



RevAMP®

ELECTRIC AUTOMATED SIDE LOADER

SERVICE MANUAL

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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

PLEASE NOTE THAT THIS MANUAL IS APPLICABLE TO THE HEIL BODY ONLY. PLEASE CONSULT THE RESPECTIVE CHASSIS MANUAL FOR ANY AND ALL ISSUES OR QUESTIONS RELATED TO THE CHASSIS. HEIL CANNOT SPEAK FOR THE CHASSIS MAKER.

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.



WARNING: Operating, servicing and maintaining equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your equipment in a well-ventilated area and wear gloves or wash your hands frequently when servicing your equipment. For more information go to **www.P65Warnings.ca.gov**.

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SECTION 1

GENERAL INFORMATION

GENERAL INFORMATION

Important Safety & Procedural Information

DANGER

This vehicle contains high-voltage and other stored energy systems. All stored energy must be removed and/or protected against. Improper servicing can cause **SERIOUS INJURY** or **DEATH**. Only qualified personnel may perform maintenance. Always disconnect and discharge all energy sources. Follow proper **“Lock-Out/Tag-Out Procedure”** on **page 12** for chassis and “” on **page 17** for the body battery. **SERIOUS INJURY** or **DEATH** will occur.

DANGER

ALL Required PPE, including Class 0 Electric Gloves, **MUST** be worn throughout all procedures where they are specified. Ensure the multimeter and other equipment are preset **BEFORE** starting the procedure. Do not remove gloves during the procedure to make adjustments to the multimeter or any other test equipment. Multimeter leads with retractable, insulated sleeves on the test probes or alligator clips must be used. **SERIOUS INJURY** or **DEATH** will occur.

WARNING

Failure to follow all instructions and safety precautions in this Service Manual and 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 and 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.

NOTICE

If you suspect a problem with the battery, stop operating the unit immediately and contact the battery manufacturer or an authorized service provider. Contact Heil Technical Services at 866-310-4345 for more information. Do not attempt to open, repair, or modify the battery under any circumstances. Do not attempt to replace the battery yourself. Battery replacement must be performed only by trained personnel authorized by the manufacturer. Store batteries in a cool, dry, and well-ventilated area, away from direct sunlight, heat sources, and flammable materials. Ensure batteries are stored at the recommended state of charge (SOC) as specified by the manufacturer to prevent degradation. Follow all local regulations and manufacturer guidelines for battery storage, disposal, and recycling.

GENERAL INFORMATION

Introduction

RevAMP is a system entirely composed of electric motors drawing their power from a battery. Thanks to its total autonomy, our electrical equipment can be installed on an electric or diesel chassis, which allows great savings. In addition to this new feature, the vehicle is designed to optimize the daily work of operators, to facilitate and reduce the frequency of maintenance by maintenance personnel and to reduce the operating costs of fleet managers. In order to get the best out of the product, careful maintenance and strict safety measures are required. It is the owner's responsibility to train its employees in proper use and to ensure that they are aware of this operations manual and its contents. To ensure optimal truck performance, proper maintenance and repairs are essential. Any modification or repair made must comply with the American National Standards Institute standard Z245.1. Failure to comply with this directive may result in property damage and/or human injury. For maintenance procedures that require special tools, it is strongly recommended to use only the appropriate tools in order to avoid any risk of further injury to the user. In case of breakage or failure, it is strongly recommended to contact the supplier in order to reduce the risk of recurrence or more serious consequences. The following sections are a guide for maintenance and service of the Heil unit.

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

This section explains the system and its major components. Diagrams and schematics of the electrical 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.

GENERAL INFORMATION

Operation

1. It is the operator's responsibility to ensure that the vehicle complies with this Operator's Manual, Occupational Safety and Health Regulations (CNESST), American National Standards Institute (ANSI) standards and any other relevant organization in the relevant province or state at all times.
2. The operator must be comfortable with the functions and location of all instruments, gauges, safety devices and controls of the device. It is strongly recommended not to use the equipment without proper instruction and training. Labels and other safety features, manual signs and traffic laws must be known to the operator.
3. 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.
4. In accordance with the local Highway Safety Code, the wearing of seat belts is mandatory when the vehicle is on the road.
5. For chassis information (engine, start-up procedure, etc.), please refer to the chassis manufacturer's instruction manual.
6. Always keep access and service doors closed and locked while the unit is in operation.
7. Use the unit only for the tasks for which it was designed.
8. Never use electrical cables or other components as a handle.
9. Always keep arms, hands, fingers or other limbs away from moving parts.
10. To dislodge waste, make sure that no moving parts of the device are activated and that you are wearing the appropriate protective equipment. It is strongly recommended to put the vehicle in Lock-Out/Tag-Out before performing any manipulation near the moving parts.
11. Do not try to lift overloaded containers. When collecting waste, the operator must ensure that the containers are safe and usable. Containers should be centered on the arm and handled slowly.
12. It is important never to pass under an element of the unit in the raised position, this unit will operate without making a sound (for example, the back door, a container, the automated arm, etc.)
13. When unloading, keep a safe distance from the truck.
14. Always make sure there is enough free space and that no one approaches when you go up or down the mechanical arm and back door.
15. It is advisable to always handle the various elements of the waste collection equipment slowly.
16. Always keep the vehicle up to date according to the maintenance schedule to ensure optimal and safe operation.
17. Before performing any maintenance on the device, it is important to put the vehicle in Lock-Out/Tag-Out.
18. All pre-programmed factory settings for electrical components do not need to be changed. A modification could cause the device to malfunction and/or increase the risk of injury or death to the operator as well as to people in the vicinity. For any information regarding these parameters and their modification, please contact the authorized Heil Dealer in your area directly.
19. A hard copy of this manual must always be available to the operator at all times.
20. Maintenance of the unit should be carried out with appropriate tools and by qualified personnel only.
21. In case of transfer of the unit to a new owner, the authorized Heil Dealer in your area must be notified to ensure adequate monitoring of the condition of the truck and the maintenance carried out.
22. Wearing safety gloves, steel-toed shoes and safety glasses is highly recommended to all operators. It is also not recommended to wear jewelry or loose clothing that could cling to the control levers or moving parts of the device.
23. According to the law, it is strictly forbidden to take control of the unit under the influence of drugs and/or alcohol.
24. The operator who takes control of the unit must have adequate training, know how controls and machines work, and be comfortable with manual signals, safety warnings and traffic laws.
25. Before each use of the device, it is important to ensure the functionality of the main components by completing the grid provided in the maintenance manual.

GENERAL INFORMATION

26. Any verification deemed non-compliant, whether in the previous grid or simply according to the judgment of the operator, must be reported to the owner immediately to remedy the situation. Before leaving the vehicle with a malfunction, follow the stop procedure that is presented later in this manual.
27. If, for any reason, the height of the device has changed, it must be ensured that this new height is indicated on the safety label provided for this purpose.
28. The operator must be aware of the position and operation of all controls and emergency devices of the device.
29. Keep the driving area, steps and handles clean and free of debris and grease.

Service/Parts Assistance

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

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

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

RECOMMENDED SPARE PARTS		
PART NO.	DESCRIPTION	QTY
A006611	Up-Down- Side Leaf Chain	2
A009562	Up-Down Leaf Chain	2
005037	Grabber's Rubber	3
009507	Grabber's Rubber	3
007246	Grabber Central Rubber	1
007393	Anti Friction Plate	3
007486	Up/Down Tensioner Upper Pin	2
W007457	Up/Down Tensioner Lower Pin	2
B000059	Up/Down Encoder	1
007393	Anti-Friction Plate	3
B007416	Up/Down Chain	1
B009717	Up/Down Chain	1
007751	Stoppers	4
B007750	Grabber's Bottom Rubber	1
007990	4" Rubber Stopper	1
A007334	Grabber Up/Down Roller	4
W007442	Intermediate Up/Down Rollers	4
A009340	Intermediate Up/Down Rollers	4
W007136	In/Out Single Roller Weldment	2
W007103	In/Out Roller Weldment	2
W007140	In/Out Roller Weldment	2
A007741	In/Out Chain	1
007757	In/Out Chain	1
007758	In/Out Chain	1
007740	In/Out stopper	6
007707	Chain Support	1
007704	Chain Support	1
B000059	Encoder (In/Out, Up/Down)	2
B000054	Proximity switch	1
B005090	In/Out motor	1

GENERAL INFORMATION

RECOMMENDED SPARE PARTS		
PART NO.	DESCRIPTION	QTY
B005178	Up-Down Motor	1
B005089	Grabber Motor	1
B007752	In-Out Gearbox	1
B007401	Up-Down Gearbox	1
B005188	Grabber Gearbox	1
B007619	Grease Brush	2
B007586	Chain 100-3	10 FT
B009977	Gearbox Compaction Chain	10 FT
B007591	Idler Bushing	1
W010025-00	Tailgate Locking Pin	2
006148	Side Rubber	2
006132	Side Rubber	2
006053	Bottom Plastic Slider	2
006091	Side Plastic Slider	2
006063	Top Plastic Slider	2
B006097	Bumper	2
B006147	1/2" 100 Gr Ejector Chain (50 ft)	2

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 for reference use only and the cart functionality is disabled. Please contact your local Heil Dealer for parts quoting and ordering.

Registration & 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**.

Figure 1.

Figure 2.

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:

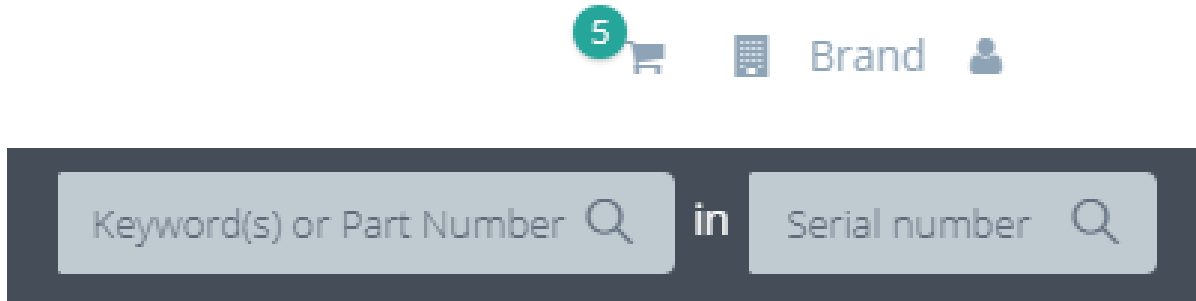


Figure 3.

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.

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).

Code	Description	Catalogue		
035-3712	GUARD, switch, proximity , TAILGATE LOCK	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BODY		
063-0122	switch, proximity , SOURCING, 18 MM	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BODY		
063-0123	switch, proximity , 30 MM.	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / INSTALLATION, ELECTRICAL, STEEL, TOP DOOR		
063-0123	switch, proximity , 30 MM.	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BODY		
212-2228	DECAL, proximity switch , ADJUSTMENT	Half/Pack, Odyssey and Factor AFL / BODY AND TAILGATE / KIT, DECAL & TRIM, STANDARD, 28 YD., WITH CNRG TAILGATE		
234-3317	PLATE, STRIKER, proximity switch , TAILGATE LOCK, 1"	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BODY		
311-3954	BRACKET, proximity switch , 30MM, LOADER	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BODY		
311-6253	BRACKET, 30 MM, proximity switch , TAILGATE LOCK	Half/Pack, Odyssey and Factor AFL / ELECTRICAL / KIT, ELECTRIC, BODY		

Figure 4.

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.

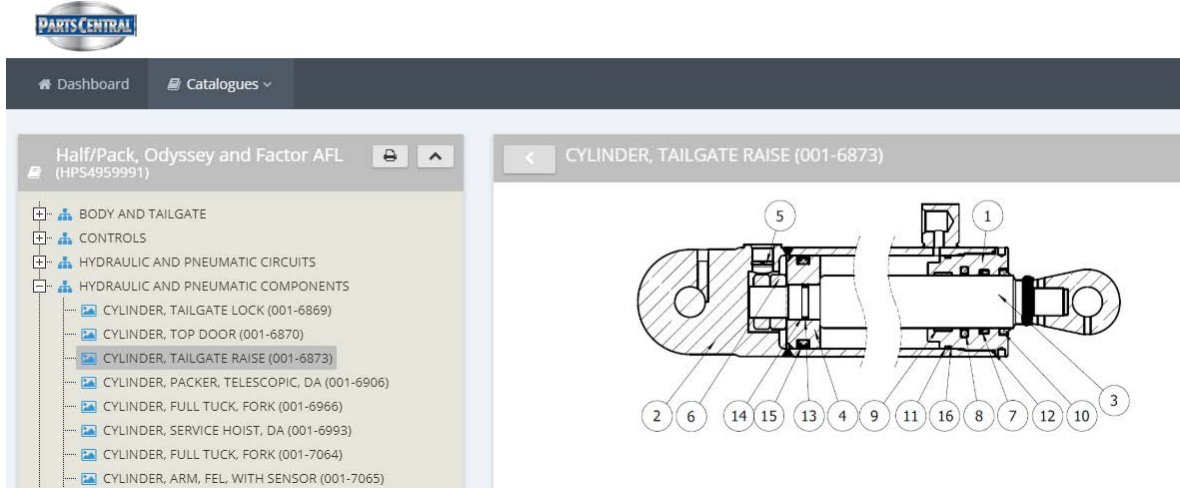


Figure 5.

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.

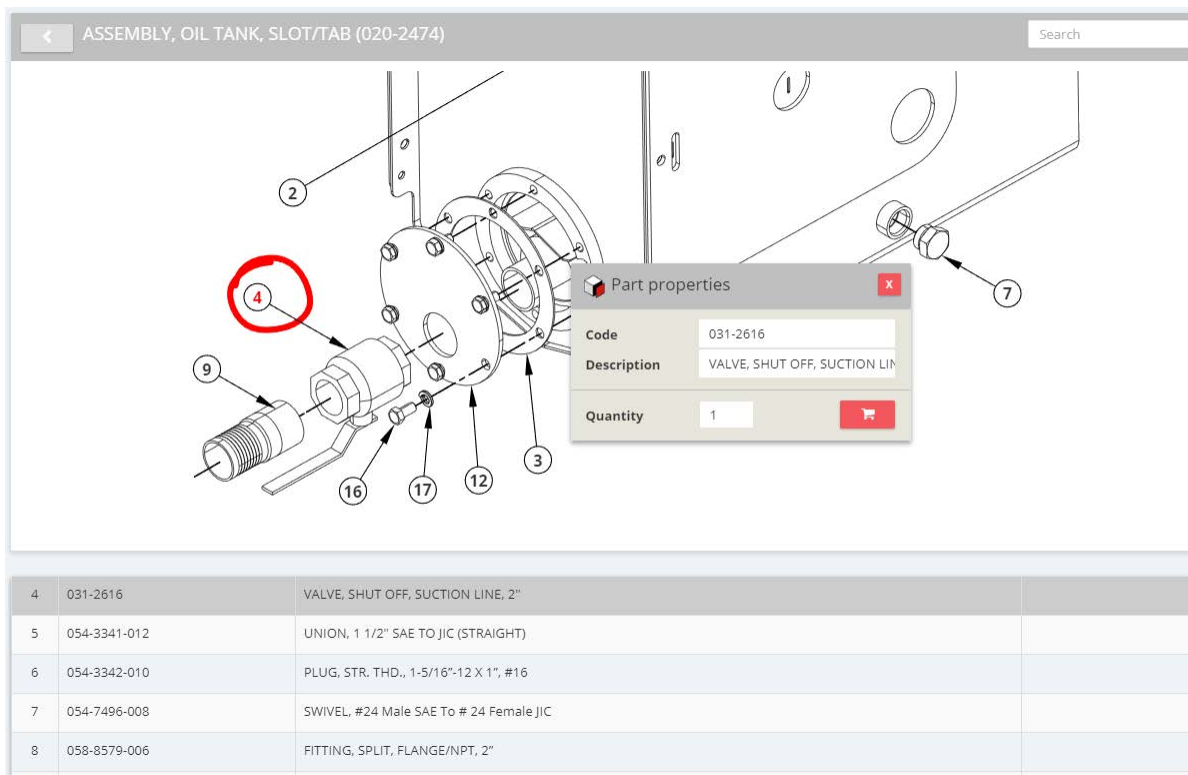


Figure 6.

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 SERIOUS INJURY or DEATH if you do not follow proper instructions.
- **WARNING** – indicates a hazardous situation, which if not avoided COULD result in SERIOUS INJURY or DEATH 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 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 or 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 and the Service Manual for this unit, other applicable manufacturer's manuals and the safety decals on the product.

DANGER

Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Always utilize the tailgate props according to specifications when propping the tailgate **“Tailgate Props” on page 49**. Never place any part of your body between the unit and the tailgate while propping or stowing the tailgate props. This area is extremely dangerous. SERIOUS INJURY or DEATH will 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 will occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate. A safety spotter is recommended to make sure that no one enters the tailgate area while the tailgate is being closed.

DANGER

The auger and ejector panel are dangerous. They can cause SERIOUS INJURY or DEATH if a person is inside the hopper. Make sure no one is inside the hopper before you begin a packer or crusher function. Put the unit in Lock-Out/Tag-Out if it is necessary to enter the hopper area.

DANGER

Lifting equipment that does not have sufficient lifting capability is dangerous, equipment will fail and cause SERIOUS INJURY or DEATH 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.

WARNING

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

GENERAL INFORMATION

DANGER

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

WARNING

Make sure the unit is in "**Lock-Out/Tag-Out Procedure**" on **page 12** when you do **ANY** 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. When the unit is not in Lock-Out/Tag-Out, 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**.

WARNING

On electrified bodies (such as RevAMP), serious death or injury can occur from improper handling of charged environments. Please be sure to observe any and all precautions with regard to working in a high voltage environment, including following proper lock out / tag out and decommissioning procedures and allowing for the discharge of residual voltage.

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.

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 **SERIOUS INJURY** or **DEATH** 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. Refer to OSHA standards and seek immediate medical help.

NOTICE

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

NOTICE

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand the instructions in this manual. Failure to do so can result in damage to the unit or other property. If you do not understand a procedure or instruction, tell the owner or the designated person immediately. Do not operate the unit if you do not understand all procedures and instructions in this manual. The owner or designated person can contact your Heil dealer or Heil for additional help. See the Operator's Manual or Service Manual applicable to the unit for contact information.

GENERAL INFORMATION

Lock-Out/Tag-Out Procedure

⚠ DANGER

This procedure **MUST** be followed before entering the unit's body or performing any maintenance, repair, or cleaning procedures on the unit.

⚠ WARNING

If you do not have functioning Lock-Out/Tag-Out equipment and/or are not an authorized employee, **STOP** and **DO NOT** initiate any service on the unit. Contact your supervisor immediately.

NOTICE

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

NOTICE

See “” on page 17 before proceeding.

Watch the service shack video online at Heil Service Shack by selecting **Lock-Out/Tag-Out**.

- A. Put the unit in a Lock-Out/Tag-Out:
 - 1. **BEFORE** you enter the unit's body
 - 2. **BEFORE** you perform ANY maintenance, repair or cleaning procedures on the unit.
- B. All stored energy must be removed and/or protected against, common sources found on Heil units (Including, but not limited to):
 - 1. Hydraulics
 - 2. Electrical
 - 3. Gravity
 - 4. Pneumatics
 - 5. Mechanical
- C. Examples of some basic equipment required:
 - 1. Multi-hasp
 - 2. Single-keyed red lock
 - 3. Lockout tag



Figure 7.

GENERAL INFORMATION

Follow These Steps:

1. APPLY the brakes. MAKE SURE the brakes prevent the unit from moving and are functioning properly.
2. Chock all wheels.
3. SET the tailgate props when the tailgate is raised for any service, maintenance or cleaning.
4. SET the body props when the body is raised for any service, maintenance or cleaning.
5. BEFORE disconnecting main battery power, VERIFY all the following stored energy sources are depleted according to your company policy:
 - a. Hydraulic (Such as forks or grabber arm in stowed position)
 - b. Pneumatic (Such as tag axles).
 - c. Mechanical (Such as springs)
 - d. Gravity (Such as tailgate raised)
6. REMOVE the key from the ignition and store it in your pocket, or another secured location for your safety.
7. Disconnect the battery power by flipping the battery box disconnect switch to OFF.
 - a. VERIFY all electrical stored energy is depleted according to your company procedure.
8. INSERT the multi-hasp into the disconnect switch.
9. ATTACH your red single-keyed Lock-Out/Tag-Out lock with your tag exposed and visible to the multi-hasp.
 - a. ALWAYS use individually assigned locks and tags when performing ANY service or maintenance with other authorized employees. Each employee MUST place their personally assigned tag and lock to the multi-hasp connected to the disconnect switch.
10. REMOVE your lock key and put it in your pocket for your safety.
 - a. ONLY the person who placed the lock and tag on the multi-hasp is authorized to remove it.
 - b. NEVER remove another employee's Lock-Out/Tag-Out equipment without approval from the authorized person responsible.
 - c. Shift or personnel changes: Off-going employees MUST provide all details pertaining to the unit's status to the oncoming employee(s). The oncoming employee(s) MUST perform the Lock-Out/Tag-Out procedure to verify all stored energy is removed from the unit BEFORE applying their Lock-Out/Tag-Out equipment.
11. BEFORE removing your Lock-Out/Tag-Out equipment to return the unit to service, follow these steps:
 - a. INSPECT the work area to ensure all nonessential items have been removed.
 - b. VERIFY all unit components are operationally intact.
 - c. ENSURE all employees are safely positioned or removed from the area.
 - d. NOTIFY all affected employees that the Lock-Out/Tag-Out devices are being removed.

GENERAL INFORMATION

Fire Danger

It is important to always have a fire extinguisher nearby (in the cabin or near the mechanical arm). This fire extinguisher must be checked monthly to make sure it is functional.

Please be advised that Heil provides 10 B:C category extinguisher(s) with each body. Please be sure to inspect for presence and condition of extinguishers before each trip.

Always keep flames or heat sources away from combustible and/or flammable materials. Avoid loading burning/smoldering waste or smoking ashes as this could ignite the contents of the body (including hopper and auger).

Critical Battery Temperature Condition

It is critical to understand that the RevAMP body is powered by a high voltage battery system – either as part of the Heil RevAMP body installation or from the chassis (e.g. the traction battery). As with all high voltage battery systems, there is a potential for critical over temperature conditions, especially if subjected to misuse or abuse. Please be sure to familiarize yourself with any and all related instructions, warnings, and procedures related to chassis battery systems (chassis battery is not Heil's responsibility). This manual only covers Heil-provided body battery systems.

In the event of a critical battery temperature condition, the below warning will displayed on the body display screen.

IF YOU SEE THIS DISPLAYED, IMMEDIATE ACTION MUST BE TAKEN.



Figure 8.

⚠ WARNING

In the event of a Critical Battery Temperature condition as displayed above, or if fire and/or smoke are observed coming from the body battery, please follow the below instructions. SERIOUS INJURY or DEATH may occur if not followed.

- Immediately stop the RCV in a safe location as far away from buildings and other vehicles as safely and reasonably possible.
- Once in a safe location, immediately turn off power to the body and follow shut-down/park instructions provided by the chassis manufacturer. Exit the RCV and move away as quickly as safely possible after power is shut off and check surrounding area for any potential dangers.
- Immediately contact relevant emergency services (e.g. 911 in most U.S. jurisdictions) and ensure you communicate that the potential emergency involves a high voltage electric garbage truck. Keep at a safe distance and warn others to keep back.

NOTE: While Heil RCV bodies are equipped with fire extinguishers, the above process must be followed for a Critical Battery Temperature condition. Operators should not attempt to fight high voltage battery fires – that must be left to professional fire fighters. Fire extinguishers are provided solely to facilitate emergency egress in a Critical Battery Temperature condition.

NOTE: Even if no visible signs of smoke or fire are observed, but the Critical Battery Temperature condition is displayed, please obey the above instructions.

GENERAL INFORMATION

Charging Electric Body Battery

The following process outlines steps to connect and charge the electric body battery. Please read through the entire process before beginning the charging process. For steps to decommission the chassis, please follow instructions provided by the respective chassis manufacturer. The Heil Co. (Heil) makes no statements for or on behalf of any chassis system or chassis manufacturer – it is your responsibility to consult with the respective manufacturer for your chassis.

NOTICE

The unit must be plugged in, and system power switch must be on and pulled up (NOT engaged) with its light illuminating in order for the battery to regulate its temperature within operating range. For more information, reference the RevAMP Operation Manual.

Connecting Power Cord to Activate Charging:

1. Plug generic charging cord into power outlet.
2. Locate the battery disconnect between cab and body on the street side of the truck, move switch to the “ON” position. The light will turn on as shown.

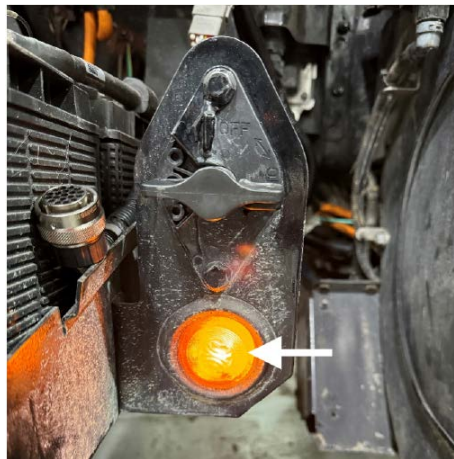


Figure 9. Battery Disconnect

3. In the cab, verify and place the system power in the “UP” position. If it is in the “UP” position with the chassis key in the “ON” position, the system power switch light will be “ON”.



Figure 10. System Power Switch in Up Position

GENERAL INFORMATION

4. Find the J1772 RECEPTACLE charging port located on the street side of the body and open cap.



Figure 11. Charging Port Closed



Figure 12. Charging Port Open

5. Before insertion, verify correct orientation of the charging plug by matching the placement of the pins from plug to the corresponding holes on the charging port.
6. Once verified, insert plug into the J1772 RECEPTACLE.



Figure 13. Charging Plug Pins



Figure 14. Charging Port

GENERAL INFORMATION

- When the charging plug is connected correctly, the electric body will automatically activate the charging sequence.



Figure 15.

- The display screen in the cab should show a green plug icon in the lower left-hand side, and the charging amps will show on the right-hand side measuring above 0 A.



Figure 16. Charging Display Screen

GENERAL INFORMATION

Electric Body Decommissioning

The following process outlines steps to decommission/commission the electric body ONLY. Please read through the entire process before beginning work. For steps to decommission the chassis, please follow instructions provided by the respective chassis manufacturer. The Heil Co. (Heil) makes no statements for or on behalf of any chassis system or chassis manufacturer – it is your responsibility to consult with the respective manufacturer.

Heil provides this process outline to help inform users. However, all users must exercise due care, professional diligence, and only perform work on systems they are fully qualified on which to work. Heil cannot control how work is done by you and, as such, you are solely responsible for your work on any Heil electric body. Please ensure you and your work fully comply with all applicable rules, regulations, and standards including but not limited to OSHA, ANSI, and NFPA standards and guidelines. Your organization and/or location may have additional safety requirements and it is up to you to assess and comply with such.

It is recommended that decommissioning work on an electric body be performed inside a dry, well-ventilated work bay with sufficient clearance. Ensure that no flammable liquids/materials are near the work area and no moisture is present on the floor. Lift arm should be free and clear. To return the unit to the same setup after decommissioning, take note of all options and set points on the display before beginning the decommissioning process. After noting the options and set points, the chassis key switch should be in the “OFF” position and the ignition key removed. Place the chassis gear in the “Neutral” position, ensure the parking brake is set, and chock the wheels. Place barriers around the unit to keep unnecessary personnel from the work area.

The decommissioning process may be performed by 1 qualified technician and 1 safety spotter / qualified observer. Technician should be fully trained on, and qualified to work with, high voltage systems. Ensure that the technician removes all metal in clothes (loose change, pocket-knives, etc.) as well as on the person, including jewelry (watches, rings, necklaces, etc.). Safety spotter / qualified observer should be standing by with the rescue hook before beginning the process. Proper PPE (hood, coveralls, gloves, boots, etc.) must be worn by the technician during the entirety of this process. A list of recommended PPE can be found in the table below.

NOTE: [OSHA 1910.269 (a) (2) (viii) requires that all high voltage qualified persons must demonstrate their proficiency and knowledge of high voltage safe work practices.]

Reference: NFPA 70E and OSHA 1910.269 as part of creating an electrically safe work condition.

Reference: ASE Electrified Propulsion Vehicles (xEV) High-Voltage Electrical Safety Standards – Level TWO – High-Voltage Vehicle

This procedure is intended to provide steps required to decommission and commission ONLY the electric body to allow work to be performed while the unit is in the decommissioned state. If any work including “Hot Work” or “Energized Troubleshooting/Work” is required to be performed, contact Heil Tech Services or perform an Arc Flash Evaluation with an Electrical Professional Engineer to determine the proper PPE required prior to performing.

Safety Spotter / Qualified Observer

Please refer to your organization’s respective safety spotter / qualified observer and arc flash protocols. Heil is not responsible for the training or protocols of your organization. When in doubt, please consult your organization’s respective safety function with any questions. DO NOT ATTEMPT TO PARTICIPATE WITHOUT PROPER TRAINING, PROTOCOLS, OR PPE. Please refer to OSHA 1910.269 and ASE Electrified Propulsion Vehicles (xEV) High-Voltage Electrical Safety Standards – Level TWO – High-Voltage Vehicle for additional details. THIS IS PROVIDED FOR GENERAL INFORMATION PURPOSES ONLY – PLEASE BE SURE TO REFER TO APPLICABLE OSHA, ASE, AND NEC REQUIREMENTS FOR SPECIFIC REQUIREMENTS WITH WHICH YOU MUST COMPLY. ONLY THOSE QUALIFIED ON ELECTRIC VEHICLE SERVICE SHOULD ATTEMPT THE DECOMMISSION OR RECOMMISSION PROCESS.

GENERAL INFORMATION

Required PPE List

Arc Flash 40 Cal Kit with Hood	1
Class 0 Electrical Gloves 1000V	1 pair
Fluke Proving unit PRV240 or equivalent	1
Fluke CAT III 1000Vdc TRMS Multimeter	1
Arc Rated Boots	1 pair
Arc Rated Blanket	1
Switchboard Matting	1
Arc Rated Knee Pads	1 pair
Electrically Rated Hand Tools	1 set
Rescue hook	1



Figure 17. Arc Flash 40 Cal Kit with Hood



Figure 18. Fluke CAT III 1000Vdc TRMS Multimeter



Figure 19. Fluke Proving unit PRV240 or equivalent.



Figure 20. Insulated Tools



Figure 21. 1000v Protective Gloves (Class0)



Figure 22. Insulated Test Leads with Adjustable Protective Shrouds

GENERAL INFORMATION

Example: Arc Flash “Go-Bag” List – Duffel Included

MFG	MFG P/N	Description	Qty
40 Cal Pyrad Kit			
CPA	AG40-GP-S-H3P-NG	Premium Gore Pyrad Jacket & Bib Kit w/ Lift Front Hood No Glove Kit (Various sizes available)	1
40 Cal Pyrad Kit w/FAN			
CPA	AG40-GP-S-H3P-NG-FAN	Premium Gore Pyrad Jacket & Bib Kit w/ Lift Front Hood Size No Glove Kit (Various sizes available)	1
Class 0 Electrical Glove Kits			
PIP	150-SK-0/9-KIT	Class 0 Electrical Safety Glove Kit, 1 Pair Black ESP Gloves, 1 Pair Goatskin Protectors, 11' Nylon Bag (Various sizes available)	1
Arc Rated Boots			
Salisbury	21406WT 10-ES	Electrigrad[™] 20kV Deep Heel Wide Throat Dielectric Overboot PR (Various sizes available)	1
Arc Rated Blanket			
Voltguard	LRIB-VB2-36X36	Black Blanket 36" x 36" Class 2, Type 1, with eyelets, Maximum Working Voltage 17kV (Tested at 20kV)	1
Switchboard Matting			
Notrax	831C0024BL	Anti Slip Non-Conductive Diamond Plate Switchboard Mat 831 1/4" Thick 2' x 3'	1
Arc Rated Knee Pads			
Alta Industries	50902	Safety Knee Pads ASTM F1506, NFPA70E Level 2, NFPA 1977, NFPA 2112 and OSHA 29 CFR 1910, 269	1
Electrically Rated Hand Tools			
Klein	33527	General Purpose 1000V Insulated Tool Kit 22-Piece	1
Rescue Hook			
Salisbury	24403	8' Fiberglass with Aluminum Bronze Alloy Head, 18" Opening	1

Read and follow all safety decals on the unit and follow the procedure below to decommission the body electrical system. Make sure that you do not damage electrical connectors when performing the **Decommissioning and Recommissioning Procedures**.

DANGER

ALL Required PPE, including Class 0 Electric Gloves, MUST be worn throughout all procedures where they are specified. Ensure the multimeter and other equipment are preset BEFORE starting the procedure. Do not remove gloves during the procedure to make adjustments to the multimeter or any other test equipment. Multimeter leads with retractable, insulated sleeves on the test probes or alligator clips must be used. **SERIOUS INJURY or DEATH** will occur.

NOTICE

The following electric body decommissioning and re-commissioning procedures **ONLY** apply to the Octillion Battery system and **DO NOT** apply to other manufacturers' batteries or configurations. Contact the Heil Technical Service if you need decommissioning instructions for a Heil body equipped with another battery type or configuration.

GENERAL INFORMATION

Electric Body Decommissioning Procedure

1. Make sure the body battery charger is disconnected from the Level II Shore Charger Interface (J1772 Receptacle) on the charger cabinet. Also, identify the electrical cabinets on the body.



Figure 23. Curb Side J1772 Charging Port Receptacle Location

2. Make sure the Chassis Key Switch is in the “OFF” position and the Ignition Key is removed.



Figure 24. Chassis Ignition Key Off and Removed

3. Make sure the Chassis Battery Disconnect Switch is in the OFF Position and the proper Lock-Out/Tag-Out procedure is applied. The Chassis Battery Disconnect Switch location varies from chassis to chassis. Refer to the Chassis Manufacturer documentation for Lock-Out/Tag-Out procedure, decommission process, and physical location of all lockout controls.



Figure 25. Chassis Battery Disconnect Switch

GENERAL INFORMATION

4. To confirm that the system is DE-ENERGIZED, use the following procedure. In accordance with NFPA 70E Requirements, prior to using a multimeter on voltages greater than or equal to 50V ac/dc, the meter shall be verified using a "Proving Unit", such as a Fluke PRV240, to validate multimeter operational status. Using an approved meter that is rated a CAT III 1000Vdc TRMS Multimeter or above, measure the voltage between the High Voltage Positive Bus Bar and High Voltage Negative Bus Bar behind the Body High Voltage Electrical Cabinet Door 2. The voltage reading should be less than 10 Vdc before continuing.

ALL EV body and chassis voltage measurements must be performed with one of the following True-RMS multimeter:

- RECOMMENDED: FLUKE 179 Multimeter: CAT III 1000V/CAT IV 600V, TRMS, 1,000 V Max AC/DC Voltage Measurement
- KLEIN TOOLS Digital Multimeter: CAT III 1000V/CAT IV 600V, TRMS, 1,000 V Max AC/DC Volt Measurement
- EXTECH Digital Multimeter: CAT III 1000V/CAT IV 600V, TRMS, 1,000 V Max AC/DC Volt Measurement

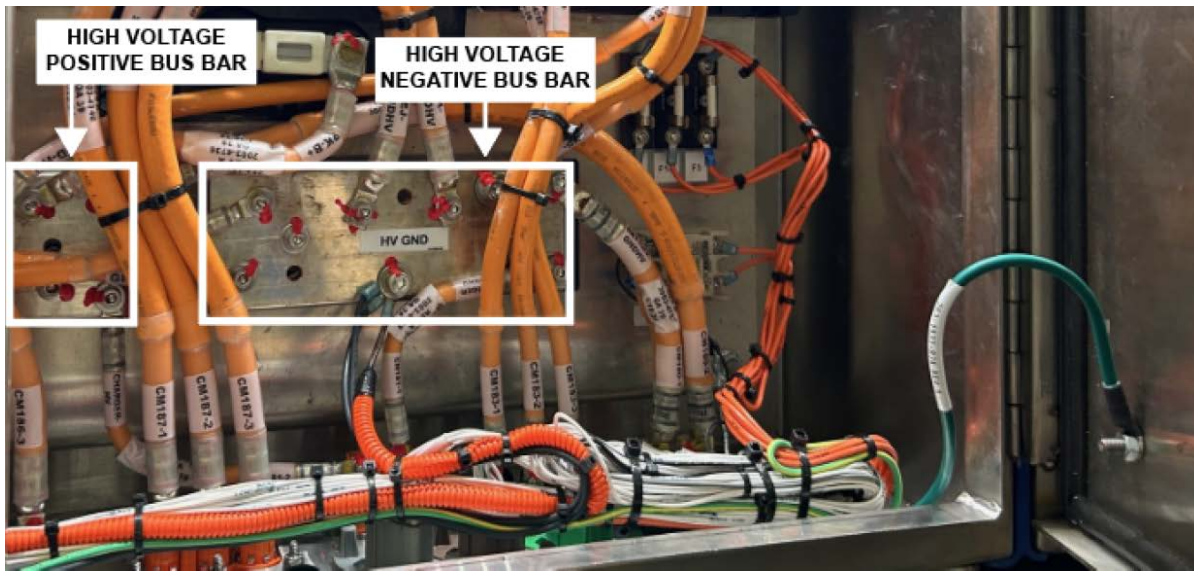


Figure 26. Body High Voltage Electrical Cabinet Panel 2 Voltage Testing Locations

If WELDING IS REQUIRED, perform steps 6 and 7 to prevent damage of body electrical components. If WELDING IS NOT REQUIRED, skip to step 8.

5. Disconnect ALL low voltage connectors (i.e., those without orange wires) from below the Body High Voltage Electrical Cabinet and the Body Controller Electrical Cabinet.



Figure 27. Locations of the Low Voltage Connectors

GENERAL INFORMATION

6. Disconnect the HMI Connector on the Body Display inside the chassis cab.



Figure 28. HMI Connector

⚠ DANGER

CLASS 0 Electrical Gloves and Safety Glasses are required for Steps 7 - 9. Failure to wear the required PPE correctly will result in **SERIOUS INJURY** or **DEATH**.

⚠ DANGER

Do not use a multimeter or any other diagnostic tool to test the battery directly. Battery testing and/or replacement must be performed only by trained personnel authorized by the manufacturer. **SERIOUS INJURY** or **DEATH** will occur.

7. Remove the Main System Disconnect (MSD) from the body battery.

NOTICE

The Main System Disconnect (MSD) has two locking mechanisms. The first lock is located on the black disengaging handle and must be in the unlock position before starting to remove the MSD. The second lock is located on the orange housing of the MSD and is required to be pressed while removing the MSD with the black disengaging handle.



Figure 29. Main System Disconnect (MSD)

GENERAL INFORMATION

8. Disconnect the low-voltage and heater power connectors from the body battery.



Figure 30. Battery Low Voltage and Heater Power Connectors

9. Disconnect the two (2) high-voltage power connectors from the body battery. Remove ARC Flash and High Voltage PPE. **The body is now decommissioned for work when no welding is required.** Place proper signage to indicate decommissioned state. If welding is required, continue to step 10.



Figure 31. Battery High Voltage Power Connectors

GENERAL INFORMATION

If WELDING IS REQUIRED, additional steps must be performed to prevent damage of body electrical components.

Electric Body Decommissioning Procedure When Welding IS Required (STEPS 10-12)

10. With Steps 1-9 completed and the Body Battery disconnected from the body, now disconnect all of the 35-pin drive connectors located behind the two Body High Voltage Electrical Cabinet Doors. There should be five (5) 35-pin drive connectors on a standard RevAMP Unit.



Figure 32. Body High Voltage Electrical Cabinet Panel 1 (3 Locations)



Figure 33. High Voltage Electrical Cabinet Panel 2 (2 Locations)

11. Disconnect ALL Battery Monitoring System (BMS) connectors.



Figure 34. Location of the Battery Management System (BMS) Connectors

12. The truck is now decommissioned for work when welding is required. Place proper signage to indicate decommissioned state.

GENERAL INFORMATION

Read and follow all safety decals on the unit and follow the procedure below to re-commission the body electrical system. The body must be in decommissioned (non-energized) state before attempting this procedure. Reference the Electric Body Decommissioning section of this manual.

⚠ DANGER

ARC Flash and High Voltage PPE must be worn for this procedure. Failure to wear the required PPE correctly will result in **SERIOUS INJURY or DEATH**.

Electric Body Re-commissioning Procedure When Welding Was Required (STEPS 1-9)

1. Re-connect the HMI Connector on the body display inside the cab of the chassis.



Figure 35. HMI Connector

2. Re-connect ALL low voltage connectors (i.e., those without orange wires) from below the two Body High Voltage Electrical Cabinet and the Body Controller Electrical Cabinet.



Figure 36. Locations of the Low Voltage Connectors

GENERAL INFORMATION

3. Re-connect ALL Battery Monitoring System (BMS) connectors.



Figure 37. Location of the Battery Management System (BMS) Connectors

4. Re-connect the five (5) 35-pin drive connectors located behind the two Body High Voltage Cabinet Doors.



Figure 38. Body High Voltage Electrical Cabinet Panel 1 (3 Locations)



Figure 39. High Voltage Electrical Cabinet Panel 2 (2 Locations)

GENERAL INFORMATION

⚠ DANGER

CLASS 0 Electrical Gloves and Safety Glasses are required for Steps 5 - 7. Failure to wear the required PPE correctly will result in **SERIOUS INJURY** or **DEATH**.

5. Re-connect the two high-voltage power connectors from the body battery.



Figure 40. Body Battery Power Connectors

6. Re-connect the low-voltage and heater power connectors from the body battery.



Figure 41. Communications Power Connectors

7. Re-connect the Main System Disconnect (MSD) to the body battery.

NOTICE

The Main System Disconnect (MSD) has two locking mechanisms. Make sure both are locked in place



Figure 42. Main System Disconnect (MSD)

GENERAL INFORMATION

8. Remove Lock-Out/Tag-Out lock from the chassis battery disconnect switch and turn switch to the ON position. The chassis battery disconnect switch location varies by chassis.



Figure 43. Chassis Battery Disconnect Switch

9. Test all body functions and then place the unit back into operational service.

Read and follow all safety decals on the unit.

Electric Body Re-commissioning Procedure When Welding Was NOT Required (STEPS 1-5)

⚠ DANGER

CLASS 0 Electrical Gloves and Safety Glasses must be worn for Steps 1 through 3. Failure to wear the required PPE correctly will result in SERIOUS INJURY or DEATH.

1. Re-connect the two high-voltage power connectors to the body battery.



Figure 44. Battery Power Connectors

2. Re-connect the low-voltage and heater power connectors to the body battery.



Figure 45. Communications Power Connectors

GENERAL INFORMATION

3. Re-connect the Main System Disconnect (MSD) to the body battery.

NOTICE

The Main System Disconnect (MSD) has two locking mechanisms. Make sure both are locked in place



Figure 46. Main System Disconnect

4. Remove Lock-Out/Tag-Out lock from the chassis battery disconnect and turn switch to the ON position



Figure 47. . Chassis Battery Disconnect Switch

5. Test all body operations and then place the unit back into operation.

Decommissioning The DC-DC Converter On The Electric Body

This section is ONLY for Electric Bodies mounted on EV Chassis. Follow the Chassis manufacturers procedures for decommissioning the chassis BEFORE decommissioning the DC-DC Converter on the electric body.

⚠ DANGER

ARC Flash and High Voltage PPE must be worn for this procedure. Failure to wear the required PPE correctly will result in SERIOUS INJURY or DEATH.

Once the Chassis Battery “Decommissioning Process” is complete:

1. Verify that the Chassis 12 Vdc or 24 Vdc Low Voltage Battery is locked out as part of the chassis manufacturer requirements.
 - a. If the 12 Vdc or 24 Vdc Low Voltage Battery was not part of the chassis manufacturer requirements, place the 12 Vdc or 24 Vdc Low Voltage battery disconnect in the “OFF” position and apply a Lock-Out/Tag-Out lock and/or tag in compliance with your Employer’s Lock-Out/Tag-Out Policy.

GENERAL INFORMATION

⚠ WARNING

It may take 15-20 minutes for voltage to dissipate from the system once it is de-energized. If the voltage has not fully dissipated **SERIOUS INJURY** or **DEATH** can occur.

2. To confirm that the system is DE-ENERGIZED, use the following procedure. In accordance with NFPA 70E Requirements, prior to using a multimeter on voltages greater than or equal to 50V ac/dc, the meter shall be verified using a "Proving Unit", such as a Fluke PRV240, to validate multimeter operational status. Using an approved meter that is rated a CAT III 1000Vdc TRMS Multimeter or above, measure the voltage between the High Voltage Positive Bus Bar and High Voltage Negative Bus Bar behind the Body High Voltage Electrical Cabinet Door. The voltage reading should be less than 10 Vdc before continuing.

ALL EV body and chassis voltage measurements must be performed with one of the following True-RMS multimeters:

- RECOMMENDED: FLUKE 179 Multimeter: CAT III 1000V/CAT IV 600V, TRMS, 1,000 V Max AC/DC Voltage Measurement
- KLEIN TOOLS Digital Multimeter: CAT III 1000V/CAT IV 600V, TRMS, 1,000 V Max AC/DC Volt Measurement
- EXTECH Digital Multimeter: CAT III 1000V/CAT IV 600V, TRMS, 1,000 V Max AC/DC Volt Measurement



Figure 48. Body High Voltage Electrical Cabinet Panel 2 Voltage Testing Locations

3. If steps 1 through 3 are verified successfully, proceed to step 5. If steps 1 through 3 were not successful, move to the beginning of this procedure and perform an acceptable Lock-Out/Tag-Out procedure.
4. Disconnect the one electrical connector (two-way) connecting the body DC-DC Converter to the chassis Power Distribution Unit (PDU).

NOTICE

The Chassis Power Distribution Unit (PDU) location varies by chassis. This illustration shows the PDU location on a Peterbilt EV chassis beneath the cab, viewed from the street side wheel well.

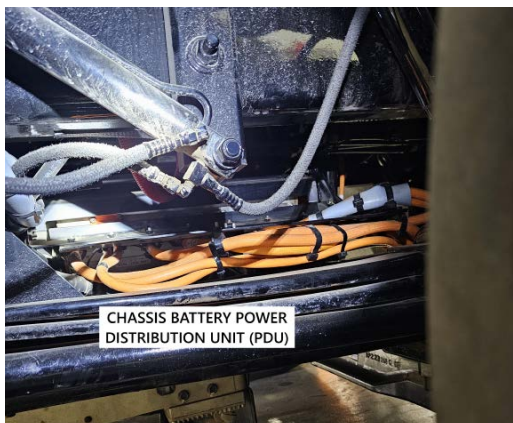


Figure 49. PDU Location on a Peterbilt EV Chassis



Figure 50. Body DC-DC Converter

GENERAL INFORMATION

5. Place the connector inside of an approved Lock-Out/Tag-Out lock box and apply your lock and/or tag in compliance with your Employer's Lock-Out/Tag-Out Policy.
6. Work can now be completed including welding operations.
 - a. If welding on the body. Place the ground lead of the welder on the body within 3 feet and as close as practically possible to the welding location.
 - b. If welding on the chassis, following the welding guidelines provided by the chassis manufacturer.

This section is ONLY for Electric Bodies mounted on EV Chassis. Read and follow all safety decals on the unit and follow the procedure below to re-commission the body electrical system. **The body must be in decommissioned (nonenergized) state before attempting this procedure.** Reference the “Decommissioning The DC-DC Converter On The Electric Body” on page 30.

DANGER

ARC Flash and High Voltage PPE must be worn for this procedure. Failure to wear the required PPE correctly will result in SERIOUS INJURY or DEATH.

1. Remove the Lock-Out/Tag-Out from the DC-DC Converter Connector.
2. Re-connect the one electrical connector (two-way) connecting the DC-DC Converter to the Chassis Power Distribution Unit (PDU).
3. Recommission the Chassis Battery by taking it out of Lock-Out/Tag-Out based on the chassis manufacturer requirements.
4. Test all body operations and then place the unit back into operation.

Storing Refuse In The Body

DO NOT store refuse in the body. The different types of debris and corrosive elements usually collected can cause severe corrosion inside the body, decreasing the life of your body and impact unloading. Additionally, 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 NLGI 2 grease or equivalent. Use anti-rust lubricant spray.

Oil Lubricant Recommendation

Use only non-detergent engine oil to lubricate all movable 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.

Standard Torque Data For Nuts & Bolts

The following recommended torque data is for use as a general guideline. Recommended torque, in foot pounds, for all Standard Application nuts and bolts provided in the following table.

NOTICE

Torque specifications on a drawing override torque values in the Standard Torque Data for Nuts and Bolts Table.

- All thread surfaces are clean and lubricated with SAE-30 engine oil. See notice above.
- Joints are rigid, that is no gaskets or compressible materials are used
- When re-using nuts or bolts use minimum torque values

GENERAL INFORMATION

TORQUE CHART - METRIC COATED HEX HEAD AND SOCKET HEAD CAP SCREWS MATED WITH PLAIN OR ZINC PLATED THREADS													
		Class 4.6 hex head cap screw with plain threads / nut						Class 8.8 hex head cap screw with plain threads / nut					
		DRY		THREAD LOCKER		LUBED		DRY		THREAD LOCKER		LUBED	
Size	Thread	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.
M4	.7												
M5	.8	2.5	22	2	17.5	2	17.5	6.5	57.5	5.5	48.5	4.5	40
M6	1	4.5	40	3.5	31	3	26.5	11	97.5	9.5	84	8	71
M7	1	7	62	6	53	5	44	18.5	164	16	141.5	13	115
M8	1.25	10.5	93	9	79.5	7.5	66.5	26.5	234.5	23	203.5	19	168
M10	1.5	20.5	181.5	17.5	155	14.5	128.5	53	469	45.5	402.5	38	336.5
		Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.
M12	1.75	36	26.5	31	23	25.5	19	92.5	68	79	58	66	48.5
M14	2	57	42	49	36	41	30	147	108.5	126	93	105	77.5
M16	2	89	65.5	76.5	56.5	63.5	47	237	175	203	149.5	170	125.5
M18	2.5	122	90	105	77.5	87.5	64.5	327	241	280	206.5	233	172
M20	2.5	174	128	149	110	124	91.5	463	341.5	397	293	331	244
M22	2.5	238	175.5	202	149	169	124.5	630	464.5	540	398.5	450	332
M24	3	300	221	257	189.5	214	158	801	591	686	506	572	422
M27	3	439	324	376	277.5	314	231.5	1171	863.5	1004	740.5	837	617.5
M30	3.5	596	439.5	511	377	426	314	1590	1173	1363	1006	1136	838
M33	3.5	812	599	696	513	580	428	2164	1596	1855	1368	1546	1141
M36	4	1042	768.5	893	658.5	658.5	548.5	2779	1681	2382	1757	1985	1464

GENERAL INFORMATION

TORQUE CHART - METRIC COATED HEX HEAD AND SOCKET HEAD CAP SCREWS MATED WITH PLAIN OR ZINC PLATED THREADS													
		Class 4.6 hex head cap screw with plain threads / nut						Class 8.8 hex head cap screw with plain threads / nut					
		Class 10.9 hex head cap screw with plain threads / nut						Class 12.9 hex head cap screw with plain threads / nut					
		DRY		THREAD LOCKER		LUBED		DRY		THREAD LOCKER		LUBED	
Size	Thread	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.	Nm	in-lbs.
M4	.7							5.5	4.5	4.5	40	4	35.5
M5	.8	9.5	84	8	71	6.5	57.5	11	9.5	9.5	84	7.5	66.5
M6	1	16	142	13.5	119.5	11.5	102	18.5	16	16	142	13	115
M7	1	26.5	234.5	22.5	199	19	168	31	26.5	26.5	234.5	22	194.5
M8	1.25	38.5	340.5	33	292	27.5	243.5	44.5	38.5	38.5	340.5	32	283
		Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.	Nm	ft-lbs.
M10	1.5	76	56	65	48	54	40	88.5	65	76	56	63.5	47
M12	1.75	132	97.5	113	83.5	94.5	69.5	155	114.5	132	97.5	110	81
M14	2	210	155	180	133	150	110.5	246	181.5	211	155.5	176	130
M16	2	328	242	281	207	235	173.5	384	283	329	242.5	274	202
M18	2.5	452	333.5	387	285.5	323	238	528	389.5	453	334	377	278
M20	2.5	641	473	549	405	458	338	749	552.5	642	473.5	535	394.5
M22	2.5	871	642.5	747	551	622	459	1018	751	873	644	727	536
M24	3	1108	817	949	700	791	583.5	1294	954.5	1109	818	925	682
M27	3	1620	1195	1389	1025	1157	853.5	1893	1463	1623	1197	1352	997
M30	3.5	2200	1623	1886	1391	1572	1160	2571	1896	2204	1626	1837	1355
M33	3.5	2994	2208	2566	1893	2138	1577	3499	2581	2999	2212	2499	1843
M36	4	3845	2836	3296	2431	2746	2026	4493	3314	3852	2841	3210	2368

GENERAL INFORMATION

Chassis Battery Disconnect Switch

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

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

NOTICE

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

NOTICE

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

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.

GENERAL INFORMATION

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

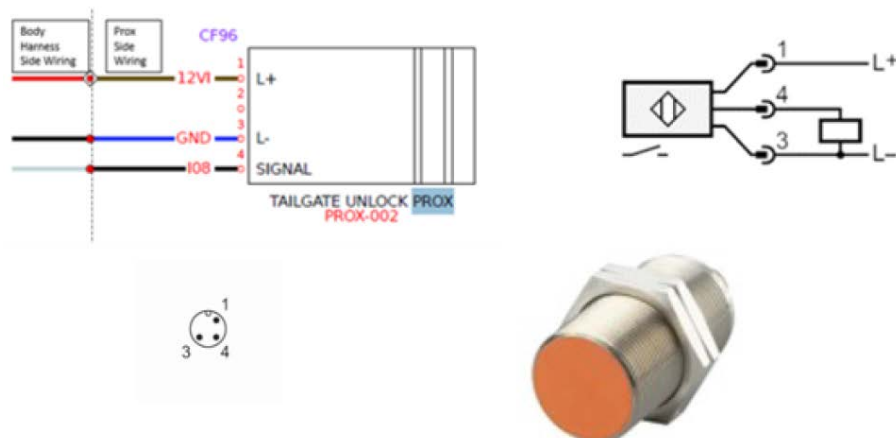


Figure 51. Proximity Switch

GENERAL INFORMATION

3 Pin Proximity Sensor

12V (12VI/PIN1) and Ground (GND/PIN3) to power up to prox and the 3rd wire (PIN 4) sends the 12V back to the controller when metal is detected on the face of prox. This is called input signal.

Steps:

1. When troubleshooting a 3-wire/Pin sourcing prox switch, turn the key switch on, but engine off. Remember Safety First!
2. Observe the prox condition, make sure it is adjusted close to the material it reads, but not so close it is damaging the prox face. Between an 1/8" to 1/4" is perfect.
3. Don't always trust the light on the rear of the prox. It can fool you. The best way to make sure your prox is working is to look at the input for the prox in the Display/HMI located in the cab of RevAMP truck. Similar to the screen shown here.
4. When you put metal material over the face of the prox, you should see the input turn on (Green in display) and when removed it should turn off (Blue in display).

Ex: Controller Input/Output screen with the TG Prox High (ON) and the TG Prox Low (OFF).

Input/Output Observations in Display (Home>> Diag>>PLC >> Pin 33 for T/G Prox)

Green: Pin 33 in Controller: TG Prox – “ON”

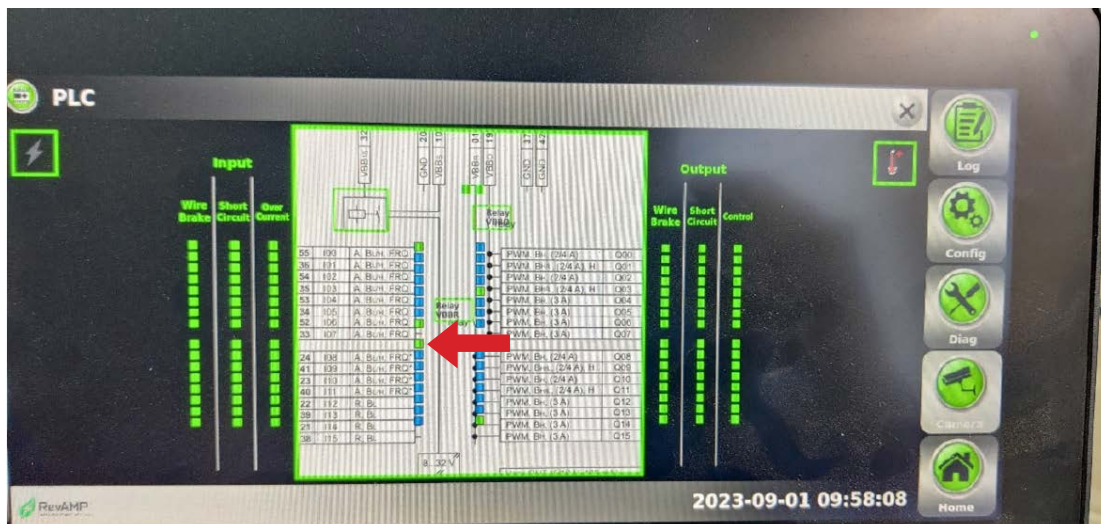


Figure 52.

Blue: Pin 33 in Controller: TG Prox – “OFF”

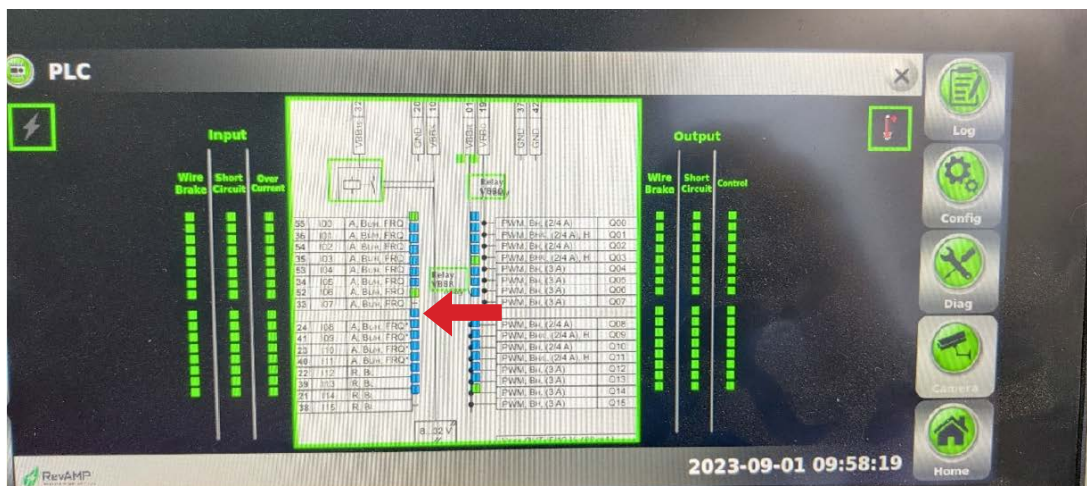


Figure 53.

GENERAL INFORMATION

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 Central EPC for a complete decal kit and individual decals. Order the decal kit or individual decals from your Heil Dealer or from Heil.

Decal Care

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

A. General Instructions

Following these instructions helps the decals adhere longer.

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

B. Pressure Washer Precautions

Pressure washing can cause damage to decals. It can cause the edges of the decals to lift and peel the decal away from the unit. Over time, the decal can fade, crack or chip away.

Use pressure washing only when other cleaning methods are not effective. If you use a pressure washer, use the following precautions.

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

C. Remove Difficult Debris

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

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

GENERAL INFORMATION

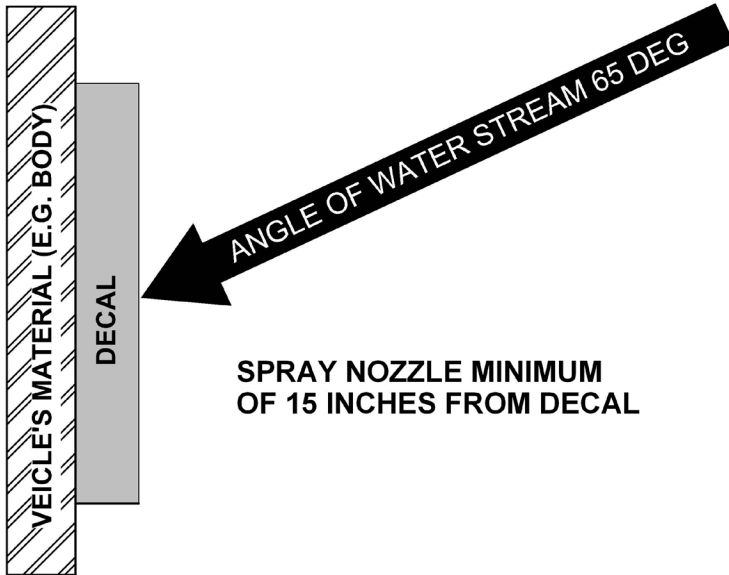


Figure 54. Recommended Technique

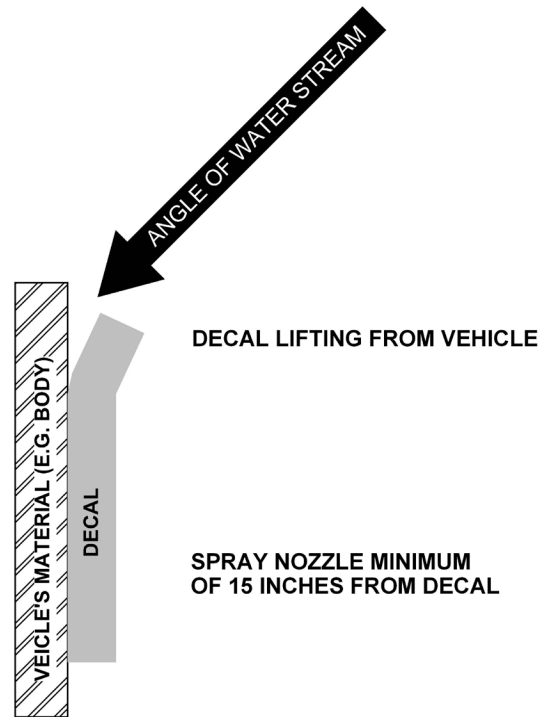
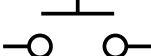
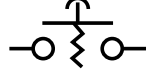
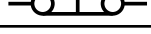
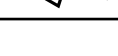


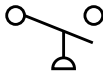
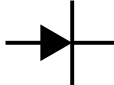
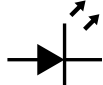
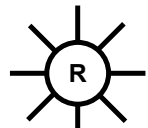
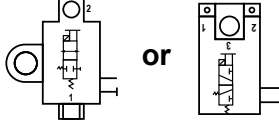
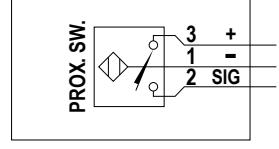
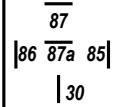
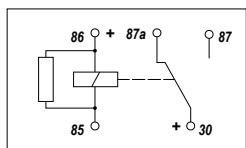
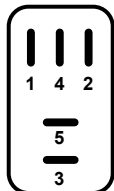
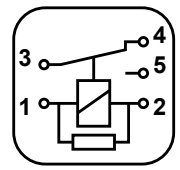
Figure 55. Incorrect Technique

GENERAL INFORMATION

Electrical Symbols

	Alternating Current
	Direct Current
	Ammeter (Amp Meter)
	Volt Meter - Measures Voltage
	Watt Meter - Measures Electric Power
	Ohm Meter
	Wire
	Connected Wires
	Unconnected Wires
	Fuse
	Breaker
	Chassis Ground Or Ground
	Battery
	On/Off Switch
	Push to make switch/sometimes momentary
	Momentary Push Button
	Push To Break Switch
	Normally Open Limit Switch
	Normally Closed Limit Switch

GENERAL INFORMATION

	Pressure Switch
	Diode
	LED - Diode
	Lamp
	Indicator Light
	Resistor
	Solenoid Operated 3 Way Pneumatic Valve/MAC Valve
	Proximity Switch
	Relay Socket (General)
	Relay (General)
	Micro Relay Socket
	Micro Relay

SECTION 2

LIFT ARM

Lift Lubrication Guide

NOTICE

Rollers on the lift of the arm are only greased to adjust the tilt of the lift. Too much grease will make the lift uneven and will damage the bearings.

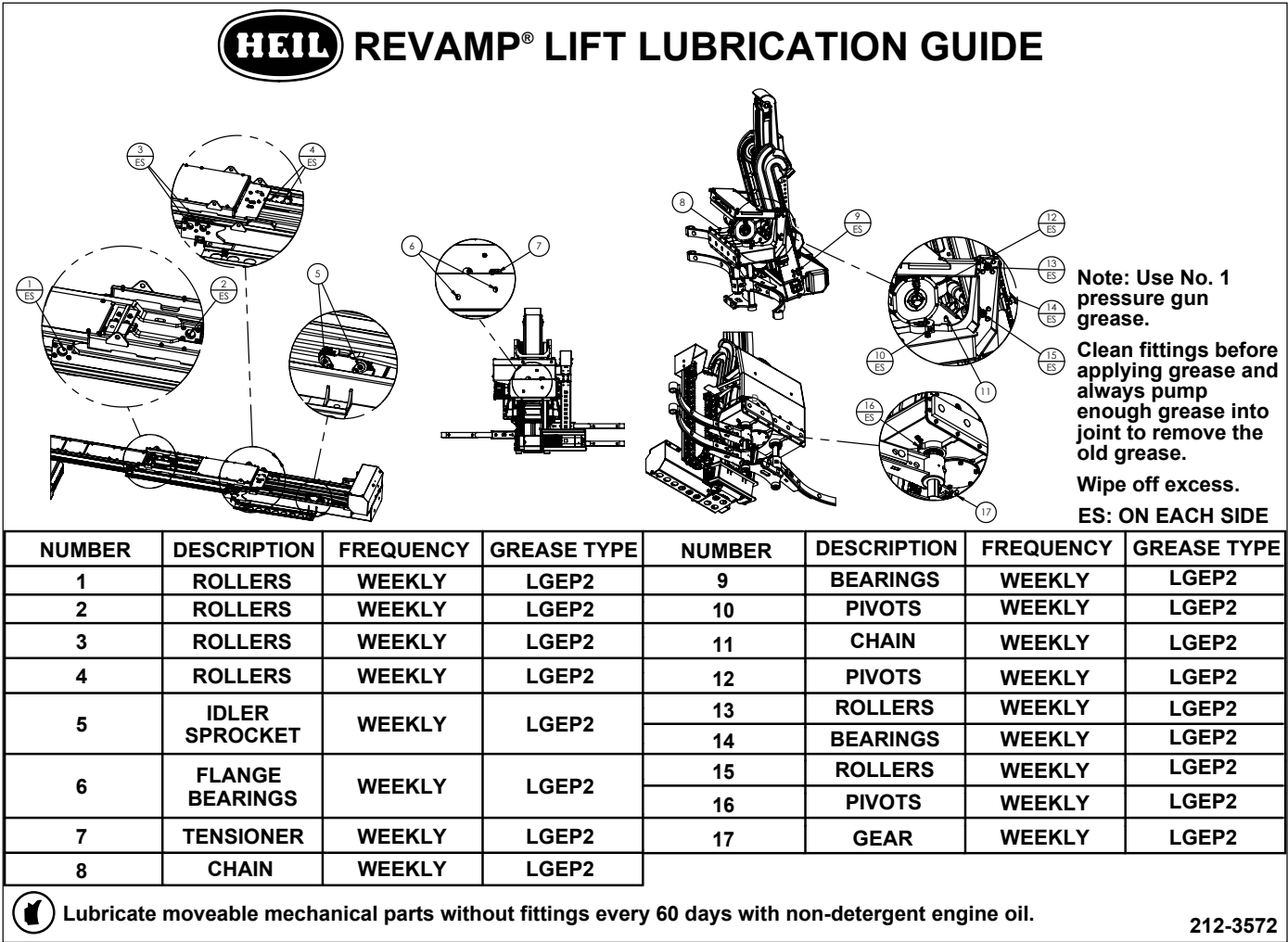


Figure 56.

SECTION 3

BODY & TAILGATE

BODY & TAILGATE

Nomenclature

Major components and their typical location on the unit.

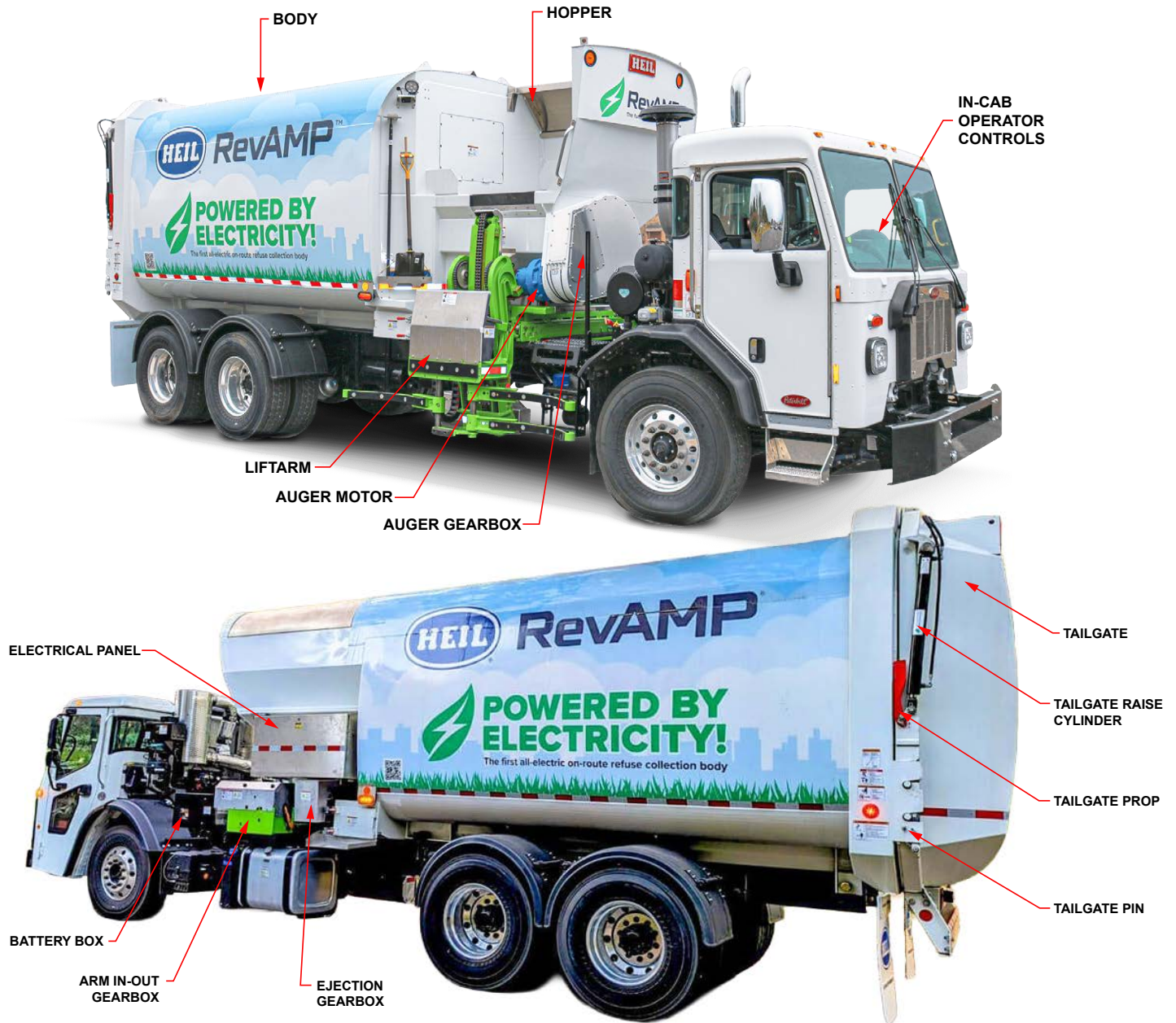


Figure 57.

BODY & TAILGATE

Greasing Points

Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess grease. Lubricate movable mechanical parts without fittings every 60 days with non-detergent engine oil. The grease points are listed in the **“Body Lubrication Guide” on page 46**. For each grease point, the grease type and the frequency are indicated. A grease pump and general tools are required in order to proceed the lubrication.

Body Lubrication Guide

Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess grease. Lubricate movable mechanical parts without fittings every 60 days with non-detergent engine oil. The grease points are listed on the following pages. For each grease point, the grease type and the frequency are indicated. A grease pump and general tools are required in order to proceed the lubrication.

Compaction System

The compaction system has five greasing points all located next to each other as shown in the drawing below. The first two are connected to the automatic grease pump which ensure an adequate lubrication of the slew bearing. The three others need a manual lubrication using a grease pump.

Ejection System

The ejection system has five greasing points. A special procedure is specified after the drawing for the two points that are inside the body.

In order to reach the two greasing points located inside the body, follow the simple steps below. If it is possible to go behind the ejection panel follow step 1 to 4 below:

1. Move the ejector panel midway to the back and then move it a little bit to the front until the trap door opens.
2. Apply a Lockout / Tag-out procedure (refer to Lockout / Tag-out procedure).
3. Carefully get behind the ejection panel through the trap door to proceed.
4. Using the grease pump, proceed to the lubrication of the two bearings.

If you are not allowed to go behind the ejector panel, follow these steps instead:

1. Position the ejection panel at mid length with the trap door shut.



Figure 58. Ejection Panel with Trap Door Shut



Figure 59. Trap Door Shut

2. Apply a Lockout / Tag-out procedure (refer Annex 1 for a suggested Lockout / Tag-out procedure).
3. Get in the body and take off the panels blocking the two access windows. Make sure that the System Power switch is activated for this step to avoid any accident.

BODY & TAILGATE

4. Using the grease pump, proceed to the lubrication of the two bearings through the access windows.



Figure 60.

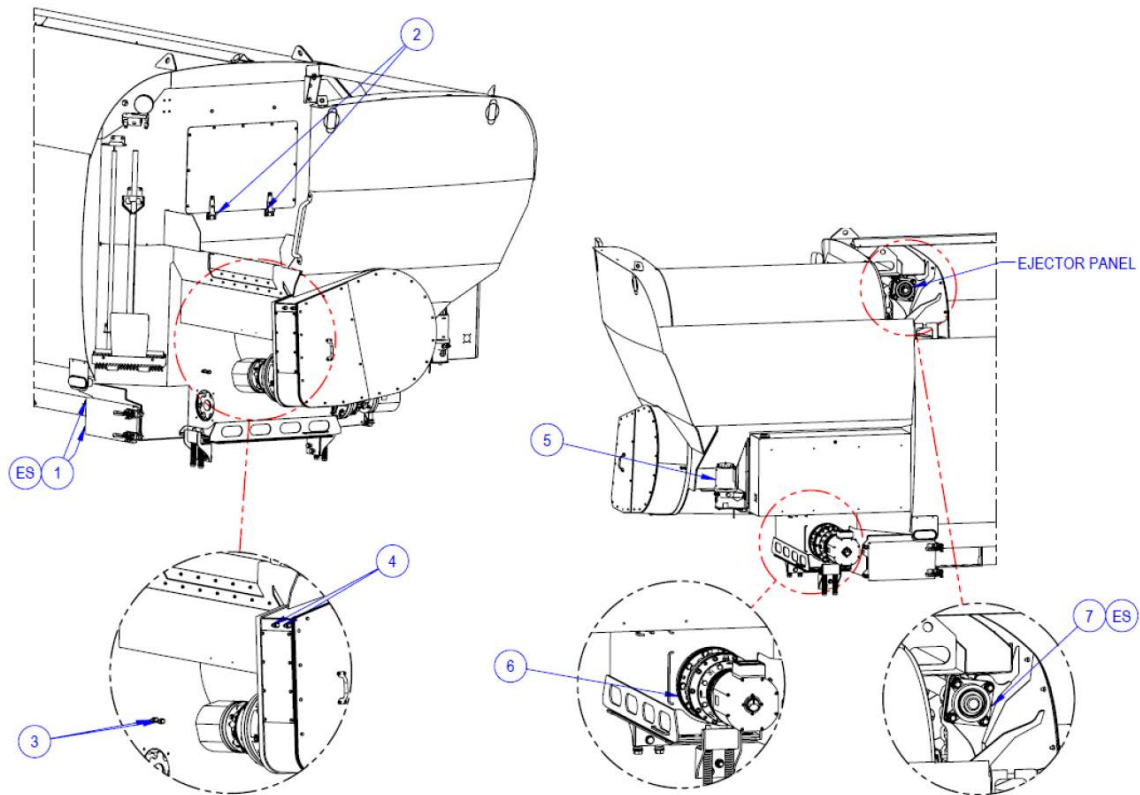


Figure 61 Body Greasing Points.

No.	Description	Grease Type	Frequency
1	Hinges	LGEP2	Weekly
2	Hinges	LGEP2	Monthly
3	Driving Shaft Bearings	LGEP2	Monthly
4	Idler and Brush	LGEP2	Monthly and Weekly
5	Slew Bearing	LGEP2	Add Grease When the Tank is Low
6	Shaft Seal	LGEP2	6 Months
7	Driven Shaft Bearings	LGEP2	6 Months

BODY & TAILGATE**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.
Damaged decal or decal not readable	Replace decal immediately.
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, lift arms, and/or attaching components have loose or missing hardware	Tighten loose hardware. Replace missing hardware.
Body structure, lift arms, and/or attaching components have 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.
Hopper liner (when equipped)	Inspect welds. Repair cracked welds. Check for damage or excessive wear. Replace as necessary.
Operation	Operate All Functions to make sure all functions work correctly.

BODY & TAILGATE

Tailgate Lubrication

See “Grease Lubricant Recommendation” on page 74 and “Body Lubrication Guide” on page 46.

⚠ WARNING

Make sure the tailgate props are engaged and locked before inspecting the tailgate seal.

Daily, 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.



Figure 62. Tailgate Seal

Tailgate 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

A tailgate in motion is dangerous. Serious INJURY or DEATH will 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

Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Always utilize the tailgate props according to specifications when propping the tailgate. Never place any part of your body between the unit and the tailgate while propping or after it has been propped. This area is extremely dangerous. SERIOUS INJURY or DEATH will 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 flat, stable ground, apply the parking brake, and chock the wheels.
2. Make sure the area around the tailgate is clear of all people.
3. UNLOCK the tailgate.
4. RAISE the tailgate enough to RELEASE and ROTATE the props so that they rest against the tailgate raise cylinder.
5. LOWER the tailgate until the tailgate cylinder rests on the Tailgate Prop
6. Turn OFF the engine and REMOVE the ignition key.
7. Put the unit in Lock-Out/Tag-Out.

BODY & TAILGATE

B. How to Store the Tailgate Props

1. When you finish using the props, take the unit out of Lock-Out/Tag-Out, insert the ignition key.
2. RAISE the tailgate enough so that you can ROTATE each prop back into the STORED position.
3. SECURE each prop with a pin.
4. LOWER the tailgate until it is completely CLOSED.
5. LOCK the tailgate.



Figure 63.

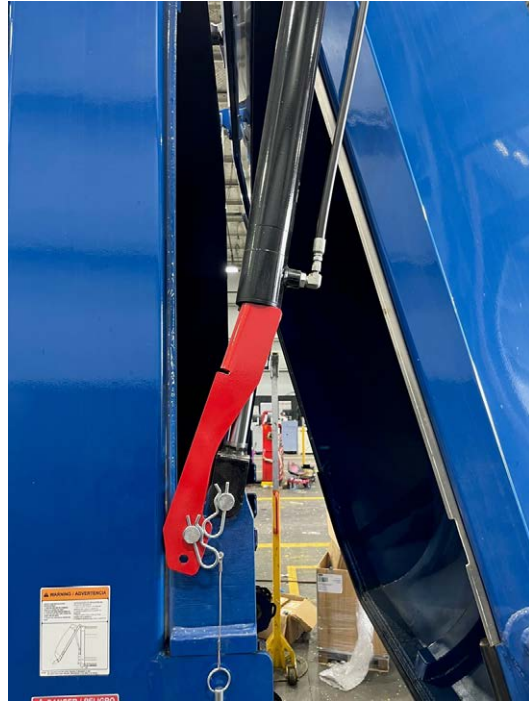


Figure 64.

SECTION 4

MAINTENANCE & ADJUSTMENT

MAINTENANCE & 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 be checked and serviced.

COMPONENT/SYSTEM	8	40	200	1000	2000	Check oil level – add if necessary
Hydraulic System	☒					Check tailgate cylinders, hoses, and fittings for leaks.
		☒				Check for proper operation.
Electrical, Battery Cables	☒					Check battery cables from battery to starter for loose cables, rubbing or damage and abrasions to cables. Replace if necessary.
		☒				Check for correct operation.
Operator Controls	☒					Lubricate as shown on Body Lube Chart.
Grease Fittings		☒				Inspect body undercoating and repair as necessary.
Body Undercoating					☒	Check for damage.
Tailgate Seal Integrity	☒					
* Daily = 8 hrs. Weekly = 40 hrs. Monthly = 200 hrs. 6 Months = 1000 hrs. Yearly = 2000 hrs.						

Body Maintenance Charts

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

WEEKLY MAINTENANCE	
Item	Required Action
Lift	Lubricate all lift components per “ Lift Lubrication Guide ” on page 43
Body Sump Hinges	Lubricate all lift components per “ Lift Lubrication Guide ” on page 43
Auger Chain Idler & Brush	Lubricate all lift components per “ Lift Lubrication Guide ” on page 43
Ejection System Chains	Inspect chain tension and adjust as required per “” on page 66
Lift Arm In/Out System Chains	Inspect chain tension and lubricate chains per “ Arm In/Out System ” on page 58
Lift Arm Up/Down Chain System	Inspect chain tension and lubricate chains per “ Arm In/Out System ” on page 58

MAINTENANCE & ADJUSTMENT

FIRST MONTH & MONTHLY MAINTENANCE		
Item	Frequency	Required Action
Compaction Planetary Gearbox	After first Month	Inspect oil level and add as required per “Compaction Maintenance” on page 54
Lift Arm In/Out System Gearbox	After first Month	Inspect oil level and add as required per “Compaction Maintenance” on page 54
Lift Arm Grabber Gearbox	After first Month	Inspect oil level and add as required per “Arm Gripper System” on page 65
Ejection System Gearbox	After first Month	Inspect oil level and add as required per “” on page 66
Lift Arm Up/Down System Gearbox	After first Month	Inspect oil level and add as required per “Arm In/Out System” on page 58
Slew Bearing	As required / minimum monthly	Fill automated grease pump reservoir
Ejection Door Access Hinges	Monthly	Lubricate per “Body Lubrication Guide” on page 46
Ejection System drive shaft bearings	Monthly	Lubricate per “Body Lubrication Guide” on page 46
Compactor Chain	Monthly	Inspect chain tension and tighten as required per “Compaction Maintenance” on page 54

2 MONTH MAINTENANCE		
Item	Frequency	Required Action
Ejection System	Every 2 months	Lubricate ejection system per manual process
Auger	Every 2 months	Inspect and repair auger hard facing and cracks as per “Inspect & Repair Auger Hardfacing” on page 72

6 MONTH & ANNUAL MAINTENANCE		
Item	Frequency	Required Action
Lift Arm In/Out System Gearbox	6 Months (continuously after first inspection)	Inspect oil level and add as required per “Compaction Maintenance” on page 54
Lift Arm Up/Down System Gearbox	6 Months (continuously after first inspection)	Inspect chain tension & Lubricate chains per “Arm In/Out System” on page 58
Lift Arm Grabber Gearbox	6 Months (continuously after first inspection)	Inspect oil level and add as required per “Arm Gripper System” on page 65
Ejection System Gearbox	6 Months (continuously after first inspection)	Inspect oil level and add as required per “” on page 66
Compaction Planetary Gearbox	6 Months (continuously after first inspection)	Inspect oil level and add as required per “Compaction Maintenance” on page 54
Ejection System bearings at top of panel	6 Months	Lubricate per “Body Lubrication Guide” on page 46
Compactor Gearbox shaft seal	6 Months	Lubricate per “Body Lubrication Guide” on page 46
Auger Chain Drive	6 Months (continuously after first inspection)	Inspect auger sprocket for tooth wear
Tailgate Lift System	Annually	Inspect hydraulic fluid level and add as per “Tailgate Maintenance” on page 57
Tailgate Proximity Switch	Annually	Inspect and clean as required per “Tailgate Maintenance” on page 57

MAINTENANCE & ADJUSTMENT

Compaction Maintenance

A. Chain Tension

The tension of the compactor's chain must be inspected every 160 hours (1 month) of operation. To inspect the chain, unscrew the trap door identified on the figure below and check the total movement of the chain in the lower segment.

⚠ WARNING

Use the “**Lock-Out/Tag-Out Procedure**” on **page 12** for the chassis and “” on **page 17** for the body battery whenever you perform maintenance or service, enter the hopper, or climb in/on the body or equipment. If the unit is not in Lock-Out/Tag-Out, equipment may operate unexpectedly. Operating equipment during maintenance, service, or while inside or on the unit can cause **SERIOUS INJURY** or **DEATH**.

1. Preparation for Tightening
 - a. Unscrew and remove the main trap door panel shown in the picture to access the tensioner.

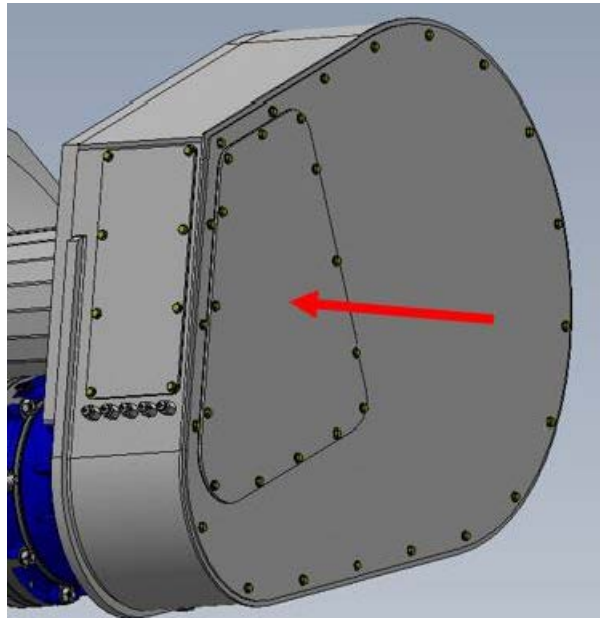


Figure 65. Trap Door Panel

- b. Roll the auger little by little using the manual control until you find the place where the chain is tightest in the lower section of the chain.

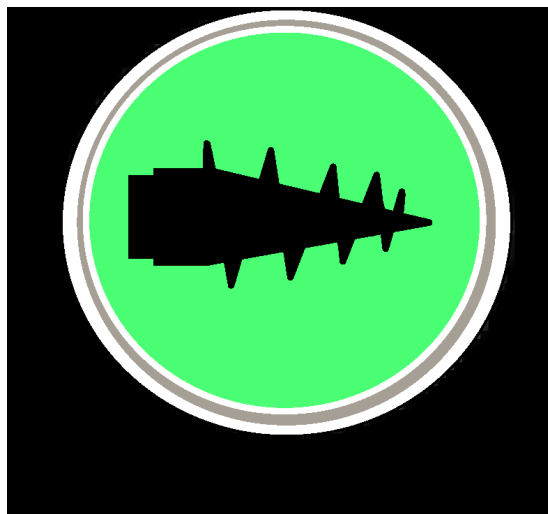


Figure 66. Packer Forward

MAINTENANCE & ADJUSTMENT

2. Chain Tightening

- a. Completely loosen the M20 inferior jam nuts blocking the tensioner.
- b. Loosen the tensioner's bolt to lower the idler sprocket and increase the tension. Proceed until the tension is adequate.

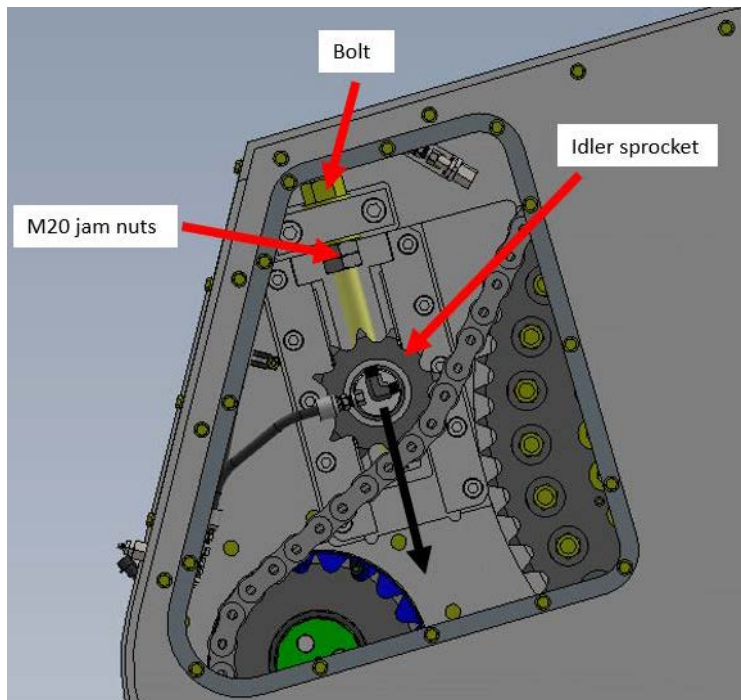


Figure 67. Tensioner Idler Sprocket

- c. To verify that the tension is adequate, make sure that the chain is firm through the trap door.
- d. For a more precise fit, it is recommended to verify the total movement of the slack strand once in a while. This movement should be of 11 mm (7/16").

NOTICE

This operation requires to remove the whole compaction front cover. Over-tensioning should be avoided in all cases.

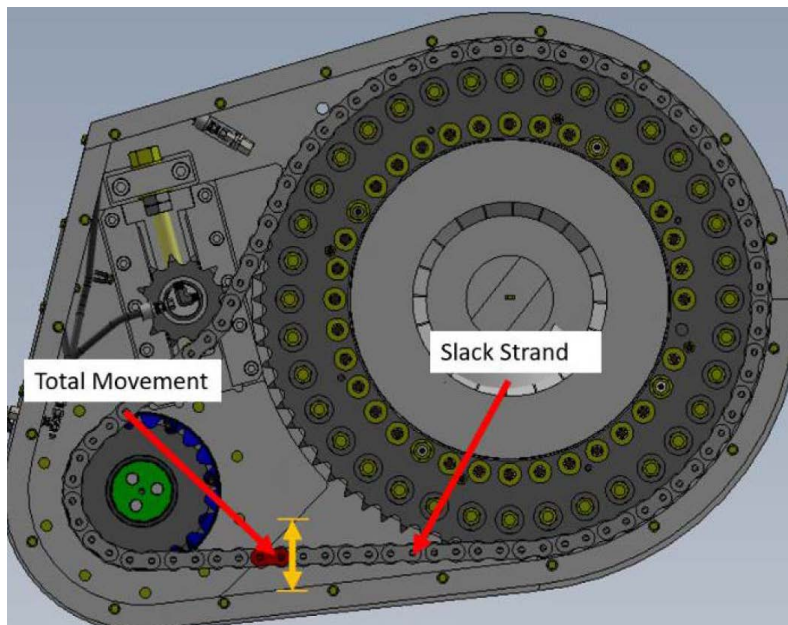


Figure 68. Tension Verification

MAINTENANCE & ADJUSTMENT

- e. Once the tightness in the chain is appropriate, tighten the interior jam nuts.
- f. Put the trap door panel back on.

Planetary Gearbox Oil Change

Frequency	Once after 160 hours of operation and once every 960 hours thereafter.
Oil type	EP Synthetic Gear Oil ISO 220
Quantity	Fill it up until the oil reaches the level of the side plug

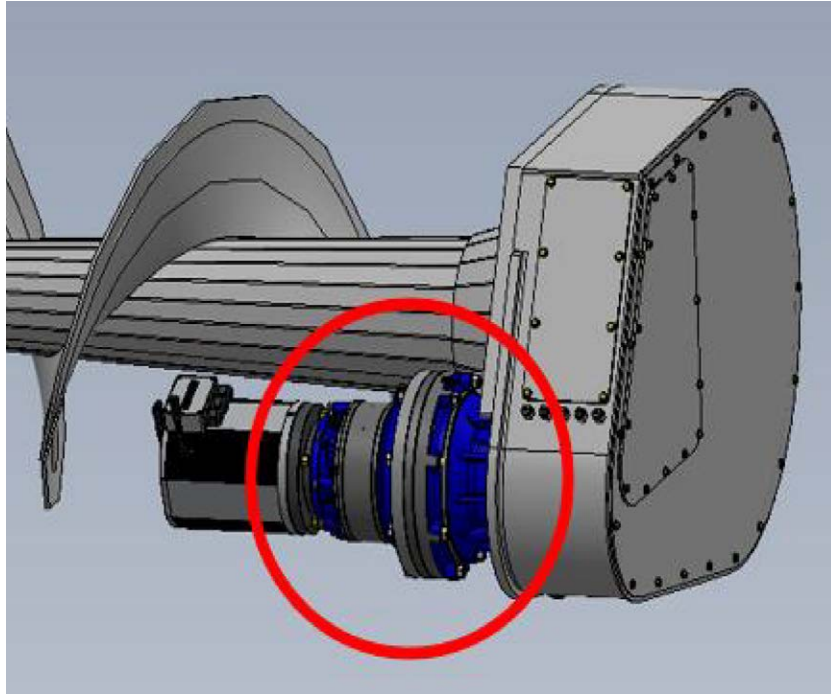


Figure 69. Planetary Gear Location

Oil Change Procedure:

1. Put an oil pan under the gearbox.
2. Open the top plug and the bottom plug and wait until the gearbox is empty of oil.

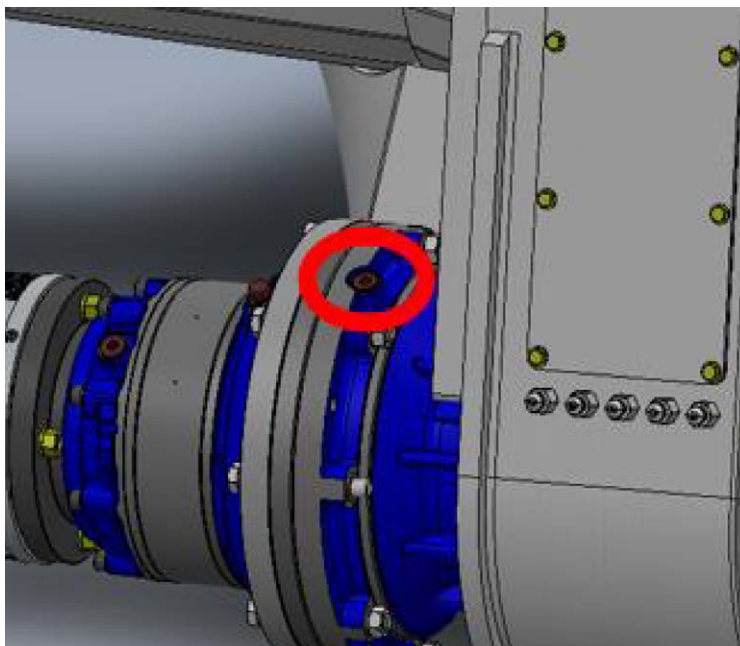


Figure 70. Top Plug

MAINTENANCE & ADJUSTMENT

3. Unscrew all the plugs, including the side plug, and clean them from filings. It is important to clean all the plugs because they are magnetic.

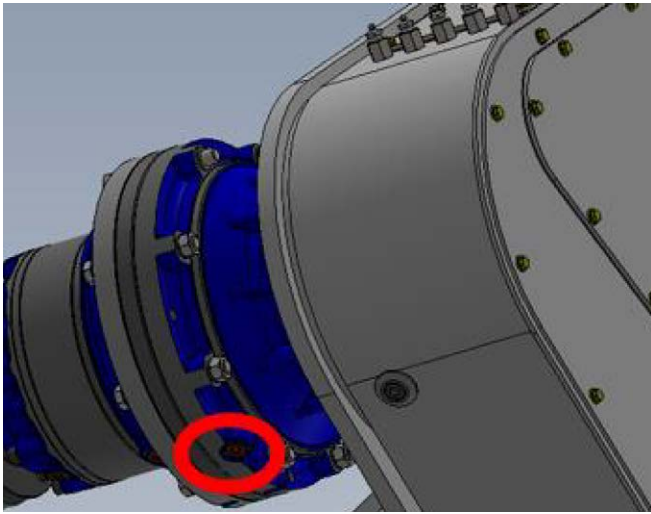


Figure 72. Bottom Plug

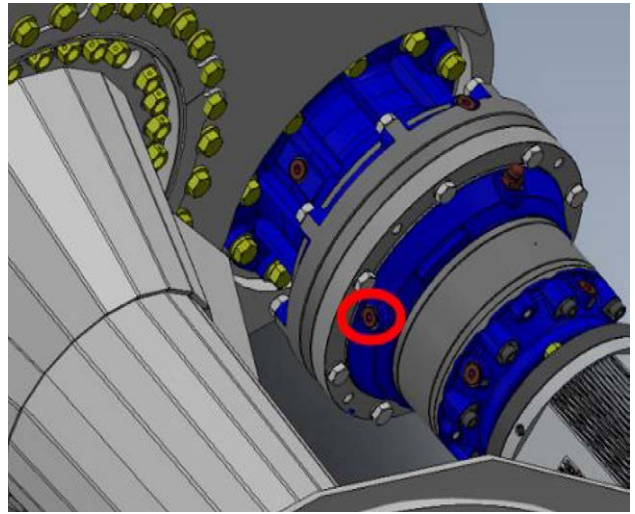


Figure 71. Side Plug

4. Screw back in place every plug except the two plugs pointed on figure below.
5. Fill the gearbox from the top plug with the oil until it reaches the level of the side plug.
6. Screw back in place the plugs.

Tailgate Maintenance

A. Proximity Switch

Clean the proximity switch when it is dirty with a cloth.

B. Cylinder, Locking Plate and Tailgate Pins



Figure 73.

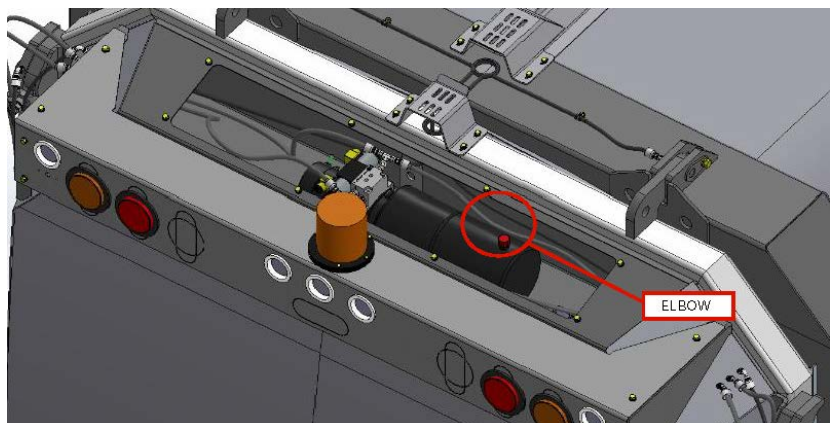


Figure 74. Tailgate

MAINTENANCE & ADJUSTMENT

Frequency	Every 1920 hours
Oil type	BIO-SYN HEES 32
Quantity	7.5 L

C. Power Unit Oil Change

Here is the procedure to change the oil of the power unit:

1. Remove the guard on the top of the tailgate.
2. Remove the elbow as pointed out on above right to access the tank.
3. Remove the oil with a pump.
4. Fill the tank.
5. Put back in place the elbow. Use PTFE tape to seal the connection between the elbow and the tank.
6. Reinstall the guard on top of the tailgate.

Arm In/Out System

⚠ WARNING

Make sure the unit is in **“Lock-Out/Tag-Out Procedure”** on page 12 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 Lock-Out/Tag-Out. When the unit is not in Lock-Out/Tag-Out, 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**.

A. Chain Lubrication

There is a total of 3 chains for the IN-OUT system of the arm. The driving chain, the fixed chain and the moving chain. The next figure presents their localization. Apply anti-rust lubricant spray on the chains once after the first 160 hours of operation and every 960 hours thereafter or when the chain appears dry.

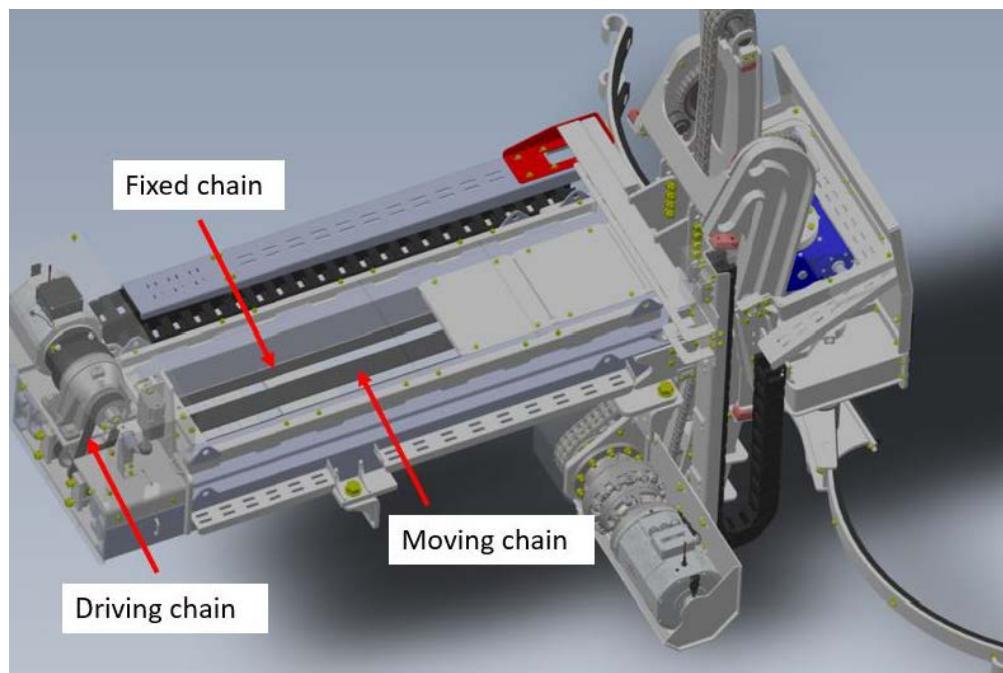


Figure 75. In-Out Chains Location

1. Make sure to Lock-Out/Tag-Out the unit before performing this procedure.
2. Preparation for Lubrication
 - a. Position the arm in full lateral extension at its lowest height. Then, stop the truck.

MAINTENANCE & ADJUSTMENT

3. Lubrication

- a. Apply anti-rust lubricant spray directly on the moving chain from under the arm.
- b. Apply anti-rust lubricant spray directly on the fixed chain from the side of the body.
- c. Remove the motor's cover shown in the picture and apply anti-rust lubricant spray on the driving chain.

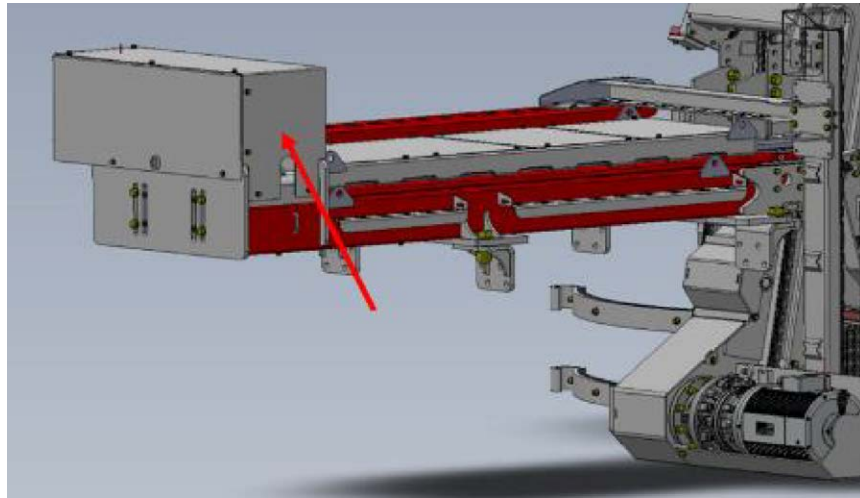


Figure 76. Motor Cover

- d. While you have access to the inside of the arm, check for wear or damage on the parts and replace them if needed.
- e. Put the motor's cover back on.

B. Chain Tension

The tension of the arm's chains must be inspected once after the first 160 hours of operation. After that, it must be inspected every 640 hours. To do so, follow the simple steps below:

1. Make sure to Lock-Out/Tag-Out the unit before performing this procedure.
2. Preparation for inspection
 - a. Position the arm almost in full lateral extension at its lowest height. It is important not to be fully extend or else the results will not be conclusive.
3. Inspection
 - a. From underneath the arm, check the total movement of the slack strand for the moving chain. The total movement should be of 33 mm (1.3").
 - b. From the side of the body, check the total movement of the slack strand for the fixed chain. The total movement should be of 33 mm (1.3").
 - c. Remove the guard and check the total movement of the slack strand for the driving chain. The total movement should be of 10 mm (0.394").

The total movement (A) is illustrated in the picture below

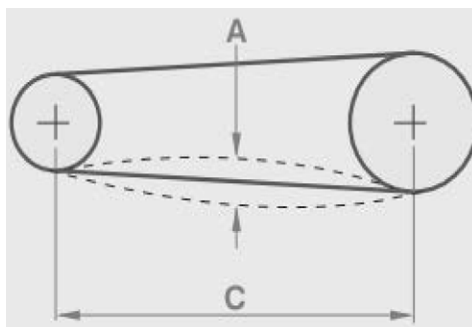


Figure 77. Chain Tension Total Movement

MAINTENANCE & ADJUSTMENT

If there is a significant difference between the required total movement of the slack strand and the actual one, refer to the procedures below to tighten or loosen each of the chains.

1. Driving Chain Tension Adjustment
2. Driving Chain: Preparation for tension adjustment
 - a. From the left-hand side of the vehicle, remove the IN-OUT motor's cover to expose the motor as shown in the Figure below.
3. Driving Chain: Tension Adjustment
 - a. Completely loosen the bolt fixing the tensioner.
 - b. Slide the idler sprocket by tightening or loosening the cross bolt. Sliding the idler sprocket towards the chain increases the tension and sliding it away from the chain decreases the tension

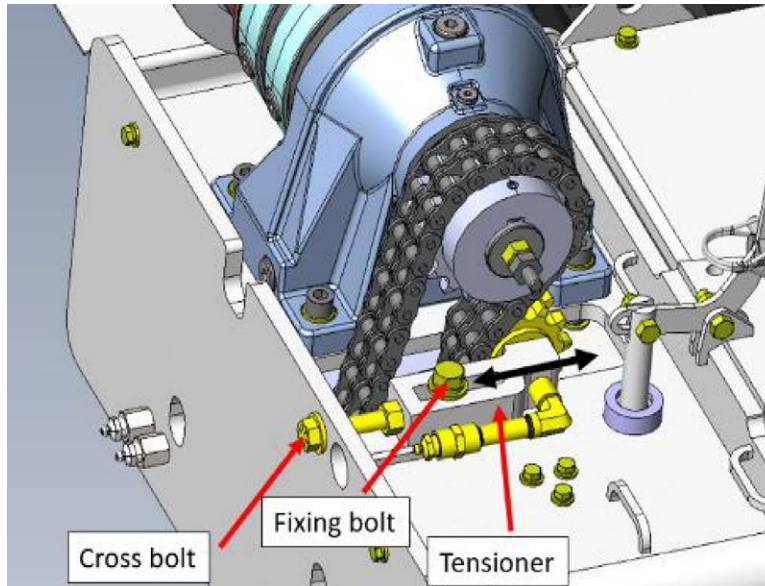


Figure 78. Driving Chain Tensioner

- c. Re-tighten the fixing bolt.
 - d. Verify the total movement of the slack strand.
 - e. Put the motor's cover back on.
4. Fixed Chain: Preparation for Tension Adjustment
 - a. Position the arm halfway.
 - b. From the side of the body, remove the arm panel shown in the Figure below.

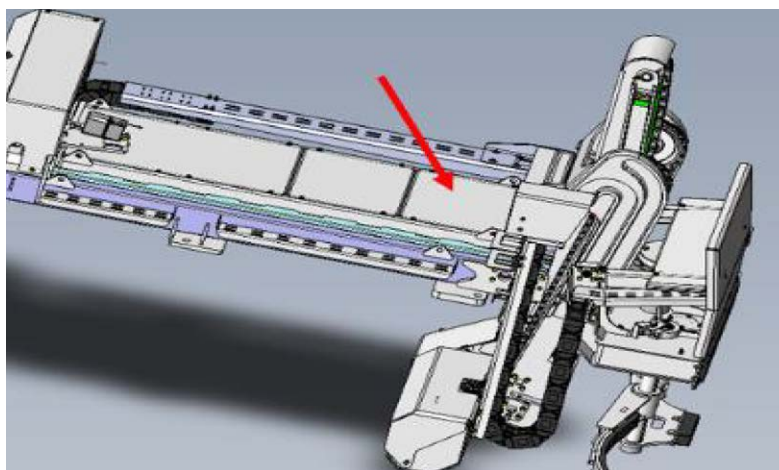


Figure 79. Arm Panel

MAINTENANCE & ADJUSTMENT

5. Fixed Chain: Tension Adjustment

- From the right-hand side of the body loosen the four bolts fixing the tensioner.
- Slide the idler sprocket by tightening or loosening the cross bolt. Sliding the idler sprocket towards the chain increases the tension and sliding it away from the chain decreases the tension

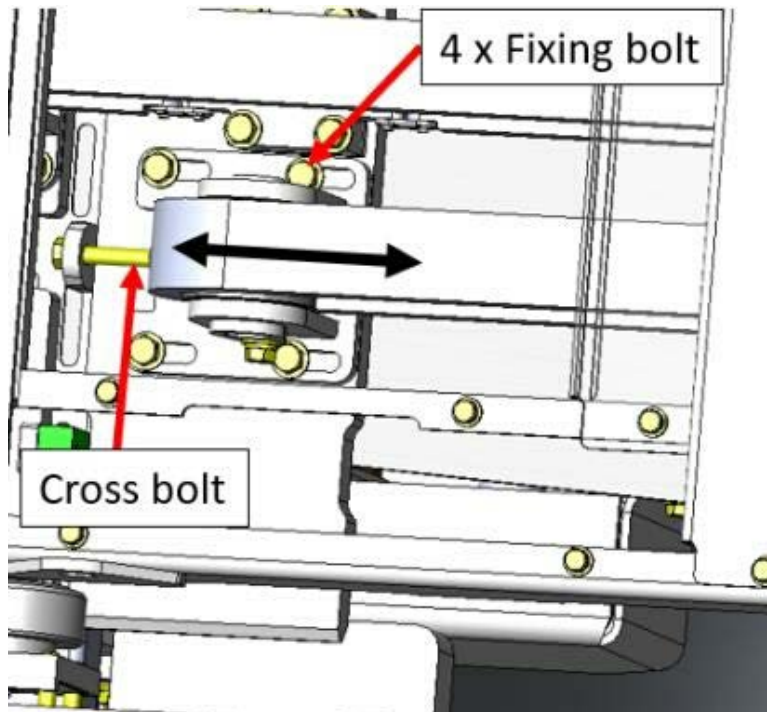


Figure 80. Fixed Chain Tensioner

- Re-tighten the fixing bolts.
 - Verify the total movement of the slack strand.
 - Put the arm panel back on.
- ### 6. Moving Chain: Preparation for Tension Adjustment
- Position the arm almost in full lateral extension at its lowest height. It is important not to be fully extend or else the results will not be conclusive. With the arm out, the tensioner easily accessible.
- ### 7. Moving Chain: Tension Adjustment
- The moving chain tensioner is similar to the fixed chain tensioner. Repeat step 5.1 to 5.4 to adjust the tension.

Gearbox Oil Change

Here is the procedure to change the oil of the in-out gearbox. Refer to the Figure 26 to find the location of the in-out gearbox.

Frequency	Every 5 years (9600 hours)
Oil type	VG220
Quantity	1.10 L

- Remove the gearbox and motor covers and apply Maxima Chain Wax on the driving chain.
- Put an oil pan under the gearbox.
- Unscrew the plugs #1 and #2.
- Once the gearbox is empty of oil, screw back the plug #1.
- Fill up the gearbox from the plug #2 until it reaches the level of the plug #3.
- Screw the plugs #2 and #3.

MAINTENANCE & ADJUSTMENT

Up-Down Gearbox Oil Change

Frequency	Once after 160 hours of operation and once every 960 hours thereafter.
Oil type	VG220
Quantity	770 ml

Here is the procedure to change the oil of the up-down gearbox:

1. Remove the covers pointed in figure below.
2. Put an oil pan under the gearbox.
3. Unscrew the top and bottom plugs of the gearbox to drain the oil.
4. Screw back on the bottom plug and unscrew the side plug.
5. With the recommended oil, fill the gearbox from the top plug until it reaches the level of the side plug.

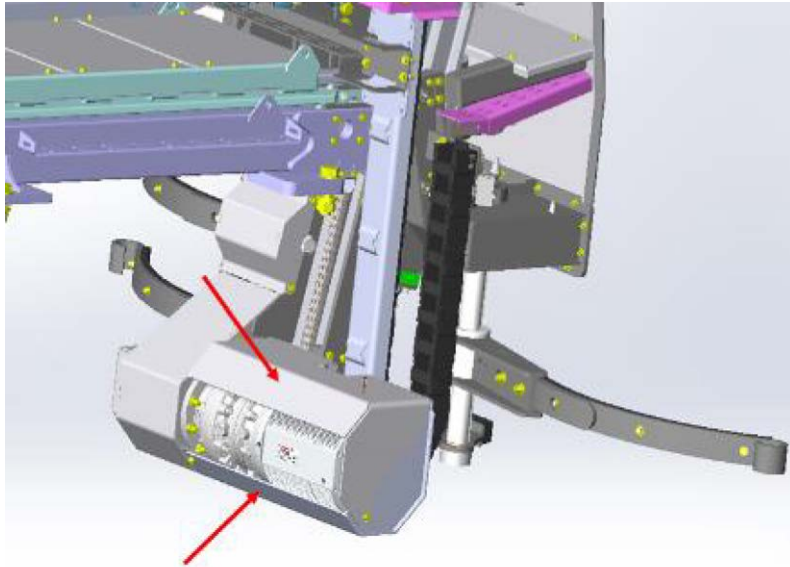


Figure 81. Up-Down Gearbox Covers

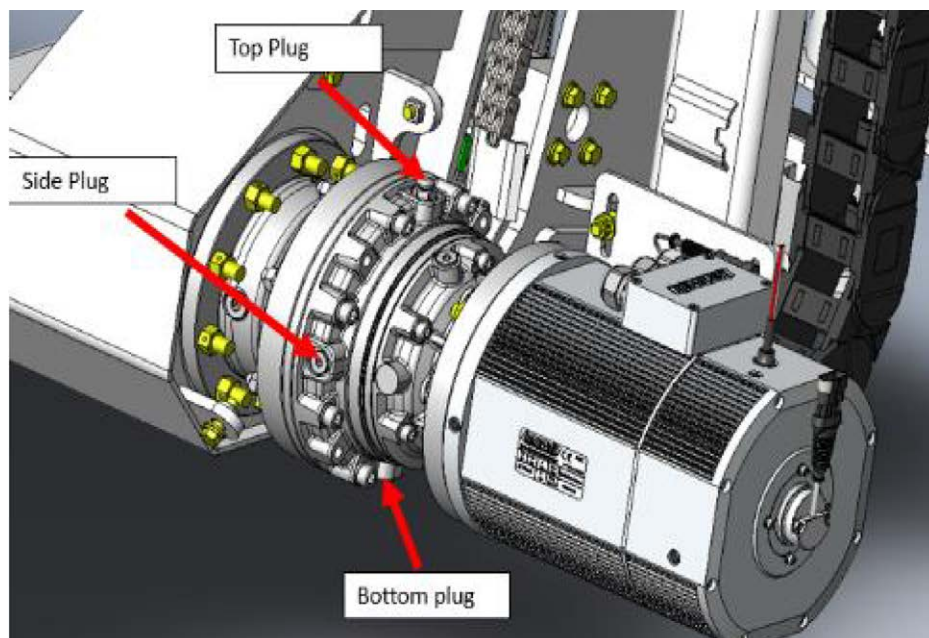


Figure 82. Up-Down Gearbox Plugs

MAINTENANCE & ADJUSTMENT

6. Screw back all the plugs.
7. Screw back the covers.

Chain lubrication

1. The lubrication of the chain must be done every 160 hours or when the chain is dry. Here is a suggested procedure
2. Safely move the arm 4 feet out and press on the emergency stop as shown.

Apply anti-rust lubricant spray on the chains from the front and from the back of the arm

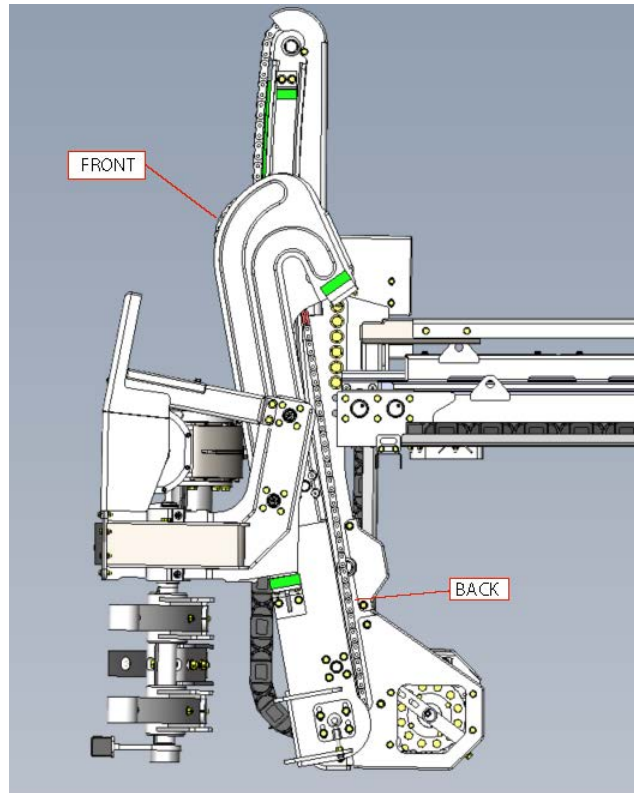


Figure 83. Chain Location Arm Front & Back

3. Remove the emergency stop and rise the arm as in the figure below.

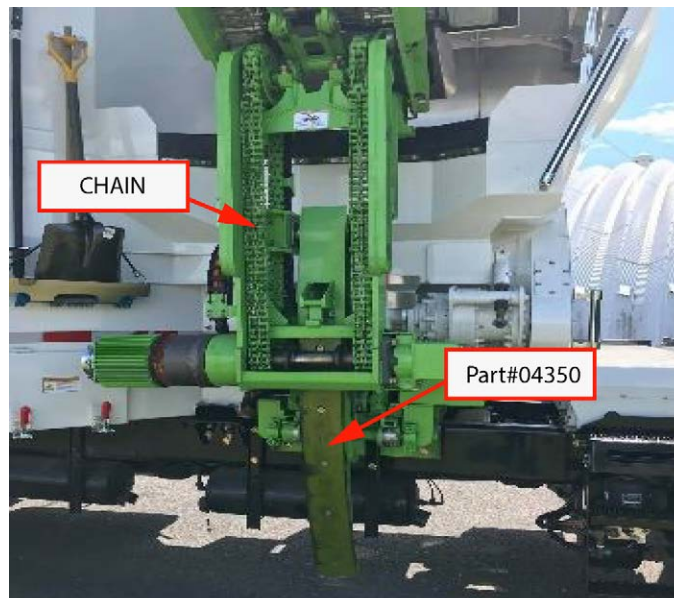


Figure 84. Arm at Raised Position

MAINTENANCE & ADJUSTMENT

4. Push on the emergency stop and apply anti-rust lubricant spray on the chain.
5. While the arm is up, look for damage on the plastic part #04350. If needed, replace it.
6. Remove the emergency stop and bring back the arm to the home position.

Chain tension

The chains tension must be verifying every 160 hours. There is a total of three chains for the up-down mechanism. Here is a suggested procedure if the tension needs to be adjusted:

Central Chain:

1. Move the arm about 4 feet in lateral extension.
2. Move the arm up slightly to ensure that the slack strand is at the level of the tensioner.
3. Press the emergency stop to prevent accidents.
4. Tighten the 2 bolts from the tensioner shown in the picture in order to increase the tension in the chain.
5. Verify that the tension is adequate. The total movement of the chain (A) should be approximately equal to $\frac{1}{2}$ ".

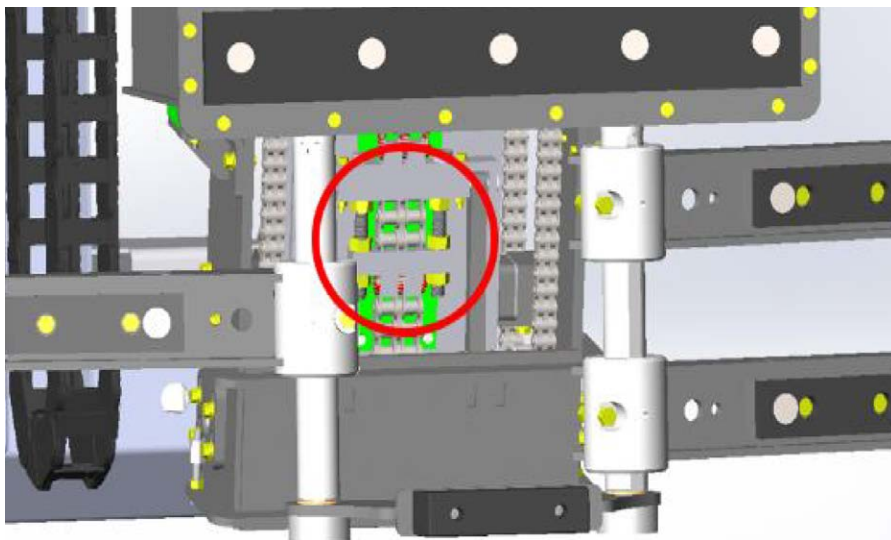


Figure 85. Up-Down Central Chain Tensioner Location

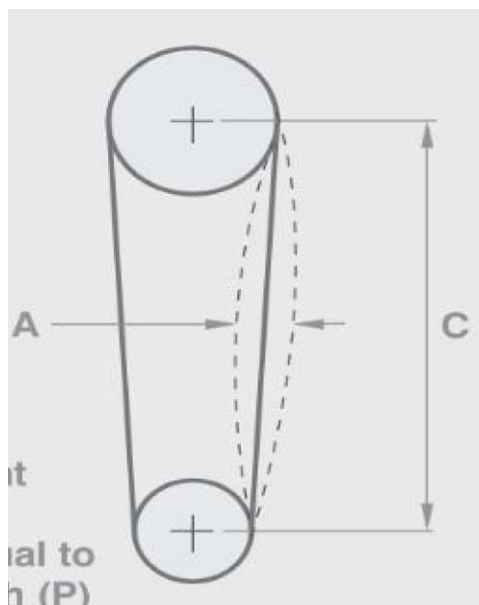


Figure 86. Total Movement of the Chain

MAINTENANCE & ADJUSTMENT

Lateral Chains:

1. Move the arm about 4 feet in lateral extension.

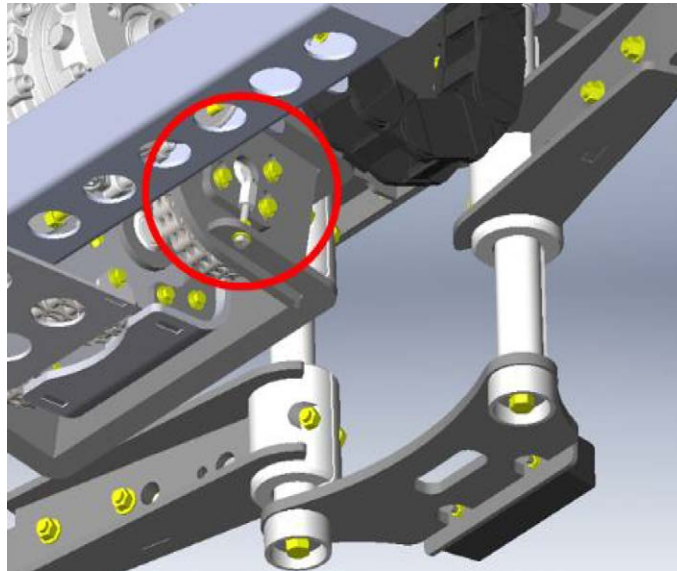


Figure 87. Up-Down Lateral Chain Tensioner Location

2. Move the arm up slightly to ensure that the slack strand is at the level of the tensioner.
3. Press the emergency stop to prevent accidents.
4. Tighten the bolt from the tensioner shown in the picture (from under the arm) in order to increase the tension in the chain. There is one tensioner for each chain.
5. Verify that the tension is adequate. The total movement of the chain (A) should be approximately equal to 3/8".

Cable Chain Inspection

Look for debris or broken component along the cable chain. Check the condition of the cable shields. Make sure that there are no burn marks or damage due to the bending of the cables. If there are any, immediately Contact **Heil Technical Services** at **866-310-4345** for help.

Arm Gripper System

Gearbox oil change

The procedure to change the oil of the grabber gearbox is detailed below.

Frequency	Once after 160 hours of operation and once every 960 hours thereafter.
Oil type	VG220
Quantity	Fill it up until it comes out by the side plug.

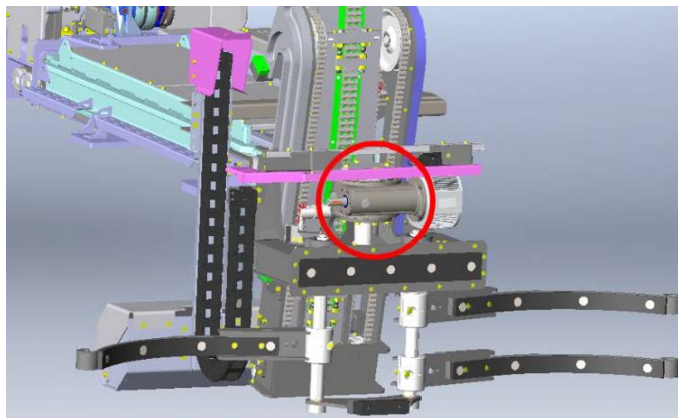


Figure 88. Location of Gripper Gearbox

MAINTENANCE & ADJUSTMENT

1. Remove the guard pointed on the figure below

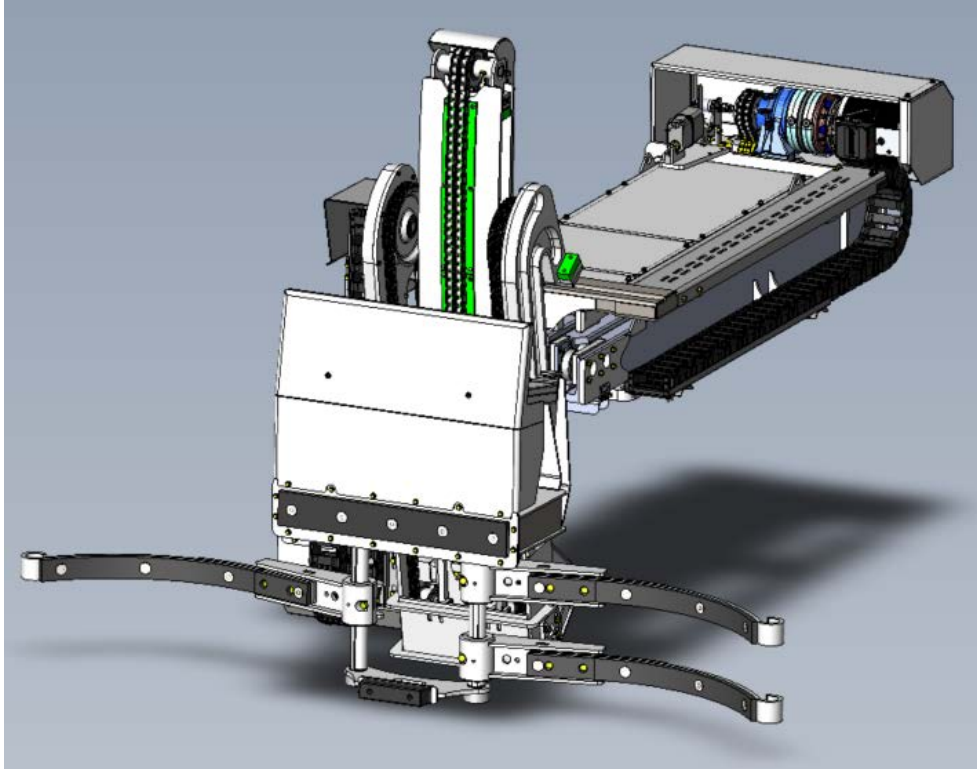


Figure 89. Front View of Arm Guard

2. Unscrew the cap that is facing the arm.
3. Screw in a hose to facilitate the draining of the gearbox.
4. Put an oil pan under the hose.
5. Raise the arm completely and wait for all the oil to drain.
6. Completely lower the arm.
7. Unscrew the hose.
8. Fill the gearbox with oil until it reaches the level of the plug.
9. Screw the plug back in.

Motor Brake Inspection

What is needed is to perform a static test with a torque wrench.

Once the EM brake is removed from the electric motor follow these steps.

1. Fix the brake on a mounting plate.
2. Put a rod in the EM brake, with an adapter for a torque wrench.
3. Then adjust the torque wrench to EM brake value of 50 Nm and make sure the brake does not slip.

NOTICE

Rod should have a 20 mm diameter and a 6 mm key way.

MAINTENANCE & ADJUSTMENT

Ejection System Maintenance

⚠ WARNING

Use the “**Lock-Out/Tag-Out Procedure**” on **page 12** for the chassis and “” on **page 17** for the body battery whenever you perform maintenance or service, enter the hopper, or climb in/on the body or equipment. If the unit is not in Lock-Out/Tag-Out, equipment may operate unexpectedly. Operating equipment during maintenance, service, or while inside or on the unit can cause serious injury or death.

A. Chain Tension

The tension of the ejector's chains must be inspected once a week or every 40 hours of use. Here is the tensioning procedure if the inspection is inconclusive. The criteria for adequate tension are specified at the end of this procedure.

1. Make sure to Lock-Out/Tag-Out the unit before performing this procedure
2. Preparation for tightening
 - a. Position the ejection panel at mid length with the trap door shut.



Figure 90. Ejection Panel Position

- b. Get in the dustcart and take off the panels blocking the two access windows.

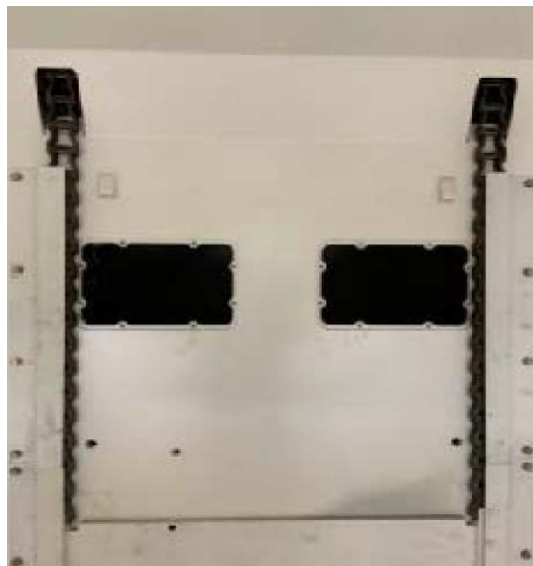


Figure 91. Opened Access Door

MAINTENANCE & ADJUSTMENT

3. Chain Tightening

Steps a to c are the same for each turnbuckle. Repeat those for the two chains. The nuts used are 1"-8.

- a. From the access door, completely loosen the lock nut.



Figure 92. Loosen Lock Nut

- b. From the access door, tighten the clamping nut until the portion of the chain behind the ejection panel starts lifting up from its rail as shown in the picture.



Figure 93. Lifted Up Chain

MAINTENANCE & ADJUSTMENT

- c. Once the chain is tight enough, retighten the lock nut. A torque of 10 lb-ft is sufficient.



Figure 94. Locked Turnbuckle

4. Verification of the tension
 - a. Fully retract the ejection panel to proceed.



Figure 95. Ejection Panel Fully Retracted

MAINTENANCE & ADJUSTMENT

- b. Pull the chain at its mid-point with a force of approximately 50 pounds and measure the lifting height. Repeat this step for each chain. The chain should lift up between 4 to 6 inches from the bottom of the chain channel if tightened properly.



Figure 97. Lifting Height



Figure 96. Lifting Position

- c. If the lifting height is not appropriate, go back to section 3 and increase or decrease the tightening in order to have a lifting height between 4 and 6 inches.
If the lifting height is appropriate, put back the panels on the access doors.



Figure 98. Closed Access Doors

Frequency	Once after 160 hours of operation and once every 960 hours thereafter.
Oil type	EP Synthetic Gear Oil ISO 220
Quantity	Fill it up until the oil reaches the level of the side plug

MAINTENANCE & ADJUSTMENT



Figure 99. Ejection Gearbox

Oil Change Procedure

1. Put an oil pan under the gearbox.
2. Open the top plug and the bottom plug and wait until the gearbox is empty of oil.
3. Unscrew all the plugs and clean them from filings. It is important to clean all the plugs because they are magnetic.
4. Screw back in place every plug except the two plugs pointed on figure below.
5. Fill the gearbox from the top plug with the oil until it reaches the level of the side plug.
6. Screw back in place the plugs.

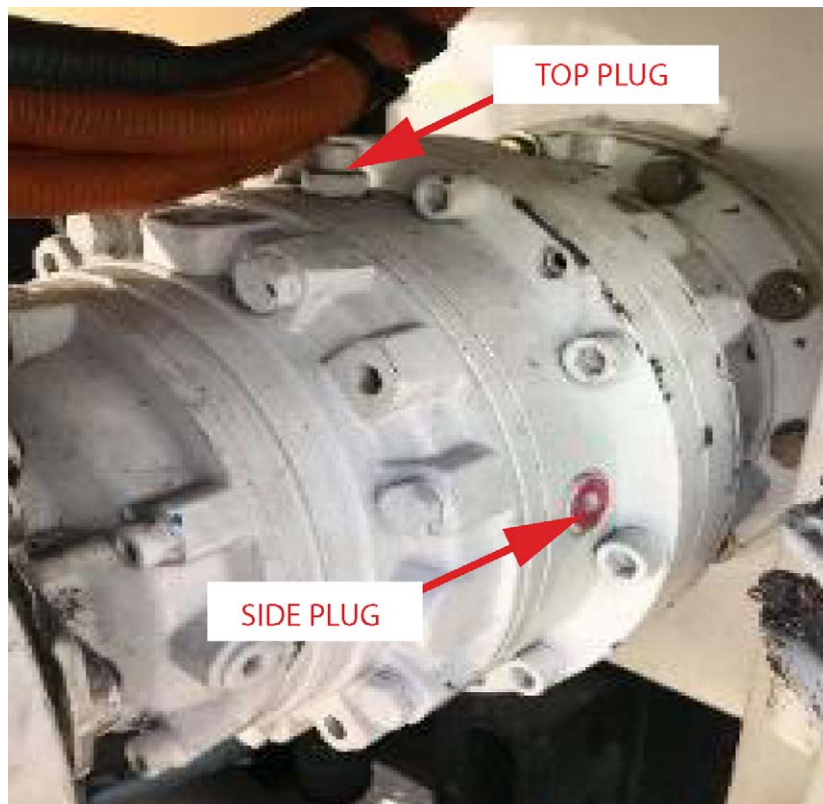


Figure 100. Gearbox Plugs

MAINTENANCE & ADJUSTMENT

Inspect & Repair Auger Hardfacing

Inspect the hardfacing welds every 320 hours, or more often if needed, depending on what waste is collected with the unit and the frequency of use. Here is the auger hardfacing instructional guide for maintenance.

⚠ WARNING

Use the “**Lock-Out/Tag-Out Procedure**” on page 12 for the chassis and “” on page 17 for the body battery whenever you perform maintenance or service, enter the hopper, or climb in/on the body or equipment. If the unit is not in Lock-Out/Tag-Out, equipment may operate unexpectedly. Operating equipment during maintenance, service, or while inside or on the unit can cause serious injury or death.

⚠ CAUTION

The auger is a very heavy piece of equipment. Special precautions must be taken when moving the auger.

A. Hopper Preparation

1. Open the canopy to the maximum or remove it if it is a fixed canopy.

B. Auger Removal Procedure

1. Make sure to Lock-Out/Tag-Out the unit before performing this procedure.
2. From the inside of the hopper, remove the bolts and the flat washers from the auger plate as shown in the figure below.

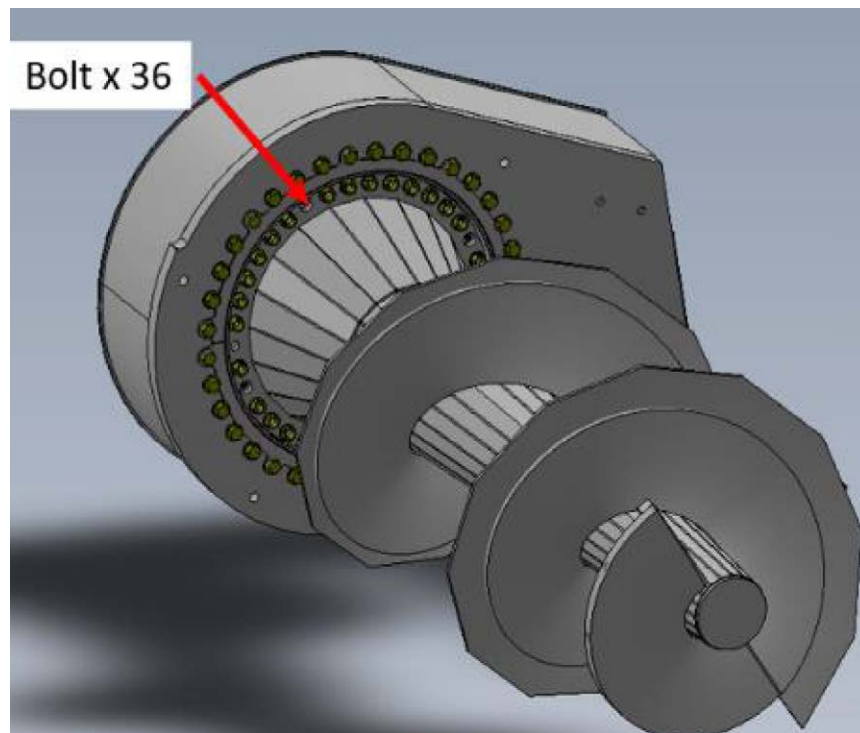


Figure 101. Bolt Location on Auger

MAINTENANCE & ADJUSTMENT

3. Attach a chain or a strap to the auger as shown in the Figure below. Using a hoist or a forklift, lift slowly the auger and remove it from the inside of the hopper.

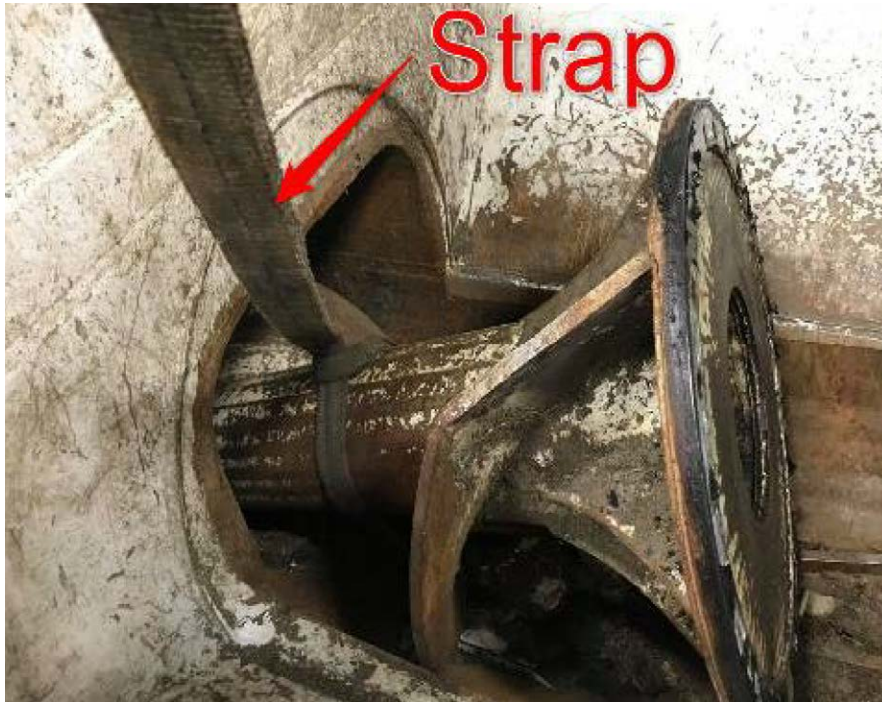


Figure 102. Strap Position on Auger

C. Auger Hardfacing Welding

1. Clean the auger by sandblasting it or with a wire brush where welds will be performed.
2. Place the auger upside as shown in the Figure below and stabilize it with straps.

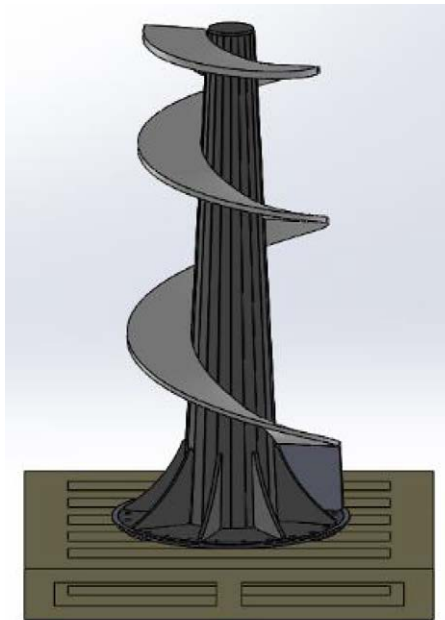


Figure 103. Auger Positioned on Pallet

MAINTENANCE & ADJUSTMENT

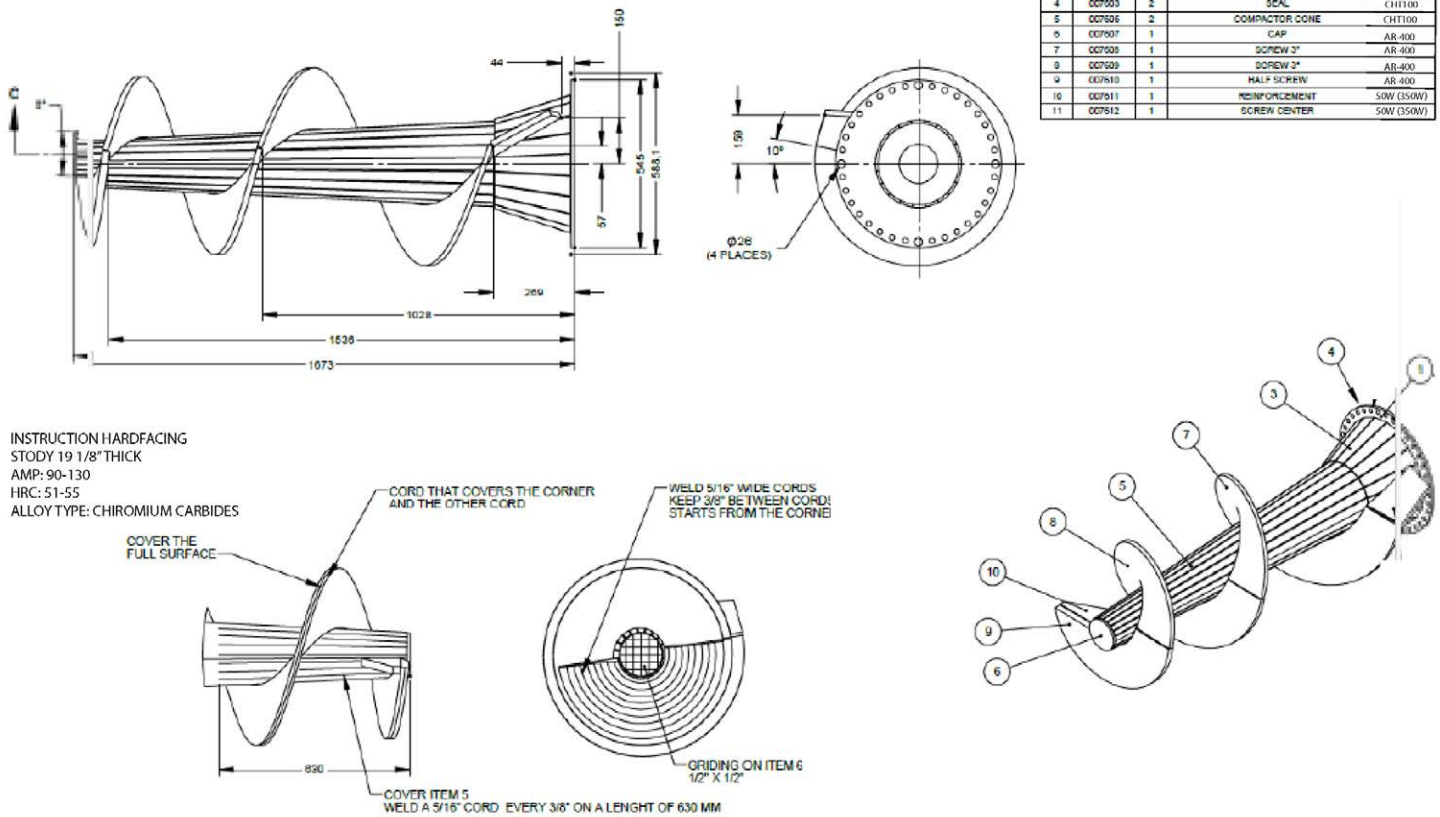


Figure 104.

Repairing Cracked Weld Joints

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

Oil Lubricant Recommendation

Use only non-detergent engine oil to lubricate all movable 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.

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 NLGI 2 grease or equivalent.

Inspect Proximity Switches

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

MAINTENANCE & ADJUSTMENT

Chain Blockage

At low temperatures, waste material buildup can freeze and expand, increasing friction and the torque required to operate the ejector panel mechanisms. This can result in the ejector panel failing to move due to frozen waste material accumulating in the chain canal and restricting chain movement.

As the chains move, an opening located near the trap door allows most waste material to fall out rather than accumulate inside the canal. This design helps prevent material buildup and reduces the likelihood of increased torque requirements caused by frozen material within the chain canal.

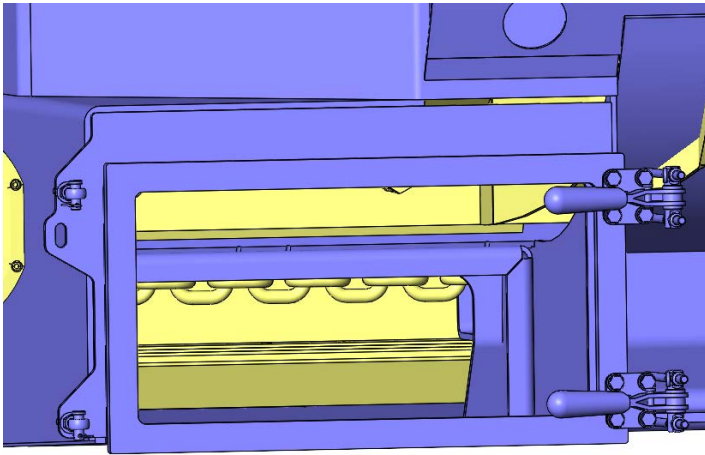


Figure 105. Chain Canal

Cleaning

Thoroughly inspect and clean the chain canals and scraper located behind the pulley bi-annually or as needed.

1. Use a tool similar to an auger to remove the accumulated waste material.



Figure 106. Auger-Type Tool



Figure 107. Auger-Type Tool After Removing Waste Material (cloths, plastic bags, and ropes accumulated in the chain canals)

MAINTENANCE & ADJUSTMENT

2. Clean the scraper located behind the pulley.



Figure 108. Dirty Scraper



Figure 109. Clean Scraper



The scraper and the pulley reduce the area where the waste material can exit, causing it to remain in the chain canal.

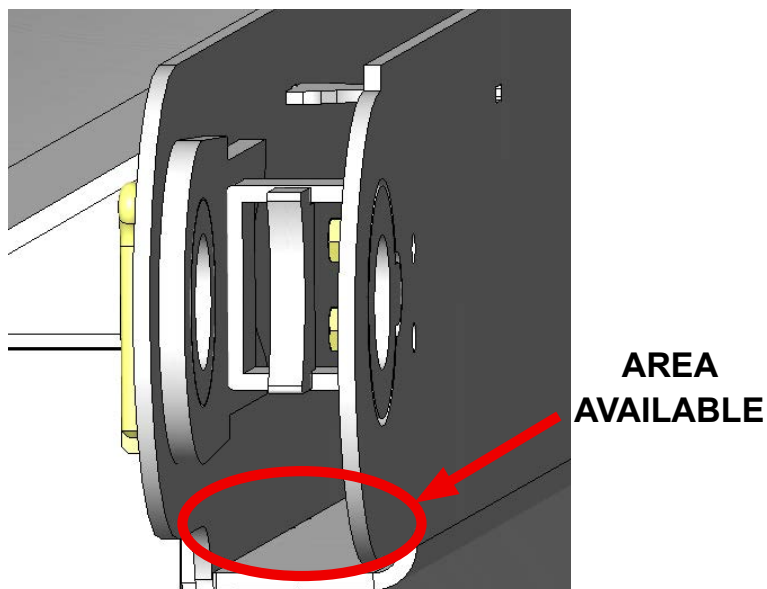


Figure 110. Scraper Located Behind The Pulley

SECTION 5

BODY & REMOTE CONTROLLERS

BODY & REMOTE CONTROLLERS

Body & Remote Controllers

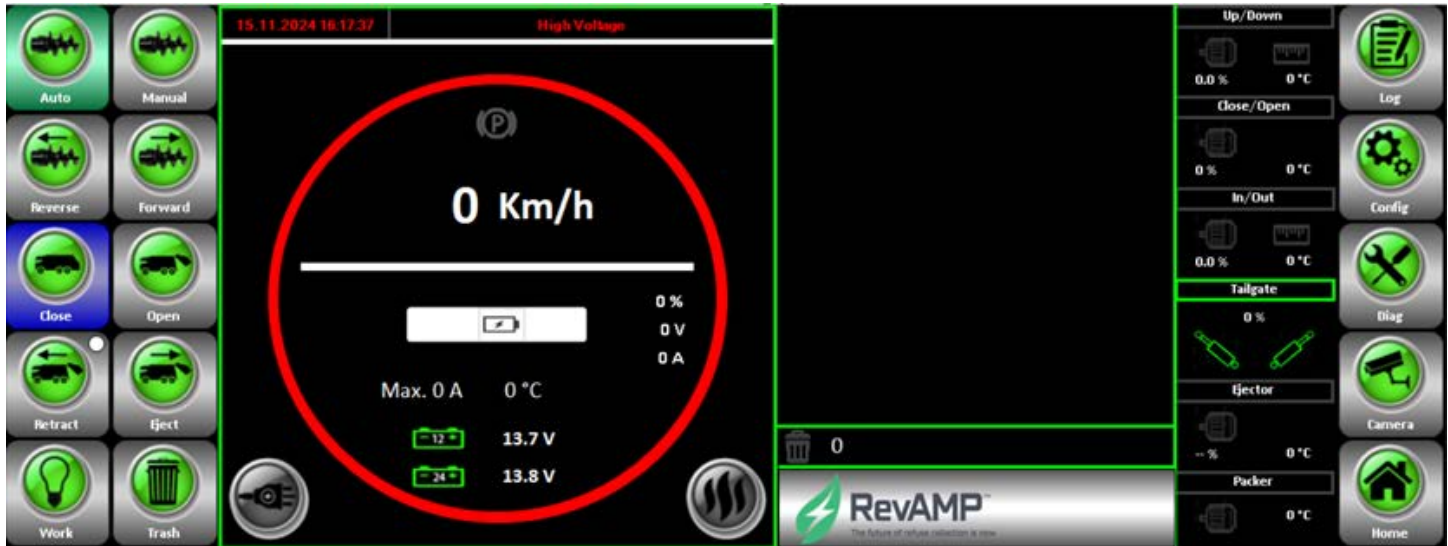


Figure 111. Main Screen

1. Packer Automatic Mode Selection

In automatic mode, when the arm reaches mid-height, the packer starts a compaction cycle and turns for a programmed number of turns.

2. Packer Manual Mode Selection

Allows the driver to manually control the auger with buttons 3 and 4.

3. Packer Reverse Button

This function can be used in manual mode only. Push and hold the button to activate the reverse rotation of the packer.

4. Packer Forward Button

- In manual mode, push and hold the button to activate the packer rotation.
- In automatic mode, when the arm reaches mid-height, the packer starts for a programmed number of turns.

5. Ejector Panel Manual Reverse Button

Push and hold to move the ejector panel to home position (toward the front)

- The gray indicator means that the ejector panel is not at home position.
- The blue indicator means that the ejector panel is fully retracted at home position (0%).
- The white dot means that the trap door is not fully closed.
- The green dot means that the trap door is fully closed.

6. Ejector Panel Manual Forward Button

Push and hold to move the ejector panel toward the back of the truck.

- The gray indicator means that the panel is not at 100%.
- The blue indicator means that the ejector panel is at 100%.

7. Tailgate Closing Manual Button

Push and hold for the tailgate to close and seal manually.

- The gray indicator means that the tailgate is not fully closed.
- The blue indicator appears when the tailgate is fully closed.

8. Tailgate Opening Manual Button

Push and hold to manually open the tailgate.

BODY & REMOTE CONTROLLERS

- a. The gray color indicates that the tailgate is not fully opened.
 - b. The blue indicator indicates that the tailgate is fully opened.
9. Hopper and Arm Work Light Control
- a. This button turns on and of the working lights over the hopper and the arm.
10. Collect mode indicator / Bin counter reset button
- a. The gray color indicates when the collection mode is off. In this case, the arm can only be retracted and lowered and the grabber can only be opened.
 - b. The green colors indicates that the collection mode is on. The arm is then fully functional. In collection mode, the rear strobe, the rear light indication (X pattern) and the side markers flasher (follow rear X pattern) starts.

NOTICE

When in collect mode, the arm camera appears in place of the battery status.

11. Alarm Screen Button Selection

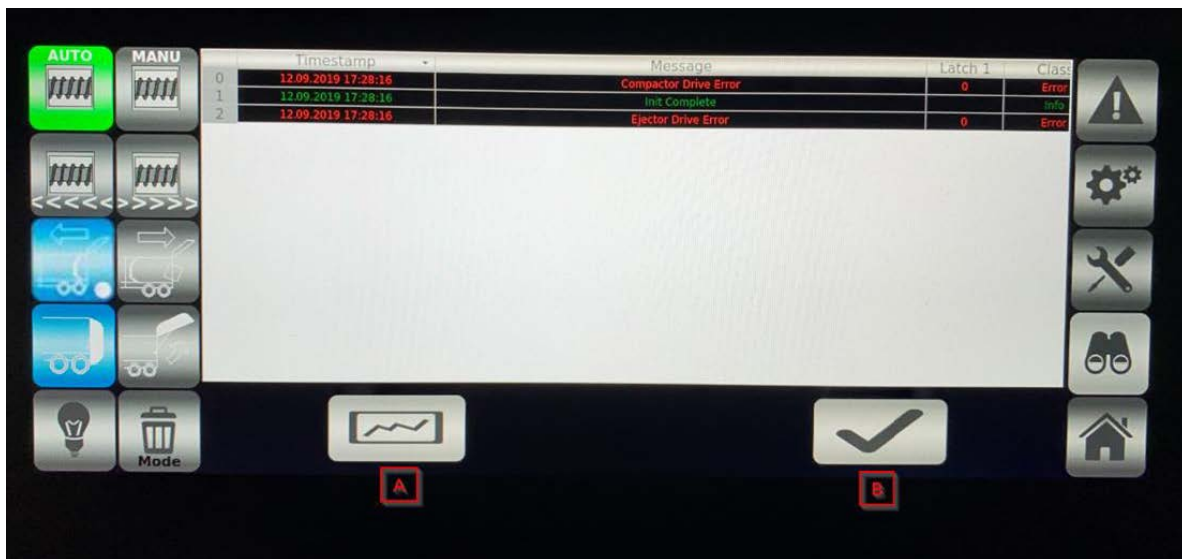


Figure 112. Alarm Screen Button Selection

- a. Press button A once for all alarm, warning and info message



Figure 113. Alarm Screen Button Selection 2

BODY & REMOTE CONTROLLERS

- b. Press button A again to return to ACTIVE alarm, warning and info message.
- c. Press button B to acknowledge a latched alarm. Most alarm acknowledge by themselves when fault condition disappears.

12. Parameter Configuration Main Screen Button Selection



Figure 114. Parameter Configuration Main Screen Button Section

a. Joystick Configuration



Figure 115. Joystick Configuration Screen

BODY & REMOTE CONTROLLERS

All the parameters in this page are factory settings.

b. General Truck Configuration

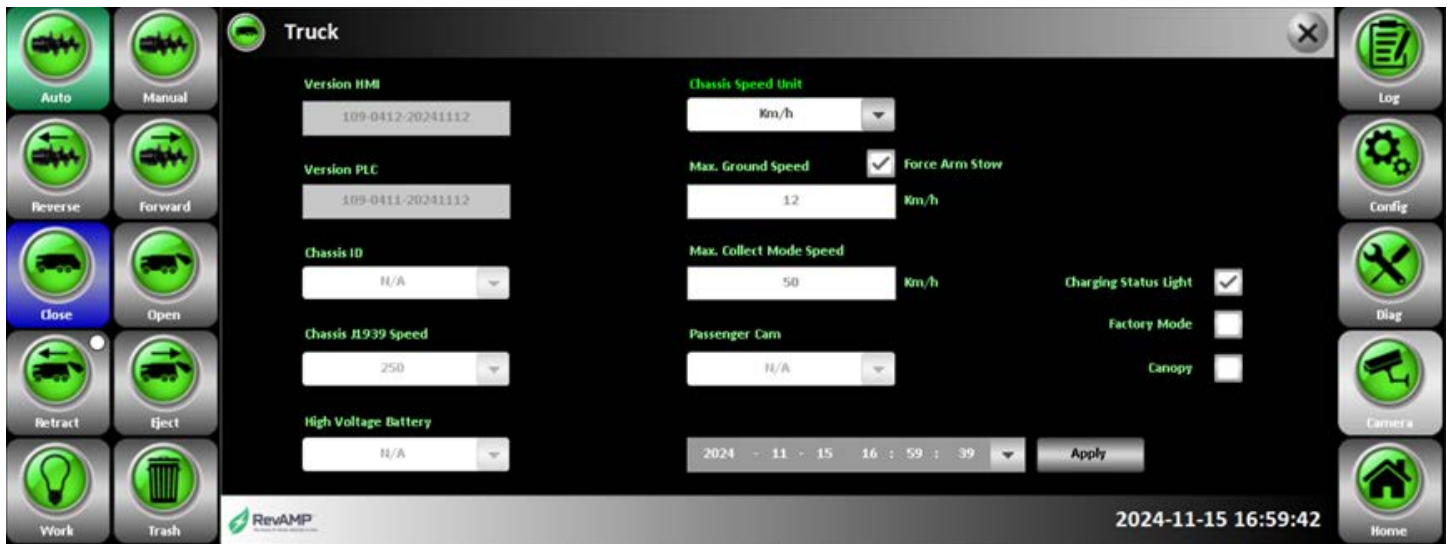


Figure 116. General Truck Configuration Screen

- (1) This indicates the PLC and HMI software version.
- (2) This section allow to user to set the HMI date and time.
- (3) This section is used to select the baud rate for CAN communication with chassis. It is factory setting.
- (4) When the factory mode is checked, the percentage value of the motors in the home page correspond to millimeters. When the box is not checked, the value of the motors displayed are in percentage. This function is very useful for the arm and ejection calibration.
- (5) The maximum ground speed is used to activate the arm interlock. If the arm is out while driving at a speed higher than the value an audible and visual alarm will occur.
- (6) As soon as the truck goes faster than this value, the arm will axiomaticly retract and be disabled.
- (7) This is used to set the speed unit in Km/h or mph.

Alarm Screen Button Selection

Alarm Screen Button Selection

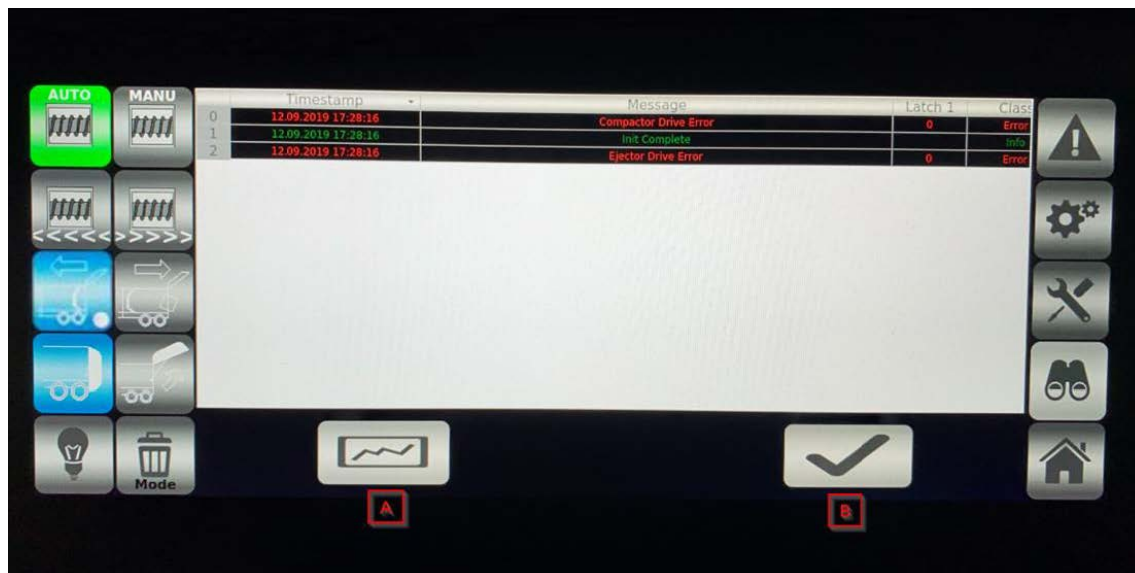


Figure 117. Alarm Screen Button Selection

BODY & REMOTE CONTROLLERS

- a. Press button A once for all alarm, warning and info message



Figure 118. Alarm Screen Button Selection 2

- b. Press button A again to return to ACTIVE alarm, warning and info message.
- c. Press button B to acknowledge a latched alarm. Most alarm acknowledge by themselves when fault condition disappears.

Electric Screen Controls

If decommissioning is required for maintenance and adjustment refer to “” on page 17.

A. System Power Switch Localization



Figure 119. System Power Switch Location

1. The first System Power switch is located in the cabin near the joystick.
2. The other System Power switch is located on the street side of the body near amber light.

B. Joystick configuration

BODY & REMOTE CONTROLLERS



Figure 120. Joystick Configuration Screen

All the parameters in this page are factory settings.

C. General truck configuration

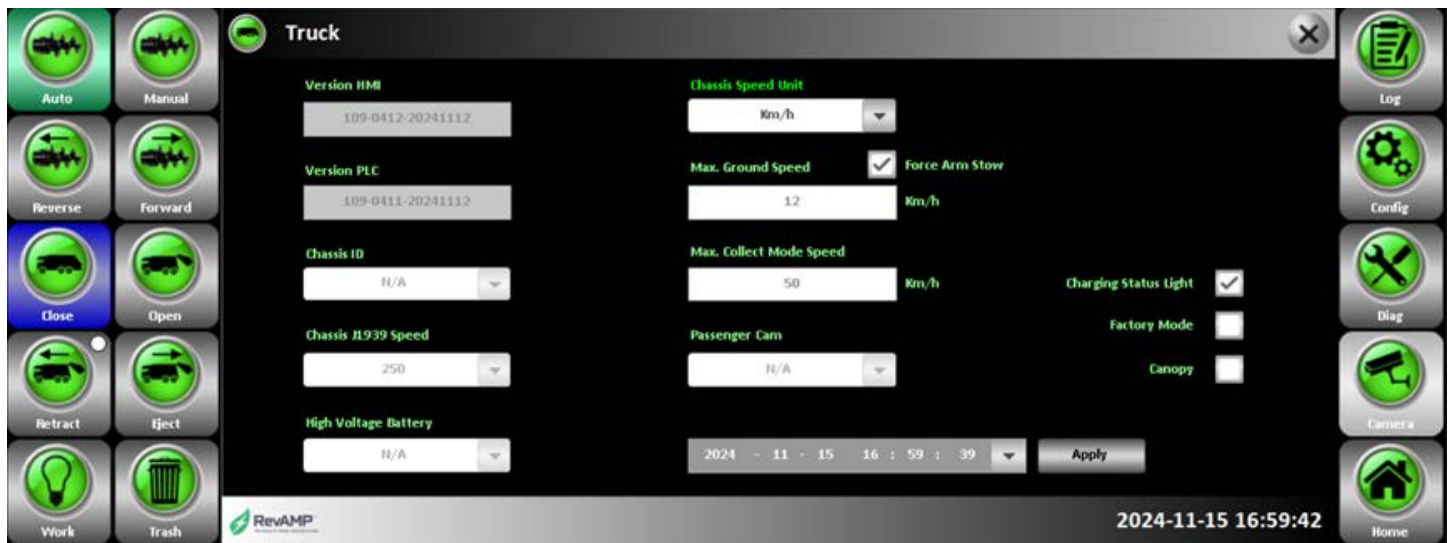


Figure 121. General Truck Configuration Screen

1. This indicates the PLC and HMI software version.
2. This section allow to user to set the HMI date and time.
3. This section is used to select the baud rate for CAN communication with chassis. It is factory setting.
4. When the factory mode is checked, the percentage value of the motors in the home page correspond to millimeters. When the box is not checked, the value of the motors displayed are in percentage. This function is very useful for the arm and ejection calibration.
5. The maximum ground speed is used to activate the arm interlock. If the arm is out while driving at a speed higher than the value an audible and visual alarm will occur.
6. As soon as the truck goes faster than this value, the arm will axiomaticly retract and be disabled.

BODY & REMOTE CONTROLLERS

D. Arm Configuration

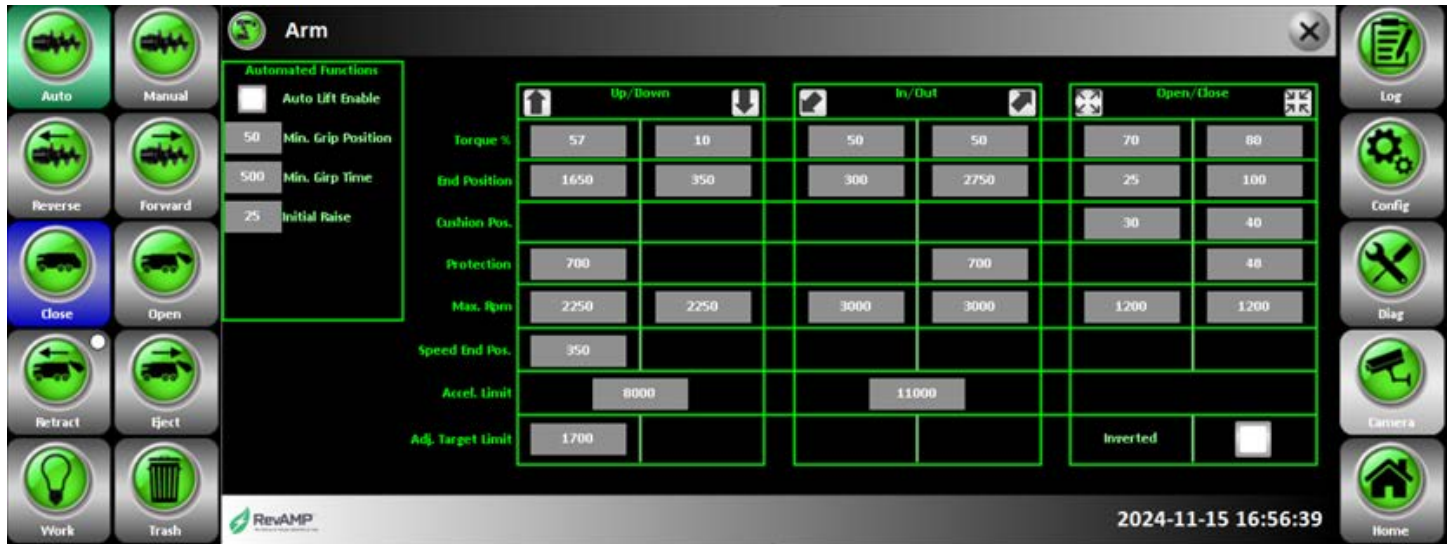


Figure 122. Arm Configuration Screen

1. Torque %: The values in this line are the maximum torque percentage allowed on each axis. These values are factory settings.
2. End Position: The values in this line are the end values in millimeters. These are set to the maximum mechanical position during the calibration process.
3. Cushion Position: The values in this lines are the values in millimeters where the cushioning start. The cushioning start few millimeters before the fully retracted and extended positions.
4. Production: These are the values in millimeters for the mid-height (up-down), distance from arm to hopper (in-out) and gripper angle opening considered as gripper open. It is related to the interlocks and camera switching if equipped.
5. Max Rpm: The max. RPM values are the maximum speed of the motors.
6. Speed End Position: The value in this line is used for the up-down cushioning calibration.
7. Inverted: The check box is used to switch the grabber configuration. It allows the user to switch from left button-open/right button-close to right button-open/left button-close.

E. Auger Configuration



Figure 123. Auger Configuration Screen

BODY & REMOTE CONTROLLERS

1. Compaction Delay(ms): Delay to switch the rotation of the auger from one direction to the other.
2. Compaction Turns: Number of auger rotations in automatic mode.
3. High Current Threshold (A): Motor current before starting in reverse (auger jammed threshold). In other words, if the current goes over 350 Amps for a set period of time (High current time), the auger will go in reverse.
4. High Current Time(ms): The current must be higher than the high current threshold for the value of high current time to start in reverse (auger jammed threshold).
5. Retraction Auto Time(ms): Duration of time by which the auger will run in reverse mode.
6. Counter Auger Full: Number of attempts the auger will run in reverse mode before stopping and giving alarm (Body full).
7. Max. Rpm: Auger's motor speed. There is no minimum value and the maximum value is 5000 RPM, higher RPM could break the planetary gearbox.
8. Max. Torque (%): Maximum auger motor torque, it can be used to limit maximum payload of the body.

F. Ejector Configuration

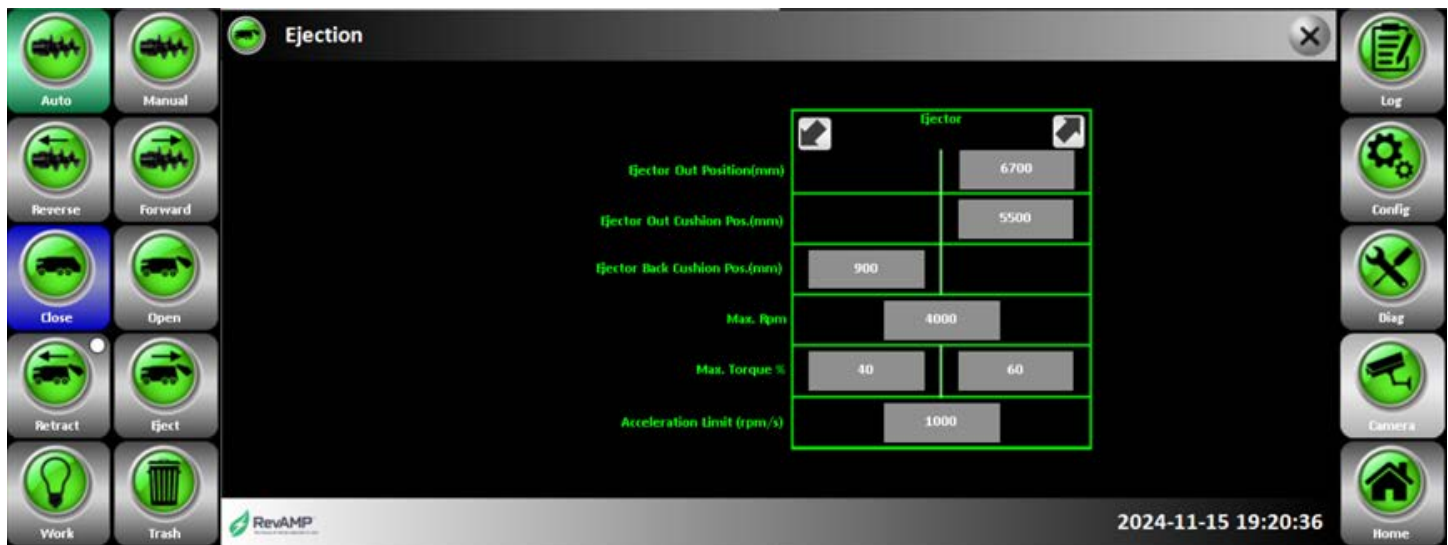


Figure 124. Ejector Configuration Screen

1. Ejector Out Position(mm): Maximum ejector position measured by a laser sensor in the body. The value is set to the maximum mechanical position during calibration.
2. Ejector Back Position(mm): Ejector home position measured by a laser sensor. The value is set to the minimum mechanical position during calibration.
3. Max.RPM: Ejector's motor speed, the maximum value is 3000RPM.
4. Max. Torque %: Maximum ejector motor torque. This value is factory set and can not be modified.
5. Ejector back cushion Pos.(mm): Ejector return position starting running at low speed to open the trap door without damage (cushioning of ejector panel on the return).

BODY & REMOTE CONTROLLERS

G. Parameter Save/Restore



Figure 125. Parameter Save/Restore Screen

1. **Save Parameters:** This button is used to save all parameters into display memory. If a memory card is connected to the USB0 port, it generates an external parameter file (see 12.8.3)
2. **Recall Parameters:** This button allows the user to recall the parameters from the display memory. If a memory card is connected to the USB0 port, it copies the external file to the display memory before recalling the parameters.
3. **Unplug:** Hit that button before removing the memory card. If the memory card is removed without pushing this button, the data on the memory card will be corrupted.



Figure 126. Memory Stick Cable Hookup

BODY & REMOTE CONTROLLERS

H. WiFi Setup

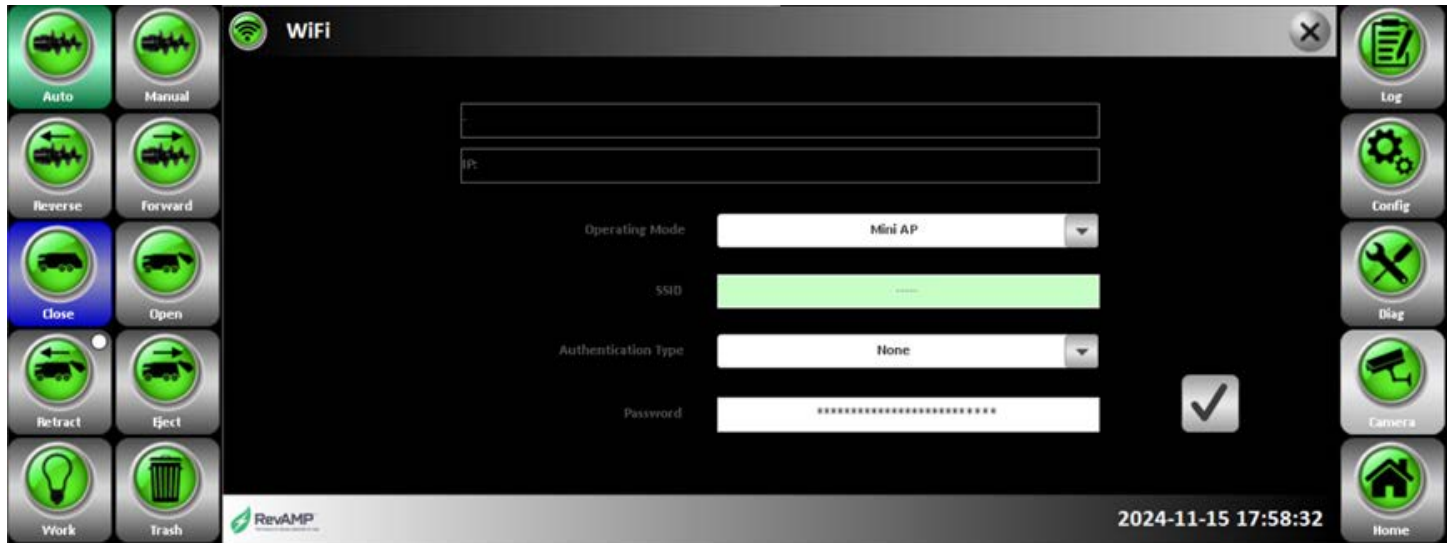


Figure 127. WIFI Setup

WiFi module can be used in Mini Acces Point mode (Direct PC to module) and standard Infrastructure mode (through DHCP router connection).

1. Operating Mode: For a standard remote connection: select “Infrastructure”
2. SSID: For a standard remote connection: Enter network SSID to connect.
3. Authentication Type: For a standard remote connection: select “WPA/WPA2 mixed”
4. Password: For a standard remote connection: Enter password of the network.

NOTE: IP address attributed by DHCP will be indicated in the upper box. Keep that IP address in note. It will be required on the PC to connect with the truck. If no further configuration are made with the WiFi module, it will connect automatically to the WiFi network (if the network is available) on each powering up of the truck.

I. User Logging – Language Setting and Brightness Setting

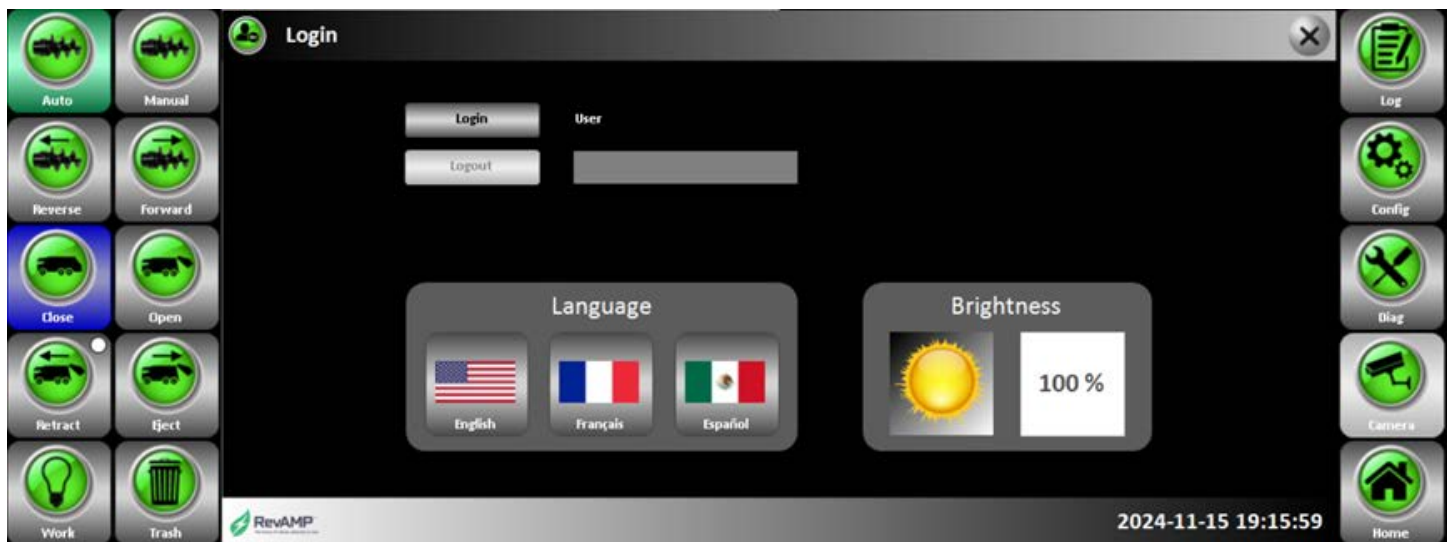


Figure 128. User Logging Screen

1. HMI logging button. Use this button to connect as any user. The default user is for the drivers. This user have access to all diagnostic feature. If a feature is not available, the button or field is grayed. Maintenance user have access to all diagnostic and configuration features. Some field are still disable and only accessible by factory user. To connect as the Maintenance use this:

User: MNT Password: MNT

BODY & REMOTE CONTROLLERS

2. Language setting: English, French, or Spanish
3. Display brightness level setting.

J. Status Main Screen Button Selection



Figure 129. Status Main Screen Button Selection

K. Joystick Test and Status



Figure 130. Joystick Test and Status

BODY & REMOTE CONTROLLERS

L. Controller I/O State and Status

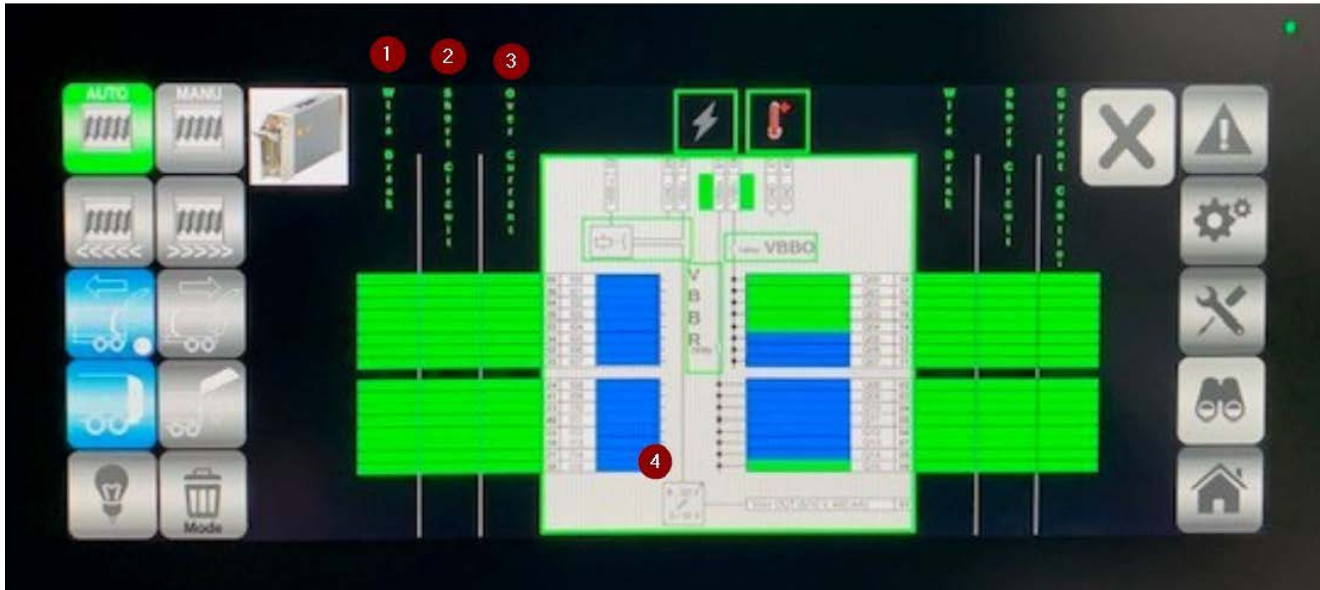


Figure 131. Controller I/O State and Status

1. Wire brake: For every output, that section will be red if the related circuit is activated and a broken wire is detected.
2. Short circuit: For every output, that section will be red if the related circuit is activated and detected as a short circuit to the control ground or body. The output will automatically be open.
3. Over current: For every output, that section will be red if the related circuit is activated and detected as over current. The output will automatically be open for 500ms. After this delay, the output will be closed again. A remained over current situation will activate and deactivate the output indefinitely.
4. Input/Output status: This section is blue by default. This indicates an input or an output not activated. When the related input or output is activated, the color pass to green.

M. Battery Monitoring System Status



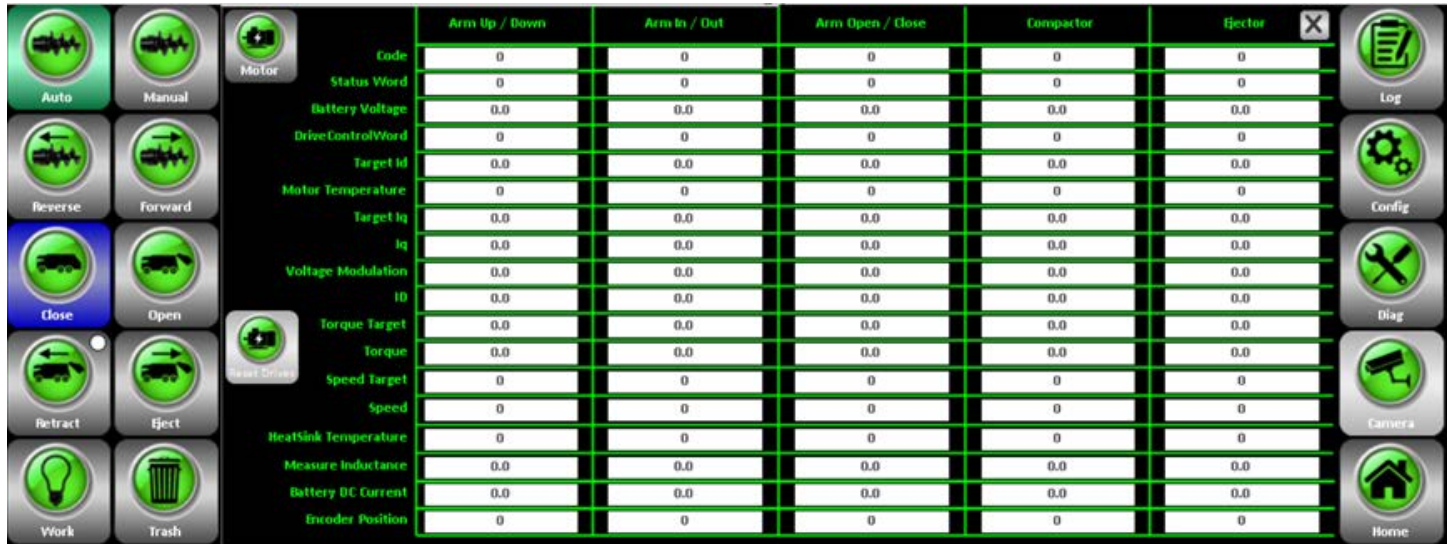
Figure 132. Battery Monitoring System Status

Same info as main screen when not in collect mode.

1. Leak Current: That number should be at 0mA. Indication of the electrical isolation level between high voltage battery pack and chassis.

BODY & REMOTE CONTROLLERS

N. Drive Status and Error Code



	Arm Up / Down	Arm In / Out	Arm Open / Close	Compactor	Ejector
Code	0	0	0	0	0
Status Word	0	0	0	0	0
Battery Voltage	0.0	0.0	0.0	0.0	0.0
DriveControlWord	0	0	0	0	0
Target Id	0.0	0.0	0.0	0.0	0.0
Motor Temperature	0	0	0	0	0
Target Iq	0.0	0.0	0.0	0.0	0.0
Iq	0.0	0.0	0.0	0.0	0.0
Voltage Modulation	0.0	0.0	0.0	0.0	0.0
ID	0.0	0.0	0.0	0.0	0.0
Torque Target	0.0	0.0	0.0	0.0	0.0
Torque	0.0	0.0	0.0	0.0	0.0
Speed Target	0	0	0	0	0
Speed	0	0	0	0	0
Heatsink Temperature	0	0	0	0	0
Measure Inductance	0.0	0.0	0.0	0.0	0.0
Battery DC Current	0.0	0.0	0.0	0.0	0.0
Encoder Position	0	0	0	0	0

Figure 133. Drive Status and Error Code Screen

Those values may be required by Heil engineering team for diagnostic or test purpose.

1. Code: Error code for a specific drive. That code needs to be transmitted to Heil for diagnostic.
2. Motor Temperature: This information is replicated in the main screen. If the motor temperature is too hot, the drive can enter in derating mode and limit torque to the motor.
3. Heatsink Temperature: Heatsink drive temperature: If too hot, the drive can enter in derating mode and limit torque to the motor.

O. CAN and Encoder Status



Network	
	CAN 1 Load : 0
	CAN 1 Error : 0
	CAN 2 Load : 0
	CAN 2 Error : 1
	CAN 3 Load : 45
	CAN 3 Error : 1
	CAN 4 Load : 0
	CAN 4 Error : 1
Up/Down  99	
Up/Down Arm  99	

2024-11-15 19:35:20

Figure 134. CAN and Encoder Status Screen

May be required by Heil for diagnostic purpose.

BODY & REMOTE CONTROLLERS

P. Component Hour Meter



Figure 135. Component Hour Meter Screen

Each motor, linear actuator and gearbox have a dedicated hour meter counter. That counter could be reset if a component is replaced on the truck. Maintenance access level is required to reset a counter.

Q. All Cameras Button

1. Press once to activate all three cameras (hopper, arm and back)

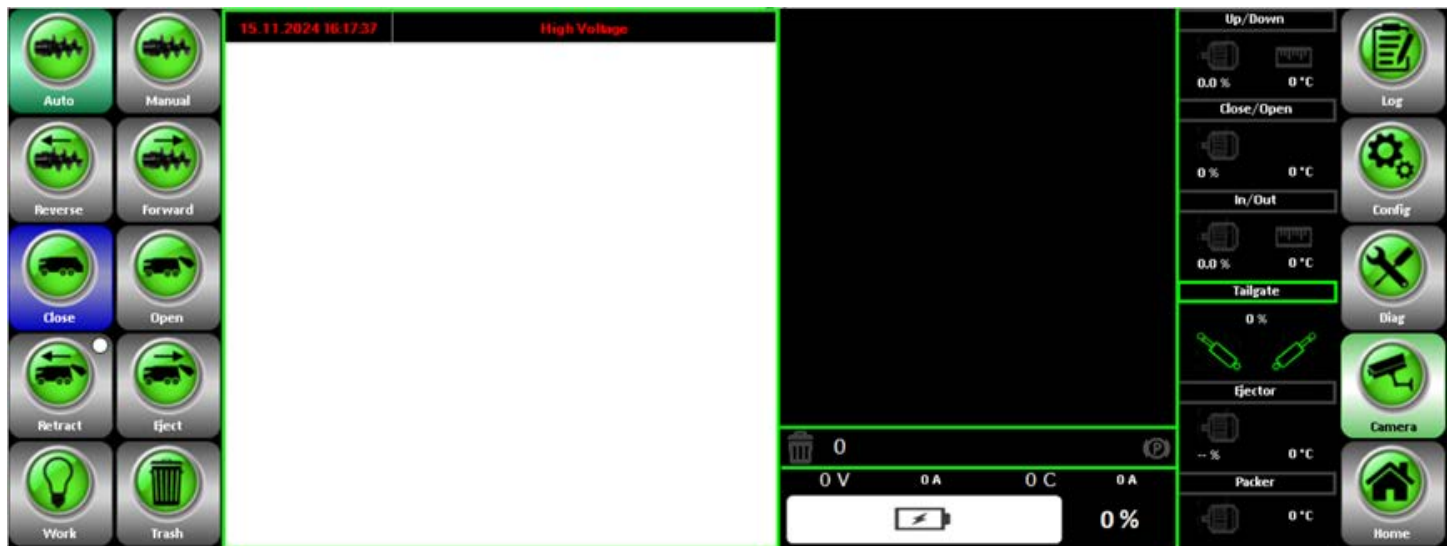


Figure 136. All Cameras Button: Press Once to Activate All Three Cameras (Hopper, Arm, and Rear)

2. Press again to de-activate the three cameras.

R. Return to main screen

S. Motor, encoders and rear actuator status

BODY & REMOTE CONTROLLERS

T. In this section you can find information related to each motor and actuators



Figure 137. Encoders, & Rear Actuator Status

1. Motor status. There are 3 different colors possible:
 - a. Gray: Motor is not powered or in pre-operational mode. This state will be activated when an emergency stop is activated. NOTE: If after powering up, a motor remain in gray state, activate the System Power switch and release it to force the drives to reset.
 - b. Red: Motor is not working or has an alarm. See the drive status page for more informations.
 - c. Green: Motor is in normal state and ready to run.
2. Encoder status. It may have two colors
 - a. Grey: Encoder is not ready, not powered or there is no communication with it (CAN issue).
 - b. Green: Encoder is in normal state and ready to run.

BODY & REMOTE CONTROLLERS

3. Position value

- a. In factory mode (12.6.4), this value is indicated as a real distance in mm. For the grabbers, that value is indicated as an angle.
- b. When not in factory mode (12.6.4), this value is indicated as a % of full stroke.

NOTICE

Packer has no distance or % indication

- c. Motors temperature (°C). Normal motor temperature must be lower than 130 °C, above that, the motor will be yellow indicating that it is hot. Above 160 °C we are in overheating condition, the motor will be red and it won't be possible to operate it until it cools down.

U. Charging Status

- a. Icon color: The charging icon is grey when the truck is not in charging mode. If the charging icon is yellow, it indicates that J1772 connector is plugged in but the vehicle is not charging. When charging starts, the icon will be green. Get behind the truck to make sure lights are flashing. This indicates that J1772 connector is connected to the charging port inlet. There is a hook located on the J1772 gun. That hook needs to be properly locked to the inlet to allow the truck to charge.
- b. To be sure the truck is charging when J1772 gun is connected, check that the hook is fully engaged.
 - (1) The icon on the screen needs to be green while charging.
 - (2) A 240VAC power outlet with a 50A breaker is required to avoid breaker tripping issues after a few minutes/ hours of charge.
 - (3) While charging, lights at the back of the truck should be flashing:
 - (a) Lower right amber light when SOC is between 0% and 24%
 - (b) Lower right and lower left amber lights when SOC is between 24% and 49%
 - (c) Lower right, lower left and upper left amber lights when SOC is between 50% and 74%.
 - (d) Lower right, lower left, upper left and upper right amber lights when SOC is between 75% and 99%.
 - (e) When charging is finished. All amber lights stay on. SOC may drop to 99% or 98% on the screen. This is normal when the battery is fully charged and internal cells are self-balancing the voltage.

NOTICE

Battery SOC shouldn't be kept at 100% for too long. It will shorten the lifespan of the battery. For a long period (a few days is considered as a long period) of non-use, we recommend keeping SOC at 40% to 80%. Good practice is to charge the truck only the day before it will be used. We can accept a full weekend of charging but even in this condition it is best to program the charging station correctly to start Sunday night, for example.

Acronyms Library

Remote Battery Charge-Discharge Management - RevAMP 12V TG Battery

- RCV: Refuse Collection Vehicle.
- HPP: Hydraulic Power Pack.
- VDC: Voltage Direct Current.
- LV: Low Voltage 12-24 VDC.
- CCA: Cold Cranking Amps
- CA: Cranking Amps
- AH: Amp Hours.
- RC: Reserve Capacity, minutes of discharge 25 amps
- HMI: Human Machine Interface
- ICE: Internal Combustion Engine Propelled Chassis
- EV: Electric Vehicle. Battery Propelled Chassis

BODY & REMOTE CONTROLLERS

A. Purposes

- Provide remote located battery for the purpose of operating auxiliary hydraulic functions.
- Reduce or eliminate instantaneous demand of electrical current on truck chassis LV circuits during operation of auxiliary functions.
- Provide proper charge/discharge control of a remote located battery.
- Provide control electronic of Hydraulic Power Pack and Auxiliary hydraulic function.

B. Component Specifications, Application Specific

Aux. Equipment Battery

Model: IFM CR2530

VDC: 12,

CCA: 750,

CA: 870,

AH: 55

RC: 120

Aux. Equipment Charger

Model: IFM CR2530

Input Voltage: 12VDC

Input Fuse Rating: 30A

Output Fuse Rating: 30A

Aux. Function Control

Model: IFM CR2530

BODY & REMOTE CONTROLLERS

System Block Diagram, General Concept

Remote Battery Charge-Discharge Management - RevAMP 12V TG Battery

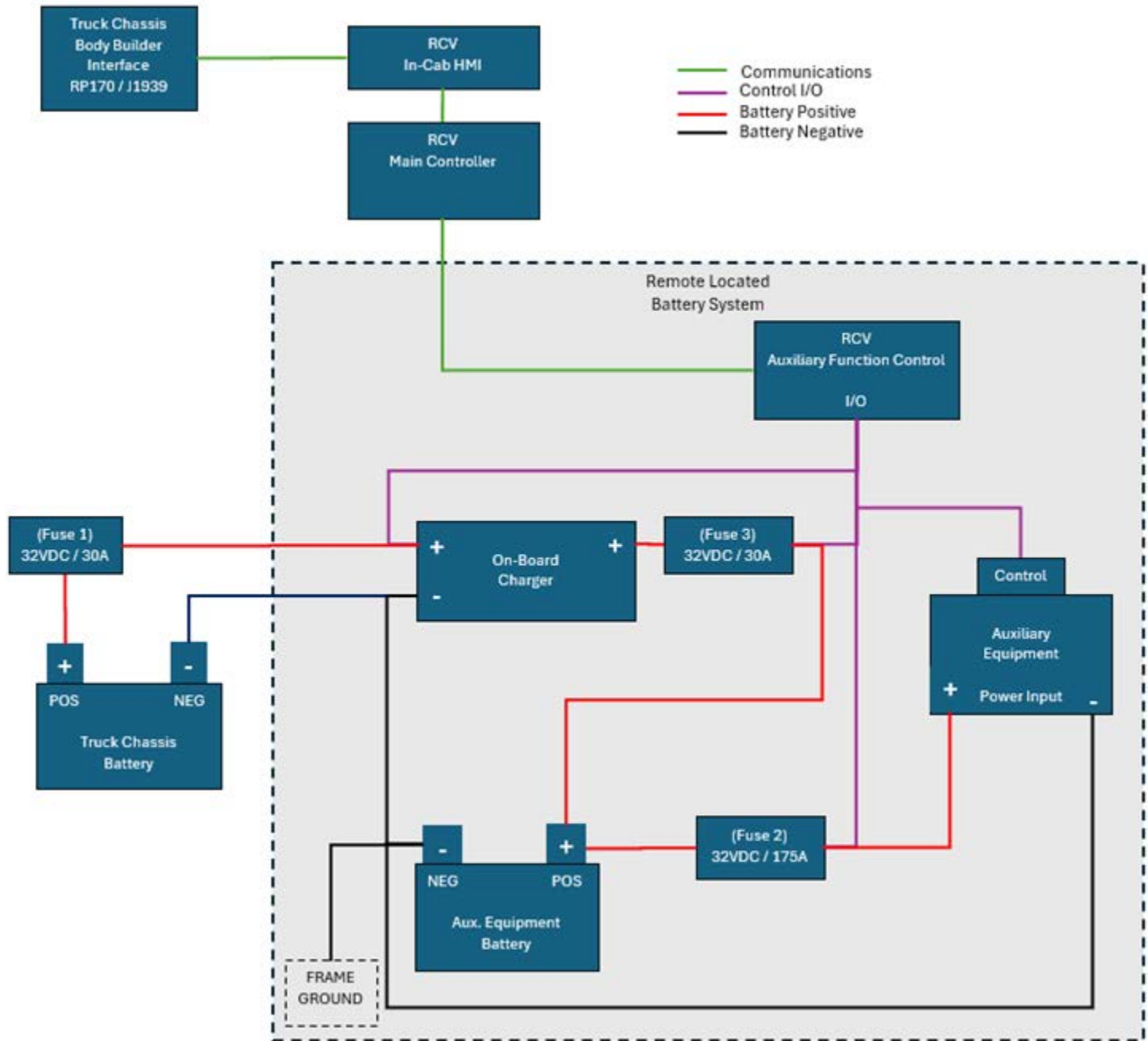


Figure 138.

BODY & REMOTE CONTROLLERS

Remote Battery Charge-Discharge Management - RevAMP 12V TG Battery

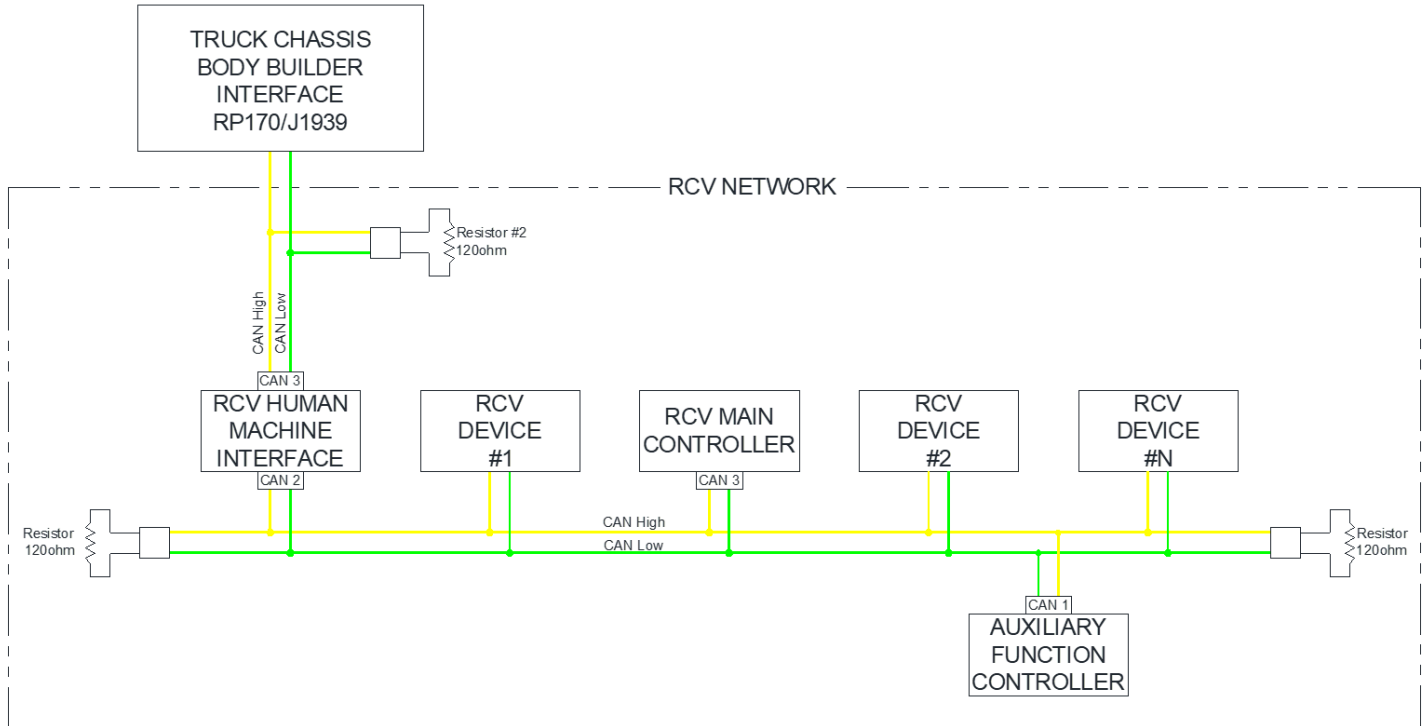


Figure 139.

BODY & REMOTE CONTROLLERSAuxiliary Function Control I/O, Application Specific

Remote Battery Charge-Discharge Management - RevAMP 12V TG Battery

PROGRAM: 109-0TBD REVISION: TBD		I/O ADDRESS	SIGNAL	PIN #	FUNCTION DESCRIPTION
CONTROLLER: CR2530 Auxiliary Function Control					
SUPPLY POWER					
S01	Controller Power	VBB-S	BINARY ACTIVE HIGH	10	Supply power to controller
S02	Charge Power	VBB-1	ANALOG	19	Monitors Supply Voltage from Truck Chassis Battery, Supply power for Outputs (0.00-0.07)
S03	Charge Output	VBB-2	ANALOG	1	Monitors Supply Voltage from Aux. Equip. Battery, Supply power for Outputs (0.08-0.15)
GND	Controller Ground	GND	N/A	2	Common Ground
GND	Output Ground	GND	N/A	37	Common Ground
GND	Output Ground	GND	N/A	42	Common Ground
INPUT FUNCTIONS					
A01	Charger Red LED	IN00	ANALOG (0...10 000 mV)	55	Monitors Charger's Red LED output, used to indicate charger status
A02	Charger Green LED	IN01	ANALOG (0...10 000 mV)	36	Monitors Charger's Green LED output, used to indicate charger status
A03	Charge Output	IN02	ANALOG (0...32 000 mV)	54	Monitors Charger's output voltage
A04	Hyd. Pressure	IN03	ANALOG (0...10 000 mV)	35	Potential future use to monitor Hydraulic Pump Output Pressure,
A05	Battery Temp.	IN04	RESISTANCE	53	Monitors Battery Temperature, PT1000 Sensor
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	Spare In	IN15	N/A	38	
OUTPUT FUNCTIONS					
B01	Spare Out	OUT00	N/A	18	
B02	Spare Out	OUT01	N/A	17	
B03	Spare Out	OUT02	N/A	16	
B04	Spare Out	OUT03	N/A	15	

BODY & REMOTE CONTROLLERS

B05	Spare Out	OUT04	N/A	14	
B06	Spare Out	OUT05	N/A	13	
B07	Spare Out	OUT06	N/A	12	
B08	Spare Out	OUT07	N/A	11	
B09	Spare Out	OUT08	N/A	2	
B10	Spare Out	OUT09	N/A	3	
B11	Hyd. Solenoid, Raise	OUT10	BINARY ACTIVE HIGH	4	Controls hydraulic solenoid for directional control valve, Raise Function (4Amp max. current)
B12	Hyd. Solenoid, Lower	OUT11	BINARY ACTIVE HIGH	5	Controls hydraulic solenoid for directional control valve, Lower Function (4Amp max. current)
B13	Electric Solenoid, Hydraulic Pump	OUT12	BINARY ACTIVE HIGH	6	Controls electric solenoid for Power unit Electric Motor (2 Amp max. current)
B14	12Volt Supply	OUT13	BINARY ACTIVE HIGH	7	Supply Voltage, Sensor Power, etc...
B15	Charger Reduced Power	OUT14	BINARY ACTIVE HIGH	8	Sets on-board charger to reduce current output
B16	Charger Enable	OUT15	BINARY ACTIVE HIGH	9	Enables On-Board charger,

Control Parameters

Remote Battery Charge-Discharge Management - RevAMP 12V TG Battery.

Control Parameters			
		Default	
Full Charge	Voltage level of auxiliary equipment battery when at 100% SOC	13.10	Volts
Full Discharge	Voltage level of auxiliary equipment battery when at 0% SOC	11.30	Volts
Full Current Charge	Resting State of Charge threshold below which full current charging is allowed.	75	% SOC
Min Chassis Voltage	Minimum Operating Voltage for the Truck Chassis Battery.	11.00	Volts
Min SOC	Minimum State of Charge for Auxiliary Equipment Batteries.	5	% SOC
Charge ON Time	Charger interval ON time for Auxiliary Equipment Batteries.	4	Minutes
Charge OFF Time	Charger interval OFF time for Auxiliary Equipment Batteries.	1	Minutes
Reduce Current Temp	Maximum auxiliary equipment battery temperature for Full Current charging.	45°	Celsius

BODY & REMOTE CONTROLLERS

Charge Sequence

Remote Battery Charge-Discharge Management - RevAMP 12V TG Battery

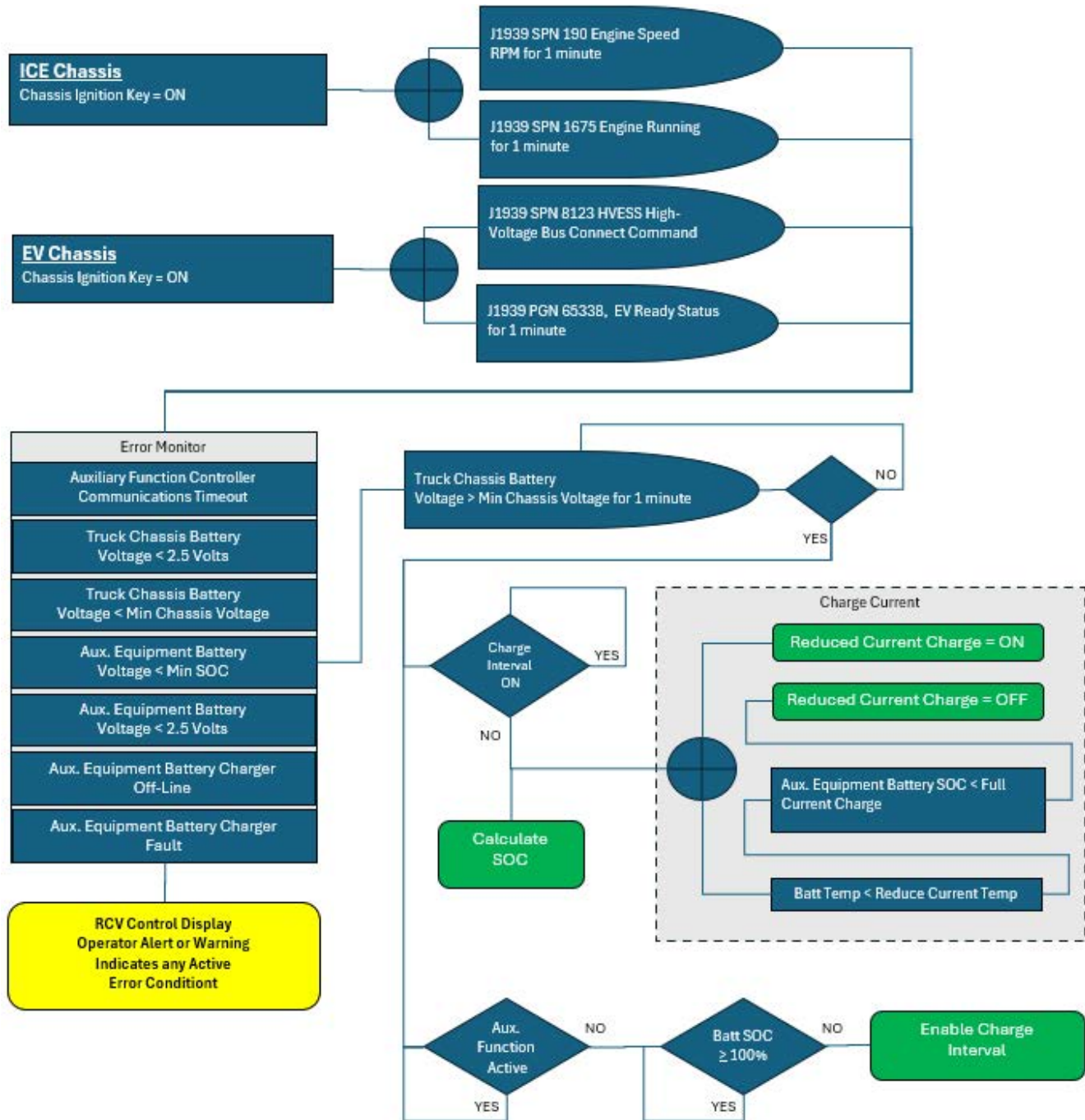


Figure 140.

Notes:

- To optimize the electrical load to the truck chassis battery/charging system, effort is made to charge the aux. battery only during periods where the chassis battery is under healthy conditions. First, by monitoring the voltage level of the chassis battery, second by attempting to determine if the battery is or should be receiving charge current from the truck chassis charging system.
- The Auxiliary Equipment battery is charged in on/off intervals. SOC calculations and charge current adjustments are performed during the interval charger off cycle.

BODY & REMOTE CONTROLLERSError / Event Logging, Indication And Result

Remote Battery Charge-Discharge Management - RevAMP 12V TG Battery. Events detailed below are logged in the RCV In-Cab HMI.

Log Message on Display	Indication	Result
TG Aux. Power, Fail Comms, Ctrl Communications Timeout	Indicates loss of communication with the RCV main controller. Reset with In-Cab E-Stop button. Possible power loss Fuse-009 in Low voltage Control Cabinet. Possible issue with CAN3 communications.	Warning Displayed
TG Aux. Power, Truck Chassis Battery Voltage Lost	Indicates Power loss to the Tailgate from the chassis battery. Possible blown fuse F1 at Truck Chassis battery connection. Possible Chassis battery disconnect open.	Charging Disable Warning Displayed
TG Aux. Power, Truck Chassis Battery Voltage Low	Indicates Low voltage supply to the charger circuit from the chassis battery. Possible low state of charge on the Truck Chassis Battery.	Charging Disable Warning Displayed
TG Aux. Power, Aux. Equipment Battery Low State of Charge	Indicates low state of charge on the Auxiliary Battery.	Auxiliary Equipment Disabled
TG Aux. Power, Aux. Equipment Battery Voltage Lost	Indicates loss of voltage from the Auxiliary Battery. Possible blown fuse F2 at the Auxiliary Battery connection.	Auxiliary Equipment Disabled
TG Aux. Power, Aux. Equipment Battery Not Charging	Indicates a voltage differential between the Charger output and Battery. Blown fuse 3 at the charger output.	Charging Disable Warning Displayed
TG Aux. Power, Aux. Equipment Battery Charger OFF	Charger Indicates, OFF when commanded ON, ignition or input voltage not present. Possible blown fuse F1 at Truck Chassis battery connection. Possible Controller Output issue.	Charging Disable Warning Displayed
TG Aux. Power, Aux. Equipment Battery Charger Fault	Charger Indicates one of the following faults. Input over-voltage limit. Input under-voltage limit. Output over-voltage limit. Output FET's over thermal limits.	Charging Disable Warning Displayed

BODY & REMOTE CONTROLLERS*Fault Codes For Octillion Battery*

DTC Code (decimal)	Fault Abbreviation (.dbc)	Fault Reaction	Basic Description	Detailed Description
1	SUBPACK_CELL_OVER_VOLTAGE_WARN	Warning	Cell voltage approaching upper limit	Maximum cell voltage detected above 3.45V, no action required
2	SUBPACK_CELL_OVER_VOLTAGE_FAULT	String Fault	Cell voltage exceeded maximum, string disabled	Maximum cell voltage detected above 3.55V, reset required to bring string back online
3	SUBPACK_CELL_UNDER_VOLTAGE_WARN	Warning	Cell voltage approaching lower limit	Minimum cell voltage detected below 2.90V, suggest charging battery
4	SUBPACK_CELL_UNDER_VOLTAGE_FAULT	String Fault	Cell voltage exceeded minimum, string disabled	Minimum cell voltage detected below 2.75V, reset required to bring string back online
13	SUBPACK_POWER_HI	Warning	Pack 12V supply too high	12V system detected above 15V
14	SUBPACK_POWER_LO	Warning	Pack 12V supply too low	12V system detected below 8V, system risks dropping out
15	SUBPACK_CHG_OVER_TEMPERATURE_WARN	Warning	Cell temperature approaching upper charge limit	Maximum cell temperature detected above 41C
16	SUBPACK_CHG_OVER_TEMPERATURE_FAULT	String Fault	Temperature too high to charge, string disabled	Charging of a high temperature string was detected, reset required to bring string back online
17	SUBPACK_CHG_UNDER_TEMPERATURE_WARN	Warning	Cell temperature approaching lower charge limit	Minimum cell temperature detected below 4C
18	SUBPACK_CHG_UNDER_TEMPERATURE_FAULT	String Fault	Temperature too low to charge, string disabled	Charging of a low temperature string was detected, reset required to bring string back online
19	SUBPACK_DCH_OVER_TEMPERATURE_WARN	Warning	Temperature approaching upper operational limit	Maximum cell temperature detected above 51C, reduce load and allow battery to cool
20	SUBPACK_DCH_OVER_TEMPERATURE_FAULT	String Fault	Temperature too high, string disabled	Maximum cell temperature exceeded, reset required to bring string back online after cooled
21	SUBPACK_DCH_UNDER_TEMPERATURE_WARN	Warning	Temperature approaching lower operational limit	Minimum cell temperature detected below -16C, allow time for pack to warm
22	SUBPACK_DCH_UNDER_TEMPERATURE_FAULT	String Fault	Temperature too low, string disabled	Minimum cell temperature exceeded, reset required to bring string back online after warmed

BODY & REMOTE CONTROLLERS

DTC Code (decimal)	Fault Abbreviation (.dbc)	Fault Reaction	Basic Description	Detailed Description
25	SUBPACK_VSENSE_OPEN_FAULT	String Fault	Pack Vsense fault	Pack cell voltage acquisition error, reset to see if fault cleared, otherwise contact for service
28	SUBPACK_CELL_AD_CONST_FAULT	String Fault	Pack high voltage measurement error	Pack HV acquisition error, reset to see if fault cleared, otherwise contact for service
29	SUBPACK_THERMAL_RUNAWAY	String Fault	Thermal Runaway	The pack has detected a cell vent occurrence, vehicle should be pulled over and towed to service
30	SUBPACK_CAB_SENSOR_FAULT	String Fault	Current sensor fault	Current sensor measurement fault has been detected, reset to see if fault cleared, otherwise contact for service
34	SUBPACK_TEMP_SENSOR_FAULT	String Fault	Temperature sensor fault	Pack temperature sensor out of range, reset to see if fault cleared, otherwise contact for service
36	SUBPACK_EXTERNAL_EEPROM_FAULT	Warning	Memory Error	A pack write error to memory has occurred, reset to see if fault cleared, otherwise contact for service
40	POWER_12_to_24V_HI	Fault	JB 12V supply too high	12V system detected above 32V, have vehicle inspected
41	POWER_12_to_24V_LO	Fault	JB 12V supply too low	12V system detected below 8V, charge 12V battery
44	HVIL_STRING1_FAULT	Fault	String 1 HVIL fault	JB detects a break in the high-voltage interlock at S1 connector, check if JB connector is in place, if installed
45	HVIL_STRING2_FAULT	String Fault	String 2 HVIL fault	JB detects a break in the high-voltage interlock at S2 connector, check if JB connector is in place, if installed
46	HVIL_STRING3_FAULT	String Fault	String 3 HVIL fault	JB detects a break in the high-voltage interlock at S3 connector, check if JB connector is in place, if installed
47	HVIL_STRING4_FAULT	String Fault	String 4 HVIL fault	JB detects a break in the high-voltage interlock at S4 connector, check if JB connector is in place, if installed

BODY & REMOTE CONTROLLERS

DTC Code (decimal)	Fault Abbreviation (.dbc)	Fault Reaction	Basic Description	Detailed Description
48	HVIL_PTC_FAULT	PTC Fault	PTC HVIL fault	JB detects a break in the high-voltage interlock at the PTC connector, check if connector is in place, if installed
49	HVIL_HVOUT_FAULT	Fault	HV output HVIL fault	JB detects a break in the high-voltage interlock at the HV out connectors, check if connectors are in place
50	TASK_COUNT_MISMATCH	Warning	Task counter error	A firmware error has been detected, report to service center
51	WATCHDOG_TIMER_FAULT	Warning	Watchdog error	A firmware error has been detected, report to service center
52	ALL_PRECHARGE_FAULT	Fault	Precharge fault	The battery system has failed to precharge the high-voltage bus
53	HI_SIDE_STRING_VOLTAGE_MISMATCH	String Fault	HV bus voltage error	The pack and JB do not agree on the string voltage present, verify HV cables are connected in the right places
54	CURRENT_MISMATCH_FAULT	Fault	Current match error	The measured current from the JB does not match that of all connected strings
55	STRING_IMBALANCE_WARNING	Warning	String imbalance	Battery strings are imbalanced from each other, system should be charged to allow strings to equalize
56	OVER_DISCHARGE_WARN	Warning	Discharge current warning	System is about to exceed allowable discharge current limit, reduce current draw
57	OVER_DISCHARGE_FAULT	Fault	Discharge current fault	System has exceeded allowable discharge current limit, reset required to bring system back online
58	NO_PACKS_ONLINE_FAULT	Fault	All packs in fault	No eligible packs available, as all packs are in fault
59	STRING_ACTIVE_FAULT	String Fault	String fault	A fault has been detected on at least one string
60	STRING1_WELDED_CONTACTOR_FAULT	String Fault	String 1 contactor welded	JB detects main Contactor for string 1 will not open, reset to see if fault cleared, otherwise contact for service
61	STRING2_WELDED_CONTACTOR_FAULT	String Fault	String 2 contactor welded	JB detects main Contactor for string 2 will not open, reset to see if fault cleared, otherwise contact for service

BODY & REMOTE CONTROLLERS

DTC Code (decimal)	Fault Abbreviation (.dbc)	Fault Reaction	Basic Description	Detailed Description
62	STRING3_WELDED_CONTACTOR_FAULT	String Fault	String 3 contactor welded	JB detects main Contactor for string 3 will not open, reset to see if fault cleared, otherwise contact for service
63	STRING4_WELDED_CONTACTOR_FAULT	String Fault	String 4 contactor welded	JB detects main Contactor for string 4 will not open, reset to see if fault cleared, otherwise contact for service
64	FAULT_ARRAY_FAULT	Warning	Fault array error	A firmware error has been detected, report to service center
65	RISO_BOARD_ID_FAULT	Warning	Riso ID error	The ID broadcast by the isolation board is incorrect, requires reconfiguring
66	JUNCTION_BOX_ID_FAULT	Warning	JB ID error	The ID broadcast by another JB is incorrect, requires reconfiguring
67	STRING1_CONTACTOR_FAULT	String Fault	String 1 Contactor won't close	JB detects main contactor for string 1 will not close, reset to see if fault cleared, otherwise contact for service
68	STRING2_CONTACTOR_FAULT	String Fault	String 2 Contactor won't close	JB detects main contactor for string 2 will not close, reset to see if fault cleared, otherwise contact for service
69	STRING3_CONTACTOR_FAULT	String Fault	String 3 Contactor won't close	JB detects main contactor for string 3 will not close, reset to see if fault cleared, otherwise contact for service
70	STRING4_CONTACTOR_FAULT	String Fault	String 4 Contactor won't close	JB detects main contactor for string 4 will not close, reset to see if fault cleared, otherwise contact for service
71	LO_SIDE_CONTACTOR_FAULT	Fault	Negative contactor won't close	JB detects negative contactor will not close, reset to see if fault cleared, otherwise contact for service
74	NO_ONLINE_ELIGIBLE_STRING	Fault	All strings in fault	No eligible strings available, as all strings are in fault
75	PRECHARGE_RESISTOR_OVERTEMP	String Fault	Precharge over-temperature	Precharge resistor has been overloaded, affected string unable to precharge until cooled down
76	PRECHARGE_RESISTOR_OVERCURRENT	String Fault	Precharge over-current	Precharge faulted due to either an external short or large power draw
77	POWER_UP_FAILED	Fault	Low voltage out of range	Internal voltage rails not meeting requirements

BODY & REMOTE CONTROLLERS

DTC Code (decimal)	Fault Abbreviation (.dbc)	Fault Reaction	Basic Description	Detailed Description
78	SPS_MUTE	String Fault	Missing pack communication	A pack has stopped communicating with the JB, check communication lines
79	STRING_MUTE	String Fault	Missing string communication	A string has stopped communicating with the JB, check communication lines
83	PRECHARGE_TIMEOUT	Fault	Precharge fault	Precharge failed to complete
84	VCU_COMM_WARN	Warning	Vehicle communication warning	Communication from the VCU was missing for 100ms
85	VCU_COMM_FAULT	Fault	Vehicle communication fault	Communication from the VCU was missing for 250ms
86	VCU_TX_FAULT	Warning	BMS communication warning	Communication to the VCU was not possible
87	UNKNOWN_STATE_FAULT	Warning	BMS state fault	The BMS has requested a non-valid state
88	INVALID_VCU_MESSAGE	Warning	CAN error	The BMS received a non-valid message
89	STRING_OVERCHARGE_FAULT	String Fault	String overcharge fault	String has exceeded allowable charge current limit, reset required to bring system back online
90	CAB_SENSOR_MUTE	Warning	Current sensor communication warning	Current sensor has stopped communicating with the JB, reset to see if fault cleared, otherwise contact for service
91	STRING_OVERCHARGE_WARN	Warning	String over-charge warning	String is about to exceed allowable charge current limit
92	STRING_OVERDISCHARGE_WARN	Warning	String over-discharge warning	String is about to exceed allowable discharge current limit
93	STRING_OVERDISCHARGE_FAULT	String Fault	String over-discharge fault	String has exceeded allowable discharge current limit, reset required to bring system back online
94	SUBPACK_THERMAL_SENSOR_HW_FAULT	String Fault	String thermal sensor fault	Pack temperature data missing, reset to see if fault cleared, otherwise contact for service
95	OVER_CHARGE_WARN	Warning	Charge current warning	System is about to exceed allowable charge current limit
96	OVER_CHARGE_FAULT	Fault	Charge current fault	System has exceeded allowable charge current limit, reset required to bring system back online

BODY & REMOTE CONTROLLERS

Encoder Calibration

A. In & Out Calibration

1. Log in as Maintenance user
 - a. From the “Home Page” push on the gear button #12.



Figure 141. In & Out Calibration 1

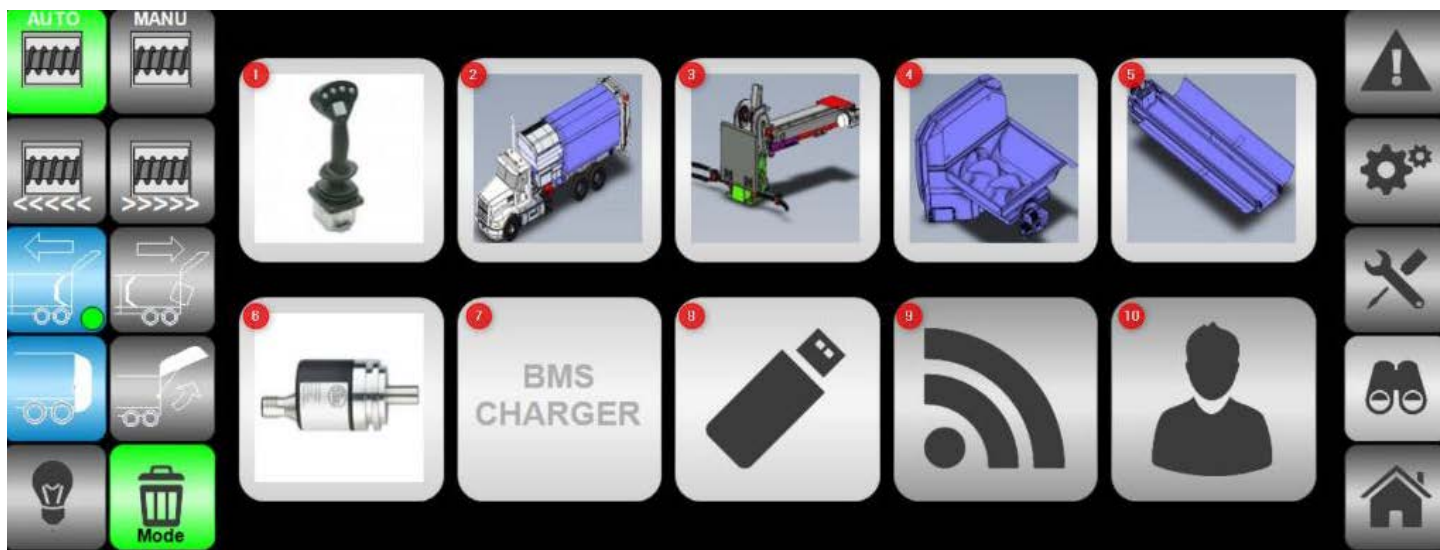


Figure 142. In & Out Calibration 2

- b. From the “Gear Page”, push on the button #10.

BODY & REMOTE CONTROLLERS

c. Push on “Login” button #1.



Figure 143. In & Out Calibration 3

- d. Enter “MNT” as “User name”.
- e. Enter “MNT” as “Password”.
- f. Push on “Ok”.
- g. Validate it is written “Maintenance” into the case “User”, otherwise repeat step 1.3 to 1.6.
- h. Return to “Home Page” by pushing the “Home” button.

2. In/out encoder calibration

- a. If the vehicle is not in collecting mode (arm activated), push on the joystick green button. At this point, the canopy is open.
- b. Move the arm to the home position (arm fully down and fully retracted)
- c. From the home page, push on the gear button #12.
- d. Push the “Encoder” button #6.
- e. In the #1, select “In/Out”.



Figure 144. In & Out Calibration 4

BODY & REMOTE CONTROLLERS

- f. Push on the position button #2 and write 100 mm.
- g. Push on the check mark button #3.
- h. Get back to the home screen by pushing on the lower right home button.
- i. Push on the gear button #12.
- j. Push on the truck button #2.
- k. Push on button #1 to activate the factory mode. The factory mode is activated when there is a check mark on the box.

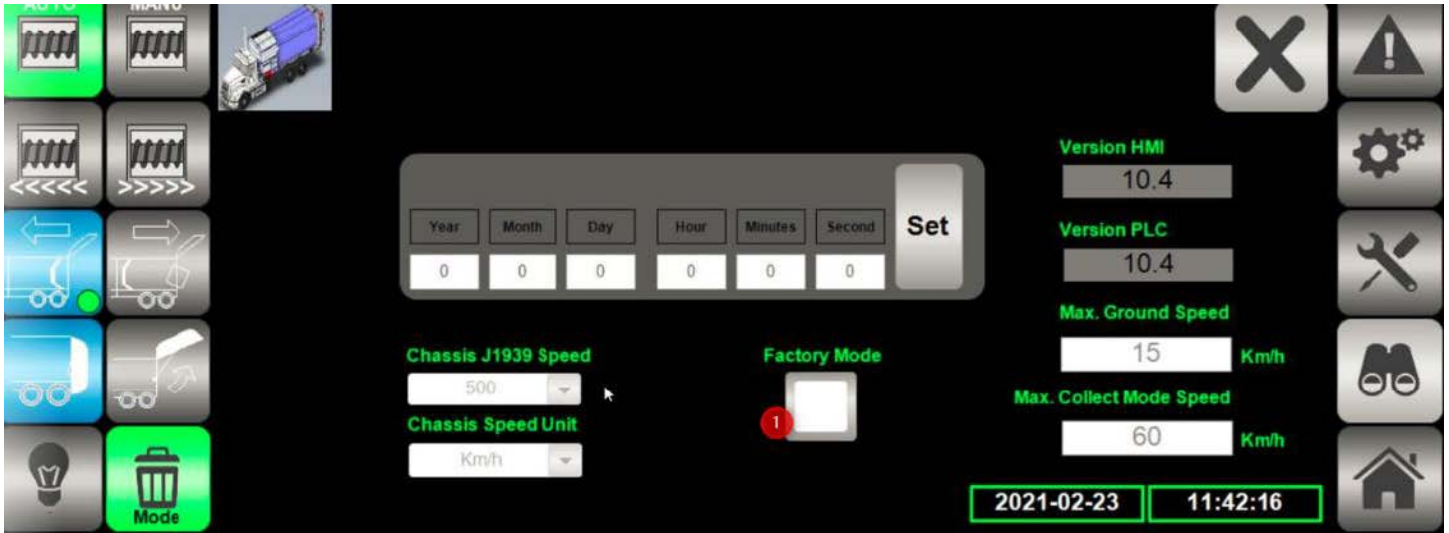


Figure 145. In & Out Calibration 5

- l. Get back to the home screen by pushing on the lower right home button.
- m. From the home page, push on the gear button #12.
- n. Push the arm button #3.
- o. Push button #4.

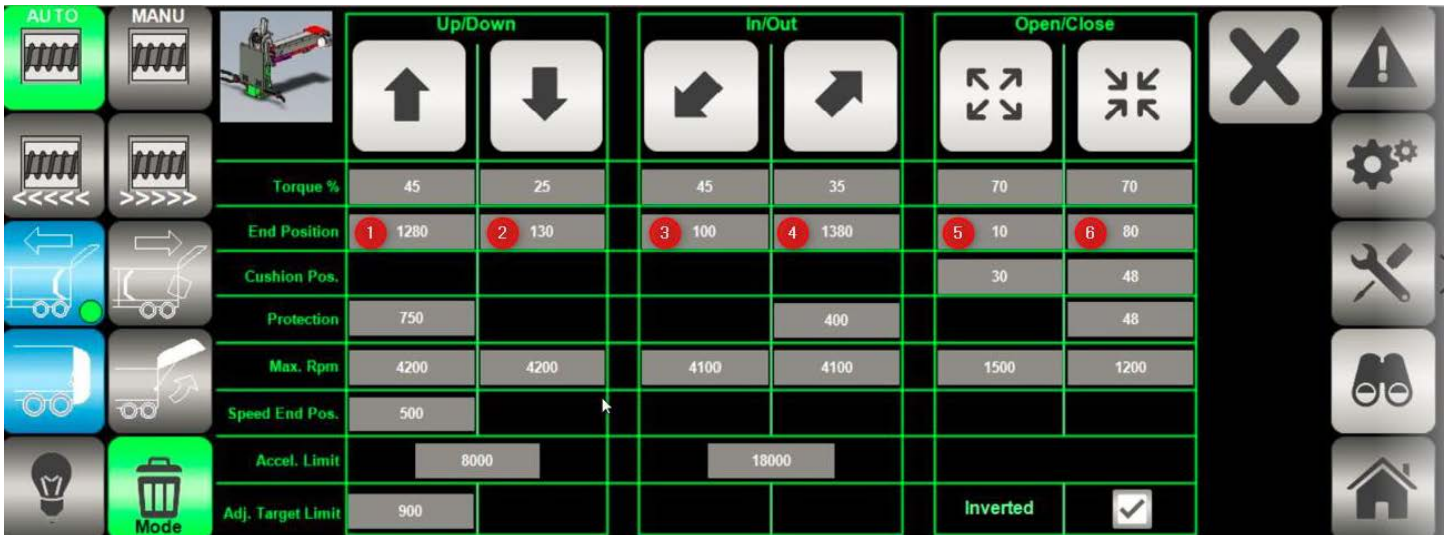


Figure 146. In & Out Calibration 6

- p. Write "5 000".
- q. Push "OK".
- r. Get back to the home screen by pushing on the lower right home button.

BODY & REMOTE CONTROLLERS

- s. Very slowly and carefully, move the arm out until it reaches its full span. Make sure to move very slowly when the arm is getting closer to its full span so it doesn't stop abruptly. Write down on a piece of paper the value indicated in the square.



Figure 147. In & Out Calibration 7

- t. 2.19 From the home page, push on the gear button #12.
- u. 2.20 From, push on the arm button #3.
- v. 2.21 Push on button #4 and write down the value noted at step 2.19 minus 200mm.
- w. 2.22 Activate the collecting mode by pushing on the green button of the joystick and test the arm on its full stroke. First slowly move the arm fully in and fully out.

If it seems well cushioned, test it at full speed. If it doesn't seem well cushioned, repeat steps 2.19 to 2.22 but put a lower value until it is well cushioned.

If everything is done well, the arm should have a nice and smooth cushioning at both fully extended and fully retracted position.

Contact Heil service department if the arm is not retracting completely or if the arm is banging.

B. Up/Down Calibration

1. Log in as Maintenance user
 - a. From the home page, push on the gear button #12.



Figure 148. Main Screen 9

BODY & REMOTE CONTROLLERS

b. From the gear page, push on the button #10.

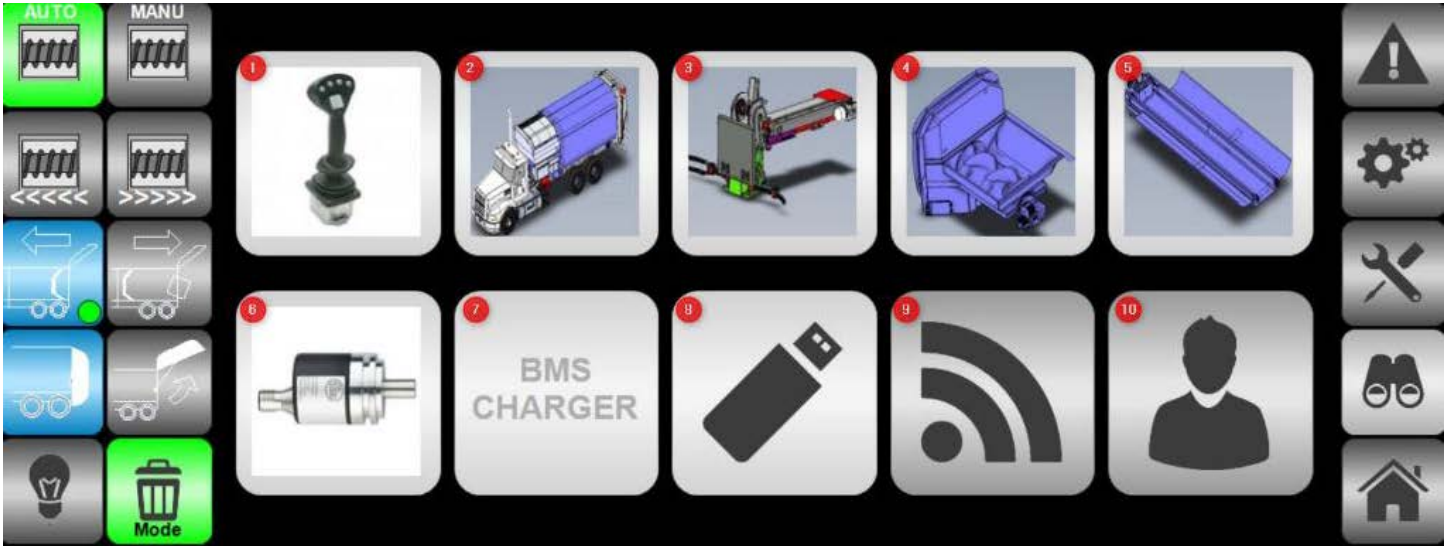


Figure 149. Main Screen 3

c. Push on “Login” button #1.

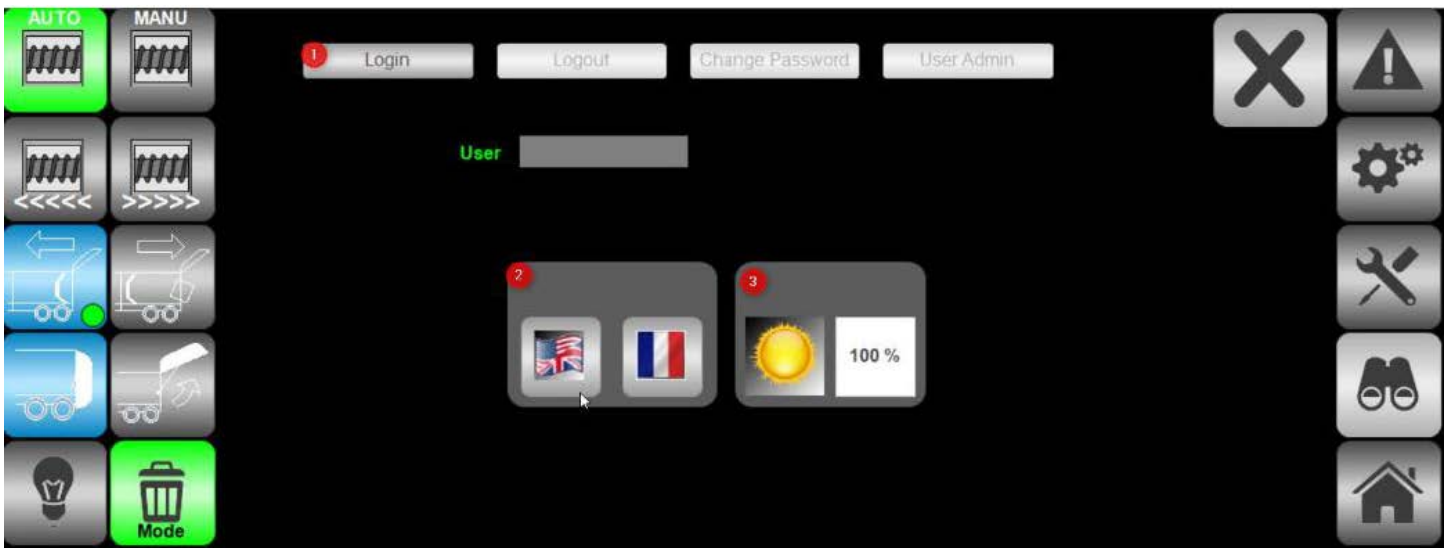


Figure 150. Main Screen 4

d. Enter “MNT” as “User name”.

e. Enter “MNT” as “Password”.

f. Push on “Ok”.

g. Validate it is written “Maintenance” into the case “User”, otherwise repeat step 1.3 to 1.6.

h. 1.8. Return to home page by pushing the home button.

2. Up/Down encoder calibration

a. If the vehicle is not in collecting mode (arm activated), push on the joystick green button. At this point, the canopy is open.

b. Get the arm to the home position (arm fully down and fully retracted)

c. From the home page, push on the gear button #12.

d. Push the encoder button #6.

BODY & REMOTE CONTROLLERS

e. In the #1 indicated, select “Up/Down”.

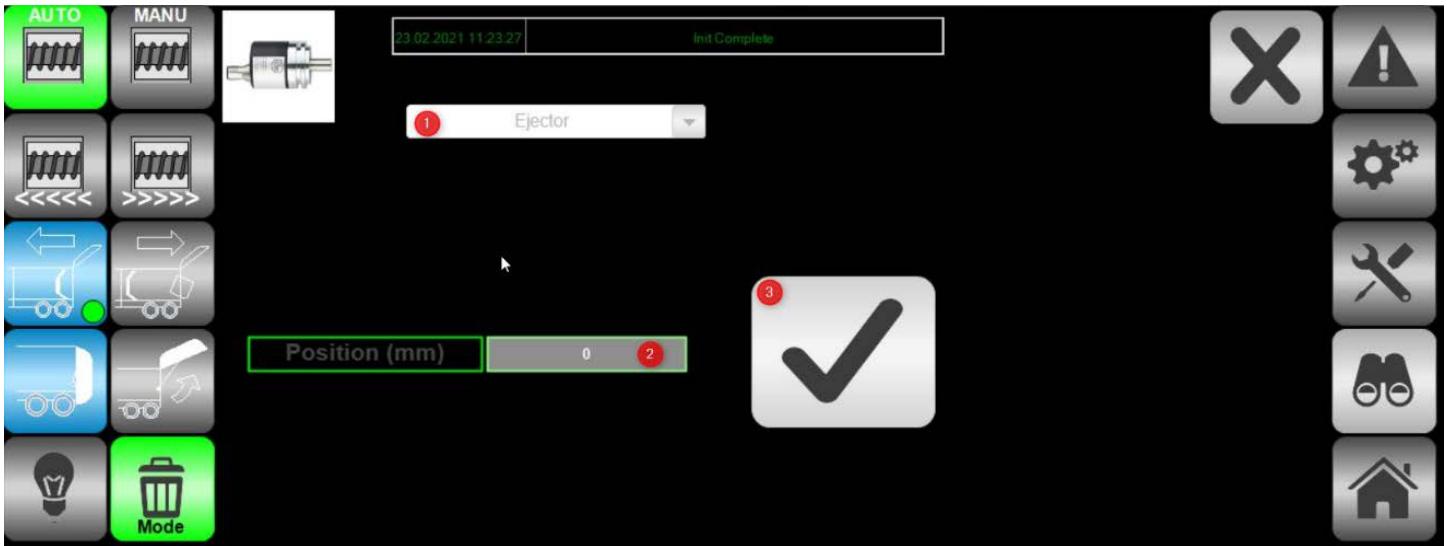


Figure 151. Main Screen 5

- f. Push on the position button #2 and write 130 mm.
- g. Push on the check mark button #3.
- h. Get back to the home screen by pushing on the lower right home button.
- i. Push on the gear button #12.
- j. Push on the truck button #20.
- k. Push on button #1 to activate the factory mode. The factory mode is activated when there is a check mark on the box.

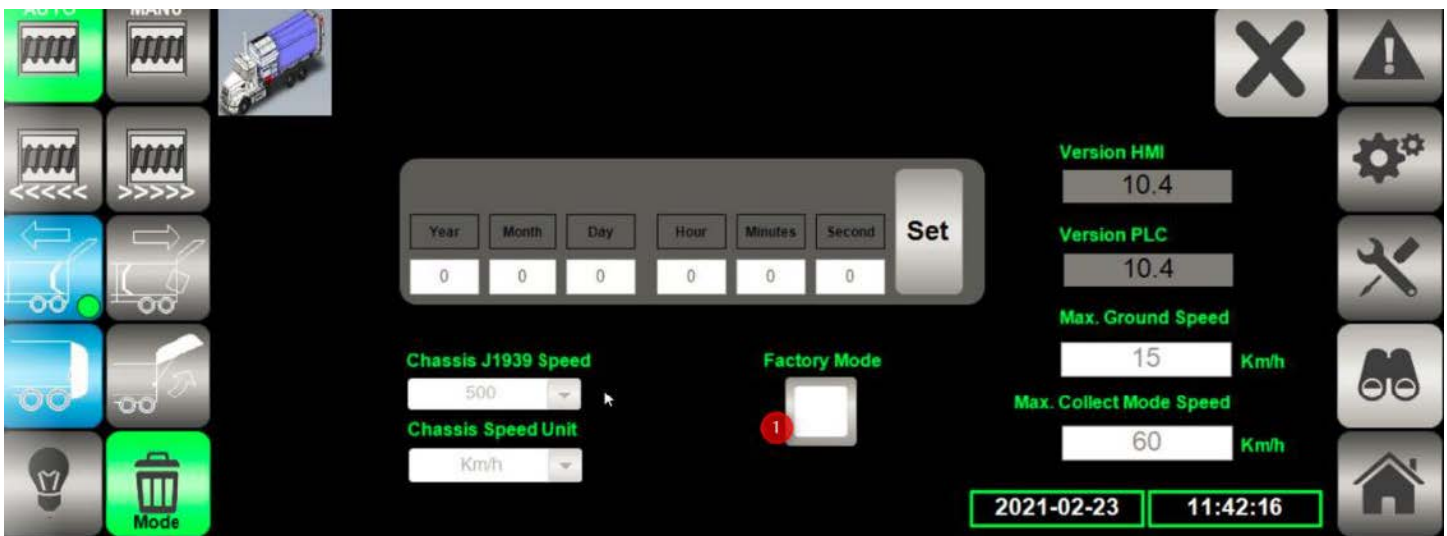


Figure 152. Main Screen 6

- l. Get back to the home screen by pushing on the lower right home button.
- m. From the home page, push on the gear button #12.
- n. Push on the arm button #3.

BODY & REMOTE CONTROLLERS

- o. Push on button #1.

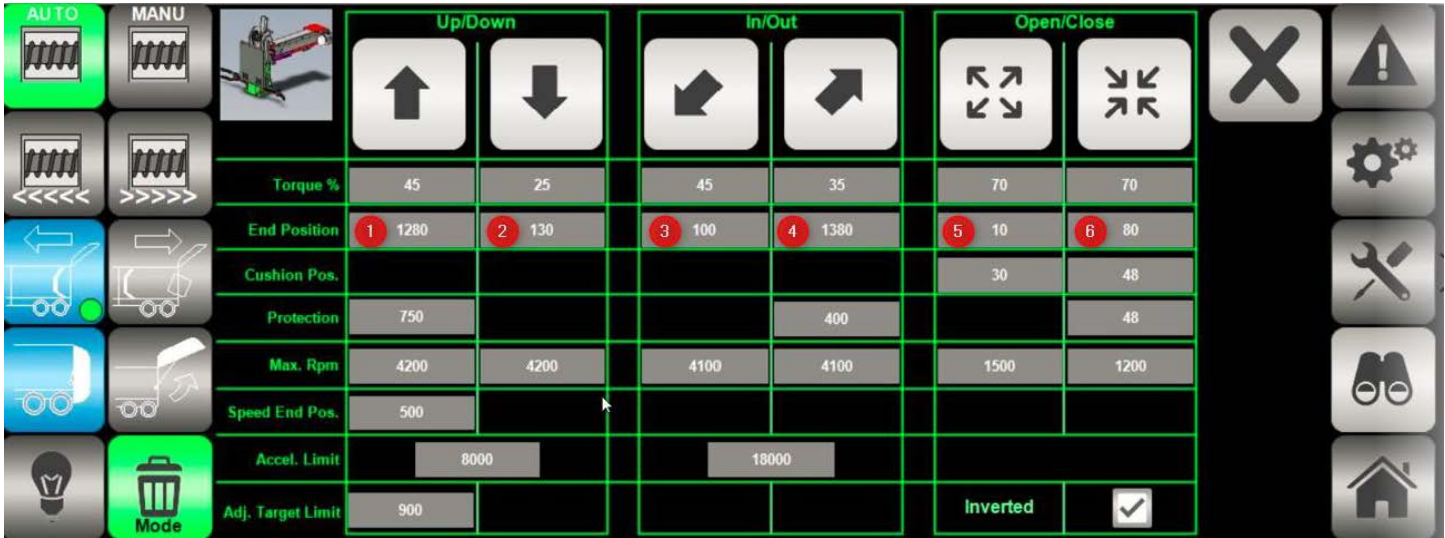


Figure 153. Main Screen 7

- p. Write "5 000".
- q. Push "OK".
- r. Get back to the home screen by pushing on the lower right home button.
- s. Very slowly and carefully, move the arm up until it reaches its full span. Make sure to move very slowly when the arm is getting closer to its full span so it doesn't stop abruptly. Write down on a piece of paper the value indicated in the square identified.



Figure 154. Main Screen 15

- t. From the home page, push on the gear button #12.
- u. Push on the arm button #3.
- v. Push on button #4 of and write down the value noted at step 2.19 minus 20mm and press "OK".
- w. Activate the collecting mode by pushing on the green button of the joystick and test the arm on its full stroke. First slowly move the arm fully up and fully down. If it seems well cushioned, test it at full speed. If it doesn't seem well cushioned, repeat steps 2.19 to 2.22 but put a lower value until it is well cushioned.

If everything is done well, the arm should have a nice and smooth cushioning at both fully up and fully down position.

Contact Heil service department if the arm is not retracting completely or if the arm is banging.

BODY & REMOTE CONTROLLERS

C. Laser Calibration

Take off the tailgate pins and then open the tailgate using the button #8. Go back to the tailgate and pivot the two red safety props.



Figure 155. Main Screen 1

2. Log in as Maintenance user

- From the home page, push on the gear button #12.
- From the gear page, push on the button #10.

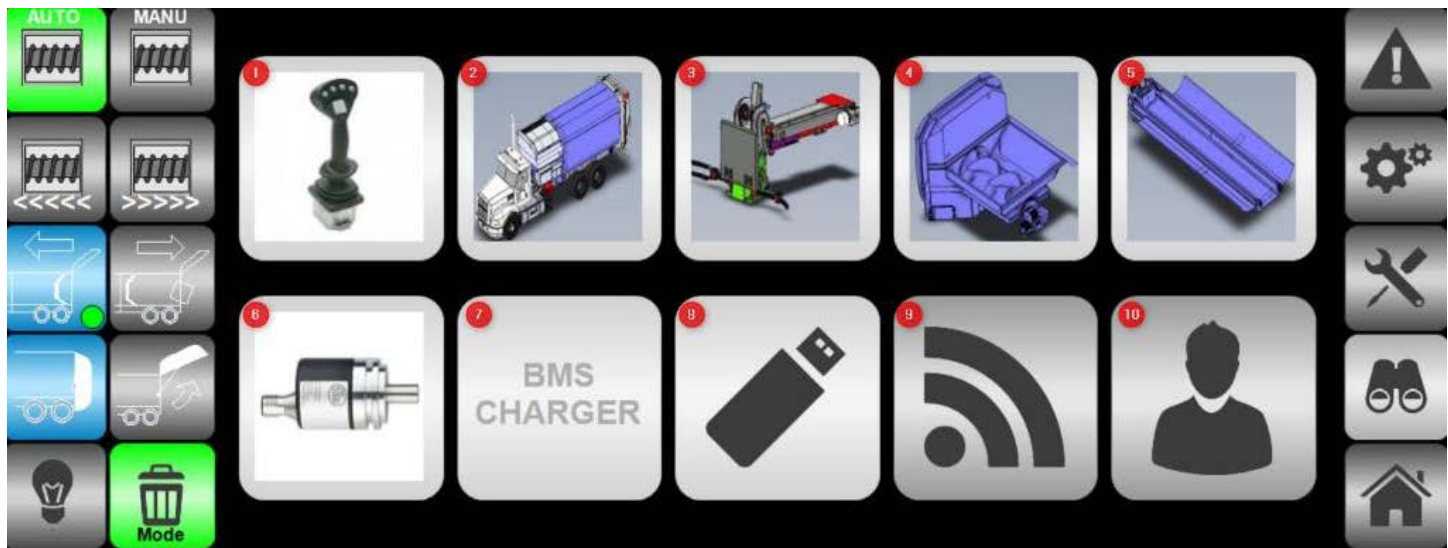


Figure 156. Main Screen 10

BODY & REMOTE CONTROLLERS

- c. Push on “Login” button #1.



Figure 157. Main Screen 11

- d. Enter “MNT” as “User name”.
 e. Enter “MNT” as “Password”.
 f. Push on “Ok”.
 g. Validate it is written “Maintenance” into the case “User”, otherwise repeat step 1.3 to 1.6.
 h. Return to home page by pushing the home button.
3. Laser calibration (ejector panel)
- a. Push on the gear button #12.
 b. Push on the truck button #2.
 c. Push on button #1 to activate the factory mode. The factory mode is activated when there is a check mark on the box.

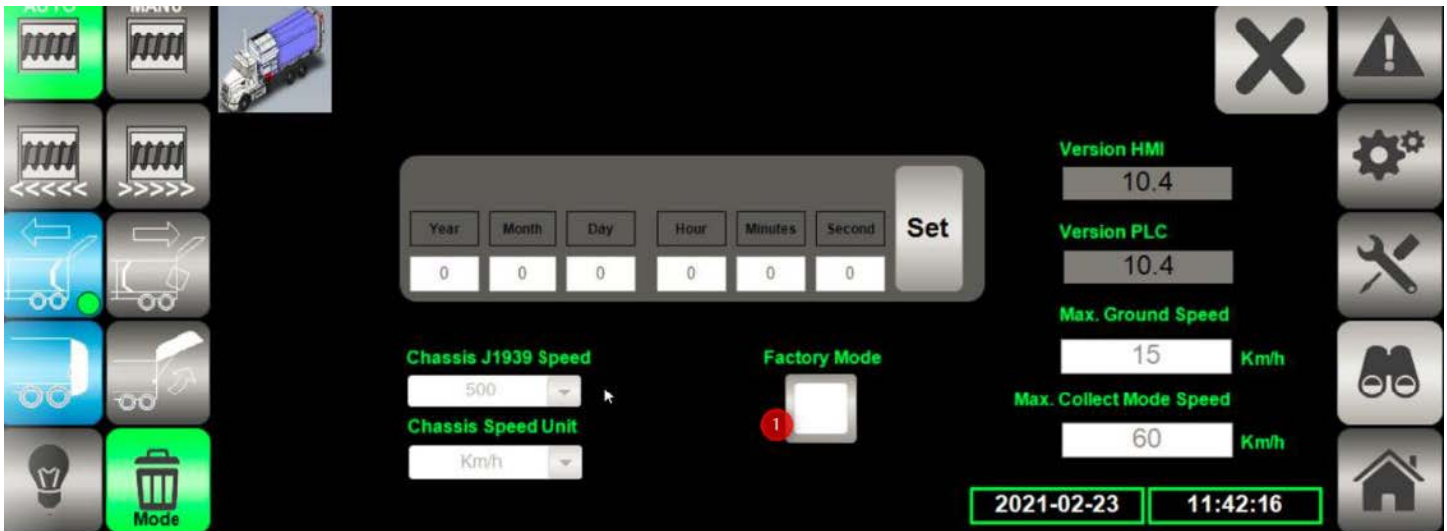


Figure 158. Main Screen 13

- d. Push on the gear button #12.
 e. Push on the ejection button #5.

BODY & REMOTE CONTROLLERS

f. Set the ejector back position to 150 mm and the ejector out position to 5000 mm.



Figure 159. Main Screen 16

- g. Go back to the home page and move the ejector panel toward the front until it stops.
- h. Push on the cab System Power switch and go at the back of the body and see if the ejector panel goes over the auger as it should. You can also open the two side trap doors and see if the ejector panel is well positioned at the front. If it is too close of the front, increase to ejector back position of 30mm and try again. If it is too far of the front, decrease the value of 30 mm and try again.
- i. Go back inside the cab, pull on the System Power switch and then push on the home button on the right bottom corner of the screen.
- j. Move the ejector panel toward the back until it stops by pushing on button #6.
- k. Note down the value of the ejector panel.



Figure 160. Ejector

- l. 1.12. Push on the gear button #12.
- m. 1.13. Push on the ejection button #5

BODY & REMOTE CONTROLLERS

- n. 1.14. Set the ejector out position to the value you noted that minus 200 mm.



Figure 161. In & Out Lubrication Guide

- o. 1.15. Test the ejector panel on a full stroke. The ejector panel should fit just over the auger when it is at the front position and should stop around 6 inches before the stoppers at the back position. Adjust the values if needed.
- p. 1.16. The final test is to do an auto-ejection. Do an auto-ejection and look if the ejector panel fit over the auger when it is at the front position and stop around 6 inches before the stoppers at the back position. During an auto-ejection, it is normal if the ejector panel goes closer to the stoppers when moving toward the back.

Encoder Localization

1. There is one encoder near the in-out motor.
2. The second encoder is near the up-down motor.

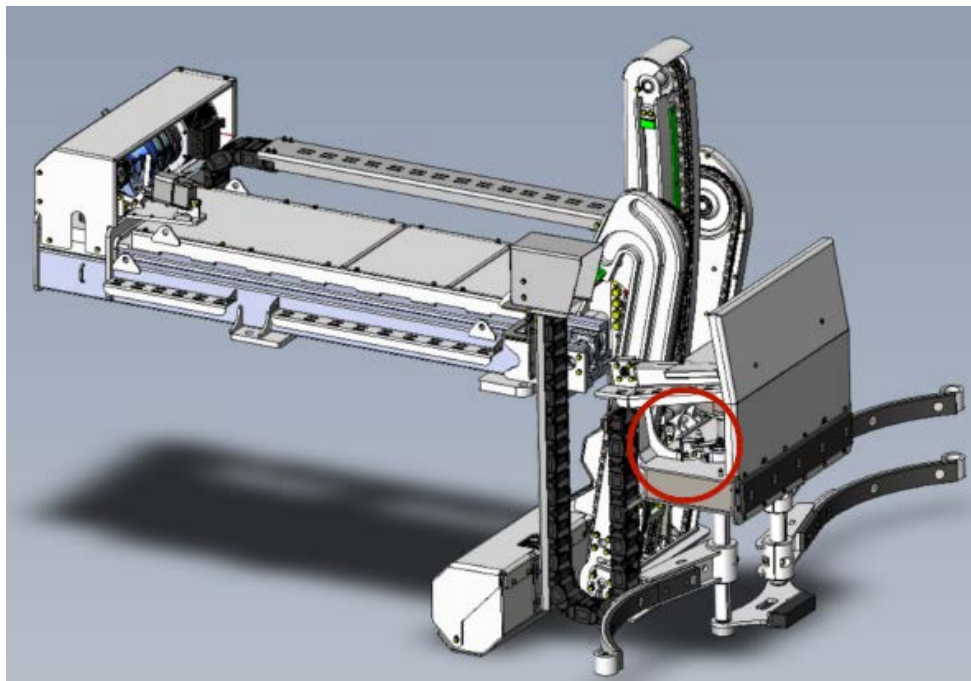


Figure 162. Proximity Sensor Location

BODY & REMOTE CONTROLLERS

Proximity Sensor Localization

There is a proximity sensor for the grabber fully opened position. It is just under the grabber with one blade near the rotation shaft.

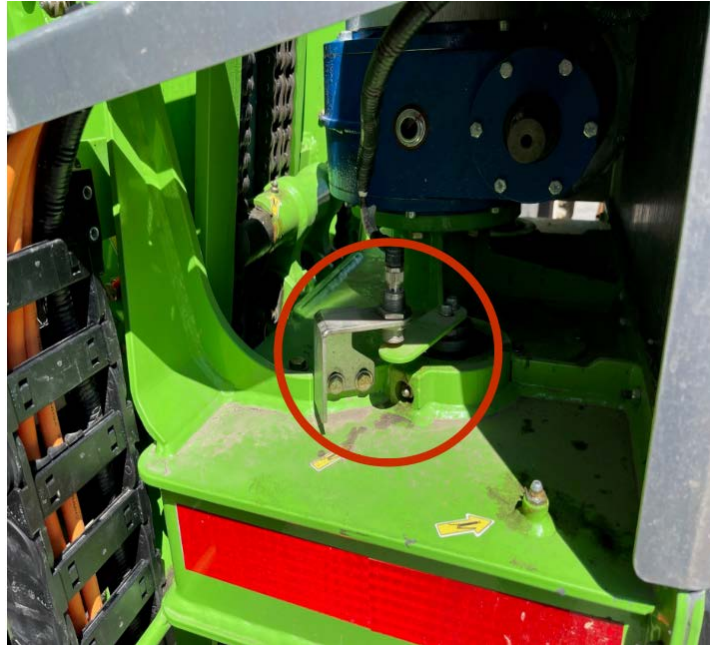


Figure 163. Proximity Sensor In Fully Open Position

Optical Sensor Localization

There is a proximity sensor for the grabber fully opened position. It is just under the grabber with one blade near the rotation shaft.

1. There is one proximity sensor near the trap door which senses when the ejector panel is fully retracted.
2. The photo eye sensor is on the wall and detects when the ejector panel is fully retracted and the trap door is in the fully opened position.

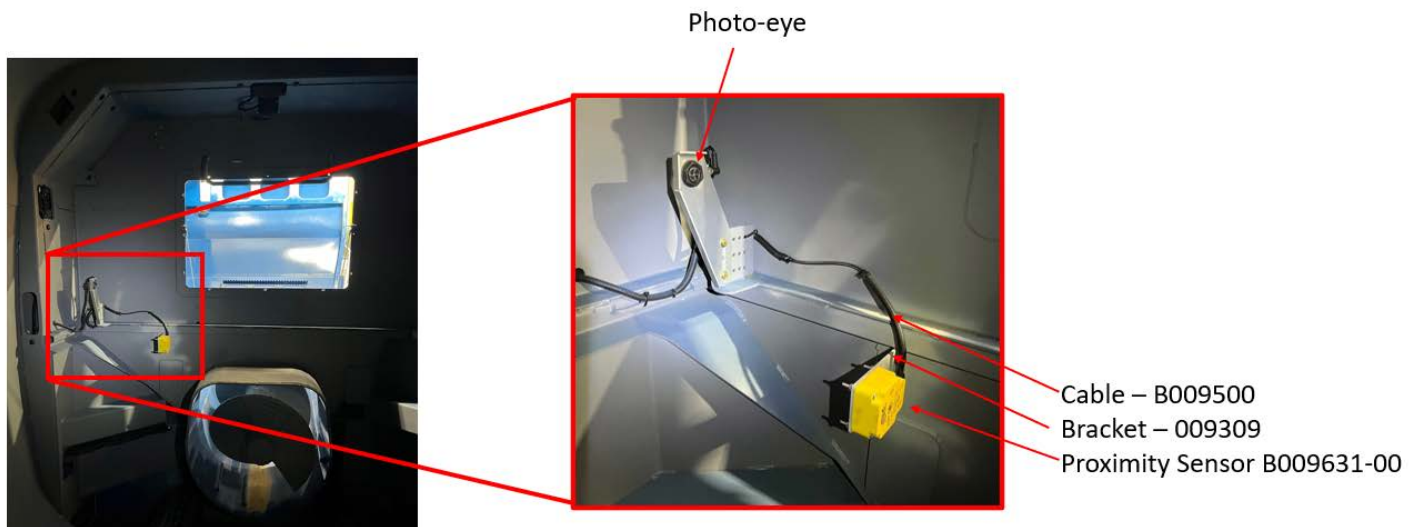
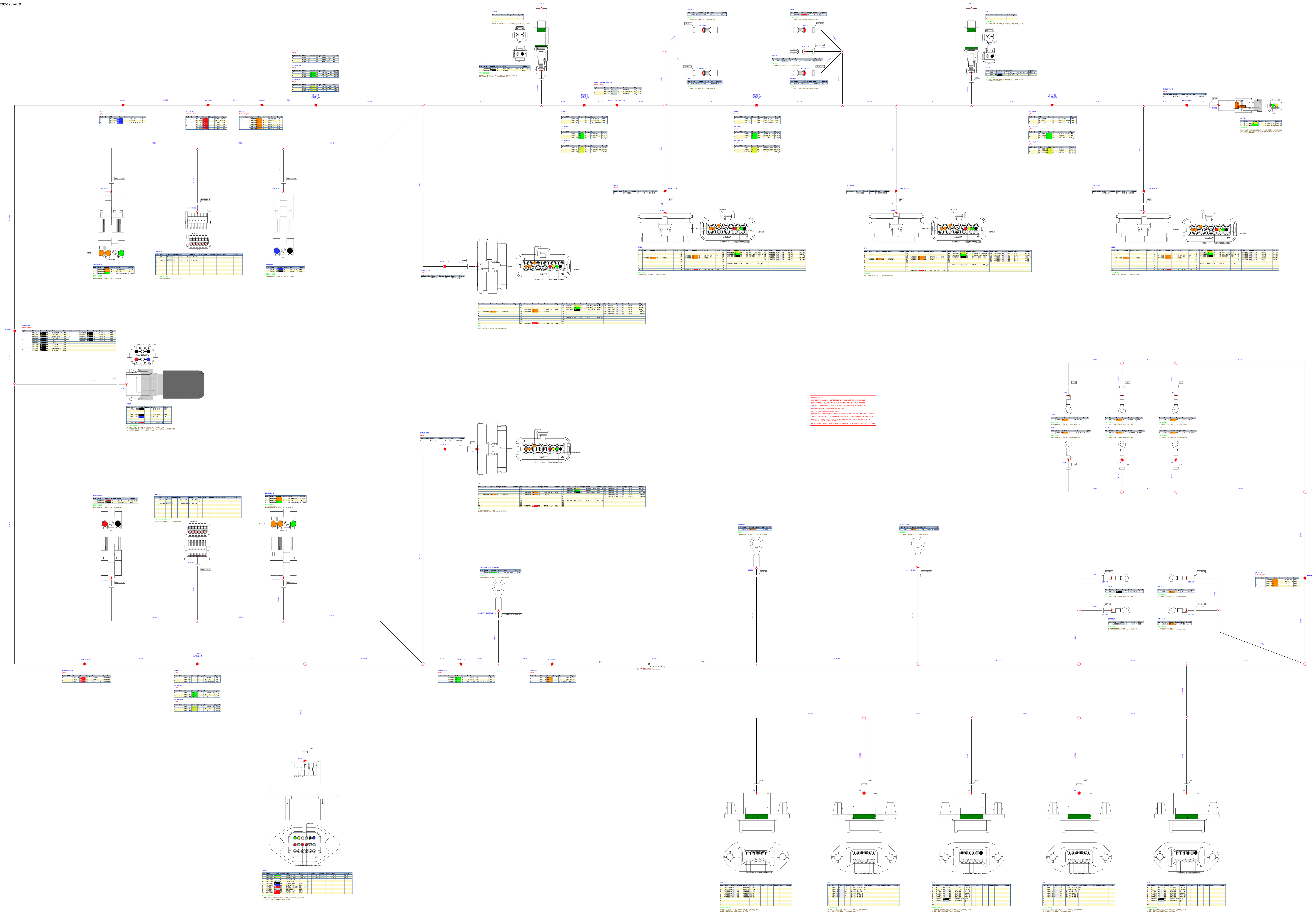
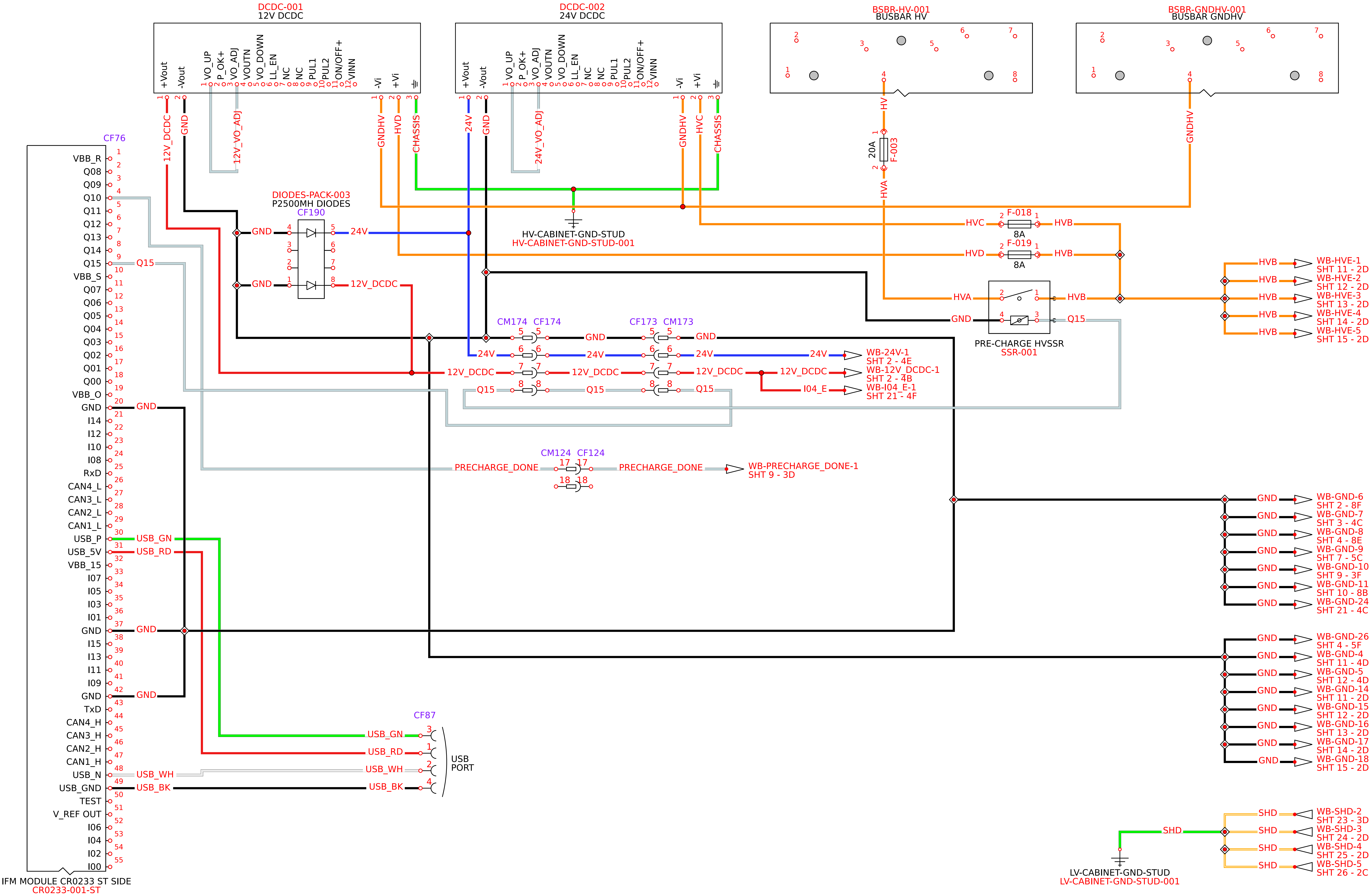


Figure 164. Optical Sensor Localization

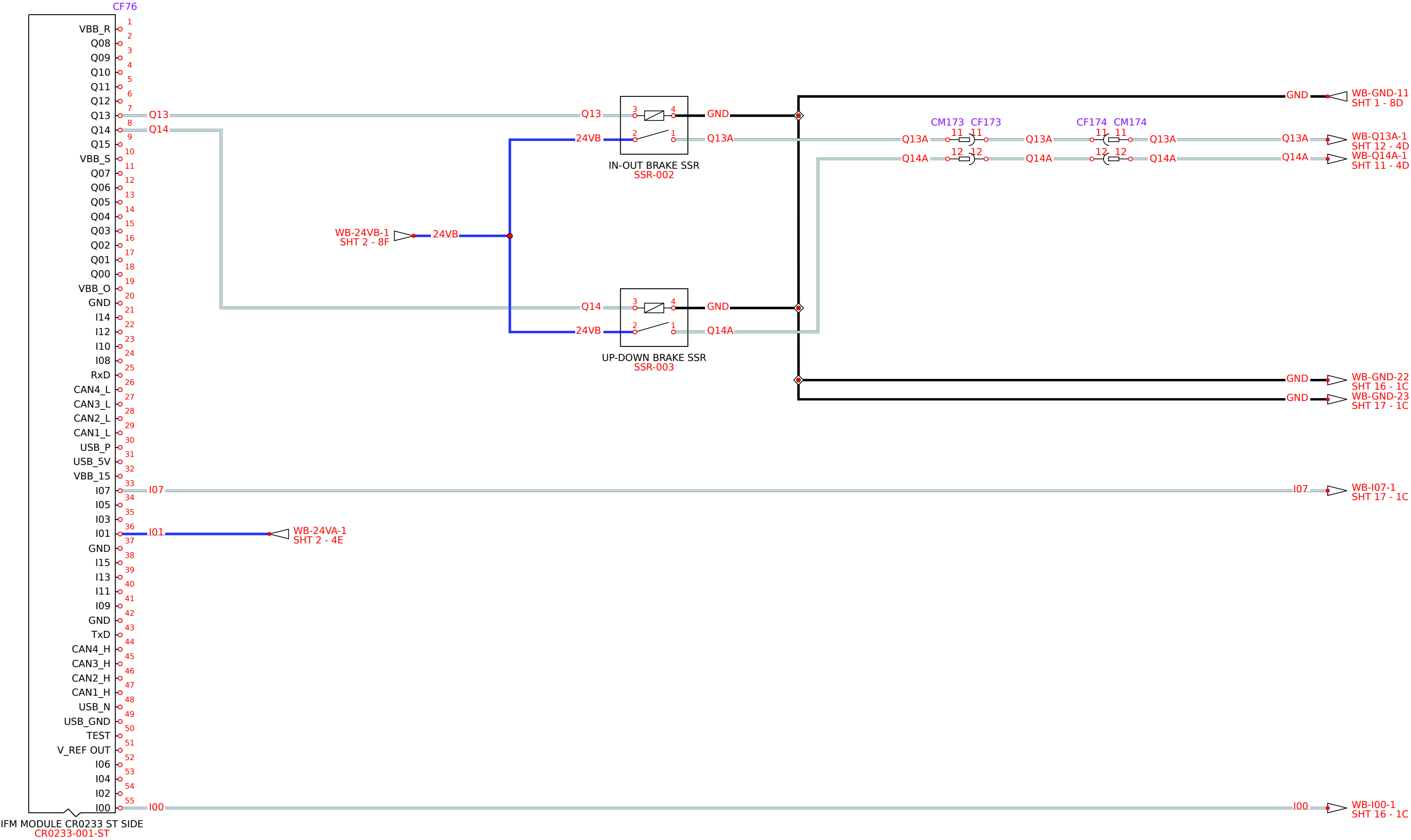
SECTION 6

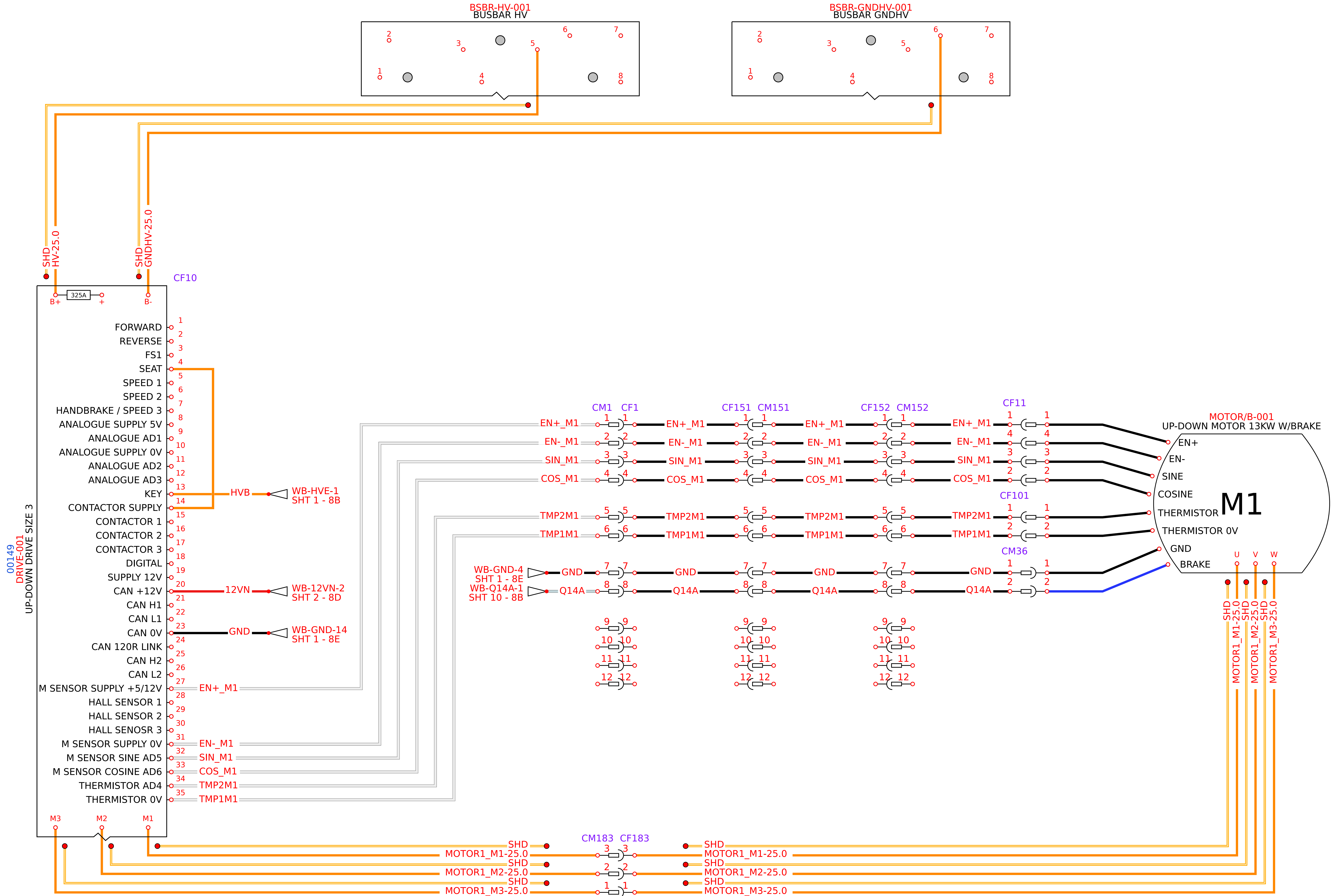
SCHEMATICS

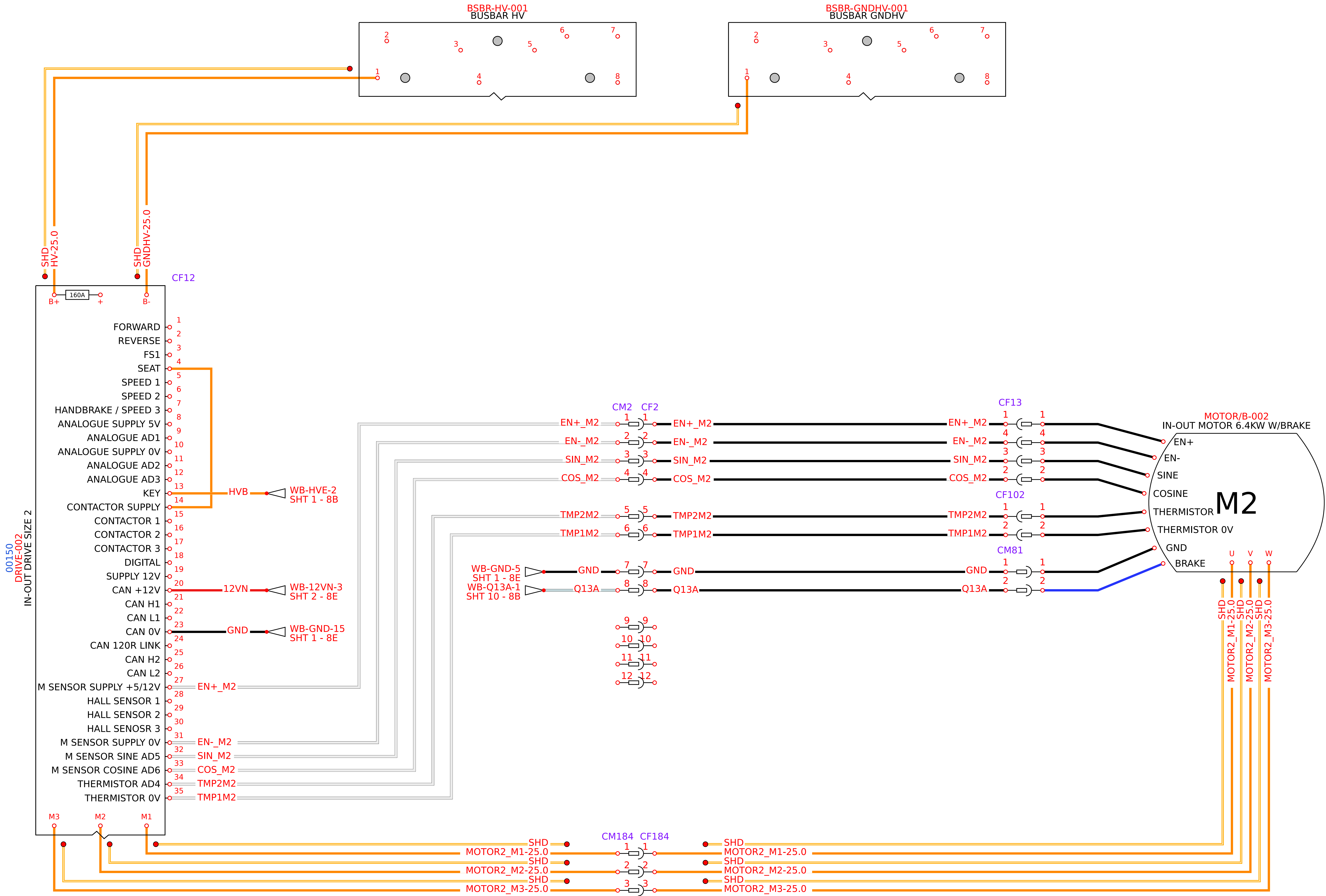


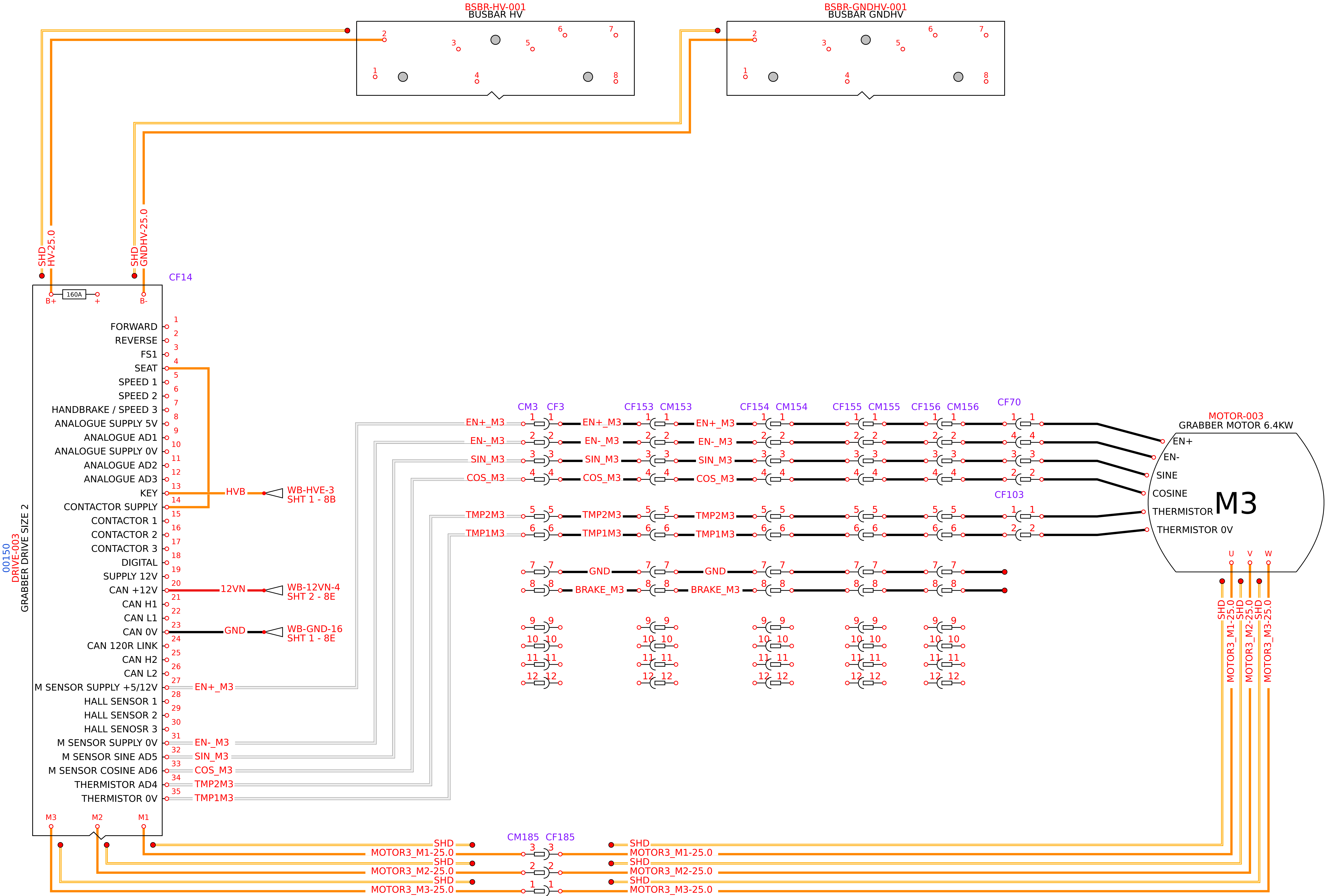


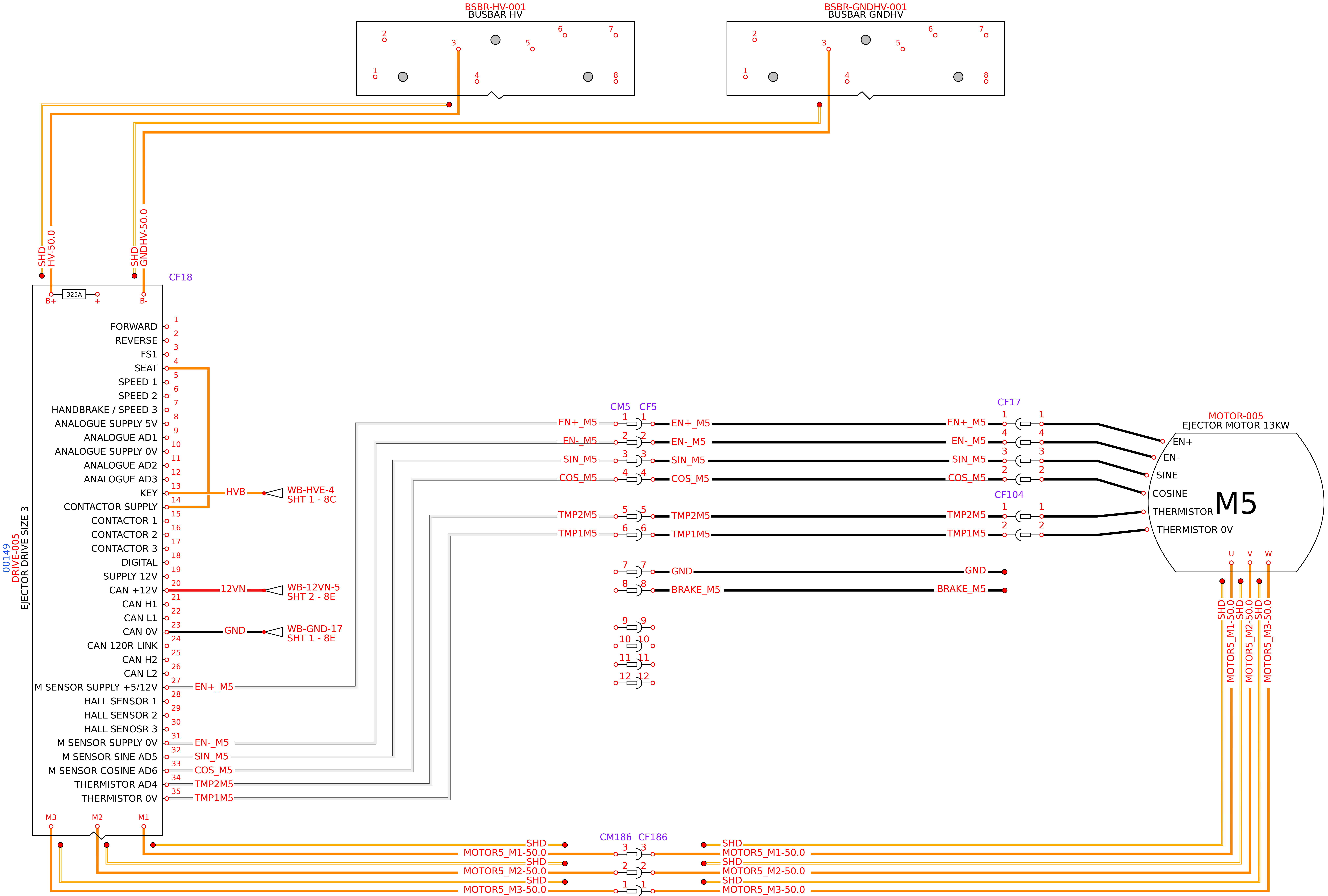
Brakes Control



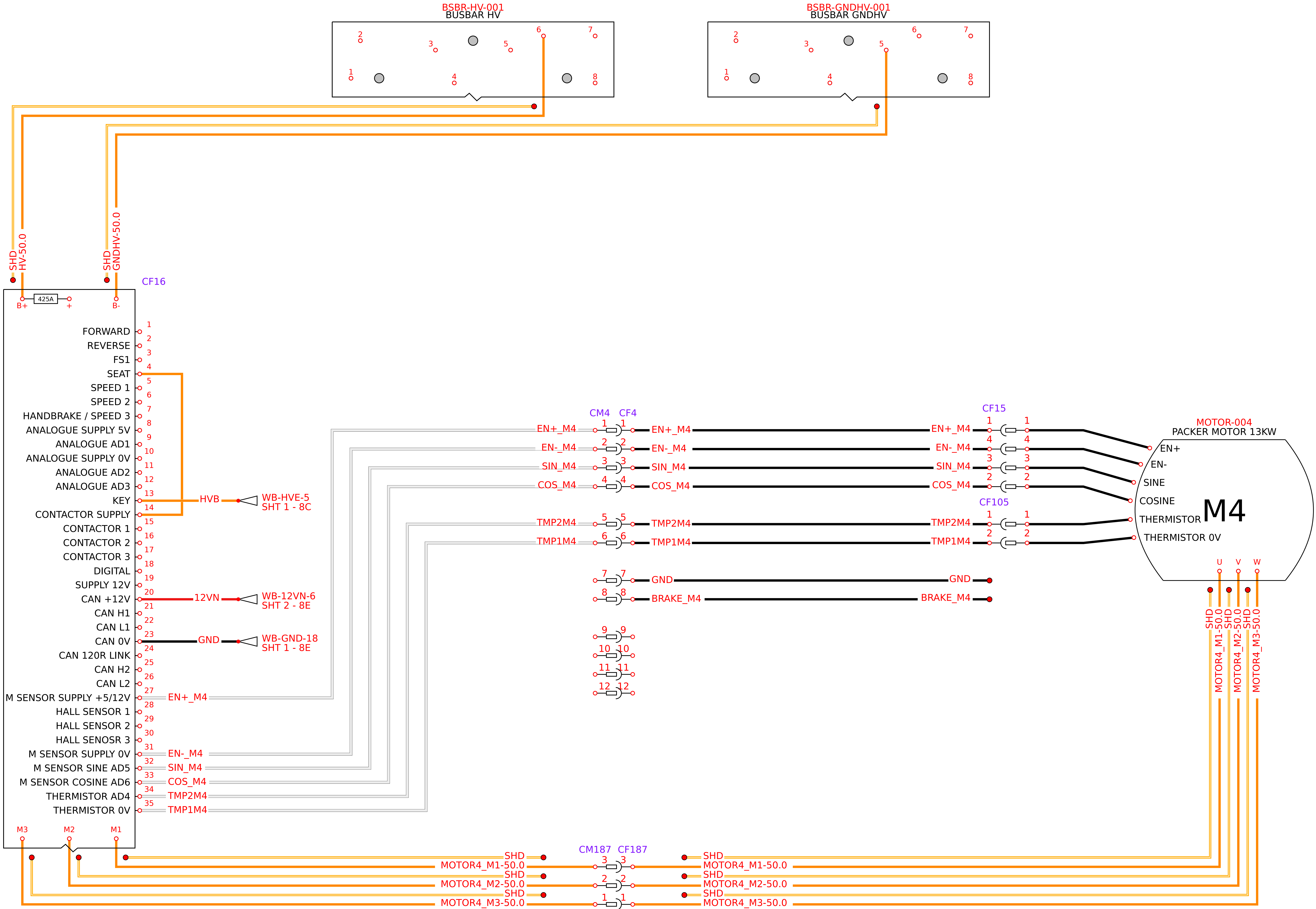


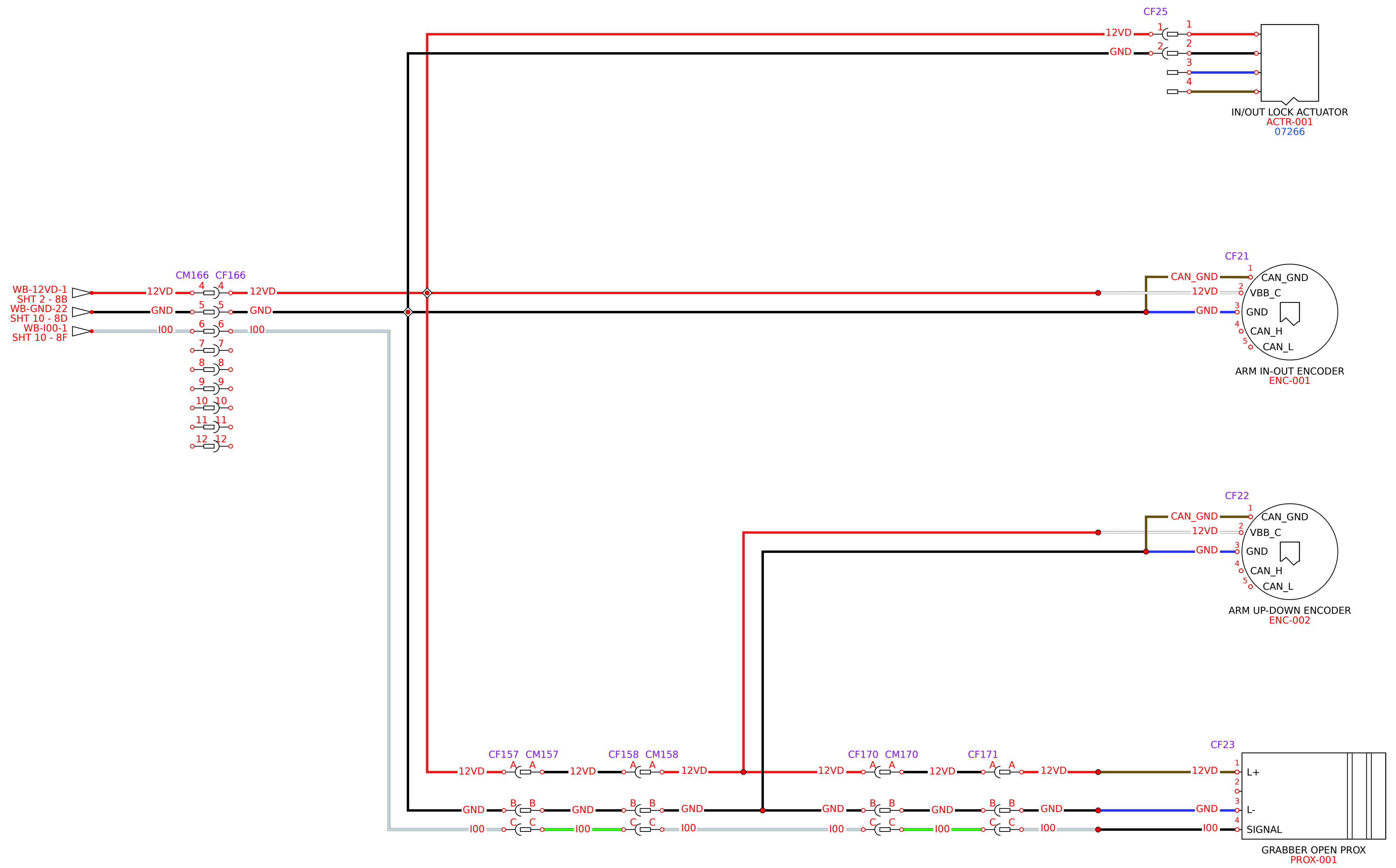




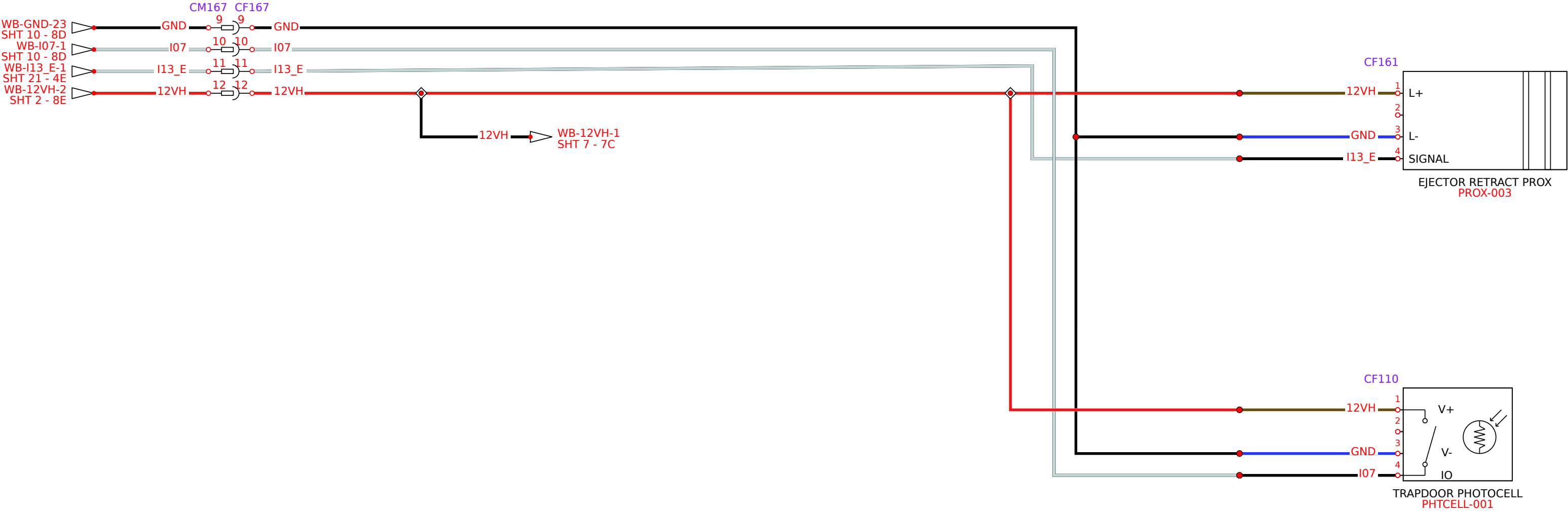


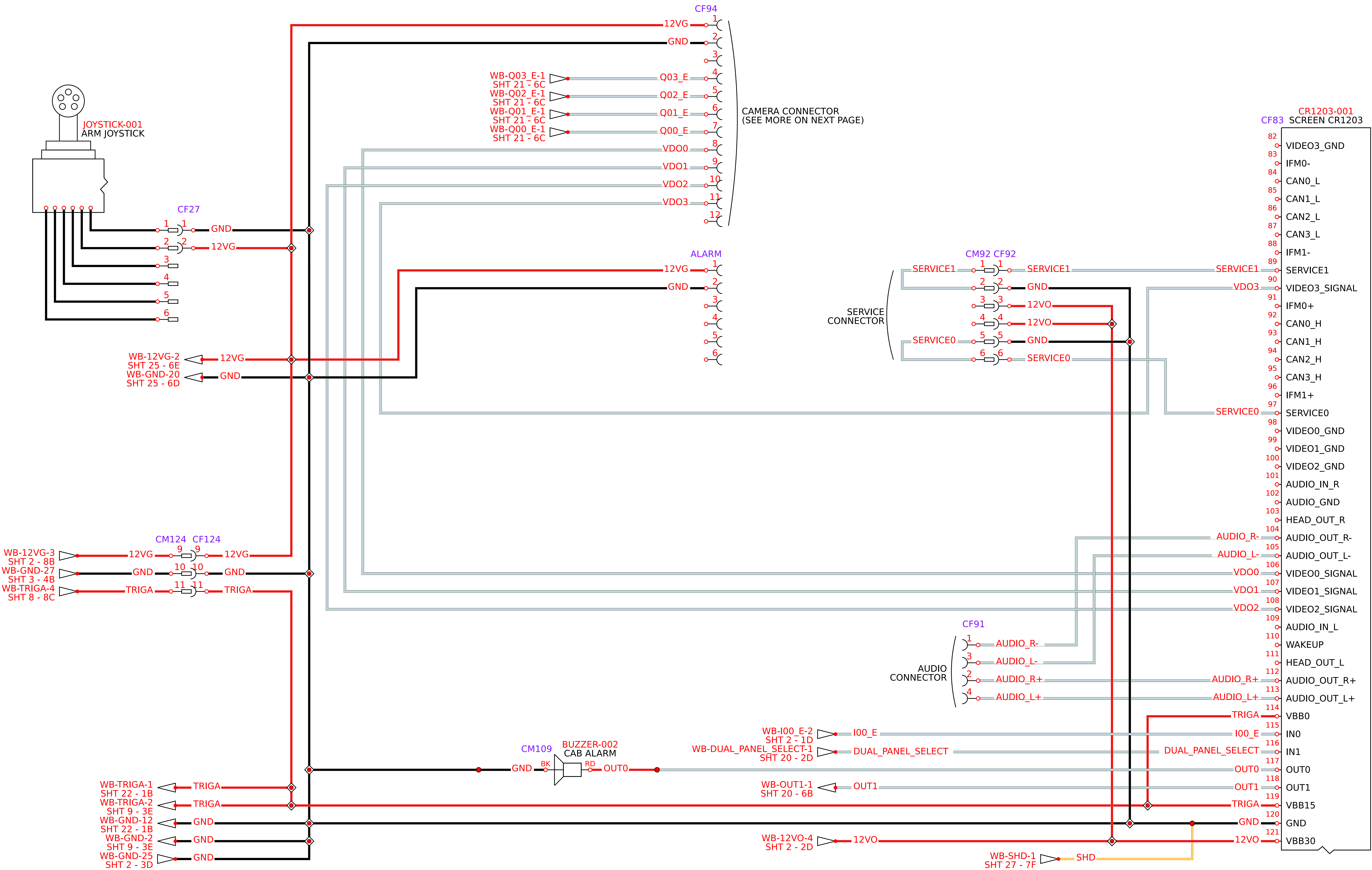
00148
DRIVE-004
PACKER DRIVE SIZE 4

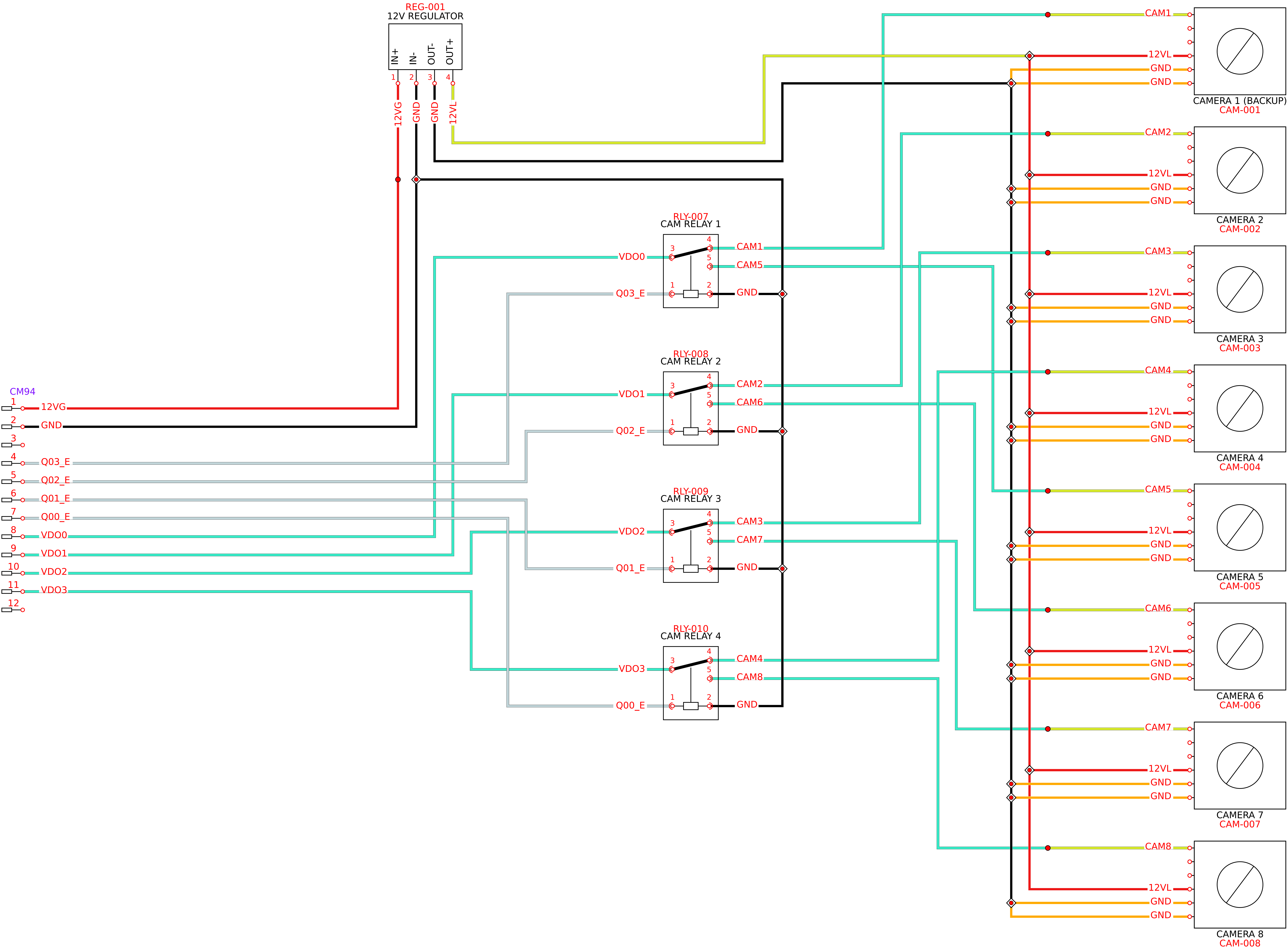


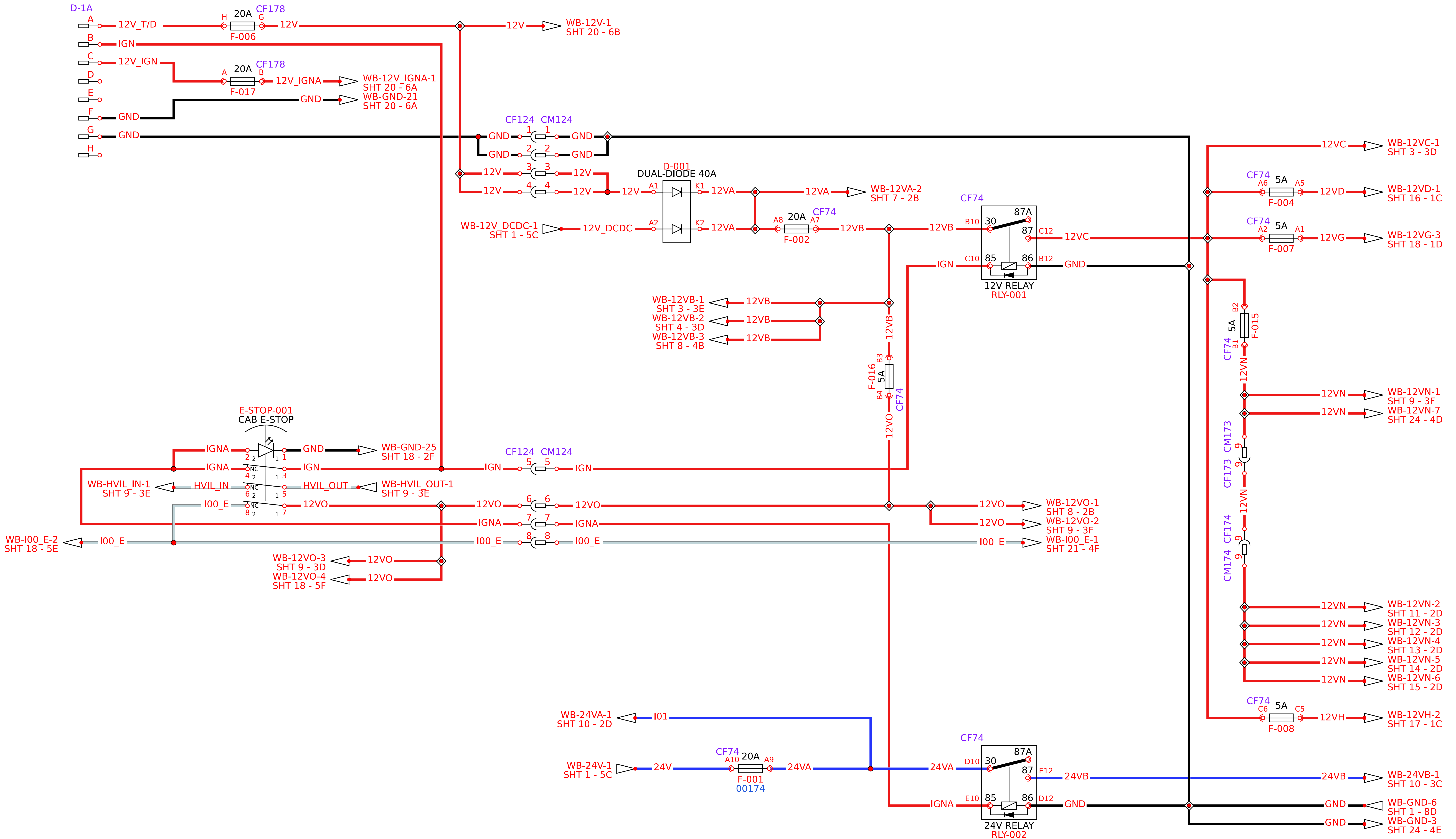


Ejector Sensors

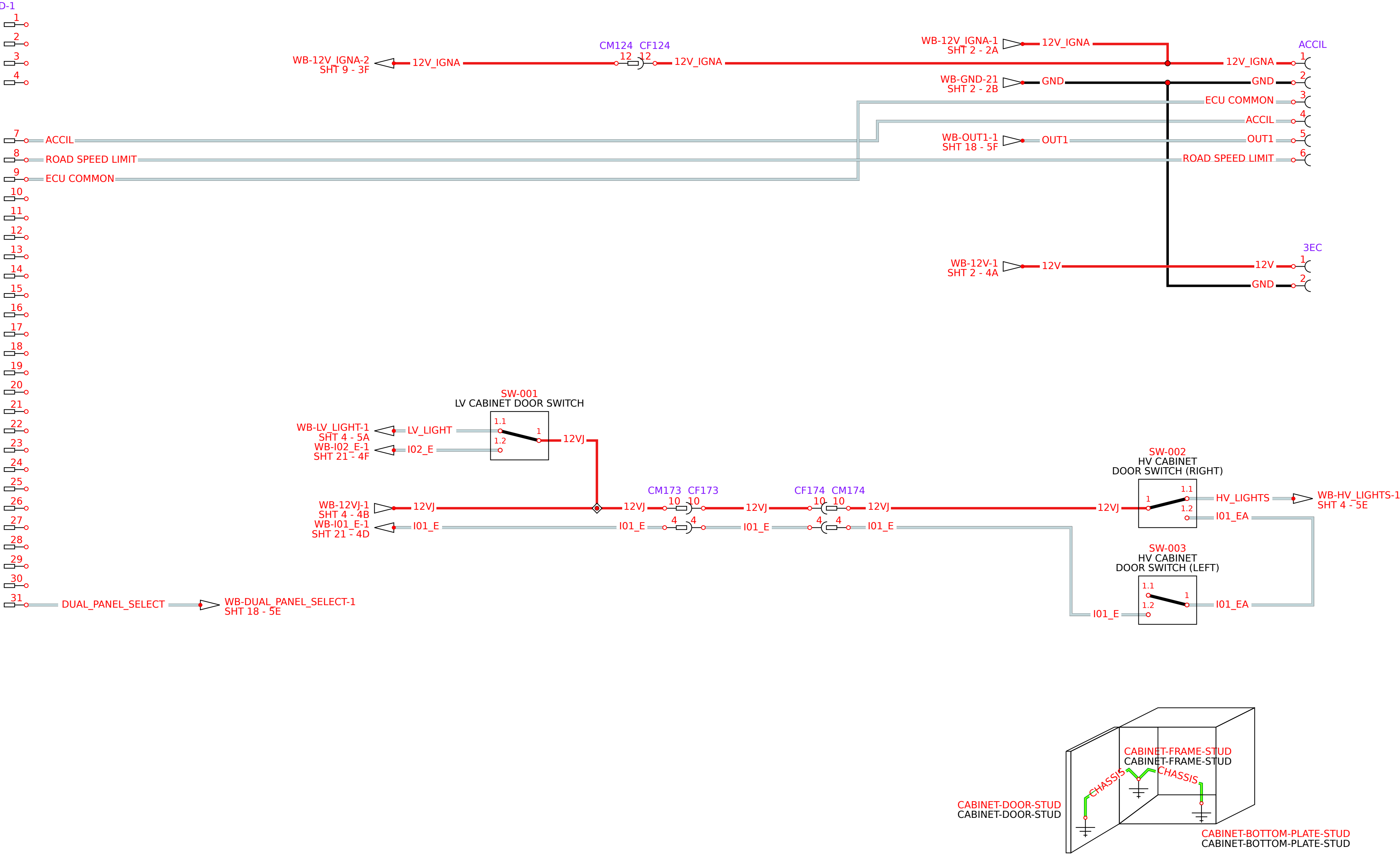


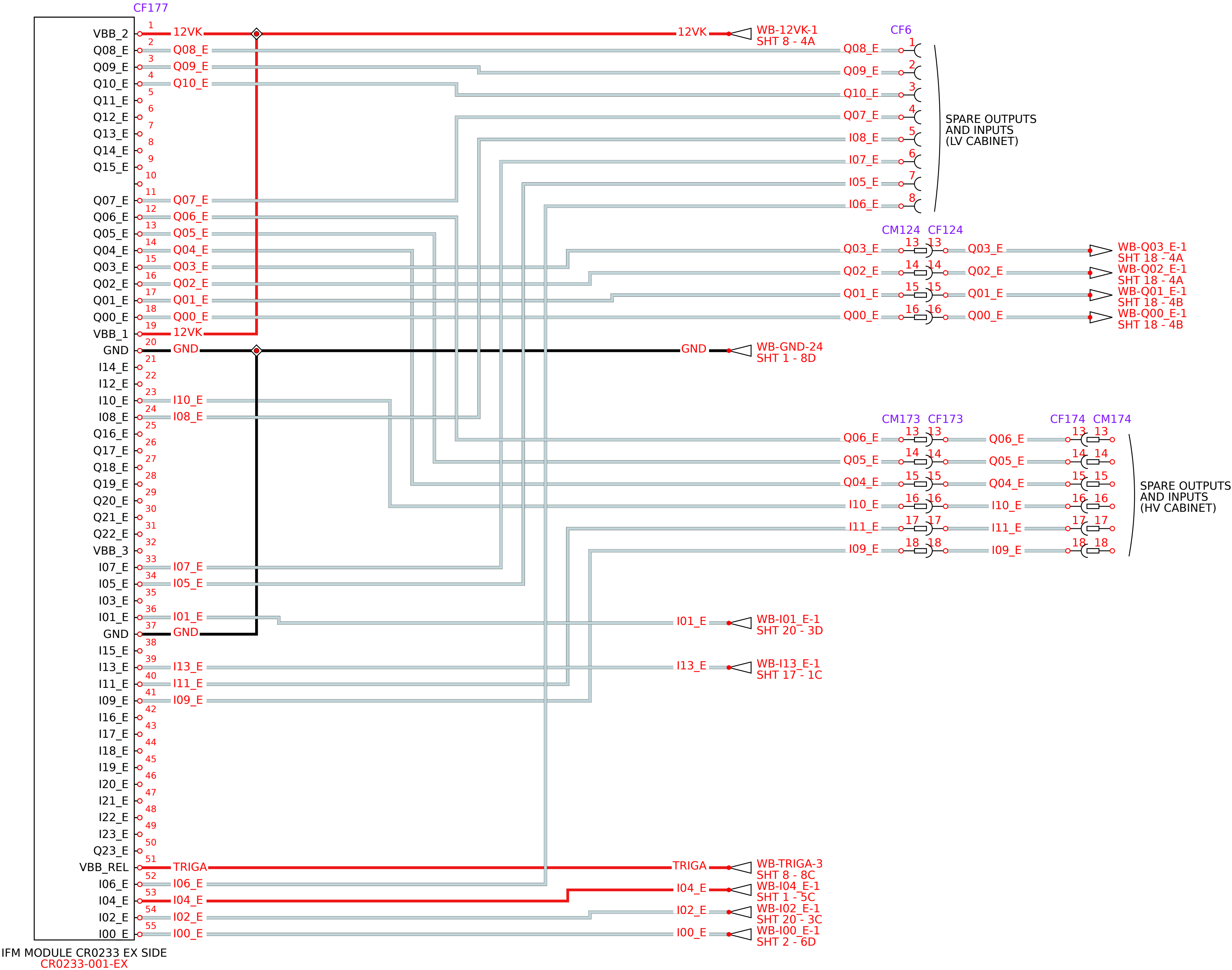




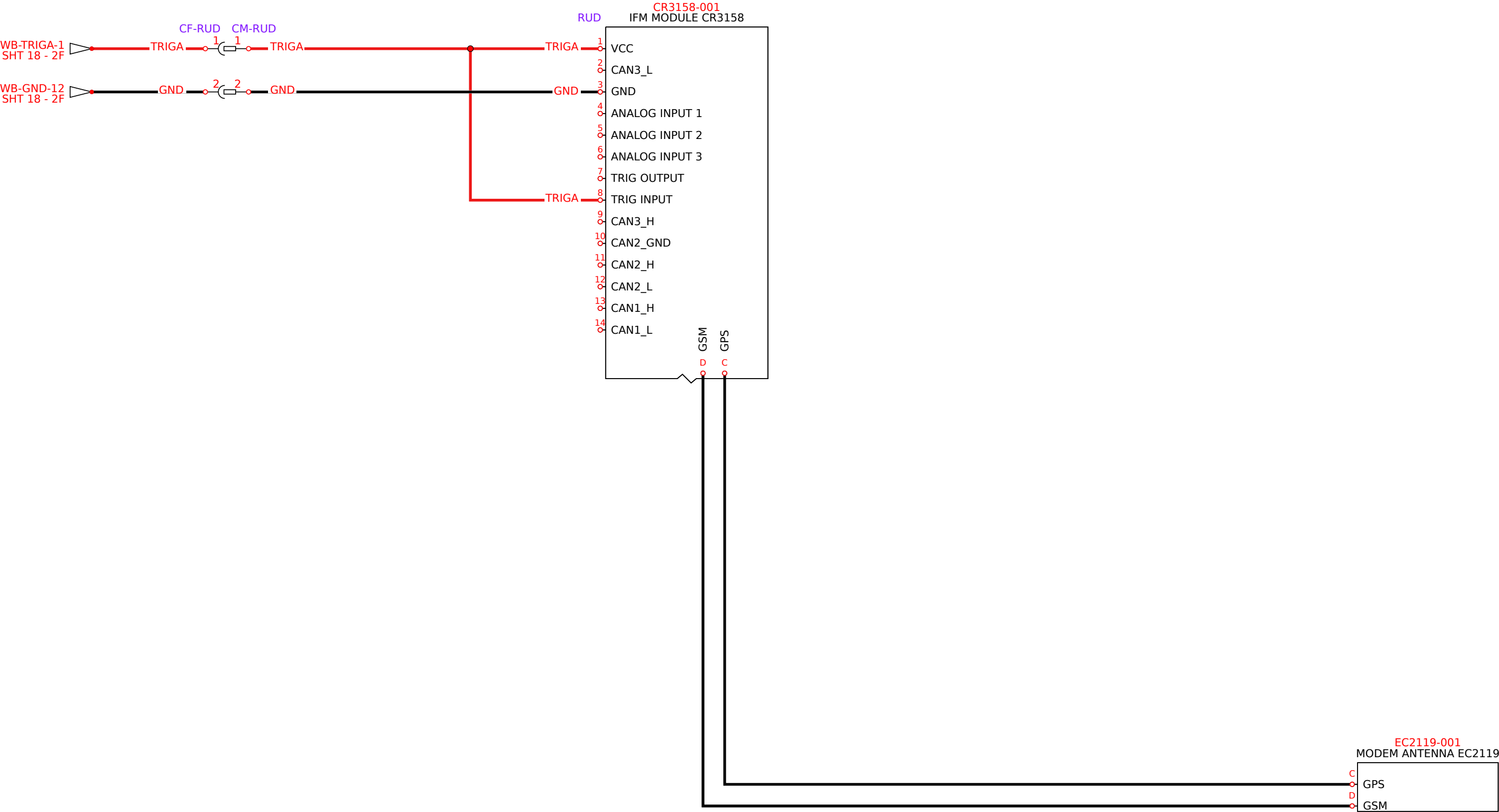


Panel Switches & Accessories



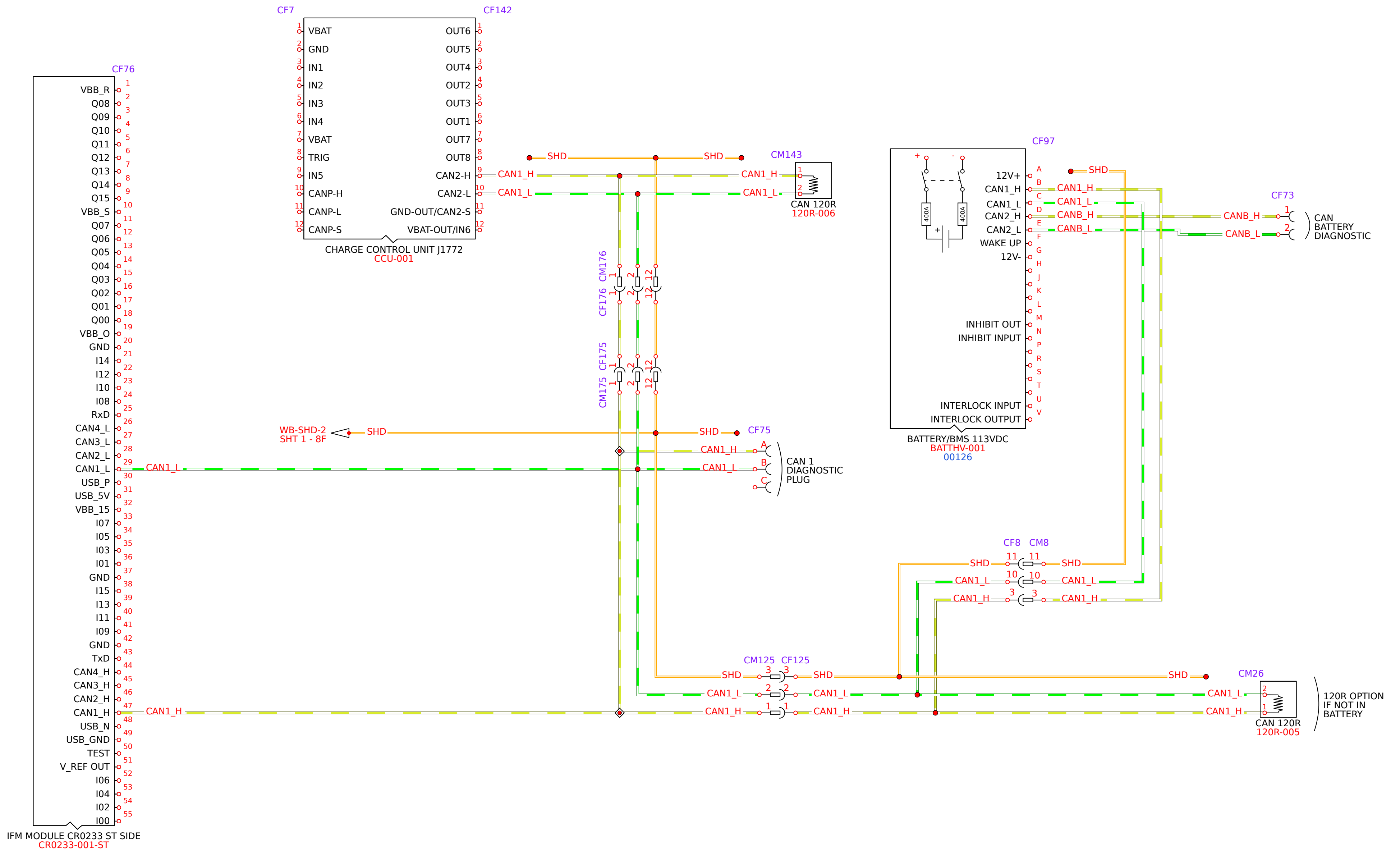


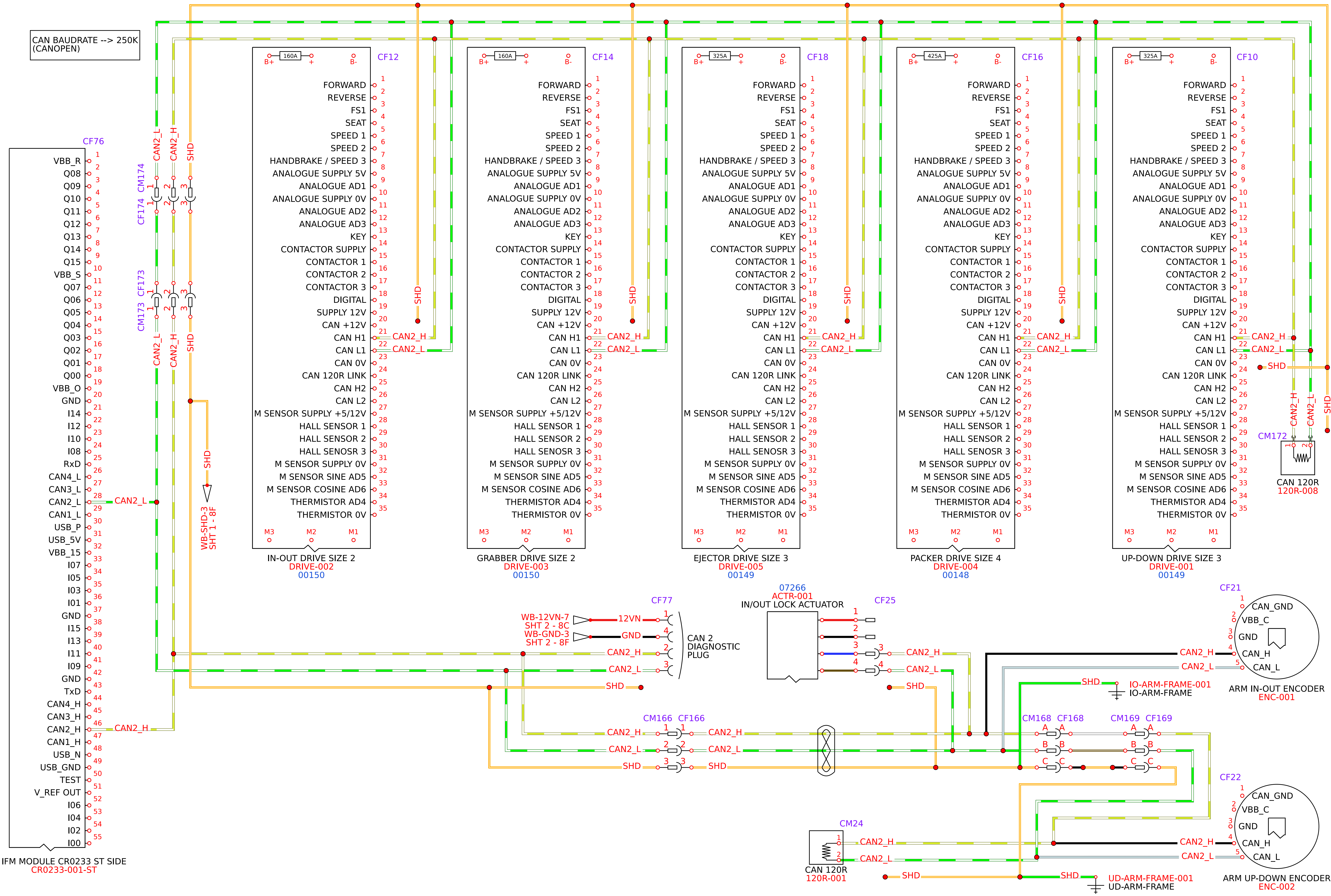
Modem



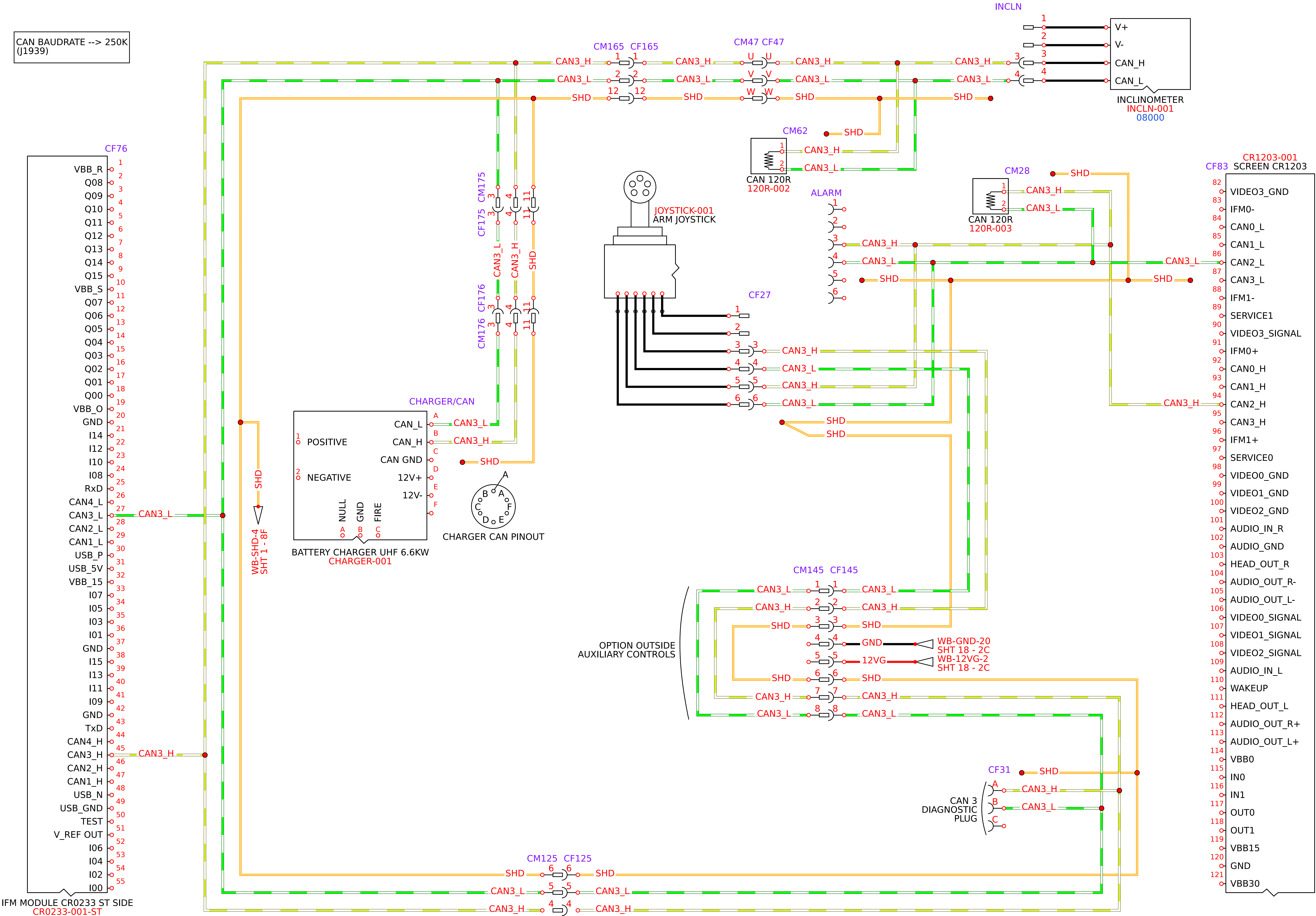
CAN 1

CAN BAUDRATE --> 500K



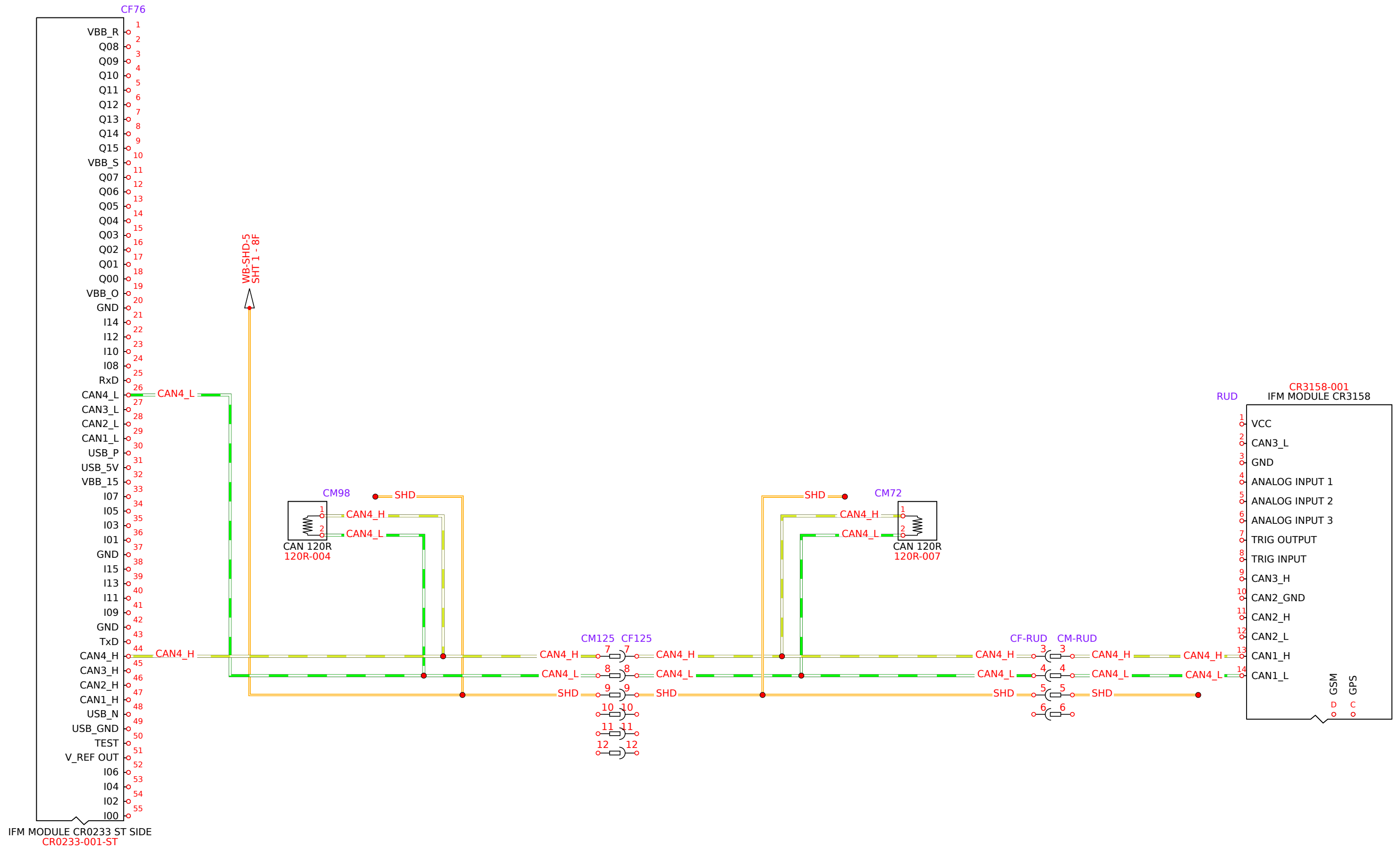


CAN BAUDRATE --> 250K
(J1939)

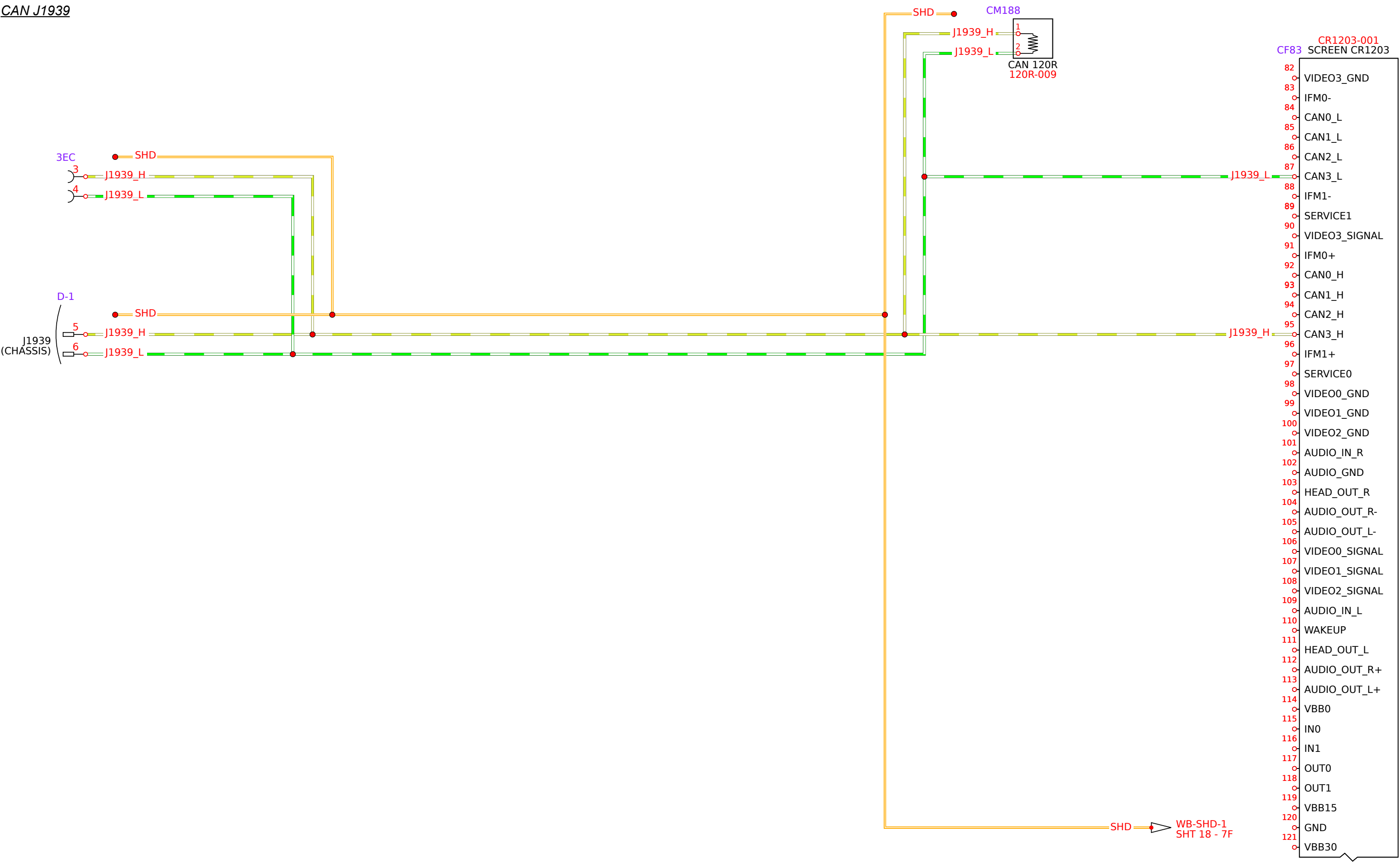


CAN 4

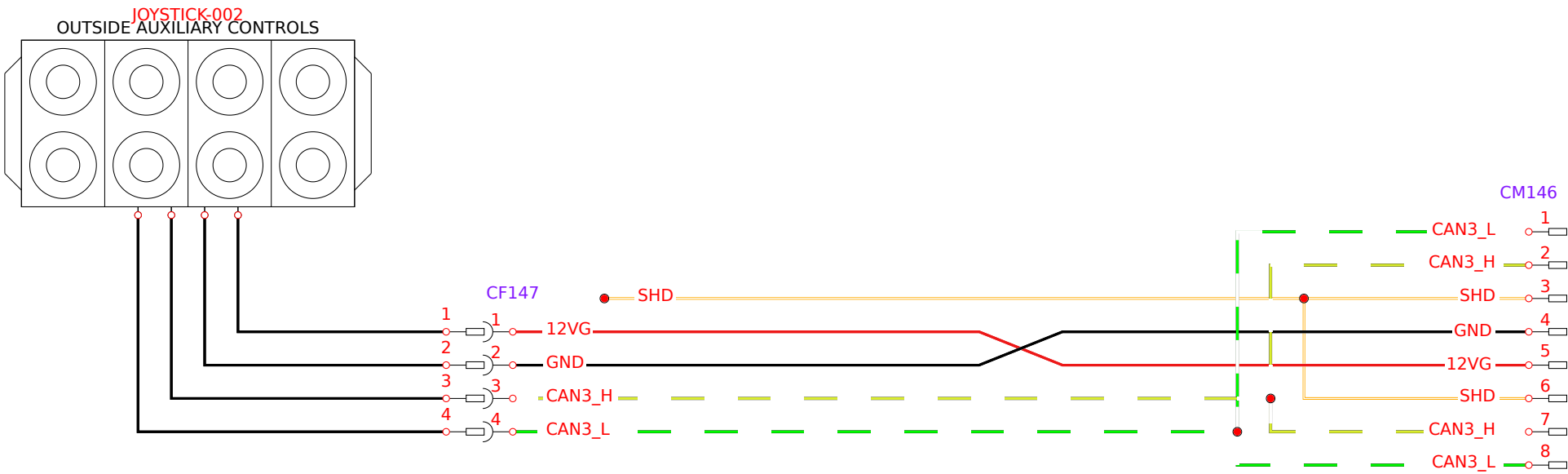
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(CANOPEN)

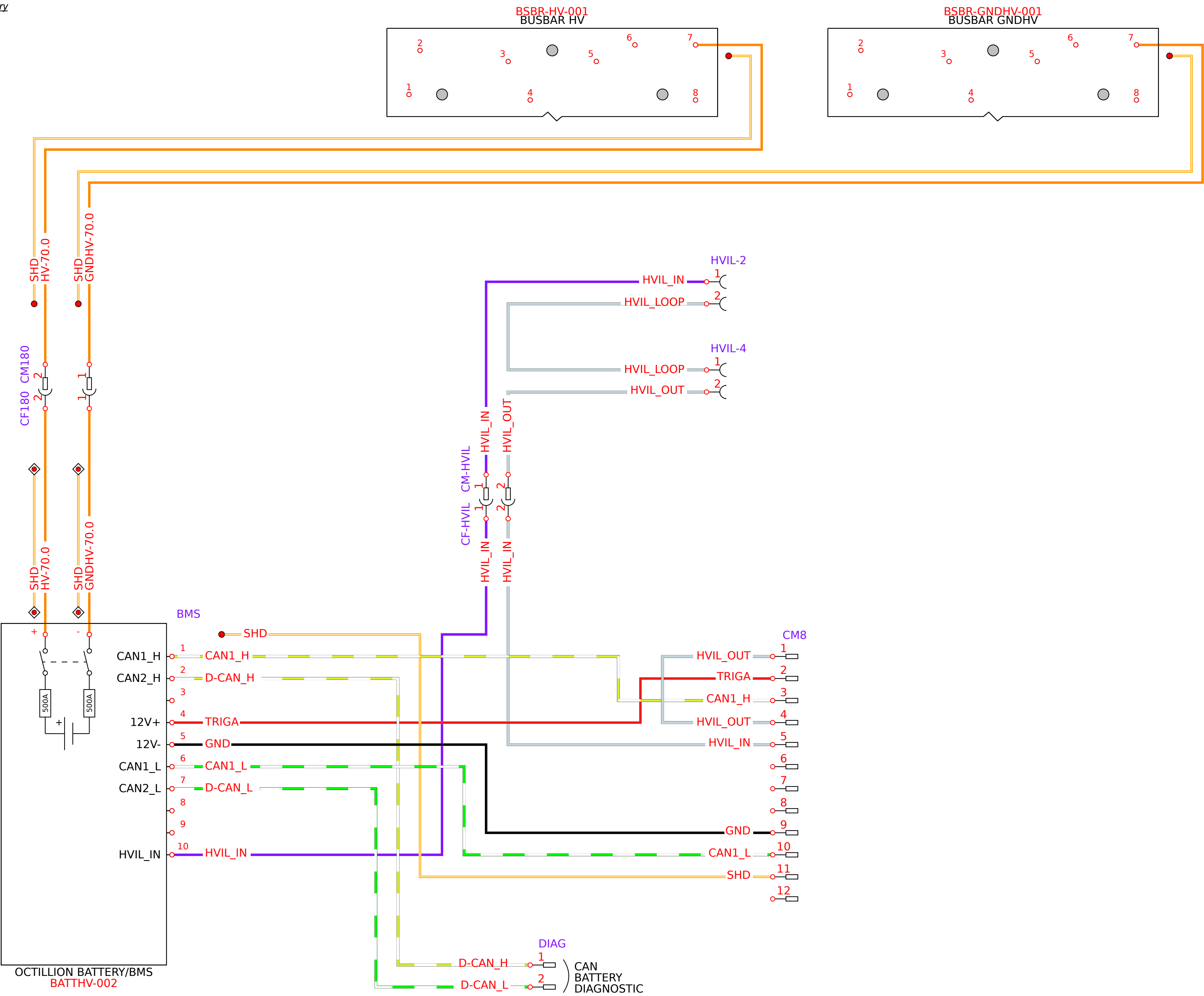


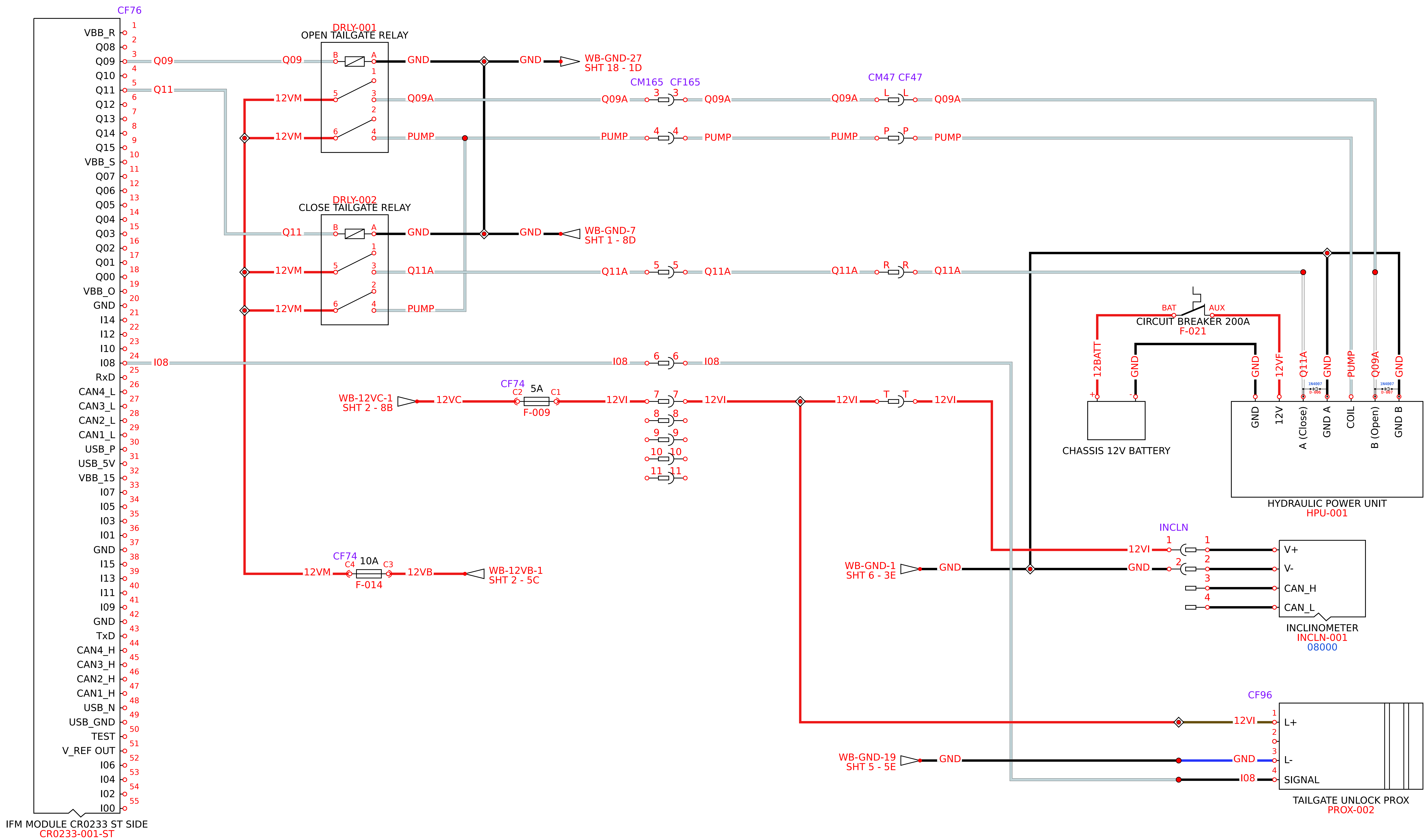
CAN J1939



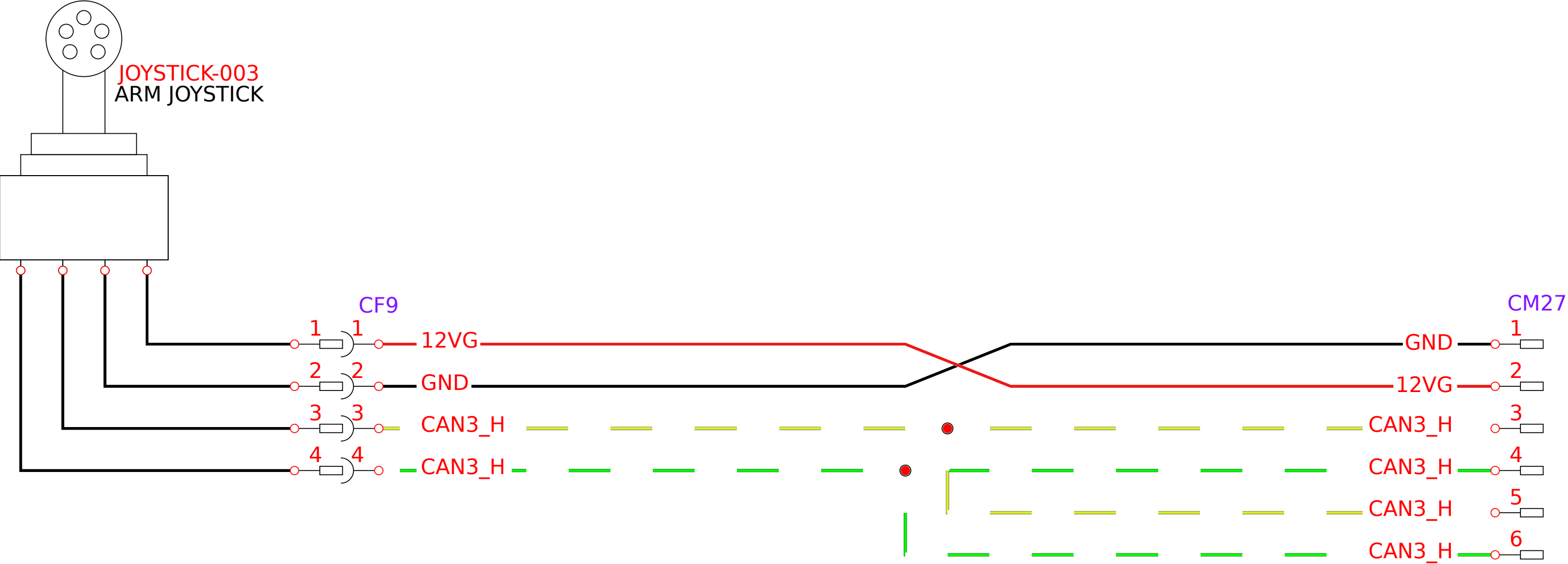
Outside Auxiliary Controls, Option

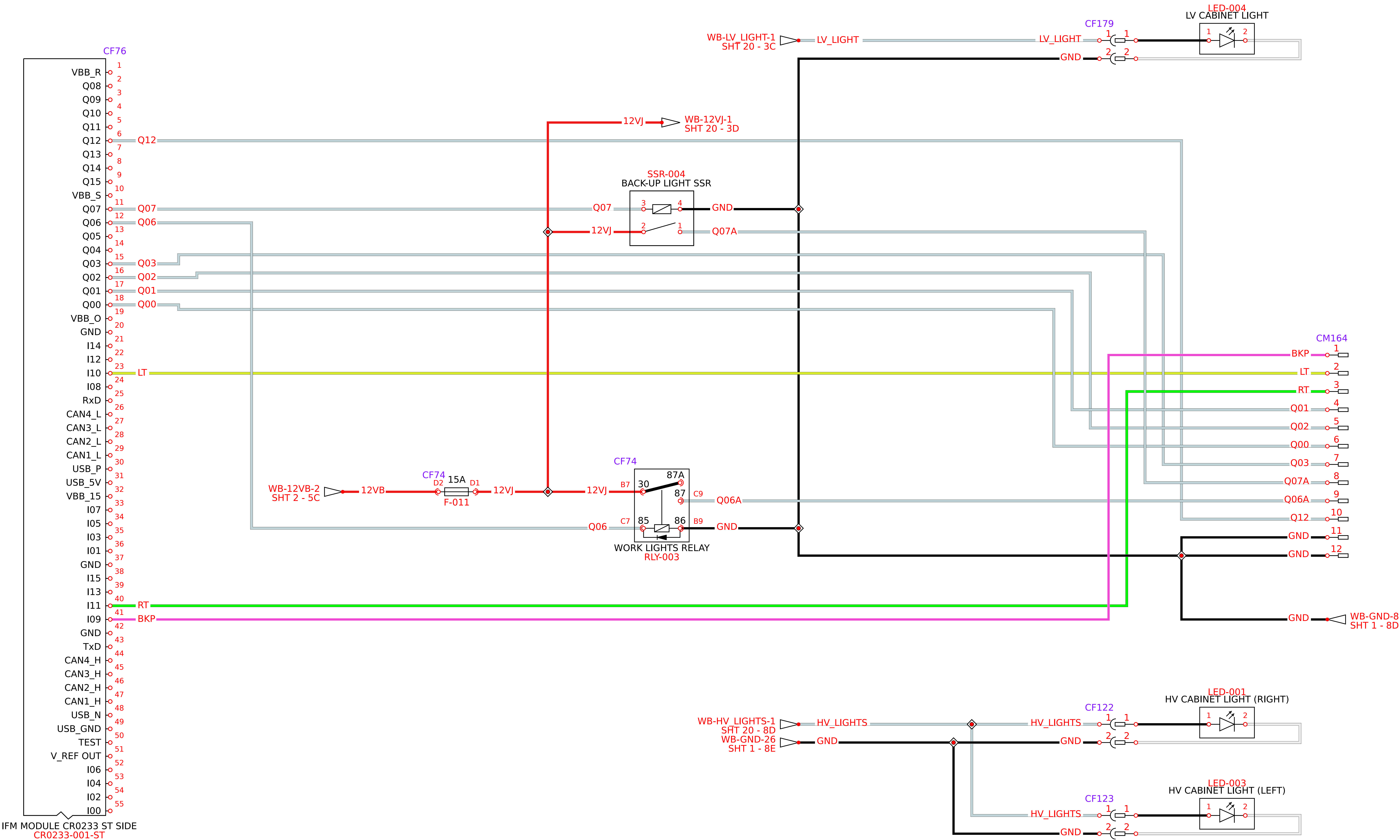


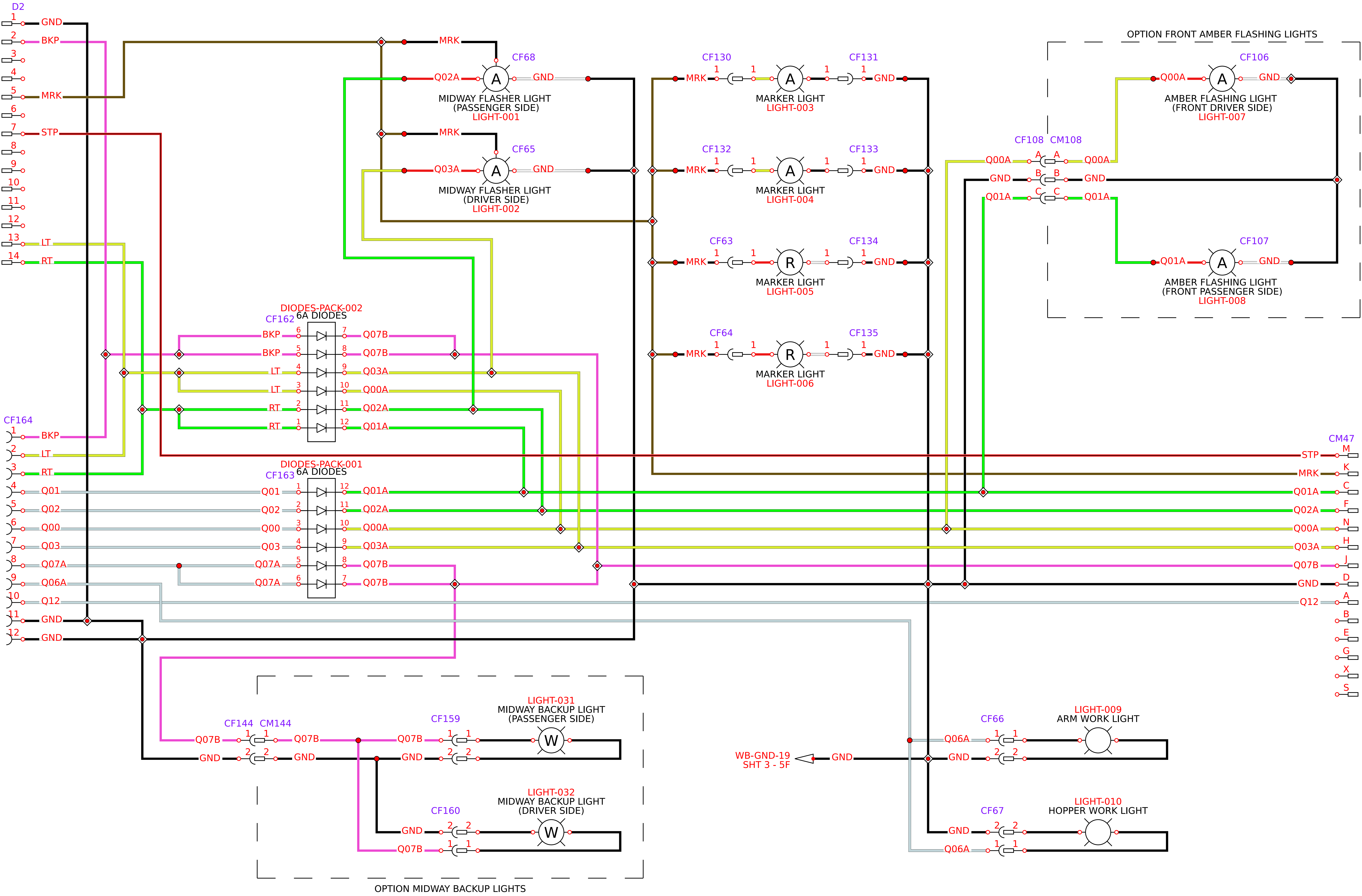


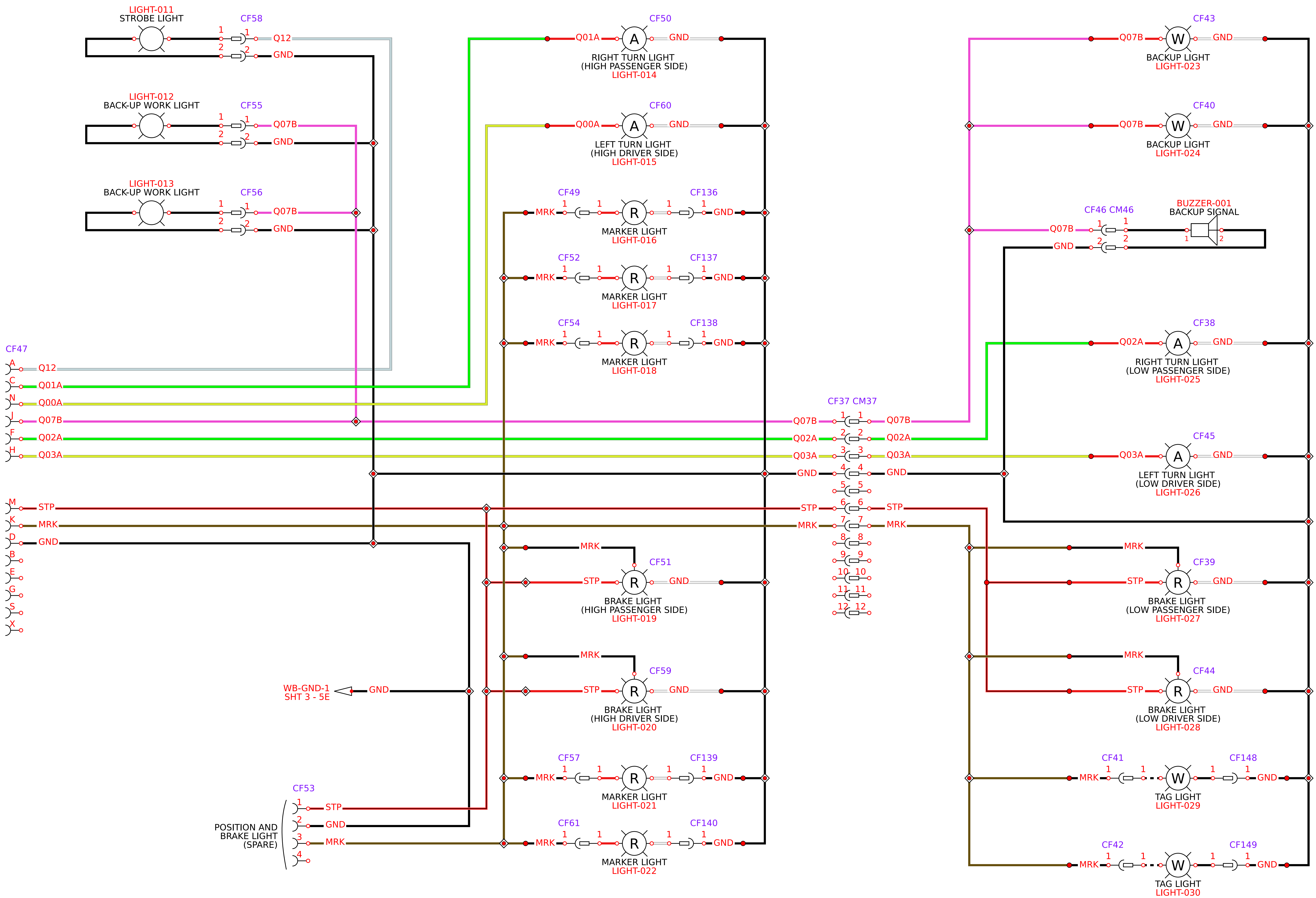


Joystick, Mechanical Deadman Option

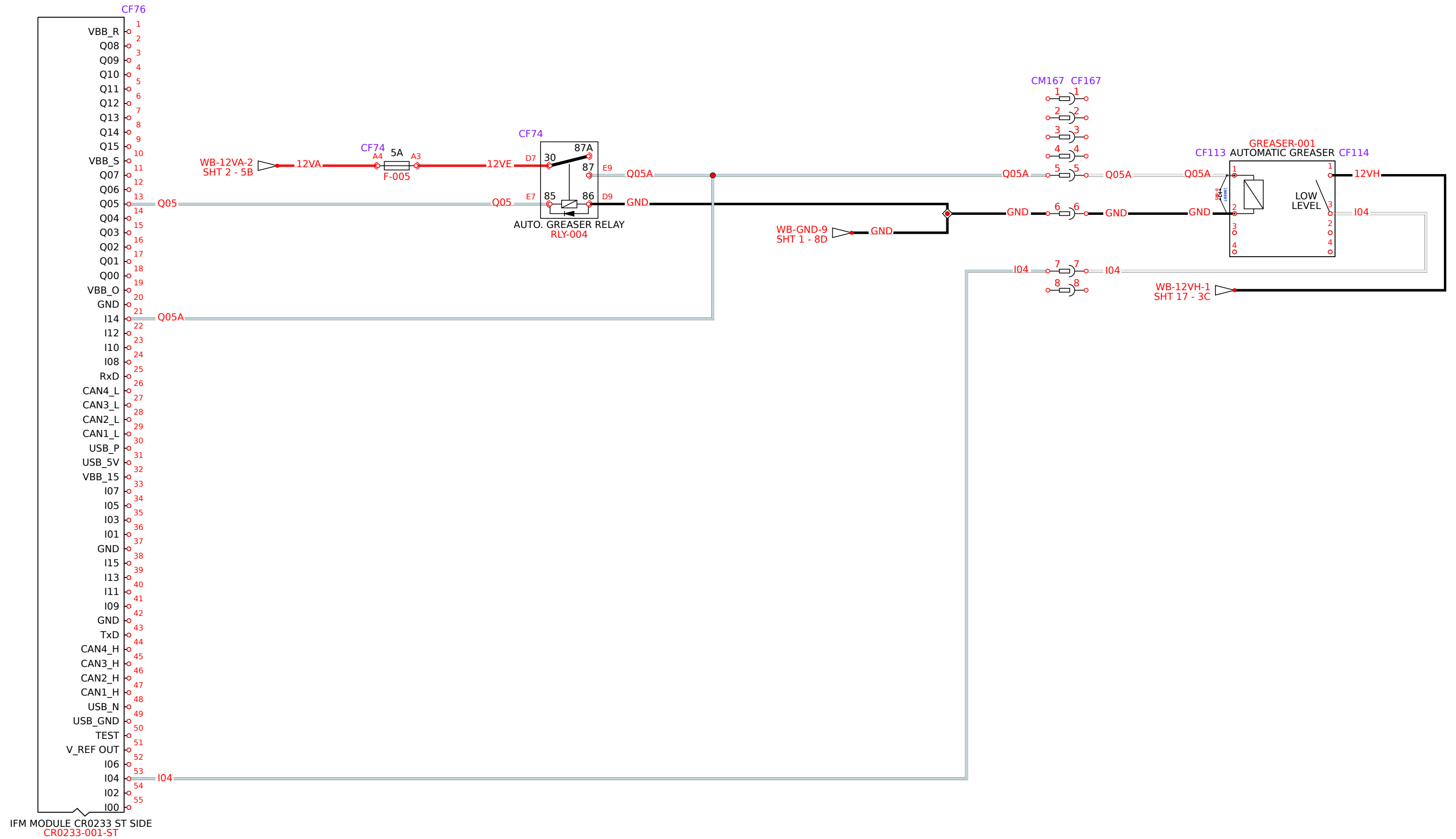




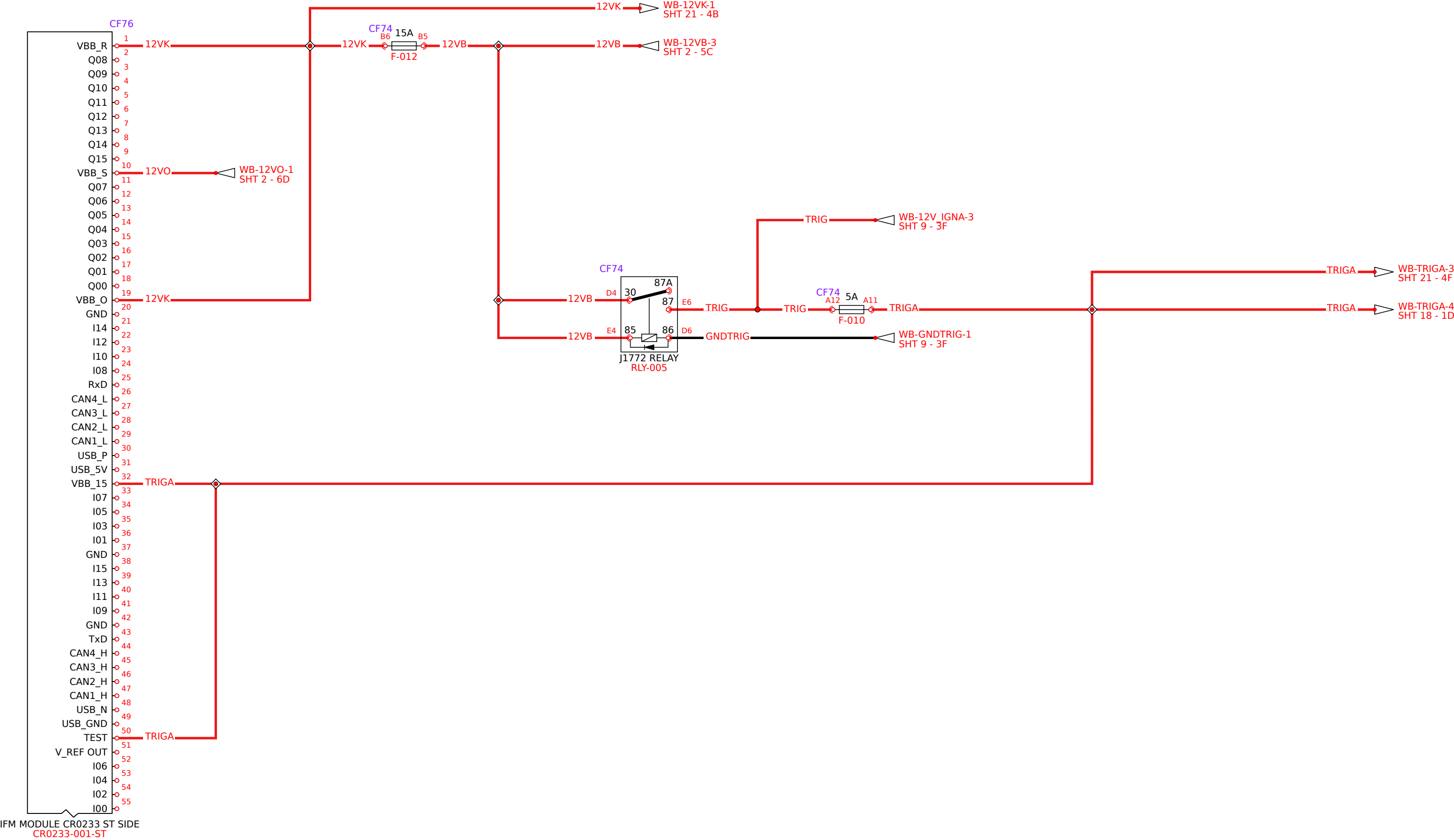




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HEIL ENVIRONMENTAL WARRANTY STATEMENT

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 dealersupplied warranty program is endorsed or supported by Heil.

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

The statements included herein is merely a summary of the full Limited Warranty provided by Heil. Please see the full limited warranty as outlined at <https://www.heil.com/warranty/> under Heil Warranty Policies and Procedures.



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