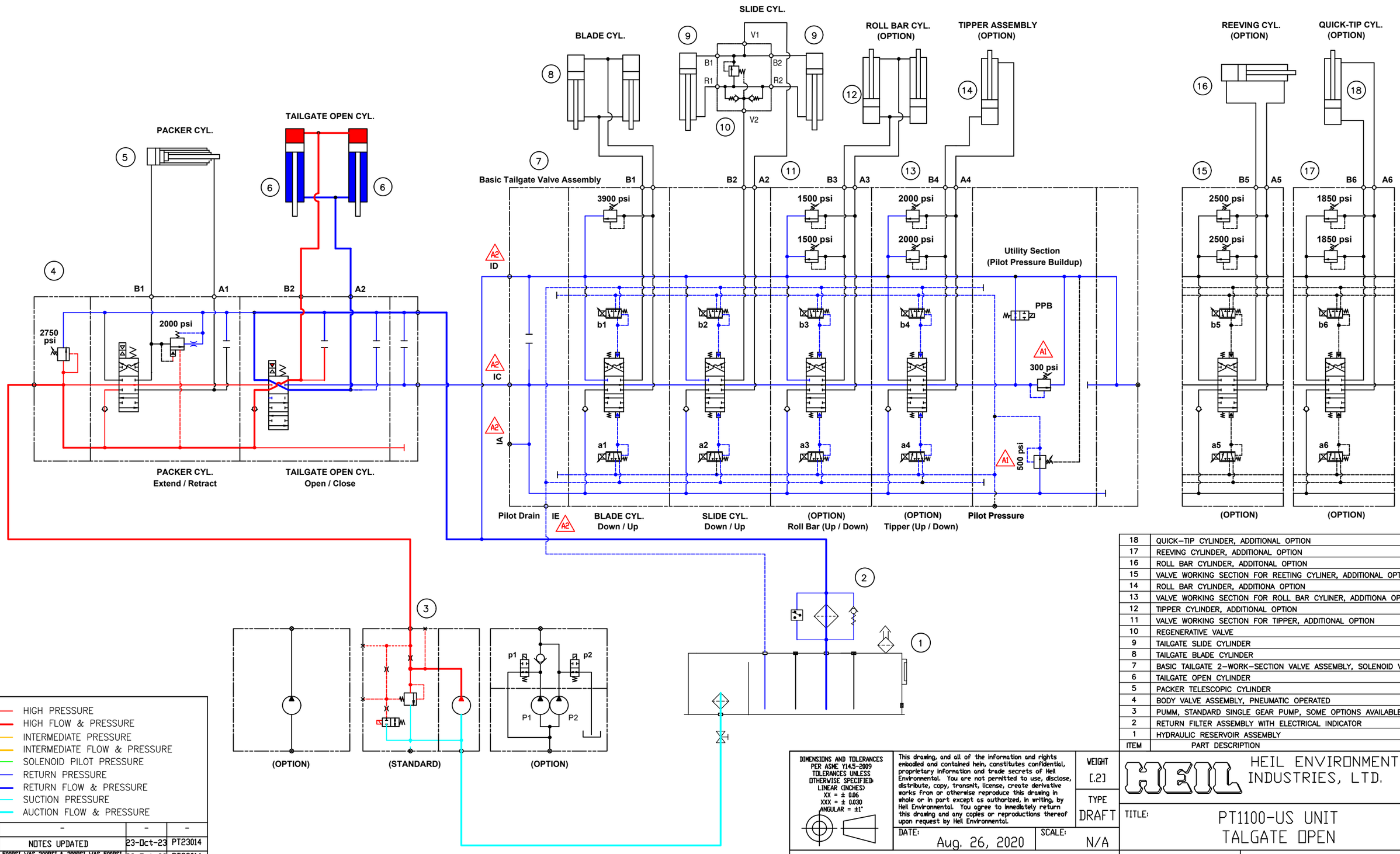
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT
PACKER RETRACTING

DRAWN BY: AJ

PART No. 701-9342-004

TAILGATE OPEN



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

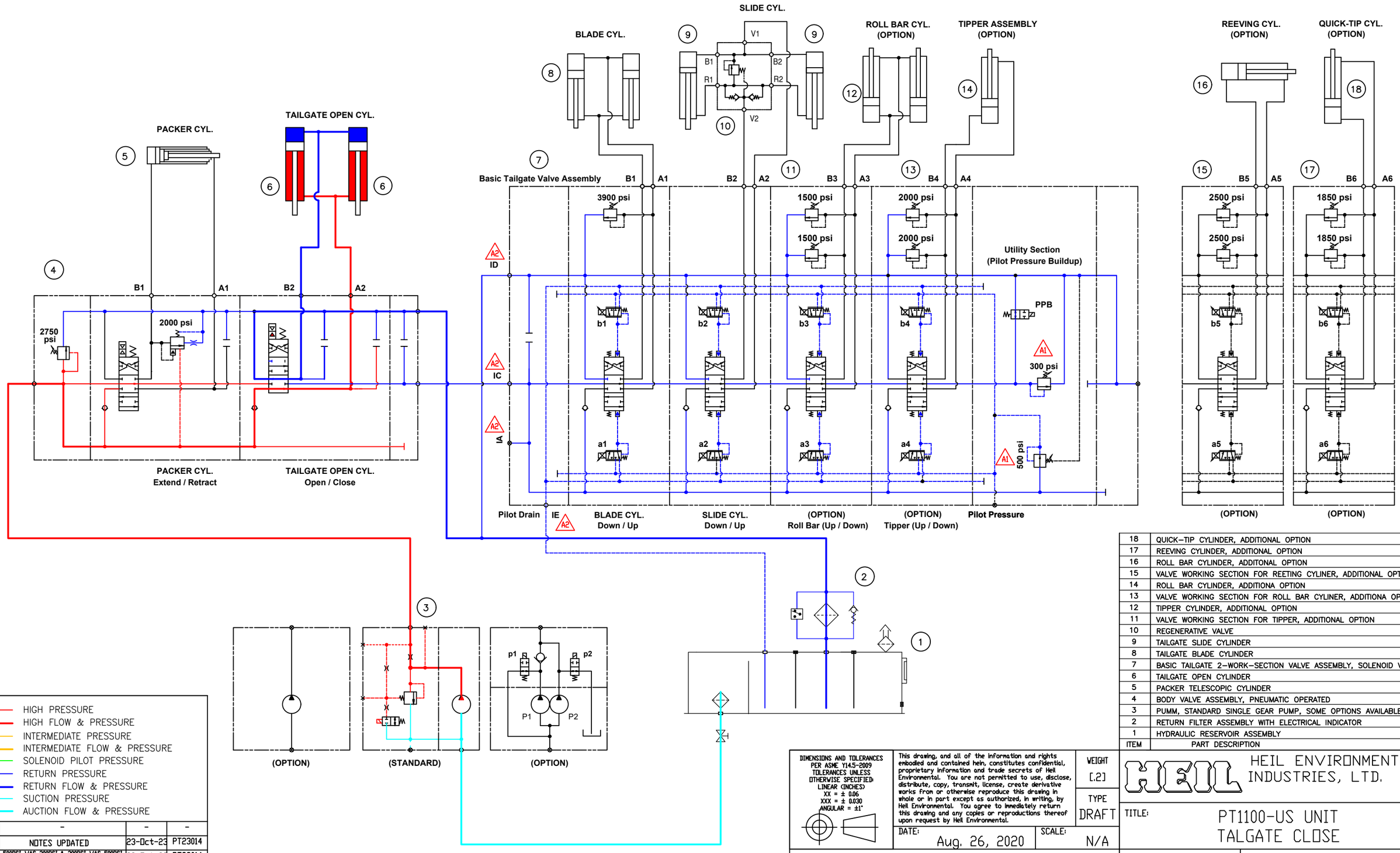
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT TALGATE OPEN

DRAWN BY: AJ

PART No. 701-9342-005

TAILGATE CLOSE



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
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4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

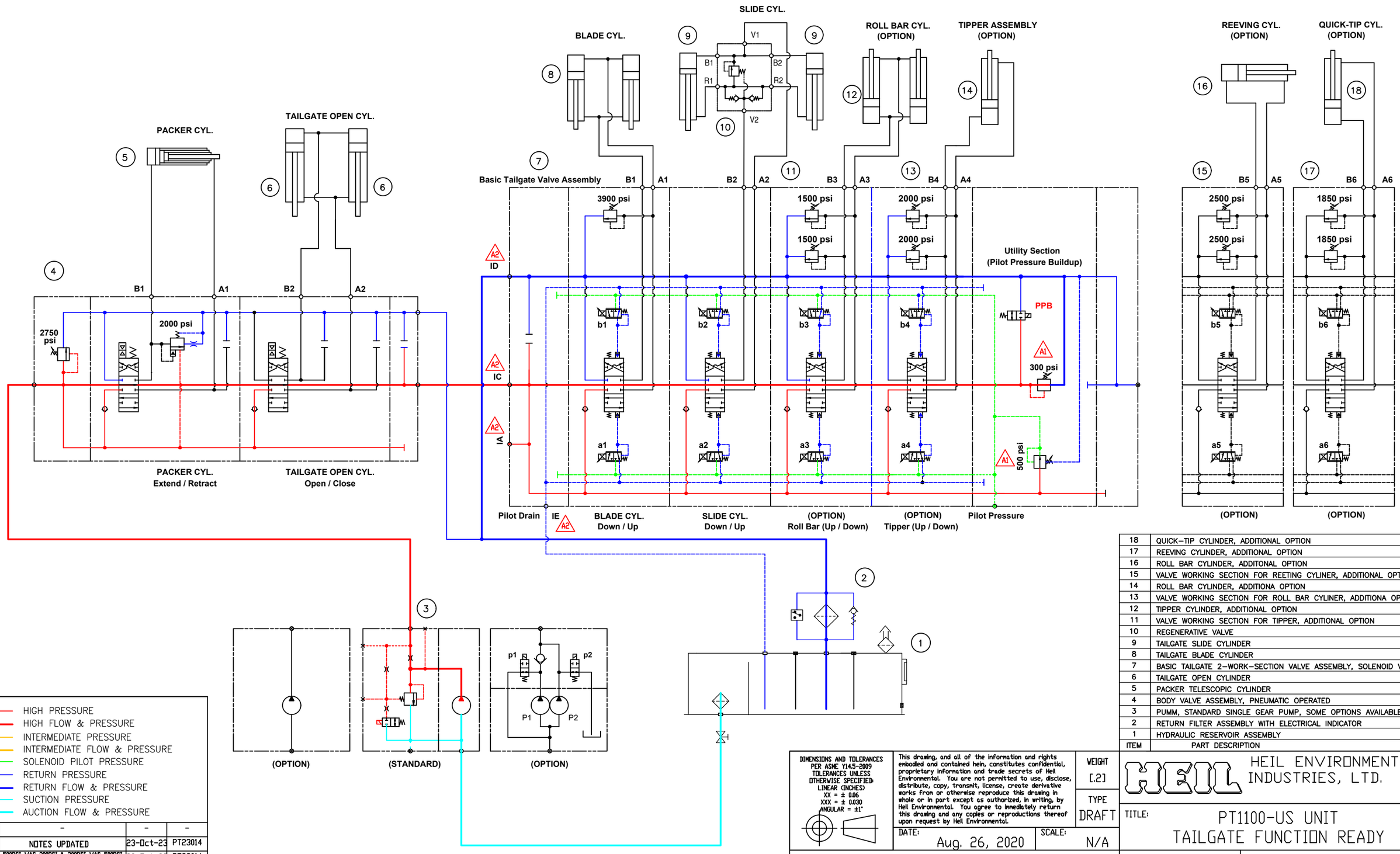
WEIGHT [.2]
TYPE DRAFT
DATE: Aug. 26, 2020
SCALE: N/A
MATERIAL:

HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT TALGATE CLOSE

DRAWN BY: AJ
PART No. 701-9342-006

TAILGATE FUNCTION READY



ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
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13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

- HIGH PRESSURE
- HIGH FLOW & PRESSURE
- INTERMEDIATE PRESSURE
- INTERMEDIATE FLOW & PRESSURE
- SOLENOID PILOT PRESSURE
- RETURN PRESSURE
- RETURN FLOW & PRESSURE
- SUCTION PRESSURE
- AUCTION FLOW & PRESSURE

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

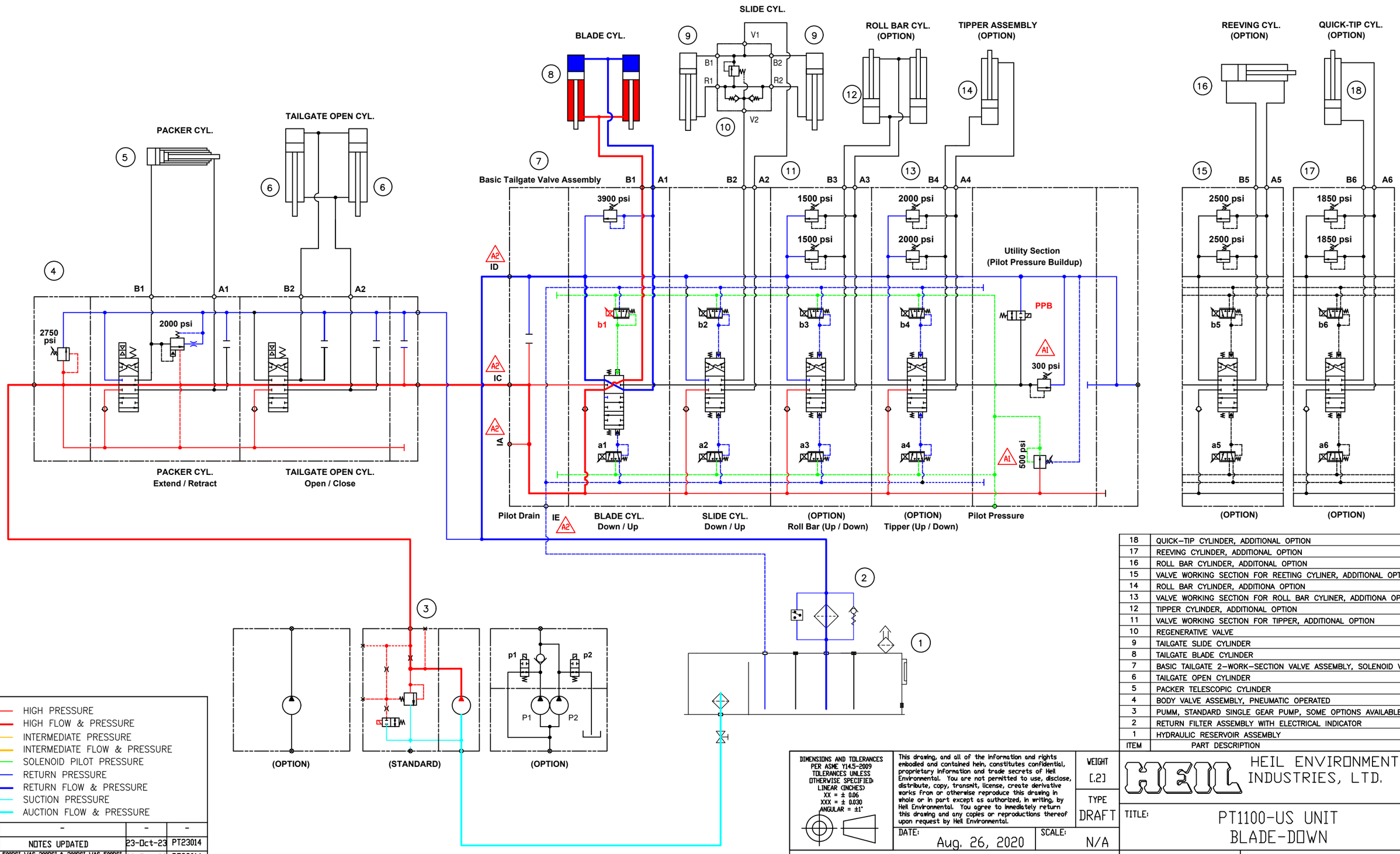
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT TAILGATE FUNCTION READY

DRAWN BY: AJ

PART No. 701-9342-007

BLADE-DOWN



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
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4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

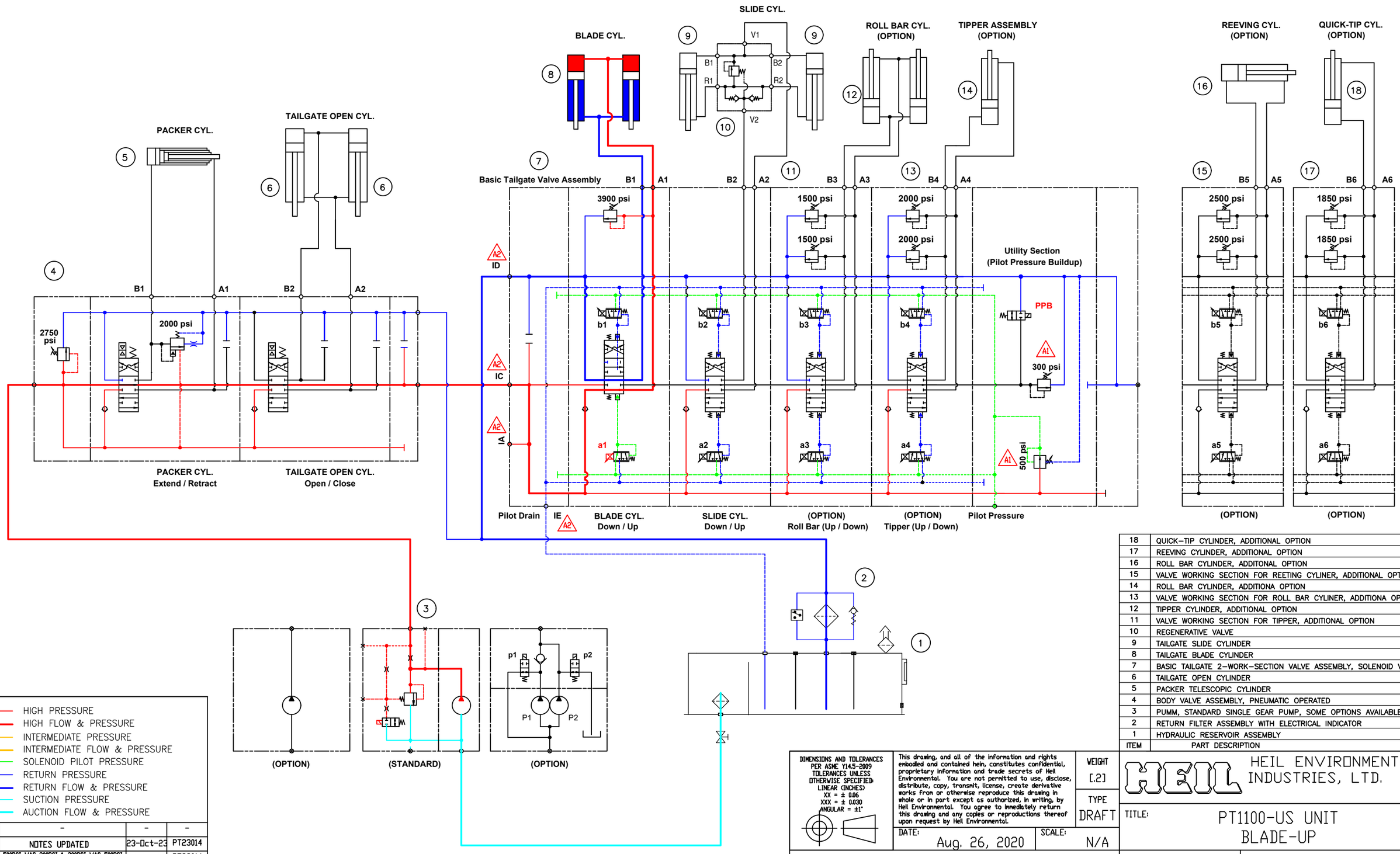
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT BLADE-DOWN

DRAWN BY: AJ

PART No. 701-9342-008

BLADE-UP



ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
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13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
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11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
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5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

- HIGH PRESSURE
- HIGH FLOW & PRESSURE
- INTERMEDIATE PRESSURE
- INTERMEDIATE FLOW & PRESSURE
- SOLENOID PILOT PRESSURE
- RETURN PRESSURE
- RETURN FLOW & PRESSURE
- SUCTION PRESSURE
- AUCTION FLOW & PRESSURE

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

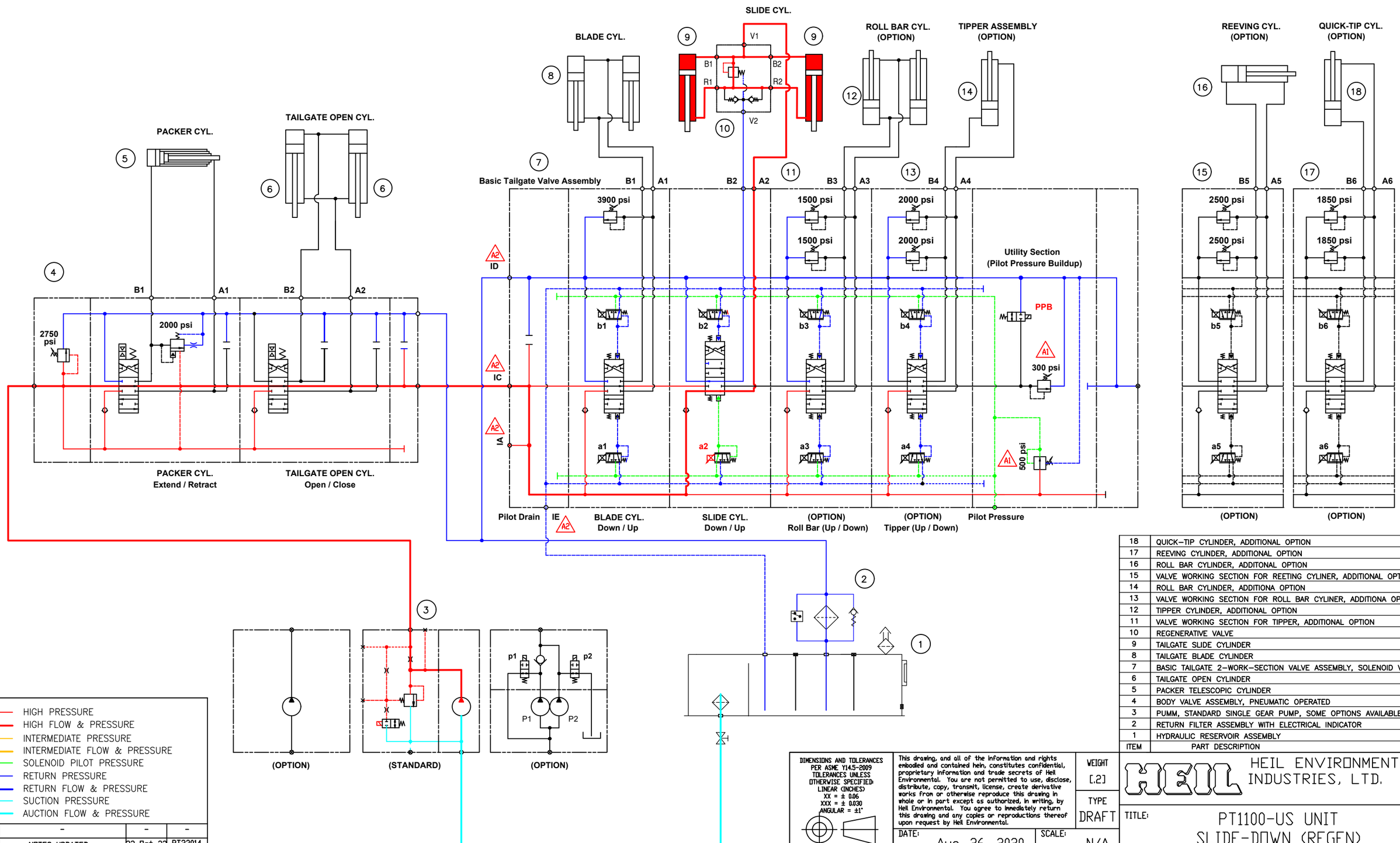
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT BLADE-UP

DRAWN BY: AJ

PART No. 701-9342-009

SLIDE - DOWN (REGEN)



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
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4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

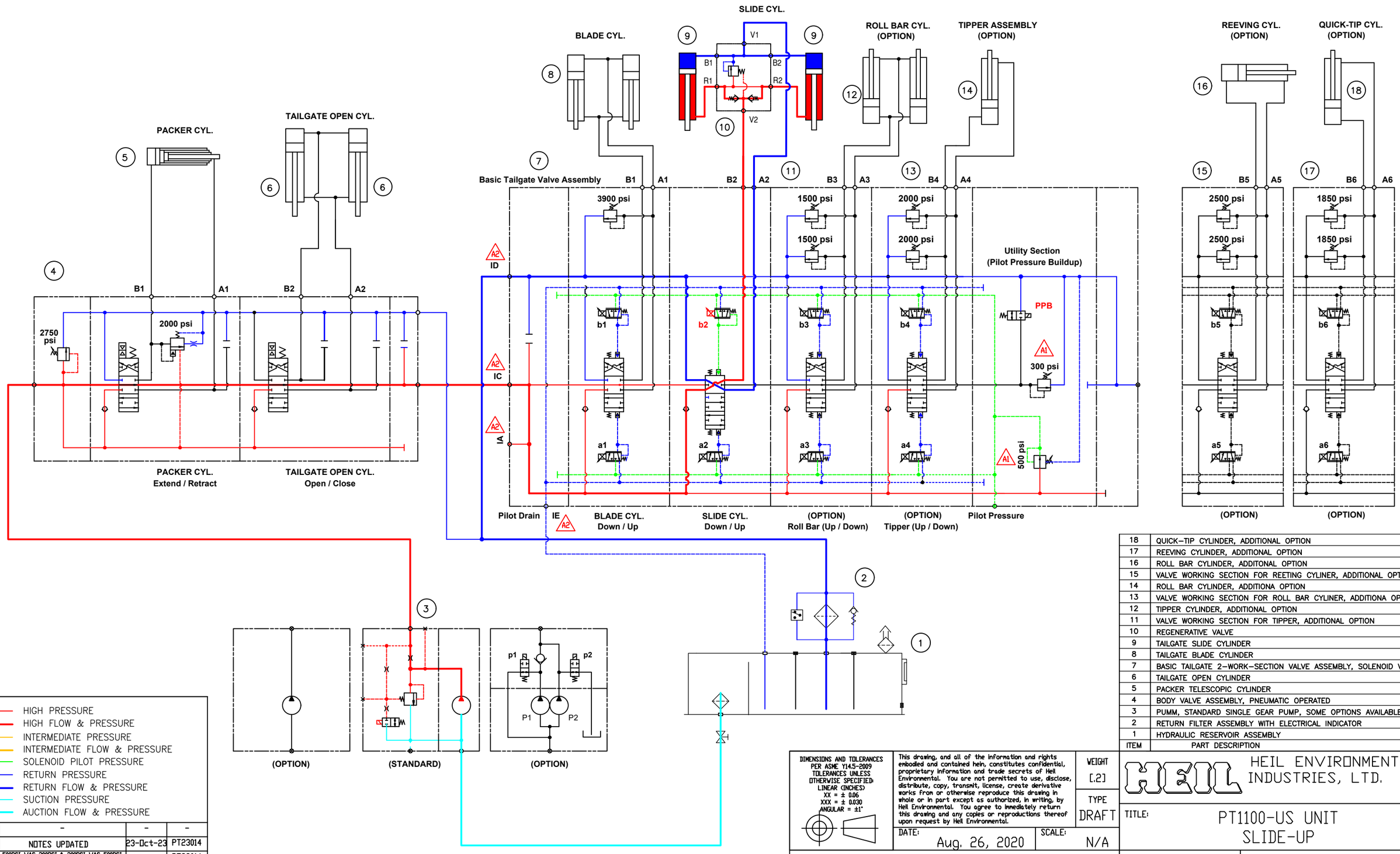
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT
SLIDE-DOWN (REGEN)

DRAWN BY: AJ

PART No. 701-9342-010

SLIDE - UP



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
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10	REGENERATIVE VALVE
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7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
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4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

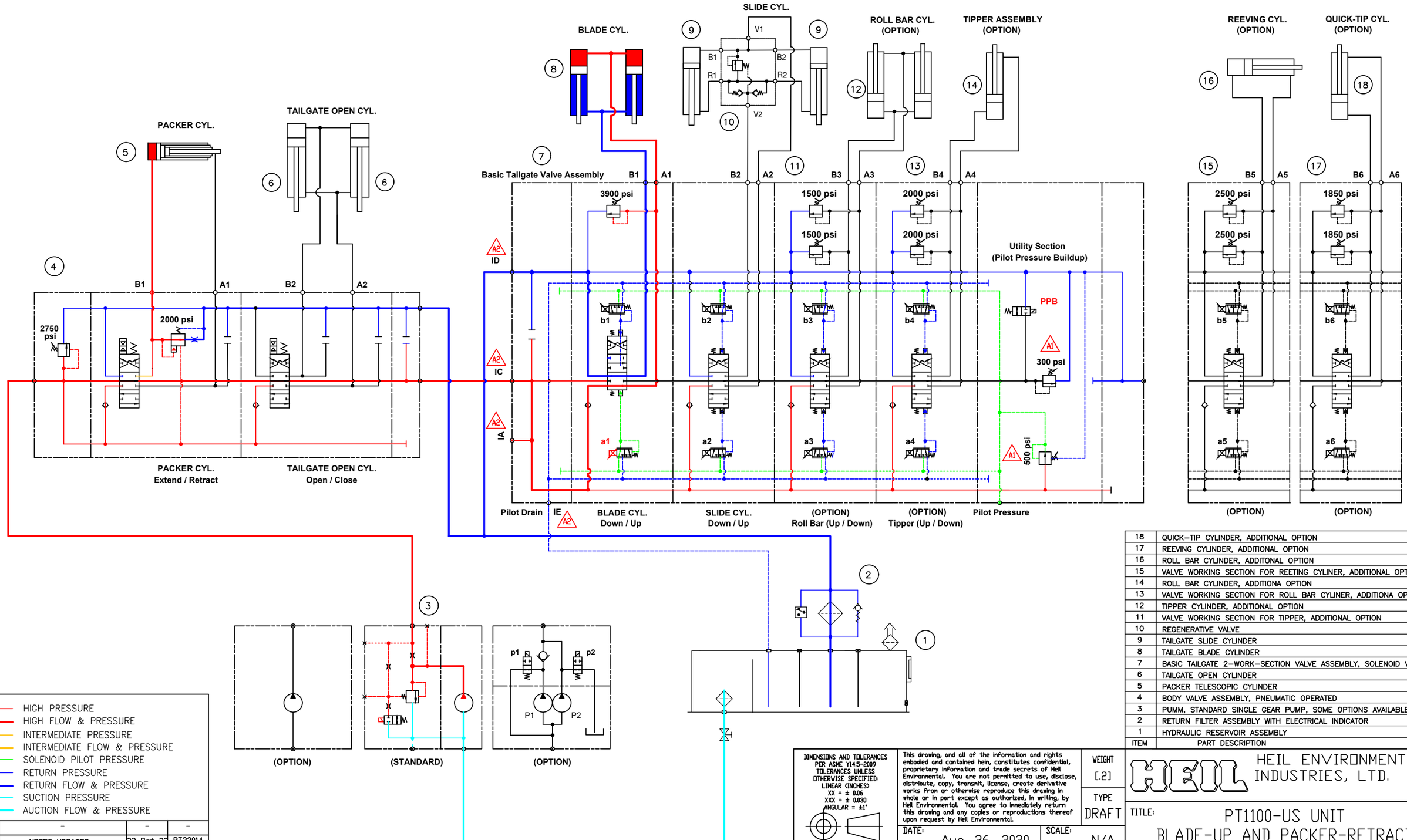
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT SLIDE-UP

DRAWN BY: AJ

PART No. 701-9342-011

BLADE-UP AND PACKER-RETRACT



	HIGH PRESSURE
	HIGH FLOW & PRESSURE
	INTERMEDIATE PRESSURE
	INTERMEDIATE FLOW & PRESSURE
	SOLENOID PILOT PRESSURE
	RETURN PRESSURE
	RETURN FLOW & PRESSURE
	SUCTION PRESSURE
	AUCTION FLOW & PRESSURE

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
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9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

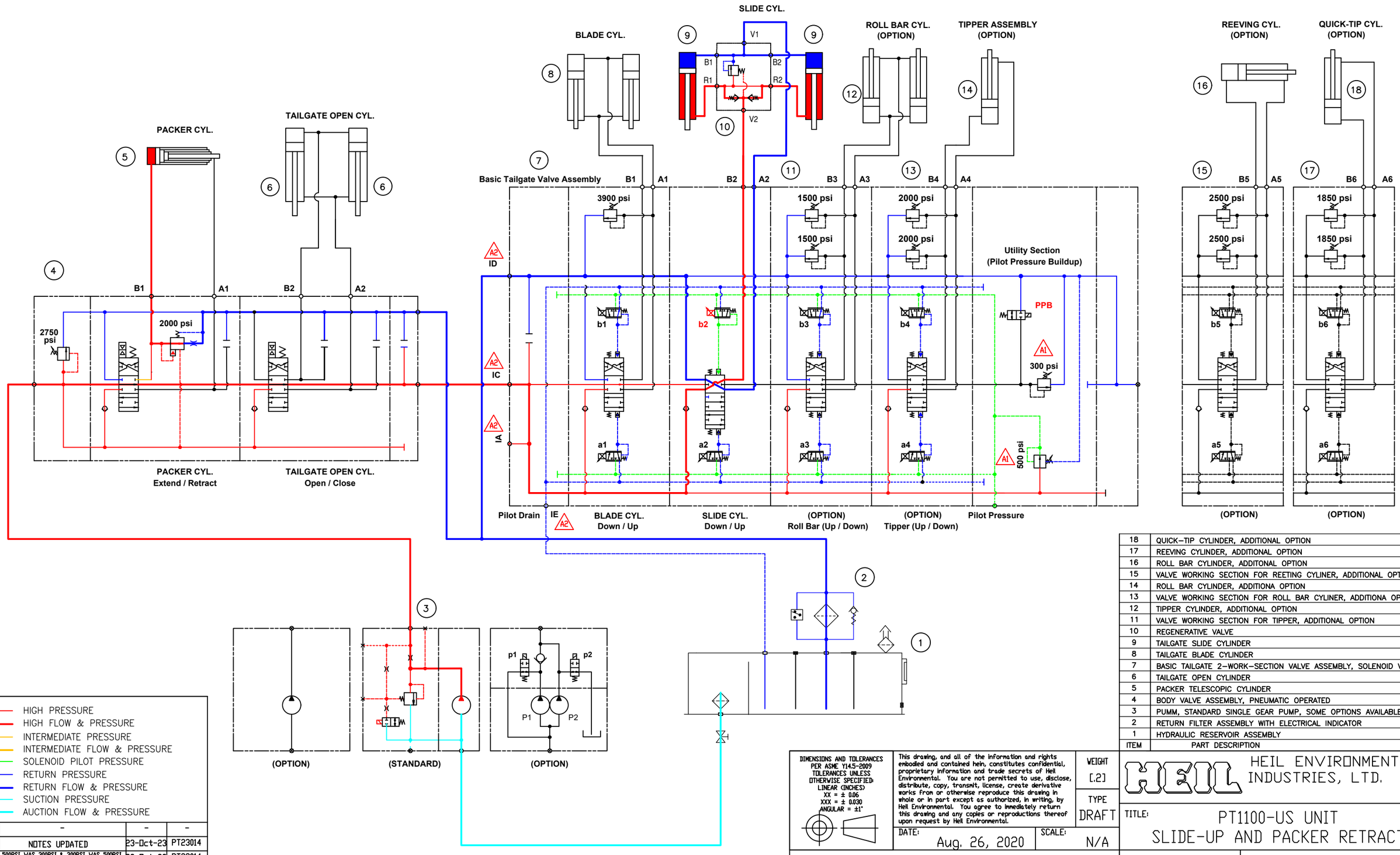
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT
BLADE-UP AND PACKER-RETRACT

DRAWN BY: AJ

PART No. 701-9342-012

SLIDE - UP AND PACKER - RETRACT



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
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3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

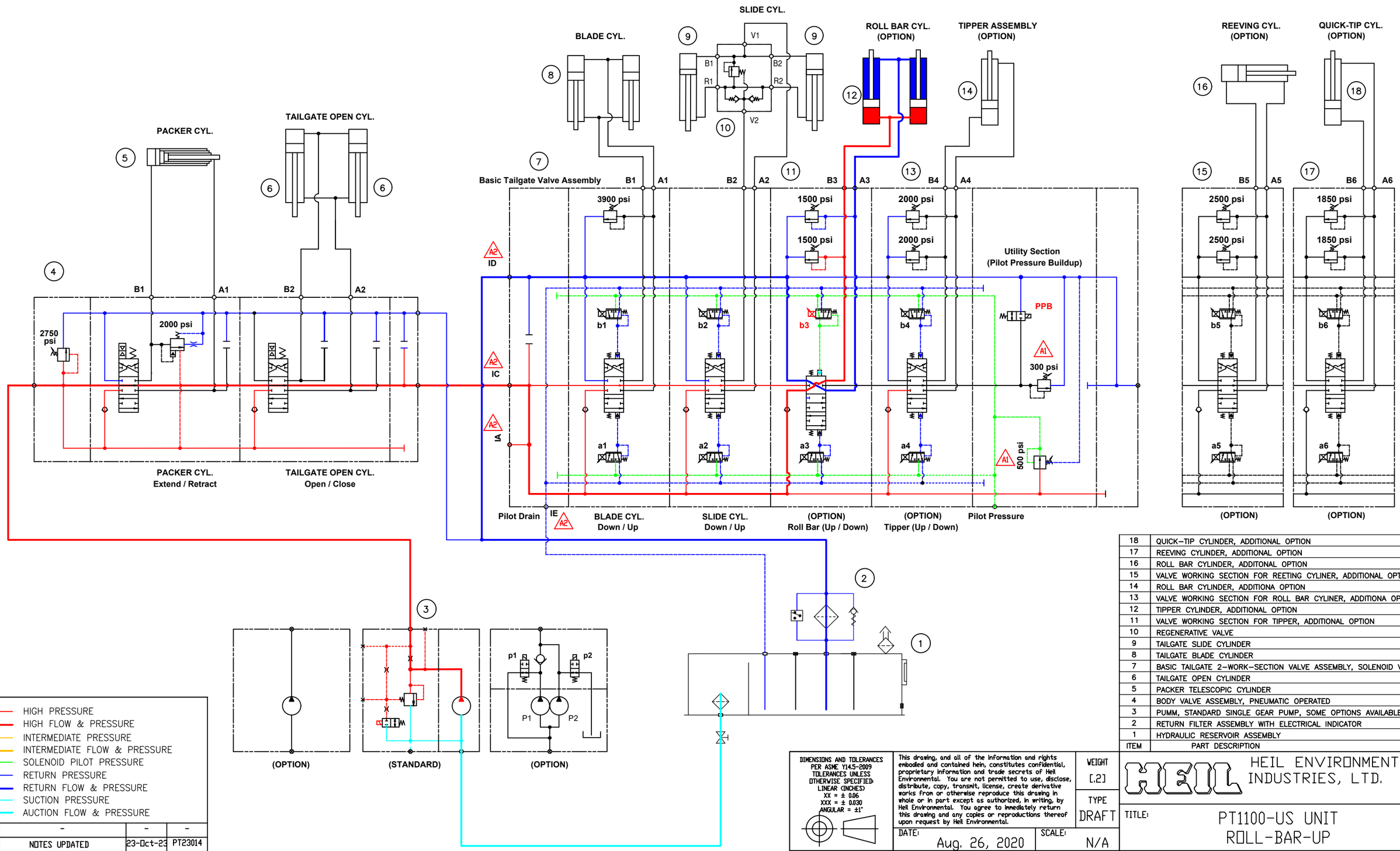
HEIL HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT
SLIDE-UP AND PACKER RETRACT

DRAWN BY: AJ

PART No. 701-9342-013

ROLL-BAR-UP



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
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3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
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1	HYDRAULIC RESERVOIR ASSEMBLY

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT: [.2]

TYPE: DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

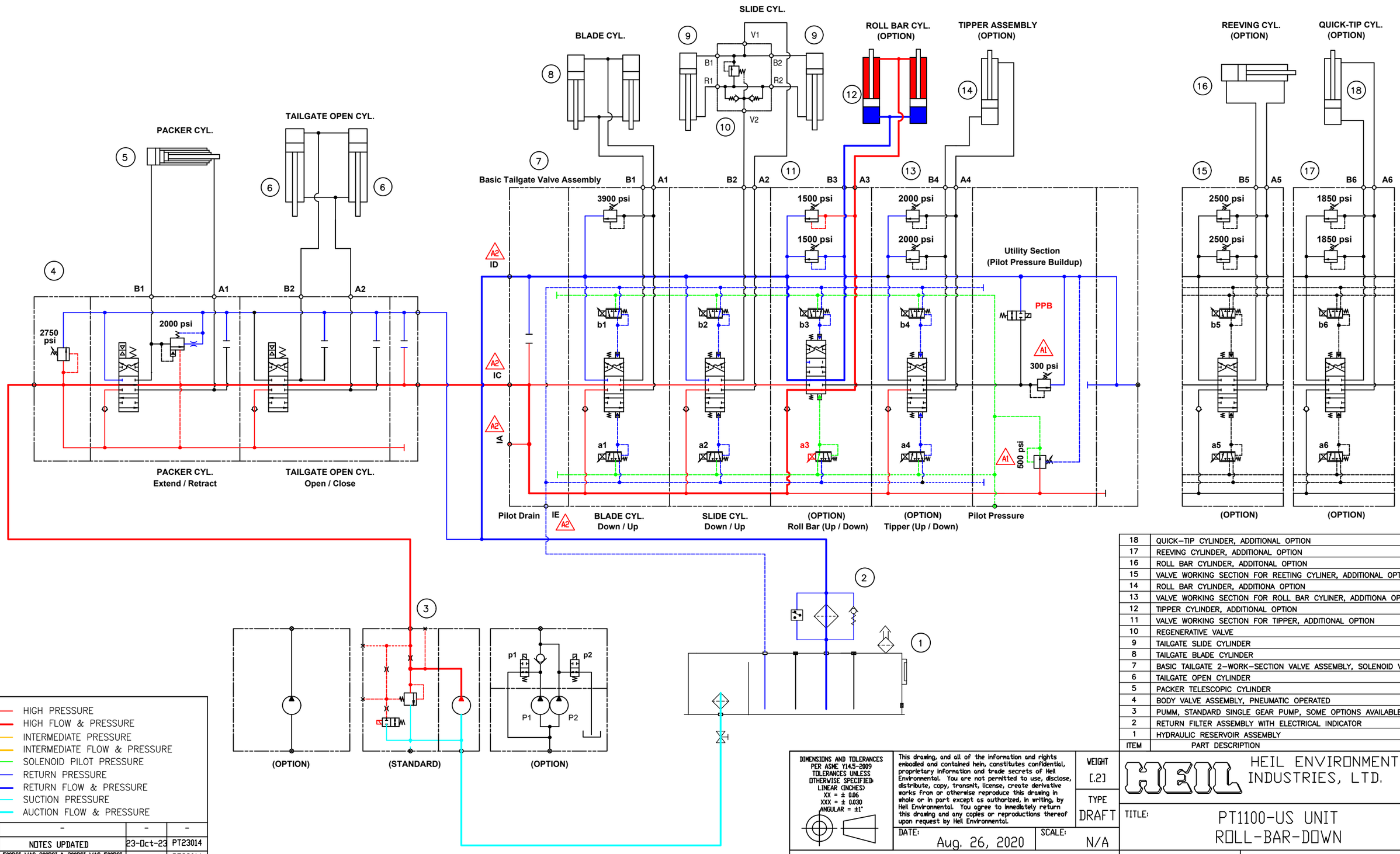
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT ROLL-BAR-UP

DRAWN BY: AJ

PART No. 701-9342-014

ROLL-BAR-DOWN



ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
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5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

- HIGH PRESSURE
- HIGH FLOW & PRESSURE
- INTERMEDIATE PRESSURE
- INTERMEDIATE FLOW & PRESSURE
- SOLENOID PILOT PRESSURE
- RETURN PRESSURE
- RETURN FLOW & PRESSURE
- SUCTION PRESSURE
- AUCTION FLOW & PRESSURE

REV.	WAS	DATE	ECO NO.
-	-	-	-
A2	NOTES UPDATED	23-Oct-23	PT23014
A1	500PSI WAS 300PSI & 300PSI WAS 500PSI RESPECTIVELY	23-Oct-23	PT23014
-	RELEASED	24-Jun-22	PT22017

DIMENSIONS AND TOLERANCES PER ASME Y14.5-2009
TOLERANCES UNLESS OTHERWISE SPECIFIED:
LINEAR (INCHES)
XX = ± 0.06
XXX = ± 0.030
ANGULAR = ±1°

WEIGHT [.2]

TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

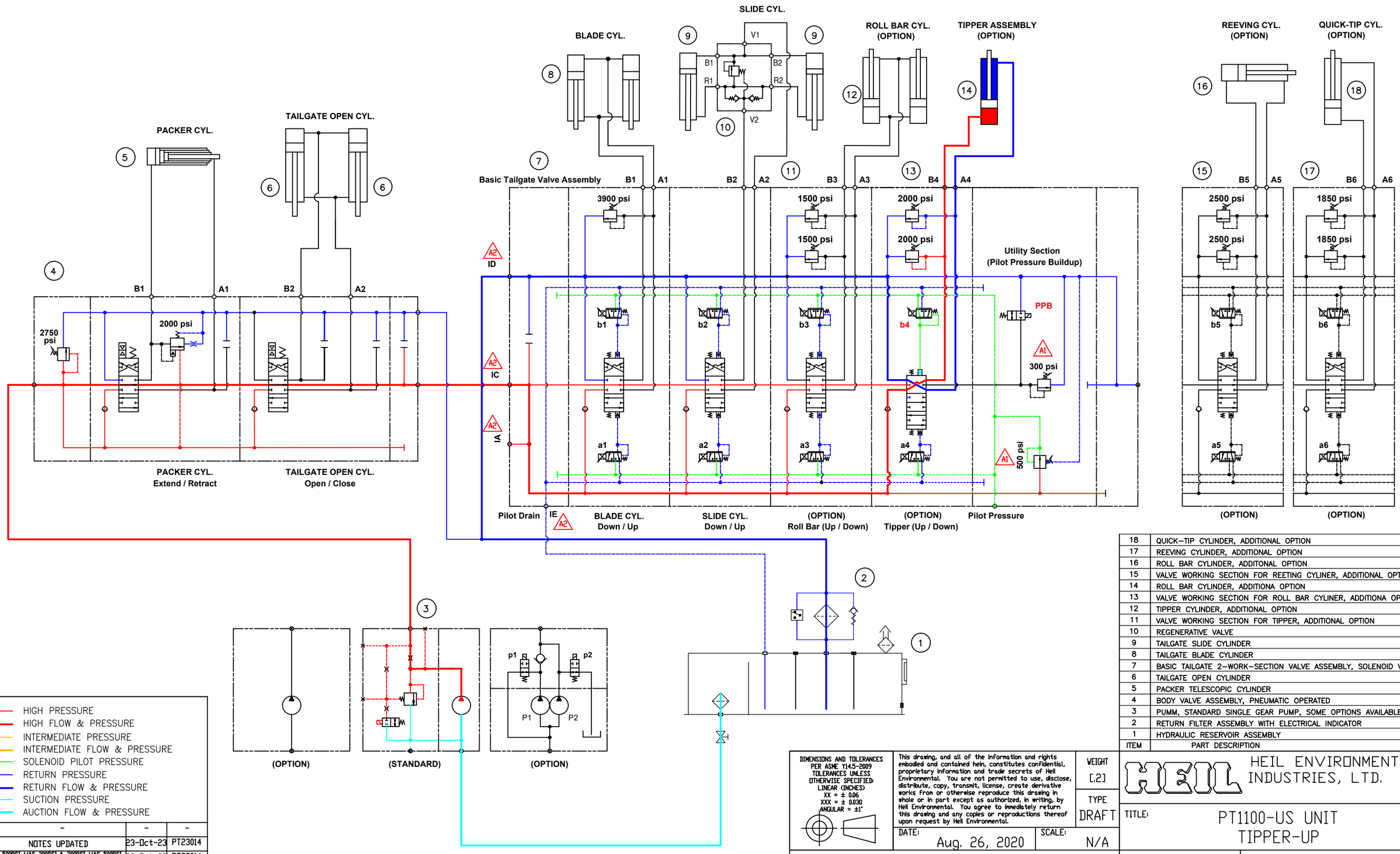
HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT ROLL-BAR-DOWN

DRAWN BY: AJ

PART No. 701-9342-015

TIPPER-UP



HIGH PRESSURE	
HIGH FLOW & PRESSURE	
INTERMEDIATE PRESSURE	
INTERMEDIATE FLOW & PRESSURE	
SOLENOID PILOT PRESSURE	
RETURN PRESSURE	
RETURN FLOW & PRESSURE	
SUCTION PRESSURE	
AUCTION FLOW & PRESSURE	

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ITEM	PART DESCRIPTION
18	QUICK-TIP CYLINDER, ADDITIONAL OPTION
17	REEVING CYLINDER, ADDITIONAL OPTION
16	ROLL BAR CYLINDER, ADDITONAL OPTION
15	VALVE WORKING SECTION FOR REETING CYLINER, ADDITIONAL OPTION
14	ROLL BAR CYLINDER, ADDITIONA OPTION
13	VALVE WORKING SECTION FOR ROLL BAR CYLINER, ADDITIONA OPTION
12	TIPPER CYLINDER, ADDITIONAL OPTION
11	VALVE WORKING SECTION FOR TIPPER, ADDITIONAL OPTION
10	REGENERATIVE VALVE
9	TAILGATE SLIDE CYLINDER
8	TAILGATE BLADE CYLINDER
7	BASIC TAILGATE 2-WORK-SECTION VALVE ASSEMBLY, SOLENOID VALVE
6	TAILGATE OPEN CYLINDER
5	PACKER TELESCOPIC CYLINDER
4	BODY VALVE ASSEMBLY, PNEUMATIC OPERATED
3	PUMM, STANDARD SINGLE GEAR PUMP, SOME OPTIONS AVAILABLE
2	RETURN FILTER ASSEMBLY WITH ELECTRICAL INDICATOR
1	HYDRAULIC RESERVOIR ASSEMBLY

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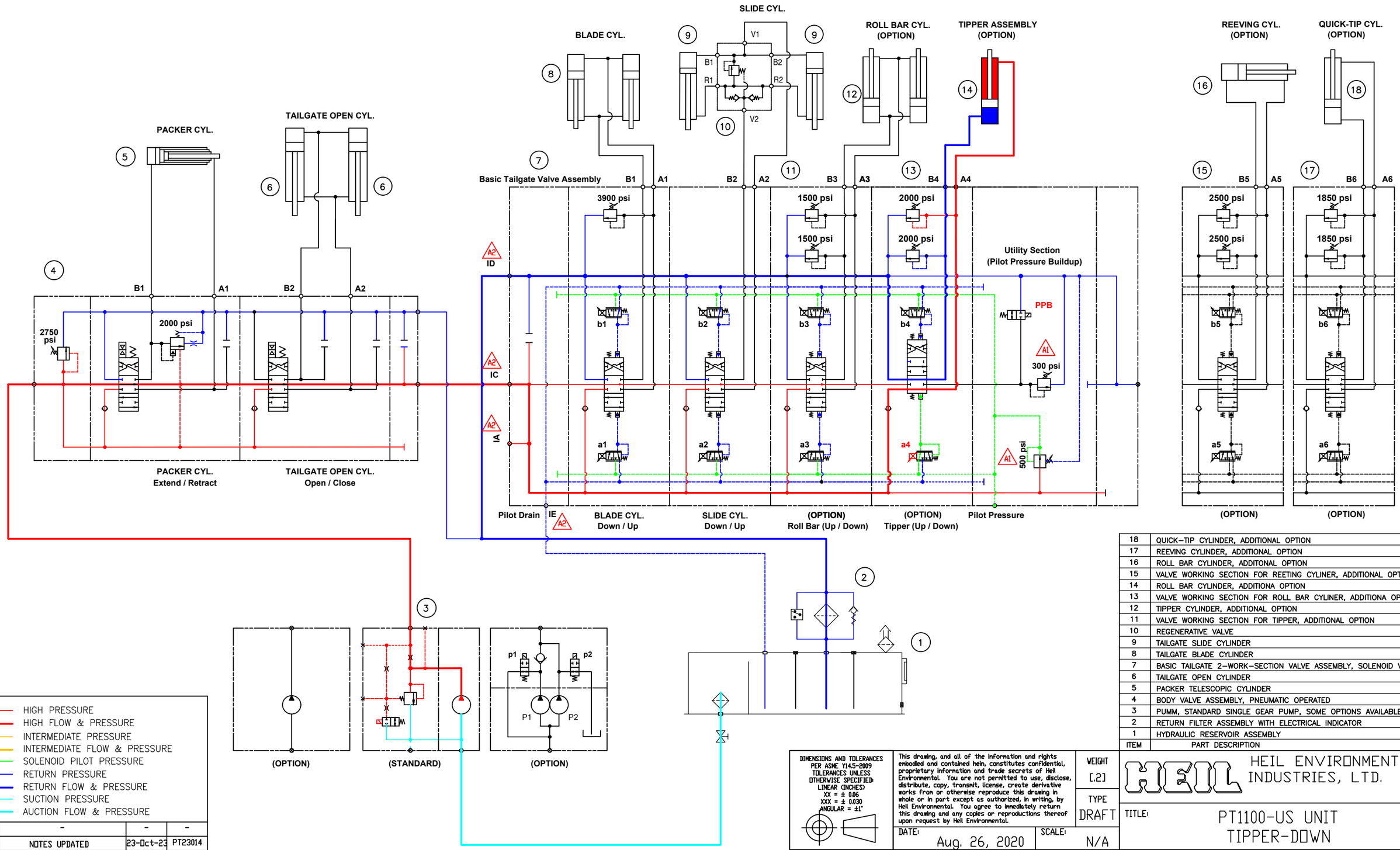
WEIGHT [.2]
TYPE DRAFT
DATE: Aug. 26, 2020
SCALE: N/A
MATERIAL:

HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT TIPPER-UP

DRAWN BY: AJ
PART No. 701-9342-016

TIPPER-DOWN



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TYPE DRAFT

DATE: Aug. 26, 2020

SCALE: N/A

MATERIAL:

HEIL HEIL ENVIRONMENTAL INDUSTRIES, LTD.

TITLE: PT1100-US UNIT TIPPER-DOWN

DRAWN BY: AJ

PART No. 701-9342-017

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INDEX

HEIL ENVIRONMENTAL WARRANTY STATEMENT

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

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

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

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

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

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

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

Revised 1/2013

www.heil.com

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

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

Parts Central:
800-528-5308

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