

ORIGINAL INSTRUCTIONS

**Nitro<sup>®</sup> 7310**  
**Tier 4B (final)**  
**Sprayer**

*PIN HEKY7310YHF001227 and above*

**OPERATOR'S MANUAL**

**Part number 48145021**  
1<sup>st</sup> edition English  
November 2017

**Miller**  
*Since 1899*

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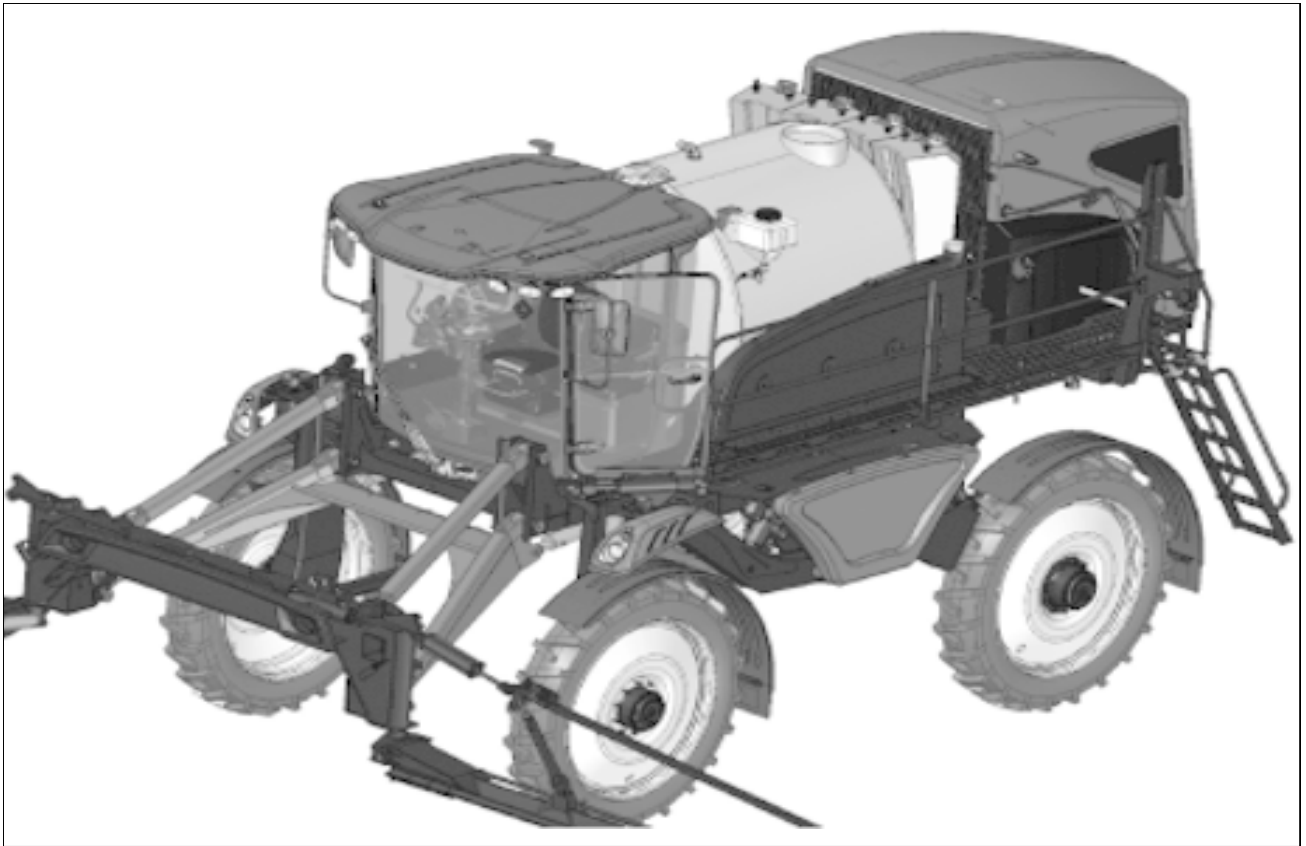
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# 1 - GENERAL INFORMATION

## Your sprayer



RAIL17SP01423FA 1

**Nitro front boom Class 3 sprayer**

## Note to the owner

This manual contains important information about the safe operation, adjustment and routine maintenance of your sprayer. The manual is divided into ten chapters as outlined in the table of contents. Refer to the index at the end of this manual for locating specific items about your sprayer.

Do not operate or permit anyone to operate or service this machine until you or the other persons have read this manual. Use only trained operators who have demonstrated the ability to operate and service this machine correctly and safely. All persons who will be operating this machine shall possess a valid operating permit and/or other applicable local required permits.

This Operator's Manual is to be stored in the manual compartment behind the operator's seat in the vehicle. Make sure this manual is in good condition. Contact your dealer to obtain additional manuals. Contact your dealer for any further information or assistance about your machine. Your dealer has approved service parts. Your dealer has technicians with special training that know the best methods of repair and maintenance for your sprayer.

Make sure the applicator is calibrated before being placed in service and at regular intervals thereafter in accordance with procedures outlined in this manual and in the control system manual. It is the operator's responsibility to keep the system properly calibrated and in good working order at all times.

Make sure the applicator is maintained to preserve and/or improve safety, accuracy and reliability of the system. Read and follow the maintenance schedule in this manual. As additional technology becomes available, the owner is responsible for improving the safety, accuracy and reliability of the applicator.

**ATTENTION:** *The engine on your machine is designed and built to government emissions standards. Tampering by dealer, customers, operators and end users is strictly prohibited by law. Failure to comply could result in government fines, rework charges, invalid warranty, legal action, and possible confiscation of the machine until rework to original condition is completed. Engine service and/or repairs must be done by a certified technician only!*

## CNH Industrial America LLC technical manuals

Manuals are available from your dealer for your machine. Your dealer can expedite your order for operator manuals and parts catalogs.

Always give the machine name, model and serial number of your machine so your dealer can provide the correct manuals for your machine.

The company is continually striving to improve its products and therefore reserves the right to make improvements and changes when it becomes practical and possible to do so, without incurring any obligation to make changes or additions to the equipment sold previously.

All data given in this manual is subject to production variations.

**NOTICE:** *Operating and service messages displayed on the electronic operating panel may vary from what is shown in the manual. If this occurs, heed the latest instructions on the electronic operating panel.*

Dimensions and weights are approximate only and the illustrations do not necessarily show the machine in standard condition. For exact information about any particular machine, please consult your dealer.



## Intended use

Nitro front boom sprayers with standard equipment and authorized attachments are intended to be used to apply agricultural chemicals in customary farming practices. Any other uses including, but not limited to, towing trailers, vehicles or implements are not recommended. Any sprayer damage resulting from unauthorized uses or installation and/or use of unauthorized equipment is not covered by the sprayer warranty.

DO NOT use this machine for any purpose or in any manner other than as described in the manual, decals, or other product safety information provided with the machine. These materials define the machine's intended use.

Use only approved accessories and attachments designed for your machine.

Consult an authorized dealer on changes, additions or modifications that can be required for this machine to comply with various country regulations and safety requirements.

Unauthorized modifications can cause serious injury or death. Anyone making such unauthorized modifications is responsible for the consequences.

Your dealer will instruct you in the general operation of your new equipment. Your dealer's staff of factory-trained service technicians will be glad to answer any questions that may arise regarding the operation of your machine.

## Electro-Magnetic Compatibility (EMC)

Interference may arise as a result of add-on equipment that may not necessarily meet the required standards. As such interference can result in serious malfunction of the unit and/or create unsafe situations, you must observe the following:


- The maximum power of emission equipment (radio, telephones, etc.) must not exceed the limits imposed by the national authorities of the country where you use the machine
- The electro-magnetic field generated by the add-on system should not exceed **24 V/m** at any time and at any location in the proximity of electronic components
- The add-on equipment must not interfere with the functioning of the on board electronics

Failure to comply with these rules will render the MILLER warranty null and void.

## Product identification

### Sprayer model and Product Identification Number (PIN)

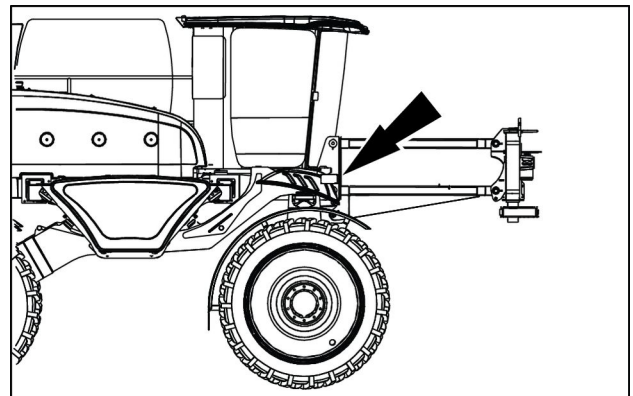
The machine identification plate displays specifications related to your sprayer, including the machine Product Identification Number (PIN).

CNH Industrial America LLC		 NEW HOLLAND NEW HOLLAND	
Type	Configuration	Racine, WI 53404 U.S.A.	
Model	Type approval	Made in:	U.S.A.
Product ID Number (PIN)		Unladen mass	kg
Permissible load mass:	kg	Rated net power	kg
Permissible load Axle 1	kg	Length	m
Permissible load Axle 2	kg	Width	m
Permissible load Axle 3	kg	Height	m
Liquid System Working Pressure	kg/cm <sup>2</sup>	Model Year	
Normal Tank Volume	L	Year of Construction	2004/2010 1.7.3

RAIL17SP00852AA 1

The machine identification plate is attached to the right-hand side lift arm frame.

**NOTE:** The machine PIN can also be displayed on the arm rest display.



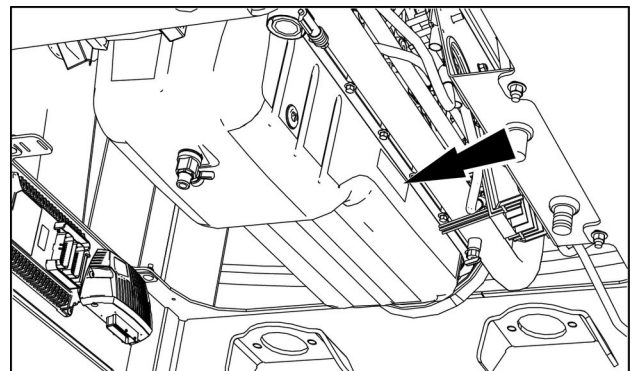
RAIL17SP00851AA 2

Refer to the machine PIN and the product model number when requiring service or parts information. Record the date of purchase, dealership name, machine PIN, and machine model number in the spaces provided.

Date Purchased:
Dealership:
PIN:
Model number:

### Engine serial number

The engine identification plate is located on the left-hand side of the engine oil pan. Refer to the number on the engine identification plate when engine service is required.

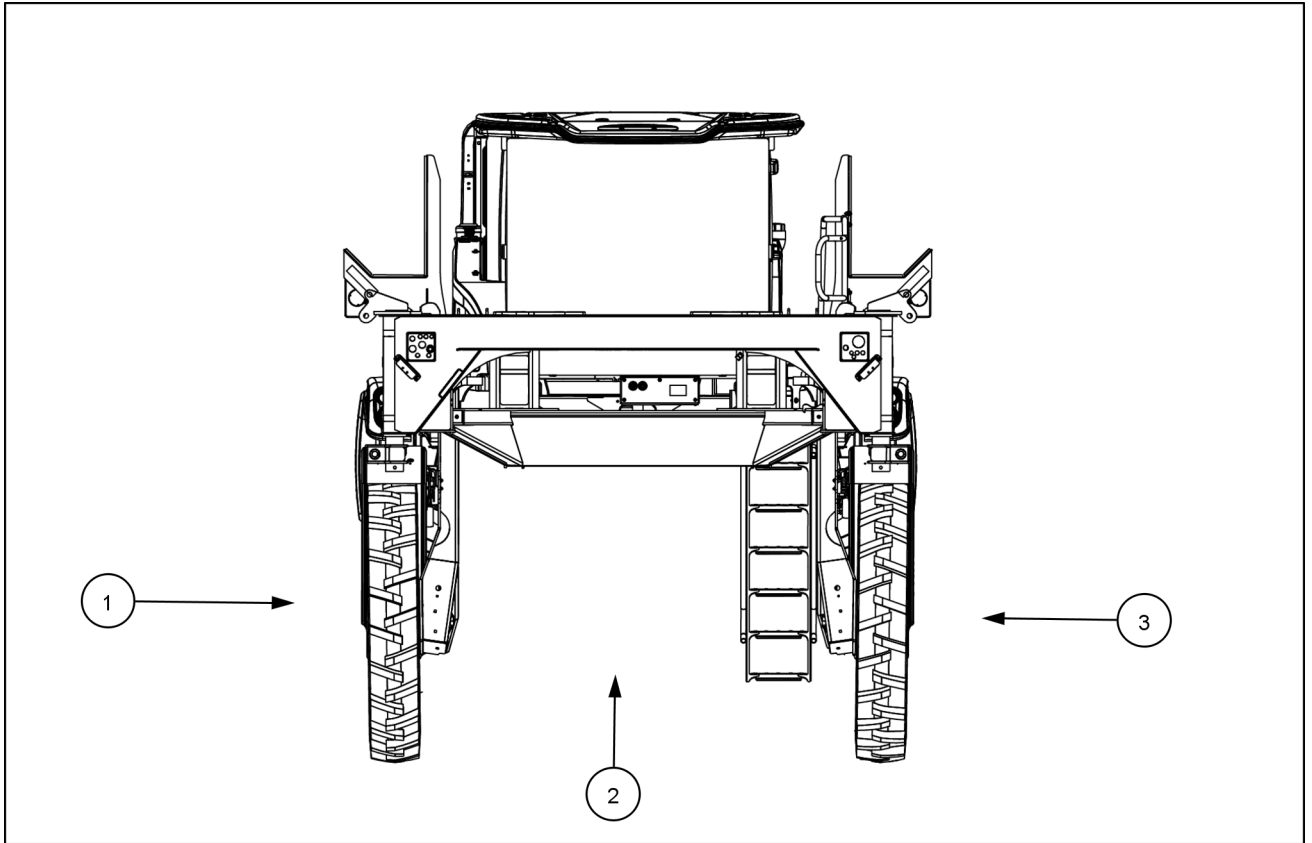


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## **Operator's manual storage on the machine**

Inside the cab is a storage bag for small manuals or other important documentation. Keep the operator's manual in the storage bag. You must keep the operator's manual with the vehicle at all times. The operator's manual must be available for use by all operators.

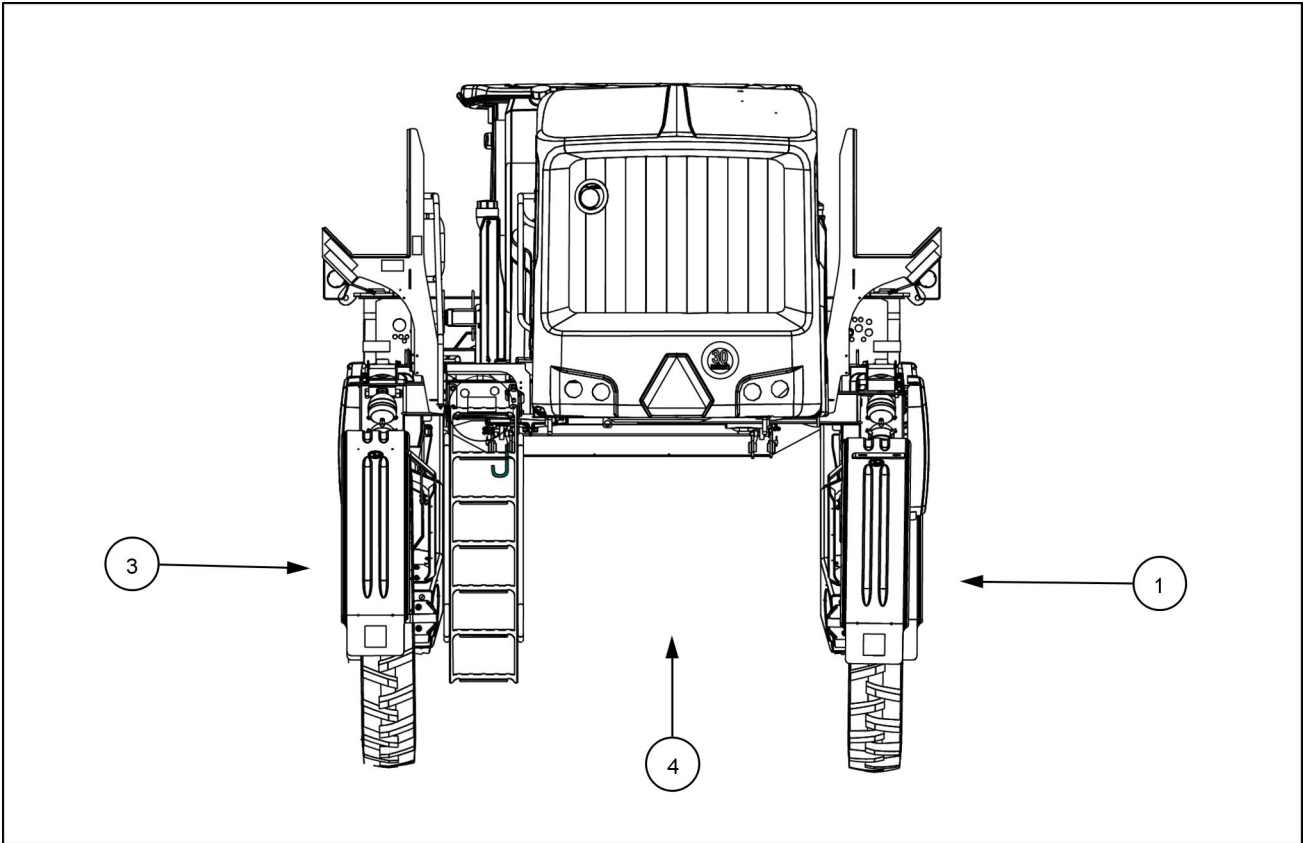
## Machine orientation



RAIL17SP00704FA 1

1. Right-hand side	2. Front of unit	3. Left-hand side
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1 - GENERAL INFORMATION



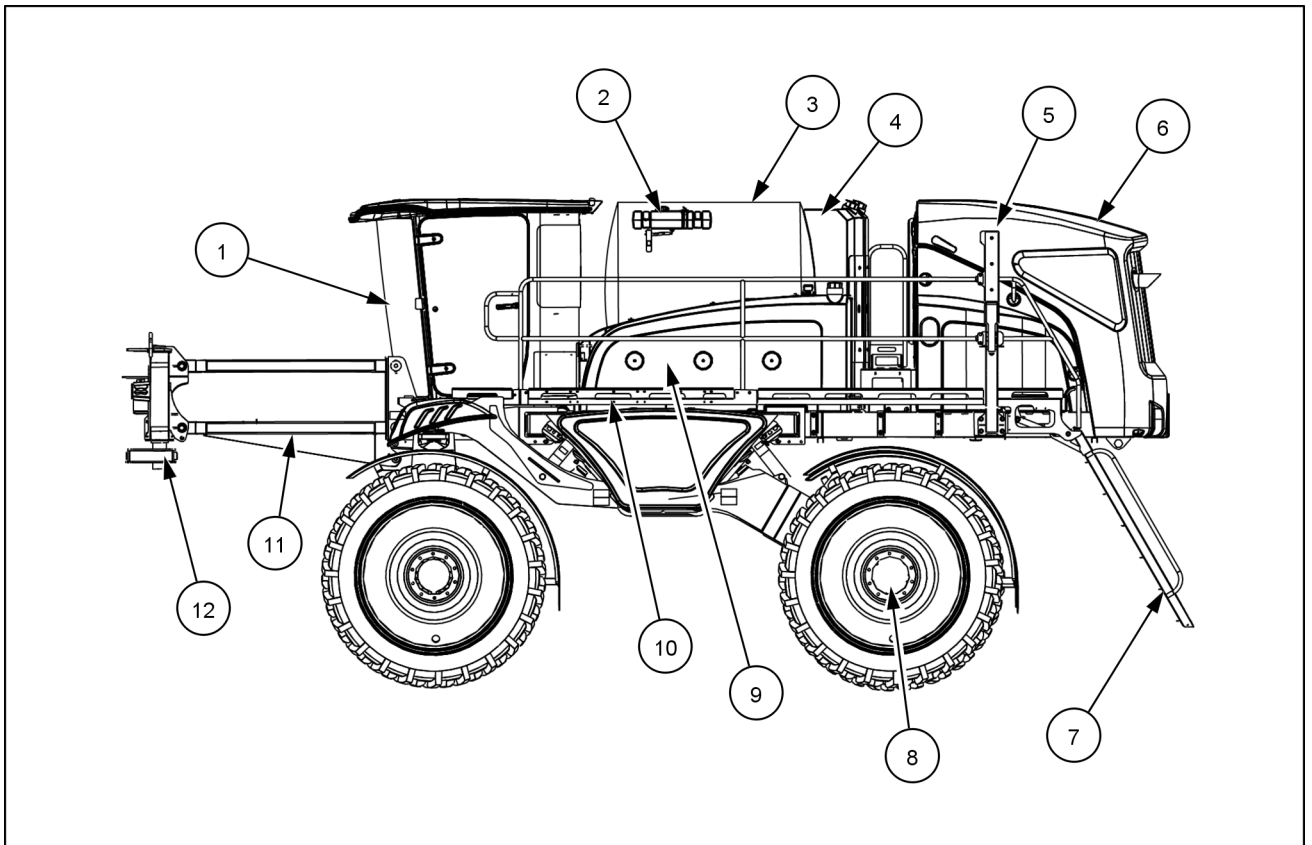
RAIL17SP00705FA 2

1. Right-hand side

3. Left-hand side

4. Rear of unit

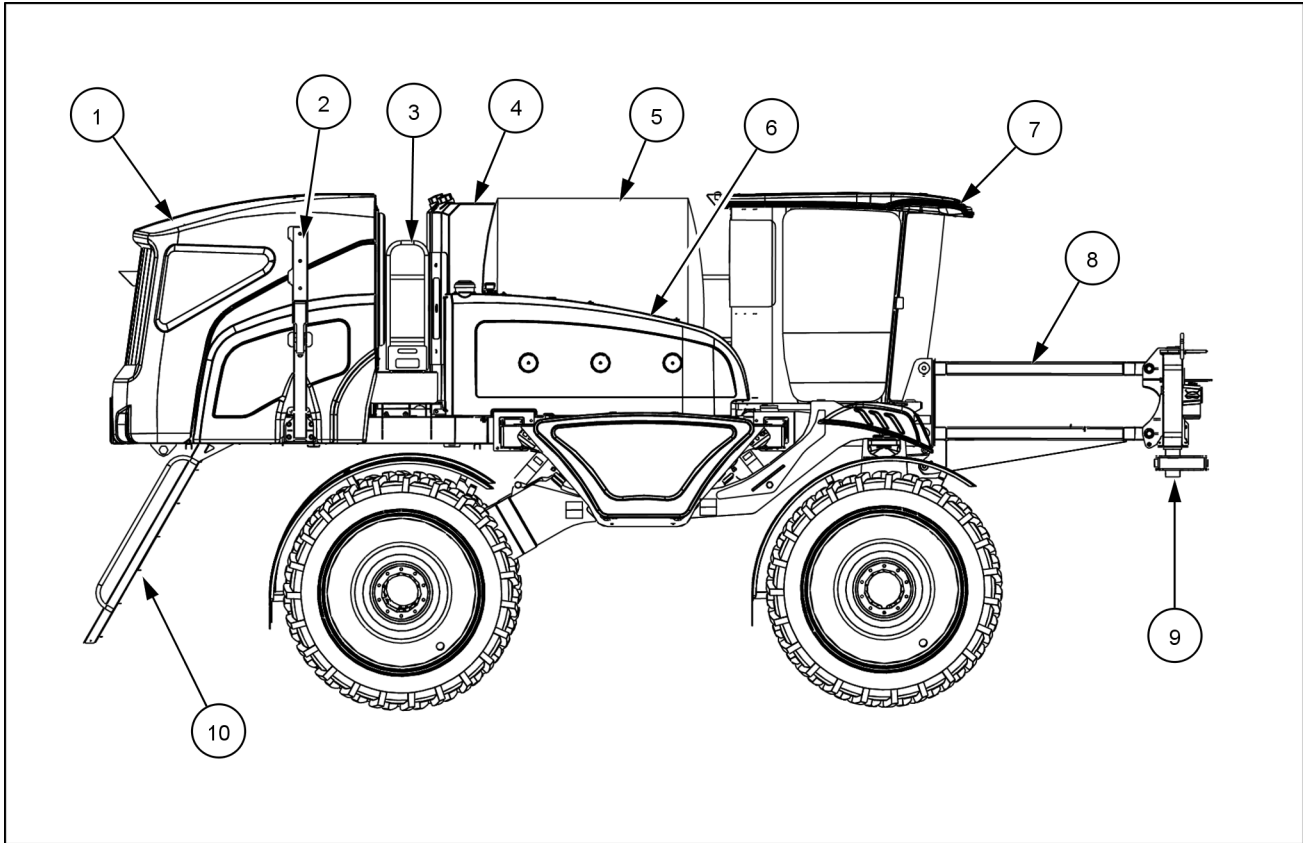
## Machine components



RAIL17SP00706FA 1

- |   |                               |
|---|-------------------------------|
| 1. Operator's cab                         | 7. Ladder                     |
| 2. Hand rinse water tank                  | 8. Planetary                  |
| 3. Product tank                           | 9. Fuel tank                  |
| 4. Chemical injection tanks (if equipped) | 10. Operator's platform       |
| 5. Boom rest                              | 11. Lift arms                 |
| 6. Engine compartment                     | 12. Front boom center section |

## 1 - GENERAL INFORMATION



RAIL17SP00707FA 2

- |   |                              |
|---|------------------------------|
| 1. Engine compartment                     | 6. Rinse water tank          |
| 2. Boom rest                              | 7. Operator's cab            |
| 3. Engine compartment walkway             | 8. Lift arms                 |
| 4. Chemical injection tanks (if equipped) | 9. Front boom center section |
| 5. Product tank                           | 10. Ladder                   |



## Selective Catalytic Reduction (SCR) system

### What is Selective Catalytic Reduction (SCR)?

Your MILLER machine is equipped with additional components to comply with national and local exhaust emissions requirements. The main components of the SCR system include the SCR catalyst, the Diesel Oxidation Catalyst (DOC), the DEF/AdBlue® supply module, and the DEF/AdBlue® tank.

### How does Selective Catalytic Reduction (SCR) work?

During combustion, harmful nitrogen oxide (NO<sub>x</sub>) molecules are formed in the exhaust. By injecting a DEF/AdBlue® solution into the exhaust prior to a catalyst, the NO<sub>x</sub> can be converted to harmless elemental nitrogen and water. This happens when the NO<sub>x</sub> molecules react inside the catalyst with the heat generated by the engine and the urea in the DEF/AdBlue® solution. The DOC is used to maximize the SCR catalyst efficiency by maintaining a 50/50 ratio of nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) prior to exhaust gases entering the SCR chamber.

**NOTICE:** Do not idle the machine with no load for more than 6 h, or damage to the SCR catalyst will occur.

During cold engine operation at low engine coolant and ambient air temperatures, water vapor will be visible from the exhaust. This water vapor will resemble steam or light white smoke, and will dissipate as the engine and machine components warm. This water vapor is considered normal.

**NOTE:** After engine shutdown, the SCR system will perform a purge cycle, which permits the supply module to continue to run for up to 90 seconds. This is considered normal and requires no action from the operator.

### What is Diesel Exhaust Fluid (DEF)/AdBlue®?

DEF/AdBlue® is a clear, colorless, non-toxic, aqueous urea solution ( 32.5%) with a slight ammonia odor. It is used to chemically reduce NO<sub>x</sub> emissions from heavy-duty diesel-powered vehicles. DEF/AdBlue® is neither explosive nor harmful to the environment. DEF/AdBlue® is classified under the minimum-risk category of transportable fluids.

International standard ISO 22241-1 defines DEF/AdBlue® quality. The American Petroleum Institute (API®) has a voluntary certification program for DEF/AdBlue®. To ensure that DEF/AdBlue® satisfies the requirements of ISO 22241, look for the API® DEF Certification Mark™ whenever you purchase DEF/AdBlue®. API Diesel Exhaust Fluid Certification Mark is a registered trademark of API in the United States and or other countries.



### Finding Diesel Exhaust Fluid (DEF)/AdBlue®

Your MILLER dealer is fully equipped to accommodate all your DEF/AdBlue® needs.

Case IH Max Service: 1-877-422-7344  
MaxService.na@cnh.com

New Holland Top Service: 1-866-639-4563  
na.topservice@newholland.com

### Storage, handling, and transport

**NOTICE:** Storage temperatures above 30 °C (86 °F) greatly reduce the shelf life of DEF/AdBlue®.

DEF/AdBlue® has a typical shelf life of 6-12 months. See the "Shelf life" table below. In order for DEF/AdBlue® to remain in a useable condition, storage requirements must be met.

- Store between -11 °C (12 °F) and 30 °C (86 °F).
- Use only an approved DEF/AdBlue® container. Contact your dealer to obtain proper storage container(s).
- Keep container tightly closed.
- Keep container in a cool, well-ventilated area.

- Keep away from heat and direct sunlight.

If the machine will exceed a four month shut down period:

1. Key OFF.

**NOTE:** Allow 2 – 5 min after Key OFF before disconnecting the batteries.

2. Drain the DEF/AdBLUE® tank.
3. Flush the tank with deionized water.
4. Drain the deionized water

**NOTICE:** Do not disconnect any electrical connections from the DEF/AdBLUE® system.

Machine start-up after extended shutdown:

1. Fill the DEF/AdBLUE® tank.
2. Replace the main filter in the supply module.
3. Start the machine.

#### Thawing

- Your MILLER machine is equipped with an internal tank heater to thaw frozen DEF/AdBLUE®. Your machine will still function until the DEF/AdBLUE® begins to flow. The SCR system will then function normally.

**NOTE:** You may notice a slight reduction in engine torque in high demand situations until the DEF/AdBLUE® is fully thawed.

- Do not heat DEF/AdBLUE® for long periods of time at temperatures above 30 °C (86 °F). This causes the solution to decompose, which very slowly decreases the expected shelf life.

**NOTICE:** Do not use an anti-gelling or freeze point improver in your DEF/AdBLUE®. The 32.5% solution is specifically designed to provide the optimum NOx reduction properties. Any further blending or adjusting of the DEF/AdBLUE® mixture will lessen its ability to perform correctly and may cause damage to the SCR components.

Handling and supply of additives, if any.

- Personal Protective Equipment (PPE) is not required under normal conditions. If splashing is likely, wear eye protection. For prolonged or repeated contact, impervious gloves are recommended. Follow the precautions listed in the SAFETY INFORMATION chapter when handling any service fluid.
- No additives are required.

**NOTICE:** Contaminated DEF/AdBLUE® can affect the performance of your machine. Follow all instructions in this manual when handling DEF/AdBLUE®.

#### Shelf life

Constant ambient storage temperature	Minimum shelf life
Less than or equal to 10 °C (50 °F)	36 months
Less than or equal to 25 °C (77 °F) <sup>1</sup>	18 months
Less than or equal to 30 °C (86 °F)	12 months
Less than or equal to 35 °C (95 °F)	6 months
Greater than 35 °C (95 °F)	<sup>2</sup>

<sup>1</sup> To prevent decomposition of DEF/AdBLUE®, prolonged transportation or storage above 25 °C (77 °F) should be avoided.

<sup>2</sup> Significant loss of shelf life: check every batch before use. See your MILLER dealer for more information on testing.

**NOTE:** The main factors taken into account to define the shelf life in the table above are the ambient storage temperature and the initial alkalinity of DEF/AdBLUE®. The difference in evaporation between vented and non-vented storage containers is an additional factor.

**NOTE:** The information in the Shelf life table is for reference only. Source: ISO 22241-3 Diesel engines - NOx reduction agent AUS 32 - Part 3: Handling, transportation and storage.

**NOTE:** DEF/AdBLUE® that remains in the tank of the machine after the season does not require any special precautions unless storage exceeds the shelf life table above.

## Disposal

- Dispose of **DEF/AdBLUE®** and any filter accumulations in accordance with all applicable Federal, State, and local laws governing waste disposal.

## Hydrocarbon management

If the engine is run at low idle speed for a prolonged period of time, hydrocarbons can accumulate in the SCR catalyst. To manage this accumulation, your machine will monitor current conditions and increase idle speed and/or activate the exhaust flap to increase the temperature inside the SCR catalyst and eliminate the hydrocarbons.

There are three messages that can be displayed to inform you that hydrocarbon management is active:

- Low Idle Increase Recommended - The engine control module desires to increase the engine speed when operating at lower temperatures or with lighter engine loads in order to elevate SCR temperatures.

**NOTE:** *This automatic engine idle speed increase is inhibited if certain features are active on the machine. For example: the transmission is in gear, the PTO is engaged, or the remote hydraulics are activated.*

- Low Idle Increase Active - The engine low idle speed has been increased to elevate exhaust temperatures in the SCR catalyst.
- SCR Catalyst Full - The SCR catalyst has become clogged with hydrocarbon accumulation.
  1. Place the machine in park and apply the hand brake (if equipped).
  2. Manually increase the engine speed to **1500 RPM** and allow the machine to run until the warning light turns off. Refer to the troubleshooting chapter in this manual for full details.

**NOTE:** *This procedure may take approximately 1 – 2 h to complete depending on the ambient air temperature.*

**NOTICE:** *Do not turn off the engine, drive the machine, or increase the load on the machine to reduce the possibility of damage to the catalyst.*

## US Environmental Protection Agency (EPA) Warranty Statement

FPT Industrial S.p.A. warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform with US Environmental Protection Agency (EPA) regulations applicable at the time of manufacture and that it is free from defects in workmanship or material which would cause it not to meet these regulations for a period of:

- 2 years or 1,500 hours of operation, whichever occurs first, for engines less than **19 kW (25 Hp)**
- 5 years or 3,000 hours of operation, whichever occurs first, for engines greater than or equal to **19 kW (25 Hp)**

**NOTE:** *This warranty applies to all units operated in the United States or Canada.*

## Coverage

The model year, class of diesel engine, and emission application determination for your engine are identified on the Emission Control Information Label. This label is affixed to one of the following areas of the engine: the top of engine's rocker arm cover, the right-hand side of the oil pan, and the right-hand side of the engine front gear cover. The warranty period begins on the date the new equipment is sold to the first retail purchaser. The presence of the emission control label is the indication that the engine conforms to the applicable standards. Any emission control system parts which are proven defective during normal use will be repaired or replaced during the warranty period.

The engine owner has responsibility to perform all the required maintenance listed in the Owner's Manual. FPT Industrial S.p.A. will not deny an emission warranty claim solely because no record of maintenance exists; however, a claim may be denied if failure to perform maintenance resulted in the failure of a warranted part.

It is recommended that replacement parts used for maintenance or repairs be FPT Industrial S.p.A. Service Parts to maintain the quality originally designed into your emission certified engine. The use of non- FPT Industrial S.p.A. parts does not invalidate the warranty on other components unless the use of such parts causes damage to warranted parts.

The manufacturer is liable for damages to other engine components caused by the failure of any warranted emission control system part. FPT Industrial S.p.A. is not responsible for failures resulting from improper repair or the use of parts that are not genuine FPT Industrial S.p.A. or FPT Industrial S.p.A. approved parts.

## Component coverage

New engines certified for sale and registered will have the following items covered by the emission warranty, depending on the emission level of the engine, if the items were first installed on the new engine as original equipment:

Fuel injection system	Exhaust after treatment Devices (if applicable)
• Fuel injection pump	• Diesel Oxidation Catalyst (DOC)
• Fuel injectors	• Diesel Particulate Filter (DPF)
• Fuel injection lines	• Selective Catalytic Reduction (SCR)
Air induction system	• Diesel Exhaust Fluid (DEF) tank and dispensing systems
• Intake manifold	Exhaust Gas Recirculation Systems (EGR)
• Turbocharger system (includes exhaust manifold)	• EGR valve assembly
• Charge air cooler	• EGR cooler
Positive Crankcase Ventilation (PCV) system (if applicable)	Cold Start Enrichment Systems
• PCV valve	Electronic Control Units, Sensors, Solenoids, and Wiring harnesses used in above systems
• Oil fill cap	

## Emissions warranty does not cover

- Repairs arising from storage deterioration, failure to maintain the equipment, negligence, alteration, improper use of the equipment, collision or other accident, vandalism, or other casualty, or operation beyond rated capacity or specification.
- Repairs arising from abuse or neglect, including but not limited to: operation without adequate coolant or lubricants, adjustments to the fuel system outside equipment specifications, over-speeding, improper storage, starting, warm-up, or shutdown practices, incorrect fuel or contaminated fuel, oil or other fluids.
- Normal maintenance services, such as engine tune-ups, engine fuel system cleaning, checks, adjustments, shimming, etc.
- Items replaced due to customer demand.
- Labor charges performed by anyone except a dealer authorized by contract to repair the equipment, unless they qualify under special provisions (i.e. outside labor).
- Any and all travel costs for items such as towing, service calls, or transporting a unit to and from the place where the warranty service is performed.
- Normal maintenance costs, including but not limited to: lubricants, coolants, fluids, fuel, filters, and associated labor. Lubricants, filters, and coolants may qualify for warranty reimbursement if they require replacement as a DIRECT RESULT of a defect in material or workmanship.
- Claims involving the inspection or reconditioning of units after storage or prior use.
- Repairs arising from service performed by agents not approved by MILLER.
- Repairs arising from any unauthorized modification to the product or the use of non- MILLER parts, implements or attachments.
- Removal, replacement, or installation of non- MILLER optional equipment, attachments or components.
- Premiums charged for overtime labor costs or out of shop expenses.
- Economic loss including lost profits, crop loss, equipment rental, or other expense.
- Unauthorized modification or updating machines without a warrantable failure.
- Any and all costs of dealer shop supplies incurred with repairs, including but not limited to: solvents, cleaners, anti-seize lubricants, loctite™, sealant, adhesive, oil-dry, shop towels, etc.
- Failure of the machine, its implements or attachments caused by improper field application or loading.
- Any and all costs for coolant, fuel, or lube (oil) analysis including supplies and lab recommendations.
- Cost associated with cleaning of machine in preparation for servicing.

## California Emission Control Warranty Statement

### Your warranty rights and obligations

California Air Resources Board and FPT Industrial S.p.A. are pleased to explain the emission control system warranty on 2015 through 2017 off-road diesel engines. In California, new heavy-duty off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. FPT Industrial S.p.A. must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, FPT Industrial S.p.A. will repair your heavy-duty off-road engine at no cost to you including diagnosis, parts and labor.

### MANUFACTURER'S WARRANTY COVERAGE:

The 2015-2017 heavy-duty off-road engines are warranted for 5 years or 3000 hours, whichever comes first. If any emission-related part on your engine is defective, the part will be repaired or replaced by FPT Industrial S.p.A.

### OWNER'S WARRANTY RESPONSIBILITIES:

- As the off-road engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. FPT Industrial S.p.A. recommends that you retain all receipts covering maintenance on your off-road engine, but MILLER cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the off-road engine owner, you should however be aware that FPT Industrial S.p.A. may deny you warranty coverage if your off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.
- Your engine is designed to operate on Ultra Low Sulfur Diesel fuel only. Use of any other fuel may result in your engine no longer operating in compliance with California's emissions requirements.
- You are responsible for initiating the warranty process. The ARB suggests that you present your off-road engine to a MILLER dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

If you have any questions regarding your warranty rights and responsibilities, you should contact NAFTA Technical Service Group at 1-630-481-2905 or email: [fpt-na-warranty@fptindustrial.com](mailto:fpt-na-warranty@fptindustrial.com).

### CALIFORNIA EMISSION CONTROL WARRANTY PARTS LIST

Fuel injection system:

- Fuel injection pump
- Fuel injectors
- Fuel injection lines

Air induction system:

- Intake manifold
- Turbocharger system (includes exhaust manifold)
- Charge air cooler

Positive Crankcase Ventilation (PCV) system (if applicable)

- PCV valve
- Oil fill cap

Exhaust after treatment Devices (if applicable)

- Diesel Oxidation Catalyst (DOC)
- Diesel Particulate Filter (DPF)
- Selective Catalytic Reduction (SCR)
- Diesel Exhaust Fluid (DEF) tank and dispensing systems

Exhaust Gas Recirculation Systems (EGR)

- EGR valve assembly
- EGR cooler

Cold Start Enrichment Systems

Electronic Control Units, Sensors, Solenoids, and Wiring harnesses used in above systems

Miscellaneous items used in above systems, such as hoses, belts, connectors, tubing, gaskets, and mounting hardware.

Emission Control Information Labels

## 2 - SAFETY INFORMATION

### Safety rules and signal word definitions

#### Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual and on machine safety signs, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

**!** DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

**!** WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

**!** CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

### FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

#### Machine safety

**NOTICE:** Notice indicates a situation that, if not avoided, could result in machine damage or property damage. The color associated with Notice is BLUE.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine damage or property damage. The word Notice is used to address practices not related to personal safety.

#### Information

**NOTE:** Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

## Safety rules

### General safety rules

Use caution when you operate the machine on slopes. Raised equipment, full tanks and other loads will change the center of gravity of the machine. The machine can tip or roll over when near ditches and embankments or uneven surfaces.

Never permit anyone other than the operator to ride on the machine.

Never operate the machine under the influence of alcohol or drugs, or while you are otherwise impaired.

When digging or using ground-engaging attachments, be aware of buried cables. Contact local utilities to determine the locations of services.

Pay attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety.

Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin, causing serious injury or infection.

- DO NOT use your hand to check for leaks. Use a piece of cardboard or paper.
- Stop the engine, remove the key, and relieve the pressure before you connect or disconnect fluid lines.
- Make sure that all components are in good condition. Tighten all connections before you start the engine or pressurize the system.
- If hydraulic fluid or diesel fuel penetrates the skin, seek medical attention immediately.
- Continuous long term contact with hydraulic fluid may cause skin cancer. Avoid long term contact and wash the skin promptly with soap and water.

Keep clear of moving parts. Loose clothing, jewelry, watches, long hair, and other loose or hanging items can become entangled in moving parts.

Wear protective equipment when appropriate.

DO NOT attempt to remove material from any part of the machine while it is being operated or while components are in motion.

Make sure that all guards and shields are in good condition and properly installed before you operate the machine. Never operate the machine with shields removed. Always close access doors or panels before you operate the machine.

Dirty or slippery steps, ladders, walkways, and platforms can cause falls. Make sure these surfaces remain clean and clear of debris.

A person or pet within the operating area of a machine can be struck or crushed by the machine or its equipment. DO NOT allow anyone to enter the work area.

Raised equipment and/or loads can fall unexpectedly and crush persons underneath. Never allow anyone to enter the area underneath raised equipment during operation.

Never operate the engine in enclosed spaces as harmful exhaust gases may build up.

Before you start the machine, be sure that all controls are in neutral or park lock position.

Start the engine only from the operator's seat. If you bypass the safety start switch, the engine can start with the transmission in gear. Do not connect or short across terminals on the starter solenoid. Attach jumper cables as described in the manual. Starting in gear may cause death or serious injury.

Always keep windows, mirrors, all lighting, and Slow-Moving Vehicle (SMV) emblem clean to provide the best possible visibility while you operate the machine.

Operate controls only when seated in the operator's seat, except for those controls expressly intended for use from other locations.



Before you leave the machine:

1. Park the machine on a firm, level surface.
2. Put all controls in neutral or park lock position. Refer to **4-7**
3. Engage the parking brake. Use wheel chocks if required. Refer to **4-30**
4. Fold and store the booms into their cradles. Refer to **3-13** for boom operation information.
5. Turn off the engine and remove the key. Refer to **4-7**

When, due to exceptional circumstances, you would decide to keep the engine running after you leave the operator's station, then you must follow these precautions:

### **General maintenance safety**

Keep the area used for servicing the machine clean and dry. Clean up spilled fluids.

Service the machine on a firm, level surface.

Install guards and shields after you service the machine.

Close all access doors and install all panels after servicing the machine.

Do not attempt to clean, lubricate, clear obstructions, or make adjustments to the machine while it is in motion or while the engine is running.

Always make sure that working area is clear of tools, parts, other persons and pets before you start operating the machine.

Unsupported hydraulic cylinders can lose pressure and drop the equipment, causing a crushing hazard. Do not leave equipment in a raised position while parked or during service, unless the equipment is securely supported.

Do not attempt to jack or lift the machine. Contact your dealer for the correct jacking instructions.

Do not attempt to tow your vehicle. Contact your dealer for correct towing instructions.

### **Wheels and tires**

Make sure that tires are correctly inflated. Do not exceed any recommended load or pressure. Follow the instructions in the manual for proper tire inflation.

Tires are heavy. Handling tires without proper equipment could cause death or serious injury.

Never weld on a wheel with a tire installed. Always remove the tire completely from the wheel prior to welding.

Always have a qualified tire technician service the tires and wheels. If a tire has lost all pressure, take the tire and

1. Bring the engine to low idle speed.
2. Disengage all drive systems.

### 3. **WARNING**

**Some components may continue to run down after you disengage drive systems. Make sure all drive systems are fully disengaged. Failure to comply could result in death or serious injury.**

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Shift the transmission into neutral.

4. Apply the parking brake.

Stop the engine, remove the key, and relieve pressure before you connect or disconnect fluid lines.

Stop the engine and remove the key before you connect or disconnect electrical connections.

Scalding can result from incorrect removal of coolant caps. Cooling systems operate under pressure. Hot coolant can spray out if you remove a cap while the system is hot. Allow the system to cool before you remove the cap. When you remove the cap, turn it slowly to allow pressure to escape before you completely remove the cap.

Replace damaged or worn tubes, hoses, electrical wiring, etc.

The engine, transmission, exhaust components, and hydraulic lines may become hot during operation. Take care when you service such components. Allow surfaces to cool before you handle or disconnect hot components. Wear protective equipment when appropriate.

Do not weld on the vehicle without first contacting your dealer. Your dealer will have specific welding instructions. When welding, always disconnect the battery before you weld on the machine. Always wash your hands after you handle battery components.

wheel to a tire shop or your dealer for service. Explosive separation of the tire can cause serious injury.

DO NOT weld to a wheel or rim until the tire is completely removed. Inflated tires can generate a gas mixture with the air that can be ignited by high temperatures from welding procedures performed on the wheel or rim. Removing the air or loosening the tire on the rim (breaking the bead) will NOT eliminate the hazard. This condition can exist whether tires are inflated or deflated. The tire **MUST** be completely removed from the wheel or rim prior to welding the wheel or rim.

## **⚠ Driving on public roads and general transportation safety ⚠**

Comply with local laws and regulations.

Use appropriate lighting to meet local regulations.

Make sure that the SMV emblem is visible.

Use safety chains for trailed equipment when safety chains are provided with machine or equipment.

Lift implements and attachments high enough above ground to prevent accidental contact with road.

When you transport equipment or a machine on a transport trailer, make sure that it is properly secured. Be sure the SMV on the equipment or machine is covered while being transported on a trailer.

Be aware of overhead structures or power lines and make sure that the machine and/or attachments can pass safely under.

Travel speed should be such that you maintain complete control and machine stability at all times.

Slow down and signal before turning.

Pull over to allow faster traffic to pass.

Follow correct towing procedure for equipment with or without brakes.

## **⚠ Fire and explosion prevention ⚠**

Fuel or oil that is leaked or spilled on hot surfaces or electrical components can cause a fire.

Crop materials, trash, debris, bird nests, or flammable material can ignite on hot surfaces.

Always have a fire extinguisher on or near the machine.

Make sure that the fire extinguisher(s) is maintained and serviced according to the manufacturer's instructions.

At least once each day and at the end of the day, remove all trash and debris from the machine especially around hot components such as the engine, transmission, exhaust, battery, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

At least once each day, remove debris accumulation around moving components such as bearings, pulleys,

belts, gears, cleaning fans, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

Inspect the electrical system for loose connections and frayed insulation. Repair or replace loose or damaged parts.

Do not store oily rags or other flammable material on the machine.

Do not weld or flame cut any items that contain flammable material. Clean items thoroughly with non-flammable solvents before welding or flame-cutting.

Do not expose the machine to flames, burning brush, or explosives.

Promptly investigate any unusual smells or odors that may occur during operation of the machine.

## **⚠ General battery safety ⚠**

Always wear eye protection when you work with batteries.

Do not create sparks or have open flame near a battery.

Ventilate the area when you charge a battery or use a battery in an enclosed area.

Disconnect the negative (-) terminal first and reconnect the negative (-) terminal last.

When you weld on the machine, disconnect both terminals of the battery.

Do not weld, grind, or smoke near a battery.

When you use auxiliary batteries or connect jumper cables to start the engine, use the procedure shown in the operator's manual. Do not short across terminals.

Follow the manufacturer's instructions when you store and handle batteries.

Battery post, terminals, and related accessories contain lead and lead compounds. Wash hands after handling. This is a California Proposition 65 warning.

Battery acid causes burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Keep out of reach of children and other unauthorized persons.

### **Instructional seat safety**

Passengers are not permitted to ride on the machine.

The instructional seat is to be used only when training a new operator or when a service technician is diagnosing a problem.

When required for the purposes of training or diagnostics, only one person may accompany the operator and that person must be seated in the instructional seat.

When the instructional seat is occupied, the following precautions must be followed:

- Machine should be driven only at slow speeds and over level ground.
- Avoid driving on highways or public roads.
- Avoid quick starts or stops.
- Avoid sharp turns.
- Always wear correctly adjusted seat belts.
- Keep door closed at all times.

### **Operator presence system**

Your machine is equipped with an operator presence system to prevent the use of some features while the operator is not in the operator's seat.

If the operator presence system is inoperable, then it must be repaired.

Never disconnect or bypass the operator presence system.

### **Reflectors and warning lights**

Turn on the hazard lights, rotating beacon and the road lights before entering onto a public road. Keep them on while traveling on the road.

### **Seat belts**

Seat belts must be worn at all times.

Seat belt inspection and maintenance:

- Keep seat belts in good condition.
- Keep sharp edges and items that can cause damage away from the belts.
- Periodically check belts, buckles, retractors, tethers, slack take-up system, and mounting bolts for damage and wear.
- Replace all parts that have damage or wear.
- Replace belts that have cuts that can make the belt weak.
- Check that bolts are tight on the seat bracket or mounting.
- If the belt is attached to the seat, make sure that the seat or seat brackets are mounted securely.
- Keep seat belts clean and dry.
- Clean belts only with soap solution and warm water.
- Do not use bleach or dye on the belts because this can make the belts weak.

## **Operator protective structure**

Your machine is equipped with an operator protective structure, such as: a Roll Over Protective Structure (ROPS), Falling Objects Protective Structure (FOPS), or a cab with a ROPS. A ROPS may be a can frame or a two-posted or four-posted structure used for the protection of the operator to minimize the possibility of serious injury. The mounting structure and fasteners forming the mounting connection with the machine are part of the ROPS.

The protective structure is a special safety component of your machine.

DO NOT attach any device to the protective structure for pulling purposes. DO NOT drill holes to the protective structure.

The protective structure and interconnecting components are a certified system. Any damage, fire, corrosion, or modification will weaken the structure and reduce your protection. If this occurs, THE PROTECTIVE STRUCTURE MUST BE REPLACED so that it will provide the same protection as a new protective structure. Contact your dealer for protective structure inspection and replacement.

## **Air-conditioning system**

The air-conditioning system is under high pressure. Do not disconnect any lines. The release of high pressure can cause serious injury.

## **Backup alarm system**

A backup alarm will sound when the joystick control is placed into the reverse direction, and the vehicle backup lights will illuminate.

## **Personal Protective Equipment (PPE)**

Wear Personal Protective Equipment (PPE) such as hard hat, eye protection, heavy gloves, hearing protection, protective clothing, etc.

## **Do Not Operate tag**

Before you start servicing the machine, attach a 'Do Not Operate' warning tag to the machine in an area that will be visible.

## **Hazardous chemicals**

If you are exposed to or come in contact with hazardous chemicals you can be seriously injured. The fluids, lubricants, paints, adhesives, coolant, etc. required for the function of your machine can be hazardous. They may

After an accident, fire, tip over, or roll over, the following MUST be performed by a qualified technician before returning the machine to field or job-site operations:

- The protective structure MUST BE REPLACED.
- The mounting or suspension for the protective structure, operator's seat and suspension, seat belts and mounting components, and wiring within the operator's protective system MUST be carefully inspected for damage.
- All damaged parts MUST BE REPLACED.

DO NOT WELD, DRILL HOLES, ATTEMPT TO STRAIGHTEN, OR REPAIR THE PROTECTIVE STRUCTURE. MODIFICATION IN ANY WAY CAN REDUCE THE STRUCTURAL INTEGRITY OF THE STRUCTURE, WHICH COULD CAUSE DEATH OR SERIOUS INJURY IN THE EVENT OF FIRE, TIP OVER, ROLL OVER, COLLISION, OR ACCIDENT.

Seat belts are part of your protective system and must be worn at all times. The operator must be held to the seat inside the frame in order for the protective system to work.

The air-conditioning system contains gases that are harmful to the environment when released into the atmosphere. Do not attempt to service or repair the system.

Only trained service technicians can service, repair, or recharge the air-conditioning system.

be attractive and harmful to domestic animals as well as humans.

Material Safety Data Sheets (MSDS) provide information about the chemical substances within a product, safe

handling and storage procedures, first aid measures, and procedures to take in the event of a spill or accidental release. MSDS are available from your dealer.

Before you service your machine check the MSDS for each lubricant, fluid, etc. used in this machine. This information indicates the associated risks and will help you service the machine safely. Follow the information in the MSDS, and on manufacturer containers, as well as the information in this manual, when you service the machine.

Dispose of all fluids, filters, and containers in an environmentally safe manner according to local laws and regula-

### **Utility safety**

When digging or using ground-engaging equipment, be aware of buried cables and other services. Contact your local utilities or authorities, as appropriate, to determine the locations of services.

Make sure that the machine has sufficient clearance to pass in all directions. Pay special attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety. Contact local authorities or utilities to obtain safe clearance distances from high voltage power lines.

Retract raised or extended components, if necessary. Remove or lower radio antennas or other accessories. Should a contact between the machine and an electric

### **Electrical storm safety**

Do not operate machine during an electrical storm.

If you are on the ground during an electrical storm, stay away from machinery and equipment. Seek shelter in a permanent, protected structure.

### **Mounting and dismounting**

Mount and dismount the machine only at designated locations that have handholds, steps, and/or ladders.

Do not jump off of the machine.

Make sure that steps, ladders, and platforms remain clean and clear of debris and foreign substances. Injury may result from slippery surfaces.

Face the machine when you mount and dismount the machine.

### **Working at heights**

When the normal use and maintenance of the machine requires you to work at heights:

- Correctly use installed steps, ladders, and railings.
- Never use ladders, steps, or railings while the machine is moving.

tions. Check with local environmental and recycling centers or your dealer for correct disposal information.

Store fluids and filters in accordance with local laws and regulations. Use only appropriate containers for the storage of chemicals or petrochemical substances.

Keep out of reach of children or other unauthorized persons.

Applied chemicals require additional precautions. Obtain complete information from the manufacturer or distributor of the chemicals before you use them.

power source occur, the following precautions must be taken:

- Stop the machine movement immediately.
- Apply the parking brake, stop the engine, and remove the key.
- Check if you can safely leave the cab or your actual position without contact with electrical wires. If not, stay in your position and call for help. If you can leave your position without touching lines, jump clear of the machine to make sure that you do not make contact with the ground and the machine at the same time.
- Do not permit anyone to touch the machine until power has been shut off to the power lines.

If an electrical storm should strike during operation, remain in the cab. Do not leave the cab or operator's platform. Do not make contact with the ground or objects outside the machine.

Maintain a three-point contact with steps, ladders, and handholds.

Never mount or dismount from a moving machine.

Do not use the steering wheel or other controls or accessories as handholds when you enter or exit the cab or operator's platform.

Do not stand on surfaces that are not designated as steps or platforms.

Do not use the machine as a lift, ladder, or platform for working at heights.

## Proposition 65

**CALIFORNIA  
PROPOSITION 65 WARNING**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

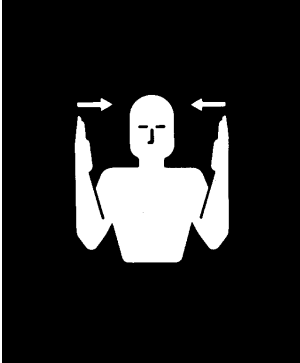
Battery post, terminals and related accessories contain lead and lead compounds.

**Wash hands after handling**

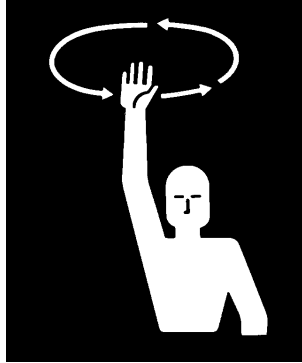
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## Hand signals

It is often necessary to communicate using hand signals in agricultural operations when noise or distance inhibit communication by voice. These hand signals, adopted by **ASAE S351** provide an easy means of communication, particularly in the interest of safety.



**THIS FAR TO GO** - Place palms at ear level facing head and move laterally inward to indicate remaining distance to go.



**COME TO ME** - Raise the arm vertically overhead, palm to the front, and rotate in large horizontal circles.



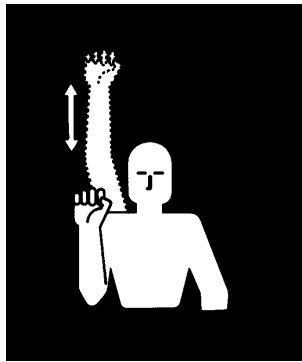
**MOVE TOWARD ME, FOLLOW ME** - Point toward person(s), vehicle(s), or unit(s), beckon by holding the arm horizontally to the front, palm up, and motioning toward the body.



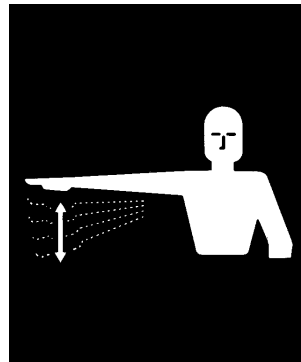
**MOVE OUT, TAKE OFF** - Face the desired direction of movement; hold the arm extended to the rear; then swing it overhead and forward in the direction of desired movement until it is horizontal, palm down.



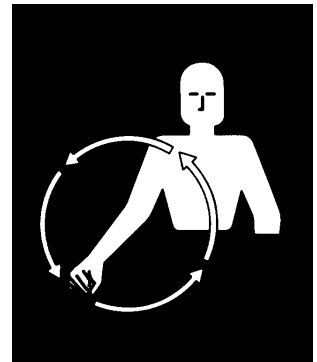
**STOP** - Raise hand upward to the full extent of the arm, palm to the front. Hold that position until the signal is understood.



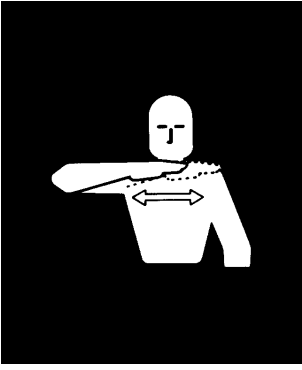
**SPEED IT UP, INCREASE SPEED** - Raise the hand to the shoulder, fist closed; thrust the fist upward to the full extent of the arm and back to the shoulder rapidly several times.



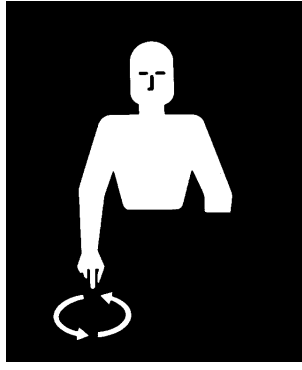
**SLOW IT DOWN, DECREASE SPEED** - Extend the arm horizontally sideward, palm down, and wave arm downward 45 degree minimum several times, keeping the arm straight. Do not move arm above horizontal.



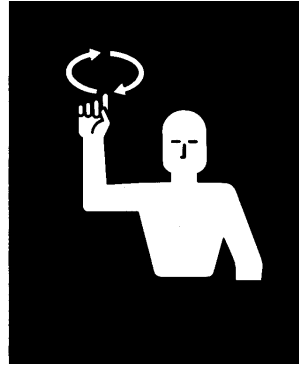
**START THE ENGINE** - Simulate cranking of vehicles by moving arm in circular motion at waist level.



STOP THE ENGINE - Draw right hand, palm down, across the neck in a "throat cutting" motion from left to right.



LOWER EQUIPMENT - Make circular motion with either hand pointing to the ground.



RAISE EQUIPMENT - Make circular motion with either hand at head level.



## Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

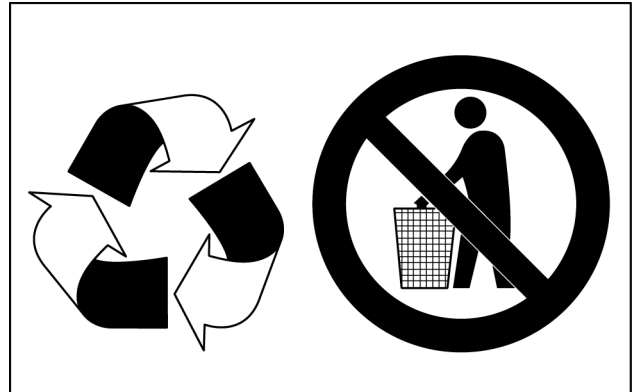
Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances. Your MILLER dealer can also provide assistance.

### Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your MILLER dealer or air-conditioning specialist has a special extractor for this purpose and can recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.

### Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. MILLER strongly recommends that you return all used batteries to a MILLER dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



NHIL14GEN0038AA 1

### Mandatory battery recycling

**NOTE:** The following requirements are mandatory in Brazil.

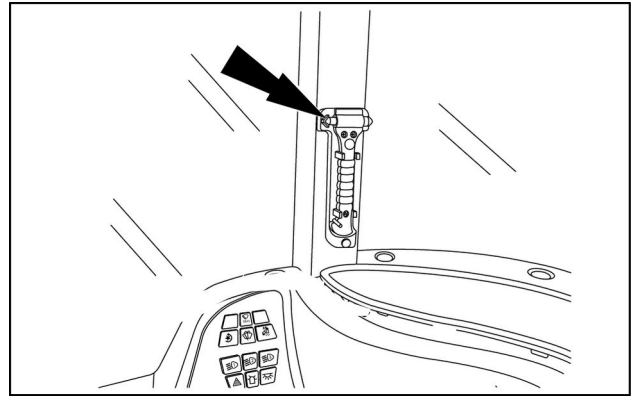
Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

## Emergency exit hammer

An emergency exit hammer is supplied with your machine. The emergency exit hammer is located on the right-hand side pillar. Use the hammer to break the right-hand side cab window glass in order to escape the vehicle in case of an emergency. Once the window is broken, exit through the opening. Contact your dealer for a replacement window.



RAIL17SP00259AA 1

## **Safety rules - Boom operation**

Read and exercise the following safety procedures when folding or unfolding booms.

The operator must:

- Be alert and aware of surroundings. Note any overhead power lines, trees or bystanders.
- Remain in complete control of the machine at all times.
- Only fold or unfold booms on private property without public access. Do not fold or unfold booms on any public thoroughfare or main road.
- Maintain a safe operating distance. Bystanders must be well outside of the machine's path while folding or unfolding booms. The operator is responsible for discontinuing fold or unfold operation when the safe working distance has diminished.
- The vehicle must be stationary (not moving forward or reverse) before attempting to and during unfolding or folding of the booms.

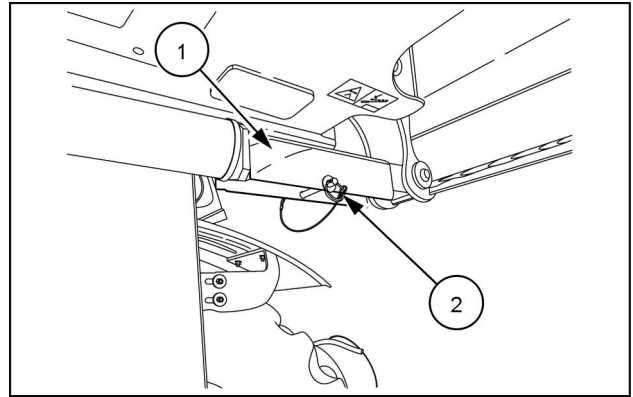
## Boom lift cylinder safety stops

### Safety stops installed

The boom lift cylinder safety stops **(1)** prevent the boom from lowering during transport or during extended periods of storage. The safety stops are attached to each lift cylinder located on the front of the machine.

Install the safety stop. Attach the safety stop onto the cylinder rod from the top side of the rod. Be sure the safety stop is positioned with the arrow pointing forward and the tab is positioned to the top side of the clevis.

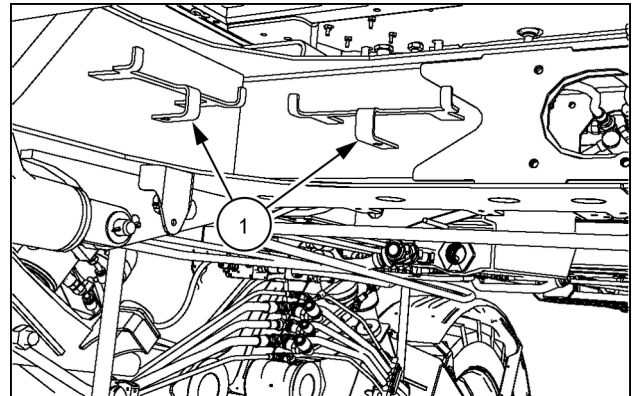
Secure the safety stop in place with the clevis pin **(2)**. Repeat the attaching process for the opposite boom lift cylinder.



RAIL17SP00225AA 1

When the boom lift cylinder safety stops are not in use, store the safety stops inside the cab away from any glass. Reinsert the pins into the safety stops when placing into storage.

The safety stops may also be stored on the storage brackets **(1)** located on the frame, under the cab. Place the cylinder stop onto the bracket and pin in place.



RAIL17SP01385AA 2

## Safety signs

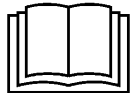
The following safety signs are on your machine as a guide for your safety and for the safety of those working with you. Walk around the machine and note the content and the location of all safety signs before you operate your machine.

Keep all safety signs clean and legible. Clean safety signs with a soft cloth, water, and gentle detergent.

**NOTICE:** Do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove safety signs.

Replace all safety signs that are damaged, missing, painted over, or illegible. If a safety sign is on a part you or your dealer replaces, make sure that you or your dealer install the safety sign on the new part. See your dealer for replacement safety signs.

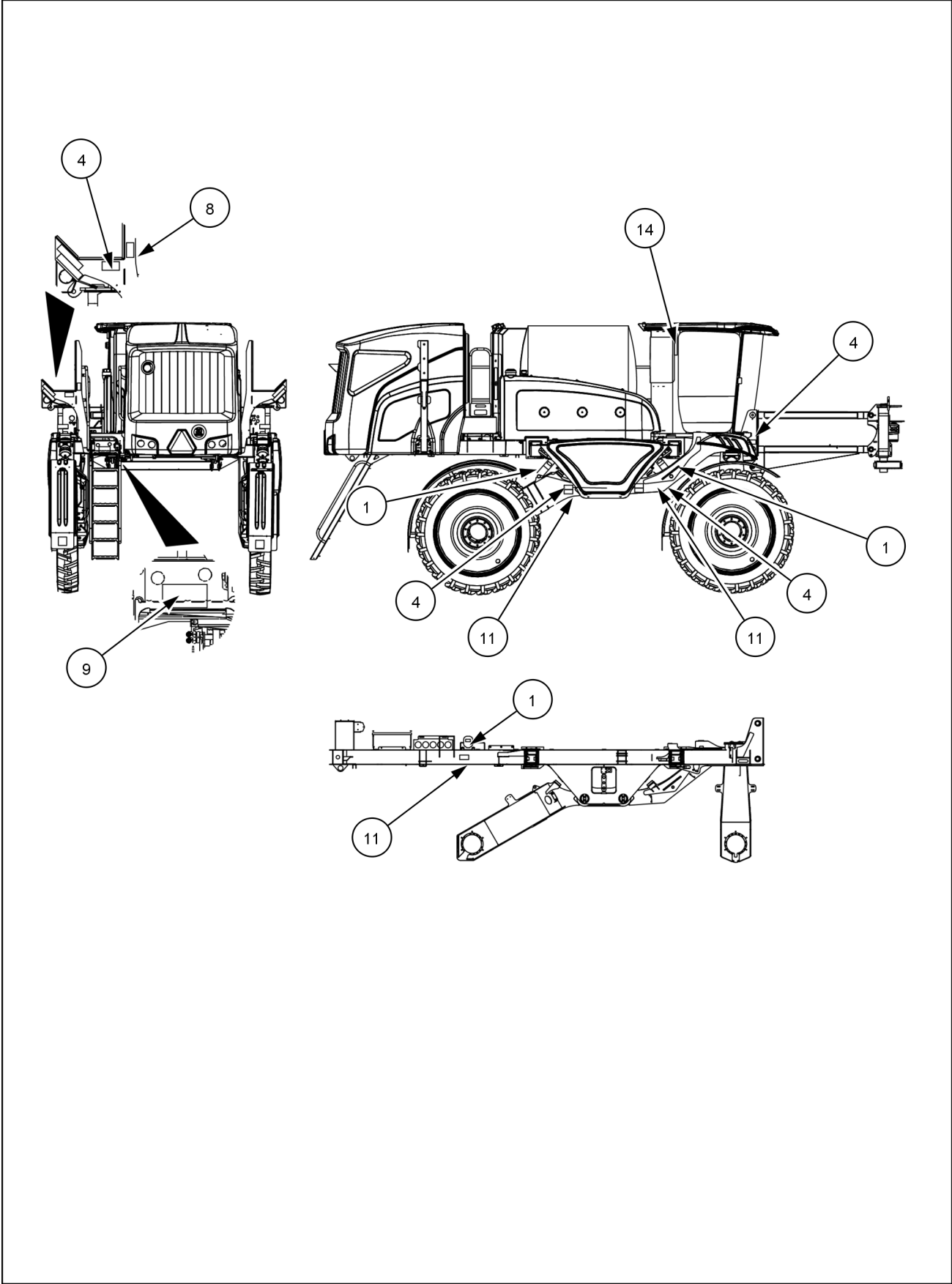
Safety signs that display the “Read operator’s manual” symbol direct you to the operator’s manual for further information regarding maintenance, adjustments, or procedures for particular areas of the machine. When a safety sign displays this symbol, consult the appropriate page of the operator’s manual.



Safety signs that display the “Read service manual” symbol direct you to the service manual. If you doubt your ability to perform service operations, contact your dealer.

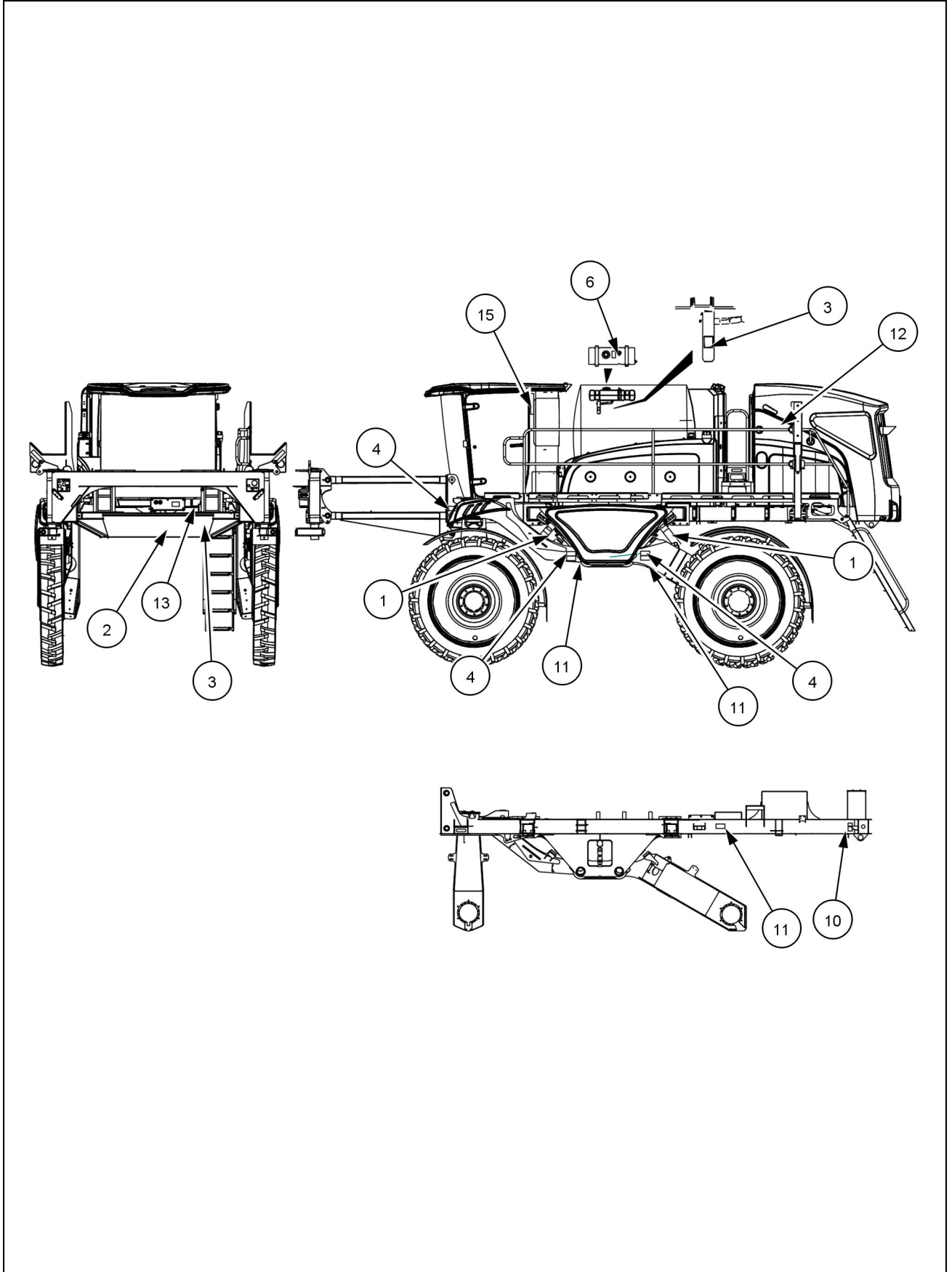


Right-hand side and rear view

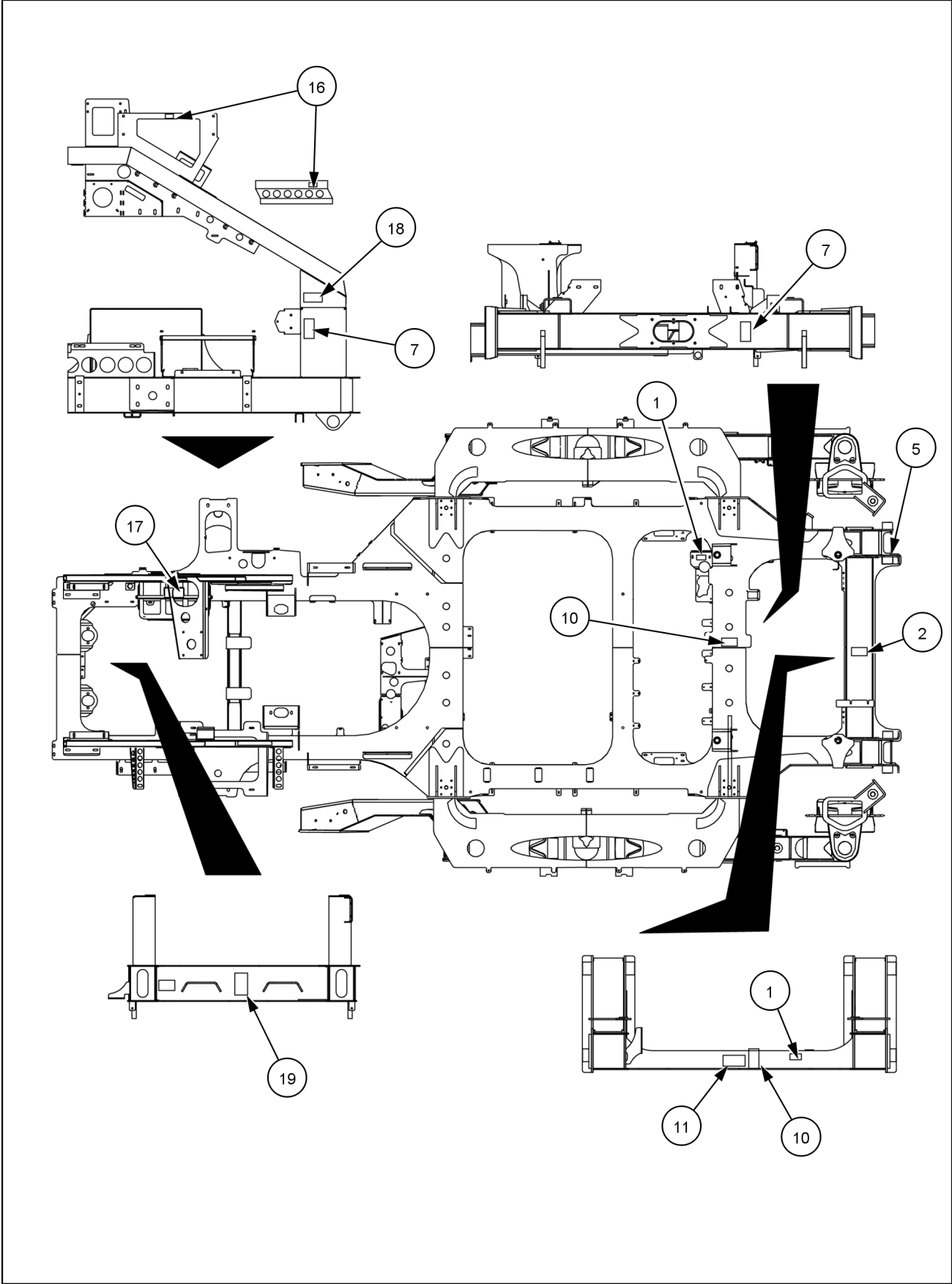


RAIL17SP00711HA 1

Left-hand side and front view



Frame (shown from top)



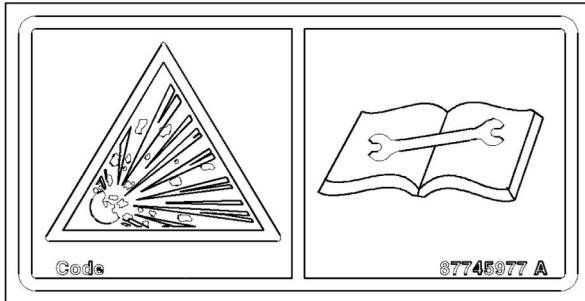


**Safety sign 1 — 87745977  
Accumulator warning**

**Located on backside of front cross member under cab.**

**Located on bottom of frame on second cross member toward left-hand side.**

**Located on front and rear suspension cylinders.  
Located on left-hand side frame rail to the rear of the engine end slider.  
(quantity 7)**



87745977 4

**WARNING**

Avoid bodily injuries from hydraulic oil and gas under pressure.

Before removing or charging accumulator

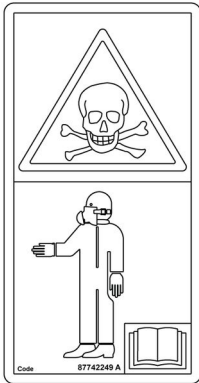
1. Start engine.
2. Relieve the pressure in the circuit by collapsing the cylinder and holding the valve open for 5 seconds.
3. Stop the engine.

Use only DRY NITROGEN for charging accumulator.

Failure to comply could result in death or serious injury.

**Safety sign 2 — 87742249**  
**Chemical warning**

**One located on bottom side of frame on cross member just below front of cab, readable from front side of frame next to chemical eductor.**  
**One located on lid of chemical eductor.**  
**(quantity 2)**



87742249 5

**WARNING**

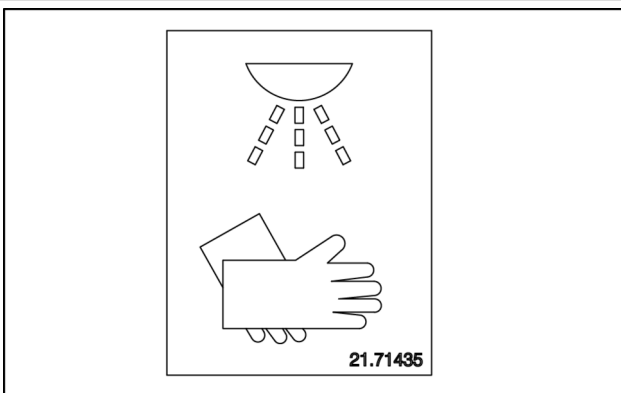
Agricultural chemicals are toxic. Chemicals not safely used, handled, stored and disposed of can cause serious injury or death or harm to the environment.

- Wear protective clothing and equipment.
- It is your responsibility to choose the best chemical for your application.
- Read, understand, and follow the chemical manufacturer's label.
- Contact your chemical supplier, county extension agent or other qualified person if you have questions on chemical usage.

Failure to comply could result in death or serious injury.

**Safety sign 3 — 21.71435**  
**Hand rinse**

**Located below hand rinse tank on side of product tank.**  
**Located next to hand rinse valve on eductor fast fill door**  
**(quantity 2)**

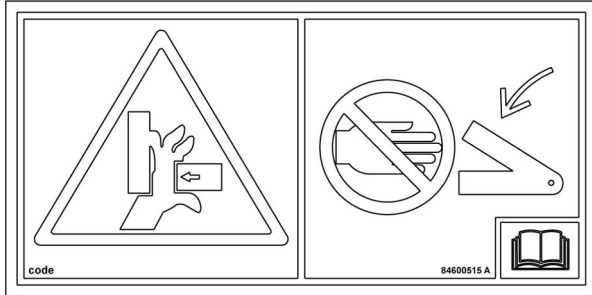


RAIL17SP01311AA 6

Hand rinse only. Do not drink

**Safety sign 4— 84600515**  
**Pinch point danger**

**Located on outside surface of each front and rear suspension legs**  
**Located at each lift arm connection point to frame.**  
**Located on left-hand side boom cradle rear side.**  
**(quantity 7)**



84600515 7

**DANGER**

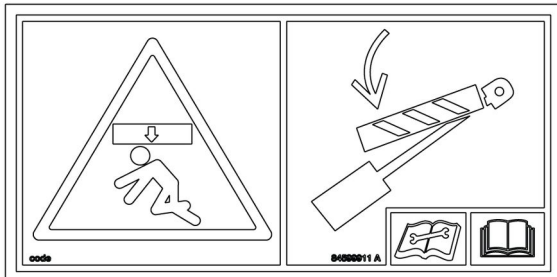
**Pinch hazard**

Keep your hands, feet, and body clear of all moving parts and oscillating points.

Failure to comply will result in death or serious injury.

**Safety sign 5 — 84599911**  
**Cylinder stop warning**

**Located on bottom side of frame just to the inside of the left-hand lift arm mount.**  
**(quantity 1)**



84599911 8

**WARNING**

**Crushing hazard**

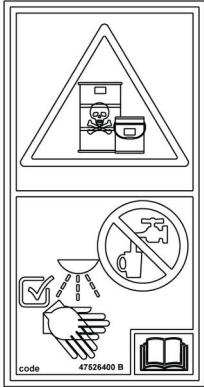
Boom may drop suddenly without warning.

Always install the cylinder stops to hold the boom in the raised position during storage, transport and service.

Failure to comply could result in death or serious injury.

**Safety sign 6— 47526400**  
**Fresh water tank warning**

**Located near fill of fresh water tank mounted on the left-hand side of the product tank to the rear of the cab.  
(quantity 1)**



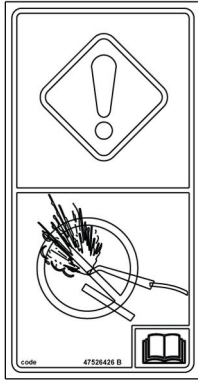
47526400 9

**WARNING**

- No chemicals
- Do not drink,  
for hand washing only
- Contaminated water consumption  
could cause injury or death
- Failure to comply could result in death or serious injury.

**Safety sign 7— 47526426**  
**Before welding**

**Located on front side of cross member below cab.  
Located on engine frame upright near the batteries.  
(quantity 2)**



47526426 10

**IMPORTANT**

Avoid machine damage  
Disconnect both positive and negative battery cables  
before welding on vehicle. Attach ground cable of welder  
no more than 2 feet from part being welded. Do Not weld  
on engine or engine mounted components.

**Safety sign 8— 84004732**  
**No riders**

**Located on upright of left-hand side boom cradle  
back stop to the rear of machine.**  
**(quantity 1)**

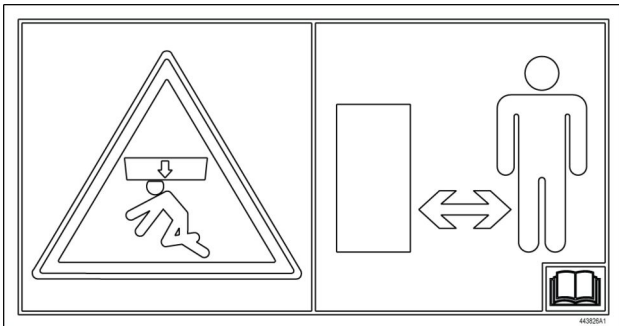


84004732 11

**DANGER**  
Fall hazard!  
No riders are permitted on walkways or ladders.  
Failure to comply will result in death or serious injury.

**Safety sign 9 — 443826A1**  
**Ladder crushing hazard**

**Located on plate just to the front of the ladder pivot  
area under walkway.**  
**(quantity 1)**

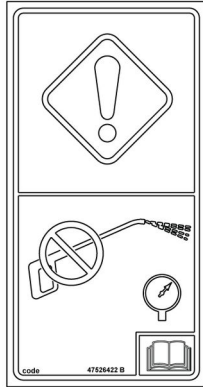


443826A1 12

**CAUTION**  
Ladder may move suddenly without warning. Stand clear  
of ladder swing path.  
Failure to comply could result in minor or moderate injury.

**Safety sign 10 — 47526422**  
**Pressure wash**

Located on front of cross member under cab between lift arm mounts.  
 Located on bottom side of frame centered under cab.  
 Located on outside of rear right frame rail under engine compartment..  
 (quantity 3)



47526422 13

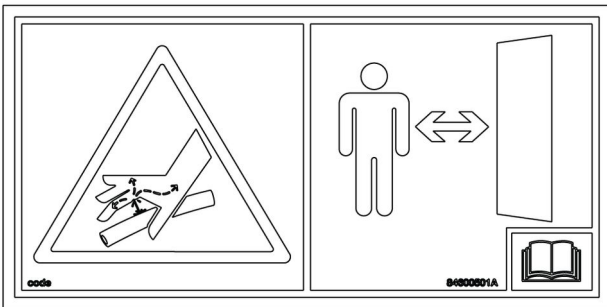
**IMPORTANT**

Avoid machine damage

Do not high pressure wash these components. Use normal water pressure of less than **345 kPa (50 psi)**

**Safety sign 11 — 84600501**  
**High pressure oil penetration warning**

Located on the outside edge of each front and rear suspension leg.  
 Located on rear side of front cross member between the lift arm mounts  
 Located on each frame rail above the rear suspension legs.  
 (quantity 7)



84600501 14

**WARNING**

Avoid high pressure fluids

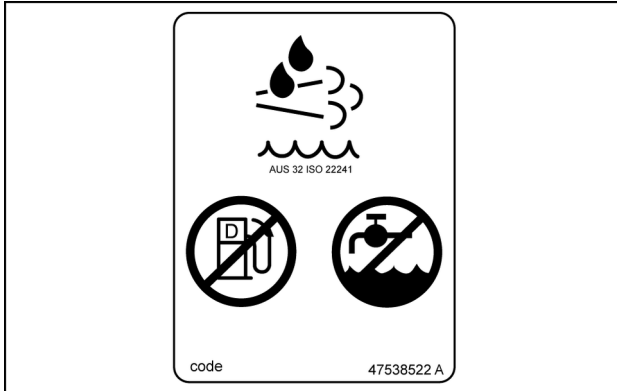
Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

Failure to comply could result in death or serious injury.

**Safety sign 12—47538522  
DEF only decal**

**Located on the outer surface left-hand side of the engine compartment hood. Decal located next to the DEF filler cap (quantity 1)**

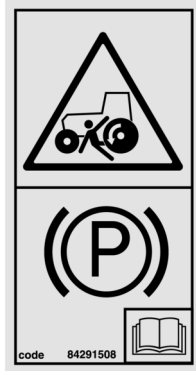


47538522 15

Only fill the DEF/AdBlue® tank with approved DEF/AdBlue® solution.  
Do not fill with diesel fuel or water.  
Refer to the Operator's Manual.

**Safety sign 13 —84291508  
Park brake engage**

**Located on panel near fast fills and chemical eductor (quantity 1)**

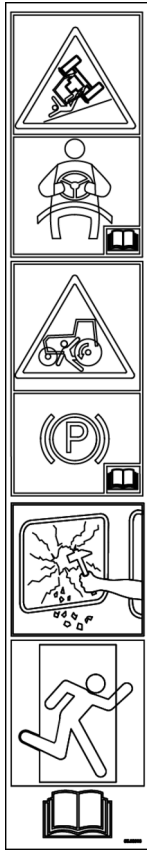


84291508 16

**WARNING**  
Run over hazard.  
Place the hydraulic control in the neutral position and engage the park brake before filling the liquid tanks.  
Failure to comply could result in death or serious injury.

Safety sign 14 — 35.03616  
Operator warnings cab interior right-hand side

Located inside cab on right side cab pillar to the rear  
of right side window  
(quantity 1)



RAIL17SP00713BA 17

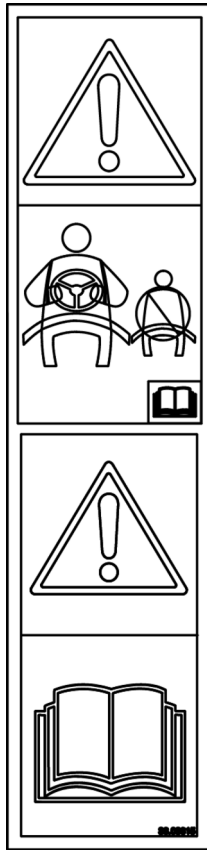
**WARNING**

Tip-over hazard. Always wear seat belt  
Only start engine from operators seat with park brake  
engaged.  
Emergency exit. break glass to exit.  
Failure to comply could result in death or serious injury.



**Safety sign 15 — 35.03615**  
**Operator warnings cab interior left-hand side**

**Located inside cab on left-hand side cab pillar to the rear of cab door.**  
**(quantity 1)**

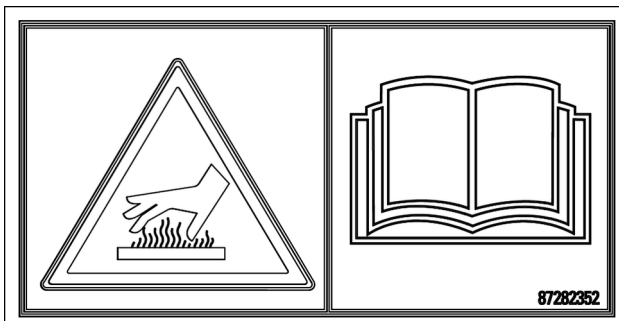


RAIL17SP00714BA 18

**WARNING**  
Always wear seat belt when operating machine.  
Read operator's manual  
Failure to comply could result in death or serious injury.

**Safety sign 16— 87282352**  
**Hot surface**

**Located on engine frame just below exhaust.**  
**Located on engine frame horizontal plate above batteries.**  
**(quantity 2)**

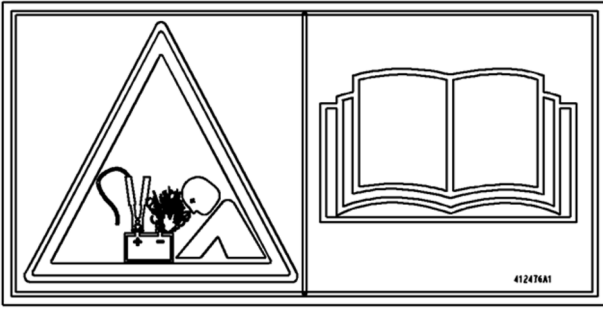


RAIL14SP01270AA 19

**WARNING**  
Hot surface  
Avoid severe burns. Do not contact muffler or exhaust components.  
Read operator's manual  
Failure to comply could result in death or serious injury.

**Safety sign 17— 412476A1  
Battery explosion warnings**

**Located on frame rail near batteries.  
(quantity 1)**

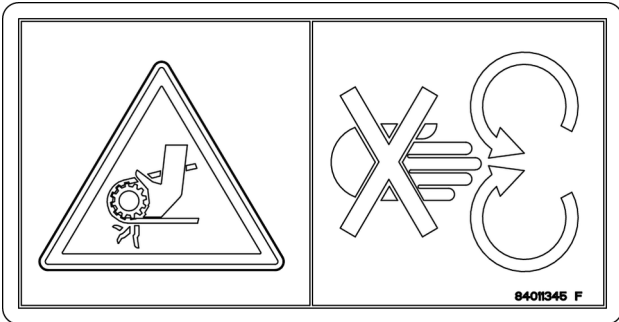


RAIL14SP01271AA 20

**WARNING**  
Explosion hazard  
Do not smoke or use open flame near battery.  
Failure to comply could result in death or serious injury.

**Safety sign 18— 84011345  
Entangle warning**

**Located on left-hand side of engine frame upright  
plate.  
(quantity 1)**

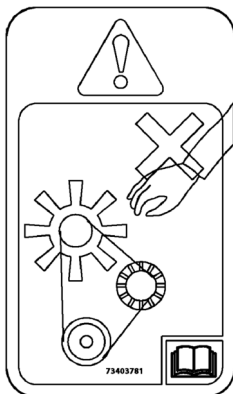


RAIL14SP01269AA 21

**WARNING**  
Shield is off or open.  
Replace or close shield before operating.  
Failure to comply could result in death or serious injury

**Safety sign 19— 73403781  
Fan warning**

**Located on rear cross member just below engine  
pulleys readable from underside.  
(quantity 1)**



RAIL14SP01272AA 22

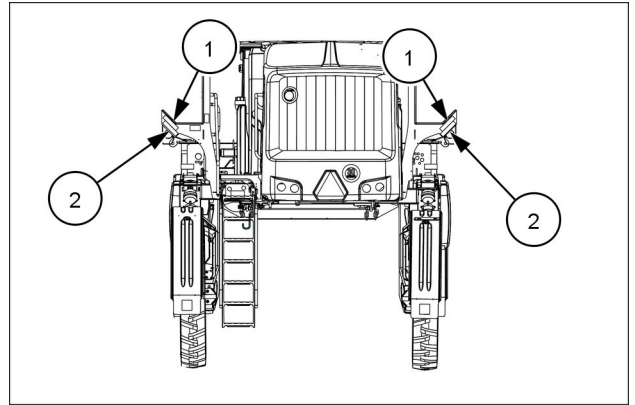
**WARNING**  
Avoid injury from rotating fan.  
Shut off engine and remove key before opening hood.  
Failure to comply could result in death or serious injury.

### Reflective decals

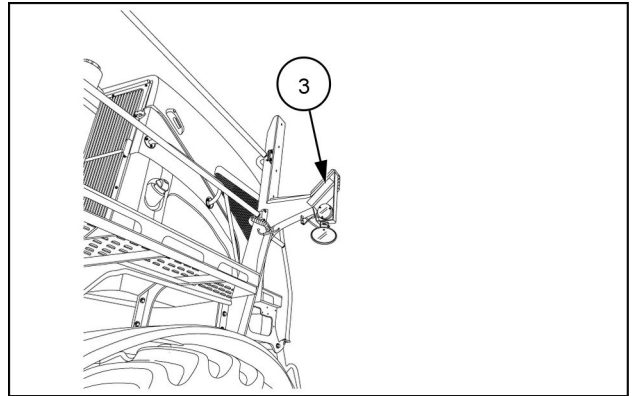
907219 (quantity 2)  
decals — red retroreflective (1)  
left-hand and right-hand sides shown

907221 (quantity 2)  
decals — orange fluorescent (2)  
left-hand and right-hand sides shown

907220 (quantity 2)  
decals — yellow retroreflective (3)  
left-hand side shown (front side of boom saddle)



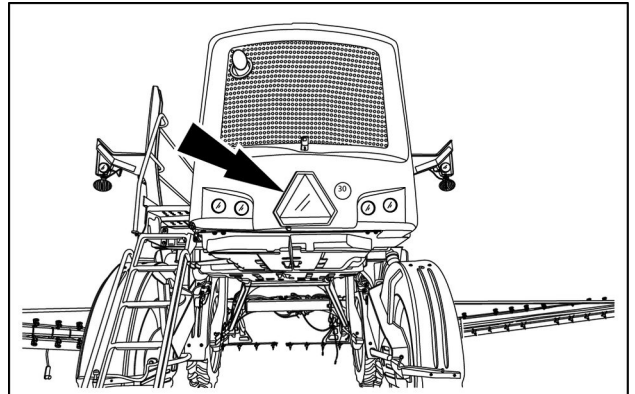
RAIL17SP00705FA 23



RAIL17SP00239AA 24

### SMV (Slow Moving Vehicle) emblem

907225 (quantity 1)  
Attached to the rear of the vehicle

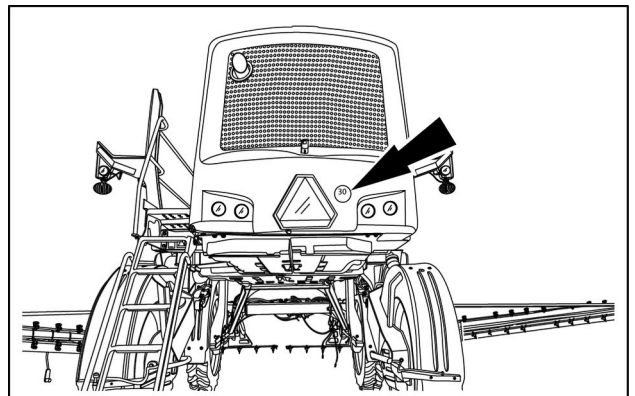


RAIL17SP01341AA 25

### SIS (Speed Indicator Symbol) emblem

87522628– 30 mph (quantity 1)  
Attached to the rear of the vehicle

87651332– 50 km/h (quantity 1)  
Attached to the rear of the vehicle



RAIL17SP01341AA 26



## 3 - CONTROLS AND INSTRUMENTS

### Access to operator's platform

### Cab entry and exit

#### ▲ WARNING

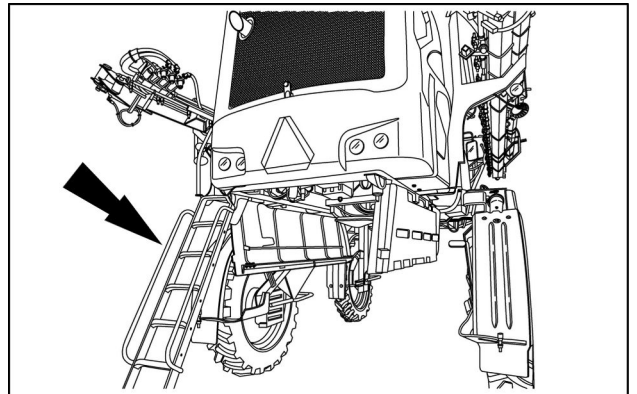
##### Fall hazard!

Jumping on or off the machine could cause an injury. Always face the machine, use the handrails and steps, and get on or off slowly. Maintain a three-point contact to avoid falling: both hands on the handrails and one foot on the step, or one hand on the handrail and both feet on the steps.

Failure to comply could result in death or serious injury.

W0141A

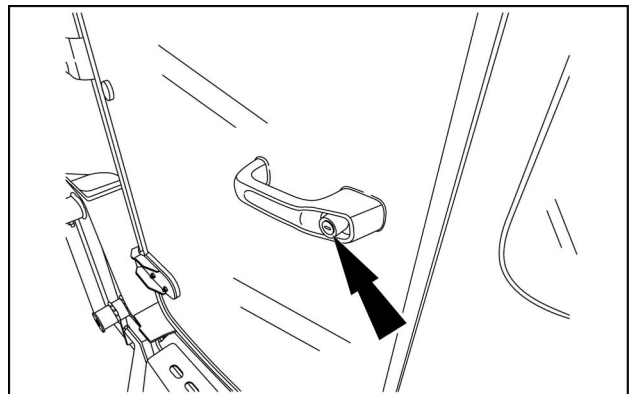
When mounting or dismounting the sprayer, use the handrails and steps provided.



RAIL17SP00272AA 1

### Cab door lock

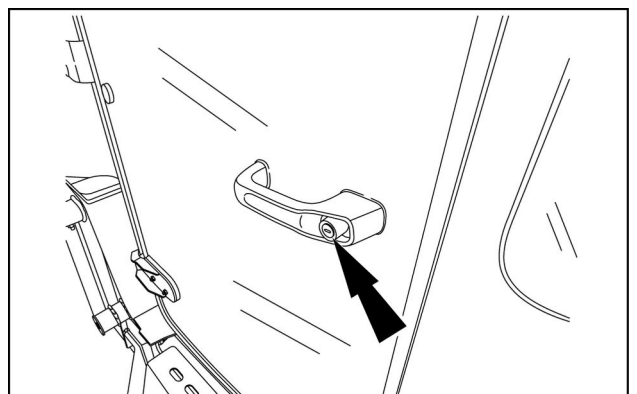
Use the key to lock or unlock the cab door from the outside. This lock uses the same key as the ignition.



RAIL17SP00275AA 2

### Control handle - outside

Push in on the handle button to open the cab door.

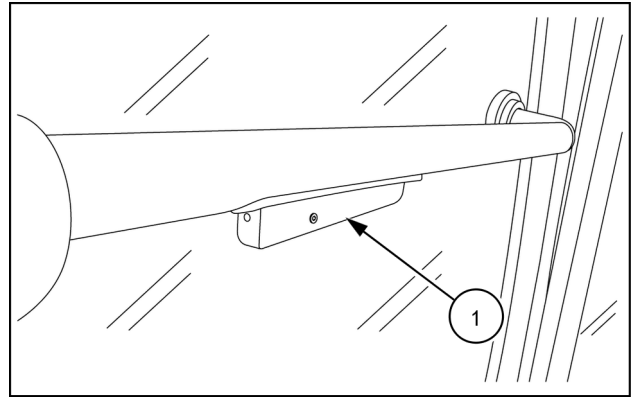


RAIL17SP00275AA 3

### Control handle - inside

To open the door from the inside, squeeze the door latch handle (1) located on the center bar of the door.

**NOTICE:** Never operate the sprayer with the cab door open.



RAIL17SP00264AA 4

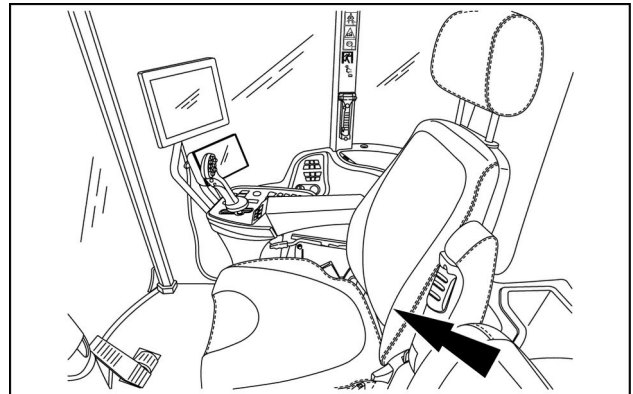
### Operator's seat

### Operator's seat

The operator's seat is equipped with controls to adjust the seat for personal comfort.

The operator's seat in the luxury cab is leather.  
The operator's seat in the deluxe cab is cloth.

Seat control and adjustment can be found at 3-3.



RAIL17SP00310AA 1

## Control identification — Luxury cab

### ⚠ WARNING

#### Loss of control hazard!

**DO NOT** make seat adjustments while the machine is in motion. All seat adjustment should be made with the machine stationary and the parking brake applied.  
**Failure to comply could result in death or serious injury.**

W0293A

The following is a list of adjustments for the seat and seat suspension:

**Fore/aft isolator (1)** — Under certain driving conditions you may want the operator's seat to absorb sudden shocks as in sudden stops. The isolator has two positions. Isolator off (position 1) pointing forward or isolator on (position 2) pointing rearward.

After the adjustment of position 1, the locking lever must latch into the desired position. For that, the seat must be pressed backwards until it latches with an audible click. It should not be possible to move the fore/aft isolator into another position when it is locked.

**Damper adjustment (2)** — The damper setting of the seat can be varied to suit different driving conditions. Turn the lever to the desired position. 1: Hardest to 5: Softest.

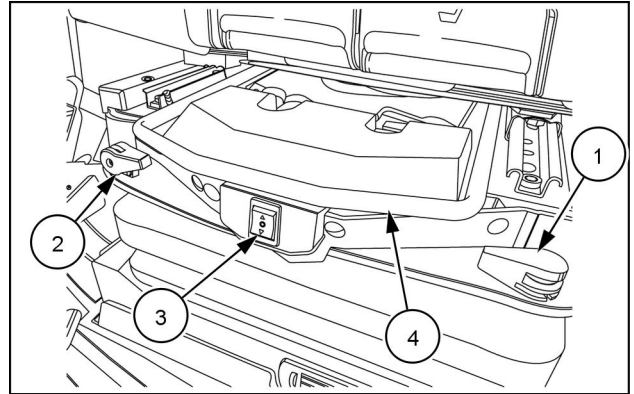
**Height and weight adjustment (3)** — This control will raise and lower the suspension. The key must be on in order for this adjustment to function. The seat is raised using a small onboard compressor.

Never operate the compressor for more than one minute. Press the top of the rocker switch and the seat will rise and the suspension will become firmer. Press the bottom of the rocker switch and the seat will lower and the suspension will become softer. Release the switch and it will return to the center (off) position.

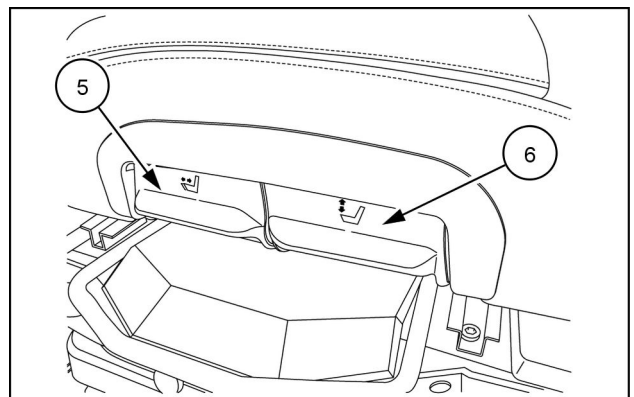
**Seat fore/aft adjustment (4)** — Lift the control up and slide the seat fore/aft. Release the control and lock into position. Be sure the control locks. Do not use your leg to pull this control.

**Seat depth adjustment (5)** — Pull up on the control to move the seat cushion back and forth. This control only moves the seat cushion, not the entire seat. Be sure the adjustment locks into position.

**Seat pan angle adjustment (6)** — Pull up on the control, then tilt the seat forward or backward until you reach the desired angle. Release the control to lock the seat in that position.

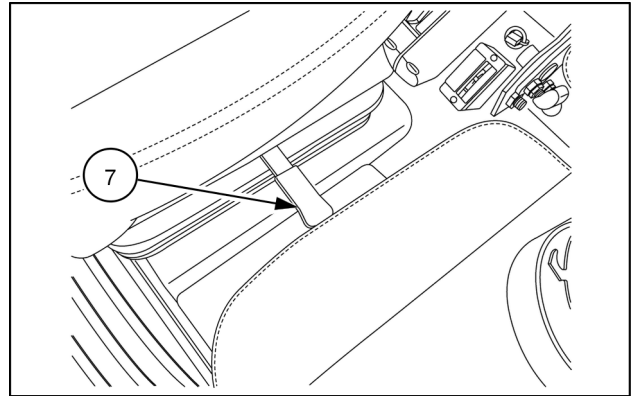


RAIL17SP00297AA 1



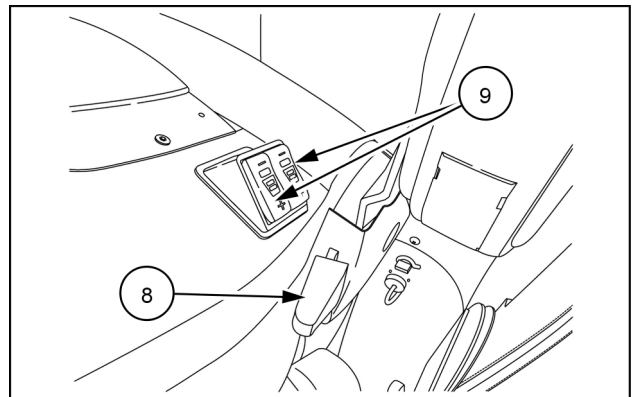
RAIL17SP00295AA 2

Lateral/horizontal suspension lock **(7)** — This control is located on the left-hand side of the seat. Push back on the lever to unlock this control. When control is unlocked the seat is allowed to move slightly side to side to absorb any slight changes in terrain. Push the lever forward to lock the seat and keep it from moving side to side.



RAIL17SP00266AA 3

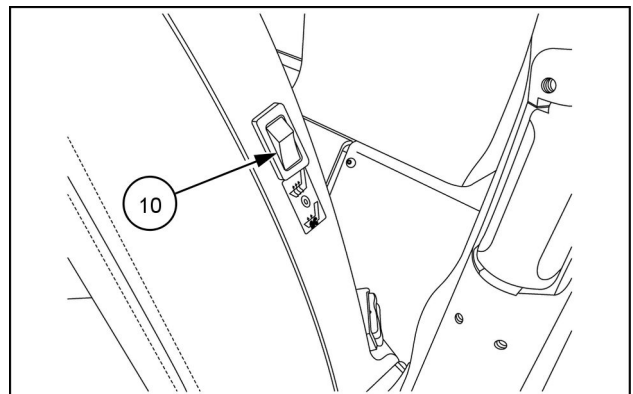
Backrest adjustment **(8)** — Located on the left-hand rear side of the seat, pull up on the lever to move the backrest to another position. Once a comfortable position is reached, release the lever to lock into position. This lever also allows you to fold the seat backrest all the way down to access the storage net behind the seat. Be sure the adjustment is locked in position.



RAIL17SP00223AA 4

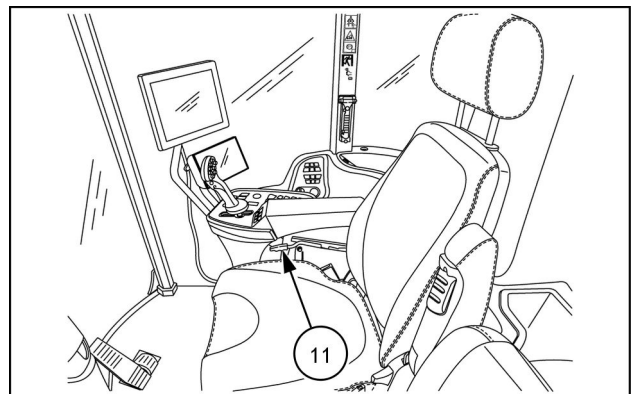
Lumbar support adjustment **(9)** — With the upper and lower switch the curvature in the upper and lower area of the backrest upholstery can be individually adjusted. This increases both the seating comfort and the performance of the driver. The lumbar curvature can be increased pressing the “+” or reduced by pressing the “-” on the relevant switch. When the backrest upholstery does no longer react by pressing the “+”, the maximum curvature has been reached and the switch should be released.

Seat heater and seat ventilation **(10)** — The seat ventilation system makes sure that the seat surface remains dry. Humidity in the contact area of the seat will be taken away. This ensures a comfortable, cool and clean seat feeling. Operate this switch to activate or deactivate the seat heater and the seat ventilation. The rocker switch is a three position switch: with the switch in the center position the seat heater and seat ventilation is OFF. Push the top of the switch in to turn the seat heater ON (seat ventilation OFF). Push the bottom of the switch in to turn the seat ventilation ON (seat heater OFF).



RAIL17SP00296AA 5

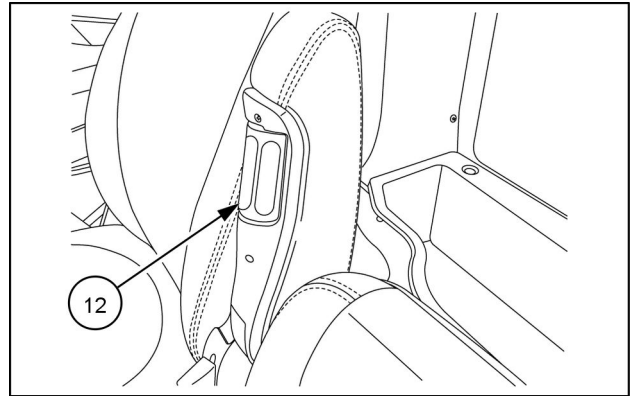
Control console only fore/aft adjustment **(11)** — This control is used to adjust the console only in relation to the seat position. Be sure the console is locked in position before operating.



RAIL17SP00310AA 6

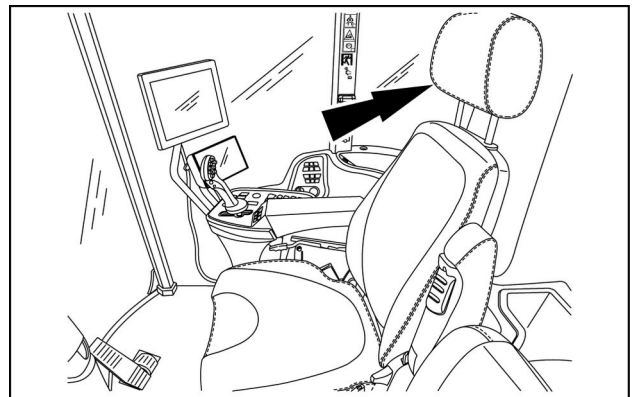


Left-hand armrest adjuster (**12**) — The left-hand armrest can be lowered down for operation or raised up for easier entry or exiting of the operator's seat. The angle of the armrest can be changed with the adjuster located under the armrest. Turn the adjuster to move the front edge of the armrest up or down.



RAIL17SP00267AA 7

Headrest- The headrest can be pulled up for height adjustment and tilted fore/aft to suit the operator. It can also be removed if desired.



RAIL17SP00310AA 8

**Instructional seat**

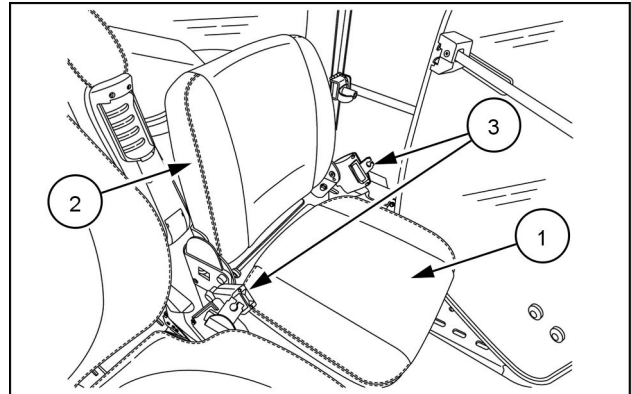
**Instructional seat**

**⚠ WARNING**

**Fall hazard!**  
**The instructional seat shall only be used when training a new operator or when a service technician is diagnosing a problem. Do not permit others, especially children, to ride in the seat. Keep the cab door(s) closed. Wear a seat belt at all times.**  
**Failure to comply could result in death or serious injury.**

W0301A

The instructional seat (1) with seat belt is available to provide seating for an experienced operator when a new operator is being trained. The instructional seat is located next to the operators seat. The instructional seat back (2) can be folded down when not in use. Seat belts (3) are standard equipment on the instructional seat. The lap type seat belt has a push button quick releases and automatic retraction to will allow unrestricted exiting and entering of the seat. Be sure the instructor always wears the seat belt when the vehicle is in operation.



RAIL17SP00311AA 1

**Forward controls**

**Steering column**

**⚠ WARNING**

**Driving hazard!**  
**Do not adjust the steering column while driving.**  
**Before adjusting the steering column:**

- stop the machine,
- put the gearshift lever in neutral, and
- apply the parking brake.

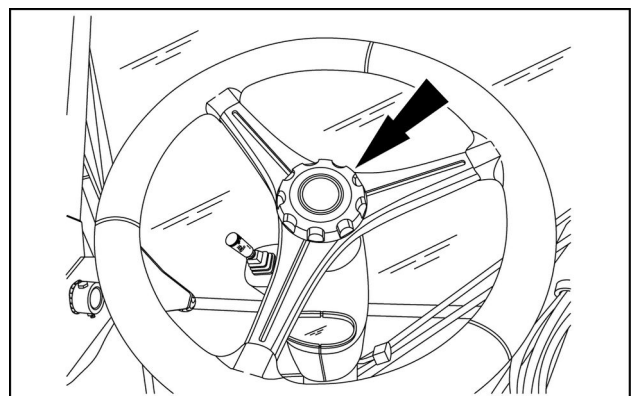
**Failure to comply could result in death or serious injury.**

W1032A

**Telescoping steering wheel**

To adjust steering wheel height: Loosen the center cap on the steering wheel, reposition steering wheel and retighten center cap. Do not use this feature while driving as a loss of vehicle control may occur.

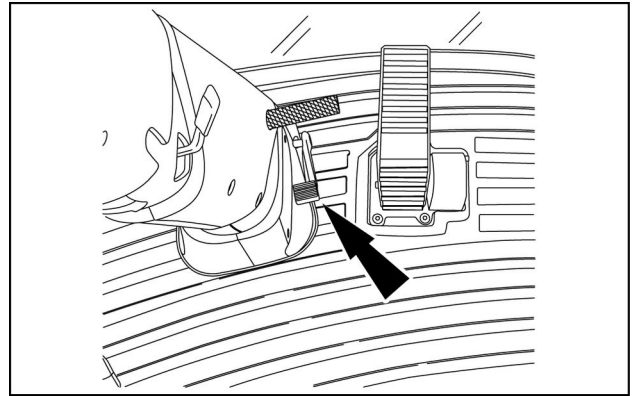
The steering wheel in the luxury cab is leather wrapped. The steering wheel in the deluxe cab is a plastic composite and has no wrapping.



RAIL17SP00299AA 1

### Lower steering column tilt

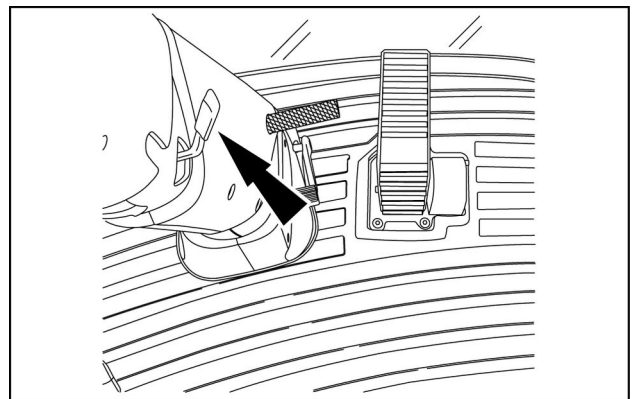
Pressing down on the foot pedal at the base of the steering column allows you to tilt the lower steering column toward or away from you. Do not use this feature while driving as a loss of vehicle control may occur.



RAIL17SP00226AA 2

### Upper steering column tilt

Push the adjustment lock handle toward the steering column and tilt the upper steering column toward or away from you. Do not use this feature while driving as a loss of vehicle control may occur.



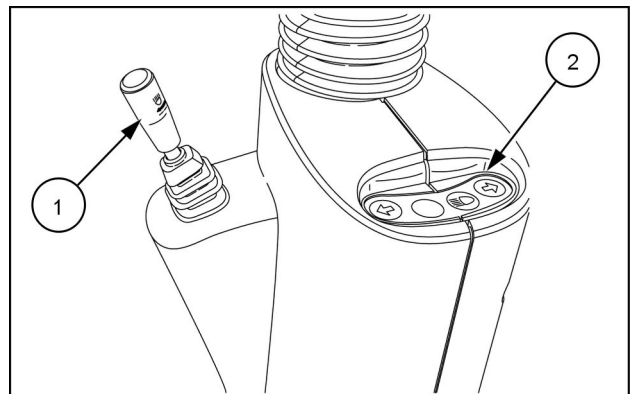
RAIL17SP00226AA 3

### Turn signals

**NOTE:** When operating the vehicle on roads or highways, always use the turn signals.

The turn signal lever (1) is located on the left side of the steering column behind and below the steering wheel. Move the turn signal lever up to indicate a right turn. Move the turn signal lever down to indicate a left turn. The center position is Off. The turn signal indicator lights (2) are located on the front lower surface of the steering column. These lights will be on whenever the turn signals are active.

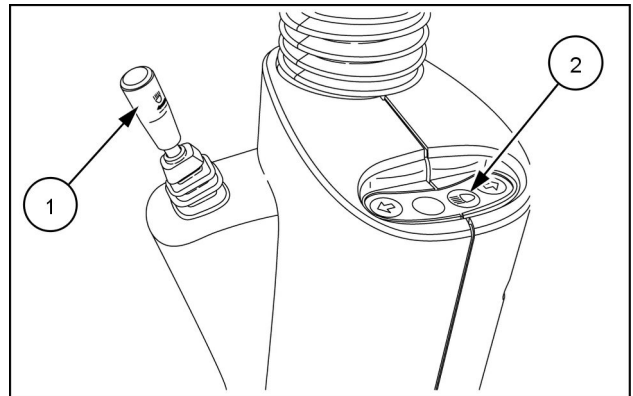
**NOTE:** The turn signals are NOT self-canceling. You must move the lever back to neutral after you complete a turn. The turn signal system will begin to beep after 20 seconds. After 30 seconds the system will turn that directional off, but the lever has to be physically moved to the center position. It will not be active when the foamer is being controlled by the turn signal lever.



RAIL17SP00303AA 4

### Headlight dimmer control

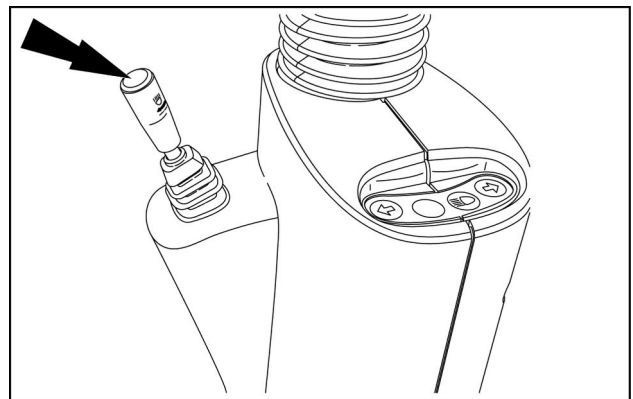
The headlight dimmer is integrated into the directional signal lever (1). Push the lever left to put the headlights on high beam. Pull the lever partially to the right to dim the headlights. Pull the lever fully to the right to flash the headlight high beams. The appropriate indicator light will come on for high beam or low beam. The indicator light (2) is located on the top surface of the steering column.



RAIL17SP00303AA 5

### Horn button

The horn button is located on the end of the turn signal lever. Press the button to activate the horn.



RAIL17SP00303AA 6

## Floor controls

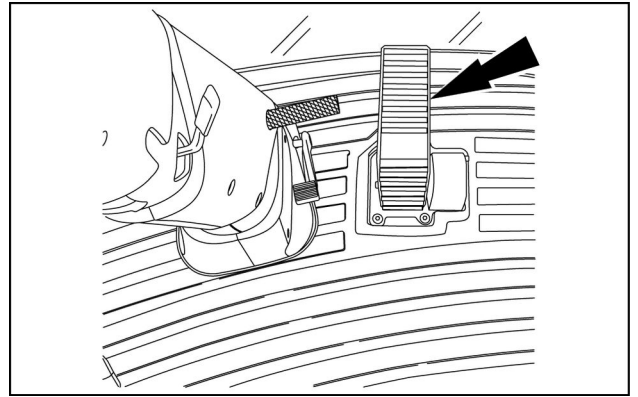
### Brake pedal

The brake pedal is located on the right side of the steering column. This pedal is used to slow the vehicle to a smooth stop. The pedal applies the brake to all four wheels and reduces the propel command to the hydrostat pumps. If the brake pedal is pressed more than 65% of travel, the machine will come to a complete stop. Return the joystick to the neutral position to reset the propel system and then continue normal operation.

If the brake is pressed less than 65% of travel and then released, the drive will return to the preset speed set by the joystick and range selector.

The brake pedal can be used in conjunction with the joystick to rapidly slow the vehicle.

To release the park brake with the engine running, the brake pedal must be completely depressed and held in that position while releasing the park brake.



RAIL17SP00226AA 1

### **⚠ WARNING**

#### **Driving hazard!**

**Be aware that extra weight and bad traction conditions such as mud or ice increase your stopping distance. Liquid in the tires, weights on the machine or wheels, tanks filled with fertilizer, herbicides, or insecticides - all these add weight and increase the distance you need to stop.**

**Failure to comply could result in death or serious injury.**

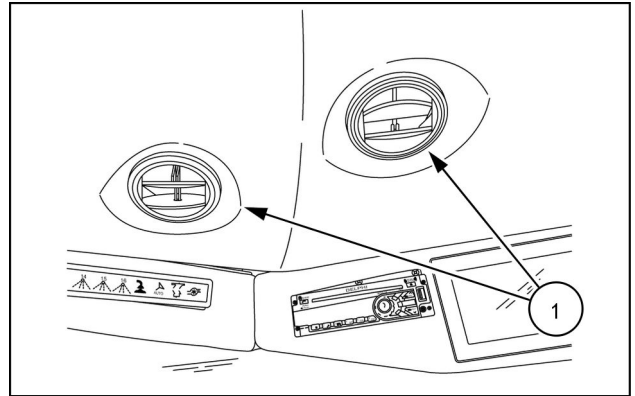
W0338A

## Ventilation

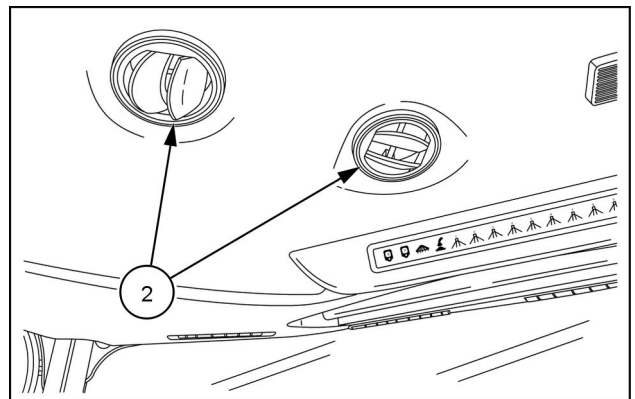
### Air discharge outlets

#### Cab Roof Heater and Air Conditioner Vents:

There are four round swivel and adjustable vents in the cab interior roof. These vents are adjustable to be directed at different areas inside the cab. They can also be closed as needed. The vents are located two on the right-hand side of the cab interior roof **(1)** and two on the left-hand side of the cab interior roof **(2)**.



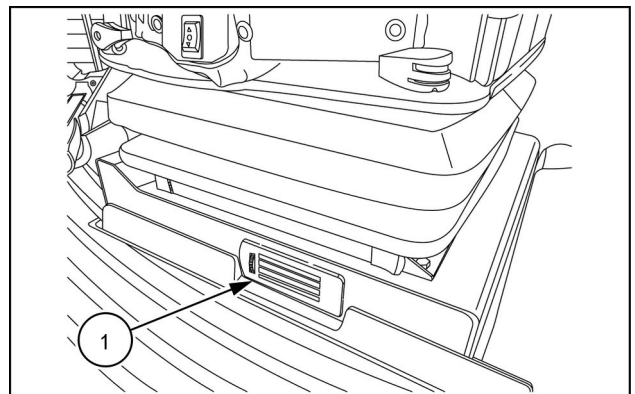
RAIL17SP00289AA 1



RAIL17SP00289AA 2

### Seat base heater and air conditioner vent

The seat base vent **(1)** is located at the front of the seat base. The vent can be closed as needed.

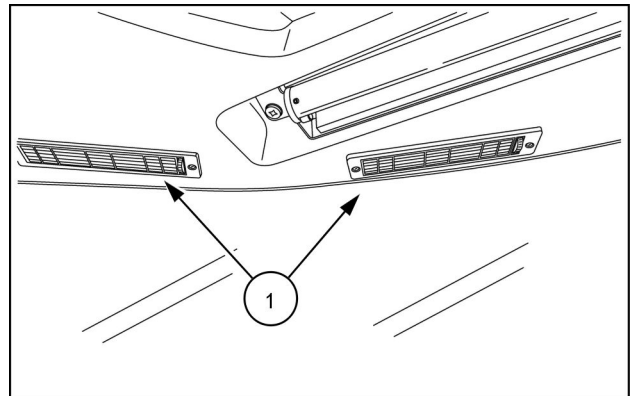


RAIL17SP00294AA 3

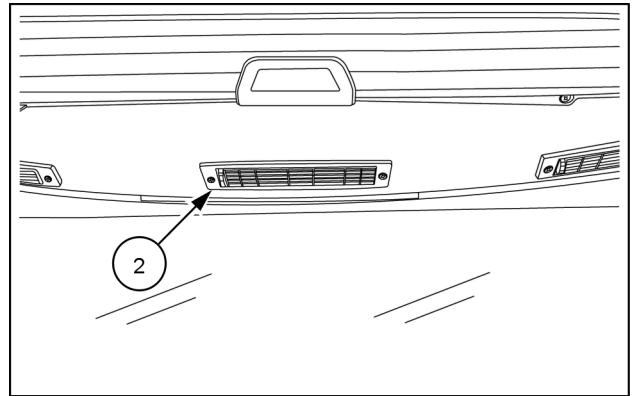
## Defroster vents

### Windshield defroster vents

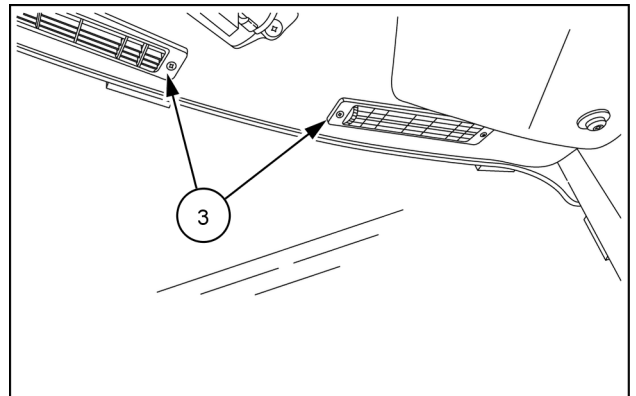
There are five defroster vents in the cab interior roof just above the windshield; two left-hand vents **(1)**, one center vent **(2)**, and two right-hand vents **(3)**. These vents are adjustable, and can be directed at the windshield or as needed.



RAIL17SP00270AA 4



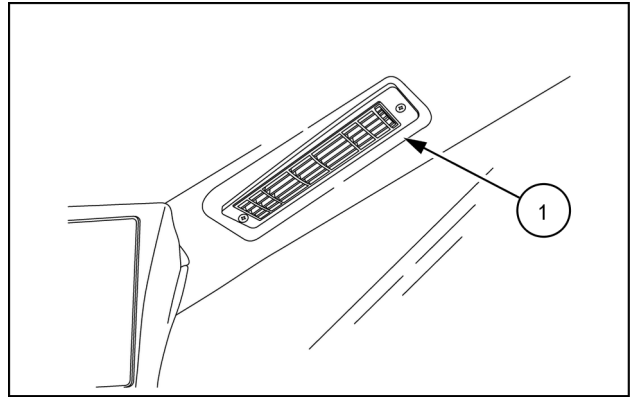
RAIL17SP00230AA 5



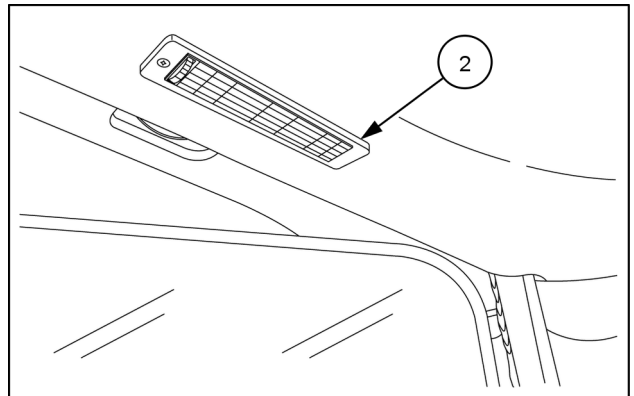
RAIL17SP00290AA 6

### Right-hand and left-hand side window defroster vents

There are two vents in the cab interior roof. One is for defrosting of the right-hand side window **(1)** and one for the left-hand side cab door **(2)**. These vents are adjustable to be directed at different areas of the window. They can also be closed as needed.



RAIL17SP00291AA 7



RAIL17SP00268AA 8

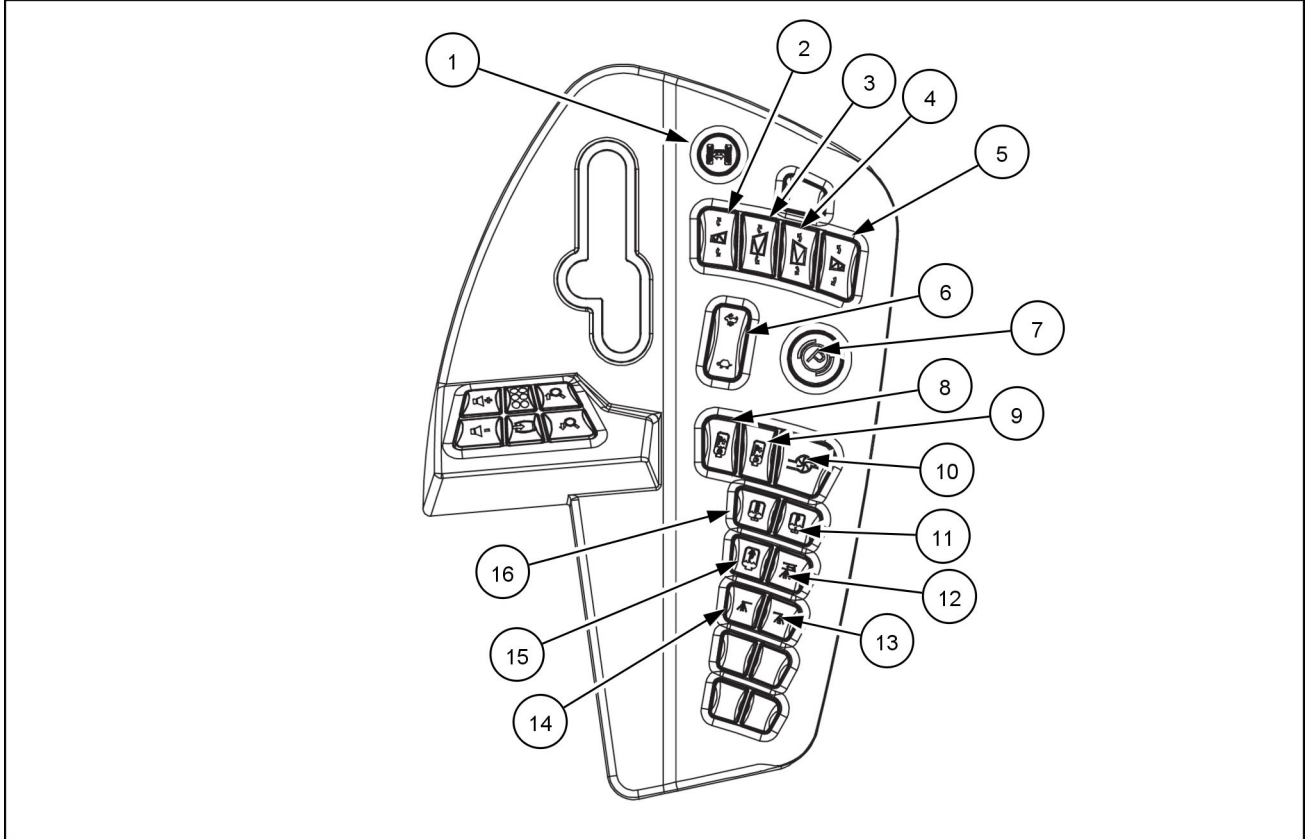


**Right-hand side controls**

**Main side console**

**Right-hand side switch control panel**

Refer to the following illustration and table that follows to identify the switches on the right side control panel.



RAIL17SP00307FA 1

Reference number	Switch description
1	Auto leg widening
2	Left-hand side secondary boom fold/unfold
3	Left-hand side primary boom swing in/out
4	Right-hand side primary boom swing in/out
5	Right-hand side secondary boom fold/unfold
6	Engine speed control
7	Park brake switch
8	Sparge increase
9	Sparge decrease
10	Product pump on/off
11	Product sump on/off
12	Boom blowout
13	Right-hand side fence row
14	Left-hand side fence row
15	Product tank rinse nozzles on/off
16	Rinse sump

### Auto leg widening

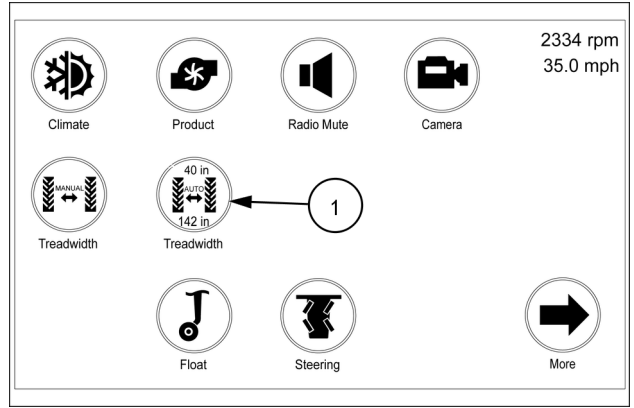
The axle width is adjustable from **305 – 406 cm (120 – 160 in)** to the center of the tires depending on crop spacing requirements or transport requirements.

The axles move in or out on both sides at the same rate which keeps the operator in the center of the machine.

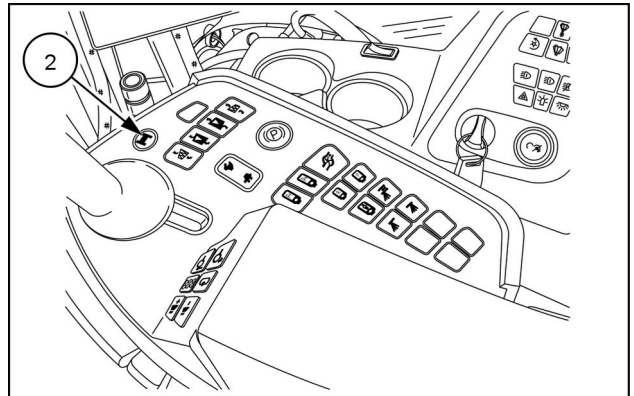
**NOTE:** When using the leg widening button on the side console, the joystick has to be in neutral.

To move the axles in or out: select your desired width using the icon (1) on the display to bring you to the setting screen. Press the auto leg widening button (2). While slowly driving the vehicle, the leg width will automatically adjust.

Refer to **6-1** for complete operation details.



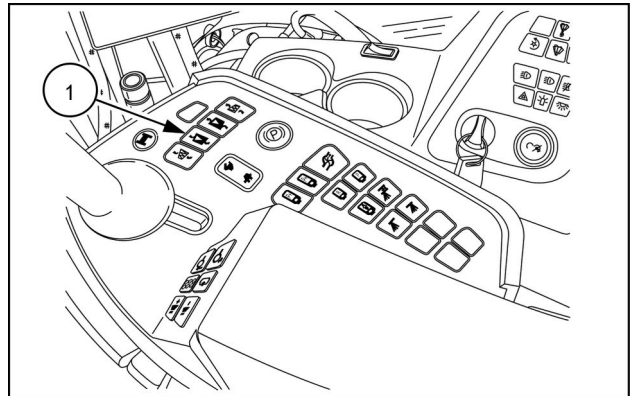
RAIL17SP00108FA 2



RAIL17SP00287AA 3

### Left-hand side primary boom swing in/out

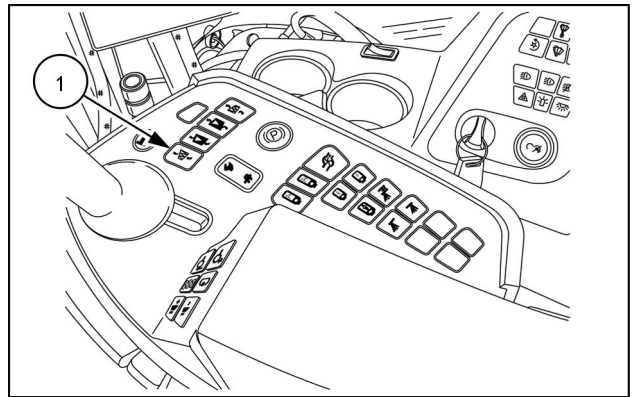
This switch (1) is used to swing the primary boom out away from the vehicle and back toward the vehicle. Refer to **6-11** for complete operation details.



RAIL17SP00287AA 4

### Left-hand side secondary boom fold/unfold

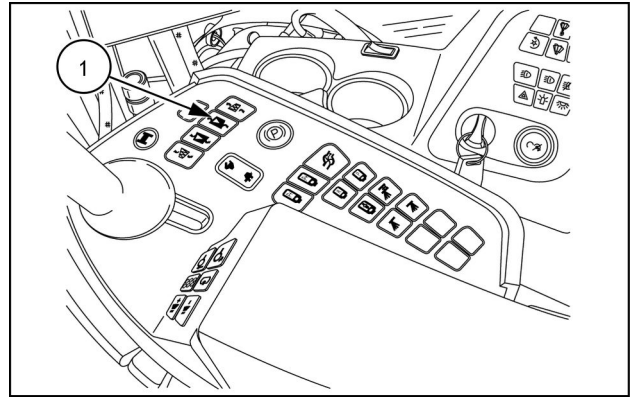
This switch (1) is used to fold or unfold the secondary boom from the primary boom. Refer to **6-12** for complete operation details.



RAIL17SP00287AA 5

### Right-hand side primary boom swing in/out

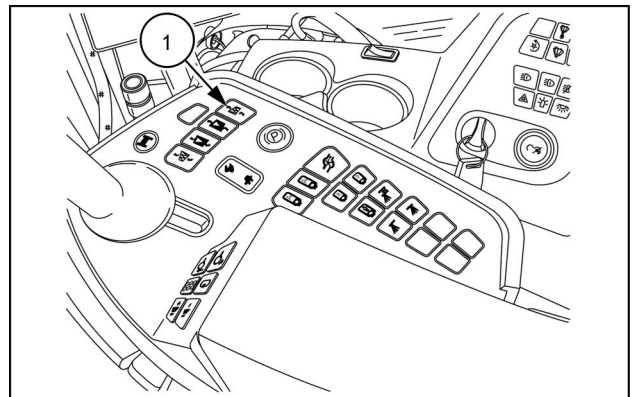
This switch (1) is used to swing the primary boom out away from the vehicle and back toward the vehicle. Refer to 6-9 for complete operation details.



RAIL17SP00287AA 6

### Right-hand side secondary boom fold/unfold

This switch (1) is used to fold and unfold the secondary boom from the primary boom. Refer to 6-5 for a detailed explanation.

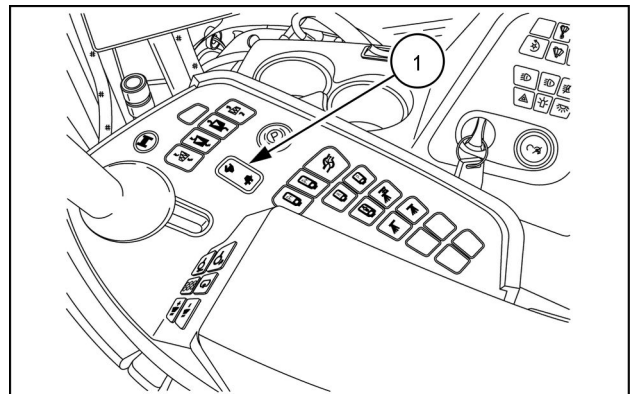


RAIL17SP00287AA 7

### Engine speed control

The engine speed control switch (1) is used to select three distinct speeds at the engine. This control is spring loaded and will return to the center position when released. The engine speed can be increased by pushing the switch toward the "Rabbit" or decreased to idle by pushing the switch toward the "Turtle". Press the "Rabbit" once for half throttle. Press the "Rabbit" twice for full throttle. Pressing a third time will return to half throttle. Press the "Turtle" for idle.

The engine speed can also be increased or decreased with the trigger in conjunction with the engine speed control button on the joystick.



RAIL17SP00287AA 8

## Park brake switch

### ⚠ DANGER

**Run-over hazard!**

Apply the parking brake before leaving the cab.

Failure to comply will result in death or serious injury.

D0028A

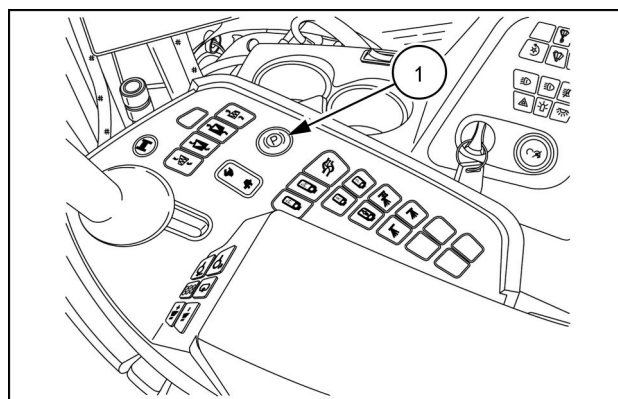
### ⚠ WARNING

**Avoid injury and/or machine damage!**

Apply the parking brake only when the machine is stationary. While driving, apply the parking brake only in an emergency. The braking action is abrupt.

Failure to comply could result in death or serious injury.

W1132A



RAIL17SP00287AA 9

The park brake switch (1) engages the vehicles park brake.

To apply the parking brake press the park brake switch (1) to engage the park brake. When the park brake is applied, the ladder will lower.

### ⚠ CAUTION

**Unexpected machine movement!**

The ladder may move suddenly without warning. Stand clear of the swing path of the ladder.

Failure to comply could result in minor or moderate injury.

C0212A

To disengage the parking brake with the engine running, first press the service brake pedal fully and hold, then press the park brake switch. When the park brake is disengaged, the ladder will raise. When the park brake disengages, the icon on the display disappears as well. The park brake switch (1) will turn from red to amber when disengaged. Engine must be running for ladder to raise

An audible alarm will sound if the hydro lever is moved from neutral (N) with the park brake engaged.

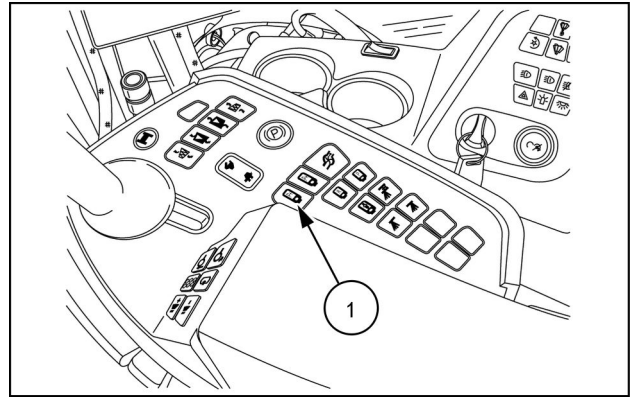
**NOTE:** Hydraulic pressure is required to disengage the park brake. If the engine and/or hydraulic system are inoperable and the machine must be moved, special procedures must be followed to disengage the park brake. See your dealer for these procedures.

### Sparge increase

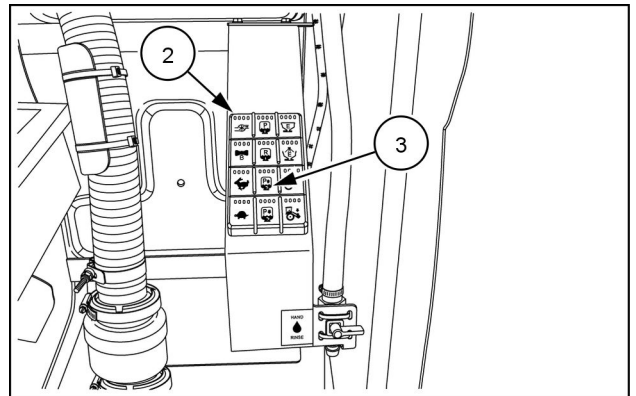
The product tank sparge flow is controlled by two separate switches. Press and hold the sparge increase switch (1) to increase the sparge flow. As the sparge increases the four led lights will illuminate indicating the percentage of sparge. Refer to the table that follows for light combination to percentage of sparge. Release the switch when correct sparge is reached. The product pump has to be running for the sparge system to operate. Adjust the sparge as needed to keep the chemical in suspension without creating foam in the product tank. Each tank is equipped with several sparge inlet and outlet locations. These locations keep the product in suspension through circulation of the product tank utilizing the product pump. The sparge can also be adjusted remotely from outside the cab using the remote key pad (2) located next to the chemical eductor/fast fills. Hold the sparge increase button (3) to increase the sparge.

Light color combination	Percentage of sparge
Red	0-6%
Red and Yellow	7-23%
Yellow	24-41%
Yellow and Green	42-58%
Green	59-77%
Green and Blue	78-99%
Blue	100%

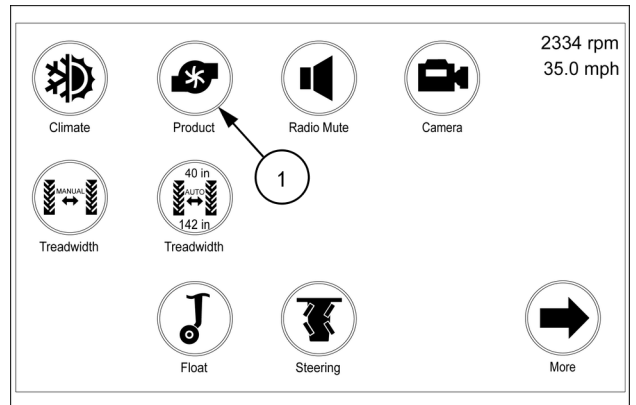
From the first armrest home page, touch the product icon (1) to bring up the product circuit screen.



RAIL17SP00287AA 10

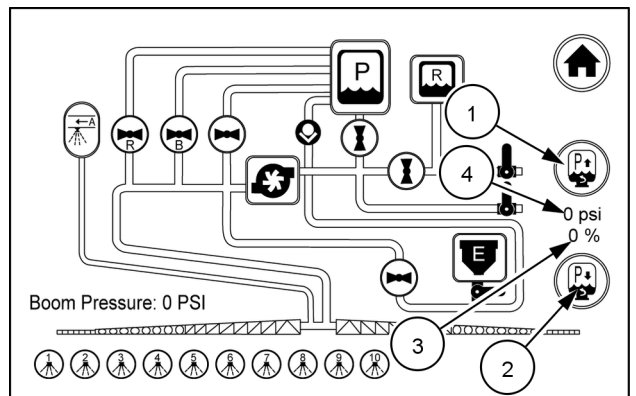


RAIL17SP00873AA 11



RAIL17SP00108FA 12

The sparge can be increased or decreased from the product circuit screen. Touch the sparge increase icon (1) or sparge decrease icon (2) to adjust. Observe the sparge percentage (3) or sparge psi (4), increase or decrease as the valve is opened or closed.



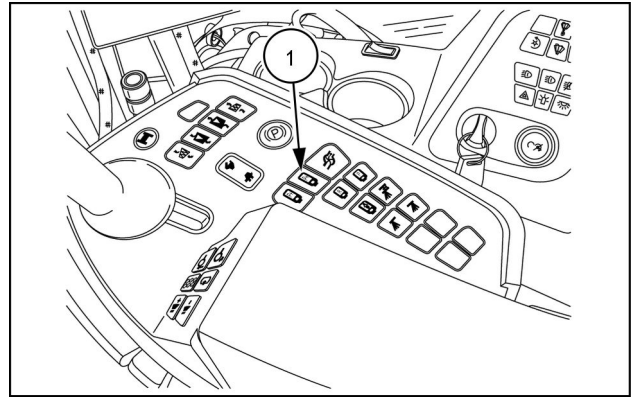
RAIL17SP00183AA 13

### Spurge decrease

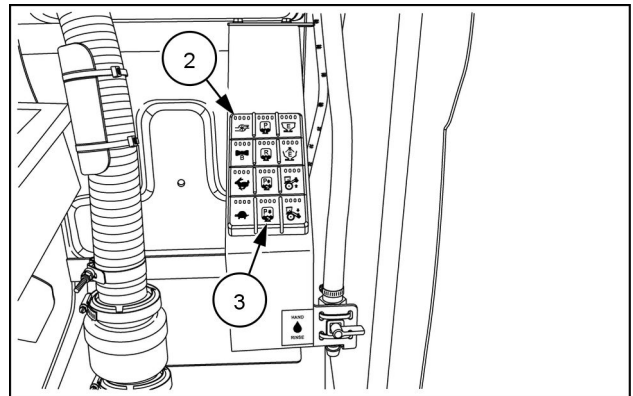
The product tank spurge flow is controlled by two separate switches. Press and hold the spurge decrease switch (1) to decrease the spurge flow. As the spurge decreases the four led lights will illuminate indicating the percentage of spurge. Refer to the table that follows for light combination to percentage of spurge. Release the switch when correct spurge is reached. The product pump has to be running for the spurge system to operate. Adjust the spurge as needed to keep the chemical in suspension without creating foam in the product tank. Each tank is equipped with several spurge inlet and outlet locations. These locations keep the product in suspension through circulation of the product tank utilizing the product pump. The spurge can also be adjusted remotely from outside the cab using the remote key pad (2) located next to the chemical eductor/fast fills. Hold the spurge decrease button (3) to decrease the spurge.

Light color combination	Percentage of spurge
Red	0–6%
Red and Yellow	7–23%
Yellow	24–41%
Yellow and Green	42–58%
Green	59–77%
Green and Blue	78–99%
Blue	100%

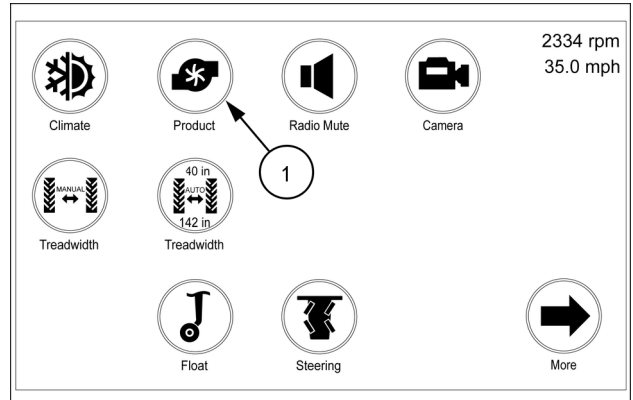
From the first armrest home page, touch the product icon (1) to bring up the product circuit screen.



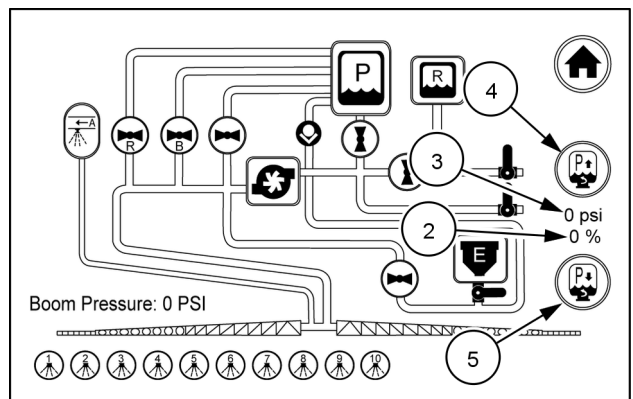
RAIL17SP00287AA 14



RAIL17SP00873AA 15

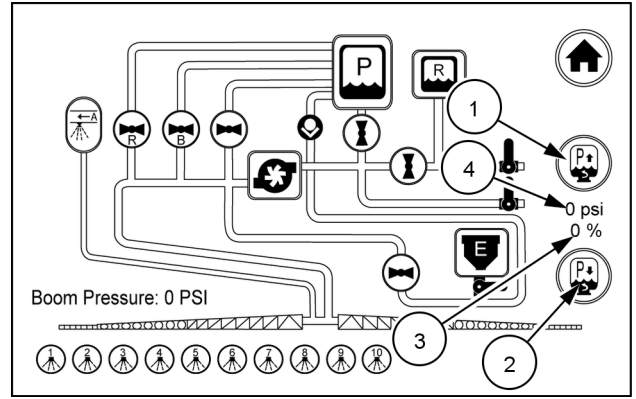


RAIL17SP00108FA 16



RAIL17SP00183AA 17

The sparge can be increased or decreased from the product circuit screen. Touch the sparge increase icon (1) or sparge decrease icon (2) to adjust. Observe the sparge percentage (3) or sparge psi (4), increase or decrease as the valve is opened or closed.



RAIL17SP00183AA 18

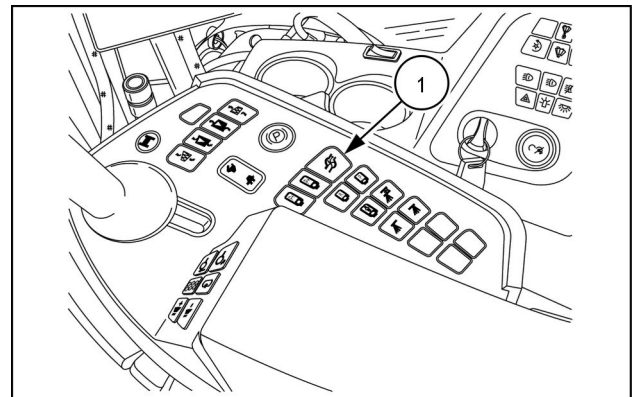
### Product pump on/off

**NOTICE:** To avoid damage to the product pump, never run the pump “Dry” without liquid in the pump.

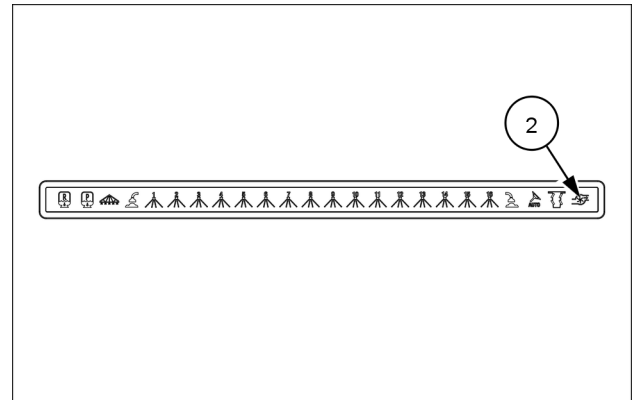
The product pump switch (1) turns on the product pump. Push the switch once to turn the pump on. Push the switch again to turn the pump off. The icon (2) on the front overhead will illuminate alerting you that the pump is on.

The icon on the front overhead display will also alert you that the product pump is turned on when the remote pump switch is used, or when the pump is turned on with the display.

Turning the product pump on with a sump closed will cause the display to show a message stating “Product Pump won’t turn on when the Product and Rinse Sumps are both closed”.

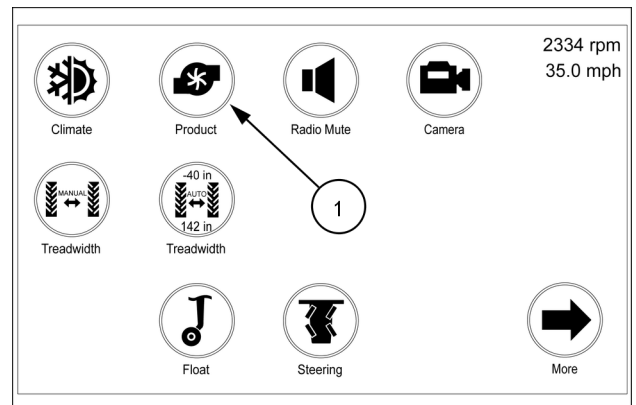


RAIL17SP00287AA 19



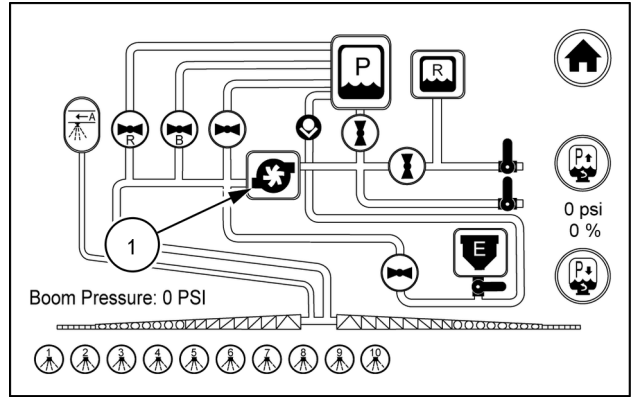
RAIL17SP00309FA 20

The pump icon will also display on the arm rest display. Touch the product icon (1) on the first home screen. The product circuit screen displays.



RAIL17SP00108FA 21

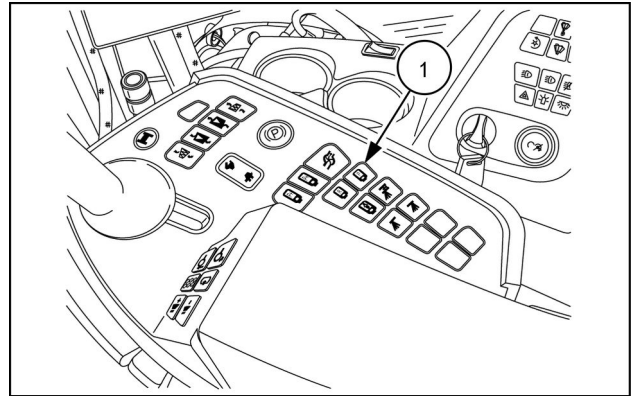
Touch the pump icon **(1)** on the product circuit screen. The product pump is activated. Touch the product pump icon again to turn the pump off.



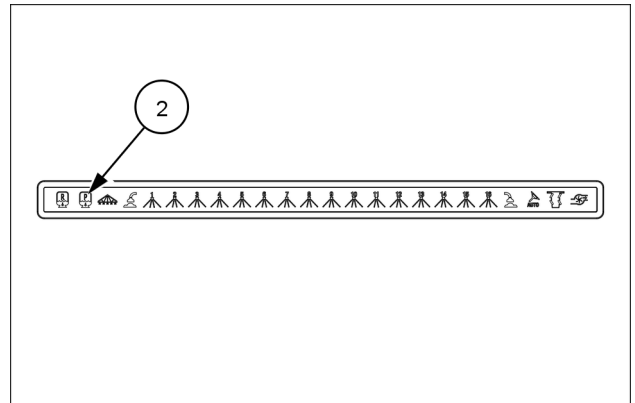
RAIL17SP00183AA 22

### Product sump on/off

This switch **(1)** opens and closes the product tank sump. Refer to **6-17** for a detailed explanation. The product tank sump icon **(2)** on the front overhead display will illuminate amber when the sump is open and change to red when the sump is closed.



RAIL17SP00287AA 23



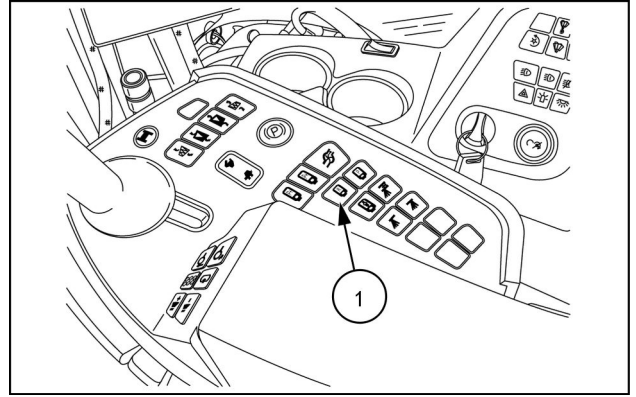
RAIL17SP00309FA 24



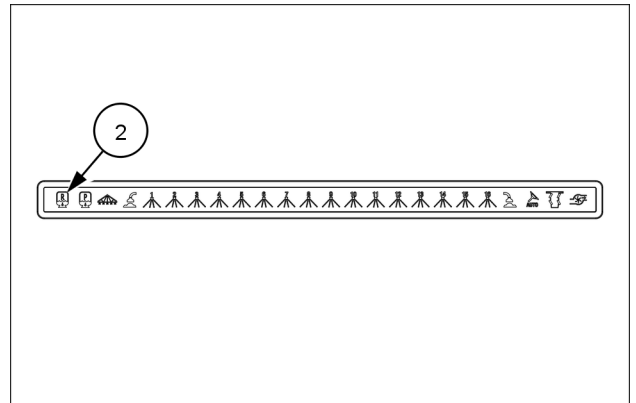
### Rinse sump on/off

This switch (1) allows the operator to open and close the rinse tank sump from the operator cab. Press the switch once to open the sump. Press the switch again to close the sump. This valve does not need to be open when filling with the fast-fill feature. The rinse tank sump icon (2) on the front overhead display will illuminate when the sump is open.

**NOTE:** When you shut the key off with the sump open, the sump will remain open. However, when you turn the key on, the sump will close. You will need to re-open the sump before starting the product pump.



RAIL17SP00287AA 25

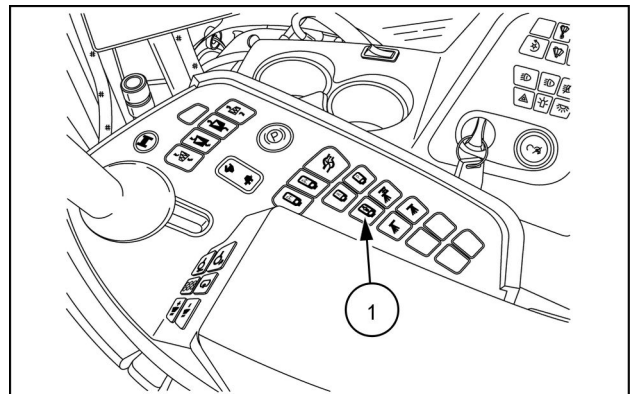


RAIL17SP00309FA 26

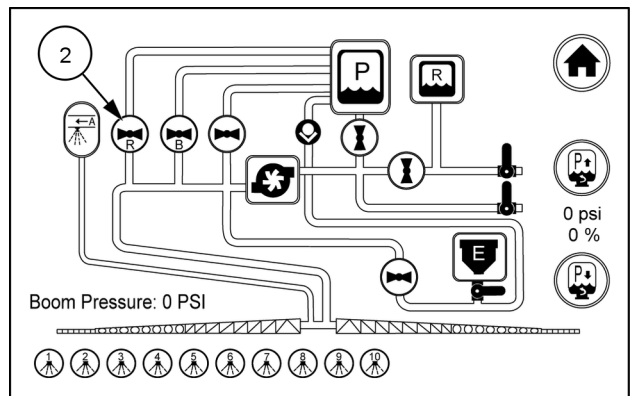
### Product tank rinse nozzles on/off

This switch (1) opens and closes the product tank rinse system valve. Be sure the rinse tank has enough water in it before turning this system on. Press the switch once to turn the valve on. Press the switch again to turn off.

The rinse system can also be activated by touching the "R" valve icon (2) on the product circuit screen.



RAIL17SP00287AA 27

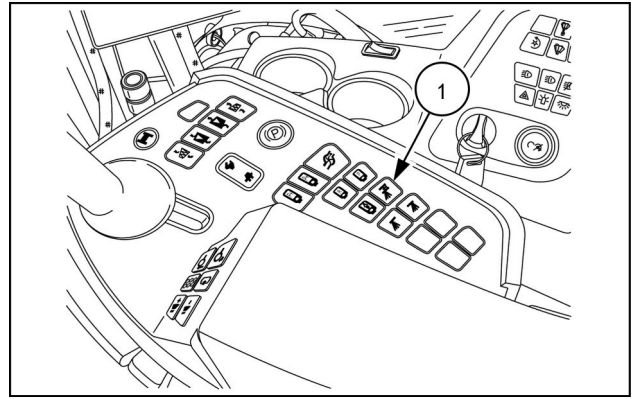


RAIL17SP00183AA 28

### Boom blowout

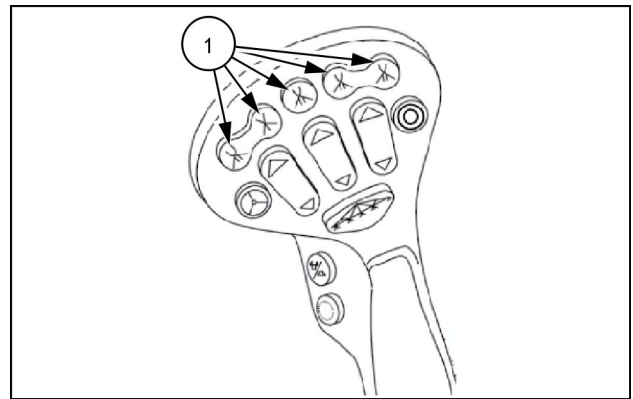
The operator can remove all liquid from the boom lines utilizing compressed air from the air storage tank. Press the switch **(1)** once to turn the system on to remove all the liquid. Press the switch again to turn the system off. The blow out system will blow all the liquid in the boom lines out through the nozzle tips.

**NOTE:** The blow out procedure should be done one section at a time to adequately remove the liquid..

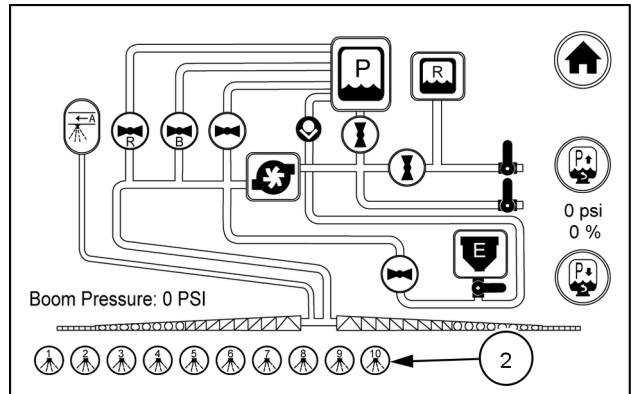


RAIL17SP00287AA 29

The boom sections can be turned on or off using the section control buttons **(1)** on the joystick or by turning the sections **(2)** on or off from the product circuit screen



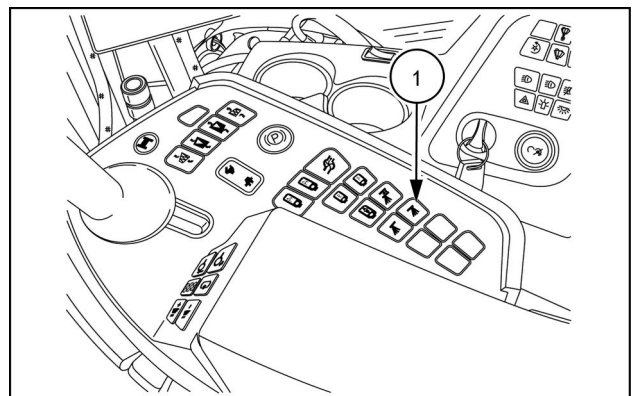
RAIL17SP00391AA 30



RAIL17SP00183AA 31

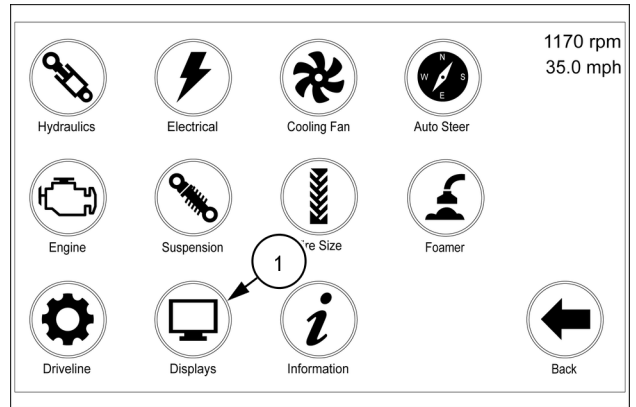
### Right-hand side fence row (if equipped)

This switch **(1)** control the nozzle mounted to the outer edge of the right-hand side boom. This switch turns the nozzle on or off. This option is useful when at the edge of a field to complete a narrow band which would require another pass, or to allow you to move away from a fence line for easier maneuvering or avoid hitting obstacles. Press the switch once to turn the fence row nozzle on. Press the switch again to turn the fence row nozzle off.

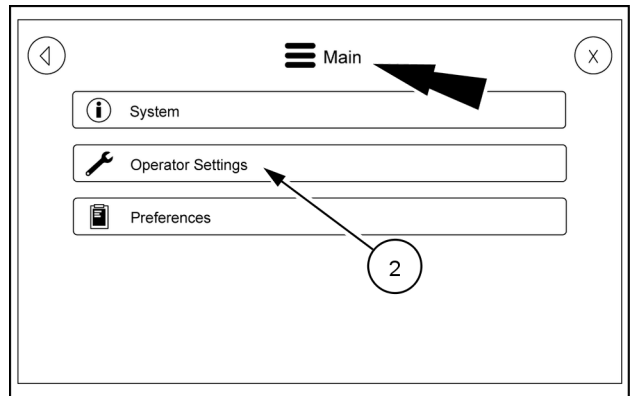


RAIL17SP00287AA 32

On the second home page touch the displays icon (1). This will bring up the main screen where you select operator settings (2).

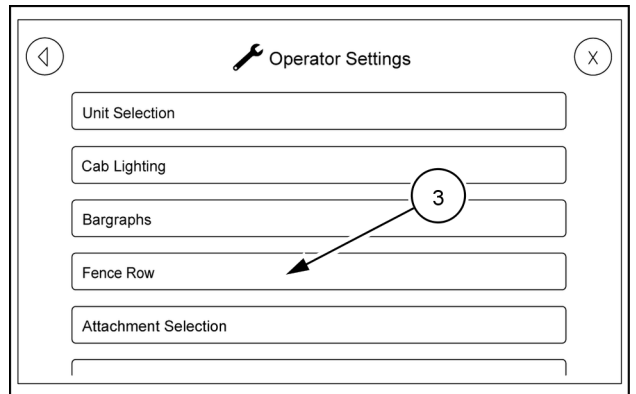


RAIL17SP00109FA 33

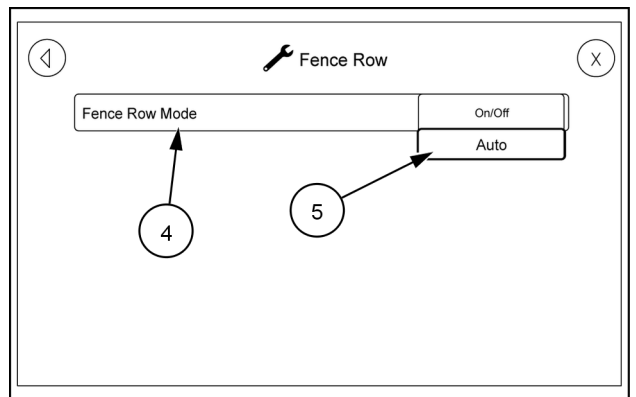


RAIL17SP00143AA 34

Touch the fence row icon (3) This will bring up the fence row mode icon (4) To have the left or right fence row nozzle turn on automatically with the outer most section, you must turn that feature on by selecting the auto icon (5).



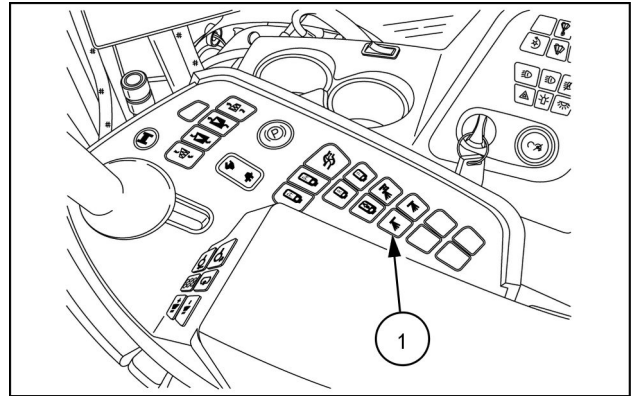
RAIL17SP00144AA 35



RAIL17SP00152AA 36

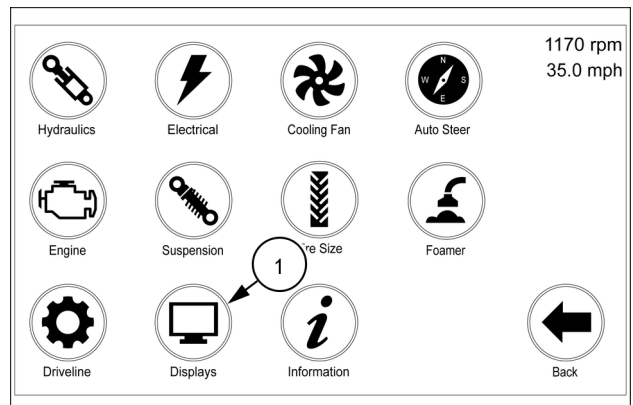
### Left-hand side fence row (if equipped)

This switch (1) controls the nozzle mounted to the outer edge of the left-hand side boom. This switch turns the nozzle on or off. This option is useful when at the edge of a field to complete a narrow band which would require another pass, or to allow you to move away from a fence line for easier maneuvering or avoid hitting obstacles. Press the switch once to turn the fence row nozzle on. Press the switch again to turn the fence row nozzle off.

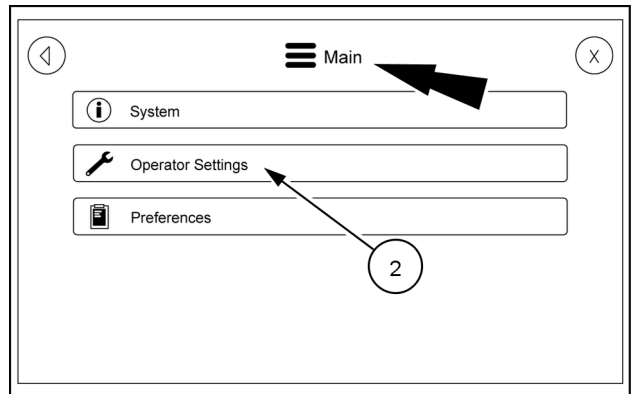


RAIL17SP00287AA 37

On the second home page touch the displays icon (1). This will bring up the main screen where you select operator settings (2)

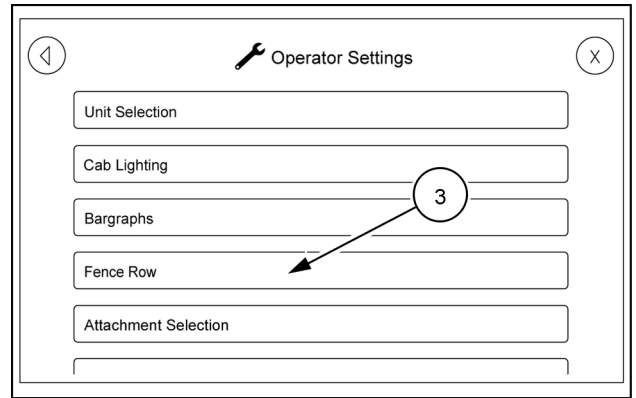


RAIL17SP00109FA 38

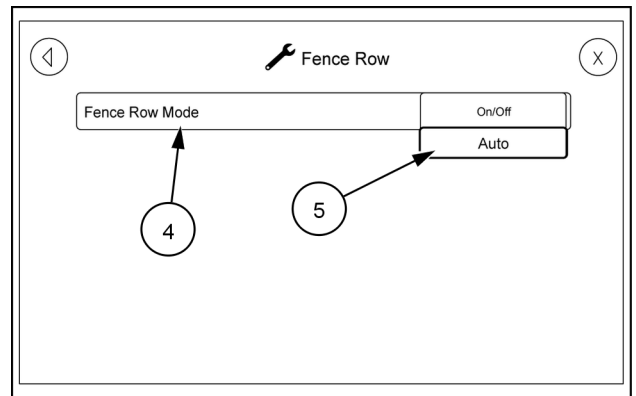


RAIL17SP00143AA 39

Touch the fence row icon (3) This will bring up the fence row mode icon (4) To have the left or right fence row nozzle turn on automatically with the outer most section, you must turn that feature on by selecting the auto icon (5).



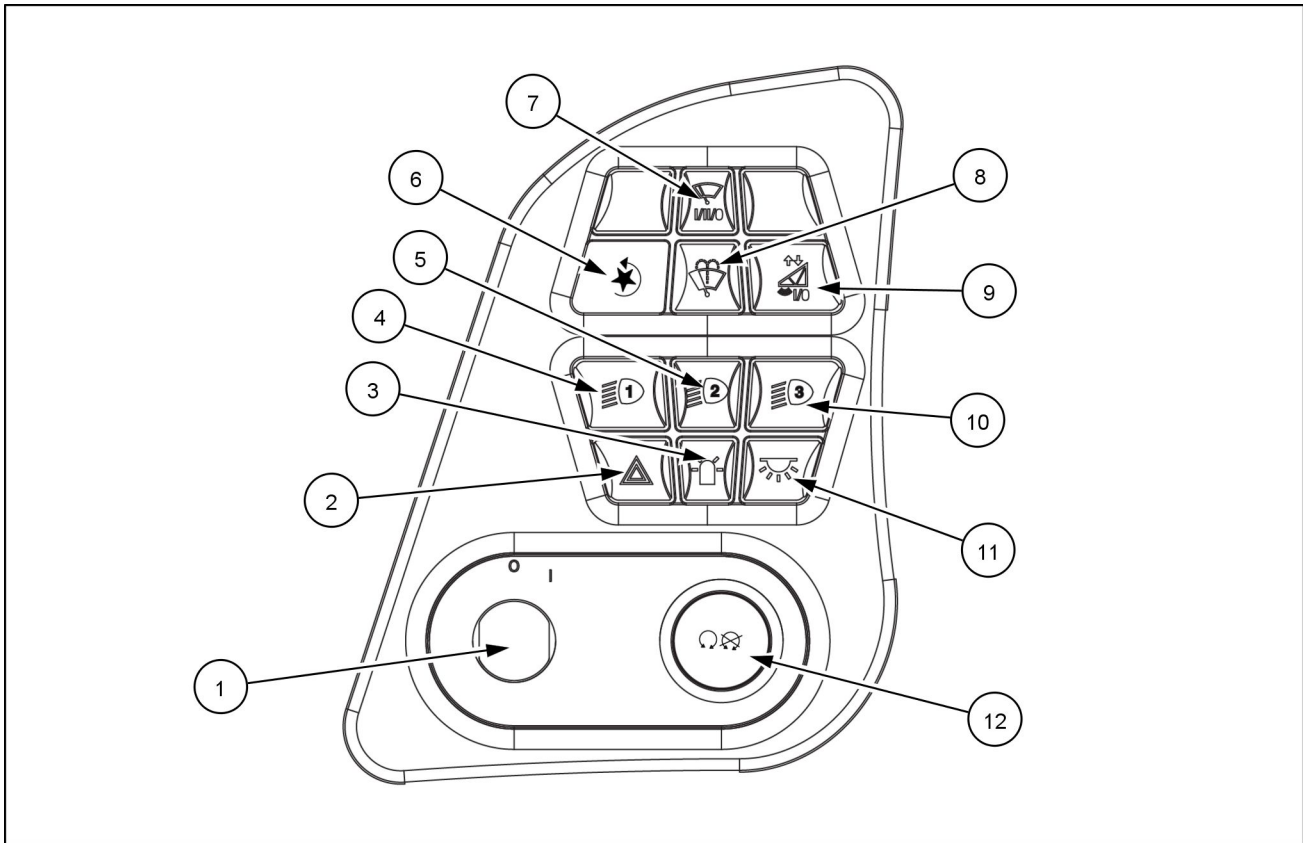
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RAIL17SP00152AA 41

## Side console

Refer to the illustration and the table that follows to identify the switches and controls of the side console



RAIL17SP00976FA 1

Reference number	Switch controlling feature
1	Accessory on/off
2	Hazard flashers on/off
3	Rotating beacons on/off
4	Road lights on/off
5	Stadium lights on/off
6	Reversing fan override
7	Windshield wiper low/high/off
8	Windshield washer on/off
9	Auto boom on/off
10	Boom lights on/off
11	Egress lights on/off
12	Engine start/stop

### Ignition switch and engine start/stop button

To start the engine, turn the ignition switch (1) to the on position. Push the engine start/stop button (2) to start the engine.

To stop the engine only and leave the electrical system active push the engine start/stop button (2). Use this way of stopping the engine if there is a need to check a fault code or the need to leave the electrical system active. Be sure to turn the ignition switch (1) off before leaving the cab.

To stop the engine and shutting the complete electrical system down turn the ignition switch to the off position.

Remove the key from the ignition switch whenever the vehicle is left unattended.

To have the electrical system live without the engine running simply turn the ignition switch to the on position.

**NOTE:** The battery disconnect and the ignition switch must be in the on position or the engine running for the lights on this vehicle to operate.

### Hazard flasher switch

The hazard flasher switch (1) controls two amber lights in the front fenders and two double—faced amber lights located on the rear boom rests.

To turn the hazard lights on, press the switch.

To turn the hazard lights off, press the switch again.

Always use the hazard lights when traveling on public roads.

The amber lights are also connected to the turn signal lever and will come on when the turn signals are activated. Refer to 3-6.

### Rotating beacon switch

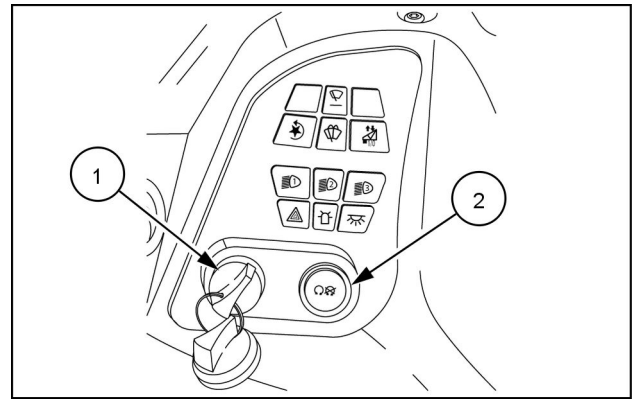
The rotating beacon switch (1) activates the rotating beacon or beacons.

To turn the rotating beacon on, press the switch.

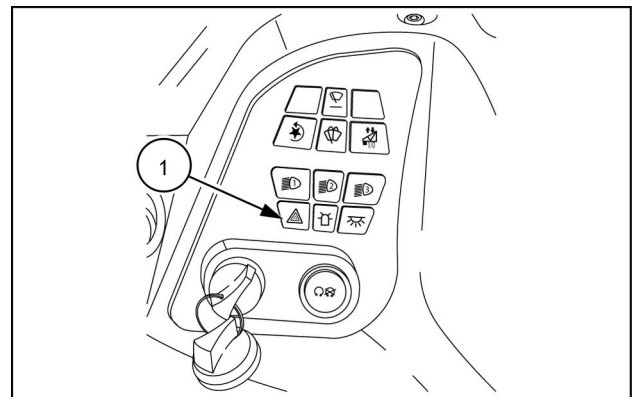
To turn the rotating beacon off, press the switch again.

Press and hold the beacon switch to change the flash pattern of the beacons.

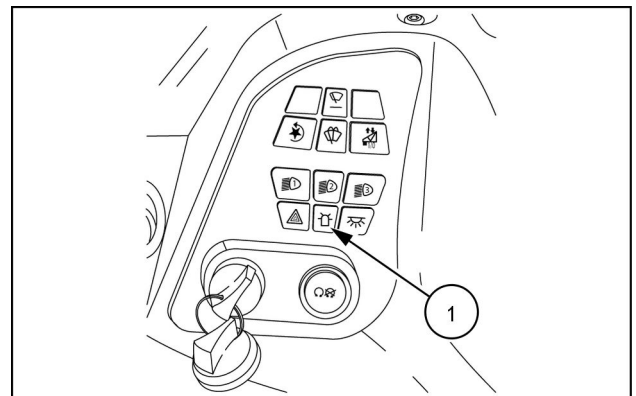
**NOTE:** Be sure the flash pattern selected meets local traffic regulations.



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RAIL17SP00263AA 3



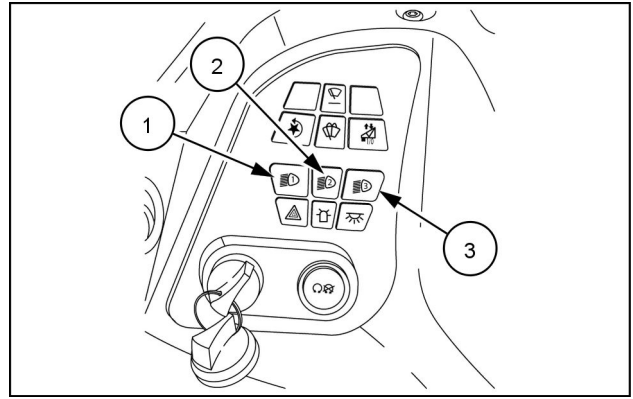
RAIL17SP00263AA 4

### Road headlights switch

The road headlight switch (1) turns the road headlights located in the front fenders on and off. Press the switch to turn the road headlights on. Press the switch again to turn the road headlights off.

### Stadium lights switch

The stadium lights switch (2) turns the six stadium lights located at the front of the cab on and off. Press the switch to turn all six of the stadium lights on. Press the switch again to turn all the stadium lights off.



RAIL17SP00263AA 5

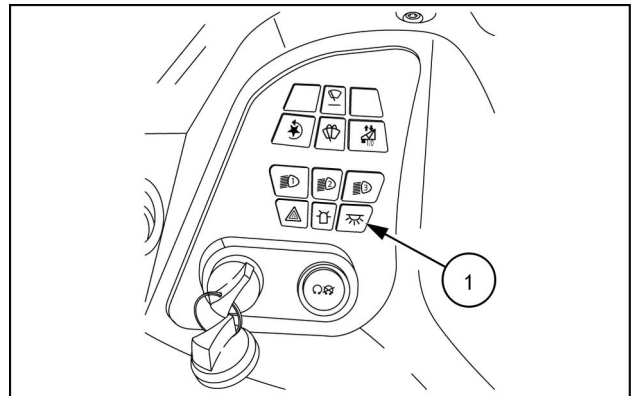
### Boom lights switch

The boom light switch (3) turns the boom lights on or off. The boom lights are located in the boom center section, and on the left-hand and right-hand boom rests. Press the switch to turn the boom lights on. Press the switch again to turn the boom lights off.

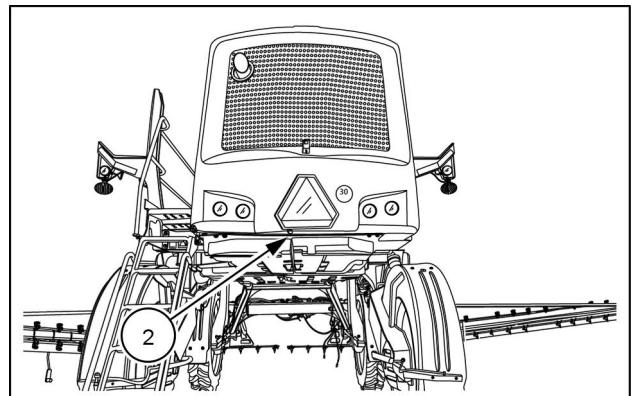
### Egress lights switch (if equipped)

The egress lights are activated by pressing the egress light switch (1). These lights will come on and stay on when switch is active. They can also be activated by pressing the outside egress light switch (2) located on the rear bottom edge of the engine compartment hood and placing the dome light switch to the left-hand side.

The egress lights consist of the lights positioned on the lower edge of the cab roof above the door, the light at the front of the engine compartment housing above the sliding doors and at the lower left rear corner of the engine compartment housing above the ladder.



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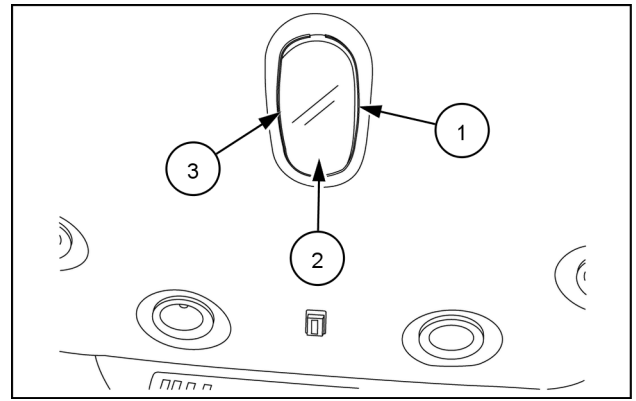
### Cab dome light

The cab dome light is located in the cab head liner and is controlled by pressing either the right side, left side or placing the light in the center position.

While facing forward in the operators seat, press the light to the right side **(1)** to have the dome light on all the time.

Place the dome light in the center **(2)** to turn the dome light off.

With the cab door closed press the dome light to the left **(3)** to have the dome light and egress lights come on when the door is opened and go off when the door is closed.

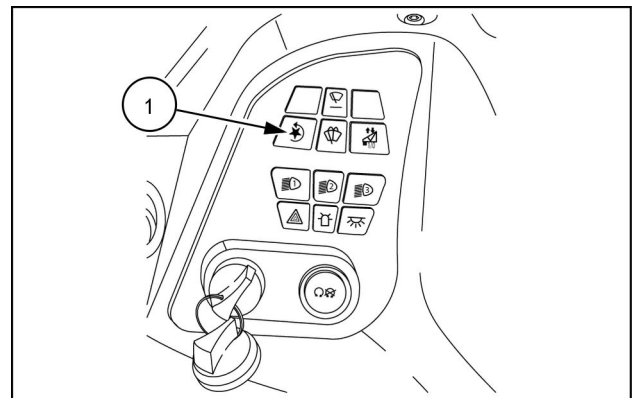


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### Reversing fan override switch

The reversing fan override switch **(1)** is used to override the automatic settings for reversing the fan which is controlled by the arm rest display.

If the cooling system becomes clogged with debris and the automatic setting has not yet engaged, push the override switch and the reverse cycle will initiate.

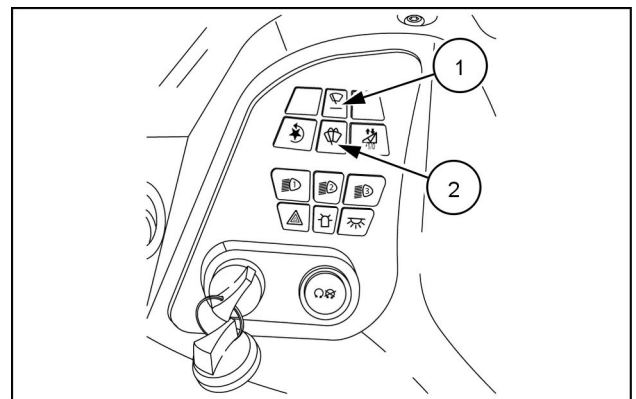


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### Windshield wiper switch

The windshield wiper will stop on the right side of the windshield when the switch is turned off. Press the switch **(1)** once to turn the wiper on low speed. Press the switch twice for high speed. Press the switch again to turn the wiper off.

The ignition switch must be in the on position for the windshield wiper to work.



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### Windshield washer switch

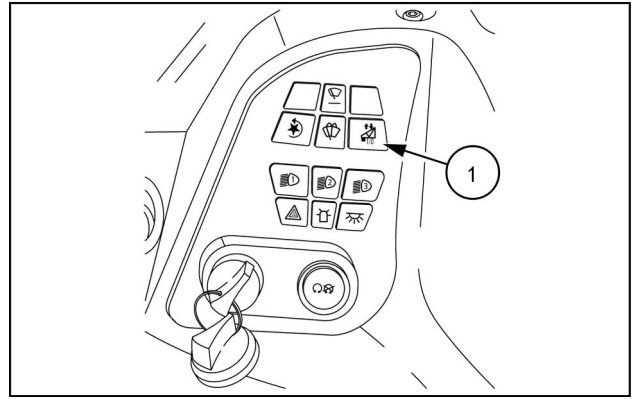
To activate the windshield washer, press and hold the washer switch **(2)** in. The washer will be activated as long as the switch is held in position. When the switch is released it will return to the off position

The ignition switch must be in the on position for the windshield washer to work.

## Auto boom switch

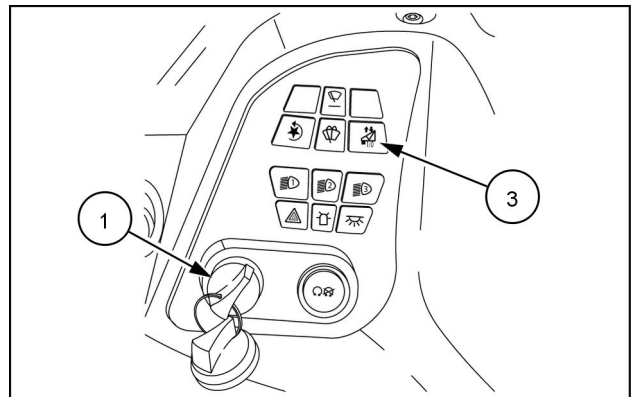
Press the auto boom switch **(1)** to unlock the auto boom (turn on switch amber). Press the auto boom switch again to lock the auto boom (turn off switch blue).

The auto boom system must be activated each time the ignition key is turned to the ON position.

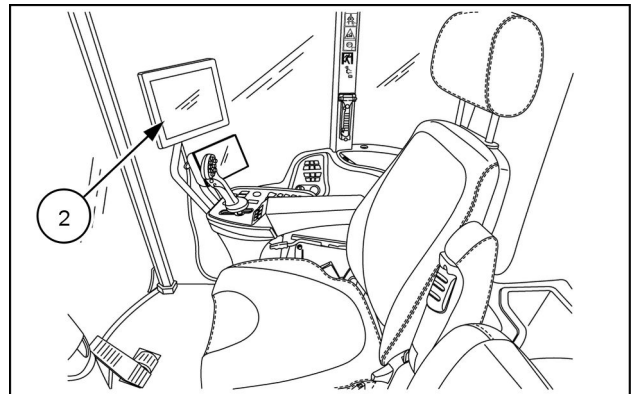


RAIL17SP00263AA 11

1. Turn the ignition key **(1)** to the ON position.
2. The **IntelliView™** monitor **(2)** will become active. After the splash screen the **Raven™** monitoring screen will appear.
3. Touch the auto boom icon on the left-hand side of the screen. A liability warning screen will appear with a green check mark on the right-hand side of the screen.
4. Touch the green check mark and the auto boom screen will appear. There is a red switch icon in the upper right-hand corner signifying the system is OFF. To activate the system press the auto boom switch **(3)** on the side console. The switch icon on the screen is now green and the switch on the side console is now amber.
5. To turn the auto boom OFF, press the switch on the side console, the switch will turn blue and the switch icon on the screen will turn red.



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RAIL17SP00310AA 13

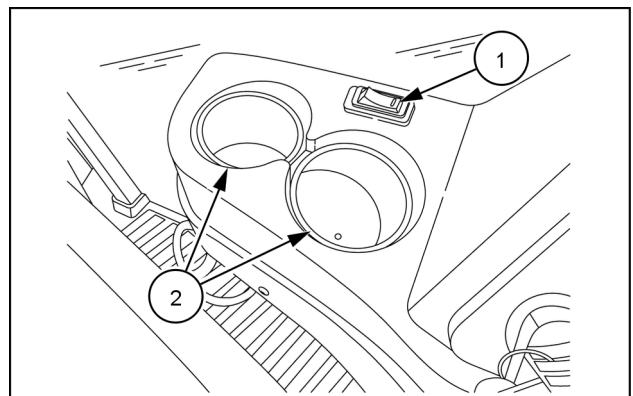
## Auto steer roading lock switch

The auto steer roading lock switch **(1)** is a rocker type switch used to disable the auto steer function when driving on roadways. The switch is located on the right side console next to the cup holder **(2)**.

Push the front of the rocker switch to enable the auto steer function.

Push the rear of the rocker switch to lock out (disable) the auto steer function.

**NOTE:** The auto steer lockout should activate automatically above a certain speed if the switch is left on while roading. If this occurs you must cycle the lock switch to reset.

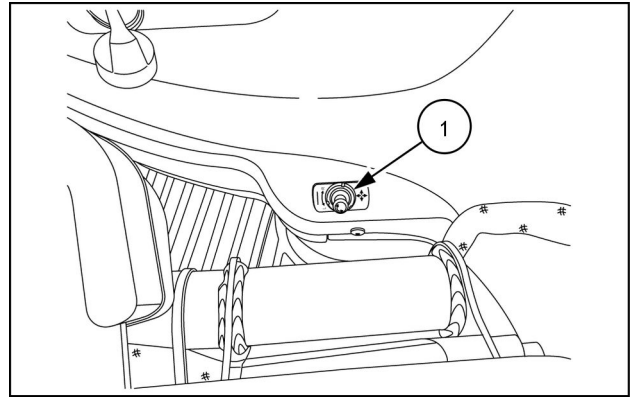


RAIL17SP00288AA 14

### Electric mirror adjustment control

To adjust the left-hand or right-hand side mirrors, locate the mirror adjustment control **(1)** to the right of the main switch panel and below the ignition switch panel. Turn the control to the right or left to select the mirror being adjusted.

Use the control by moving it forward, backward or side to side to adjust. When adjustment is complete turn the control back to the center. There is a small white indicator on the control.



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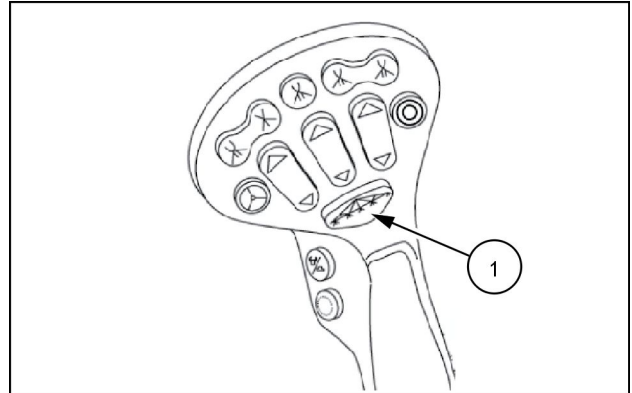
# Joystick control handle

## Boom control functions

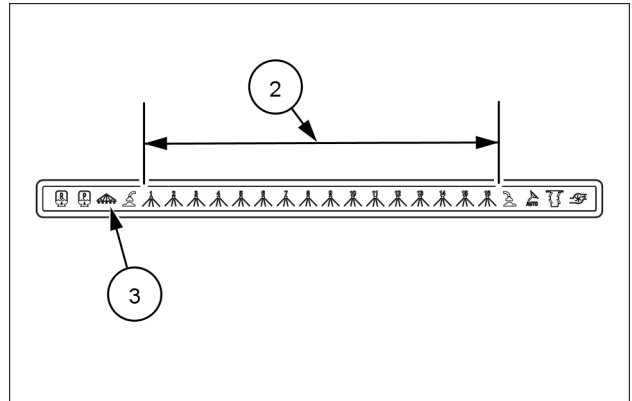
The joystick control handle is used to control boom functions as well as speed and direction of travel. The joystick control handle also controls the auto steer on/off (if equipped) and the optional foamer.

The face of the joystick has several buttons that are used to control boom functions.

**Master on (1):** When the Master button on the joystick is pushed to activate the boom functions the master on button will turn on all the boom sections. The boom section icons (2) on the front overhead display will illuminate as well as the boom master icon (3). When the master on button is pushed again, it will shut off all the boom sections. When the button is pushed the button will turn "Green" showing that it is active. When turned off the button will change back to red.



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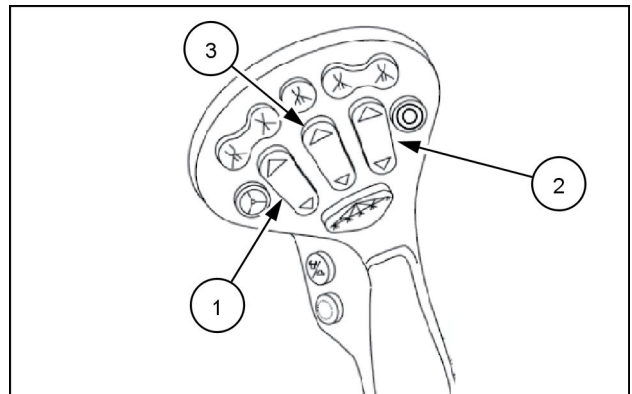


RAIL17SP00309FA 2

**Left boom tilt up and down (1):** Tilts the left boom up or down. The top of the button will tilt the boom up and the bottom of the button will tilt the boom down.

**Right boom tilt up and down (2) :** Tilts the right boom up or down. The top of the button will tilt the boom up and the bottom of the button will tilt the boom down.

**Center section (lift arms) raise and lower (3):** Raises or lowers the center section of the boom. The top of the button will lift the center section up and the bottom of the button will lower the center section. The lift arms can also be raised and lowered from the remote key pad located on the side of the fill snorkel under the frame. Engages/disengages the float circuit if equipped and active.

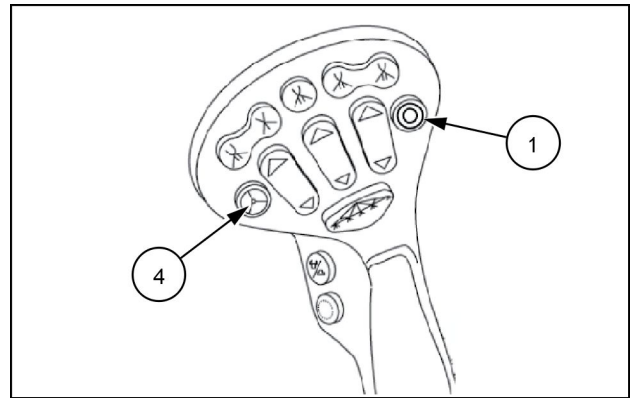


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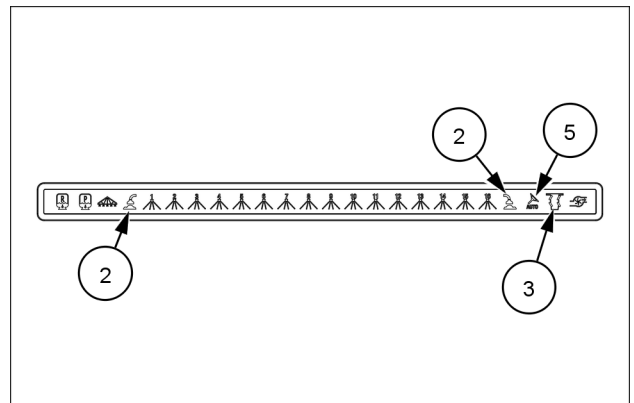
Multi-function button on/off for foamer or 4 wheel steer **(1)** (depending how your vehicle is equipped): Pushing the button will turn the foamer system (when not equipped with 4 wheel steer) or 4 wheel steer on or off. When active the foamer icon **(2)** or the 4 wheel steer icon **(3)** on the front overhead display will illuminate.

If your vehicle has 4 wheel steer and a foamer, the left right foamer selection will be controlled by the turn signal lever when the foamer is turned on with the display.

Auto steer on and off (if so equipped) **(4)**: Pushing the button turns the auto steer on. The auto steer icon **(5)** on the front overhead display will illuminate. Push the button again to turn the auto steer off and the icon will go off.



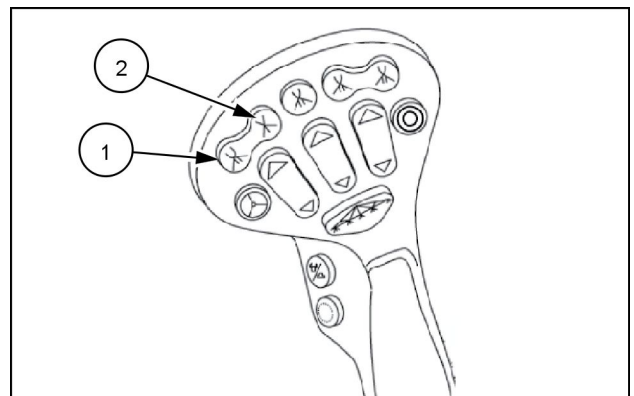
RAIL17SP00391AA 4



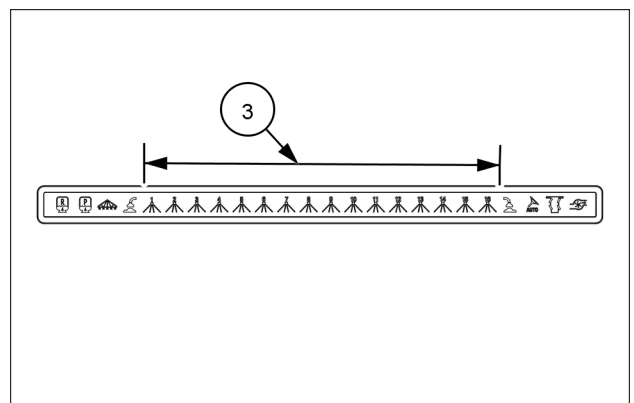
RAIL17SP00309FA 5

Boom section 1 (1 and 2 for 10-section boom) on and off **(1)**: Push the left side of the button to turn boom 1 on. The icon **(3)** on the front overhead display will illuminate indicating that the section is active. The button will change to green. Push the left side again to turn boom 1 off and the button will change back to red. The button will change to amber when the switch is on and the master is off.

Boom section 2 (3 and 4 for 10-section boom) on and off **(2)**: Push the right side of the button to turn boom 2 on. The icon on the front overhead display will illuminate indicating that the section is active. The button will change to green. Push the right side again to turn boom 2 off and the button will change back to red. The button will change to amber when the switch is on and the master is off.

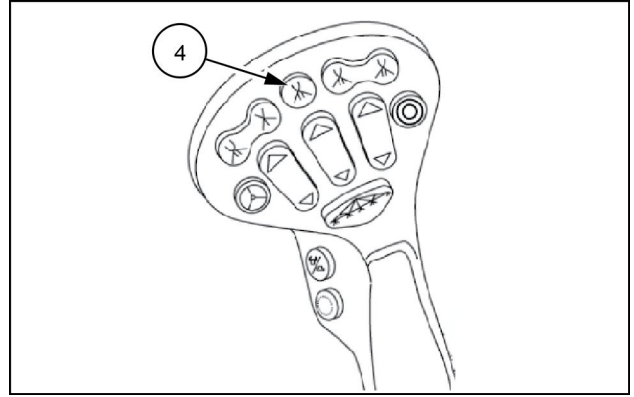


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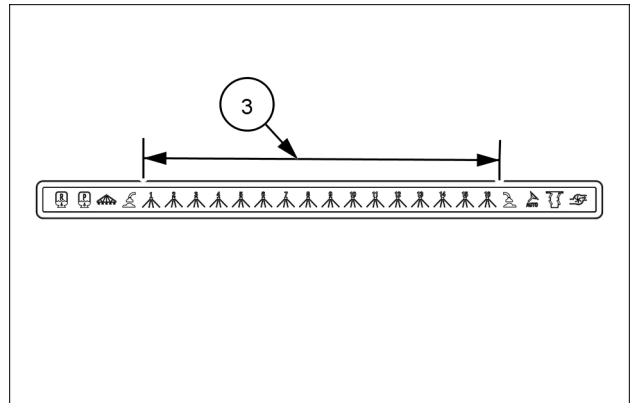


RAIL17SP00309FA 7

Boom section 3 (5 and 6 for 10-section boom) on and off **(4)**: Push the button to turn boom 3 on. The icon **(3)** on the front overhead display will illuminate indicating that the section is active. The button will change to green. Push the button again to turn boom 3 off and the button will change back to red. The button will change to amber when the switch is on and the master is off

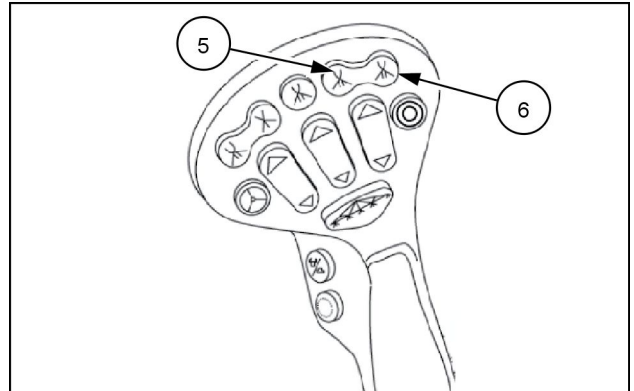


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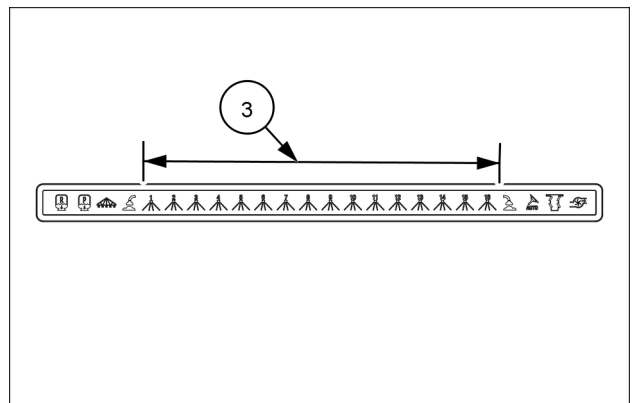
RAIL17SP00309FA 9

Boom section 4 (7 and 8 for 10-section boom) on and off **(5)**: Push the left side of the button to turn boom 4 on. The icon **(3)** on the front overhead display will illuminate indicating that the section is active. The button will change to green. Push the left side again to turn boom 4 off and the button will change back to red. The button will change to amber when the switch is on and the master is off.



RAIL17SP00391AA 10

Boom section 5 (9 and 10 for 10-section boom) on and off **(6)**: Push the right side of the button to turn boom 5 on. The icon on the front overhead display will illuminate indicating that the section is active. The button will change to green. Push the right side again to turn boom 5 off and the button will change back to red. The button will change to amber when the switch is on and the master is off.



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## Direction control and travel speed functions

In addition to the boom control buttons, the joystick is also used to control direction of travel as well as speed of travel.

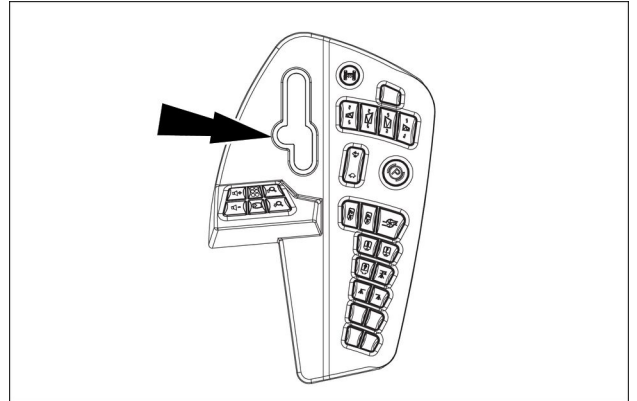
To Start the engine: the three following conditions must be met:

1. The joystick must be in the neutral position.
2. The parking brake must be set.
3. The operator must be seated in the operator's seat.

Before the machine is allowed move forward or reverse, the following steps must be completed:

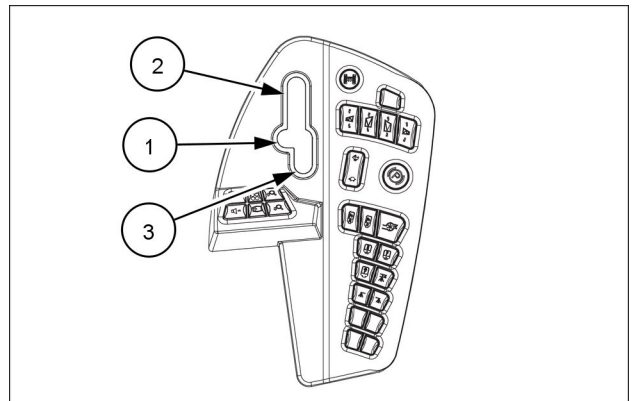
1. Turn ignition switch to the ON position. (The engine must also be running)
2. Place the joystick in the neutral position.
3. Disengage the vehicle park brake..
4. Press brake pedal to full travel and release.

**NOTE:** These steps must be completed each time the ignition switch is turned to the STOP position.



RAIL17SP00307FA 12

To Move Forward: From the center (Neutral) position **(1)** push the joystick forward **(2)** to move forward. Pushing the joystick further forward also increases the travel speed within that range. Pushing the joystick full forward will take the speed up to the preset speed in that range. Pushing the joystick halfway will take the speed up to half of the preset speed in that range. Depending how far you push the joystick forward will determine how fast the vehicle will move in that range.



RAIL17SP00307FA 13

To Move in Reverse: From the center (Neutral) position pull the joystick backward **(3)** to move in reverse. Pulling the joystick further backward also increases the travel speed up to a preset speed of **8 km/h (5 mph)**. If the range speed setting selected is less than **8 km/h (5 mph)**, the reverse speed will be limited to the lower range speed.

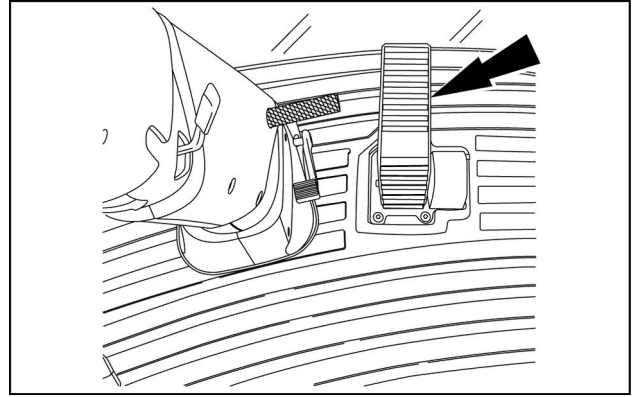
**Slowing Vehicle with Joystick:** The joystick should be used to slow the vehicle under normal operating conditions.

**Brake Pedal:** The brake pedal is located on the right side of the steering column. The pedal is used to slow the vehicle to a smooth stop. The pedal applies the brake to all four wheels and reduces the propel command to the hydrostat pumps. If the brake pedal is pressed more than 65% of travel, the machine will come to a complete stop. Return the joystick to the neutral position to reset the propel system and then continue normal operation.

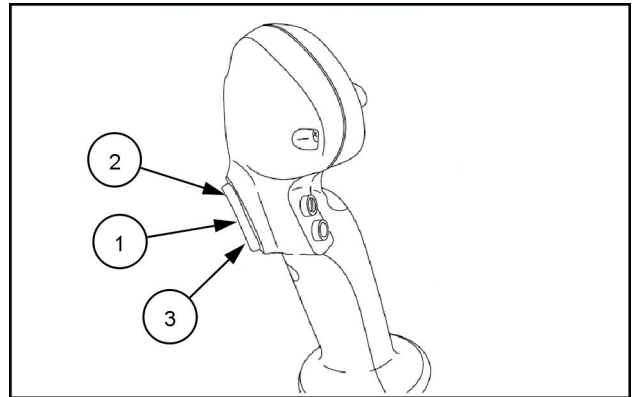
If the brake is pressed less than 65% of travel and then released, the drive will return to the preset speed set by the joystick and range selector.

The brake pedal can be used in conjunction with the joystick to rapidly slow the vehicle.

**To increase or decrease “Tic” marks within a range:** With the joystick in any position, the “Tic” marks within a range can be moved up or down by using the trigger (1) on the joystick without any buttons held. Push the top (2) of the trigger to increase or the bottom (3) of the trigger to decrease the preset “Tic” marks on the display.

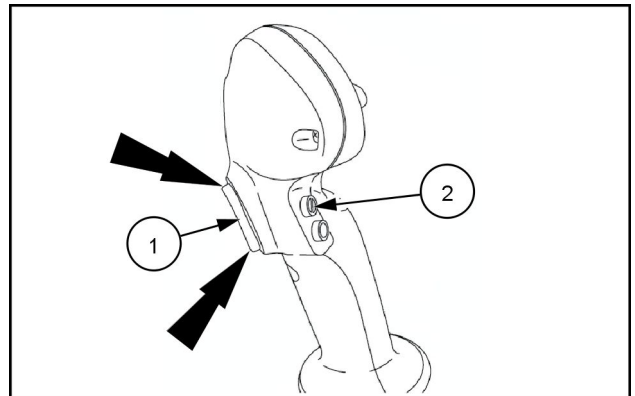


RAIL17SP00226AA 14



RAIL17SP00696AA 15

The engine speed can be increased or decreased with the trigger (1) in conjunction with the engine speed control button (2). While holding the engine speed button on the side of the joystick, use the trigger on the front of the joystick to increase (upper part of trigger) or decrease (lower part of trigger). The button must be held when using the trigger.

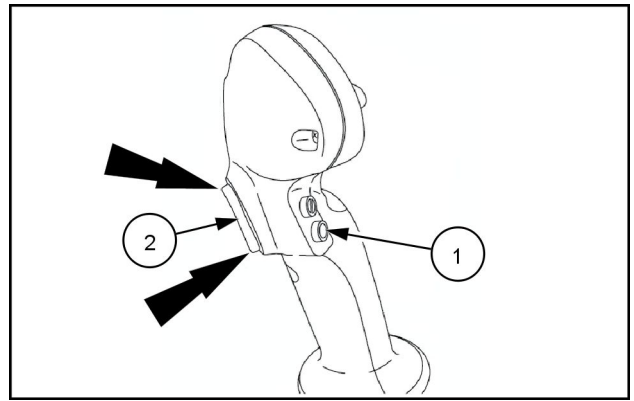


RAIL17SP00696AA 16

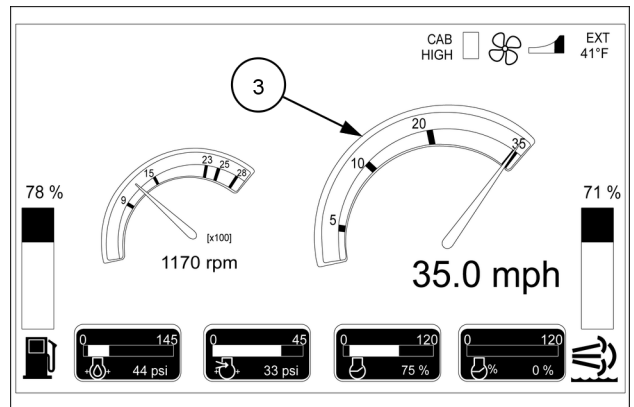


The range selector is a push button (1) on the side of the joystick along with the trigger (2) on the front of the joystick and has four speed ranges. Speed range is selected with the trigger, in conjunction with pressing the range button. The speed range can be changed up or down at any time with the vehicle in motion forward or reverse “shift on the go”. While holding the range selector button down, use the trigger on the front of the joystick to shift up (trigger up) or shift down (trigger down). The range button must be held down while using the trigger. Watch the speedometer (3) on the home page of the A-post display as you shift through the ranges. The arc of the speedometer will change colors in the ranges. The range you are in will display as white as well as the lower range.

The range marks on the speedometer gauge will move as you set the speed desired for each range. Refer to 3-62 for a detailed explanation of how to set.



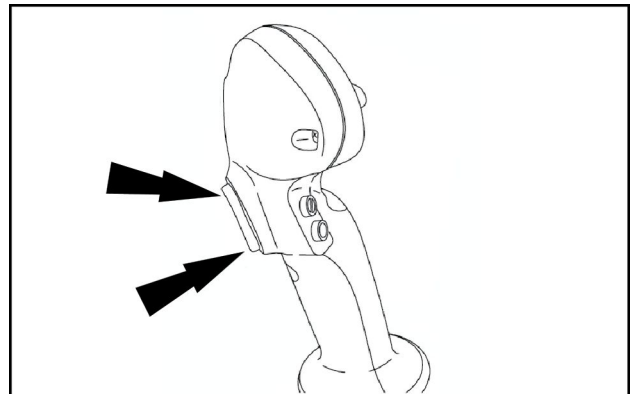
RAIL17SP00696AA 17



RAIL17SP00107FA 18

In each of the speed ranges, you have the ability to increase or decrease the speed by **0.3 km/h (0.2 mph)**. To change the speed within a range, simply press the top of the trigger (without pressing the range selector button) to increase the speed or press the bottom of the trigger (without pressing the range selector button) to decrease the speed.

The speed ranges can also be increased or decreased with the display screen. Refer to 3-88



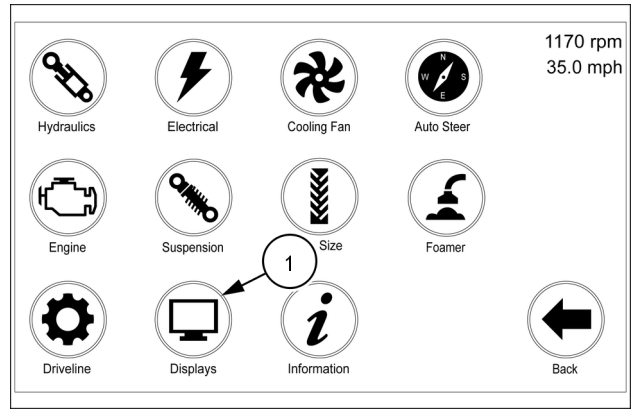
RAIL17SP00696AA 19

### Activating index section control joystick

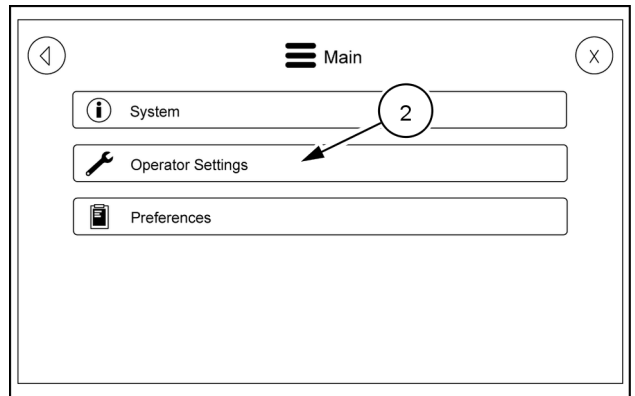
The joystick handle can be reprogrammed to the indexing mode.

On the armrest second home page, touch the Displays icon (1). The Main screen will appear. Touch the Operator Settings icon (2).

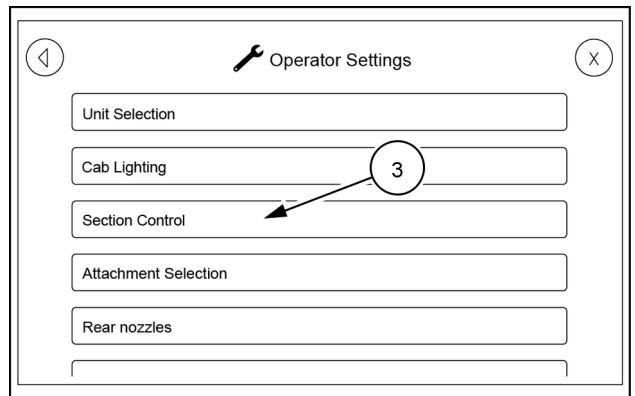
The Operator Settings screen is a scroll screen. Use the finger swipe method to scroll down until the Section Control icon (3) appears. Touch the Section Control icon



RAIL17SP00109FA 20

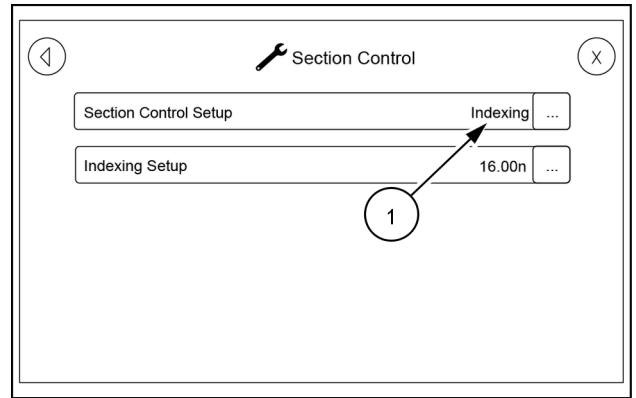


RAIL17SP00143AA 21

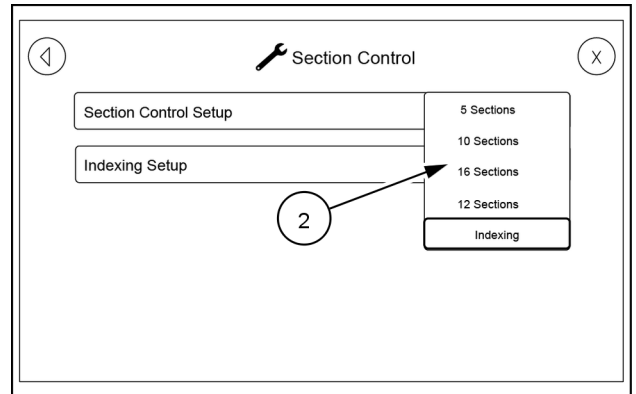


RAIL17SP01462AA 22

The Section Control screen will appear. This screen has two selectable options. Touch the Section Control Setup icon (1) at the right-hand side to bring up a menu (2) where the number of sections to be indexed can be selected.

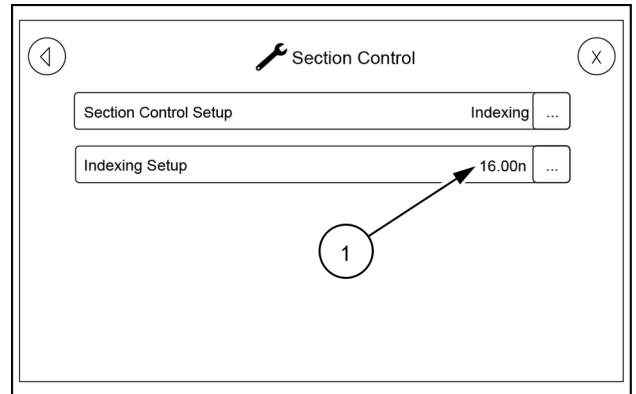


RAIL17SP01463AA 23

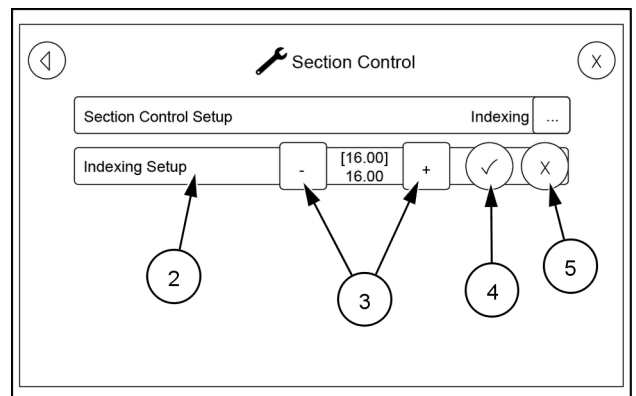


RAIL17SP01464AA 24

On the Section Control screen touch the Indexing Setup icon (1) at the right-hand side to bring up the Indexing Setup icon (2) where the number of sections to be indexed can be set by using the (+) or (-) icons (3). After the setting is correct, touch the check mark icon (4) to lock the setting in. Then touch the X icon (5) to close the selection and save. If the number of sections has not been changed, close the selection with the X icon



RAIL17SP01463AA 25



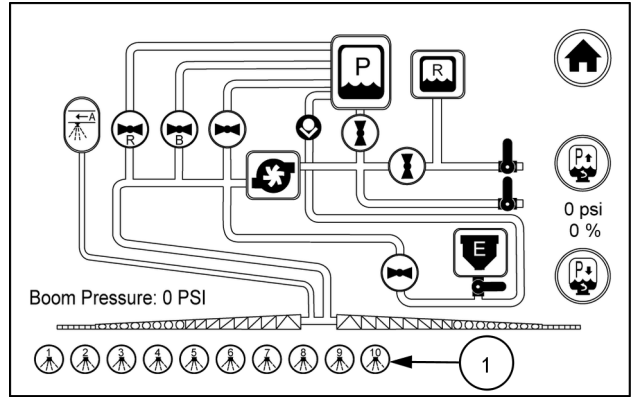
RAIL17SP01465AA 26

### Index section control joystick

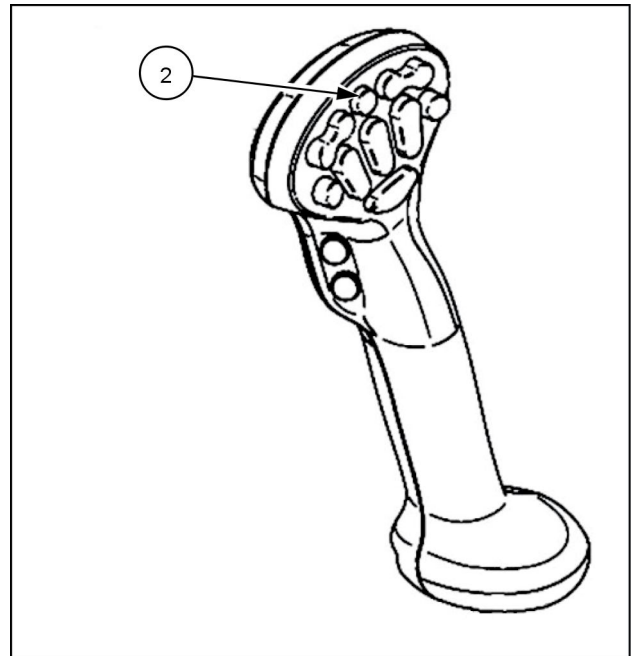
Refer to **3-62** for product pump operation.

The joystick handle can be reprogrammed to the indexing mode by going to the machine setup screen and choosing indexing. Activate the indexing system.

The individual sections can be turned off from the outer section first to the inner sections in one of two ways. Using the touch screen you can touch the individual valves **(1)** to turn off. The valve will be red when off. To turn the sections back on from the inner toward the outer you can touch the valves in order or press the center button **(2)** on the joystick to turn all on at once. The valves will turn green when on.



RAIL17SP00183AA 27

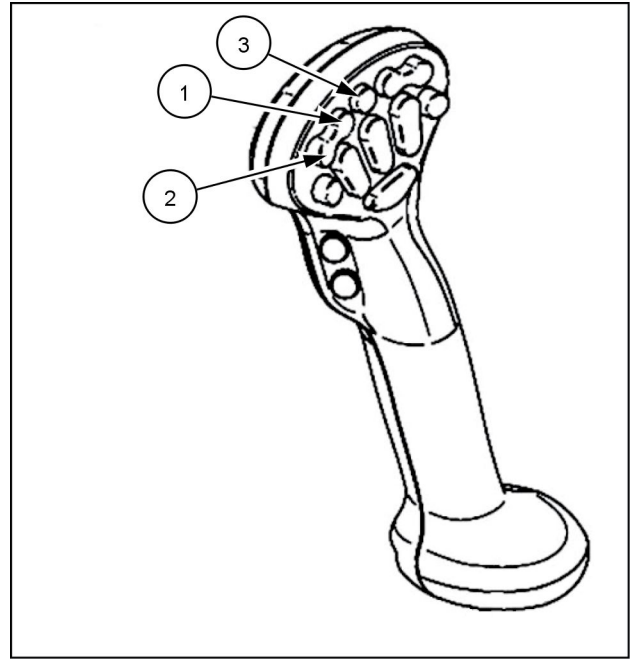


RAIL15SP00918AA 28

To turn the sections off or on with the joystick, choose which side of the boom you will be turning off.

For the left side boom: press the right half **(1)** of the left side section control to turn the sections off one at a time starting at the outer most section. Each time the button half is pressed the next section will be turned off. To turn the left side sections back on, from the inner most to the outer most, press the left half **(2)** of the left side section control to turn the sections on in order from the inner section. Each time the button is pressed the next section will turn on.

To turn all the sections on immediately, press the center button **(3)** on the joystick.



RAIL15SP00918AA 29



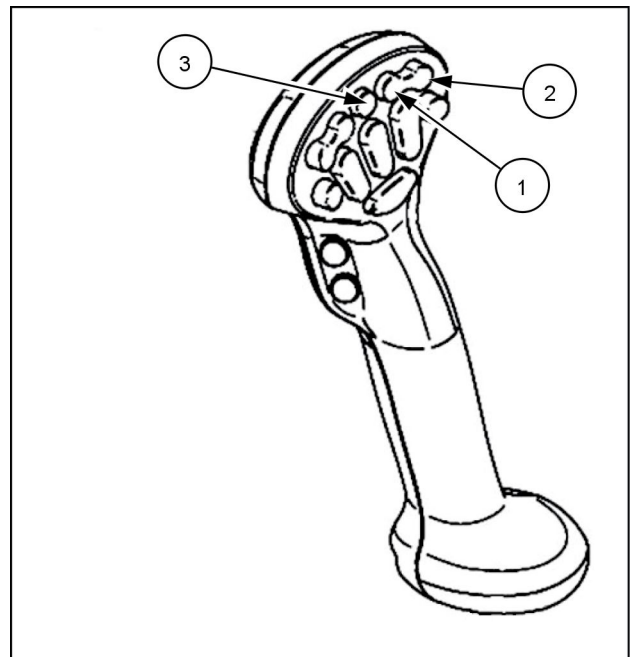
RAIL15SP00919AA 30



RAIL15SP00921AA 31

For the right side boom: touch the left half **(1)** of the right side section control to turn the sections off one at a time starting at the outer most section. Each time the button half is pressed the next section will be turned off. To turn the right side sections back on, from the inner most to the outer most, press the right half **(2)** of the right side section control to turn the sections on in order from the inner section to the outer. Each time the button is pressed the next section will turn on.

To turn all the sections on immediately, press the center button **(3)** on the joystick.

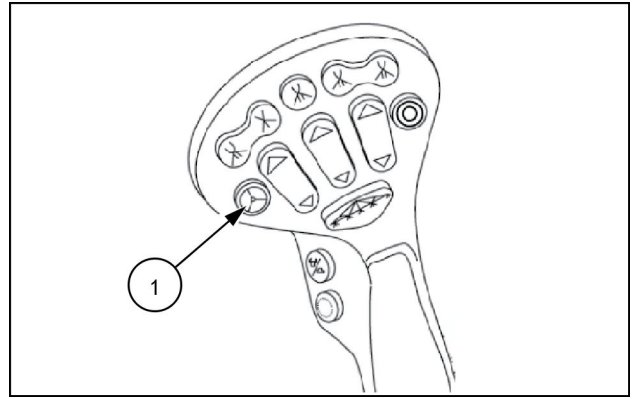


RAIL15SP00918AA 32

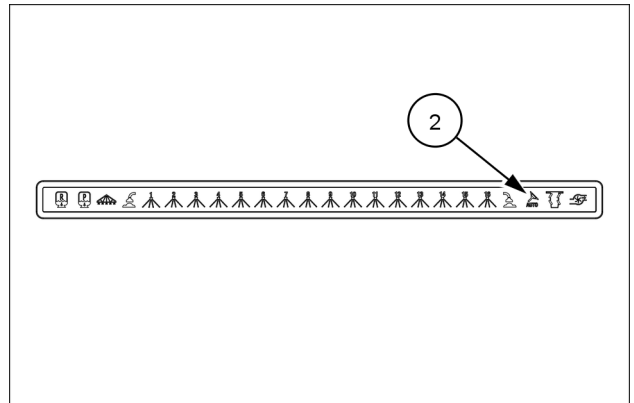
### Auto steer on/off button (optional)

When equipped with the auto steer option, it will be turned on and off using the auto steer button **(1)** on the joystick. Push the button to activate the auto steer option. Once the auto steer is engaged, the button will turn green. The auto steer icon **(2)** on the front overhead display will illuminate. Push the button again to turn the system off. Once the auto steer disengages, the button will turn back to red. Turning the steering wheel manually will also disengage the auto steer.

**NOTE:** You must engage AutoSteer via the display before you can use the functionality.



RAIL17SP00391AA 33

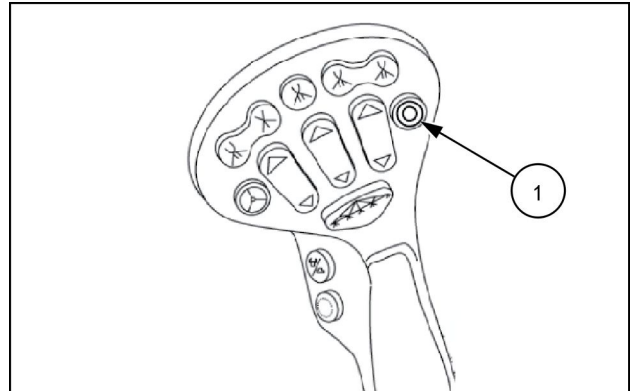


RAIL17SP00309FA 34

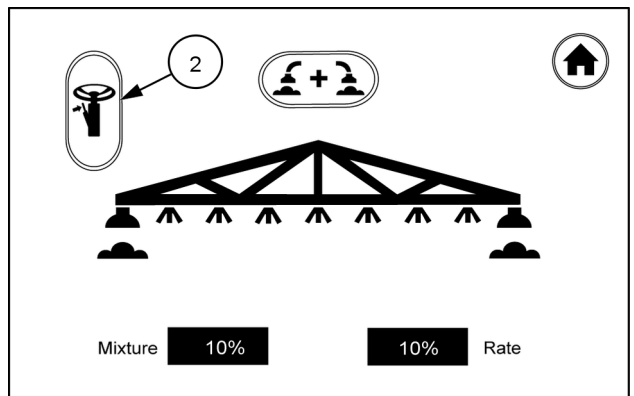
### Multi-function button

The multi-function button **(1)** on the joystick will work as off-right-off-left-off by pressing in this order when the foamer option is active.

The multi-function button on the joystick will toggle both sides (off-both-off) when the dual foamer is turned on with the screen and the turn signal lever icon **(2)** on the screen has been activated.



RAIL17SP00391AA 35



RAIL17SP00204AA 36

## Radio

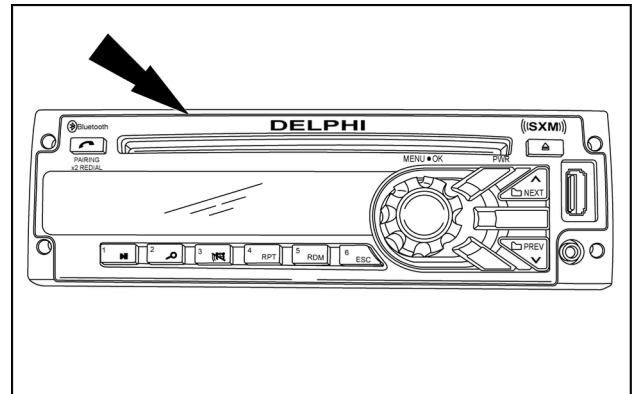
### AM/FM/WX stereo radio with compact disc player (Bluetooth® capable)

For any programming of the radio, refer to the radio operator's manual that is supplied with your vehicle.

Use of the **SiriusXM®** radio service requires a subscription. Refer to the radio operator's manual for subscription information.

### Radio antenna

The radio antenna is located in the cab roof.



RAIL17SP00282AA 1

### Radio controls switch panel

Just to the rear of the joystick on the right side console is a panel with six push buttons that controls certain radio functions. They are: seek up, seek down, source, volume down, volume up and presets.

These controls work in conjunction with the radio controls.

**Seek Up (1)** - Press and hold this button to scan up through the channels. Let the button go when a station is found. If the channel is to be stored, press the presets button to store it.

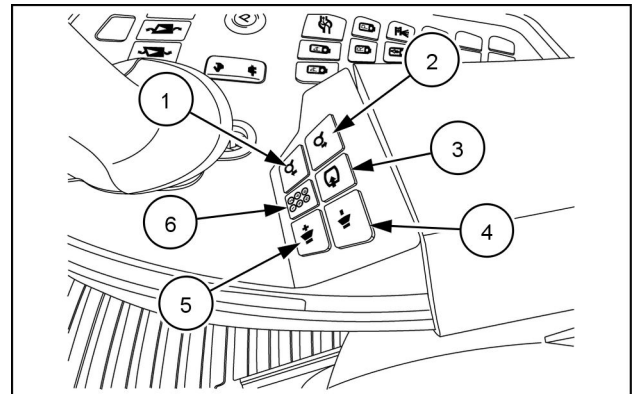
**Seek Down (2)** - Press and hold this button to scan down through the channels. Let the button go when a station is found. If the channel is to be stored, press the presets button to store it.

**Source (3)** - Press the button to switch between AM/FM/Satellite/Weather. Each press will change the source.

**Volume Down (4)** - Press and hold to decrease the volume of the radio. When released the radio will hold that volume.

**Volume Up (5)** - Press and hold to increase the volume of the radio. When released the radio will hold that volume.

**Presets (6)** - Press this button to scan through the preset radio stations. Each press will change to the next saved radio station. It has the capability to store 6 radio stations.



RAIL17SP00281AA 2

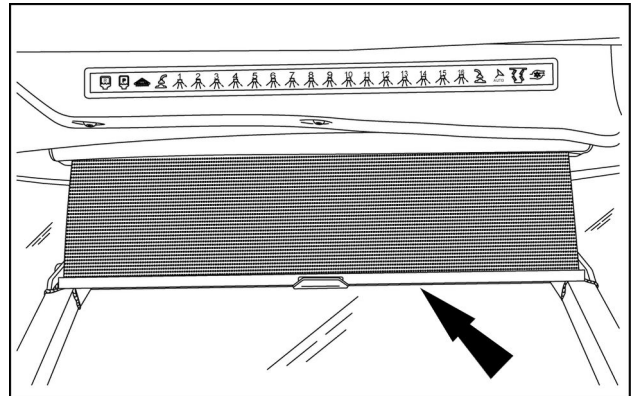
## Overhead controls

### Front sun shade

#### Front pull down sun shade

The front sun shade can be pulled down as needed. When not using the sun shade, it can be pushed up out of the way.

The sun shade will hold any position. Grab the sun shade by the center handle when re positioning.



RAIL17SP00300AA 1

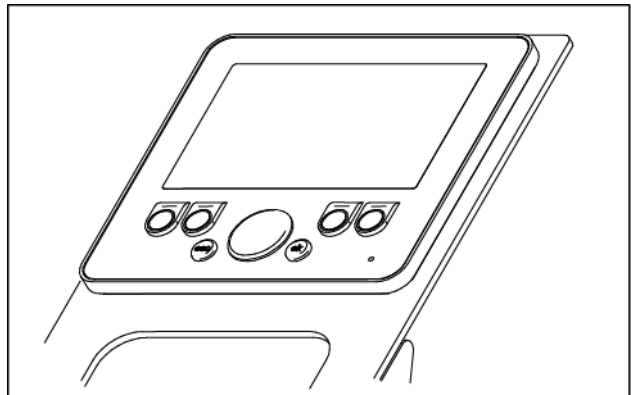
## Exterior controls

### Tank fill monitor (if equipped)

The vehicle fast-fill assembly includes an attached tank fill monitor (if equipped).

Use the tank fill monitor to record the amount of product or rinse water that you fill into the tanks.

See 6-30 for the operation of the tank fill monitor.



RAIL17SP00702AA 1



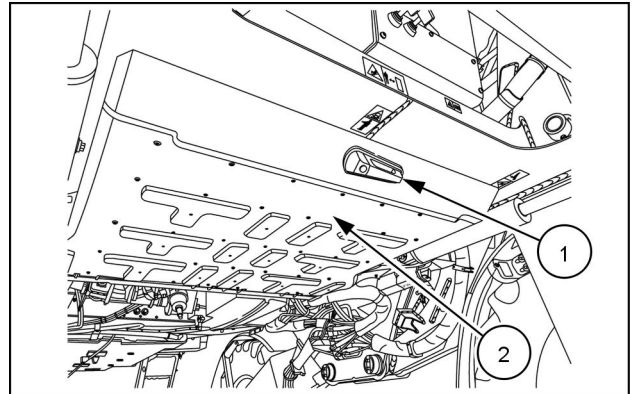
## Exterior remote control key pad

At the front of the frame, locate the latch **(1)** for the eductor/fast-fill (door). Unlatch and open the eductor/fast-fill (door) **(2)** .

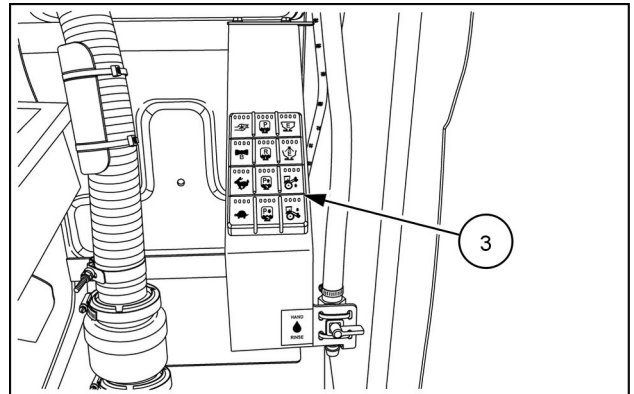
Be sure to close and latch the eductor/fast-fill (door) when finished.

The exterior remote key pad **(3)** is assembled to the eductor/fast-fill (door).

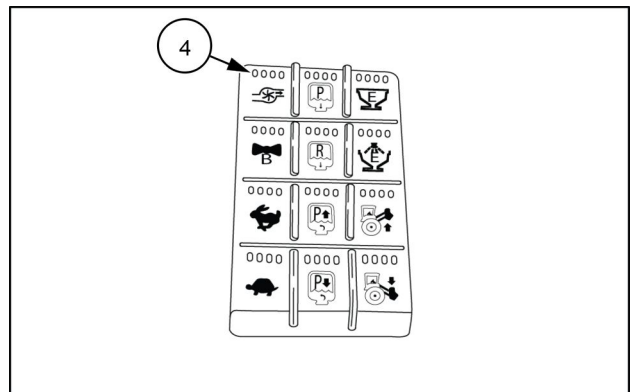
Each switch on the key pad has four led lights **(4)** which will illuminate indicating that the function is either on or open.



RAIL17SP00867AA 1



RAIL17SP00873AA 2

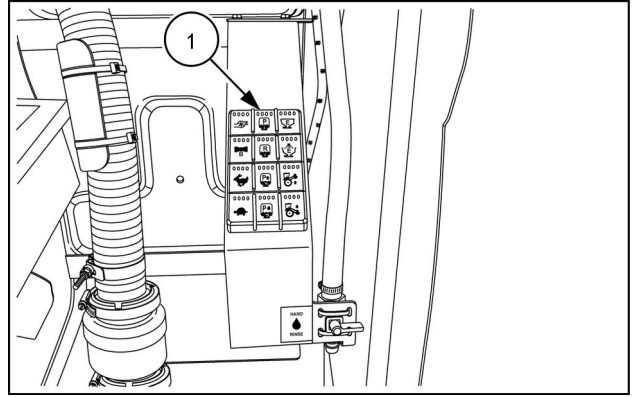


RAIL17SP00796AA 3

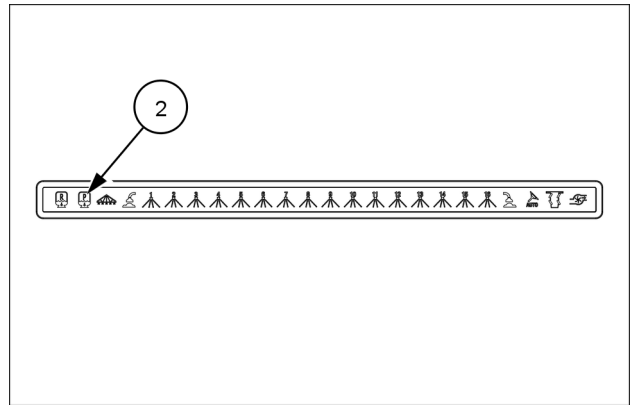
### Remote product tank sump open/close switch

The remote product tank sump switch (1) allows the operator to open and close the product tank sump from outside the cab. Press the switch to open the product tank sump. When the product tank sump is open the four led lights on the switch will illuminate indicating that the sump is open. Press the switch again to close the sump.

The "Sump is Open" light (2) in the front overhead panel will also come on when opening the sump with this switch.



RAIL17SP00873AA 4



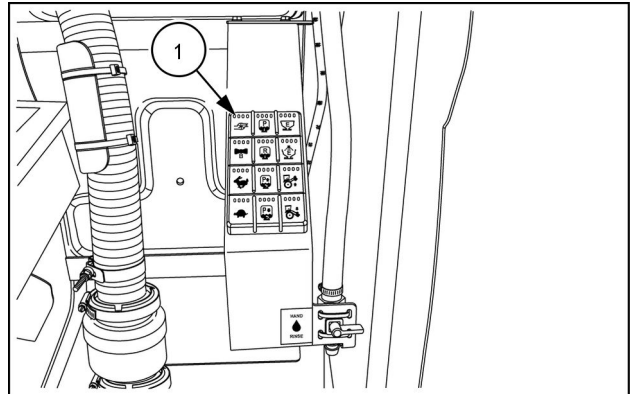
RAIL17SP00309FA 5

### Remote product pump on/off switch

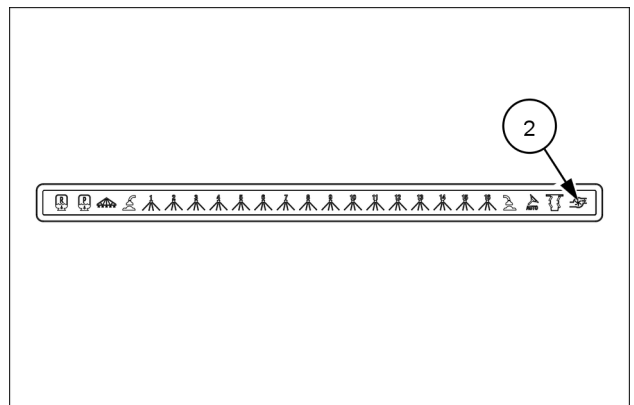
**NOTICE:** To avoid damage to the product pump, never run the pump "Dry" without liquid in the pump.

The product tank sump or rinse tank sump must be open before turning product pump on.

The product pump can also be activated from outside the cab. Push the product pump switch (1) once to turn the pump on. When the product pump is on, the four led lights on the switch will illuminate indicating that the pump is on. Push the switch again to turn the pump off. When the product pump is turned on the pump icon (2) in the front overhead panel will illuminate.



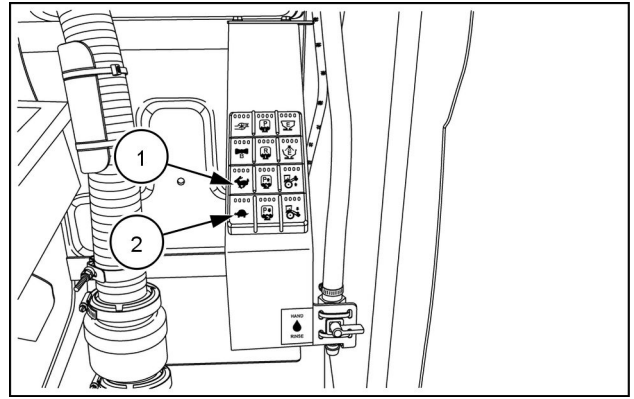
RAIL17SP00873AA 6



RAIL17SP00309FA 7

### Remote throttle control switch

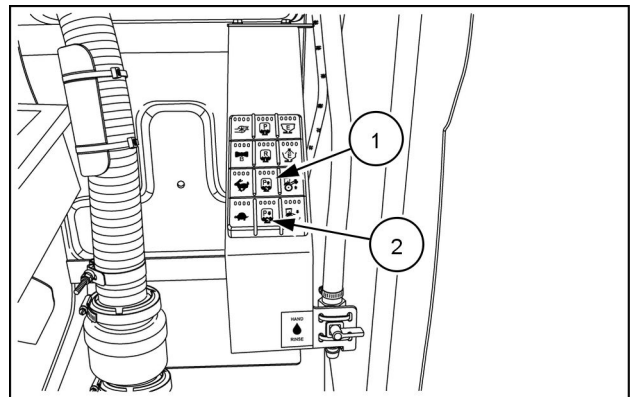
The remote throttle control switch allows the operator to change the engine speed from outside the cab. The engine speed can be increased from idle by pushing the “Rabbit” (1) or decreased to idle by pushing the “Turtle” (2). Press the “Rabbit” once for half throttle. Press the “Rabbit” twice for full throttle. Press the “Turtle” for idle.



RAIL17SP00873AA 8

### Remote product tank sparge flow control switches

Push the sparge increase switch (1) to increase the sparge flow. As the sparge increases the four led lights will illuminate indicating the percentage of sparge. Refer to the table that follows for light combination to percentage of sparge. Push the sparge decrease switch (2) to decrease the sparge flow. As the sparge decreases the four led lights will illuminate indicating the percentage of sparge. Refer to the table that follows for light combination to percentage of sparge. The product pump has to be running for the sparge system to operate. Adjust the sparge as needed to keep the chemical in suspension without creating foam in the product tank. Each tank is equipped with several sparge inlet and outlet locations. These locations keep the product in suspension through circulation of the product tank utilizing the product pump.



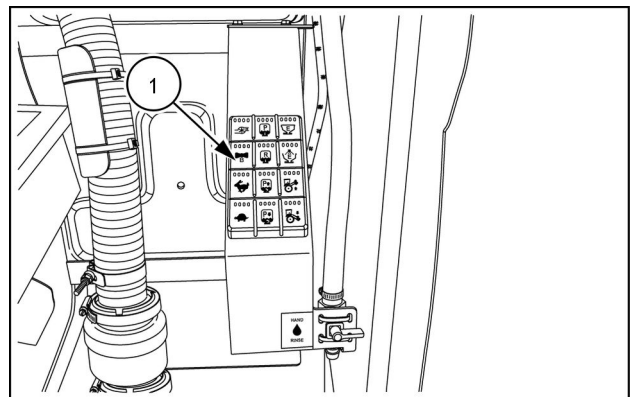
RAIL17SP00873AA 9

Light color combination	Percentage of sparge
Red	0–6%
Red and Yellow	7–23%
Yellow	24–41%
Yellow and Green	42–58%
Green	59–77%
Green and Blue	78–99%
Blue	100%

### Bypass valve on/off switch (if equipped)

The optional bypass valve switch (1) is used to turn the bypass valve on or off. Press the bypass valve switch once to turn the bypass valve on. When the bypass valve is on, the four led lights on the switch will illuminate indicating that the valve is on. Press the bypass valve switch again to turn the bypass valve off.

The bypass valve is used when filling the product tank from a nurse tank that does not have an on board pump. After opening the bypass valve, hold the product pump switch until the pump starts (approximately 5 seconds).

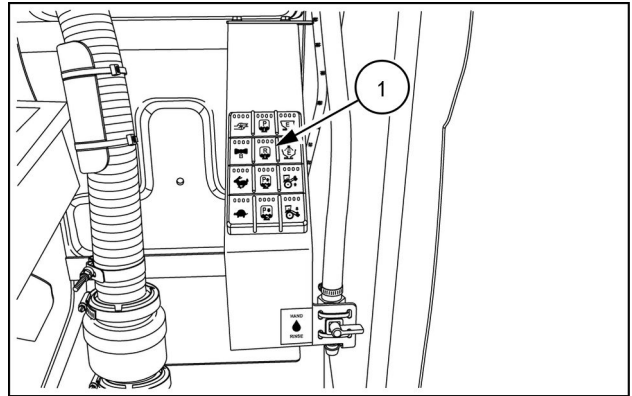


RAIL17SP00873AA 10

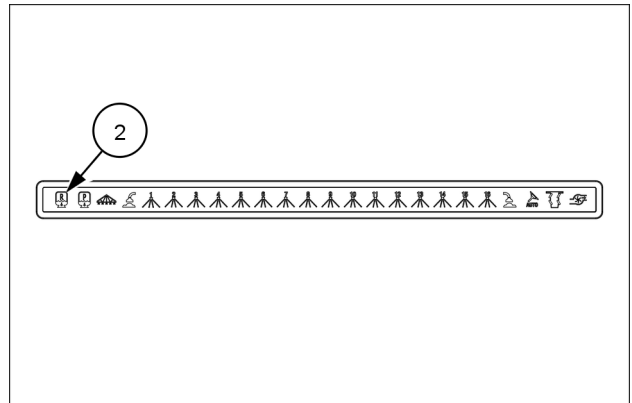
### Remote rinse tank sump valve open/close switch

The remote rinse tank sump switch (1) allows the operator to open and close the sump from outside the cab. Press the switch to open the sump. When the sump is open, the four led lights on the switch will illuminate indicating that the sump is open. Press the switch again to close the sump.

When the rinse tank sump valve is open, the rinse tank icon (2) on the front overhead panel will illuminate.



RAIL17SP00873AA 11

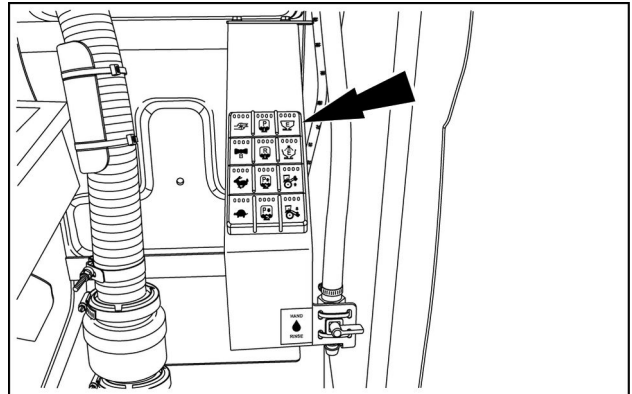


RAIL17SP00309FA 12

### Chemical eductor on/off switch

The chemical eductor on/off switch is used to turn the chemical eductor on and off. Press the switch to turn the chemical eductor on. When the eductor is on the four led lights on the switch will illuminate indicating the eductor is on. Press the switch again to turn the chemical eductor off. Be sure the chemical eductor lid is closed when using the eductor.

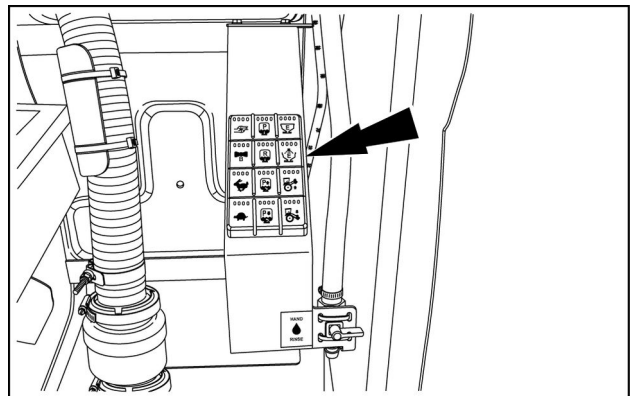
**NOTE:** When the chemical eductor switch is activated, the engine will rev up and the pump will start. These happen automatically.



RAIL17SP00873AA 13

### Chemical eductor rinse on/off switch

The chemical eductor rinse on/off switch is used to rinse the inside of the eductor hopper. Press the switch to turn the chemical eductor rinse on. When the eductor rinse is on the four led lights on the switch will illuminate indicating that the rinse is on. Press the switch again to turn the chemical eductor rinse off. Be sure the chemical eductor lid is closed when using the eductor rinse.



RAIL17SP00873AA 14

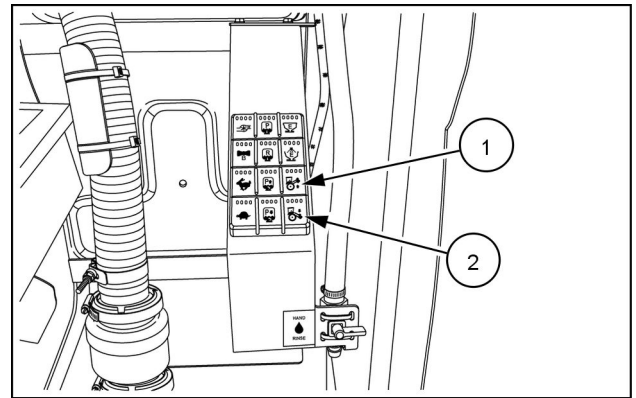
### Remote lift arm raise and lift arm lower switches

The lift arm raise switch (1) and the lift arm lower switch (2) are used to raise and lower the lift arms from outside the cab.

**NOTE:** The lift arms will raise or lower at a slower speed than operating from the joystick control buttons in the cab.

Press the lift arm raise switch to raise the lift arms. Hold the switch to operate. The lift arm raise will stop when the switch is released.

Press the lift arm lower switch to lower the lift arms. Hold the switch to operate. The lift arm lower will stop when the switch is released.



RAIL17SP00873AA 15

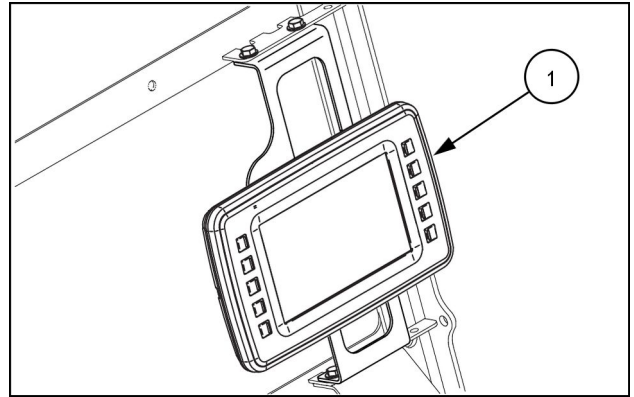
## Auto-rinse display (if equipped)

The vehicle Auto-Rinse option controls the rinsing of the product tank. The Auto-Rinse option includes a display monitor (1) and an electric valve.

The display is mounted on the eductor drop-down door.

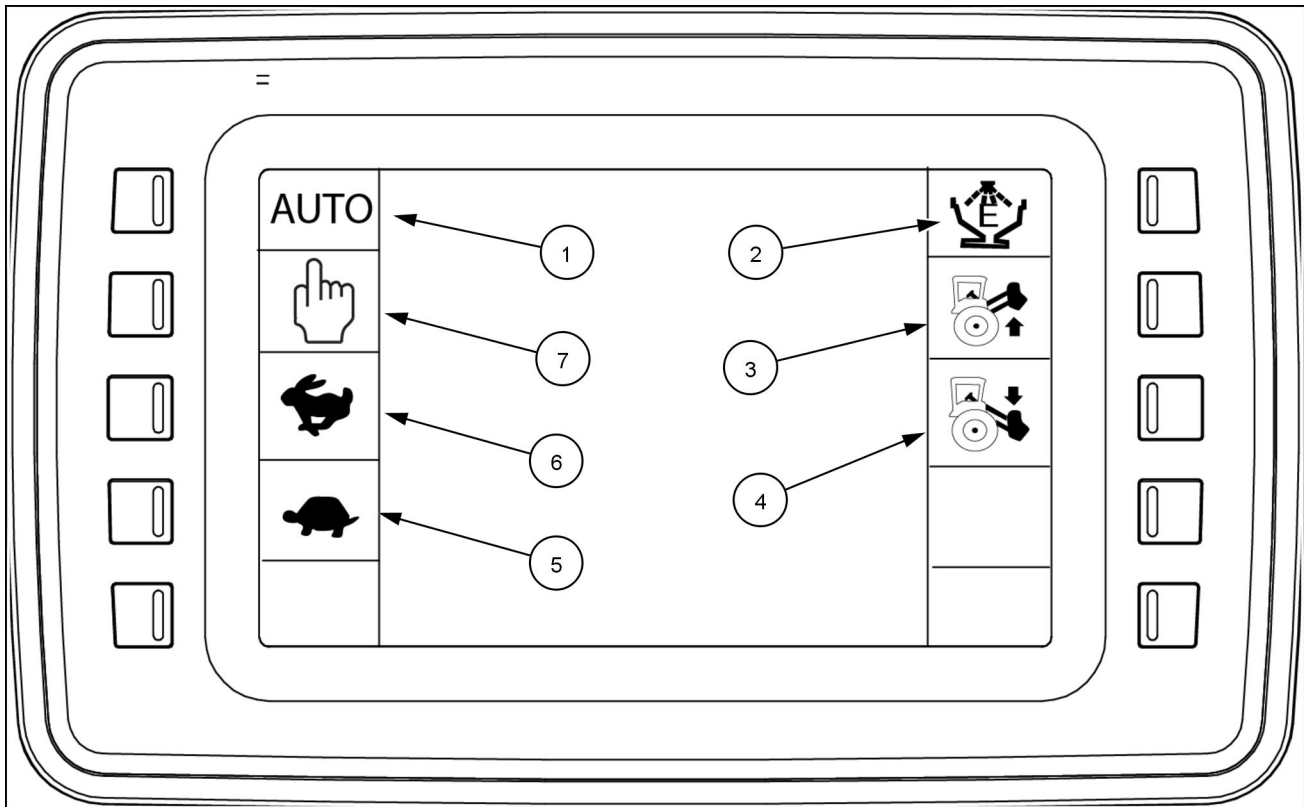
The Auto Rinse display (if equipped) replaces the standard remote key pad. The Auto Rinse display controls the same features as the standard remote key pad with additional features. For external remote key pad refer to **3-45** for functions of the buttons.

Refer to **6-51** for operation of the auto-rinse feature.



RAIL17SP01460AA 1

The features controlled by the Auto-Rinse display are shown in the following image. Refer to the table that follows for control identification

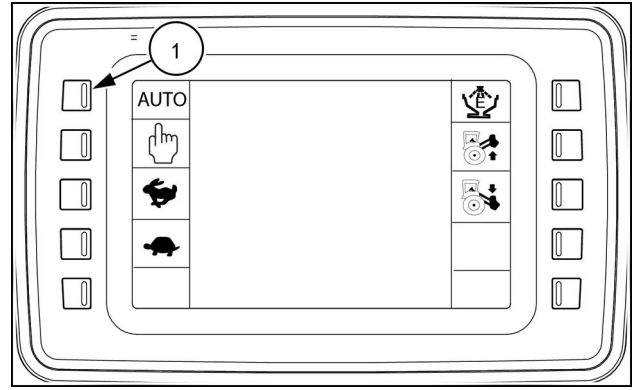


RAIL17SP01569FA 2

Button position on display	Feature controlled
1	Auto rinse
2	Chemical eductor rinse
3	Lift arms raise
4	Lift arms lower
5	Engine speed decrease
6	Engine speed increase
7	Manual rinse

### Auto rinse button

Push the Auto Rinse button **(1)** on the Auto-Rinse display to bring up the Auto Mode Select Page.



RAIL17SP01569FA 3

On the Auto Mode Select Page there are several selections to choose from.

Fill product tank with a nurse tank **(1)** through the fast fill.

Fill the product tank using the product pump **(2)**.

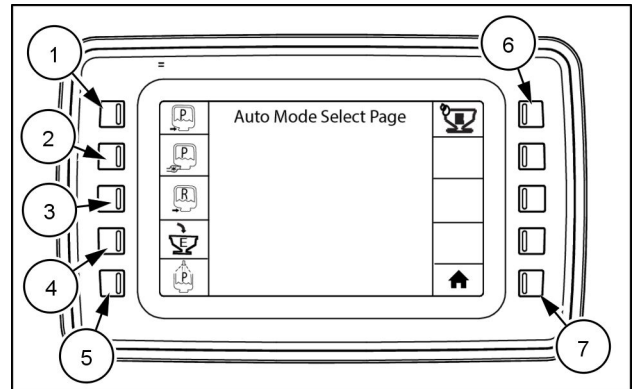
Fill the rinse tank **(3)**.

Turn on the chemical eductor function **(4)**.

Rinse the product tank **(5)**.

Wash the chemical eductor **(6)**.

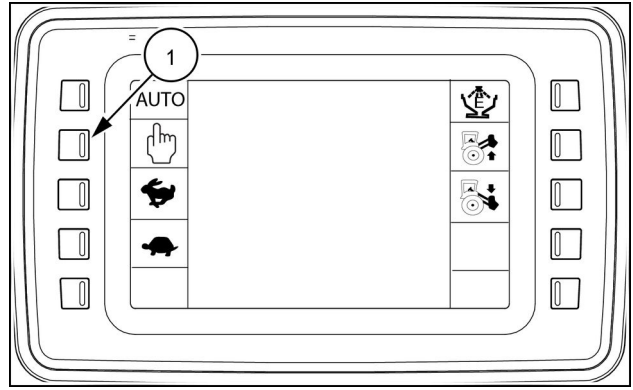
Home button **(7)** to return to the home page.



RAIL17SP01570AA 4

### Manual rinse button

Push the Manual Rinse button (1) on the Auto-Rinse display to bring up the Manual Page.



RAIL17SP01569FA 5

On the Manual Page there are several selections to choose from.

Product pump button (1). To turn product pump ON or OFF.

Product tank sump button (2). To open or close the product tank sump.

Rinse tank sump button (3). To open or close the rinse tank sump.

Sparge increase button (4). To increase the sparge in the product tank.

Sparge decrease button (5). To decrease the sparge in the product tank.

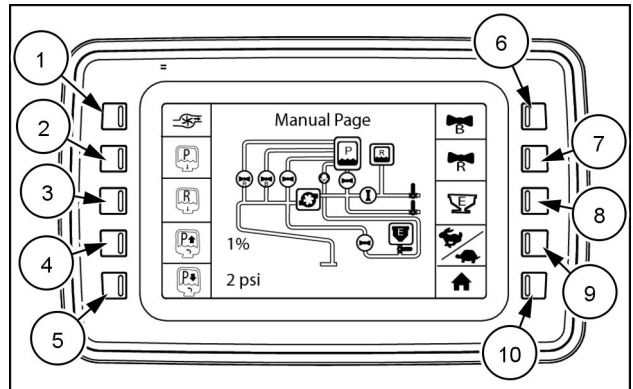
Bypass valve open or close button (6). Used to open or close the bypass valve.

Rinse valve open or close button (7). Used to open or close the rinse valve.

Chemical eductor ON or OFF button (8). Used to turn the chemical eductor ON or OFF.

Engine speed increase or decrease button (9). Used to increase or decrease the engine speed.

Home button (10) to return to the home page.



RAIL17SP01594AA 6

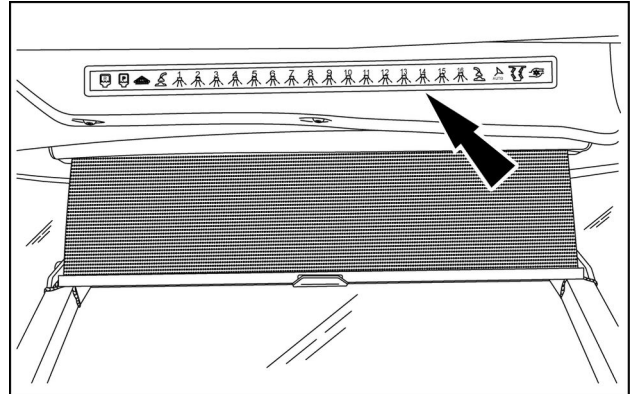


**Display**

**Cab mounted displays**

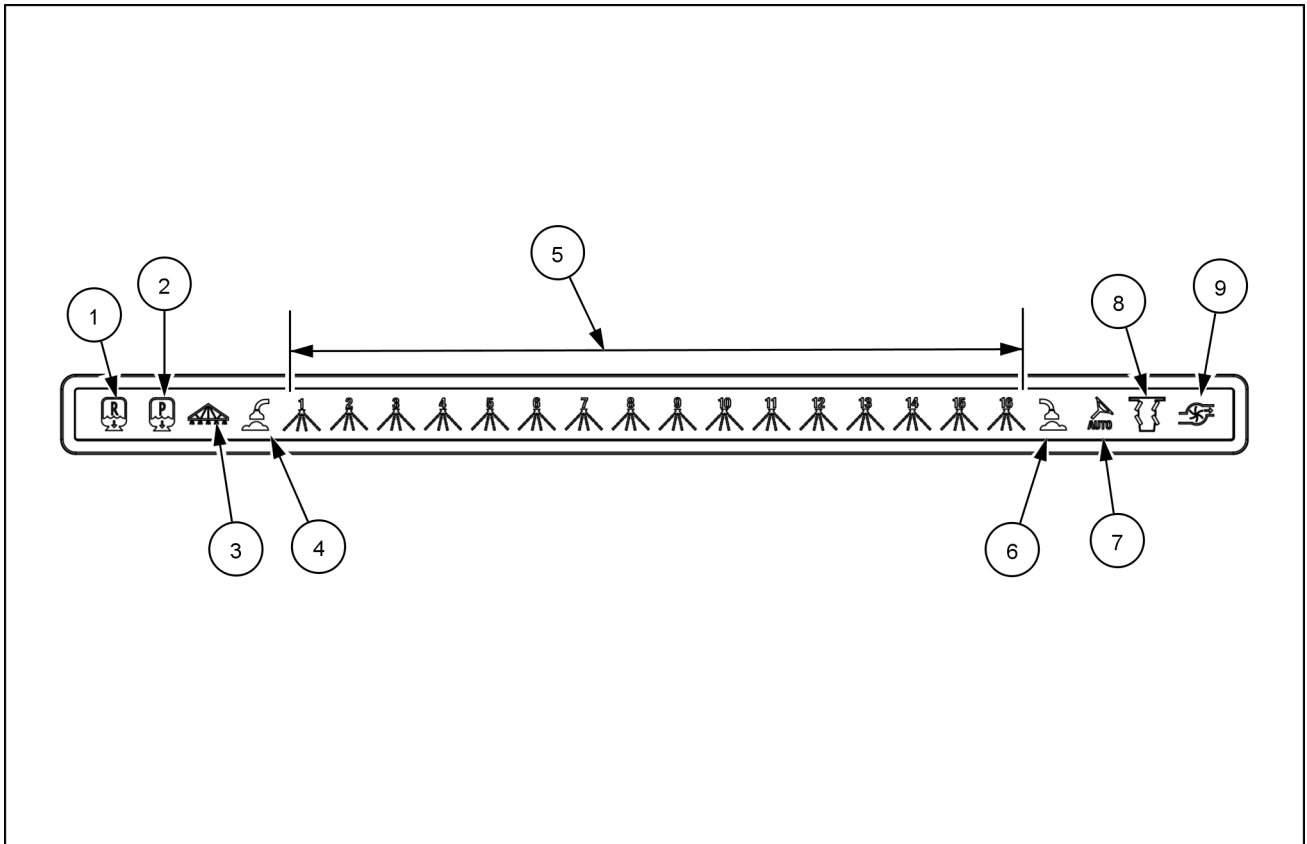
**Forward overhead display panel**

The forward overhead display panel is located at front of the cab above the windshield. The icons on the display will illuminate red when that feature is on or active.



RAIL17SP00300AA 1

Refer to the illustration and the table that follows for the feature the icons represent.



RAIL17SP00309FA 2

Reference number	Feature activated
1	Rinse tank sump open
2	Product tank sump open
3	Master boom control on
4	Left side foamer on
5	Individual boom sections on
6	Right side foamer on

### 3 - CONTROLS AND INSTRUMENTS

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Reference number	Feature activated
7	Auto steer on
8	Four wheel steer on
9	Product pump on

## A-Post display

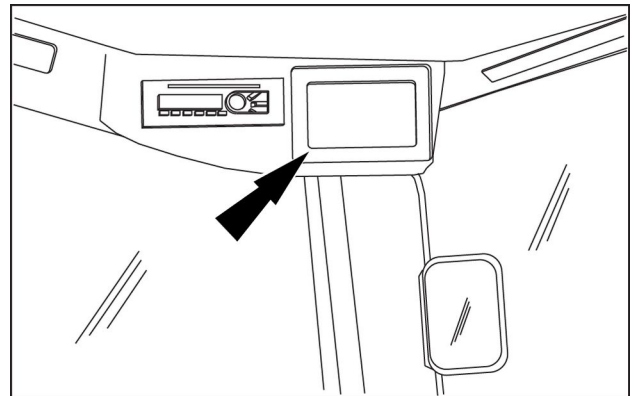
A vehicle operation display is mounted in the headliner by the right-hand A-post, inside of the sprayer cab. This display is a monitoring screen only.

The display will become active when the ignition key is turned to the ON position.

The main information displayed on the screen are

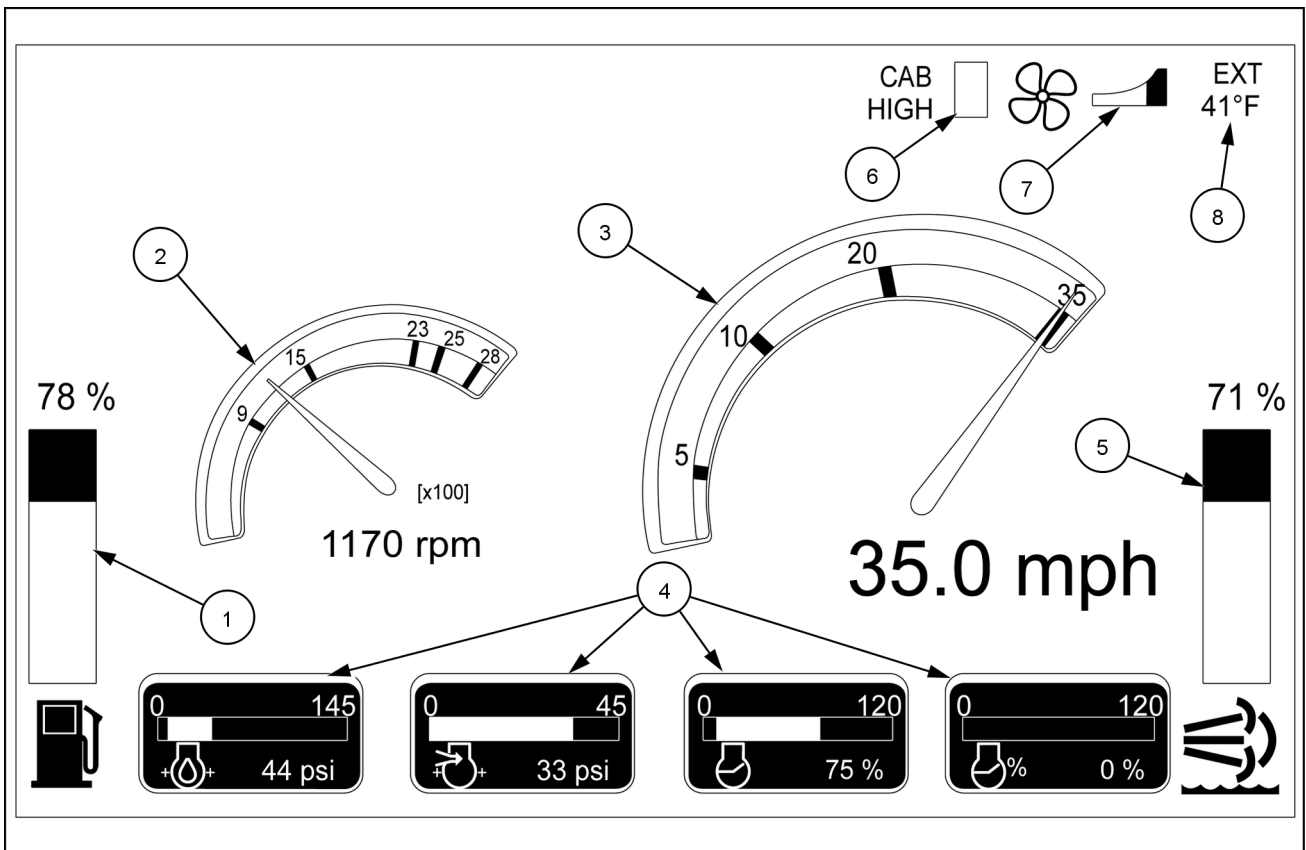
- Fuel level
- Engine RPM
- Vehicle speed
- DEF level (if equipped)
- Cab temperature
- Cab fan speed
- External temperature

There are also four lower monitoring gauges present on the screen. The monitoring gauges can be changed to display various operating functions of the machine.



RAIL17SP00787AA 1

The following illustration and table describe the information displayed on the A-post display screen.



RAIL17SP00107FA 2

Item	Description
1	Fuel Level Gauge
2	Engine RPM
3	Speedometer
4	Monitoring Gauges
5	DEF Fluid Level
6	Cab Temperature
7	Cab Fan Speed
8	External Temperature

## Monitoring gauge selection

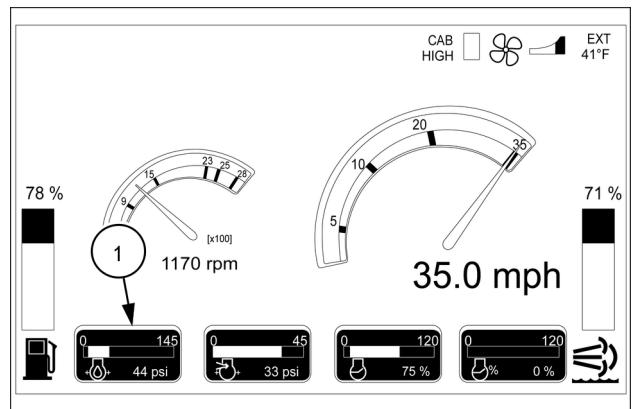
The monitoring gauges displayed on the A-Post display screen may be changed to suit the needs of the operator. The monitoring gauges are selectable from a pop-up menu.

The selections for the monitoring gauges are:

- Engine oil pressure
- Turbo boost pressure
- Engine oil temperature
- Engine percent load and current speed
- Intake manifold temperature
- Actual engine percentage torque
- Engine coolant temperature
- Hydrostatic charge pressure
- Auxiliary pump pressure
- Brake supply pressure
- Hydraulic oil temperature (tank)

To change the individual monitoring gauges, touch the appropriate gauge selection (1 through 4), 1 being the gauge farthest to the left (1).

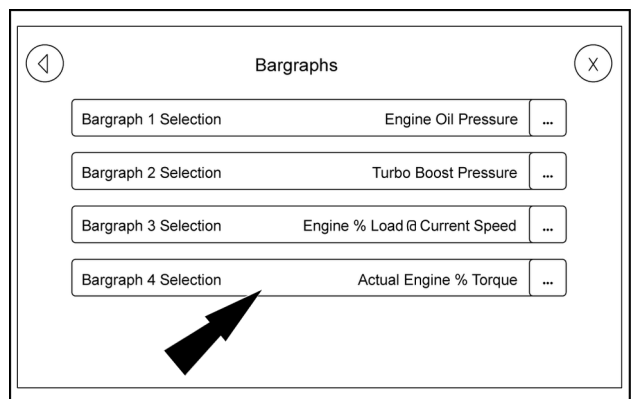
The pop-up monitoring gauge selection menu appears.



RAIL17SP00107FA 3

Use the pop-up "Bargraphs" menu to select the appropriate gauge (1 through 4).

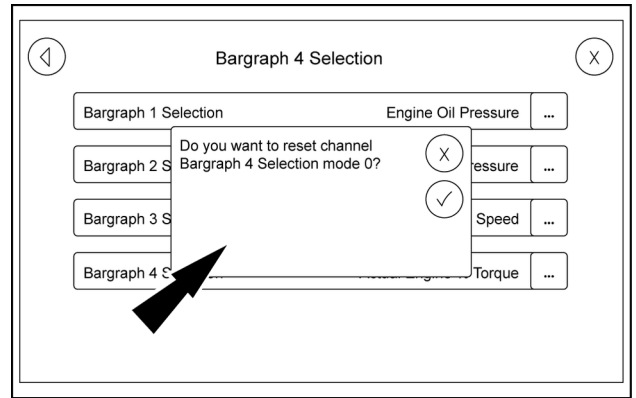
The gauge selection pop-up menu appears.



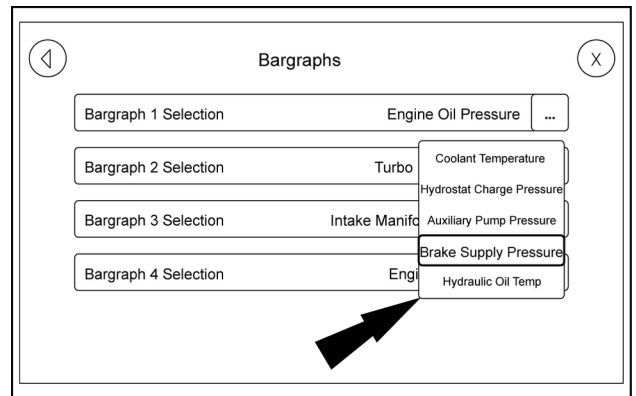
RAIL17SP00110AA 4

Press the desired monitoring gauge selection from the list. The change confirmation screen displays.

**NOTE:** In order to display all of the selectable monitoring gauges available, scroll down through the selectable gauges list by swiping the list.

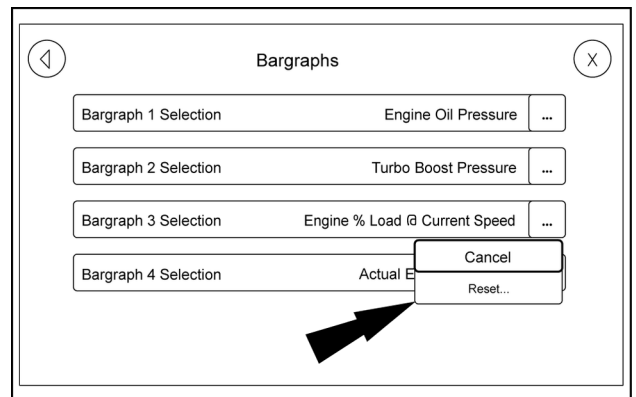


RAIL17SP00111AA 5



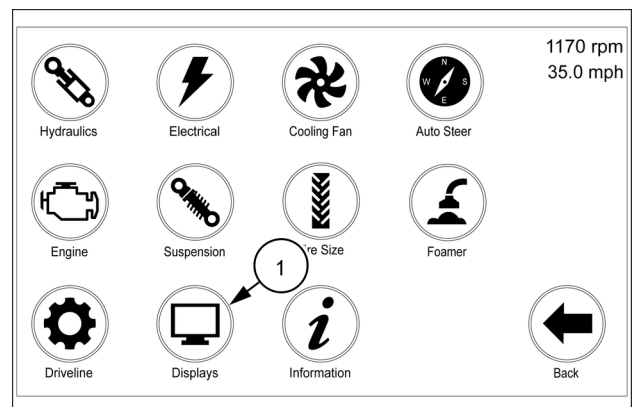
RAIL17SP00113AA 6

Press Reset to confirm your selection, or press Cancel to leave the selection as is. The "Bargraphs" selection screen disappears and, the A-post main page displays with the chosen monitoring gauge displayed.



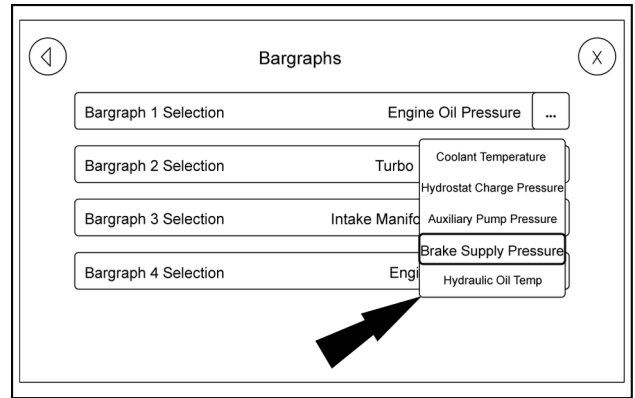
RAIL17SP00112AA 7

The monitoring gauge selection may also be accomplished by using the arm rest display. Access the second page of the arm rest display home page and press the Displays button (1). The "Bargraphs" selection screen appears.



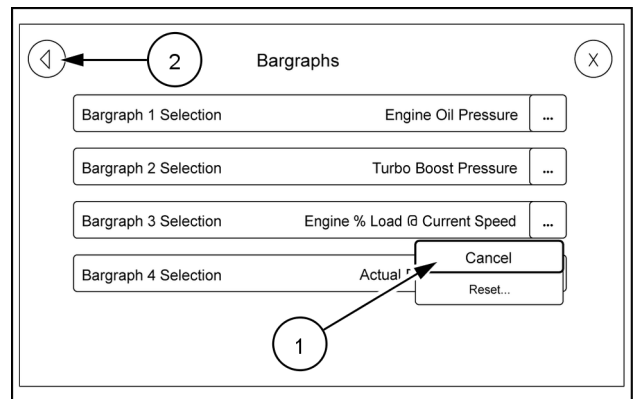
RAIL17SP00109FA 8

Press the desired monitoring gauge selection from the list.  
The change confirmation screen displays.



RAIL17SP00113AA 9

Press Reset to confirm your selection, or press Cancel to leave the selection unchanged **(1)**.  
Press the back arrow button **(2)** to return to the arm rest display home page.



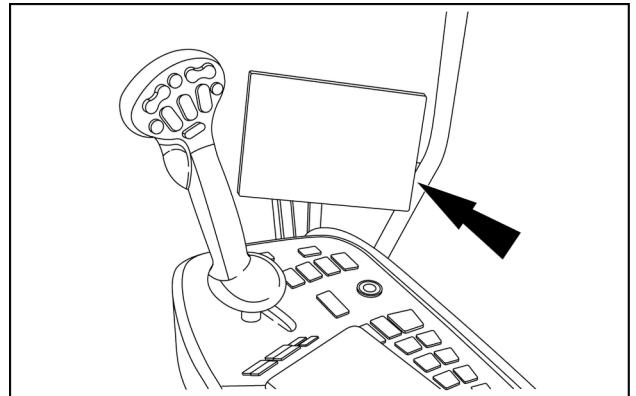
RAIL17SP00112AA 10

## Arm rest display

### Display overview

#### Arm rest display

The arm rest display located on the front of the right-hand console, allows the operator to monitor various functions of the vehicle

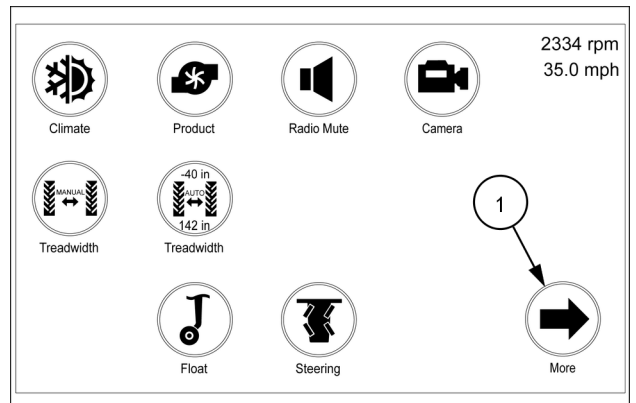


RAIL17SP00377AA 1

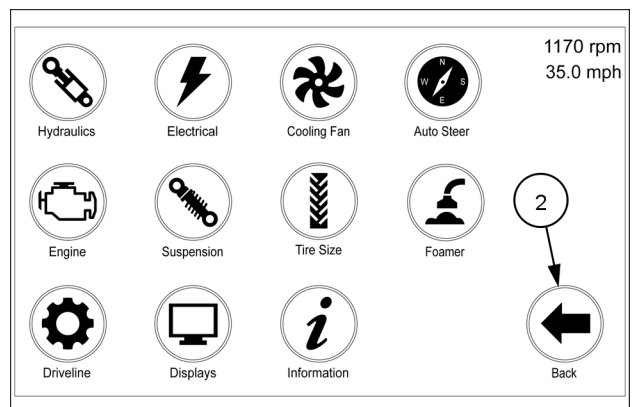
#### Home page screens

When the ignition key is turned to the ON position, the display will become active. The display will first display the splash screen and then the home page screen will display. This screen is the first of two home screens. Both screens are touch screen displays. Touch the “More” arrow (1) on the first screen to switch to the second home screen. Touch the “Back” arrow (2) on the second screen to return to the first home screen.

Touch an icon on either home display screen and you will be taken directly to the screens related to that icon.

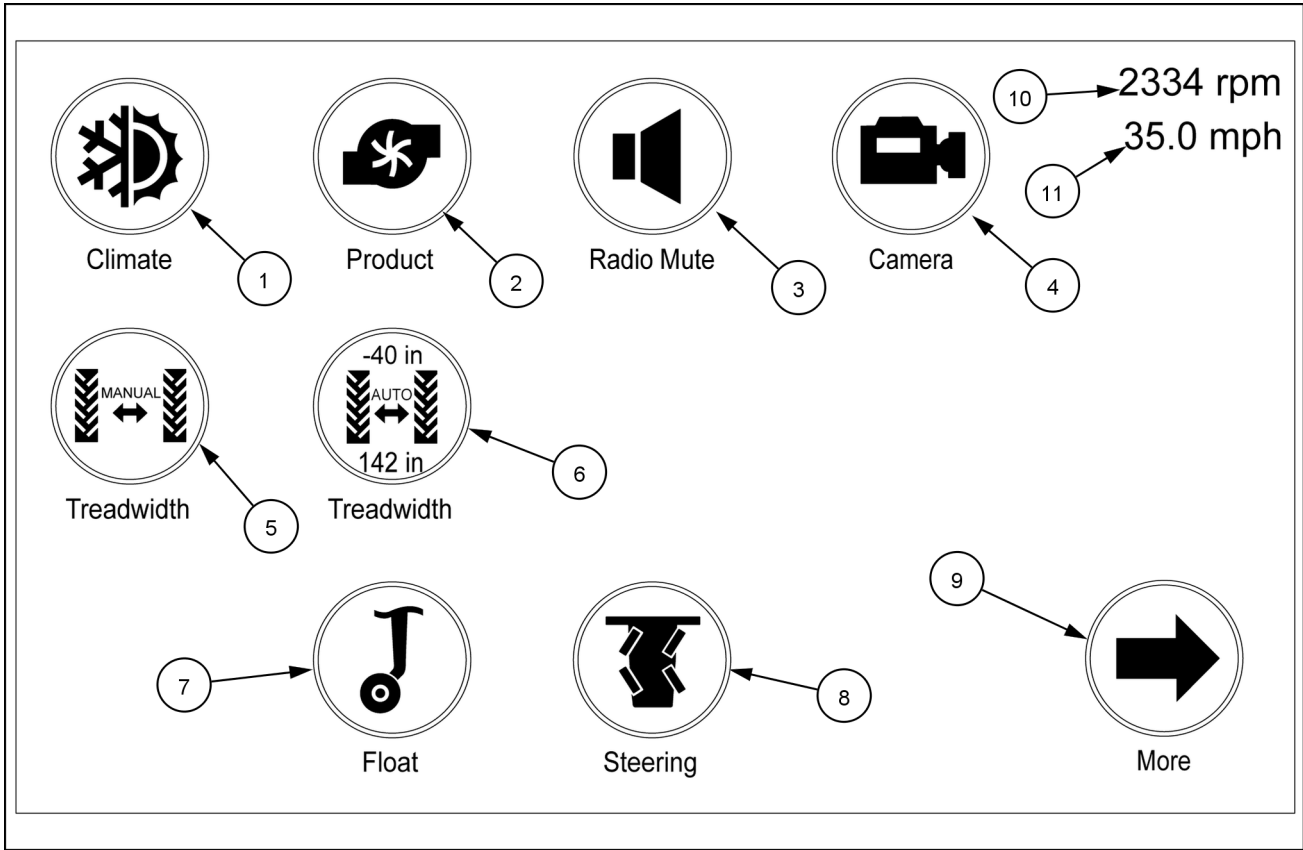


RAIL17SP00108FA 2



RAIL17SP00109FA 3

The following illustration and table describe the information displayed on the first home screen display.

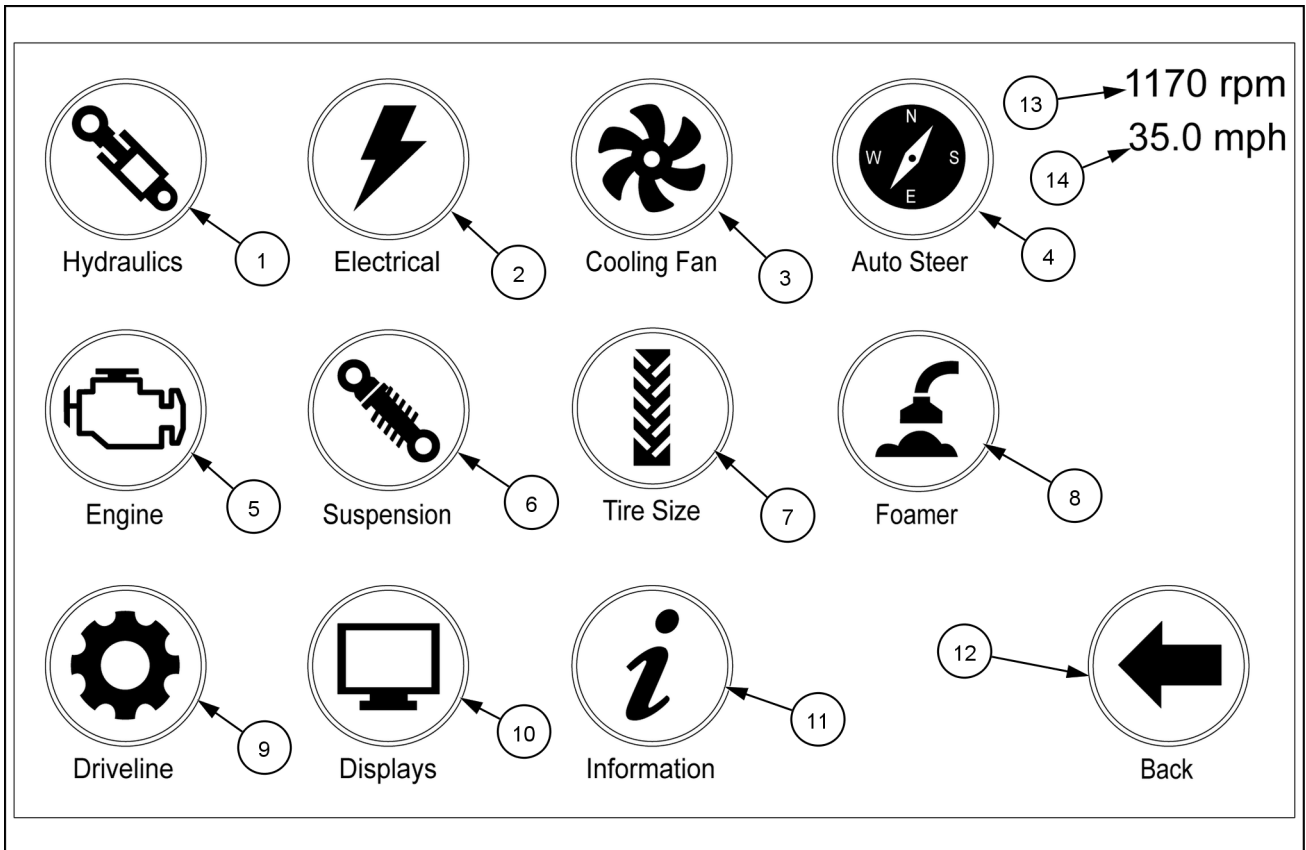


RAIL17SP00108FA 4

Item	Description
1	Climate control inside cab
2	Product pump
3	Radio mute control
4	Backup camera setting (luxury cab only)
5	Manual tread width setting (if equipped)
6	Auto tread width setting (if equipped)
7	Float setting (if equipped)
8	Steering four wheel steer (if equipped)
9	More
10	Engine rpm (monitoring only)
11	Vehicle ground speed (monitoring only)



The following illustration and table describe the information displayed on the second home screen display.



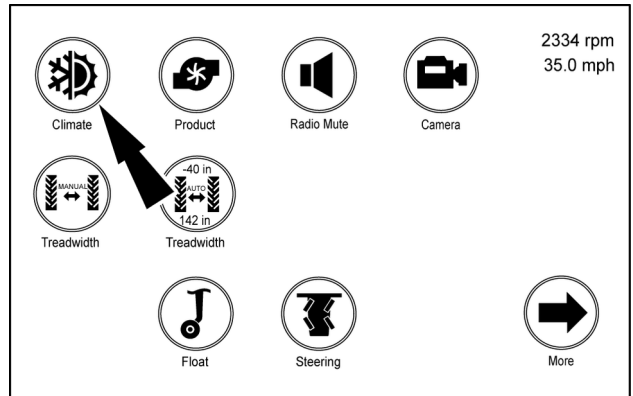
RAIL17SP00109FA 5

Item	Description
1	Hydraulic system monitoring
2	Electrical fuse monitoring
3	Engine cooling fan settings
4	Auto steer valve calibration
5	Engine fault codes and service interval timer
6	Suspension settings
7	Tire size selection
8	Foamer setting and adjustments (if equipped)
9	Drive line settings
10	Display settings
11	Information screen
12	Back arrow
13	Engine rpm (monitoring only)
14	Vehicle ground speed (monitoring only)

## Climate icons and screens

### Cab climate icon and screens

To adjust cab air temperature and fan speed, touch the climate icon on the first home display screen.



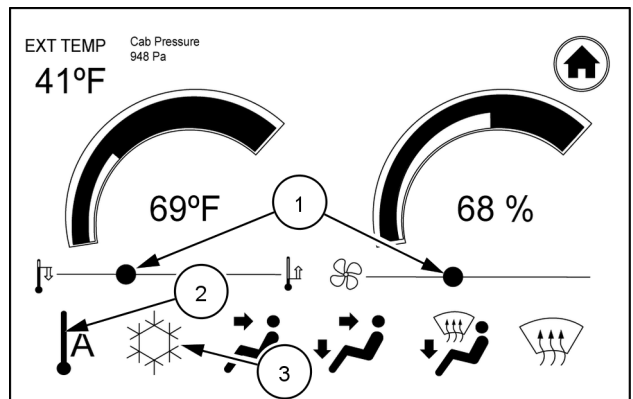
RAIL17SP00184AA 1

From this screen you can adjust the cab inside temperature or fan speed by sliding the appropriate white circle (1) to the right or left.

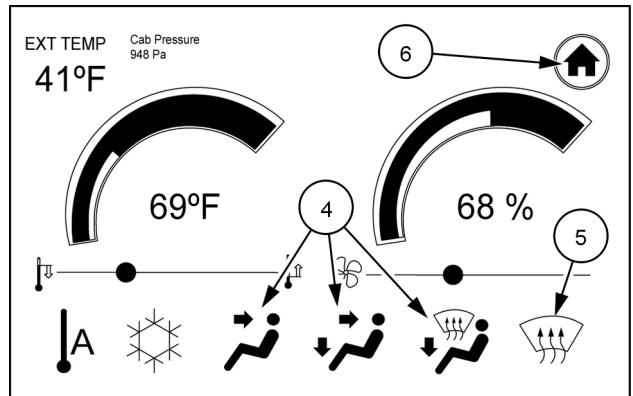
In the lower part of the screen you can set the “Auto” temperature control (2), air conditioning (snowflake) constant on (3), determine which vents (4) you want to be active or setting the vents to defrost (5) only. Simply touch the appropriate icon and it will turn white signifying that it has been selected.

Once all the settings are complete, touch the “Home” icon (6) to return to the home page.

The EXT TEMP in the upper left-hand corner of the screen monitors the temperature outside of the cab



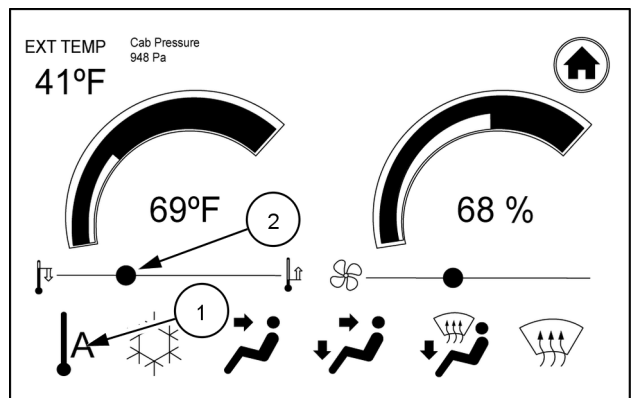
RAIL17SP00182AA 2



RAIL17SP00182AA 3

### Auto mode

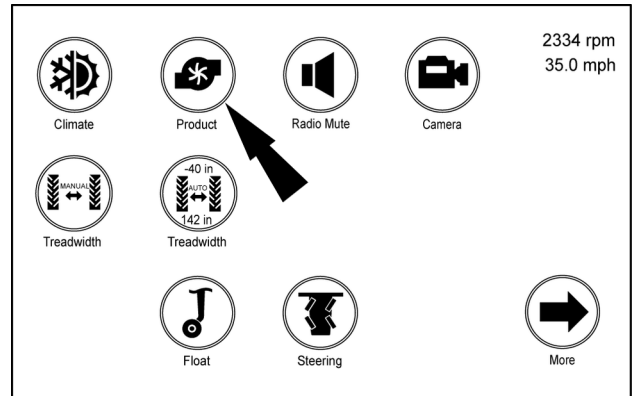
The auto mode is set by touching the auto temperature icon (1). Once the auto temperature icon is touched, all the icons below the line will disappear as well as the setting slider for the fan speed. Use the temperature slider (2) to set the desired inside temperature. In the auto mode this temperature will be maintained.



RAIL17SP00182AA 4

## Product icons and screens

From the armrest first home display touch the product icon to bring up the product screen.



RAIL17SP00184AA 1

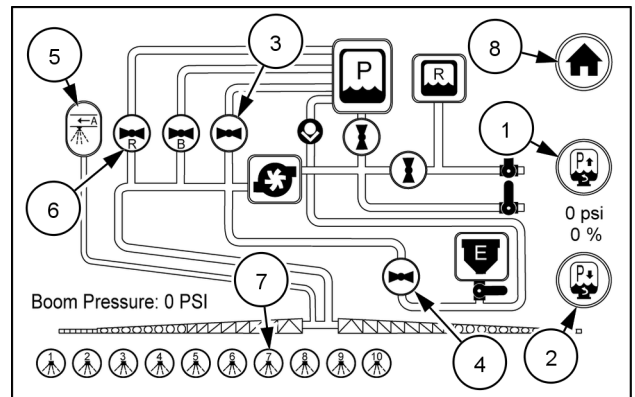
From this screen you can adjust the sparge pressure up or down as needed by touching the sparge up icon (1) or sparge down icon (2) to prevent foaming in the product tank and to keep the chemical in suspension. The sparge valve icon (3) will rotate as the sparge is increased or decreased. You can turn the appropriate valves on or off by touching the appropriate icon such as eductor valve (4) or boom blowout (5).

When a valve is open, the icon will turn green and be parallel with the flow in that line. When a valve is closed (6) it will turn red and be perpendicular to the flow in that line.

In the lower part of the screen you can turn boom sections (7) on or off. Simply touch the appropriate icon.

You can also turn the boom blowout valve (5) on and off from this screen.

Once all the settings are complete, touch the "Home" icon (8) to return to the home page.



RAIL17SP00183AA 2

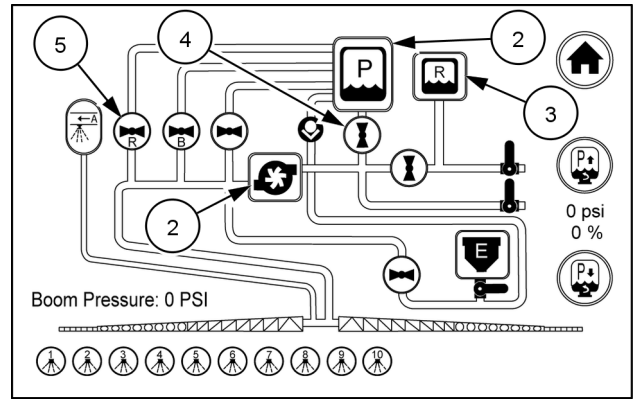
### Product pump screen

On the product pump screen the pump can be turned ON/OFF with a touch of the icon **(1)** or with the switch. ON is indicated with color change of lines and animation of impeller. Interlocks prevent inadvertent cavitation of the pump.

From the product pump screen you can select the product circuit **(2)** or the rinse circuit **(3)**. You can also turn on or off the sections of the boom. Simply touch either the “P” or “R” system icons for product circuit or rinse circuit. Touch the appropriate section ball valve icons **(4)** to turn on or off. When the valve icon is parallel with the piping, the valve is ON. When the valve icon is perpendicular to the piping, the valve is OFF. Manual valves are shown without a status bar inside the circle.

Ball valve symbols: ON is symbolized with the status bar in line (parallel) **(4)** with the circuit lines or flow. OFF is symbolized with the bar perpendicular **(5)** to the flow.

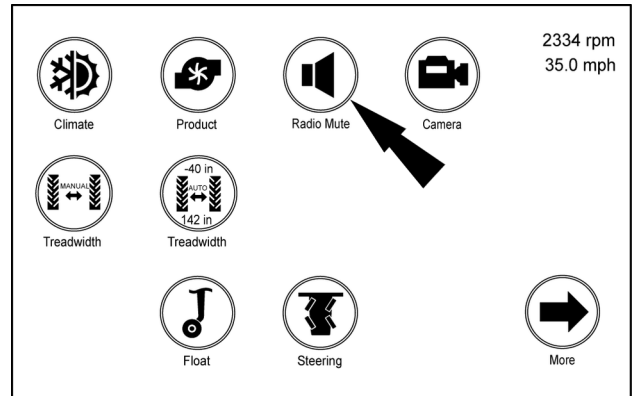
Yellow indicates an OFF section valve that will turn on if you use the master switch. Red indicates an OFF section valve that will not turn on if you use the master switch. Green indicates an ON section valve.



RAIL17SP00183AA 3

## Radio mute icon

From the armrest first home display touch the radio mute icon to mute the radio. Touch the radio mute icon again and the radio volume will return to the original setting.



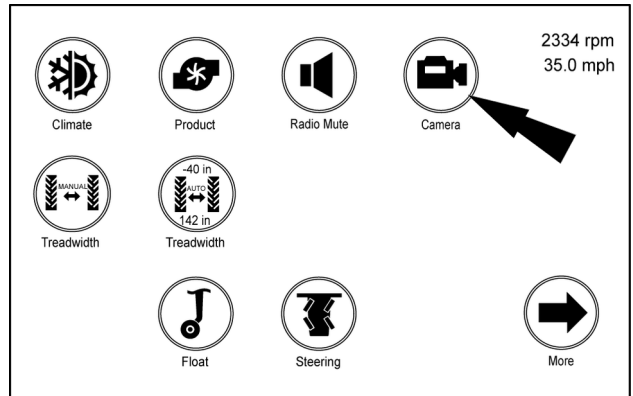
RAIL17SP00184AA 1

## Camera icon and screens

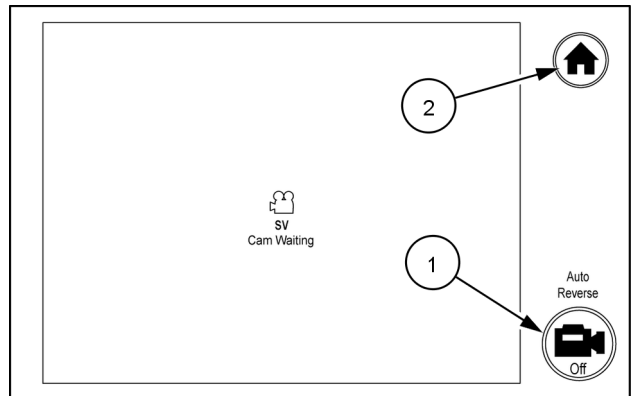
From the armrest display first home page touch the Camera icon.

From the camera screen you can turn the auto reverse on or off. Touch auto reverse camera icon **(1)** to turn the auto reverse on (icon will turn yellow). The camera will come on when the vehicle is put into reverse. Touch the auto reverse camera icon to turn the auto reverse OFF (icon will turn blue). The camera will not come on when the vehicle is put into reverse.

Touch the home icon **(2)** in the upper right-hand corner to return to the home page.



RAIL17SP00184AA 1



RAIL17SP00185AA 2

## Tread width (manual) icon and screens

From the armrest display first home page touch the tread width (manual) icon. This will bring up the screen which is the combined (1) tread width screen.

**NOTE:** The icons will remain grayed out until movement of the vehicle has started. The icons will turn to the appropriate in or out once moving.

From this screen you can move both sides in or out at the same time. The icons will be grayed out indicating no vehicle movement. While moving slowly touch the IN icon (2) to move both sides in at the same time. The values will change as the wheels move inward.

**NOTE:** Dimensions are from center to the center of the tires.

While moving slowly touch the OUT icon (3) to move both sides out at the same time. The values will change as the wheels move out.

**NOTE:** Dimensions are from center to the center of the tires.

Touch the combined icon (1) at the top of the screen to change to the separate adjustment screen or touch the home icon (4) in the upper right-hand corner to return to the home page.

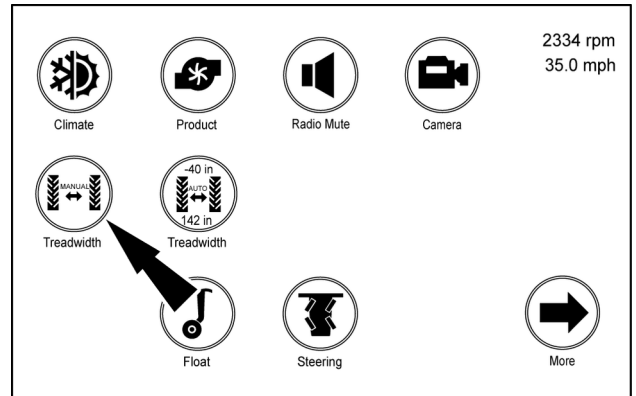
At this screen you can move each side in or out separately. The values will change as that side moves in or out.

**NOTE:** The machine must be moving 0.8 – 8 km/h (0.5 – 5 mph) while adjusting the tread width.

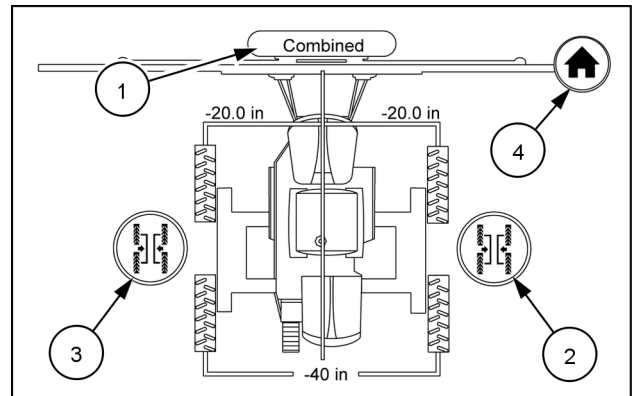
Touch the in icon (5) on either side to move that side in. Touch the out icon (6) on either side to move that side out.

**NOTE:** Dimensions are from center of machine to the center of the tire.

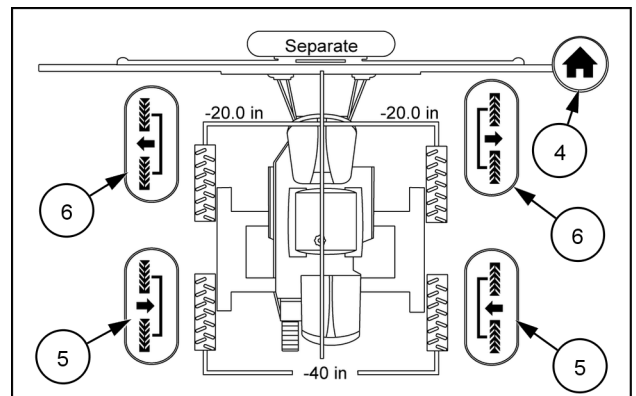
Touch the home icon (4) in the upper right-hand corner to return to the home page or touch the separate icon to go back to the combined screen.



RAIL17SP00184AA 1



RAIL17SP00774AA 2



RAIL17SP00773AA 3

## Tread width (automatic) icon and screens

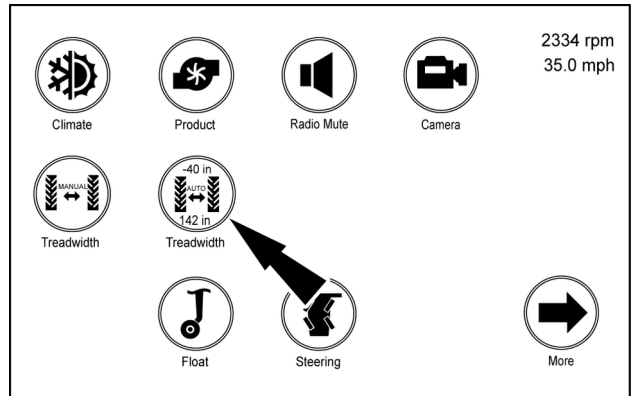
From the armrest display first home page touch the tread width (auto) icon. This will bring up the screen where you can set the width you want while slowly driving the vehicle at least **0.8 km/h (0.5 mph)** with the touch of the auto tread width button **(1)** on the side console.

This will bring up a screen where you can set the intended field tread width. Touch the intended field width icon to bring up the setting window. Touch and slide the setting circle **(2)** to the desired tread width. When you touch the auto tread width button on the side console, when in neutral, once the sprayer starts to move, the wheels will go out to this setting and stop.

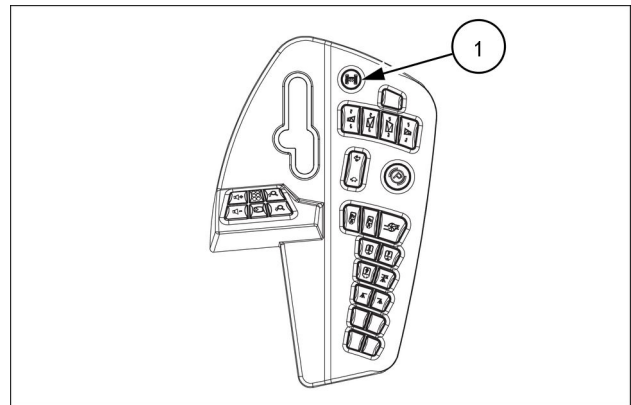
Touch the variable icon **(3)** on the intended field tread width screen to change from variable to max **(4)**. Touch the max icon and the screen will change to variable and will be at the preset width. If you select variable the tread width can go to any preset width. If you select max when you press the auto tread width button on the side console with the joystick in neutral, once the sprayer starts to move, the wheels will go out to the maximum width and stop. Press the button once and it goes to the predisposed setting. Press and hold the button, the switch will turn green and the wheels will go all the way in.

On the home screen, watch the tread width settings on the tread width icon. The actual width is indicated as the upper number and the intended width is indicated below the icon.

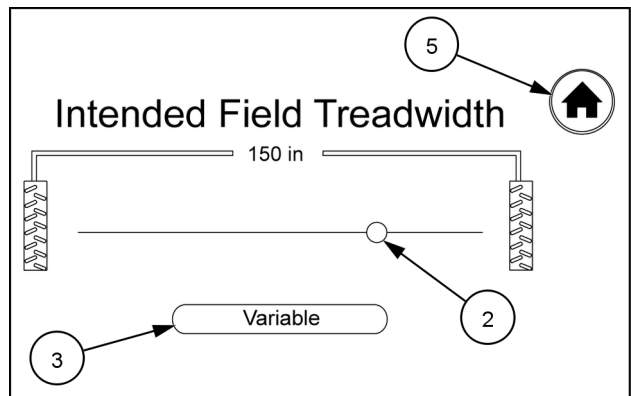
Touch the home icon **(5)** in the upper right-hand corner to return to the home page.



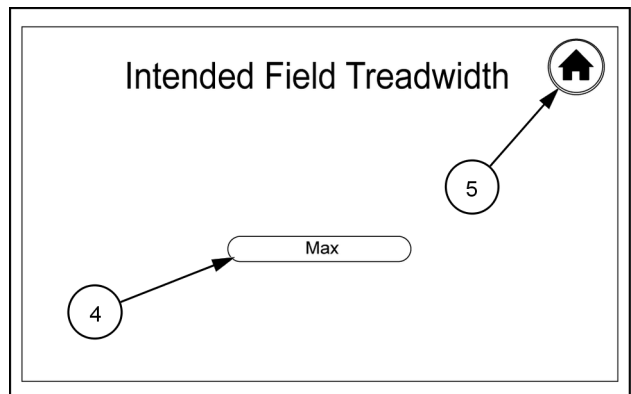
RAIL17SP00184AA 1



RAIL17SP00307FA 2



RAIL17SP00115AA 3



RAIL17SP00772AA 4



## Float icon and screens (if equipped)

From the armrest display first home page touch the float icon. This will bring up the screen where you can turn the float on or off and also set the pressure desired on the float.

Touch the float icon (1) and it will turn yellow indicating that the float is active. The active icon (2) on the right-hand side of the screen will appear.

The lower icon (3) will indicate if the ground engaging profile is on or off.

To turn the float on (engage), start to lower the lift arms with the center button (4) on the joystick. This will bring up the screen with the up/down arrows.

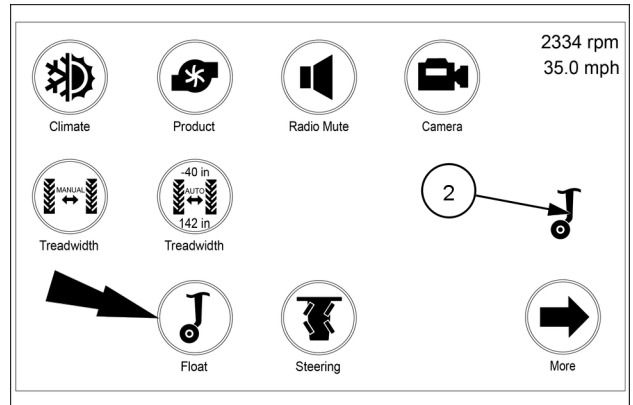
To turn the float off (disengage), start to raise the lift arms with the center button on the joystick. This will shut off the screen with the up/down arrows.

When the ground engaging profile is on, you have the option of changing the amount of float pressure being applied with the up or down arrows (5).

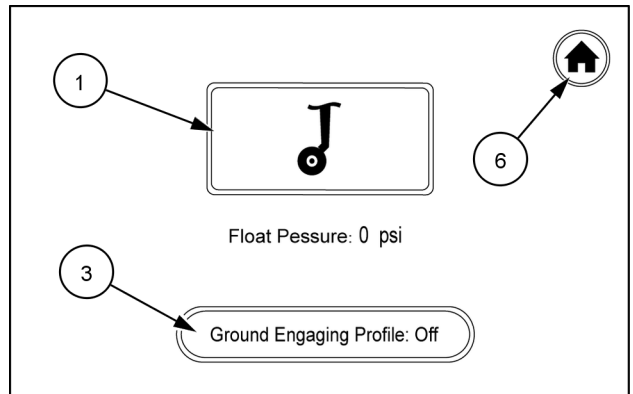
Use the up arrow to increase the amount of lift assist (making the ground engaging attachment lighter on the ground) and the percentage on the scale will go up.

Use the down arrow to decrease the amount of lift assist (making the ground engaging attachment heavier on the ground) and the percentage on the scale will go down.

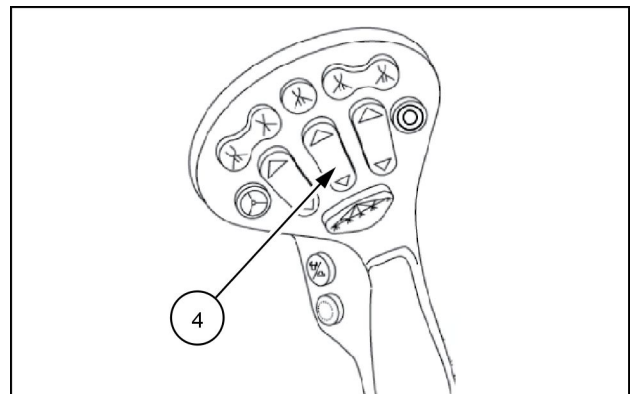
Touch the home icon (6) in the upper right-hand corner to return to the home page.



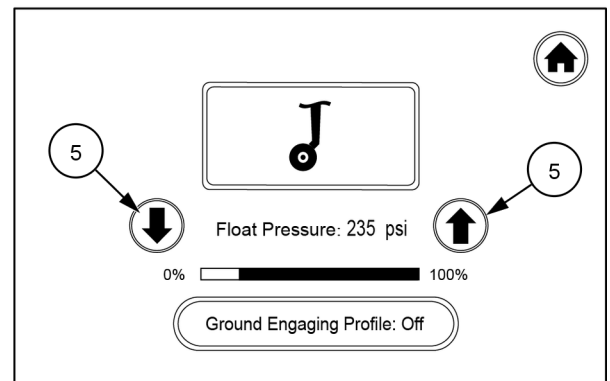
RAIL17SP01435FA 1



RAIL17SP00186AA 2



RAIL17SP00391AA 3



RAIL17SP00710AA 4

## Steering icons and screens (if equipped)

From the armrest display first home page touch the Steering icon. This will bring up the screen where 4 wheel steer setting can be done.

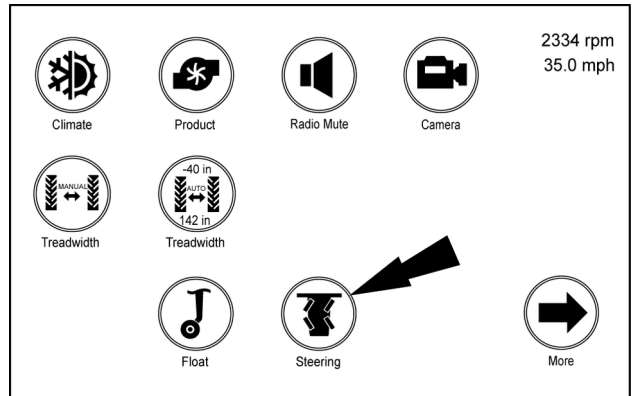
On this screen there are several icons that are active. They are: The 2 wheel steer mode icon (1), 4 wheel steer mode icon (2), 4 wheel steer information icon (3), the front wheel sensitivity zone setting icon (4) and the home icon (5).

Touch the 2 wheel steer mode icon (1) to show the wheels locked on the screen for 2 wheel steer.

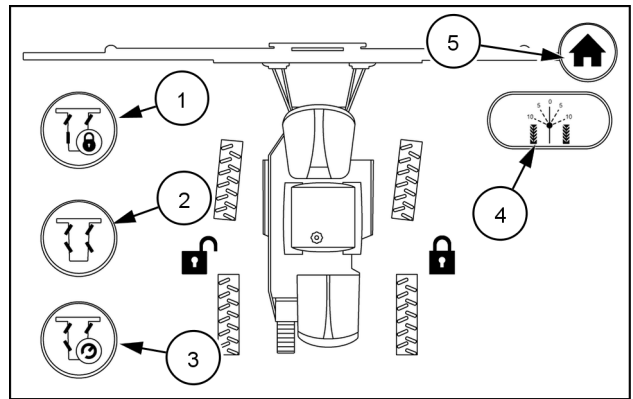
Touch the 4 wheel steer mode icon (2) to show the rear wheels unlocked on the screen for 4 wheel steer.

Touch the front steering sensitivity icon (4) just below the home icon to bring up the setting window. On this window use the slider circle on the screen to adjust the sensitivity zone. The sensitivity zone is the area when set will allow the front wheels to steer a set amount before the rear wheels begin to steer. This setting is used when the rear wheels need to steer at a certain time to eliminate crop damage caused by the rear wheels steering too soon or too late in relation to the front wheels.

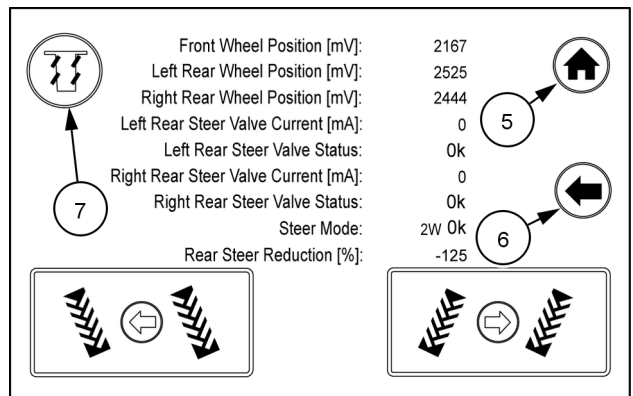
Touching the 4 wheel steer information icon (3) will bring up a screen which is a monitoring screen only. Touch the back arrow icon (6) to go back one screen. Touch the manual mode steering icon (7) on the left-hand side to bring up the cal mode screen. This manual mode icon is available in the cal mode. Touch the home icon (5) in the upper right-hand corner to return to the home page.



RAIL17SP00184AA 1



RAIL17SP00116AA 2

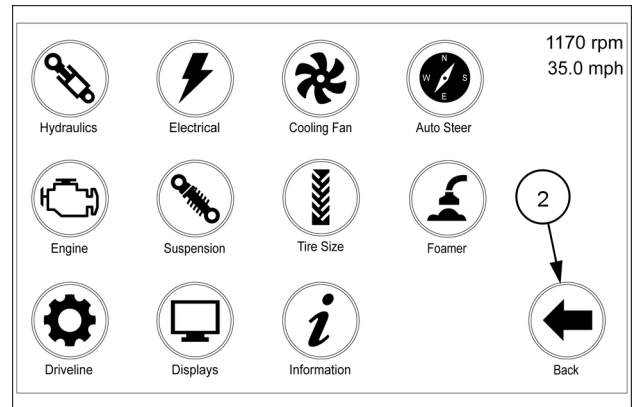
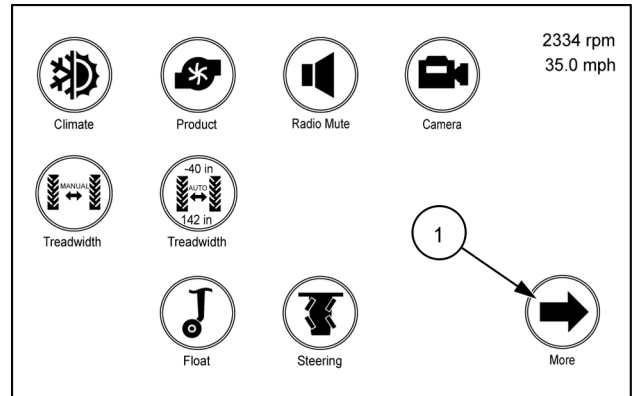


RAIL17SP00188AA 3

## Arm rest display second home screen

To switch to the second arm rest display screen from the first arm rest display screen, simply touch the More icon **(1)** at the lower right-hand corner.

To return to the first arm rest display screen, from the second arm rest display screen, touch the back arrow icon **(2)** on the lower right-hand corner of the screen.

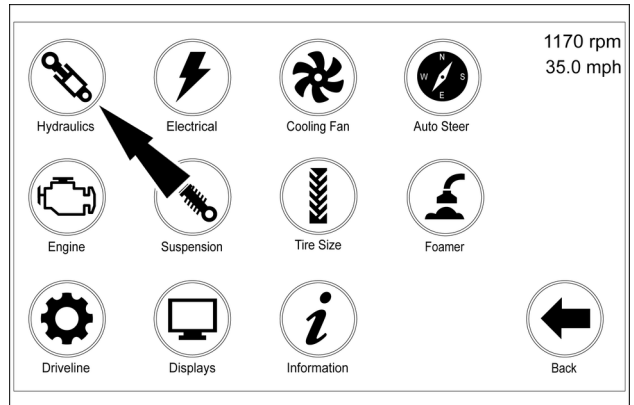


## Hydraulic icon and screens

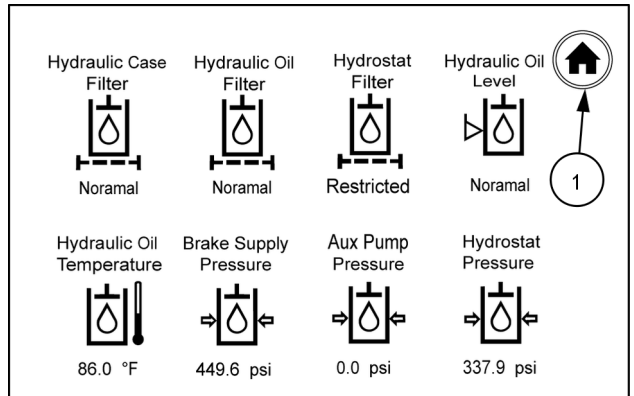
From the arm rest display second home page touch the hydraulics icon.

The monitoring screen has no selectable items. When a fault is detected the corresponding icon will turn red.

Touch the home icon (1) in the upper right-hand corner to return to the home page.



RAIL17SP00109FA 1



RAIL17SP00189AA 2

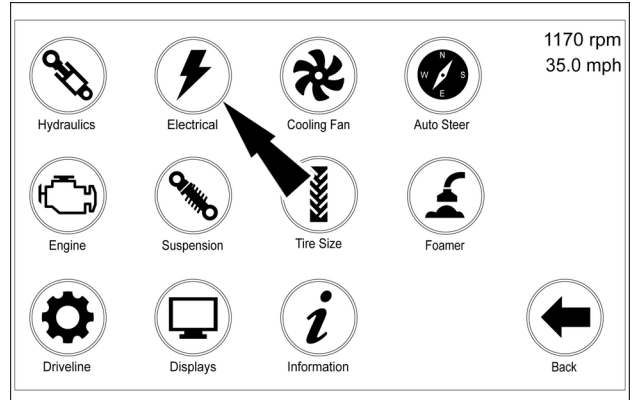
## Electrical icon and screens

### Cab fuse and relay block

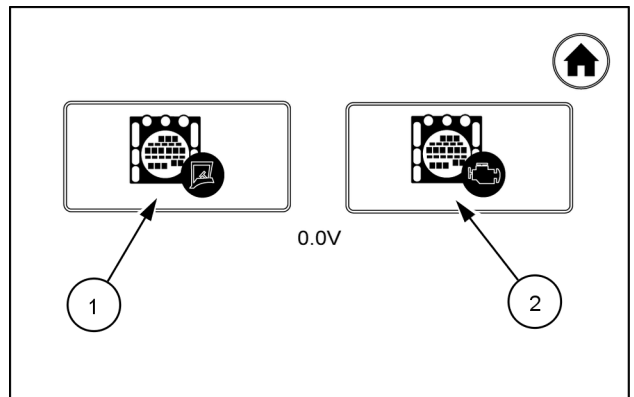
From the arm rest display second home page touch the electrical icon.

This screen is a monitoring screen for the fuse and relay blocks. From the electrical screen you can select the separate fuse and relay blocks by touching the cab (1) or engine (2) fuse and relay blocks. Touch the cab icon to bring up the actual fuse and relay block (3). Touch the icon (4) to the right of the fuse and relay block to bring up a list of the fuses and relays (5) and what they protect.

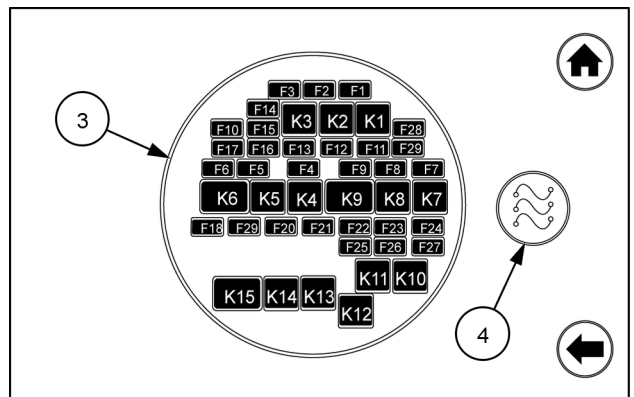
Relays shown in the fuse and relay block will turn green when active.



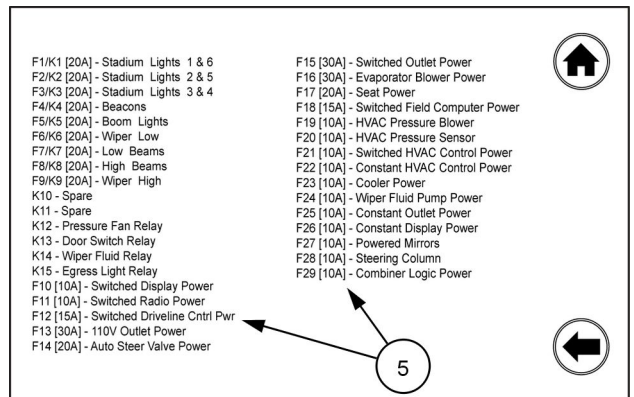
RAIL17SP00109FA 1



RAIL17SP00190AA 2



RAIL17SP00191AA 3



RAIL17SP00192AA 4

### Engine end fuse and relay block

Touch the engine icon to bring up the actual fuse and relay block (6). Touch the icon (7) to the right of the fuse and relay block to bring up a list of the fuses and relays (8) and what they protect.

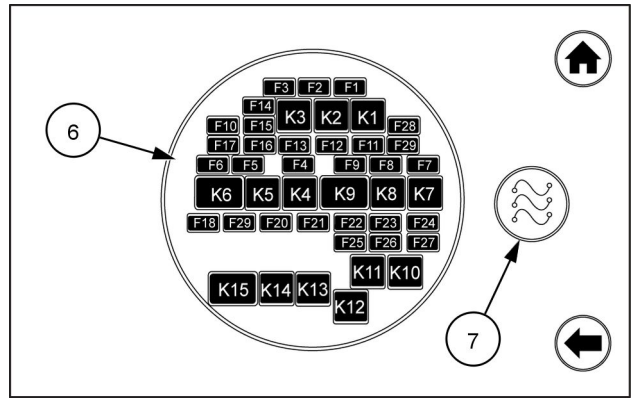
To go back one screen, touch the back arrow icon (9) at the lower right-hand corner of the screen.

Touch the home icon (10) at the top right-hand corner to return to the home page.

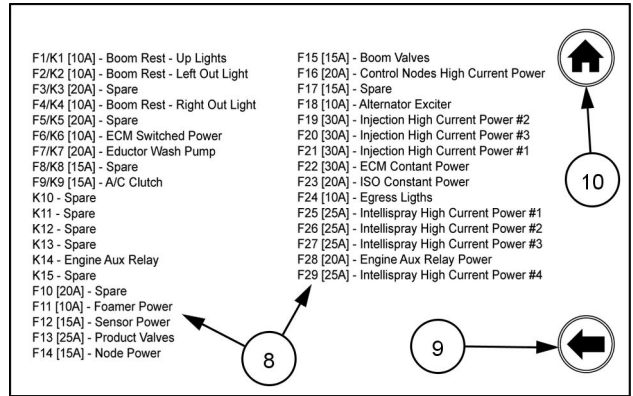
When a fuse has failed the individual fuse will turn red. An alarm will display on the home page of the arm rest display indicating which fuse and relay panel has the blown fuse. Touch the OK icon and then go to the second arm rest display home page and touch the appropriate icon to bring up the fuse and relay block.

Inside the cover of each fuse block are several spare fuses to use if a fuse should fail.

Relays shown in the fuse and relay block will turn green when active.



RAIL17SP00193AA 5



RAIL17SP00194AA 6

## Cooling Fan icon and screens

From the arm rest display second home page touch the cooling fan icon.

This screen is used to change the reversing time interval as well as the length of time it will reverse.

**NOTE:** The fan will not reverse at low engine RPM.

From this screen you can change the auto time interval **(1)**, the reverse time interval **(2)** by touching the appropriate icon to bring up the adjustment screens. Adjust as desired using the up or down arrows **(3)** on the setting screen. To leave the adjustment touch the selected icon again.

Once the times are set, the right-hand side of the screen will act as a count down from the original set values. The Auto Time Interval and the Reverse Time Interval will both count down.

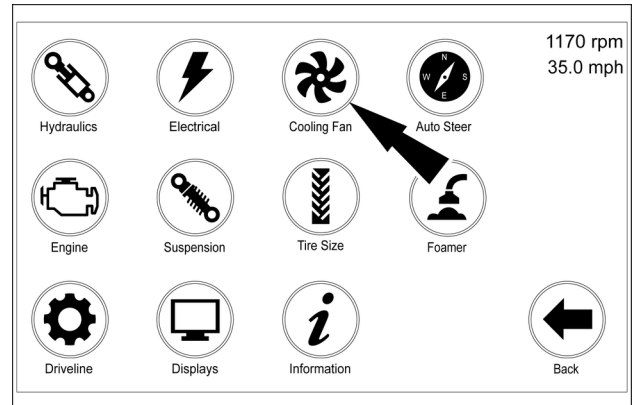
Touch the “Disable” reversing fan **(4)** icon (lower left) to disable the fans reversing ability. Touch the manual override **(5)** icon (lower right-hand icon) to manually override the settings and turn the reversing feature on. Press it again to return to normal operation.

Touch the “Fan” **(6)** icon (below the home icon) to set the fan speed to 100%. Fan is in auto mode unless the fan icon is pressed. When the icon is touched the fan will turn yellow and percentage will be set to 100%.

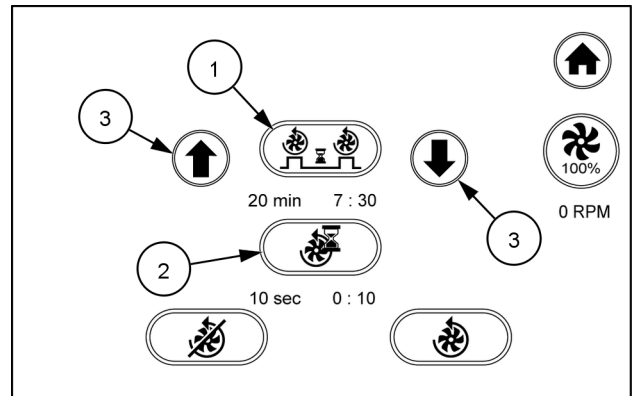
Touch the home icon **(7)** to return to the home page.

The reversing fan override switch **(1)** on the side console is used to override the automatic setting of the reversing fan.

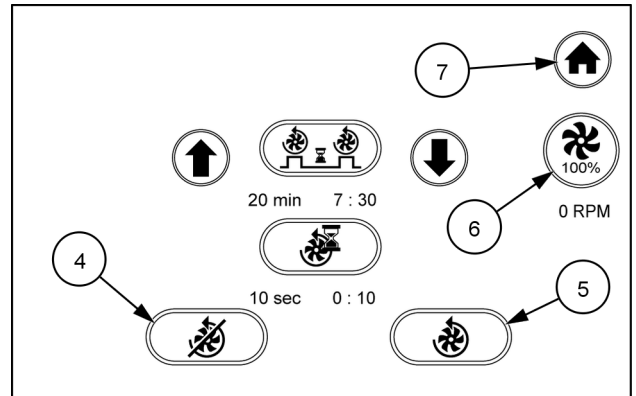
If the cooling system becomes clogged with debris and the automatic setting has not yet engaged, push the override switch and the reverse cycle will initiate.



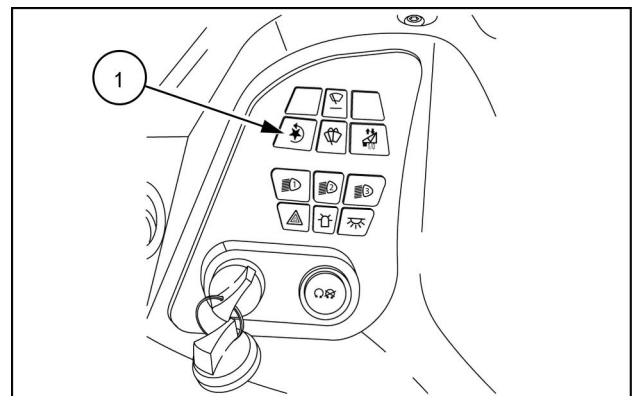
RAIL17SP00109FA 1



RAIL17SP00195AA 2



RAIL17SP00195AA 3

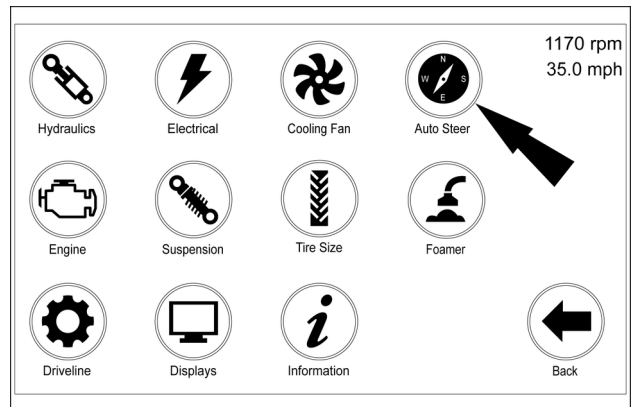


RAIL17SP00263AA 4

## Auto Steer icon and screens

From the arm rest display second home page touch the auto steer icon to bring up the auto steer valve page.

Contact your authorized MILLER dealer for calibration of the rear wheels.



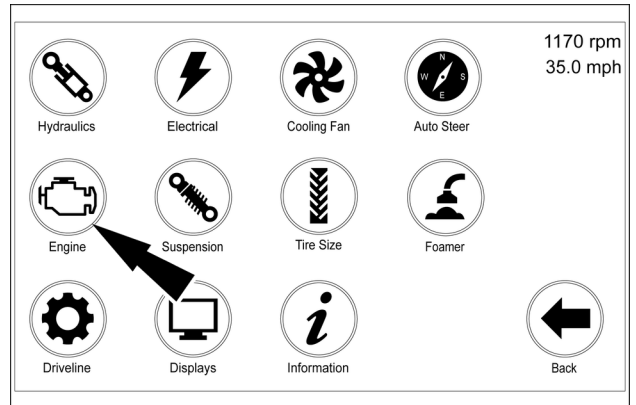
RAIL17SP00109FA 1



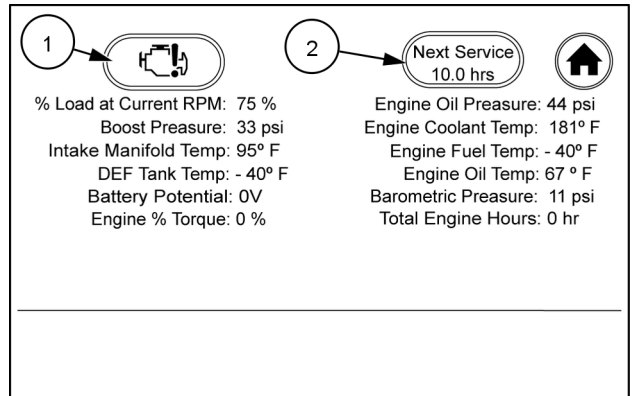
## Engine icon and screens

From the arm rest display second home page touch the engine icon to bring up the engine/service timer page.

On the engine/service timer page you can select the Engine icon (1) or the next Service icon (2).



RAIL17SP00109FA 1



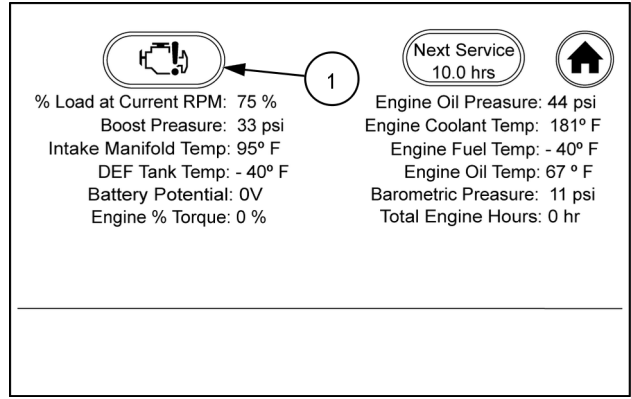
RAIL17SP00200AA 2

### Engine button

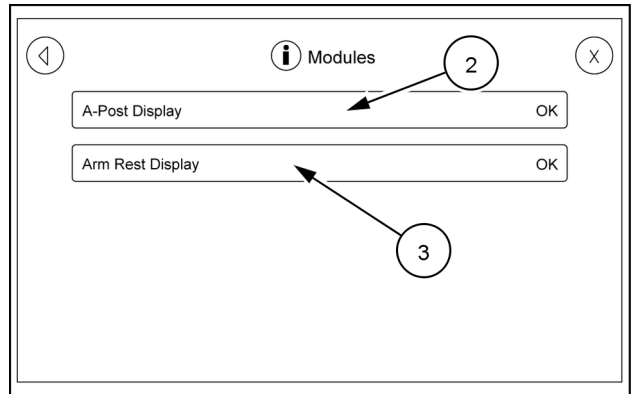
Touch the engine button (1) to bring up the modules screen.

The modules screen has two selectable options. They are: A-Post Display (2) and Arm Rest Display (3).

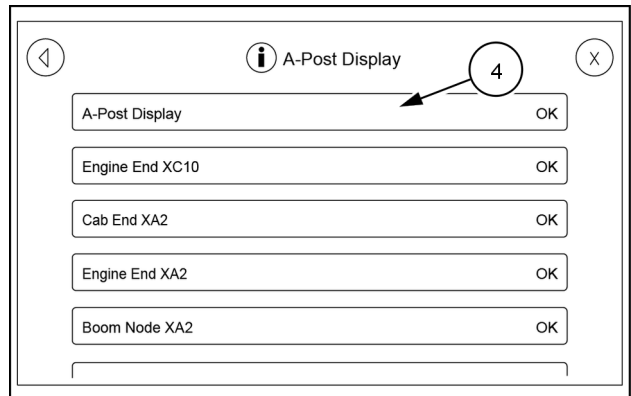
Touching the Arm rest display icon will bring up a scroll list that can be scrolled through using your finger to swipe the list. Scroll down to the engine icon. Touch the first category which is A-post display (3) to bring up the read only information screen. Use the back arrow to go back one page.



RAIL17SP00200AA 3

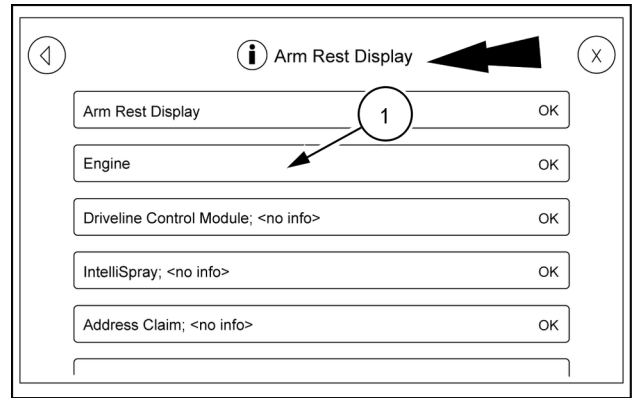


RAIL17SP00121AA 4



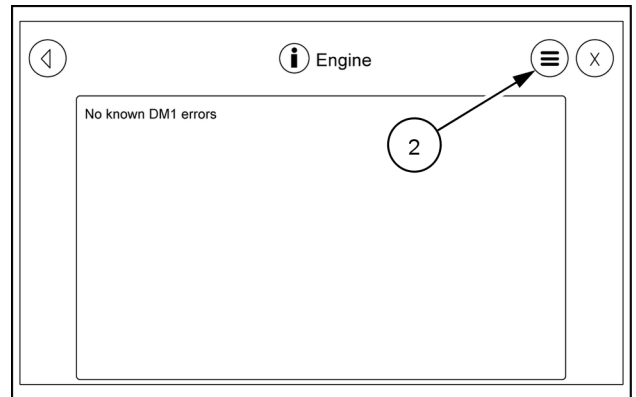
RAIL17SP00980AA 5

Return to the arm rest scroll page. Touch the category engine (1) . this will bring up a DMI errors screen. If any active faults are recorded they will show up in this window.



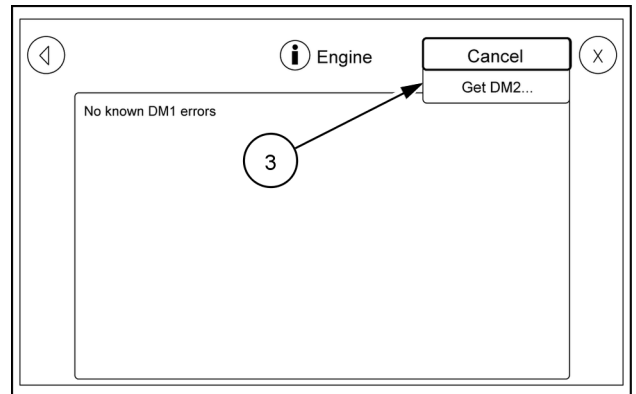
RAIL17SP00133AA 6

On the DMI errors screen touch the icon (2) in the upper right-hand corner.



RAIL17SP00135AA 7

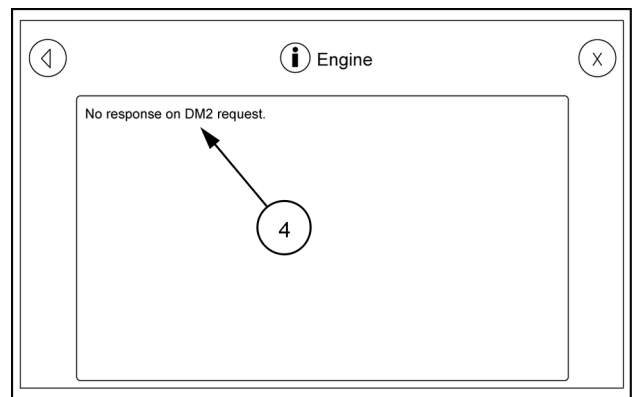
Touching this icon will bring up a screen which has a pull down menu (3) in the upper right-hand corner. Touch the get DM2 icon will bring up a list of in active faults. Press the Cancel button to clear the faults.



RAIL17SP00136AA 8

If there are no faults listed in the DM2 window you will get a screen that indicates no response on DM2 request (4).

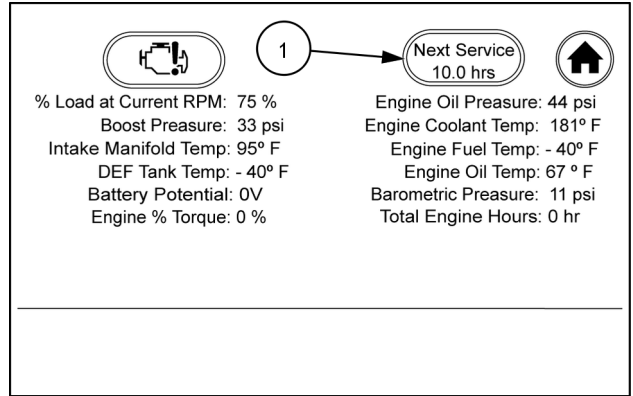
Press the back arrow to go back one page.



RAIL17SP00137AA 9

### Next Service button

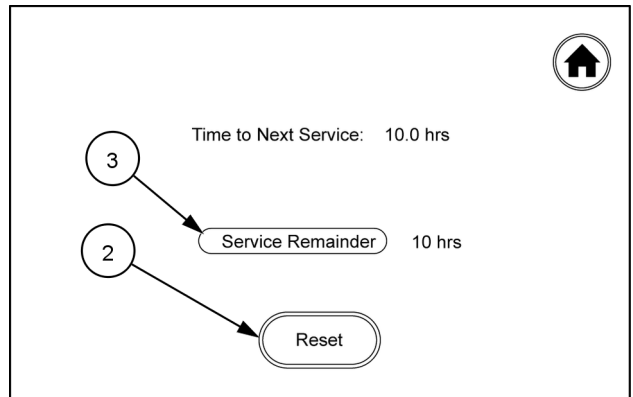
Touch the Next Service button **(1)** to bring up the service interval screen where you can set the service timer. Any aftertreatment alarms will also show on this screen.



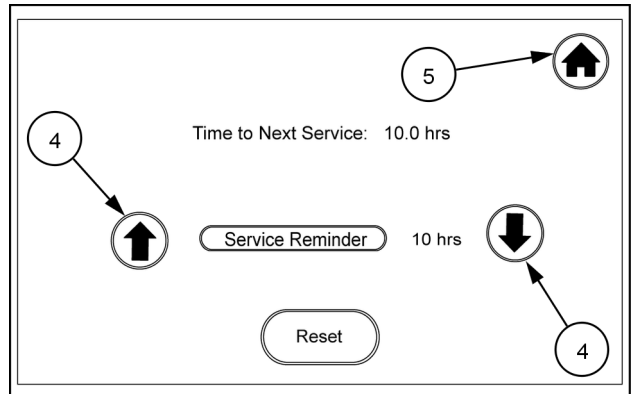
RAIL17SP00200AA 10

When the service timer has expired, if you do not wish to change any times, touch the reset button **(2)** to restart the timer. If you want to change the service timer interval, touch the set service reminder button **(3)** to bring up the setting arrows **(4)**. Touch the up or down arrows to change the time. Touch the service reminder button to set the new interval.

Touch the home icon **(5)** in the upper right-hand corner to return to the home page.



RAIL17SP00201AA 11



RAIL17SP00401AA 12

## Suspension icon and screens

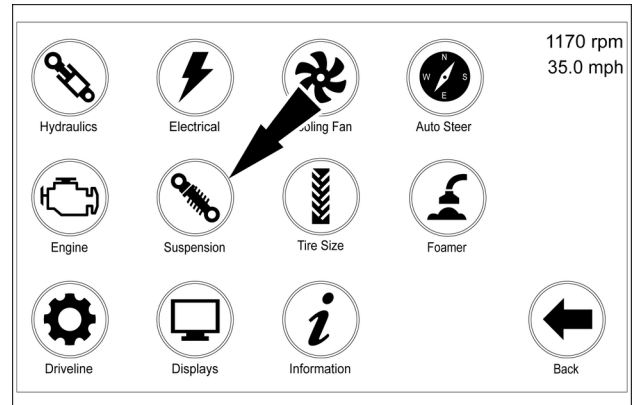
From the arm rest display second home page touch the suspension icon . This will bring up the suspension setting screen.

In the manual mode (1) you can use the up/down arrows (2) to adjust the corners individually or you can raise (3) or lower (4) the entire vehicle at once.

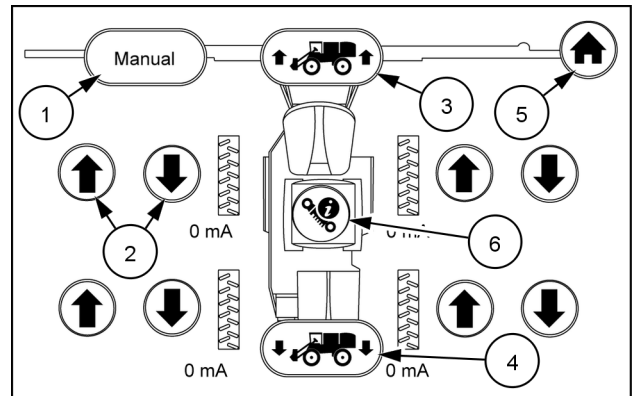
pressing the lower icon (4) allows the machine to be lowered to the suspension stops for transport purposes.

Touch the home icon (5) in the upper right-hand corner to return to the arm rest display second home page.

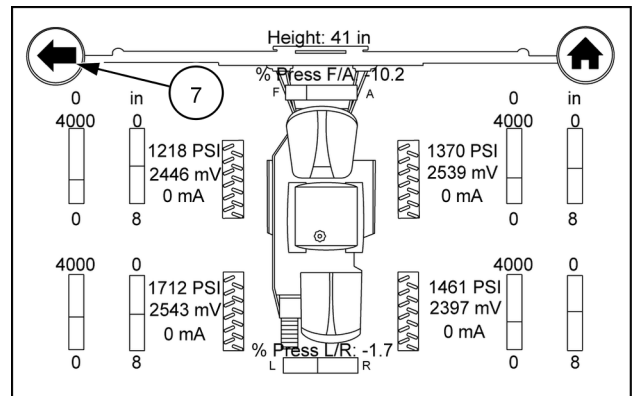
The information icon (6) will display a read only page showing the individual settings. Use the back arrow (7) to return to the previous page, or touch the home icon to return to the arm rest display second home page.



RAIL17SP00109FA 1



RAIL17SP00172AA 2

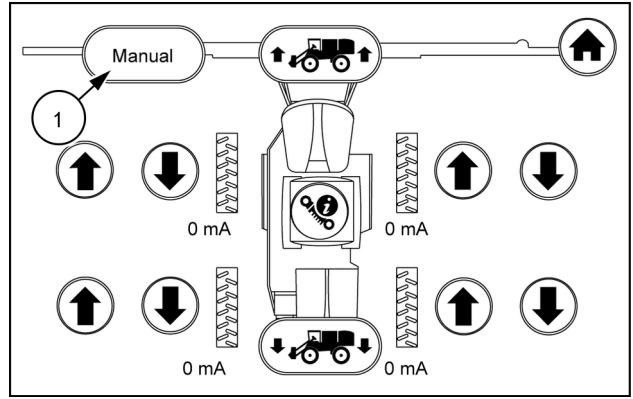


RAIL17SP00173AA 3

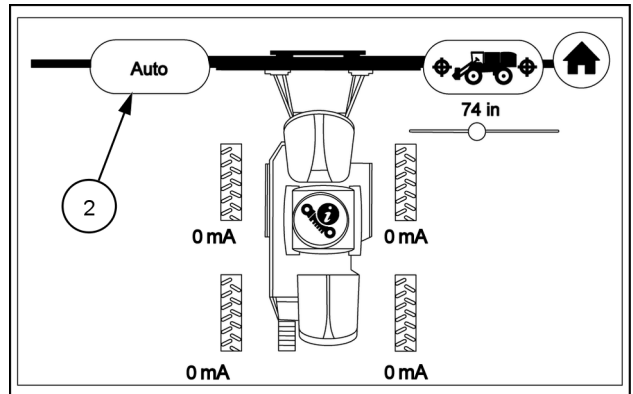
### 3 - CONTROLS AND INSTRUMENTS

Touch the Manual icon (1) once to set the display to the auto mode, touch the auto icon (2) and the display will change to the Auto + mode. Touch the Auto + icon (3) and the display will change back to the manual mode. In the auto mode the Manual icon will change to Auto, and up and down icons will disappear.

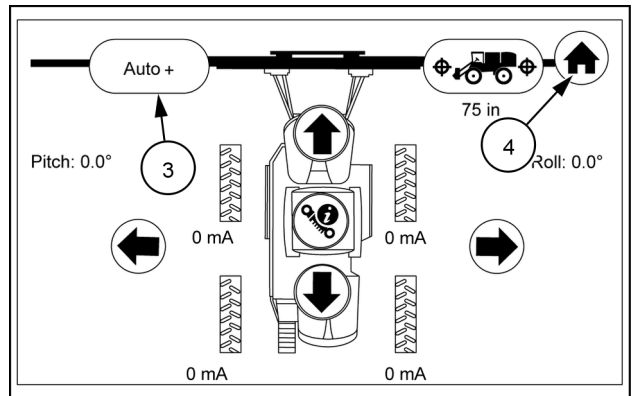
To return to the Manual screen touch the Auto icon, then the Auto + icon. Touch the home icon (4) to return to the arm rest display second home page.



RAIL17SP00172AA 4



RAIL17SP00402AA 5

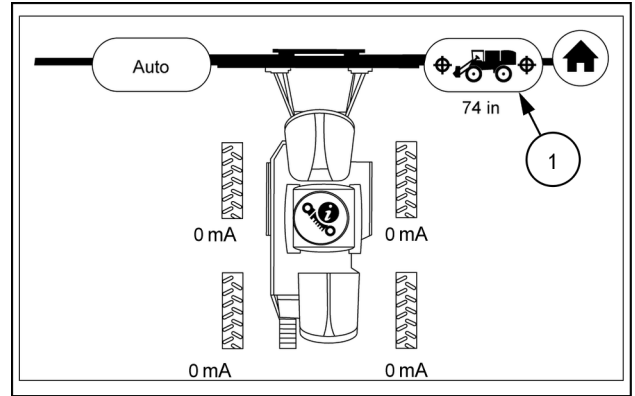


RAIL17SP00403AA 6

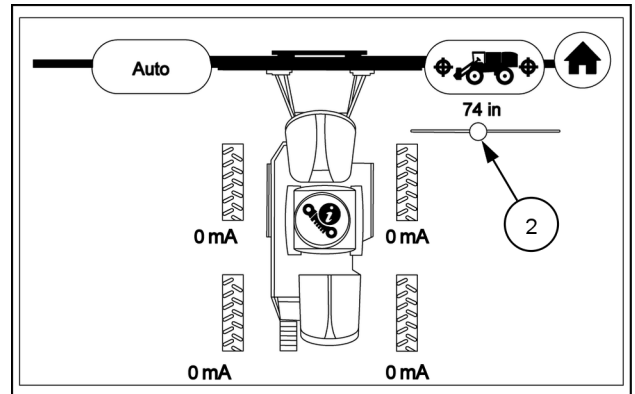
In the Auto mode the machine will automatically adjust to the angle of the terrain at the preset height, both side to side and front to back. Touch the setting icon (1) and the setting screen will display. Use the slider circle (2) to adjust the height. Touch the setting icon again to lock the setting in.

In the Auto + mode you can adjust the pitch and roll of the machine by using the left-hand or right arrows (3) or the front and rear arrows (4). Each touch of the arrows will change the value. This feature is helpful for attaching booms, tool bars or other attachments.

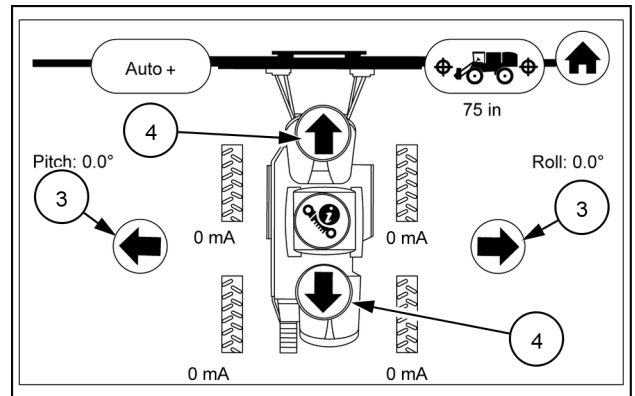
In the Auto + mode it will hold the roll (3) (side to side) setting as well as the pitch (4) (front to back) setting.



RAIL17SP00404AA 7



RAIL17SP00402AA 8



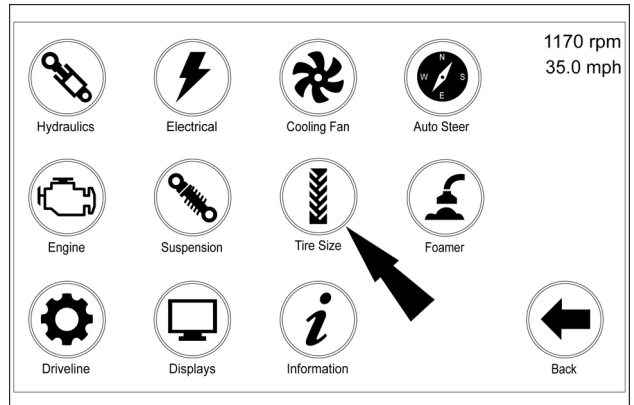
RAIL17SP00403AA 9

## Tire Size icon and screens

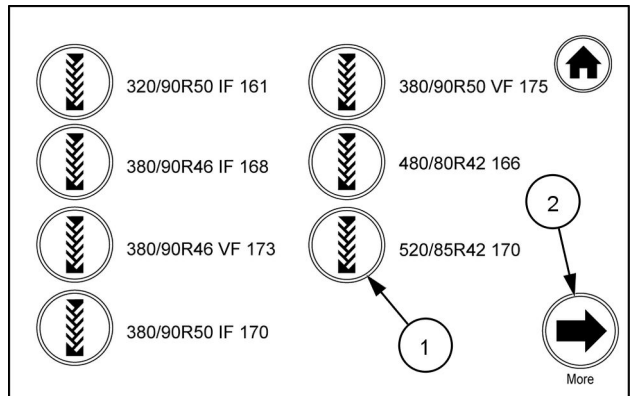
From the arm rest display second home page touch the Tire Size icon. This will bring up a screen which has the standard tires shown (1).

If changing to one of these listed tire sizes, touch the icon of the tire and the system will adjust.

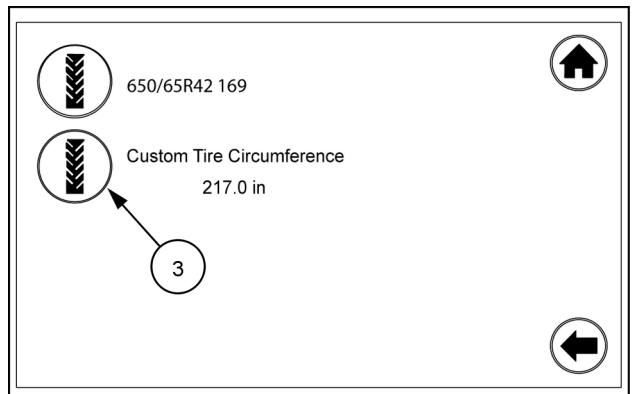
Touch the more icon (2) to bring up a screen which has more tire sizes as well as the custom tire icon (3).



RAIL17SP00109FA 1



RAIL17SP00202AA 2

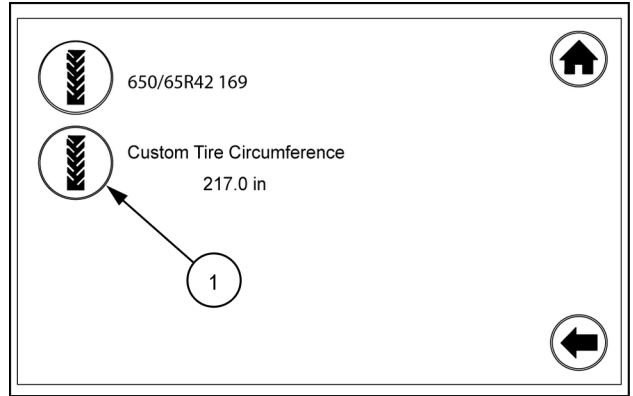


RAIL17SP00398AA 3

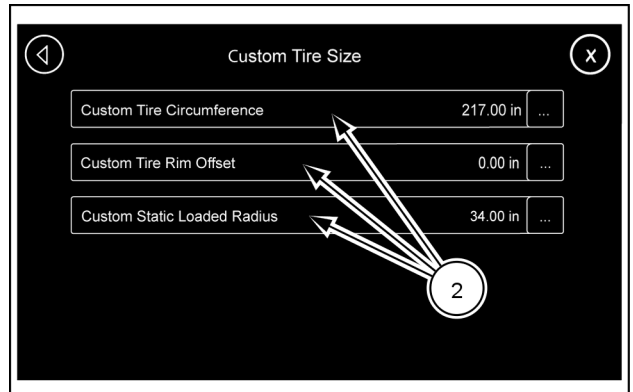


If installing a tire size not shown on the display, touch the Custom Tire Circumference icon (1) to bring up a screen which has three selectable categories (2).

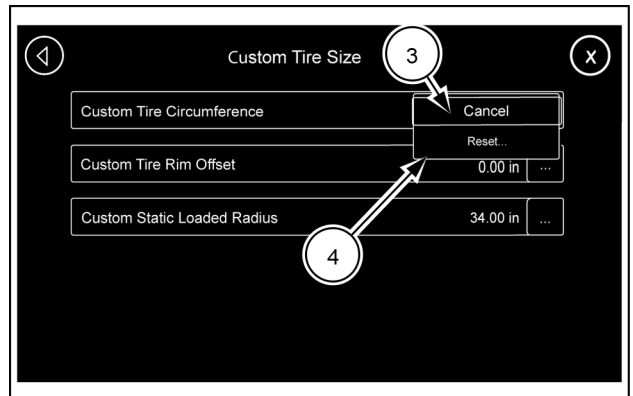
Select the icon of each category and touch the right-hand side and a pop-up menu (3) will appear. Select the reset icon (4) to add in your tire circumference, tire rim offset and static loaded radius.



RAIL17SP00398AA 4



RAIL17SP00400AA 5



RAIL17SP00399AA 6

## Foamer icon and screens

**NOTE:** Be sure the foamer water supply valve under the rinse water tank is turned on before operating the foamer.

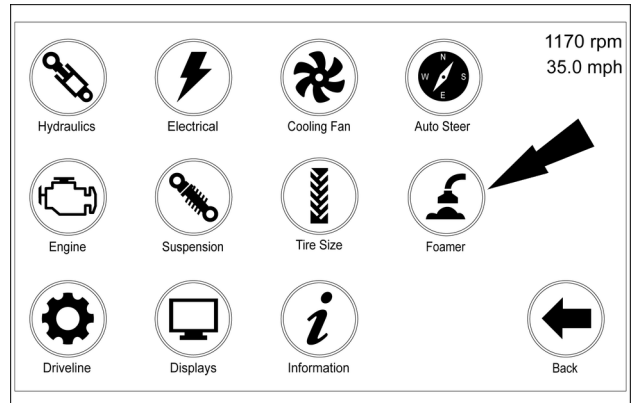
From the arm rest display second home page touch the Foamer icon. This will bring up the screen where you can select the turn signal lever control icon (1), dual foamer on/off icon (2), set the concentrate Mixture (3) and Rate (4).

When the turn signal lever icon (1) is active the icon will turn yellow and will control the left-hand and right-hand foamer. When a foamer side is active the foamer icon (5) in the front overhead display will turn orange indicating which side is on.

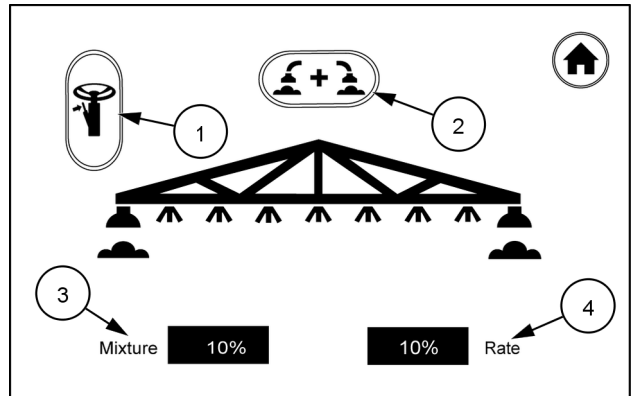
Touch the dual foamer icon (2) and the icon will turn yellow indicating that both foamers are active. Both foamer icons in the front overhead display will also turn red.

With the dual foamer ON, the system ignores the turn signal switch status (turn signal position) and continuously dispenses foam out both sides until button is cycled OFF.

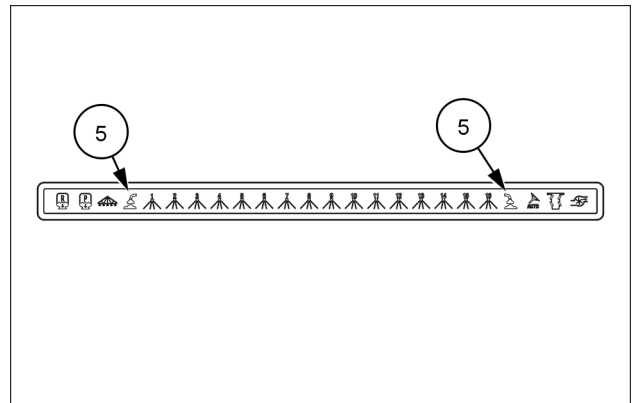
With the dual foamer turned on with the joystick button when turn signal not selected on screen. Also switch left-hand and right-hand foamer with joystick button when not in dual foamer mode on screen.



RAIL17SP00109FA 1



RAIL17SP00203AA 2

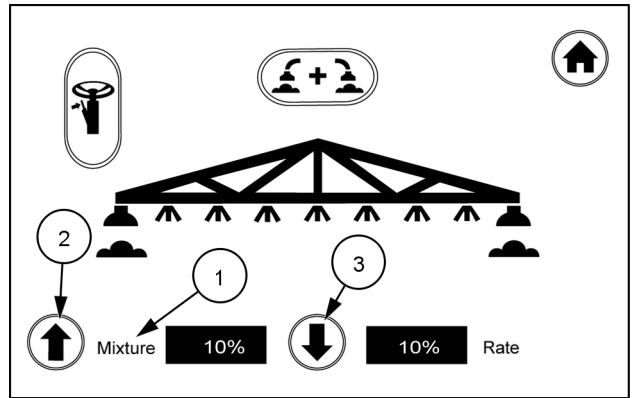


RAIL17SP00309FA 3

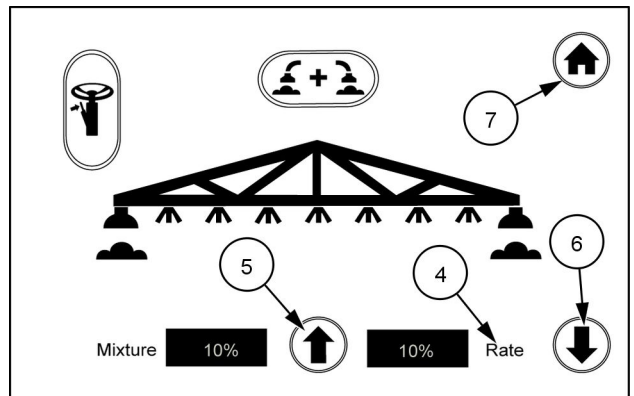
From the foamer screen touch the Mixture icon (1) and the up (2) and down (3) arrows will appear. Use the arrows to adjust the mixture from dry to wet, depending on conditions.

From the foamer screen touch the Rate icon (4) and the up (5) and down (6) arrows will appear. Use the arrows to adjust the rate of the foam, depending on conditions.

Touch the home icon (7) to return to the home page.



RAIL17SP00206AA 4



RAIL17SP00207AA 5

## Driveline icon and screens

From the arm rest display second home page touch the Driveline icon.

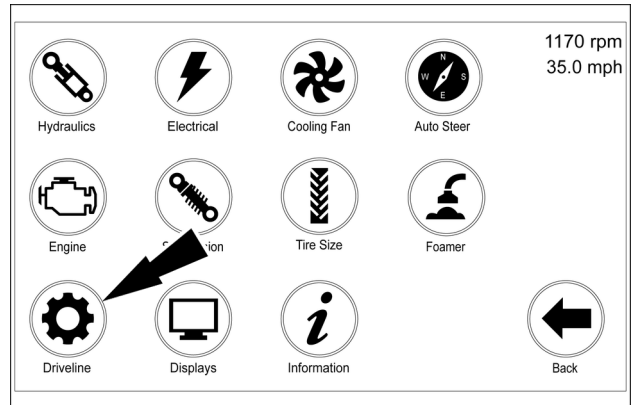
On the driveline screen touch the range setup icon (1). Touch the desired range icon (2) to bring up the up/down arrows (3) for that range. The arrows will increase or decrease the speed by .2 mph per push in that range. When set touch the next range icon to be changed if desired.

All the speed ranges 1 through 4 are changed in the same manner.

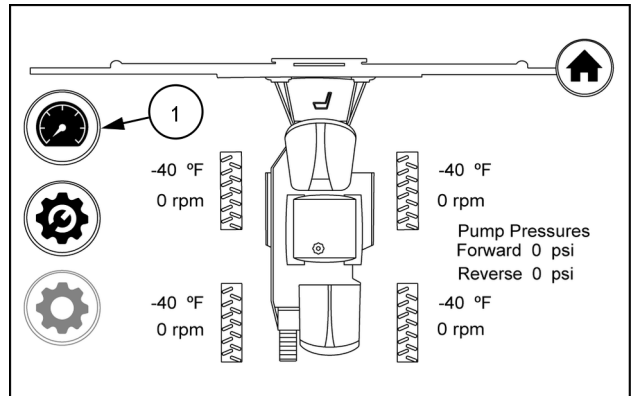
If all the ranges are set at 0.0 mph, you must start the adjustments with range 4.

Touch the back arrow (4) to go back to the driveline screen.

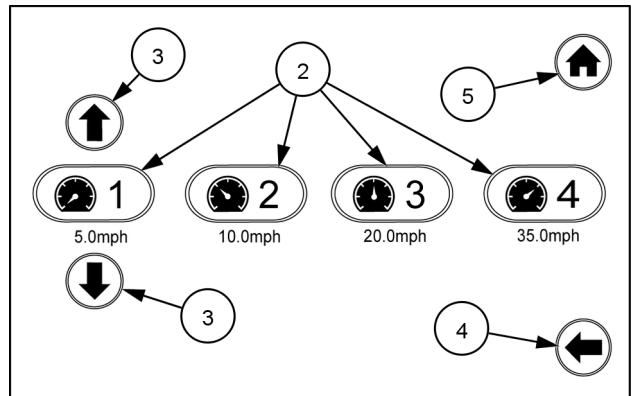
Touch the home icon (5) to return to the home page.



RAIL17SP00109FA 1



RAIL17SP00174AA 2

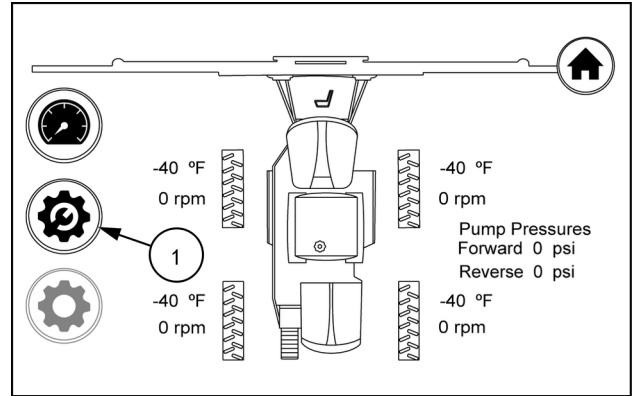


RAIL17SP00208AA 3

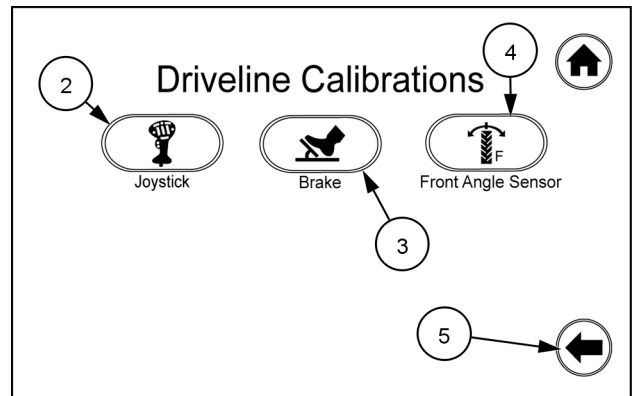
The joystick, brake pedal and front angle sensor can be calibrated by touching the calibration icon (1) on the driveline screen.

Touch the desired icon, Joystick (2), Brake (3) or Front Angle Sensor (4) to bring up the desired feature. Touching any of these icons will bring up sub screens for calibrating that feature.

Touch the back arrow (5) to go back one page.



RAIL17SP00174AA 4



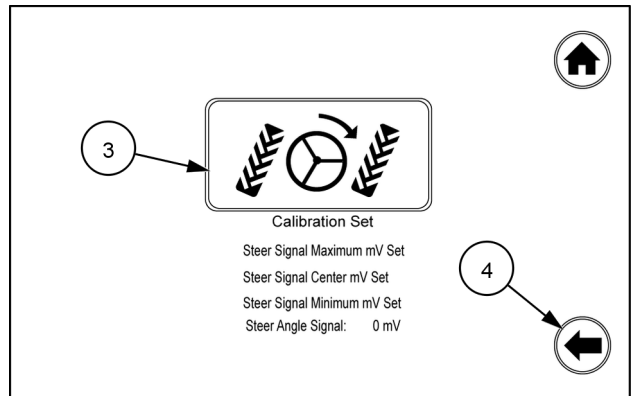
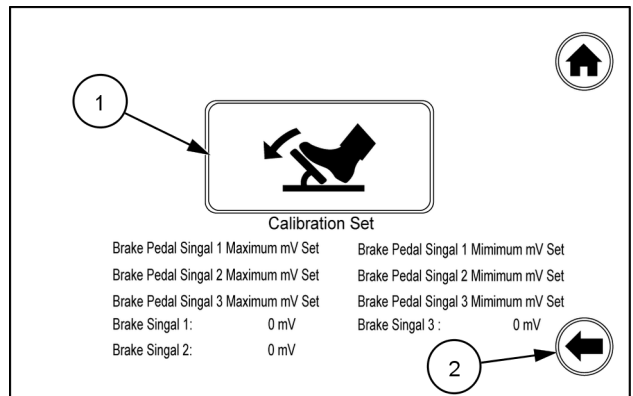
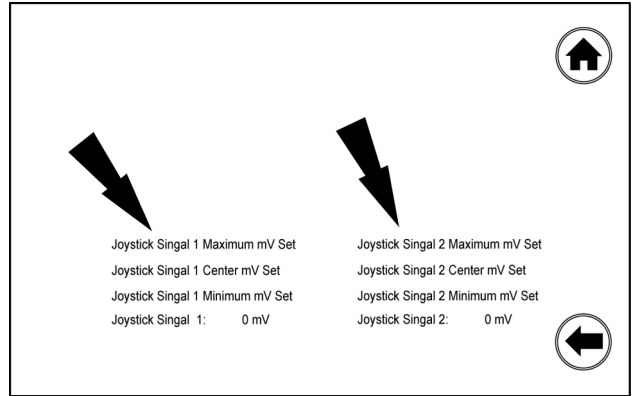
RAIL17SP00212AA 5

All components can be calibrated only if replaced or unplugged while powered.

The calibration screens for the joystick can only be reset if the joystick is replaced.

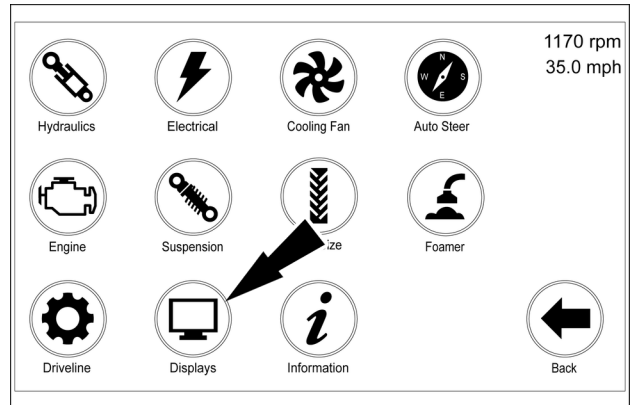
The calibration screen for the brake pedal is accessed by touching the brake pedal icon (1). Touch the back arrow (2) to go back one page.

The calibration screen for the steering angle sensor is accessed by touching the steering angle sensor icon (3). Touch the back arrow (4) to go back one page.



## Displays icon and screens

From the arm rest display second home page touch the Displays icon.



RAIL17SP00109FA 1

Use the back arrow on the screens until you get back to the main page.

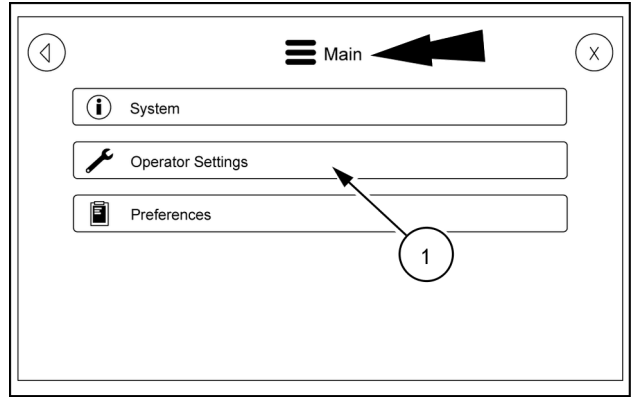
On the main page touch the Operator Settings icon **(1)**. Touching this icon will bring up a screen that has multiple categories. This screen is a swipe screen to see all the categories.

Touch category Unit Selection **(2)**. This will bring up a screen where you can select SAE or metric for the display. Touch the Units icon **(3)** and a pull down menu will appear.

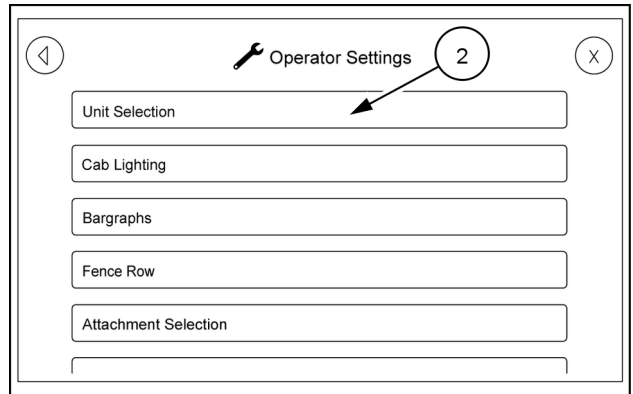
Select the value you want to display. Touch the Metric icon **(4)** and the display will be metric.

From this screen you can Cancel **(5)** your selection or Reset **(6)** the display back to the preset value.

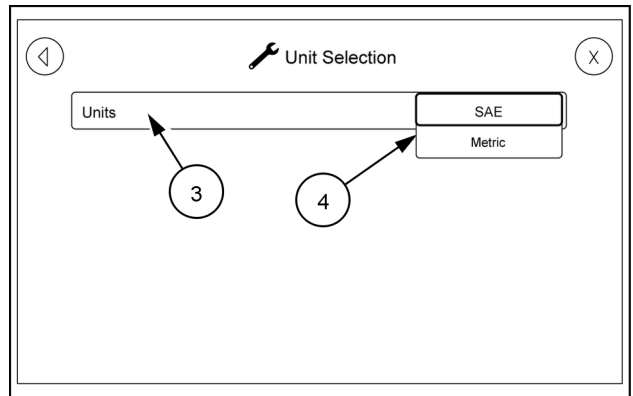
Use the back arrow **(7)** to go back one page.



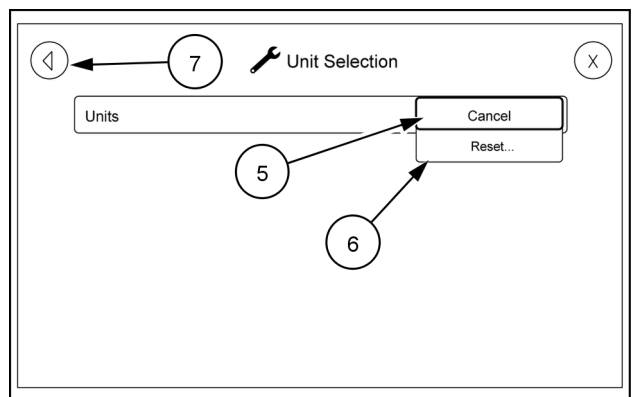
RAIL17SP00143AA 2



RAIL17SP00144AA 3



RAIL17SP00146AA 4

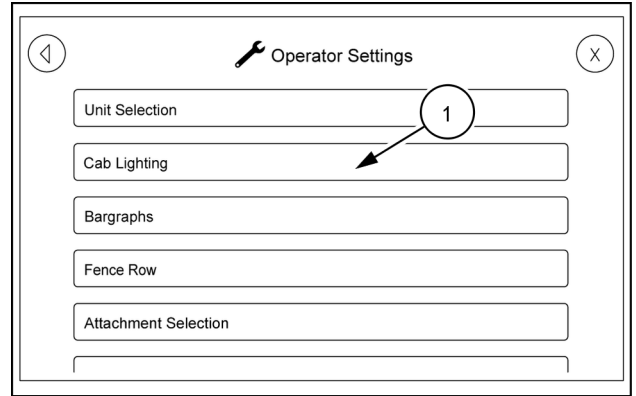


RAIL17SP00147AA 5

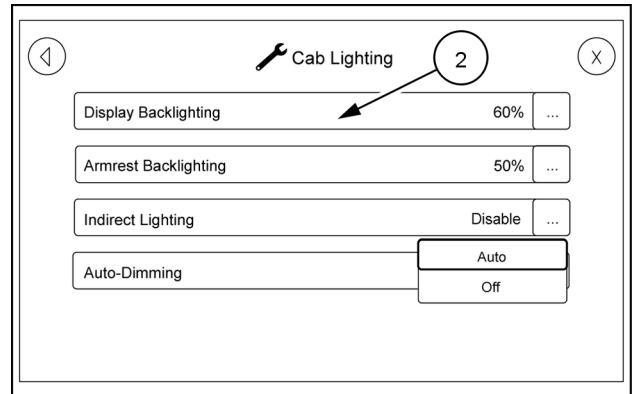


Return to the operator settings scroll screen. Touch the category Cab Lighting (1).

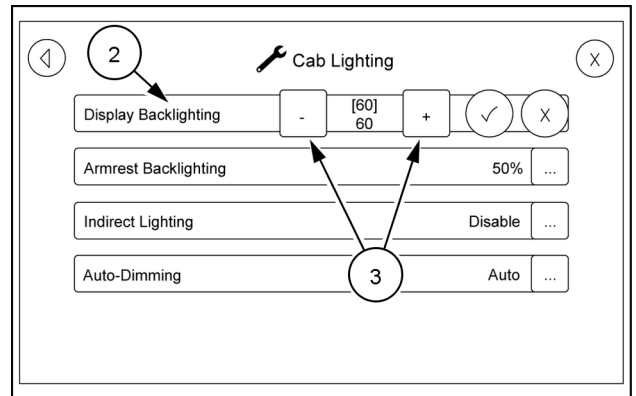
This will bring up a screen where you can select which lighting you want to adjust. Touch the Display Backlighting icon (2) and the setting icons (3) will appear. Touch the plus (+) or minus (-) to adjust the light intensity. Once the proper setting is reached touch the check mark to lock the setting in or touch the X to leave the setting as is.



RAIL17SP00144AA 6

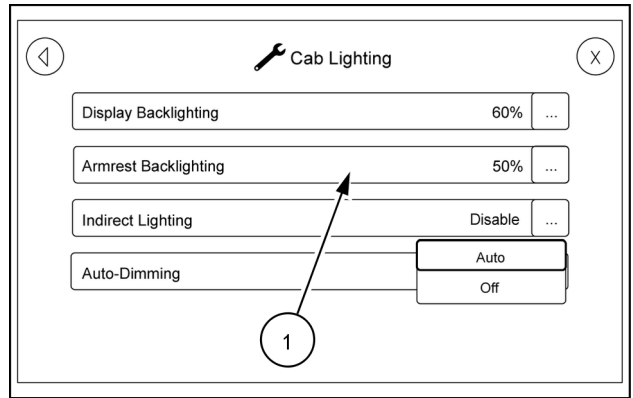


RAIL17SP00151AA 7

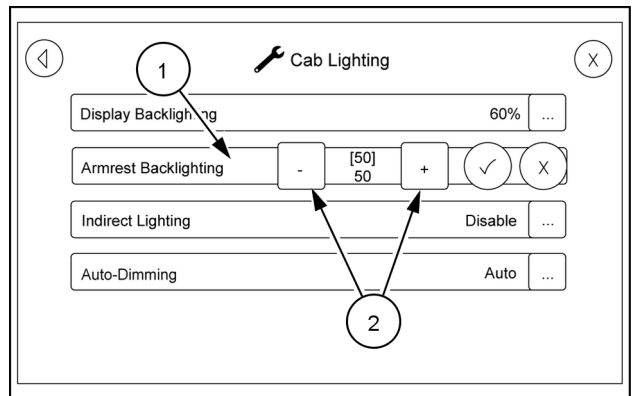


RAIL17SP00148AA 8

Touch the Armrest Backlighting icon **(1)** and the setting icons **(2)** will appear. Touch the plus (+) or minus (-) to adjust the light intensity. Once the proper setting is reached touch the check mark to lock the setting in or touch the X to leave the setting as is.



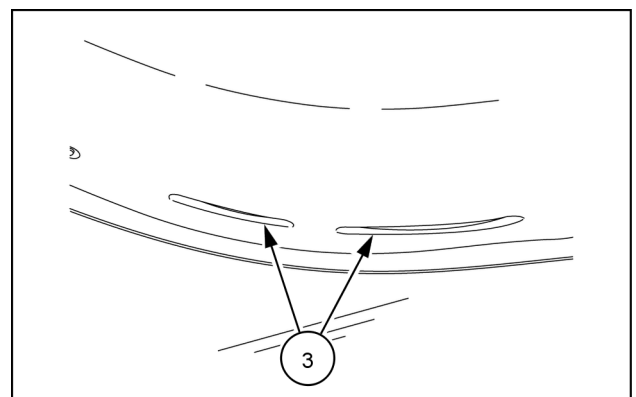
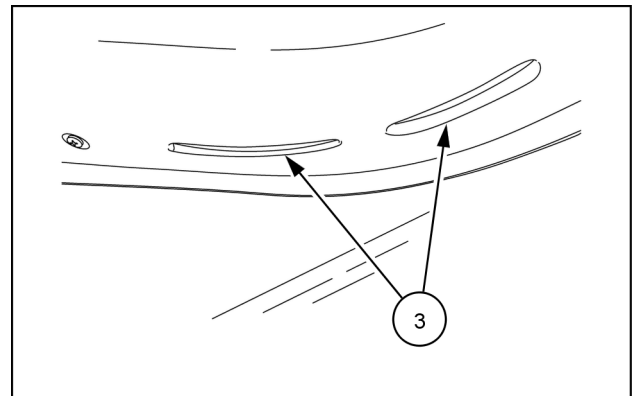
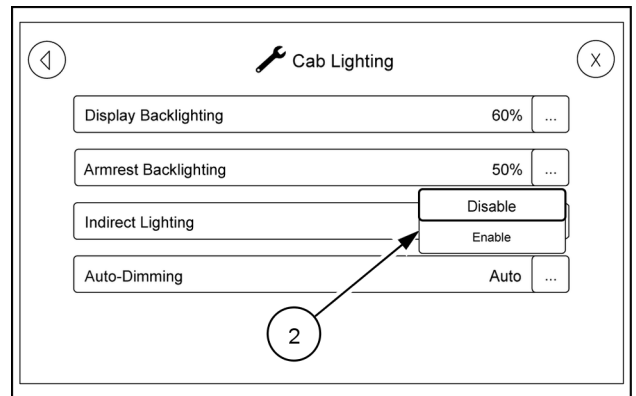
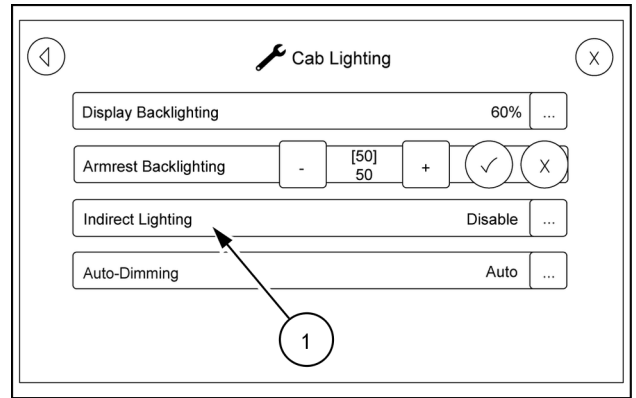
RAIL17SP00151AA 9



RAIL17SP00149AA 10

Touch the Indirect Lighting icon (1) and a pull down menu (2) will appear. From the pull down menu you can choose to Disable or Enable the lighting.

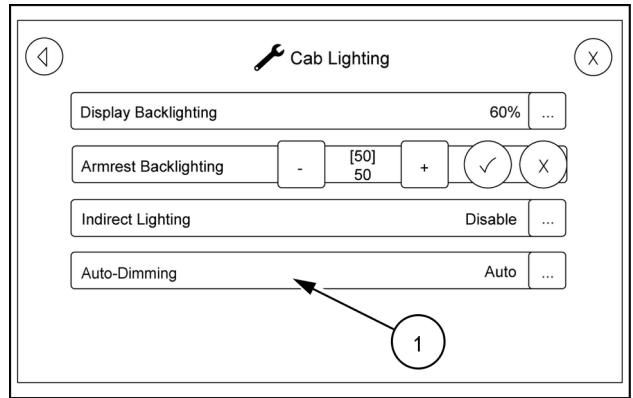
The Indirect Lighting (3) is located in the cab headliner (two on each side) behind the operator. They are used for accent lighting.



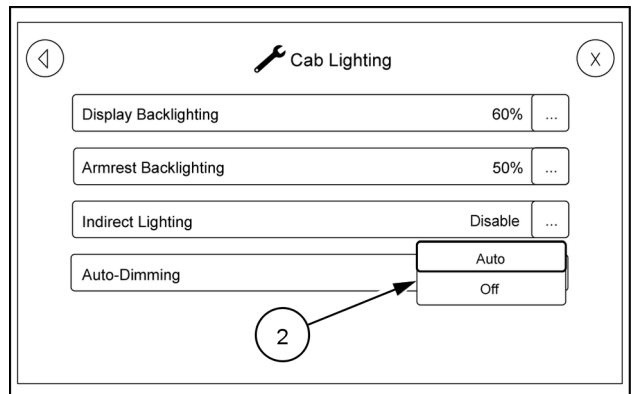
Touch the Auto-Dimming icon **(1)** (luxury cab only) and a pull down menu **(2)** will appear. From the pull down menu you can choose to set the dimming to Auto or Off.

When the auto-dimming is set to auto, low beam headlights come on automatically when the sensor in the cab senses low light. Interior lights will also dim when the headlights come on.

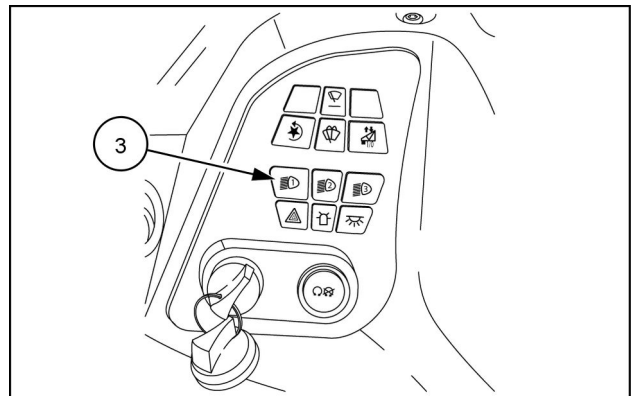
When the auto-dimming is set to off, the headlights must be turned on manually with the headlight switch **(3)** on the side console. Press the switch to turn the low beam headlights on. Press the switch again to turn the low beam headlights off.



RAIL17SP00149AA 15



RAIL17SP00151AA 16



RAIL17SP00263AA 17

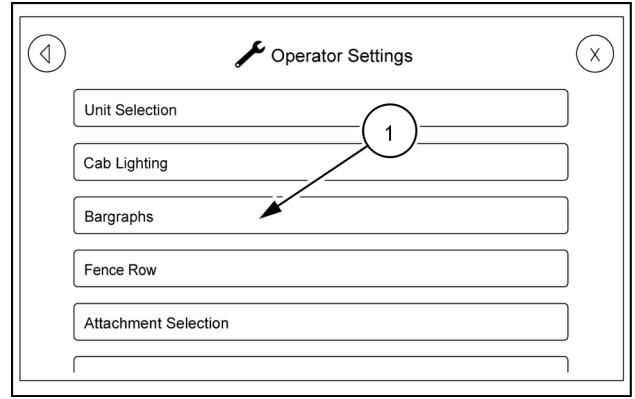
Return to the operator settings scroll screen. Touch the category selection **(1)**.

The bar graph selection screen will appear. The four selections (1 through 4) correspond with the four gauges across the bottom of the upper A-post display 1 being the gauge farthest to the left.

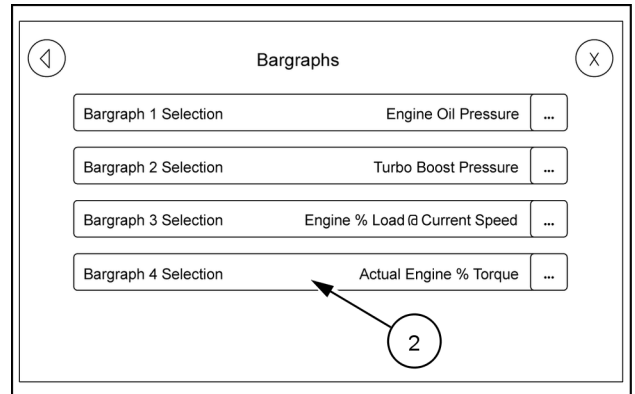
Touch one of the bar graph selections **(2)** and a pop-up menu **(3)** will appear. These menus are longer than what is displayed. Use the swipe method to scroll through the list.

Once the selection is made touch the selected category for that gauge and the gauge will change.

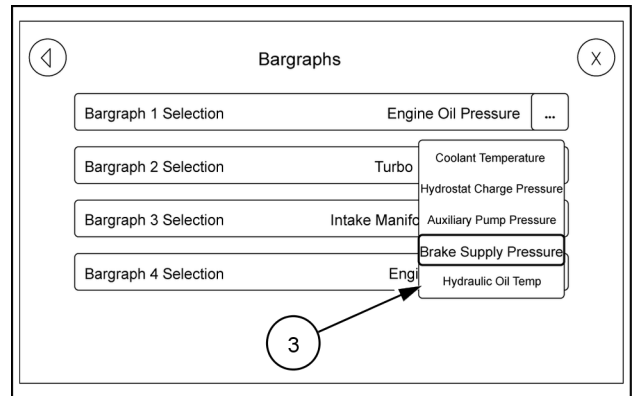
All four of the gauges can be customized per operator needs.



RAIL17SP00144AA 18



RAIL17SP00110AA 19



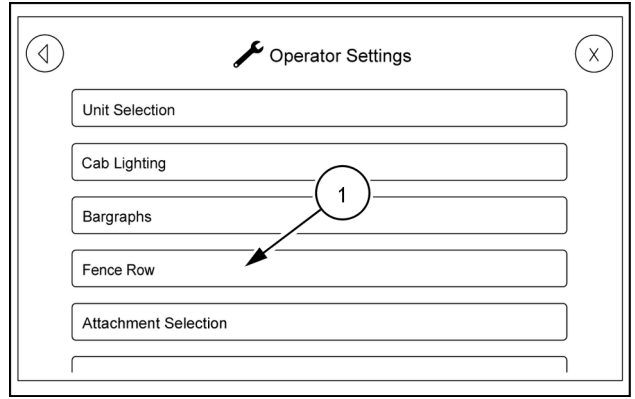
RAIL17SP00113AA 20

Return to the operator settings scroll screen. Touch the category Fence Row (1).

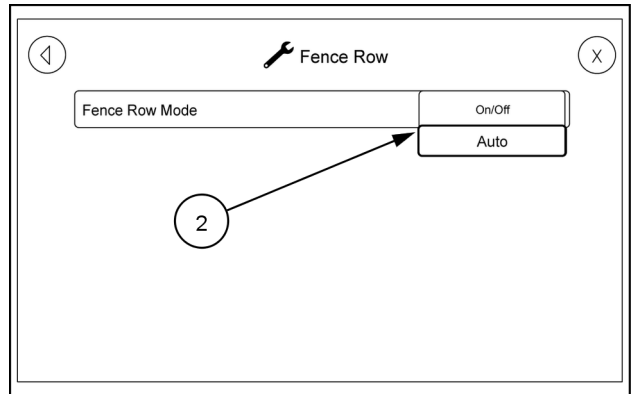
The fence row selection screen will appear. Touch the fence row icon and On/Off or Auto menu (2) will pop-up.

If you select on/off the right-hand and left-hand side fence row nozzles will be controlled by the fence row switches (3) on the side console by pressing the switch for the side desired.

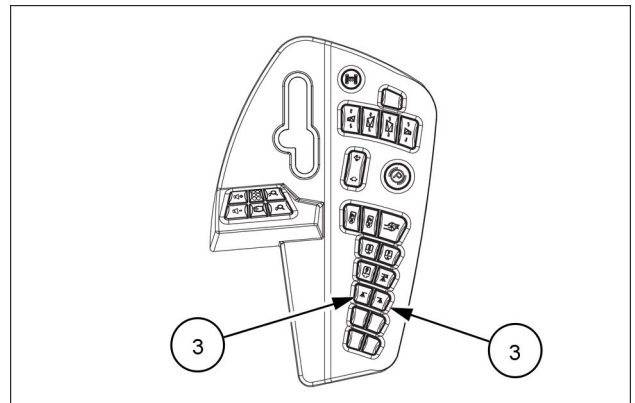
If you select auto, the right-hand and left-hand fence row nozzles are controlled with the outer most boom section on that side.



RAIL17SP00144AA 21



RAIL17SP00152AA 22

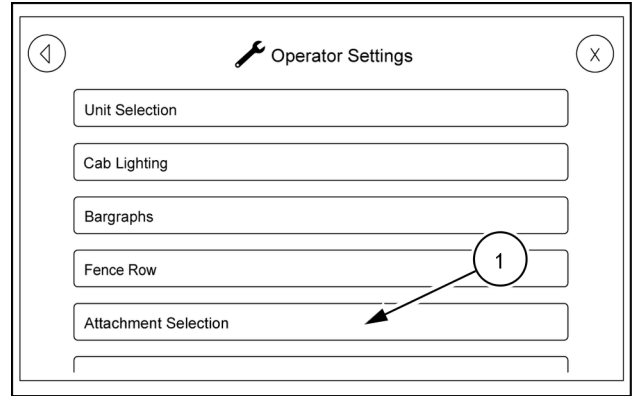


RAIL17SP00307FA 23

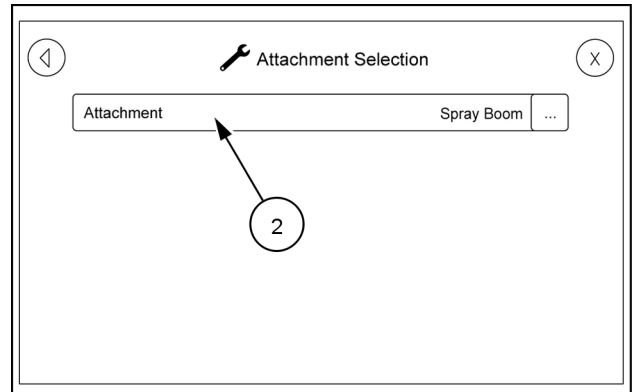
Return to the operator settings scroll screen. Touch the category attachment selection (1).

The attachment selection screen will appear. Touch the Attachment Selection icon (2) and a pop-up menu (3) will appear.

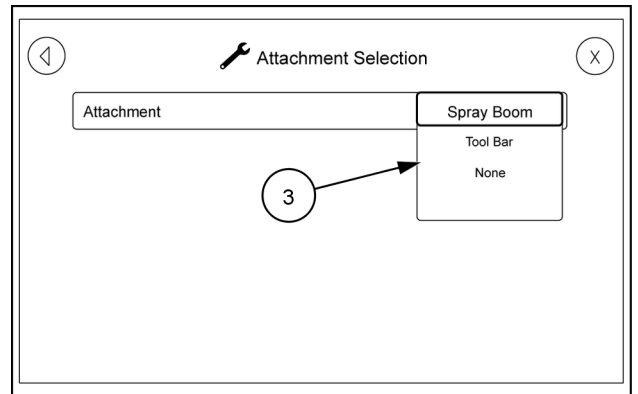
Select the type of attachment you have attached to your unit. You can choose from spray boom, tool bar or none.



RAIL17SP00144AA 24

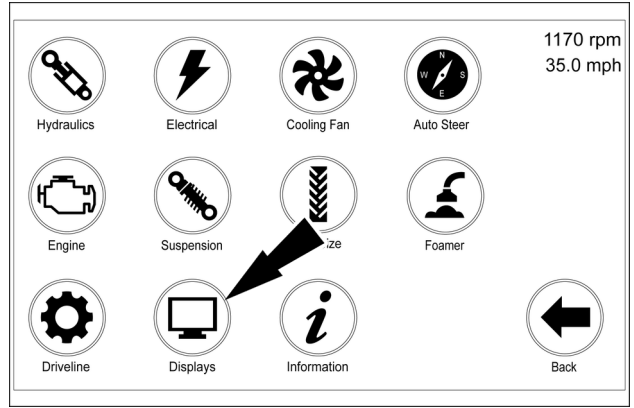


RAIL17SP00153AA 25

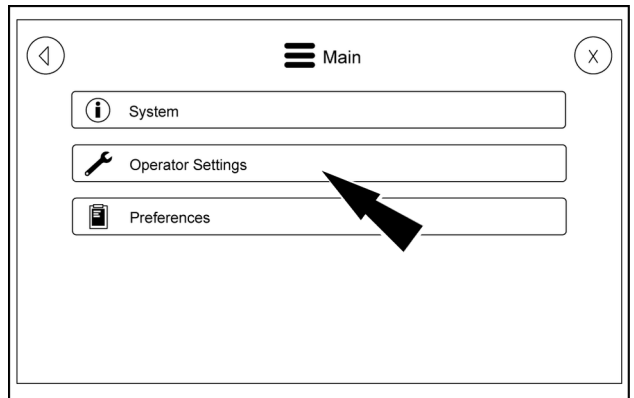


RAIL17SP00154AA 26

Return to the arm rest display second home page and touch the displays icon. This will bring up a page where you can select the operator settings icon.

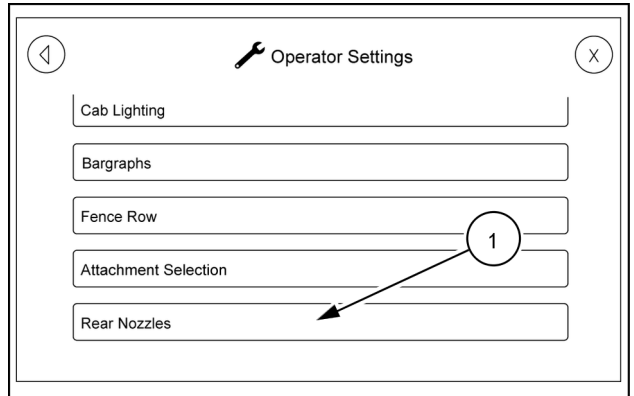


RAIL17SP00109FA 27



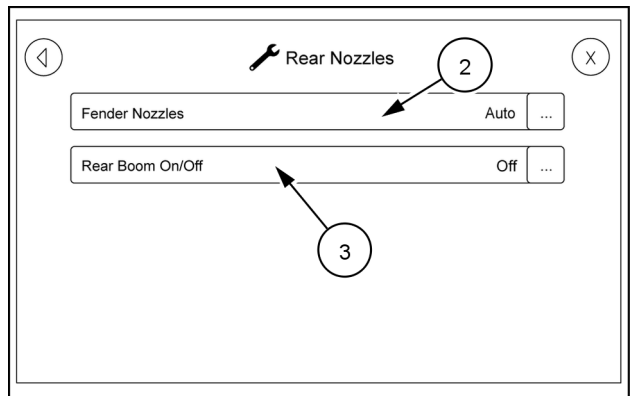
RAIL17SP00143AA 28

On the operator settings scroll screen. Use the swipe method to find the rear nozzle category. Touch the category Rear Nozzle (1).



RAIL17SP00145AA 29

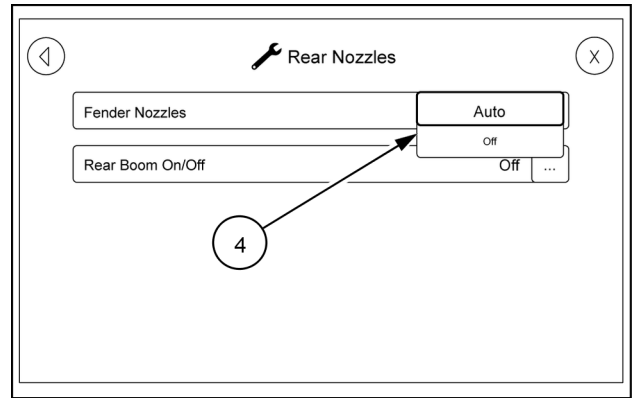
This will bring up a screen where you can select Fender Nozzles (2) or Rear Boom On/Off (3).



RAIL17SP00155AA 30

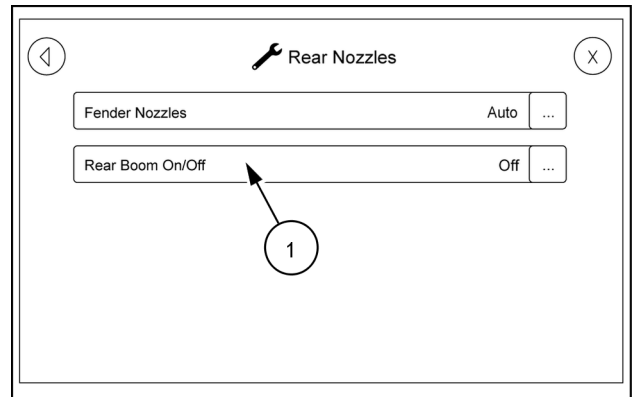


Touch the fender nozzles and a pop-up menu **(4)** will appear. You can select Auto or Off. If you select Auto, the fender nozzles will come on automatically with the proper boom section. Off will prevent the fender nozzles from operating.

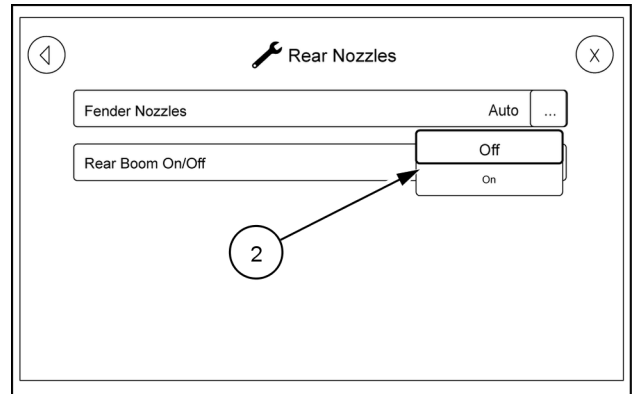


RAIL17SP00156AA 31

Touch the Rear Boom On/Off icon **(1)**. This will bring up a pop-up menu **(2)** where you can choose on or off.



RAIL17SP00155AA 32

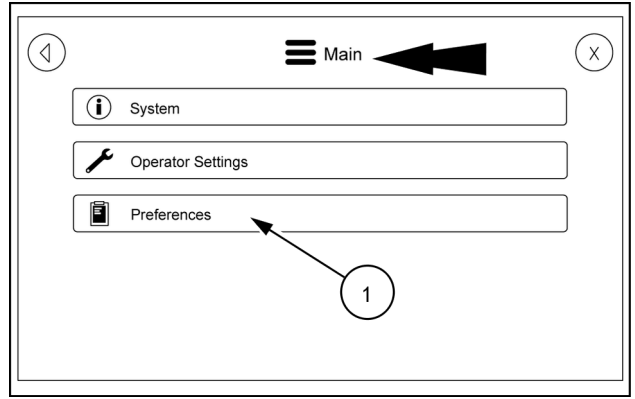


RAIL17SP00157AA 33

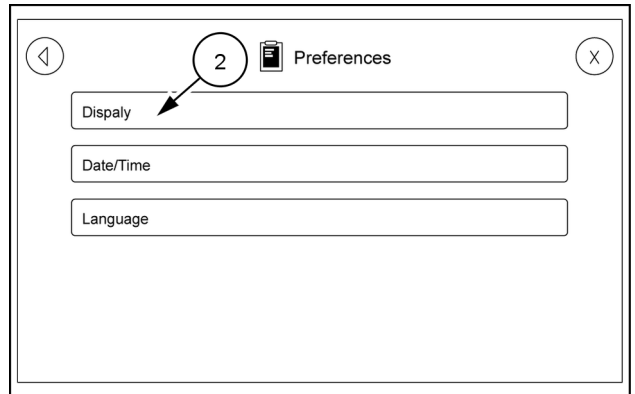
Use the back arrow on the screens until you get back to the main page.

On the main page touch the Preferences icon (1). Touching the Preferences icon will bring up a screen that has three selectable categories. Touch the Display icon (2) which will bring up a backlight and screen saver screen.

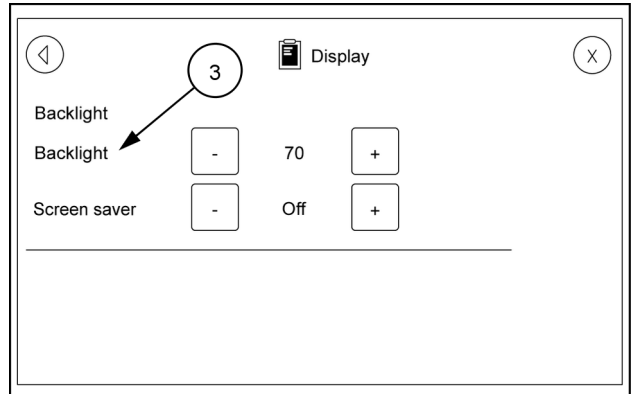
Touch the Backlight selection (3) to bring up the setting screen (4). Use the plus(+) or minus(-) to change the backlight intensity. Once the correct setting is reached touch the check mark to lock the setting in.



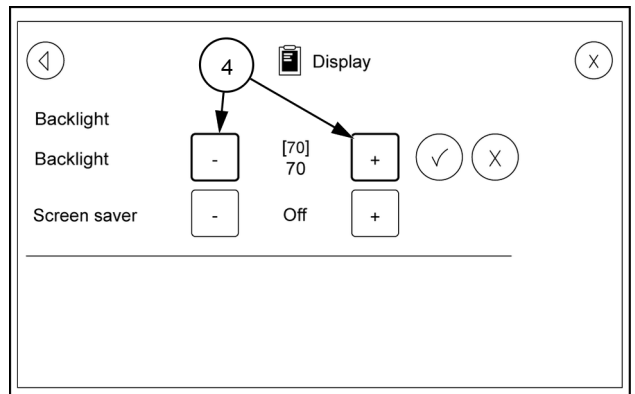
RAIL17SP00143AA 34



RAIL17SP00158AA 35



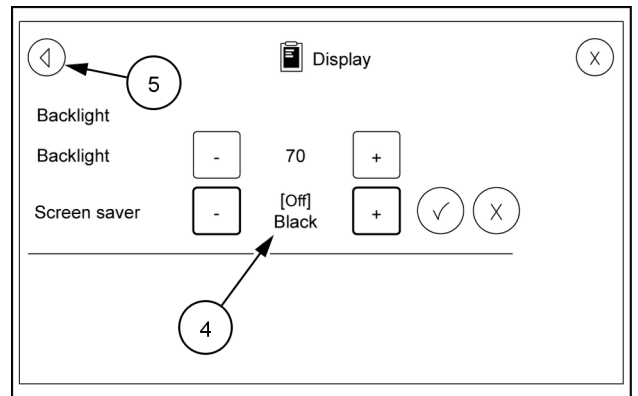
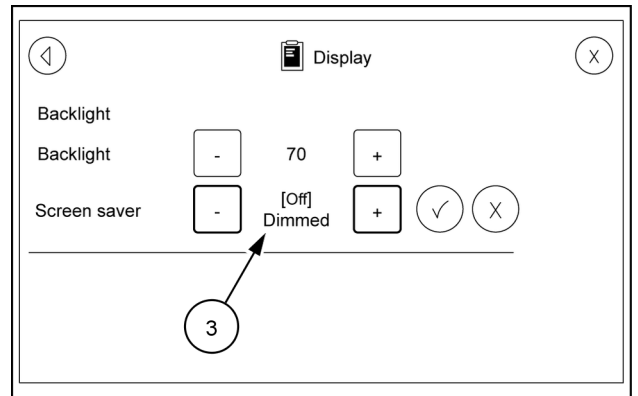
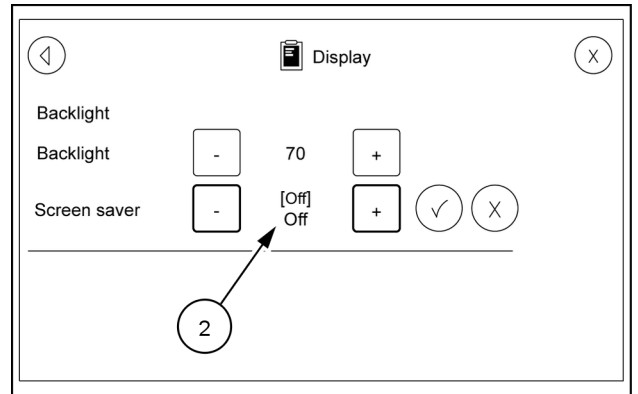
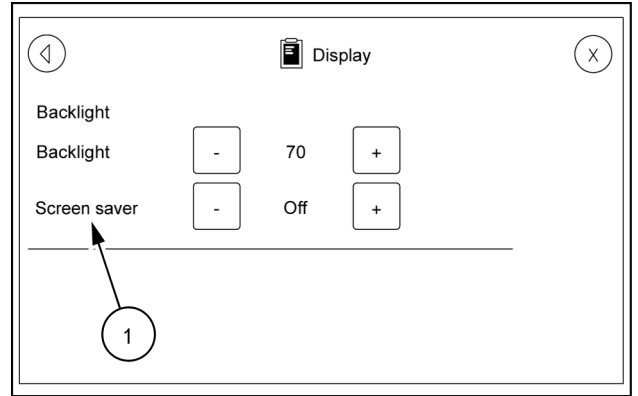
RAIL17SP00159AA 36



RAIL17SP00160AA 37

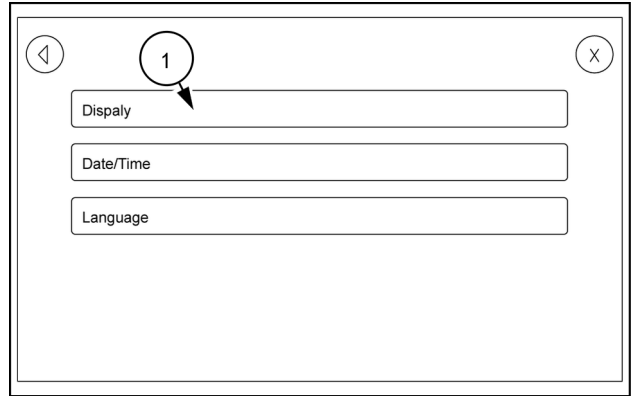
Touch the Screen Saver icon (1) to bring up the setting screen. Use the plus(+) or minus(-) to change the screen saver. Once the correct setting is reached, touch the check mark to lock the setting in. The screen saver can be set to off (2), dimmed (3) or black (4).

Use the back arrow (5) to go back one page.

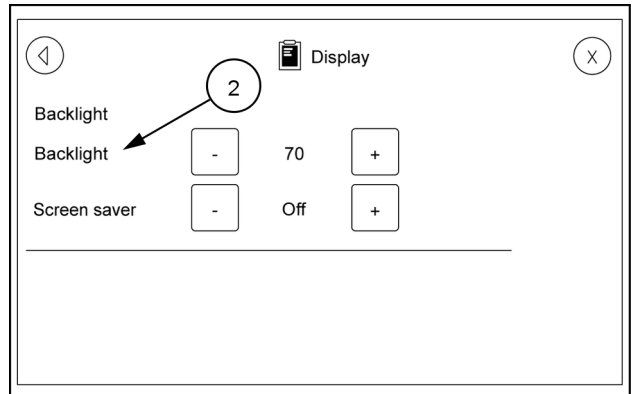


Touching the Display icon will bring up a screen that has three selectable categories. Touch the Display icon **(1)** which will bring up a backlight and screen saver screen.

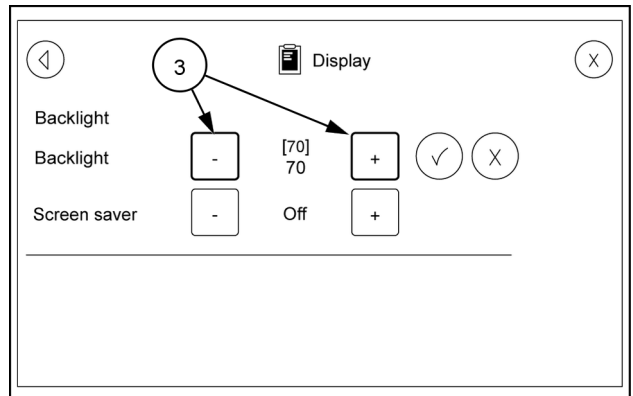
Touch the Backlight icon **(2)** to bring up the setting screen **(3)**. Use the plus(+) or minus(-) to change the backlight intensity. Once the correct setting is reached touch the check mark to lock the setting in.



RAIL17SP00158AA 42



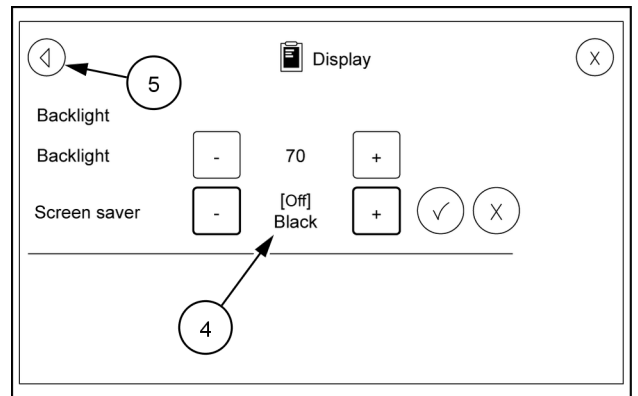
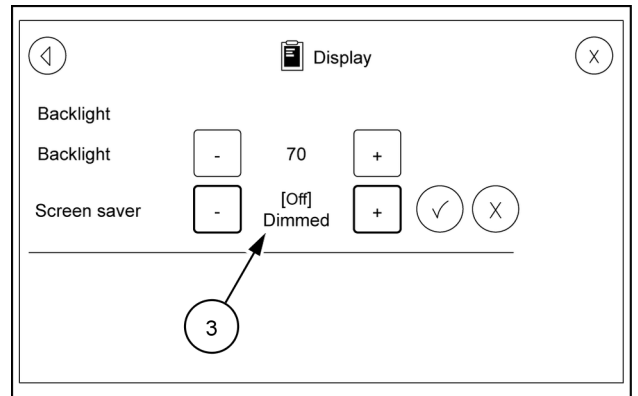
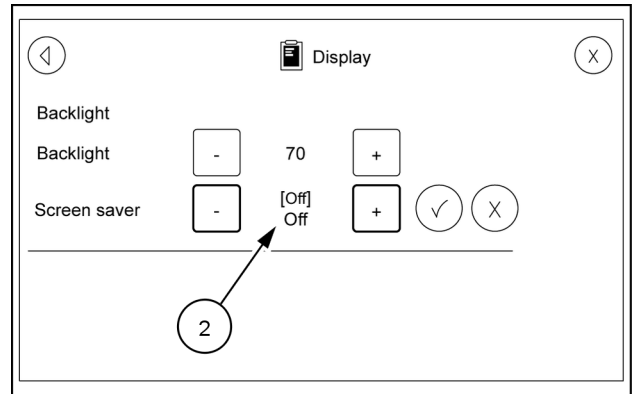
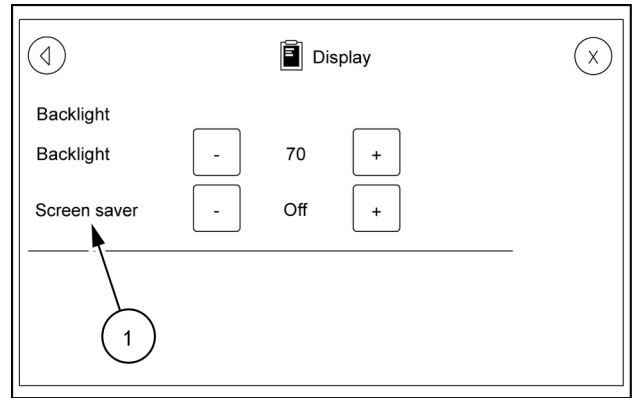
RAIL17SP00159AA 43



RAIL17SP00160AA 44

Touch the Screen Saver icon (1) to bring up the setting screen. Use the plus(+) or minus(-) to change the screen saver. Once the correct setting is reached, touch the check mark to lock the setting in. The screen saver can be set to off (2), dimmed (3) or black (4).

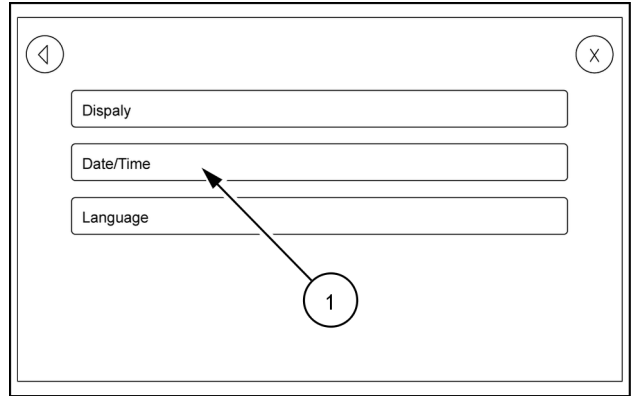
Use the back arrow (5) to go back one page.



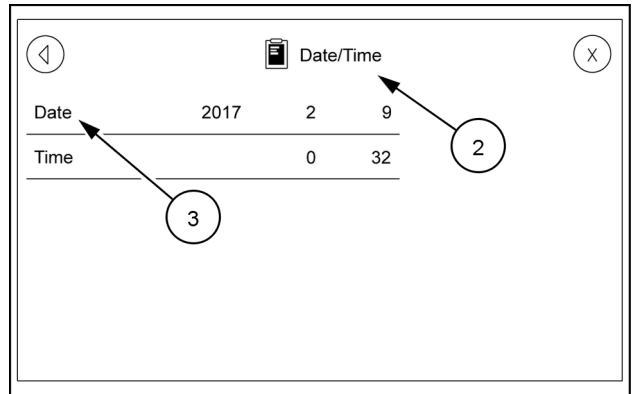
Use the back arrow key until you reach the preferences page.

On the preferences page touch the Date/Time icon (1)  
Touching this icon will bring up a Date/Time screen (2).

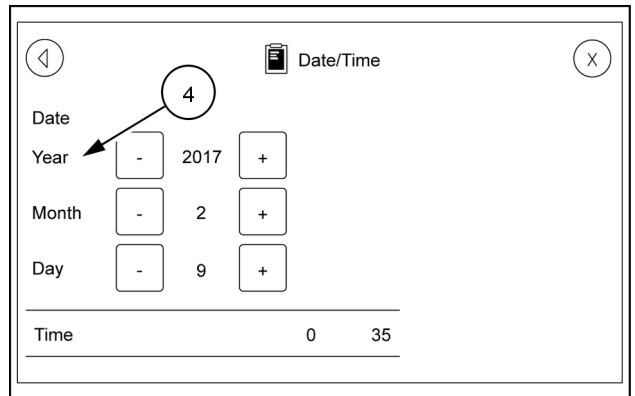
Touch the Date icon (3) to bring up the date setting screen.  
Touch the Year icon (4) to bring up the year setting screen (5).  
Use the plus(+) or minus(-) icons to set the year.  
Once the year is set, touch the check mark to lock the year in.



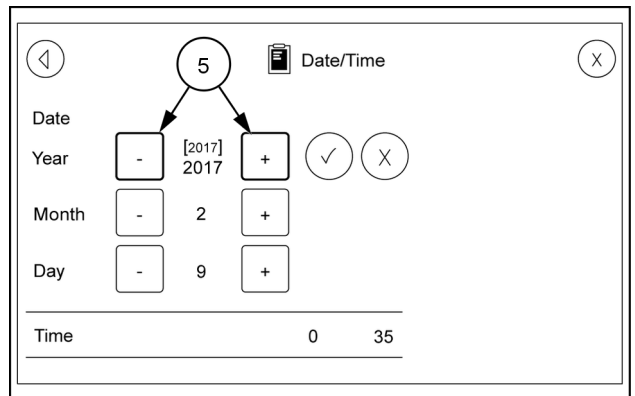
RAIL17SP00158AA 49



RAIL17SP00164AA 50



RAIL17SP00165AA 51

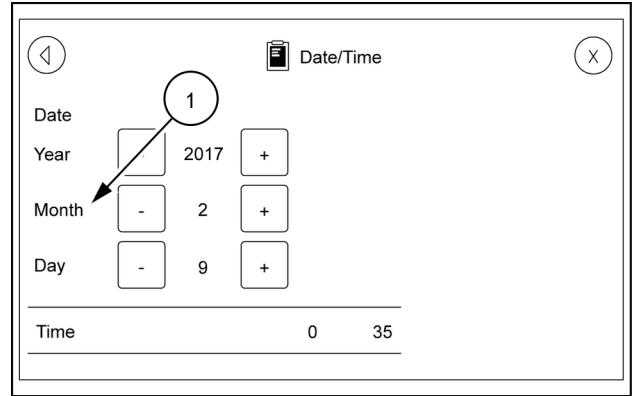


RAIL17SP00166AA 52

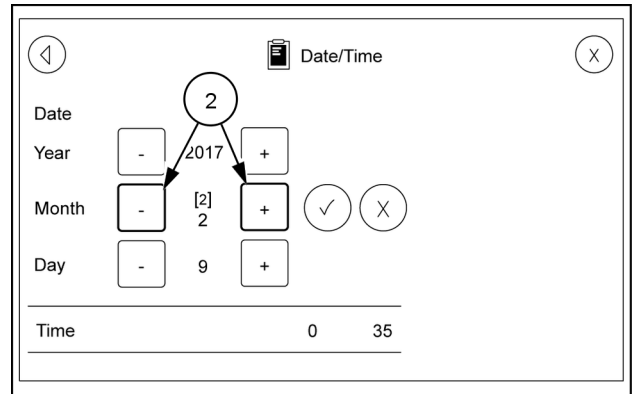
Touch the Month icon **(1)** to bring up the setting screen **(2)**. Use the plus(+) or minus(-) icons to set the month. Once the month is set, touch the check mark to lock the month in.

Touch the Day icon **(3)** to bring up the setting screen **(4)**. Use the plus(+) or minus(-) icons to set the day. Once the day is set, touch the check mark to lock the day in.

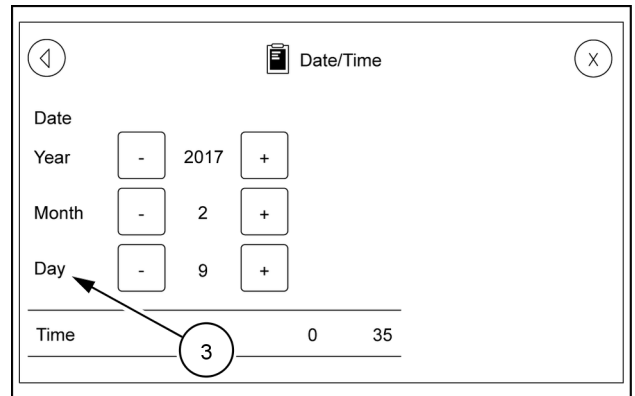
Use the back arrow to go back on page.



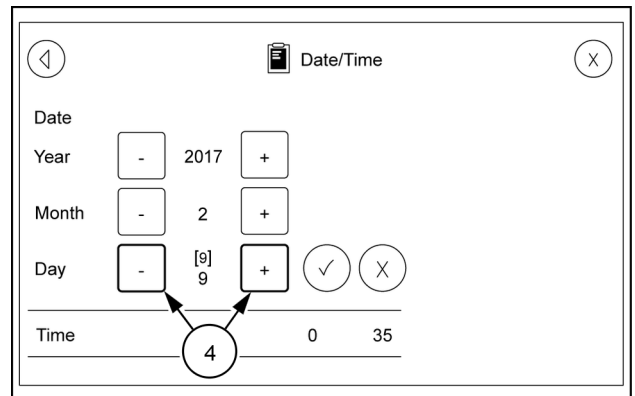
RAIL17SP00165AA 53



RAIL17SP00167AA 54



RAIL17SP00165AA 55



RAIL17SP00168AA 56

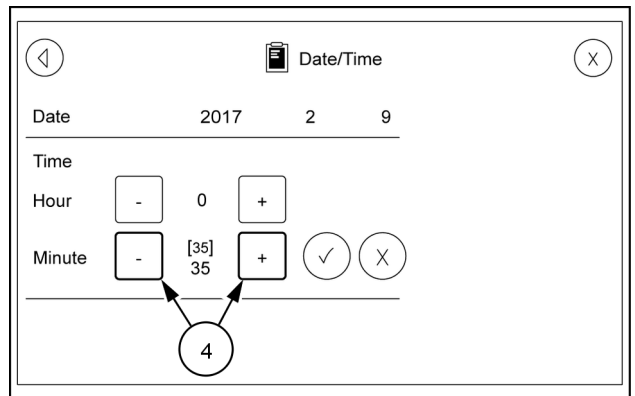
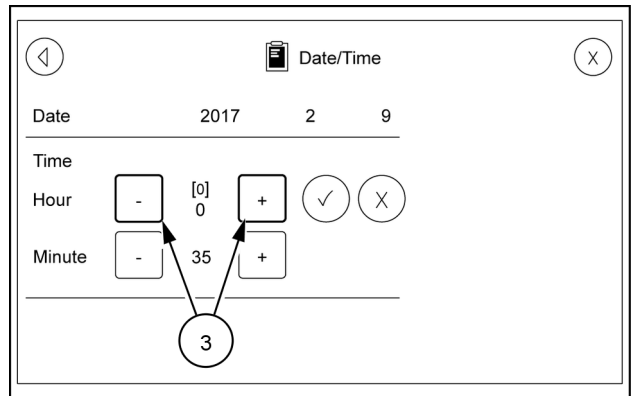
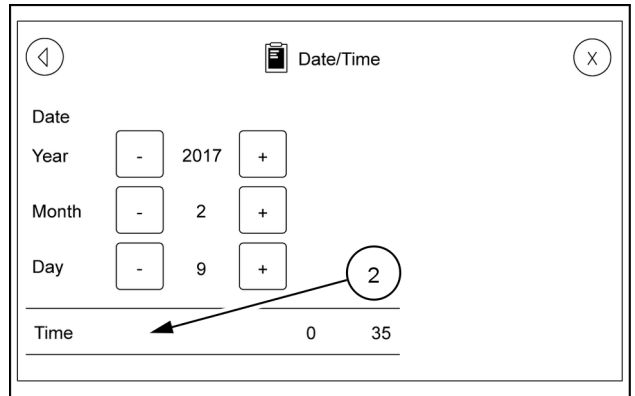
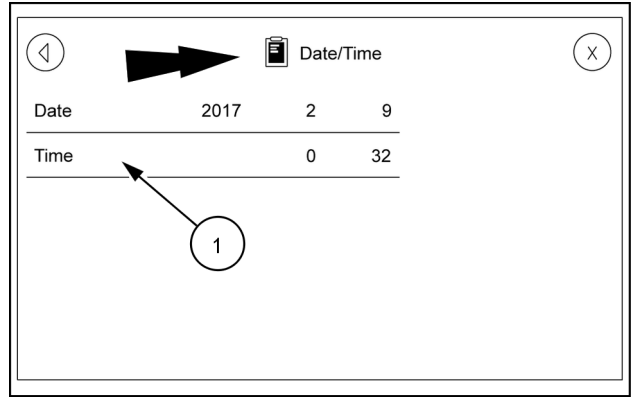
Use the back arrow key until you reach the date/time page.

From this page touch the Time icon (1) to bring up the date/time screen. At the bottom of this screen touch the Time icon (2) to bring up the hour setting screen (3).

Use the plus(+) or minus(-) icons to set the hour. Once the hour is set, touch the check mark to lock the hour in.

Touch the Minute icon (4) to bring up the minute setting screen. Use the plus(+) or minus(-) icons to set the minutes. Once the minutes are set, touch the check mark to lock the minutes in.

Touch the back arrow to go back one page.

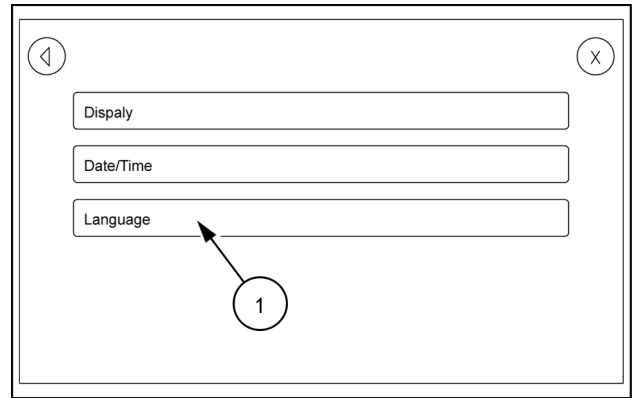




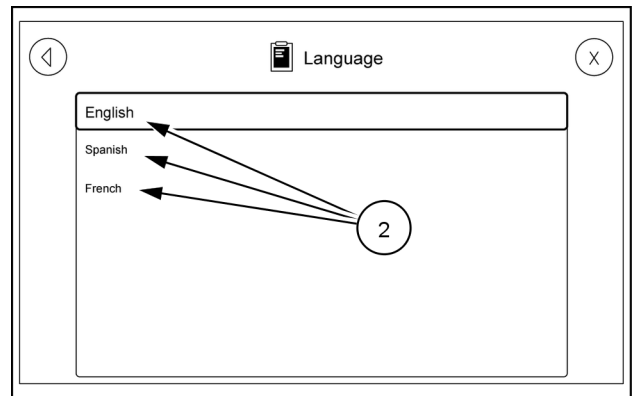
Use the back arrow key until you reach the preferences page.

On the preferences page touch the Language icon **(1)**. Touching this icon will bring up a screen where you can change the display language.

Touch the icon of the Language **(2)** desired and the display will change.



RAIL17SP00158AA 61



RAIL17SP00171AA 62

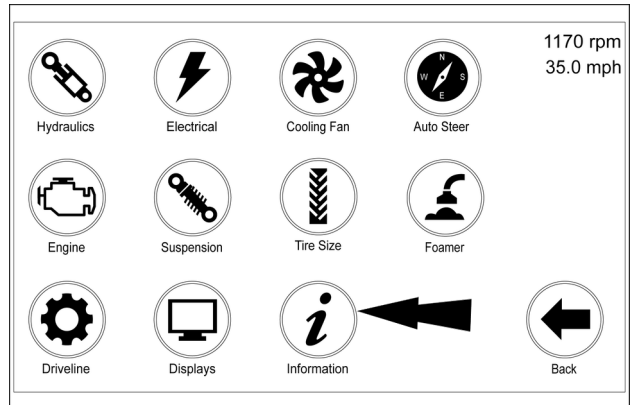
## Information icon and screens

From the arm rest display second home page touch the information icon

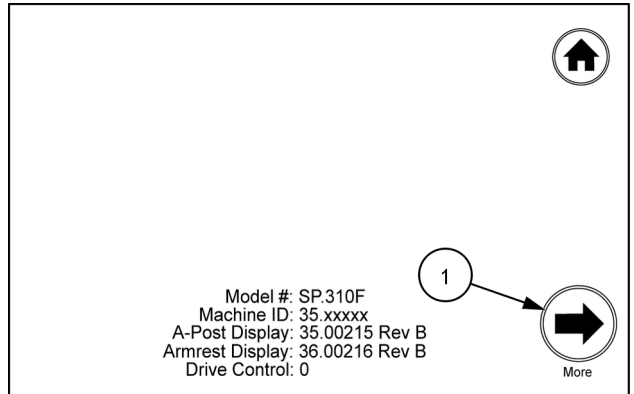
This will bring up a read only screen with machine information.

Touch the More icon (1) at the lower right-hand corner to bring up a read only screen containing the rate controller settings for your unit.

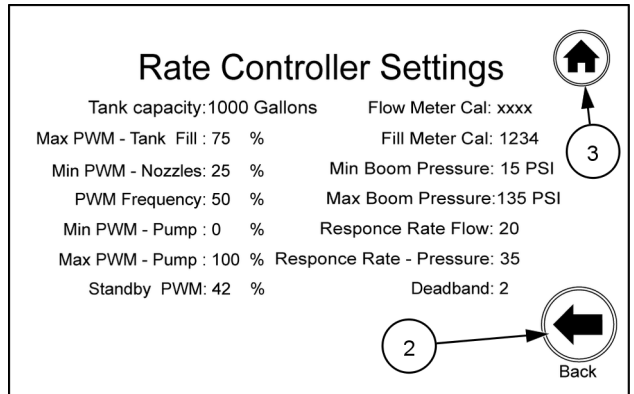
Touch the back arrow (2) to go back one page or touch the home icon (3) to return to the arm rest display second home page.



RAIL17SP00109FA 1



RAIL17SP00216AA 2



RAIL17SP00217AA 3

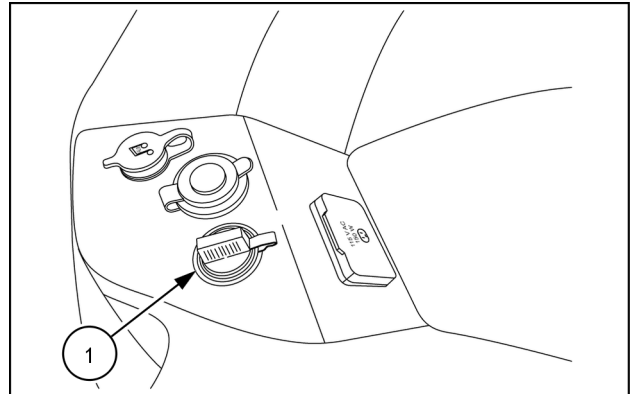
## Cab features

### Power ports and outlets

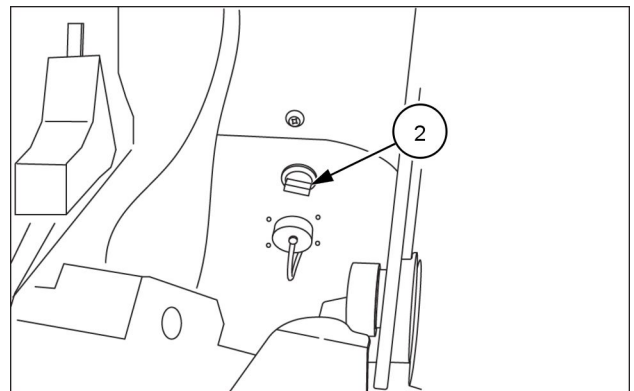
#### Power ports

There are two power ports in the vehicle cab. One power port is located in the storage compartment on the right-hand side behind the operator's seat (1). The other power port is located on the back wall of the cab between the operator's seat and the instructional seat (2). Lift up the operator's seat armrest to access this power port. The power port is used for electrical accessories such as cell phone chargers. These ports have continuous power whether the ignition is on or off. Pull the protective cover off to gain access to the ports.

The power ports should not be used for power loads over **10 A**.



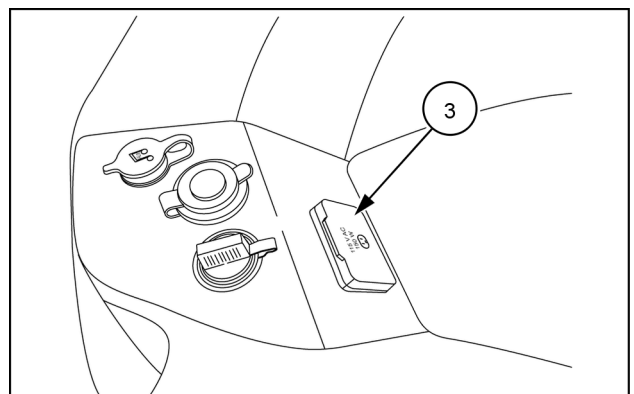
RAIL17SP00369AA 1



RAIL17SP00695AA 2

#### 110 volt power outlet (luxury cab only)

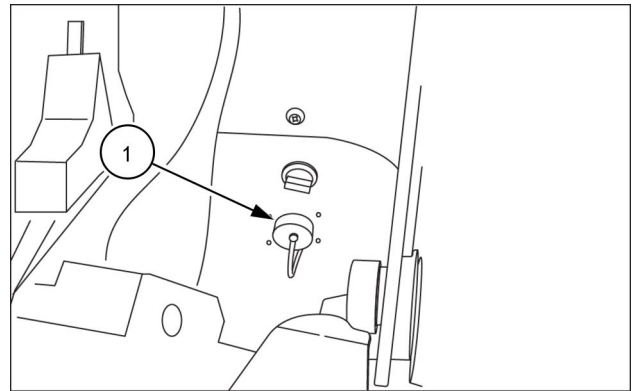
There is a **110 V** power receptacle (3) in the vehicle luxury cab. The power receptacle is located in the storage compartment to the rear right side of the operator's seat. The power receptacle is used for electrical accessories requiring **110 V** for operation.



RAIL17SP00369AA 3

### Auxiliary Power Outlets

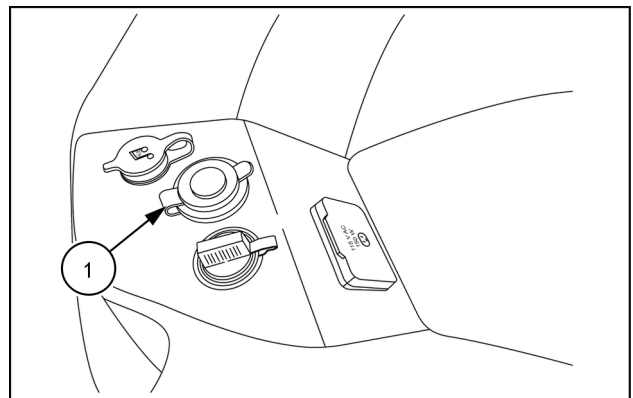
The auxiliary power outlet (1) is located on the back wall of the cab between the operator's seat and the instructional seat just below the power port. Lift up the operator's seat armrest to access this power outlet. This outlet provides two 30 amp terminals. When connected, one power terminal provides a continuous power source (2 o'clock position), the other provides power (10 o'clock position) only when the ignition key is turned to the run position. The terminal at the 6 o'clock position is ground.



RAIL17SP00695AA 4

### USB Ports

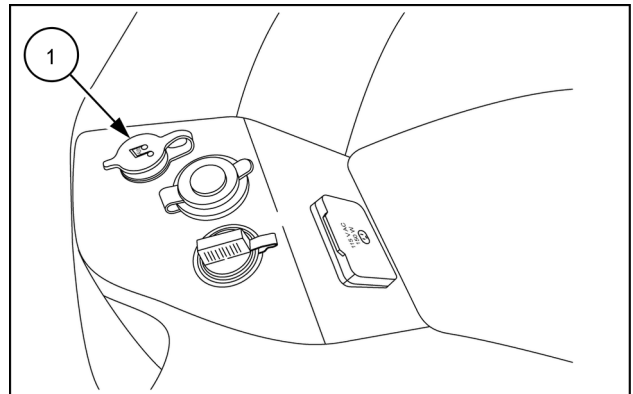
The USB ports (1) are located in the storage compartment to the rear right-hand side of the operator's seat. The two USB are under a single cover. Open the cover to expose the two ports. Close the cover when not using the ports.



RAIL17SP00369AA 5

### Auxiliary Input Receptacle

The auxiliary input receptacle (1) is located in the storage compartment to the rear right-hand side of the operator's seat. Open the cover to expose the receptacle. Close the cover when not using the port.



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## 4 - OPERATING INSTRUCTIONS

### Commissioning the unit

#### Before starting the engine

##### **▲ WARNING**

**Inhalation/asphyxiation hazard!**  
**Make sure there is proper ventilation before starting the engine.**  
**Failure to comply could result in death or serious injury.**

W0091A

##### **▲ WARNING**

**Hazard to bystanders!**  
**ALWAYS make sure the work area is clear of bystanders and domestic animals before starting this procedure. Know the full area of movement of the machine. Do not permit anyone to enter the area of movement during this procedure.**  
**Failure to comply could result in death or serious injury.**

W0245A

##### **▲ WARNING**

**Unexpected machine movement!**  
**Before starting the engine, move all operating controls to neutral or park lock position. This prevents accidental movement of the machine or start up of power-driven equipment.**  
**Failure to comply could result in death or serious injury.**

W0302A

#### First sprayer use

Before starting your unit for the first time, make the following checks:

- Make sure the sprayer engine is properly lubricated and greased as described in the Maintenance chapter of this manual.
- Check the oil level in the engine crankcase. Check the fluid level in the pump drive gear box and the hydraulic reservoir. See the maintenance chapter of this manual.
- Check that the fuel tank is filled with clean fuel that meets the specifications given in this manual.
- Check the engine, hydraulic system, fuel and cooling system for air or oil leaks.
- Check that the air conditioner compressor belt is adjusted correctly. The alternator belt is self-tensioning.
- Remove any water or sediment from the water separator on the primary fuel filter.
- Check the air pressure in the tires and check the wheel bolt torque.
- Check the coolant level in the coolant overflow bottle. Add **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT** as needed.
- Check the **DIESEL EXHAUST FLUID (DEF)/AdBLUE®** level using the level indicator on the A-Post display in the cab.

#### Daily inspection

- Walk around and visually inspect the sprayer daily. Check for such items as hoses or wires rubbing against other components, oil leaks, trash buildup, loose bolts or anything that would affect the normal operation of the sprayer.
- Inspect the exhaust system and repair if leaking, failed, or damaged.
- Make any necessary corrections before operating the sprayer.

## Seat belts

### **⚠ WARNING**

#### **Avoid injury!**

**Before starting the engine, securely fasten the seat belt. The seat belt can help ensure your safety if it is properly used and maintained. Never wear a seat belt loosely or with slack in the belt system. Never wear the belt if it is twisted or pinched between the seat structures. Failure to comply could result in death or serious injury.**

W0142A

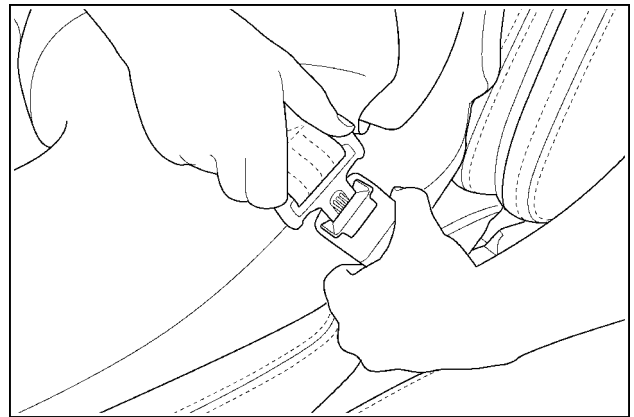
### **⚠ WARNING**

#### **Fall hazard!**

**The instructional seat shall only be used when training a new operator or when a service technician is diagnosing a problem. Do not permit others, especially children, to ride in the seat. Keep the cab door(s) closed. Wear a seat belt at all times. Failure to comply could result in death or serious injury.**

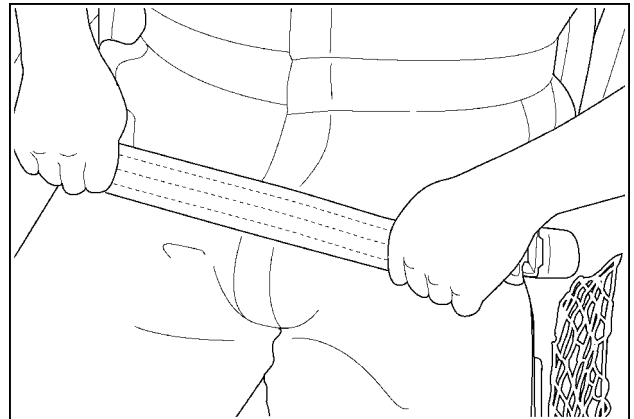
W0301A

Always securely fasten your seat belt before operating the sprayer. From time to time, carefully inspect the seat belts for worn areas and replace belts when needed. Adjust the position of the operator's seat. Pull the seat belt completely across your body. Push the metal eye into the buckle until it locks.



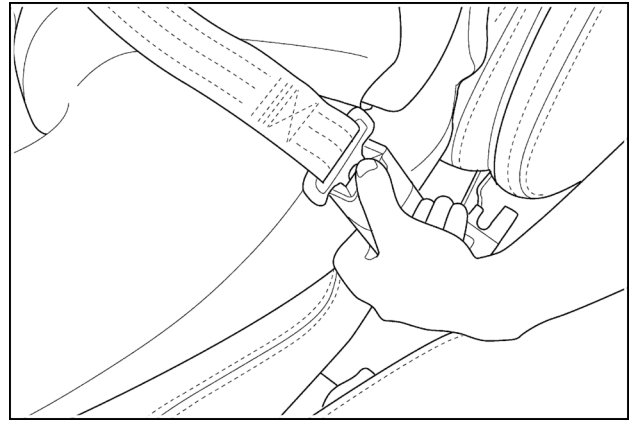
RCPH08CCH268AAC 1

Adjust the position of the seat belt as low across your body as possible.



RCPH08CCH267AAC 2

To release the seat belt, push the button in the center of the buckle and separate the buckle and metal eye. When you are training an operator, be sure the instructional seat belt is also securely fastened.



RCPH09FWD037AAJ 3

### Steering column adjustment

#### **⚠ WARNING**

**Loss of control hazard!**

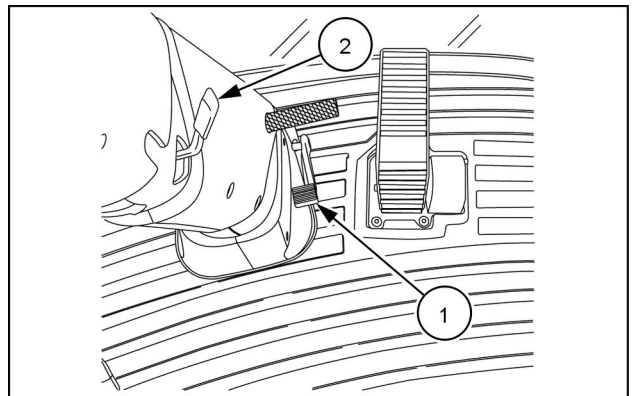
**DO NOT make seat adjustments while the machine is in motion. All seat adjustment should be made with the machine stationary and the parking brake applied.**

**Failure to comply could result in death or serious injury.**

W0293A

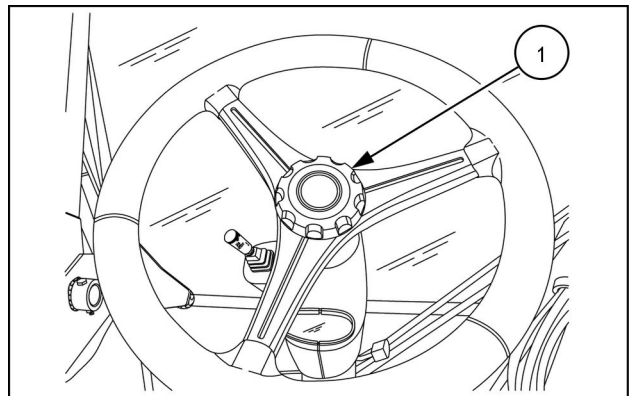
Lower steering column tilt control — Press down on the foot pedal (1) at the base of the steering column to tilt the lower steering column toward or away from you

Upper steering column tilt control — Push the adjustment lock handle (2) toward the steering column and tilt the upper steering column toward or away from you.



RAIL17SP00226AA 4

Steering wheel telescoping adjustment - The steering wheel can be telescoped in or out by turning the center cap (1) counterclockwise, reposition the steering wheel as needed and then turning the center cap clockwise to tighten.



RAIL17SP00299AA 5

## Starting the unit

### Normal engine starting

#### Run-in Procedure

**NOTICE:** After the engine starts, operate the engine at low idle speed for a few minutes so enough lubricant reaches the turbocharger bearings and engine parts before operating the engine at rated speed.

**NOTICE:** If run-in instructions for a new engine are not followed, damage to piston rings and the cylinder bores could occur.

#### Load

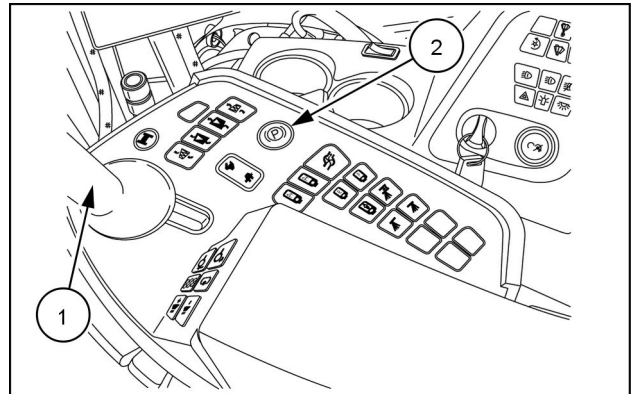
During the first eight hours of operating the sprayer in the field, operate at a lower speed than normal. During the next 12 operating hours, the engine must not be operated with excessive loads at low engine revolutions per minute

**NOTICE:** Do not overload the engine.

#### Start up

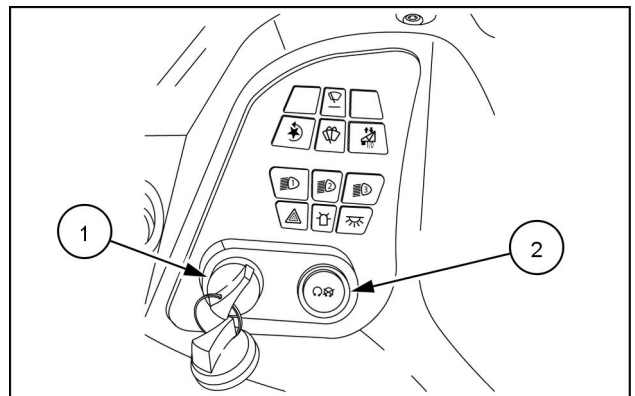
Make sure the joystick control handle (1) is in the "Neutral" position. The park brake (2) must be engaged and the operator is seated in the operator's seat.

**NOTE:** The starter will not engage unless the joystick control handle is in the "Neutral" position and the park brake is engaged and the operator is seated in the operator's seat.



RAIL17SP00287AA 1

Sound the horn by pushing on the end of the turn signal lever before starting the engine. Turn the ignition switch (1) from the OFF position to the ON position. Push the START/STOP button (2) to start the engine.



RAIL17SP00263AA 2



Whenever the ignition is turned On, if the engine senses that the temperature is too cold, the "Wait to Start" message will display on the arm rest display. It will remain on until the preheat temperature has been satisfied. The engine will not start with the wait to start lamp on. Once the light goes out, with the key in the ON position and press and hold the START/STOP button to crank the engine. Hold the START/STOP button until the engine starts.

**NOTICE:** Do not use the starting motor for more than 15 seconds without stopping. Wait 2 to 3 minutes between starting attempts to allow the starting motor to cool.

**NOTICE:** If the engine starts and then stops, wait for the starter motor to stop turning before you press the START/STOP button again.

After the engine is warm, check that the oil pressure and coolant temperature indicators are in the normal range and that all operating values, displayed on the arm rest display, are indicating normal operation. If not, shut down the engine and locate the cause.

### Warm up period

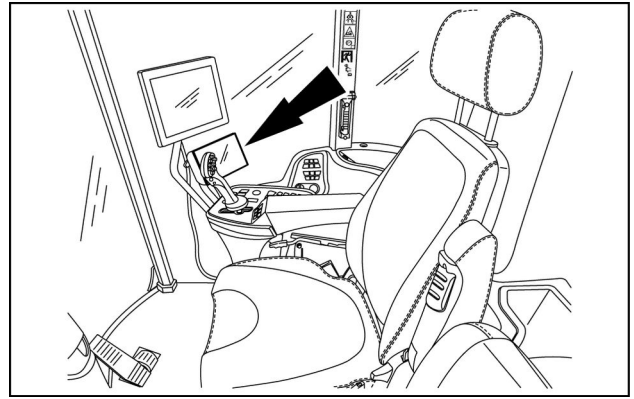
Both the engine and the hydraulic system require a warm-up period before operation.

- When a diesel engine is operated cold at high throttle, it will miss and run rough. This is normal and will subside as the engine warms.
- When hydraulic oil is operated cold, it will create a whining noise. The noise will subside as the hydraulic oil warms.
- Normal warm up for engine and oil is within 2 minutes at **1200 RPM**. In severe cold it may be necessary to continue warm up for an additional 4 minutes. But, after hydraulic oil reaches **4 °C (40 °F)**, the fault has turned off and the engine or oil is not ready, check for other causes.

Before the drive system can operate efficiently, the following conditions must be met.

- The hydraulic oil in the reservoir must be higher than **4 °C (40 °F)**. If the oil is below **4 °C (40 °F)**, the drive system will de-rate to **5 km/h (3 mph)** and a fault will appear on the arm rest display. Once the oil warms to greater than **4 °C (40 °F)**, the fault will turn off, however the drive must be returned to Neutral to reset the drive. Then move joystick to desired range and normal operation can be resumed.
- Once the oil warms to greater than **4 °C (40 °F)**, the fault will turn off, however the drive must be returned to Neutral to reset the drive. Then move joystick to desired range and normal operation can be resumed.

**NOTE:** If the hydraulic oil is less than **2 °C (35 °F)**, the vehicle will be limited to a speed of **5 km/h (3 mph)**. After the hydraulic oil has warmed to a temperature of **4 °C (40 °F)**, normal operation of the vehicle will resume.



RAIL17SP00310AA 3

## Cold temperature operation

### **⚠ DANGER**

**Explosion hazard!**

**DO NOT use ether starting fluid. Explosion, death, serious personal injury, or serious engine damage could occur.**

**Failure to comply will result in death or serious injury.**

D0085A

An engine block heater is factory installed. The electrical plug is located on the left-hand side of the engine, by the starter. Preheat the engine using this heater for several hours prior to cold weather starting.

Two batteries provide 2000 Cold Cranking Amps (CCA).

The engine is equipped with intake air heaters to aid in cold weather starting.

1. Turn the ignition key to the on position and the preheat sequence will start.  
The duration of the preheat sequence depends on the ambient temperature.
2. When the preset temperature is reached, press the start button and crank the engine until it starts.

**NOTE:** *The start button will not function until the preset temperature is reached.*

**NOTE:** *If the engine does not start, repeat the preheat process.*

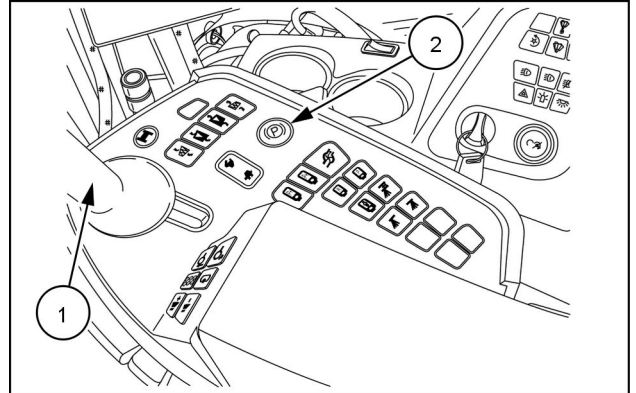
3. Do not crank the starter for more than 15 seconds.
4. Allow the starter to cool between tries.

## Stopping the unit

### Stopping the engine

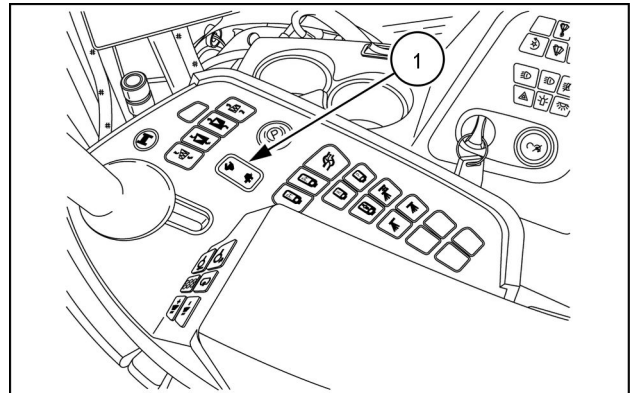
**NOTICE:** Before stopping the engine after operating under heavy load, run the engine at low idle speed of **900 RPM** for a short period of time (3 to 5 minutes). This allows the engine and turbocharger temperature to decrease gradually. If the engine stops when operating under a load, start the engine immediately to prevent excessive heat buildup due to the lack of cooling and lubrication oil flow.

1. Slow the unit and bring the vehicle to a complete stop by moving the joystick control handle (1) to the neutral position and depressing the brake pedal more than 65% of the pedal travel. Apply the parking brake (2) by pressing the parking brake switch.



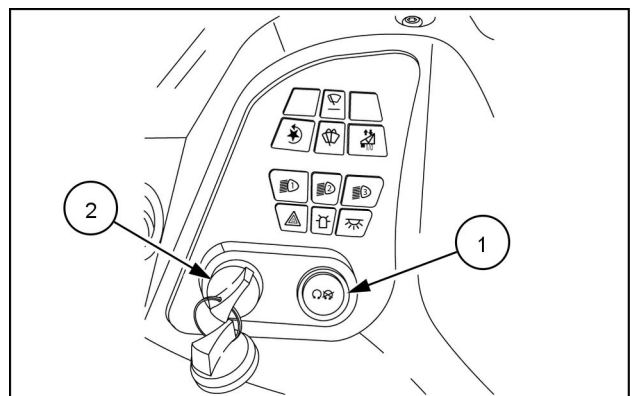
RAIL17SP00287AA 1

2. Decrease the speed of the engine with the engine speed control switch (3) to idle position for 3 to 5 minutes to decrease the temperature of the engine and turbocharger.



RAIL17SP00287AA 2

3. Press the START/ STOP button (1) to stop the engine. Turn the accessory switch (2) to OFF to turn off electrical power to both the engine and electrical components in the cab. Remove the accessory key from the accessory switch.



RAIL17SP00263AA 3

## Moving the unit

## Moving the unit

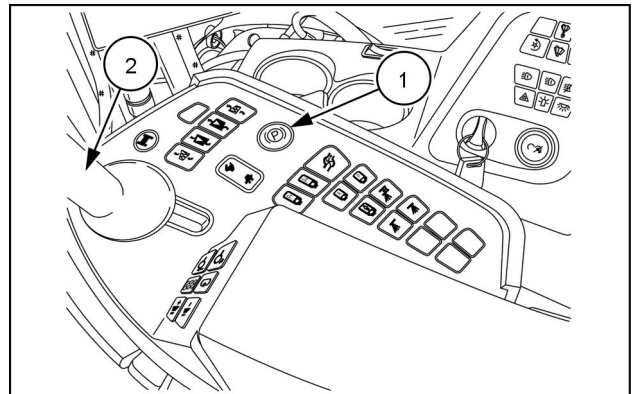
### ⚠ WARNING

**Avoid injury!**  
**Operate controls only when seated in the operator's seat.**  
**Failure to comply could result in death or serious injury.**

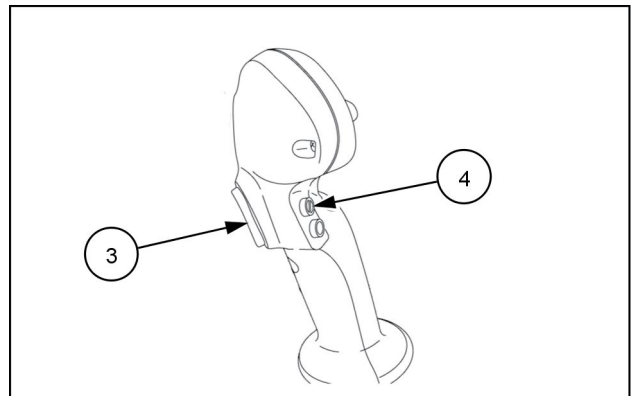
W0956A

**NOTICE:** If the engine stops when operating with a load, immediately start the engine again to prevent excessive heat, caused by stopping the flow of oil for cooling and lubrication.

1. With the parking brake (1) engaged and the joystick control handle (2) in neutral, turn the accessory key to the ON position. Press the START/STOP button to start the engine.
2. Set the engine speed to **1200 RPM** with the engine speed trigger (3) on the joystick control handle in conjunction with the engine speed control button (4) and let the engine warm up to operating temperature. Once the engine is at operating temperature the machine is ready to drive.
3. Depress the brake pedal completely and hold. Release the park brake by pushing the park brake button. With the joystick control handle (2) in neutral, push the joystick forward to move the vehicle forward. Pushing the joystick further forward also increases the travel speed within that range. Pushing the joystick full forward will take the speed up to the preset speed in that range. Pushing the joystick halfway will take the speed up to half of the preset speed in that range. Depending how far the joystick is pushed forward will determine how fast the vehicle will move in that range.



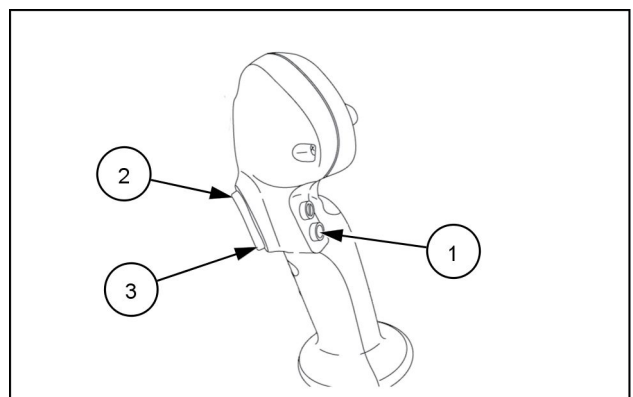
RAIL17SP00287AA 1



RAIL17SP00396AA 2

**NOTE:** An audible alarm will sound if the joystick control handle is moved from neutral (N) with the park brake engaged.

4. Hold the range selector button (1) in and slowly press the top of the trigger (2) on the joystick. Each press of the top of the trigger (2) will shift up one range at a time to higher ranges (4 ranges) which will increase speed. Each press of the bottom of the trigger (3) will shift down one range at a time to a lower range and will decrease speed. Pull the joystick control handle back to neutral to stop the machine and use the service brake.



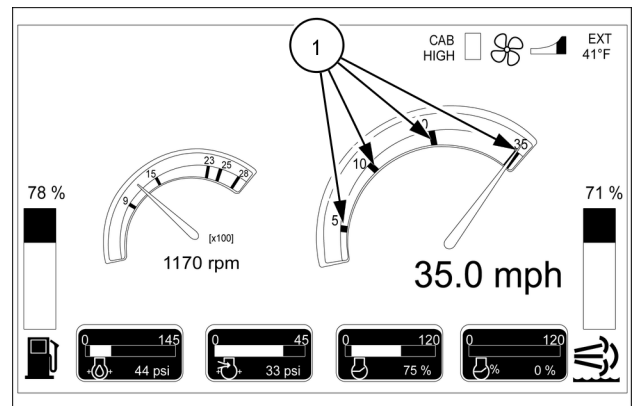
RAIL17SP00396AA 3

**NOTICE:** Be sure to slow the ground speed of the vehicle with the joystick before changing the range selector to a slower speed range. If changing from high speed to low speed with the range selector without slowing the vehicle with the joystick, the operator maybe jolted forward unexpectedly.

5. Note the different characteristics of the hydrostatic drive. The range selector button and trigger will let you select your desired ground speed by changing the speed range. The speed range can be changed up or down at any time with the vehicle in motion forward or reverse “shift on the go”. Each of these ranges will work in any speed increment of the joystick **(2)**. Move the lever forward from neutral to increase speed, and move lever backward to neutral to decrease ground speed, which also acts as a built in braking device for the unit. To put machine in reverse move lever back from neutral. Machine will increase reverse speed the further the lever is pulled backward.

The hydrostatic control system will respond slowly during cold weather start up until hydraulic fluid reaches operating temperature.

6. The range marks on the speedometer gauge **(1)** will move as you set the speed desired for each range.



RAIL17SP00107FA 4

7. To move the vehicle in reverse, from the center (neutral) position, pull the joystick backward to move the vehicle in reverse. Pulling the joystick further backward also increases the travel speed up to a preset speed of **8 km/h (5 mph)**.

## Battery combiner

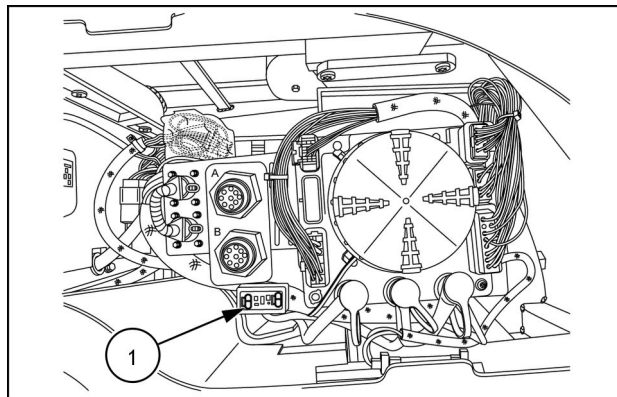
Your vehicle is equipped with a battery combiner. The combiner functions to protect sensitive electronic equipment during cranking by separating the battery banks (starting – two batteries, electronics - one battery)

When engine cranking is completed, the combiner senses a charging level voltage over **13.1 V** (direct current) and combines the battery banks. This allows machine to have all three batteries at its disposal during operation.

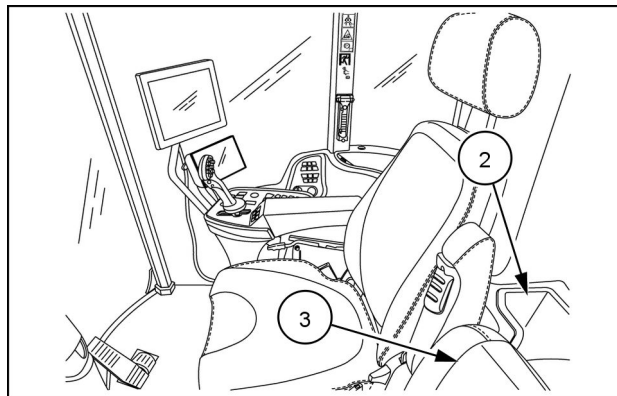
When the machine is shut off (engine turned off), the combiner will once again separate the battery banks when the voltage drops below **12.7 V** (direct current).

With the batteries separated, the normal loads on the machine are isolated to only the electronics battery. If the operator was to drain this battery (leave lights on, leave the field computer on, etc.), the starting battery bank would see no ill effect, meaning they would stay completely charged since they are separated from the electronics battery.

The battery combiner switch (1) is located under the storage tray (2) behind the training seat (3). To access the combiner switch, remove the storage tray.



RAIL17SP01408AA 1



RAIL17SP00310AA 2

The combiner switch is intended for use only if the electronics battery has been drained. By turning the switch to the ON position, the combiner manually combines the battery banks, and back feeds the system, which allows the machine to start using the fully charged starting batteries.

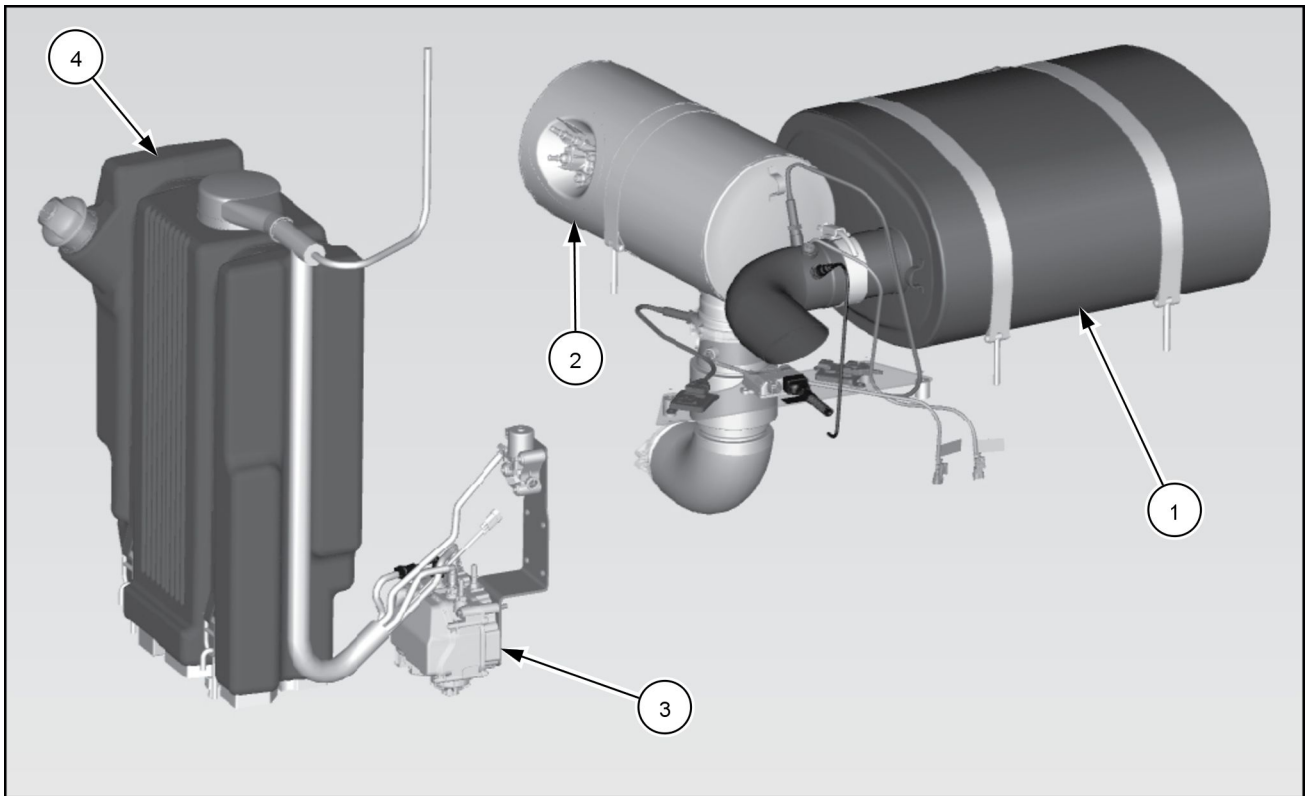
**NOTE:** When the switch is in the "On" position, the batteries are combined at all times. Leave the combiner switch in the "On" position until the drained battery is charged. Whenever the batteries are combined the combiner switch (1) will be illuminated. The combine state is also shown on the electrical page in the second home page of the armrest display.

When the machine has started and the alternator begins to charge the drained battery, the switch must be placed in the Auto position to ensure intended functionality of combiner system.

**NOTE:** Leave the combiner switch in the On position until the drained battery is charged.

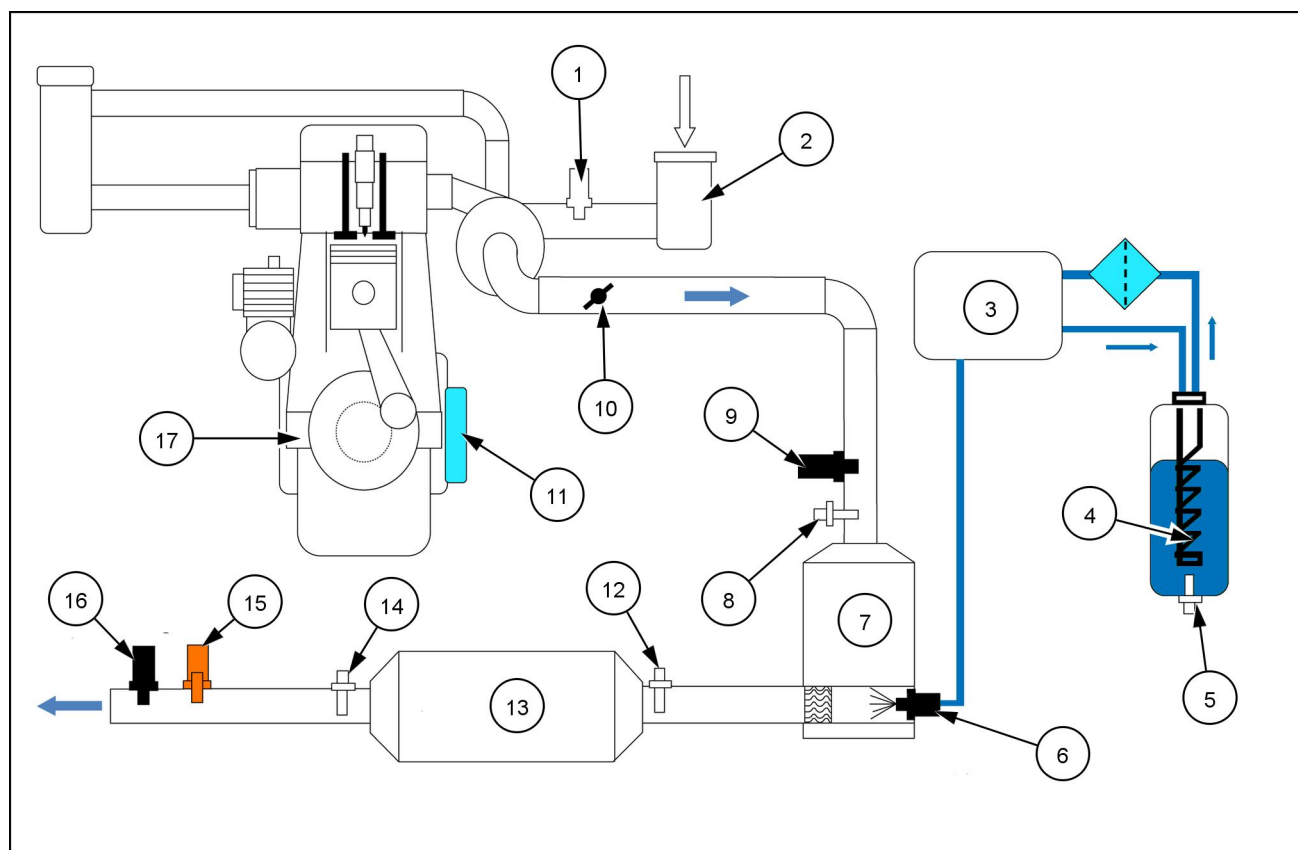
## Selective Catalytic Reduction (SCR) - Overview

Your MILLER machine is equipped with additional components to comply with national and local exhaust emissions requirements. The main components of the SCR system include the SCR catalyst (1), the Diesel Oxidation Catalyst (DOC) (2), the Diesel Exhaust Fluid (DEF)/AdBlue® supply module (3), and the DEF/AdBlue® tank (4).



RAIL17SP00985FA 1

## SCR operation



NHIL13ENG1393AA 2

- |  |  |
|--|--|
| (1) Intake air humidity and temperature sensor | (10) Exhaust flap                                |
| (2) Air filter                                 | (11) Engine Control Unit (ECU)                   |
| (3) Supply module                              | (12) SCR upstream temperature sensor             |
| (4) DEF/AdBlue® level and temperature sensor   | (13) Selective Catalyst Reduction (SCR) catalyst |
| (5) DEF/AdBlue® quality sensor                 | (14) SCR downstream temperature sensor           |
| (6) Dosing module                              | (15) NH <sub>3</sub> sensor                      |
| (7) DOC and mixer                              | (16) Downstream NO <sub>x</sub> sensor           |
| (8) DOC upstream temperature sensor            | (17) Engine                                      |
| (9) Upstream NO <sub>x</sub> sensor            |  |

The humidity in the intake to the engine (17) affects the emissions in the exhaust stream. The intake air humidity sensor (1) is located in the intake air piping to the engine between the air filter (2) and the intake manifold. The information from this sensor is sent directly to the Engine Control Unit (ECU) (11).

Engine exhaust system temperature is critical to the catalytic reactions that take place in the emissions control components. To quickly increase the catalyst temperature at initial start-up and light operating loads, there is an exhaust flap (10) located in the exhaust stream near the turbocharger. The maximum temperature of the exhaust flap is critical, therefore engine coolant is circulated through the core of this valve. Limiting NO<sub>x</sub> emissions in the exhaust stream is one of the major goals of the emission control system on these engines. The upstream NO<sub>x</sub> sensor (9) is located in the exhaust stream at the inlet to the Diesel Oxidation Catalyst (DOC) (7). The NO<sub>x</sub> sensor transmits data to the ECU via the engine CAN data bus.

A temperature sensor (8) is located at the inlet to the DOC to closely monitor temperature.

DEF/AdBlue® fluid freezes at **-11 °C (12 °F)**. A DEF/AdBlue® fluid level and temperature sensor (4) is installed in the tank and the instrument cluster displays those levels. The DEF/AdBlue® quality sensor (5) monitors the quality of the DEF/AdBlue® fluid.

To precisely control the quantity of DEF/AdBlue® fluid injected from the DEF/AdBlue® tank into the exhaust stream, a DEF/AdBlue® dosing module (6) is integrated in the outlet area of the DOC canister. The dosing valve is Pulse Width Modulation (PWM) controlled by the ECU. The ECU determines the amount of DEF/AdBlue® fluid to inject based on inputs from sensors in the exhaust stream. Pressurized DEF/AdBlue® fluid is supplied to the dosing module from the supply module (3) at approximately **9 bar (130 psi)**.



Removal of  $\text{NO}_x$  requires a chemical reaction. This chemical reaction takes place in the SCR **(13)**. DEF/AdBlue® reacts with the SCR catalyst to convert  $\text{NO}_x$  to harmless nitrogen and water vapor.

To assure that the emission system is functioning correctly, a downstream  $\text{NO}_x$  sensor **(16)** is located in the exhaust stream at the outlet of the SCR.

The  $\text{NH}_3$  sensor **(15)**, located at the outlet of the SCR catalyst monitors ammonia ( $\text{NH}_3$ ) levels to ensure the proper amount of DEF/AdBlue® is being used.

Temperature is very important to the chemical reactions that take place in the emission control system. An SCR upstream temperature sensor **(12)** is located in the exhaust stream at the inlet of the SCR and compares the reading of the SCR downstream temperature sensor **(14)** located in the exhaust stream at the outlet of the SCR. The catalyst requires about **230 °C (446 °F)** for the chemical reaction to take place.

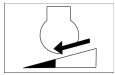
## Diesel Exhaust Fluid (DEF)/AdBlue® display warnings

### Diesel Exhaust Fluid (DEF)/AdBlue® instrumentation warning

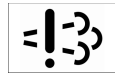
**ATTENTION:** The fuel system, exhaust after-treatment system, and engine on your machine are designed and built to government emissions standards. Tampering by dealers, customers, operators, and users is strictly prohibited by law. Failure to comply could result in government fines, rework charges, invalid warranty, legal action, and possible confiscation of the machine until rework to original condition is completed. Engine service and/or repairs must be done by a certified technician only!

Your MILLER machine is equipped with a warning system to inform the operator of the DEF/AdBlue® level, system malfunctions, and engine power loss that may result from the SCR system for reducing exhaust emissions.

#### Warning symbols



Engine power loss occurring



SCR failure



Engine stop



Low DEF/AdBlue® level



DEF/AdBlue®



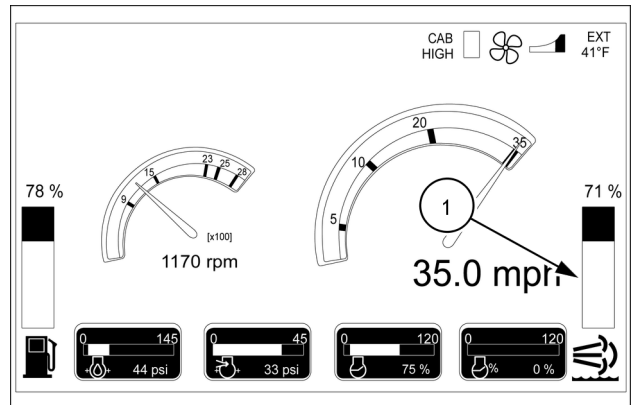
Warning/Fault light



Stop engine light

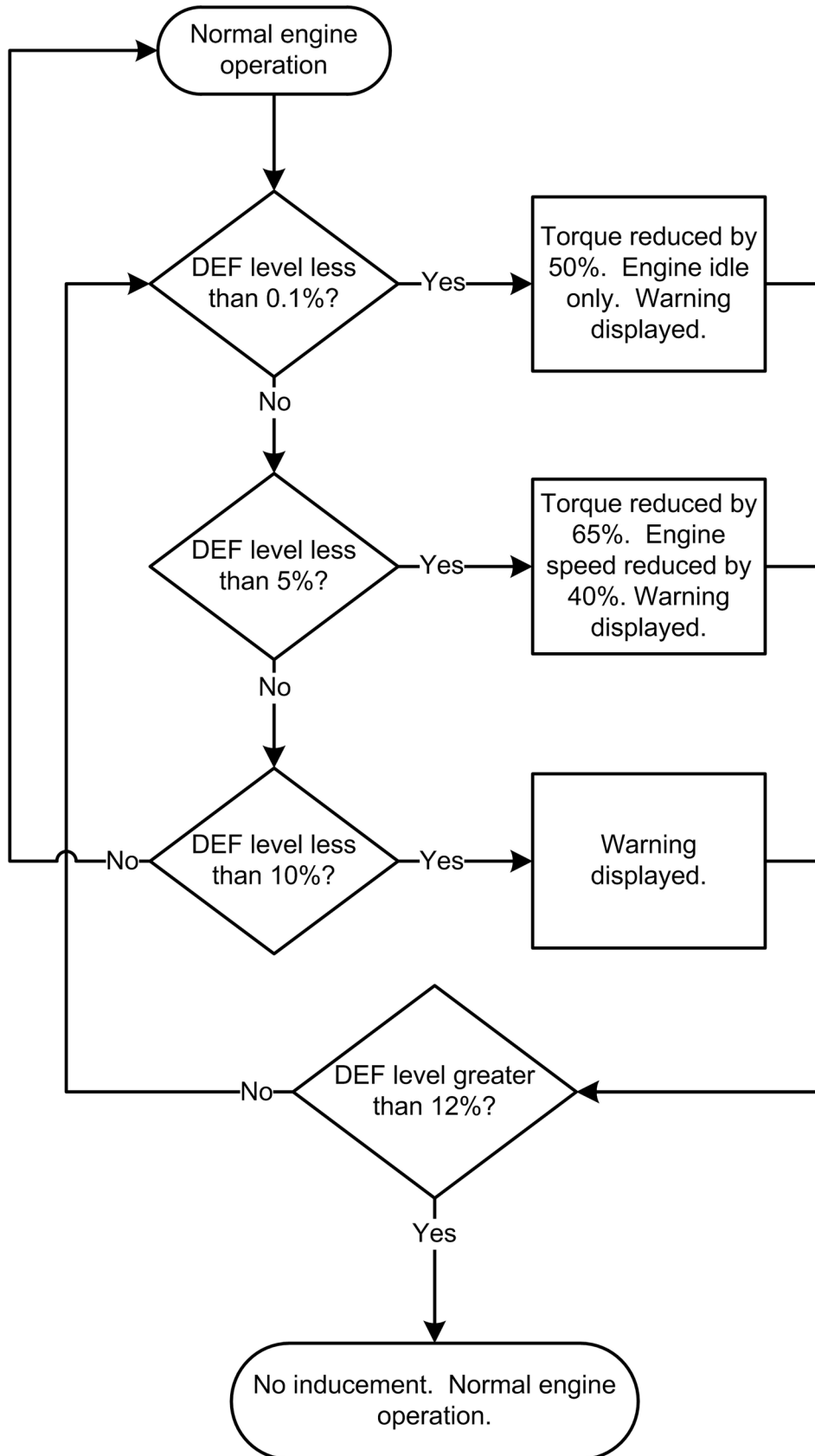
During normal operation of your MILLER machine, the A post display displays the DEF/AdBlue® fluid level (1) at all times.

Warning lights and indicators will be illuminated with a warning on the A post display. The display changes automatically to allow the operator to view the warning indicator and display message.



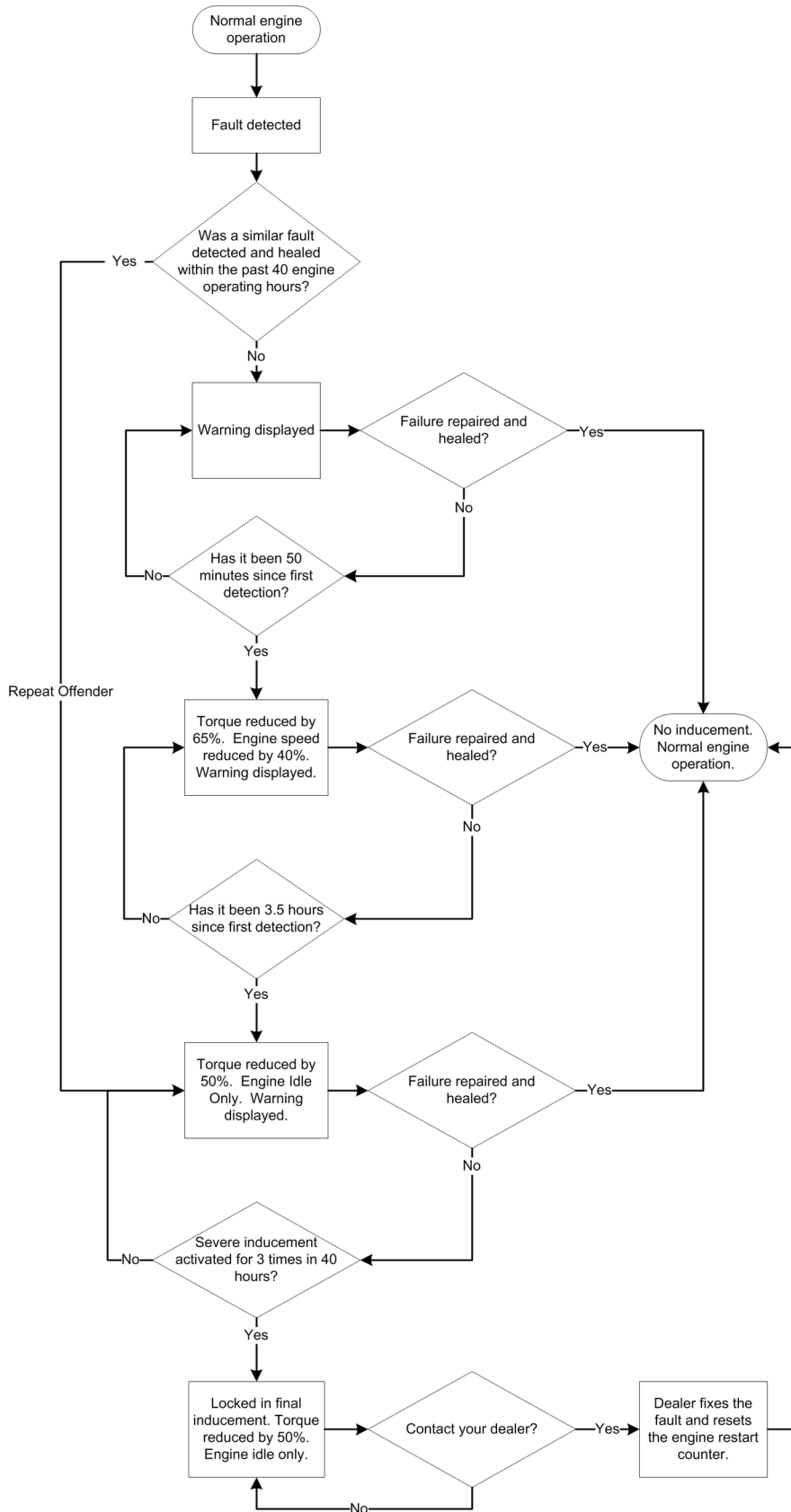
RAIL17SP00107FA 1

**DEF/AdBlue® level faults, failures, and engine power loss levels**



NHPH14ENG0567HA 2

**DEF/AdBlue® quality faults, failures, and engine power loss levels**



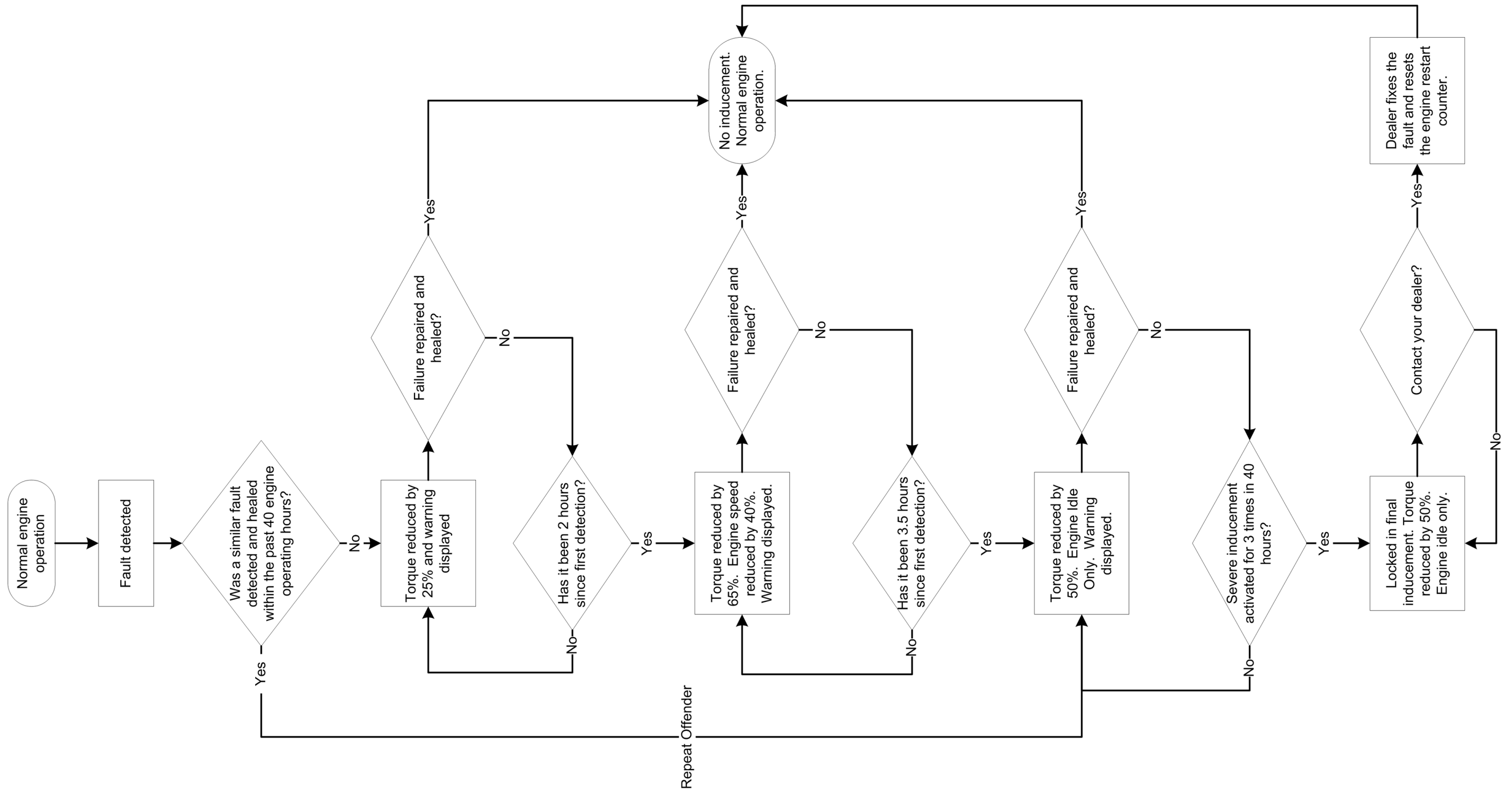
## SCR system technical faults, failures, and engine power loss levels

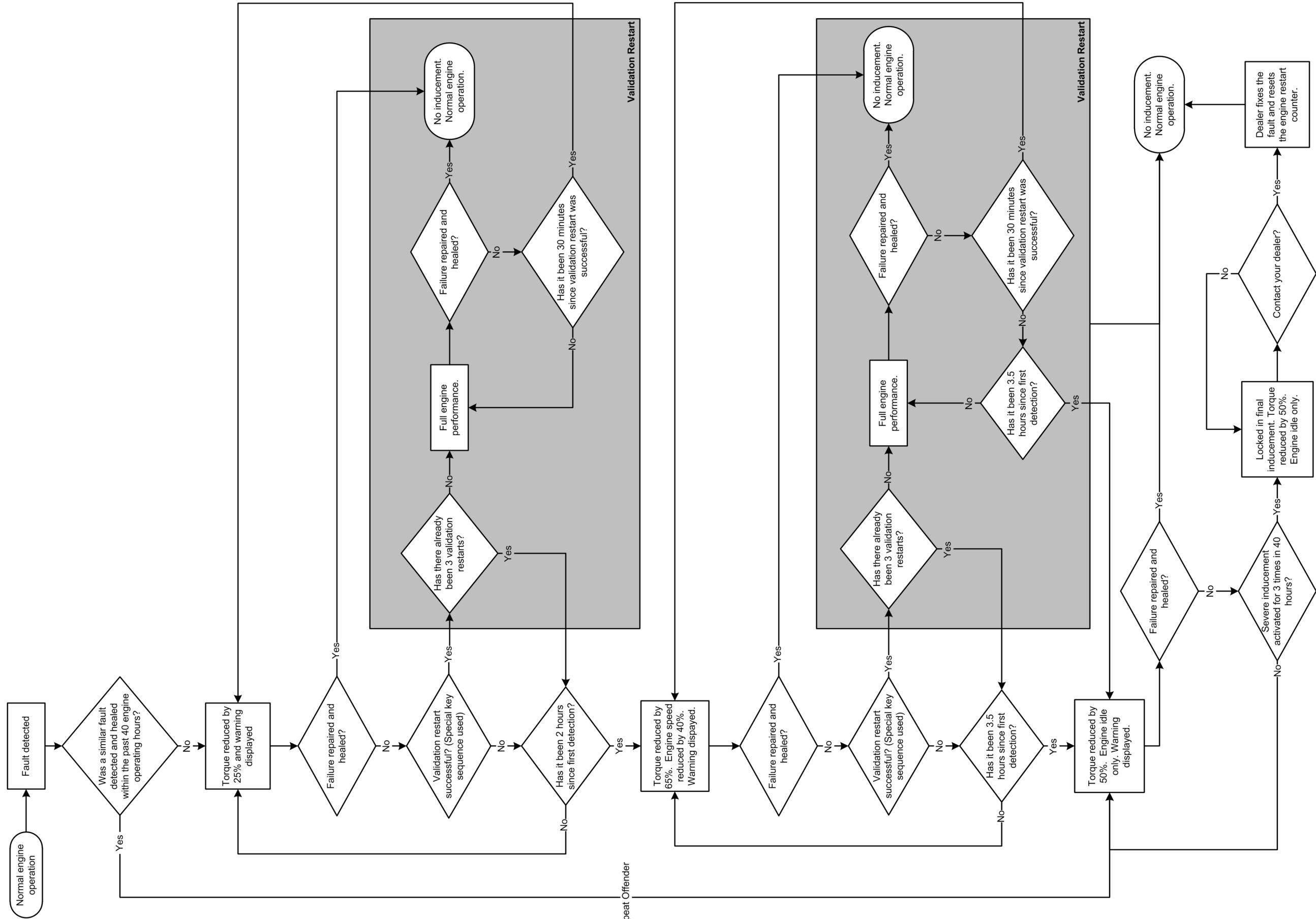
There are two types of strategies that are applied to your machine based on the type of failure that occurs.

- For electrical failures, use figure 4.
- For failures that require the SCR system to be operational, use figure 5 and see the section on validation re-starts.

**NOTE:** You can restart the engine and receive full engine power up to two times at any point after the machine detects a fault. However, if the machine detects the same fault within 40 operating hours, torque will be reduced to 50% and the engine will be reduced to idle immediately. If you attempt a third restart, the engine will be locked at 50% torque and engine idle. Contact your MILLER dealer to reset the engine restart counter and resolve the fault causing the loss of productivity.









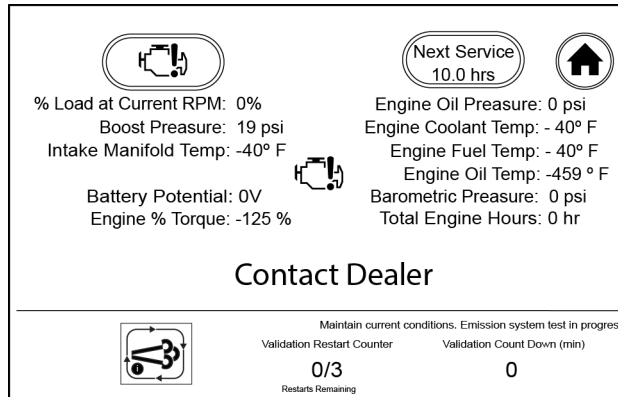
### Validation re-starts

Validation re-starts allow operation of the machine for up to **30 min** without power loss after a poor DEF/AdBlue® quality or SCR system fault has been detected. Up to three re-starts are permitted. Re-starts are counted if either of the following conditions are met:

- Engine speed exceeds **1000 RPM**
- Engine running time exceeds **5 min**

Normal operation will resume if a reset is detected within the **30 min** window. If a reset is not detected within **30 min**, power loss will occur as described in the flowcharts.

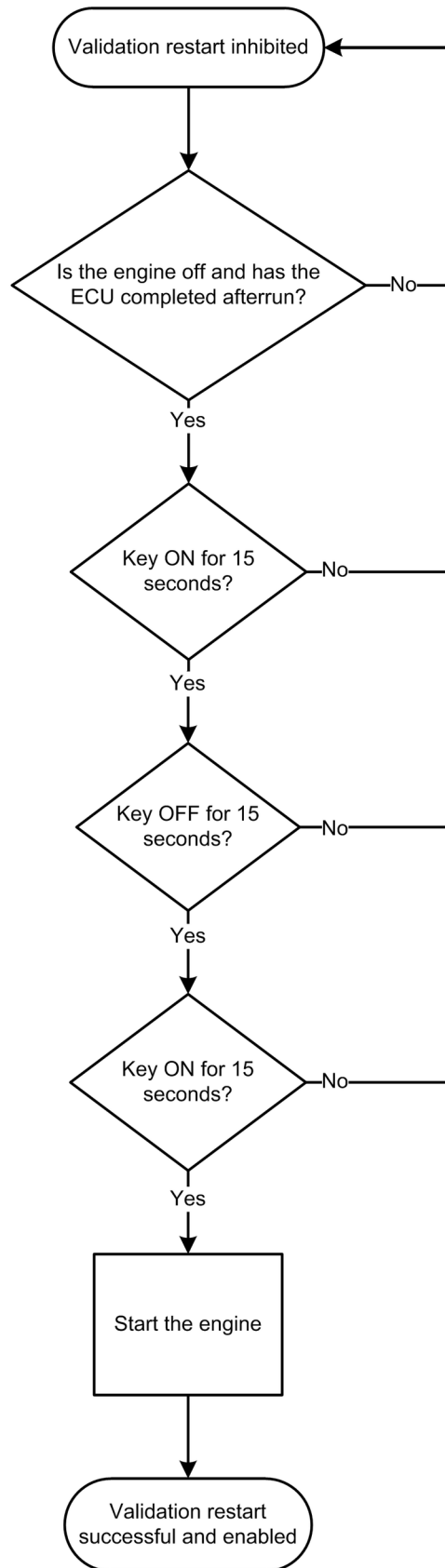
The validation restart count is displayed on the engine page of the arm rest display.



RAIL17SP01459AA 6

If all three validation re-starts have been used and the system has not been reset, the machine is limited to **50%** torque and engine idle only. See your local authorized MILLER dealer for repair.

The following flow chart details the steps to activate validation re-starts.



NPH14ENG0568HA 7

## Resetting the Selective Catalytic Reduction (SCR) system

For DEF/AdBlue® storage tank fluid level faults, failures that can cause engine power loss:

- The DEF/AdBlue® tank level must be raised above **12%** total volume.
- The key switch must be cycled to the Off position or throttle returned to low idle position.

For DEF/AdBlue® quality and SCR system technical faults, failures that can cause engine power loss:

- To fully reset the system, the component/failure causing the fault must be repaired or replaced.
- Switching off the engine will reset the system and the engine will restart at full power.
- If the same failure is re-detected within **40 h** of engine operation, the maximum engine power loss level will be introduced.
- If the same failure is detected three consecutive times within **40 h** of engine operation, maximum engine power loss will remain active after engine restart until the system is repaired.
- Please contact your authorized MILLER dealer for service.

## Four Wheel Steer (4WS) if equipped

Your vehicle may be equipped with four wheel steer **Four Wheel Steer (4WS) modes** (4WS) steering. The following are descriptions and operating steps for the use of 4WS.

The Four Wheel Steer (4WS) option provides the operator with an choice of two steering control modes; Two Wheel Steer (2WS) and Four Wheel Steer (4WS). There is a significant difference in the operation of the machine between these two modes. The 2WS mode provides for better control of increased guidance but prevents the operator from making tight turns. The 2WS mode is desirable when operating at higher speeds, or when more precise vehicle positioning is required. The 4WS mode helps the vehicle reduce soil disturbance and crop damage. 4WS also provides for quicker vehicle direction changes (tight turning), to assist minor path corrections (guidance).

**NOTE:** *Care should always be taken on hills, 4WS operation does not reduce the probability of roll-over.*

### Operation characteristics

In 4WS mode, the rear wheel steering angle 100% matches, or coordinates, with the front wheels at speeds from 0 to 8 mph. Two measures of 4WS performance are tracking and actual crop damage. Tracking performance varies with the relationship between steering wheel speed and vehicle speed. The best tracking occurs, driving straight or in turns, when the steering wheel position is set and held constant, and the vehicle has traveled forward beyond one wheelbase length. The best reduction of crop damage occurs with practiced coordination of vehicle speed and steering wheel speed. Below 8 mph, tracking performance also depends upon other factors, including the amount of traction available, topography of the operating arena, soil type and moisture, vehicle weight and its distribution, and the amount, type and moisture content of any vegetative layer. These factors contribute to lateral slip of the front and rear tires, resulting in less wheel tracking and possible damage to crops.

Above 8 mph, lateral wheel slip and vehicle stability become more pronounced. The rear wheel steering command is reduced, proportional to increasing speed, from 100% matching of the front wheels at 8 mph to 35% matching at 12 mph and above. Also, the system will disengage 4WS mode entirely in the higher speed ranges. The higher speed ranges are 3rd and 4th speed. Upon switching to these ranges, the machine will revert to 2WS mode, whether or not 4WS is the selected. In either case, when in 2WS mode, the machine will turn the rear wheels straight and then hydraulically engage mechanical locks built into the rear kingpins. The locks are supplemental security, and are intended to keep the rear wheels straight in case of hydraulic or electric failure. In normal operation, the steering cylinders determine the rear wheels position, and the locks are never responsible for holding the toe.

## 4WS operation

### **⚠ WARNING**

**Unexpected machine movement!**

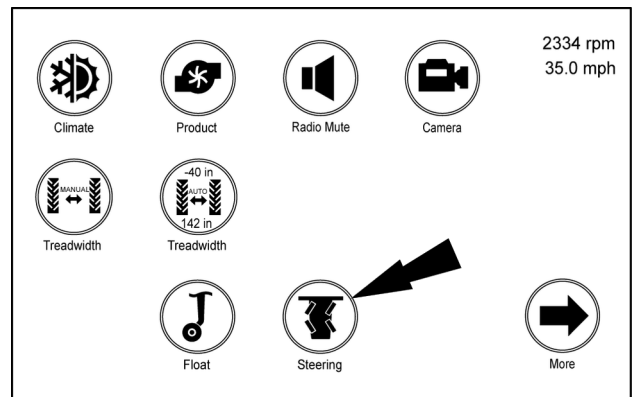
**When the machine is stationary and the engine is running, the parking brake must be ON.**

**Failure to comply could result in death or serious injury.**

W1107A

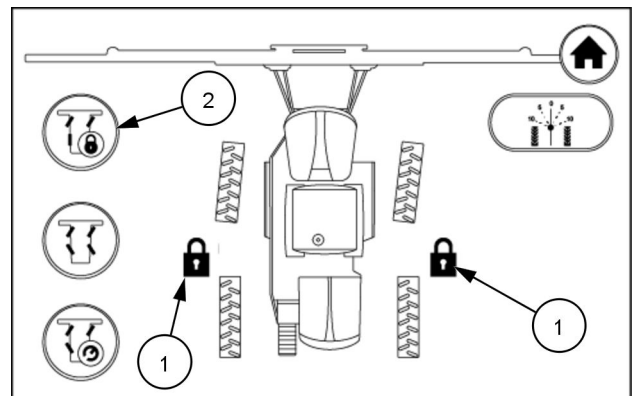
**NOTE:** The 4WS function is initiated through the armrest display or the multi function button on the joystick.

1. Drive the vehicle on to a hard, level surface and bring the vehicle to a complete stop.  
Apply the park brake.
2. Touch the Steering icon on the armrest display first home page. The four wheel steer setting page will display.



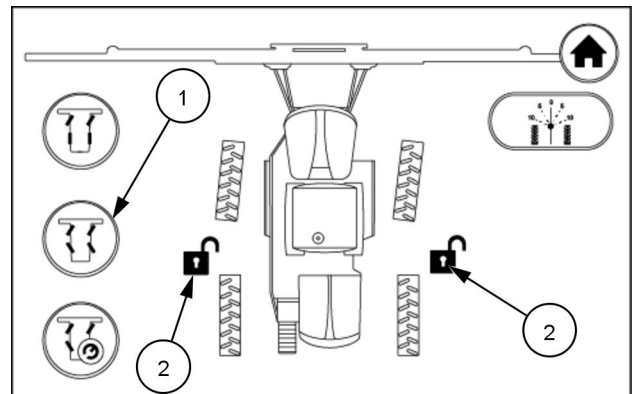
RAIL17SP00184AA 1

3. Switch from two wheel steer to four wheel steer: Verify that the rear wheels are locked, indicated by the locked padlock icons (1). This will verify that the vehicle is in two wheel steer mode, with the rear wheels locked and not steerable and the 2 wheel steer icon (2) will turn yellow.



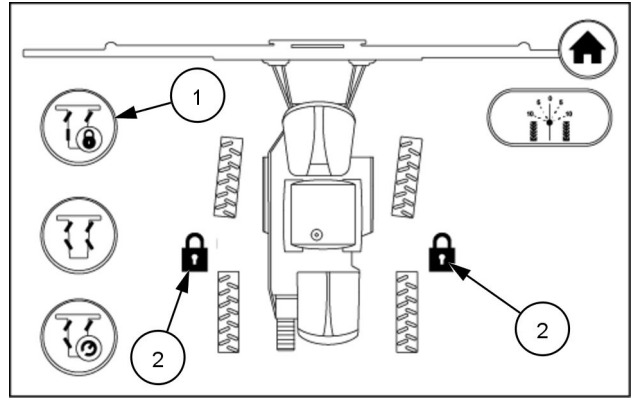
RAIL17SP01284AA 2

4. Touch the four wheel steer button (1) to activate the four wheel steer function. The padlock icons (2) will change from locked to unlocked, indicating that the rear wheels are unlocked and are steerable.



RAIL17SP01285AA 3

5. To place the vehicle back into two wheel steer mode, touch the two wheel steer button **(1)**. The padlock icons **(2)** will change from unlocked to locked, indicating that the rear wheels are locked in the forward position and are not steerable. Also the multi function button on the joystick can be used to switch back to two wheel steer.



RAIL17SP01284AA 4

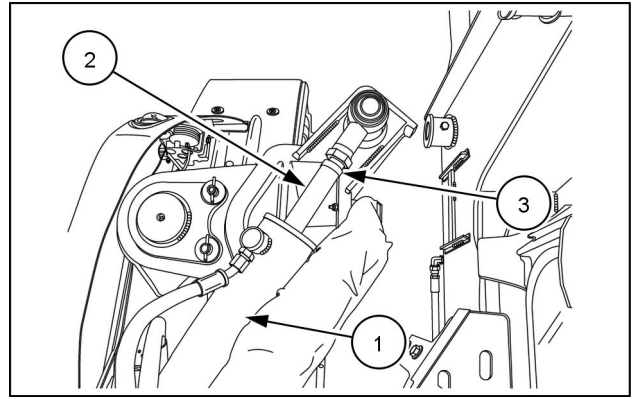
## Steering cylinder phasing

The steering cylinders re-phase at the end of each stroke. Every time the cylinders reach the end of the stroke, they re-time themselves and compensate for misalignment. This procedure must be done several times a day. A sharp turn at the end of the field will accomplish this. When the cylinders reach the end of the stroke, keep turning the steering wheel to purge the oil in the system, which realigns the cylinders. Repeat this procedure by turning in the other direction. The frequency of this procedure will increase as the seals in the cylinders wear. If the cylinders seem to drift, see your dealer for a seal repair kit.

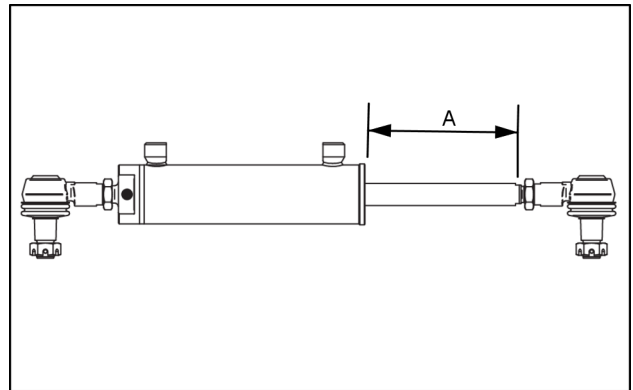
### Phasing steer cylinders

1. Start the engine and with the vehicle in two wheel steer, turn the front wheels full left and then full right to purge all the air out of the steer cylinders. Do this several times.
2. Check for any leaks.
3. While driving the vehicle, use the leg widening switch and retract the leg widening cylinders all the way in. Be sure all four cylinders are completely retracted by visual inspection.

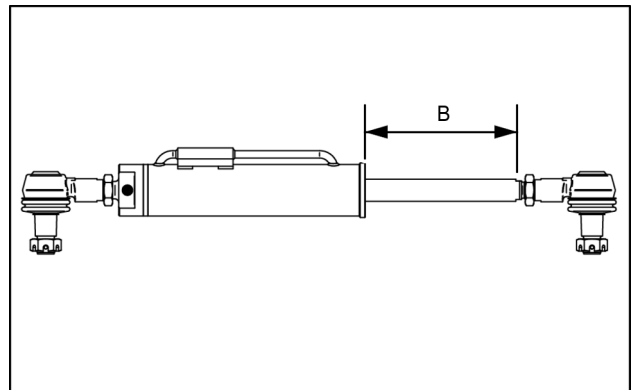
4. Manually steer the front and rear wheels until the steer cylinders (1) are at half stroke. Measure the cylinder rod extension (2) from the edge of the cylinder barrel to the paint line on the rod (3) just behind the rod end jam nuts. This dimension must be **13 cm (5 in) (A)** for 2 wheel steer units only. For 4 wheel steer units this dimension must be **13 cm (5 in) (B)** for all four cylinders



RAIL17SP00254AA 1

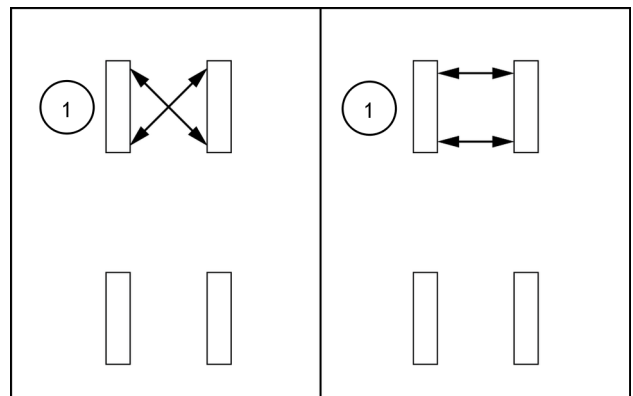


RAIL17SP01029AA 2



RAIL17SP01028AA 3

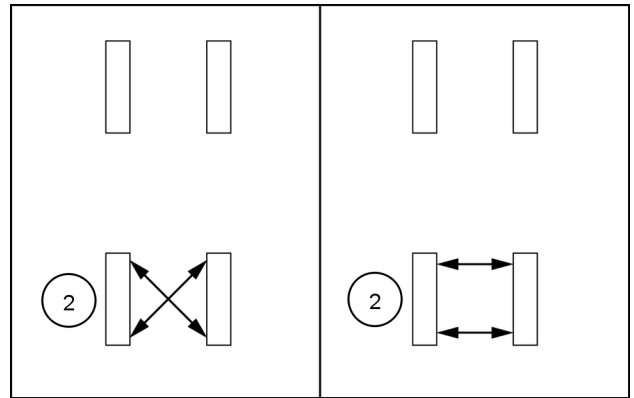
5. Check the toe at the front wheels (1). Be sure the wheels are square with each other first. Find the center of the rim at the front and rear of each front tire. Mark the rims at both of these points. Use a tape measure to measure the distance from the inside of the front of the left rim to the inside of the rear of the right rim. Repeat by measuring from the front of the right rim to the rear of the left rim. These two dimensions should be the same. Measure the distance across the front of the rims. At the rear of the rim measure the distance across rear of the rims. The front dimension should be **6.35 – 19.05 mm (0.25 – 0.75 in)** less than the rear measurement. If the toe-in is not within this range front to back, adjust both cylinder rods equally until proper toe is achieved. Be sure to retighten the rod end jam nuts after adjusting.



RAIL14SP01012AA 4



6. Check the toe at the rear wheels **(2)** . Be sure the wheels are square with each other first. Find the center of the rim at the front and rear of each rear tire. Mark the rims at both of these points. Use a tape measure to measure the distance from the inside of the front of the left rim to the inside of the rear of the right rim. Repeat by measuring from the front of the right rim to the rear of the left rim. These two dimensions should be the same. Measure the distance across the front of the rims. At the rear of the rim measure the distance across rear of the rims. The front dimension should be **0.00 – 12.70 mm (0.00 – 0.50 in)** less than the rear measurement. If the toe-in is not within this range front to back, adjust both cylinder rods equally until proper toe-in is achieved. Be sure to retighten the rod end jam nuts after adjusting.



RAIL14SP01013AA 5

## Parking the unit

### Parking the unit

#### ⚠ DANGER

Run-over hazard!  
Apply the parking brake before leaving the cab.  
Failure to comply will result in death or serious injury.

D0028A

#### ⚠ WARNING

Avoid injury and/or machine damage!  
Apply the parking brake only when the machine is stationary. While driving, apply the parking brake only in an emergency. The braking action is abrupt.  
Failure to comply could result in death or serious injury.

W1132A

### Park Brake

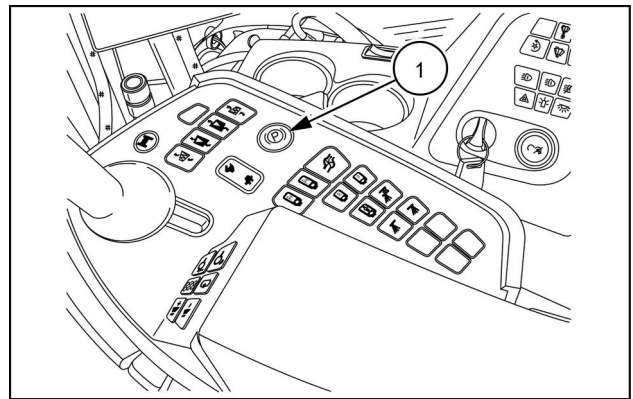
Whenever parking the unit, the parking brake must be engaged. The parking brake control switch is located on the right control panel. When the park brake is applied, the switch will turn blue. When the park brake is disengaged the switch will turn yellow. Apply the parking brake by pressing the switch. When the park brake is applied, the ladder will lower.

Hydraulic pressure is required to disengage the park brake. If the engine and/or hydraulic system are inoperable and the machine must be moved, special procedures must be followed to disengage the park brake. See your dealer for these procedures.

**NOTE:** The parking brake switch (1) must be in the engaged position when starting the machine. The machine will not start if the park brake is disengaged. After the machine is started the parking brake must be disengaged for the machine to move.

**NOTE:** The floor brake pedal must be engaged in order for the park brake to be released. This is only required at each initial engine start.

**NOTE:** Always apply the parking brake when vehicle is stopped. Setting the park brake will also lower the ladder. Disengaging the park brake will raise the ladder.



RAIL17SP00287AA 1

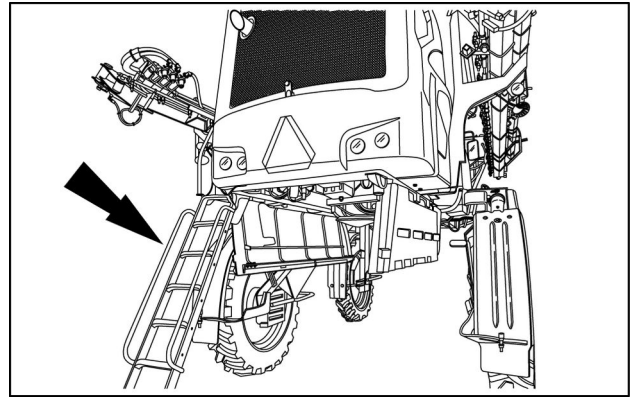
**⚠ CAUTION**

**Unexpected machine movement!**  
**The ladder may move suddenly without warning. Stand clear of the swing path of the ladder.**  
**Failure to comply could result in minor or moderate injury.**

C0212A

**Ladder**

The ladder on the left rear side gives access to the walkway and cab. The hydraulic ladder is activated by the parking brake. When the parking brake is engaged the ladder will go down. When the parking brake is disengaged, the ladder will go up.



RAIL17SP00272AA 2



## 5 - TRANSPORT OPERATIONS

### Road transport

### Warning lamps and SMV symbol

#### ⚠ WARNING

##### Collision hazard!

Collision of high-speed road traffic and slow moving machines can cause death or personal injury. On roads use transport lighting according to local laws. Make sure that the slow moving vehicle emblem is visible. Pull over to let faster traffic pass. Slow down and signal before you turn off a road. Failure to comply could result in death or serious injury.

W0316C

Your sprayer has the following warning lamps and signs:

1. Front flashing amber directional and warning lights (1)
2. Front high/low beam headlights (2)
3. Rear flashing and directional amber warning lights (3)
4. Slow Moving Vehicle (SMV) sign (4)
5. Stop and directional lights (5)
6. Speed Identification Sign (SIS) (6)
7. Fluorescent orange, red, and yellow reflector tape (7)
8. Beacon lights (8)

The flashing amber warning lights and beacon light must be operating when the sprayer is operated on a road during day or night. A vehicle operator that comes near the sprayer must see the SMV symbol on the rear and the flashing amber warning lights from the front and the rear.

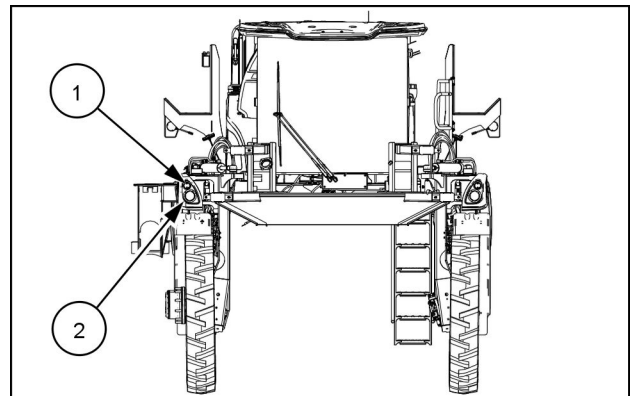
The SMV symbol must be replaced when the bright orange center triangle has faded to a pale orange color. This fading of the orange fluorescent center will occur due to long exposure to sunlight, and reduces daytime identification by approaching vehicle drivers.

The SIS sign informs traffic of the machine speed.

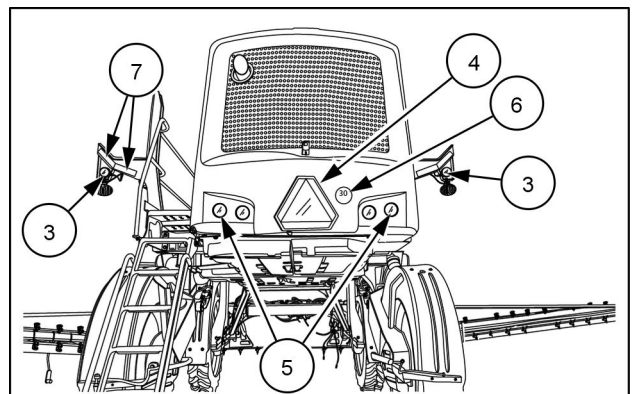
Fluorescent orange and red reflector tape is attached on the left-hand and right-hand rear sides of the rear boom cradles. The yellow reflector tape is attached on the left-hand and right-hand front sides of the rear boom cradle.

The beacon lights are visible from the front or the rear of the unit.

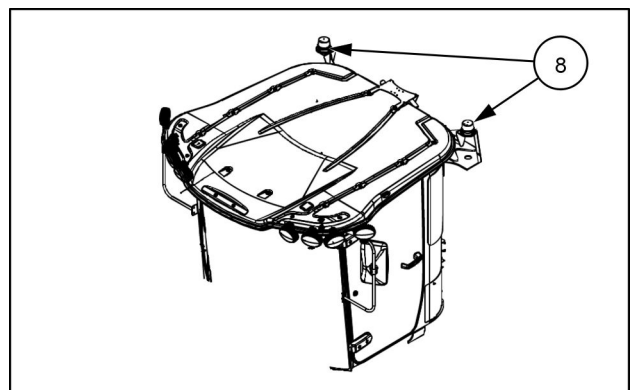
Make sure to use these items correctly when operating the sprayer on the road. The proper use of these items will provide safety and protection for the sprayer operator and other vehicle operators.



RAIL17SP00397AA 1



RAIL17SP01341AA 2



RAIL17SP01392AA 3

## Safe road travel

### ⚠ WARNING

#### Collision hazard!

Collision of high speed road traffic and slow moving machines can cause death or personal injury. On roads use transport lighting according to local laws. Make sure the Slow Moving Vehicle (SMV) emblem is visible.

Failure to comply could result in death or serious injury.

W0115A

### ⚠ WARNING

#### Equipment failure could cause accident or injury!

Always fasten seat belt securely before operating the machine. Inspect seat belt parts for wear and/or damage. To ensure operator safety, replace any and all worn or damaged parts of the seat belt prior to operation.

Failure to comply could result in death or serious injury.

W0046B

Before road travel:

1. Use the leg widening switch on the right side console to adjust the wheel width to the minimum width. You must be driving the vehicle forward or backward over **0.8 km/h (0.5 mph)** when adjusting the tread width.
2. Fold and store the booms in the storage cradles. Be sure to lower the booms completely onto the cradles, relieve all pressure on the tilt cylinders by holding the right and left tilt lower buttons on the joystick. This will allow the booms to rest completely on the storage cradles and eliminate any boom bounce during transport.
3. Shut the Master On button on the joystick control handle to the Off position (button will glow blue).
4. Check the service brake for proper operation.
5. Empty all product from the product tank before leaving the field. Do not attempt to drive this vehicle at high speeds with product in the tank. Fill product tank once you have reached the area of operation.
6. Turn on the hazard lights, beacon and the road lights before entering onto a public road. Keep them on while traveling on the road.
7. A Slow Moving Vehicle (SMV) sign is installed on the rear of the sprayer. Check local requirements regarding removal or covering the SMV sign when traveling at speeds greater than **40 km/h (25 mph)**.
8. Clean off all hazard and road lights when going from the field to the road.

The operator should always be ready to use the service brake should a rapid stop be necessary.

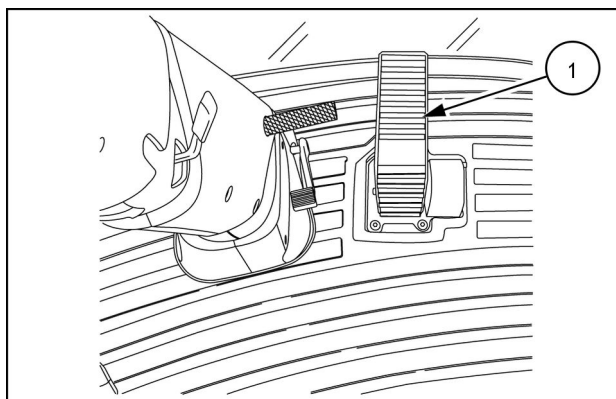
During road travel, turn on hazard warning lamps and headlights, do not use front or rear flood lights.

**NOTICE:** Do not transport with loaded product tank. Transport with product in the product tank could result in premature wear.

Slowing Vehicle with Joystick: Use the joystick to slow the vehicle under normal operating conditions.

**Brake Pedal:** The brake pedal (1) is located on the right side of the steering column. The pedal is used to slow the vehicle to a smooth stop. The pedal applies the brake to all four wheels and reduces the propel command to the hydrostat pumps. If the brake pedal is pressed more than 65% of travel, the machine will come to a complete stop. Return the joystick to the neutral position to reset the propel system and then continue normal operation. If the brake is pressed less than 65% of travel and then released, the drive will return to the preset speed set by the joystick and range selector.

The brake pedal can be used in conjunction with the joystick to rapidly slow the vehicle.



RAIL17SP00226AA 1

## Shipping transport

### Shipping on trailer

#### ⚠ WARNING

**Driving hazard!**

**Know all rules, regulations, laws, and required safety equipment for transporting or operating this machine on a road or highway. See your dealer to obtain a rotating beacon, backup alarm, Slow Moving Vehicle (SMV) emblem, and other safety equipment.**

**Failure to comply could result in death or serious injury.**

W0154A

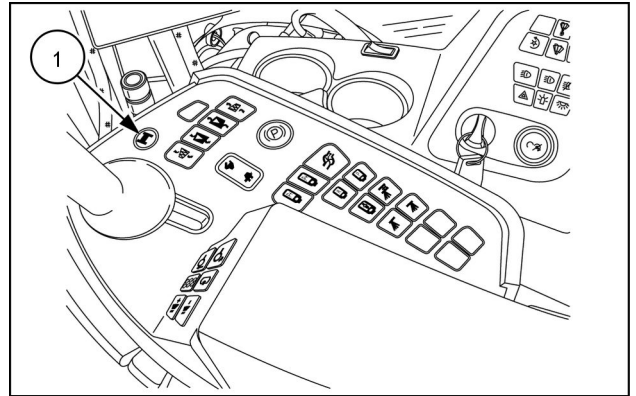
Before shipping the vehicle on a trailer, the tread width of the vehicle must be narrowed to its least widest position, the suspension must be lowered to the lowest position, and the booms must be folded and stored in the boom cradles at the center section set down against the cylinder stops.

#### Tread width adjustment

Use the tread width control, on the arm rest display, to narrow the tread width to **305 cm (120 in)**.

The vehicle must be driven forward in order for the tread width to adjust.

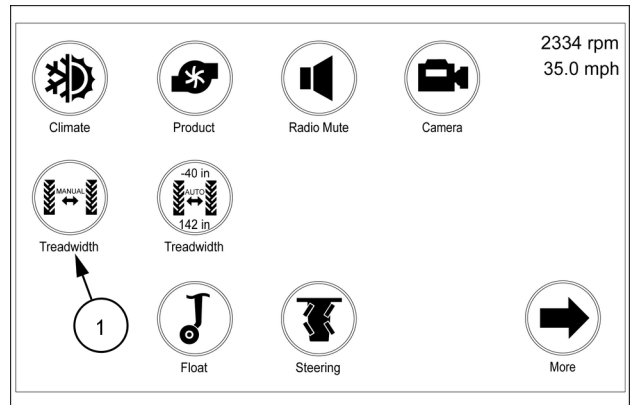
An alternate tread width adjustment may also be performed. With the drive in neutral, press and hold the auto leg widening button (1) on the armrest, the button will turn green and the wheels will go to the narrow position.



RAIL17SP00287AA 1

Setting the tread width on the arm rest display:

From the arm rest display first home page, touch the tread width (manual) icon (1). The Manual Tread Width screen displays.



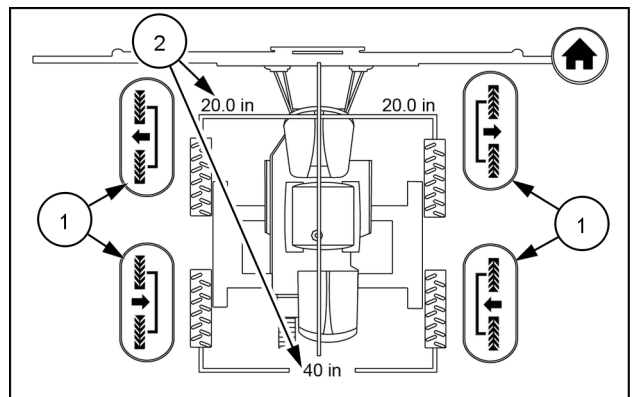
RAIL17SP00108FA 2

From the Manual Tread Width screen, touch and hold the appropriate button (tread width in, tread width out) (1) while driving the vehicle slowly forward.

The right side or left side tread widths can be adjusted separately by pressing and holding the appropriate button on the Manual Tread Width screen.

Touch and hold the combined left and right tread width buttons at the same time to move both sides simultaneously.

As the tread width changes, the tread width values (2) displayed on the screen change to reflect the tread width value.



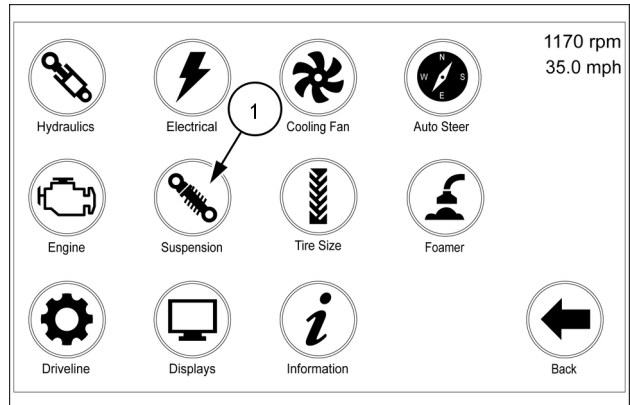
RAIL17SP01003AA 3

## Suspension lowering

**⚠ DANGER**  
**Pinch hazard!**  
**Keep your hands, feet, and body clear of all moving parts and oscillating points.**  
**Failure to comply will result in death or serious injury.**

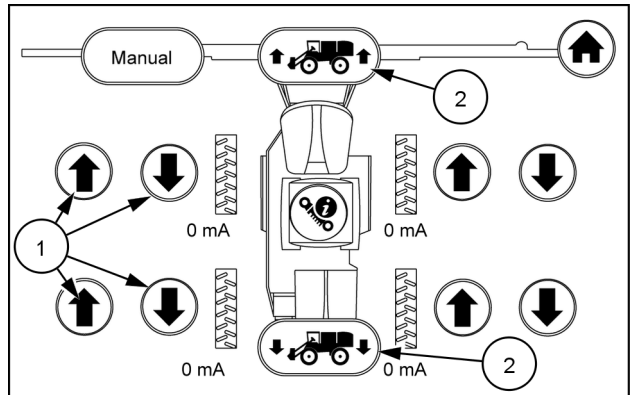
D0206A

To lower the vehicle suspension, press the Suspension button (1) found on the arm rest display second home page. The Manual Suspension screen displays.



RAIL17SP00109FA 4

From the Manual Suspension screen you can set suspension height, as well as manually adjust the height. In the manual mode, use the up/down arrow buttons (1). The suspension for the vehicle may also be raised or lowered at the same time by pressing the appropriate suspension raise or suspension lower button (2). With the park brake disengaged, hold the combined up or down icon (2).



RAIL17SP00172AA 5

## Boom storage

**⚠ DANGER**  
**Pinch hazard!**  
**Keep your hands, feet, and body clear of all moving parts and oscillating points.**  
**Failure to comply will result in death or serious injury.**

D0206A

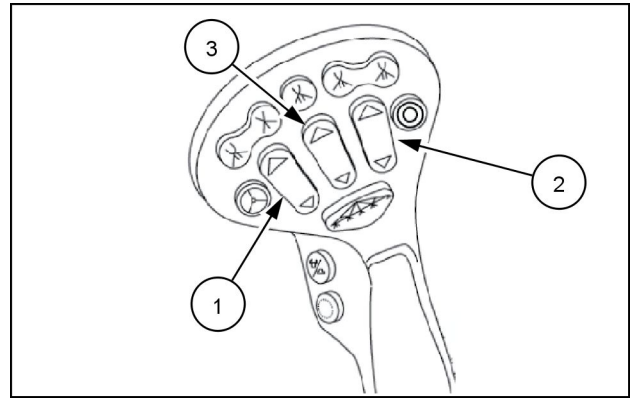
**⚠ WARNING**  
**Crushing hazard!**  
**The boom may drop suddenly without warning. Always install the cylinder stops to hold the boom in the raised position during storage, transport, and service.**  
**Failure to comply could result in death or serious injury.**

W1532A



Use the joystick control to lower boom against the transport stops.

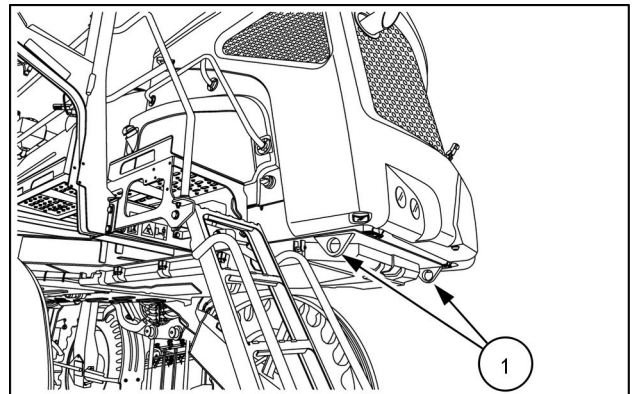
1. Completely raise the left-hand and right-hand booms using the left-hand tilt raise button **(1)** and the right-hand tilt raise button **(2)** on the joystick.
2. Lower the boom center section down against the transport stops on the lift cylinders using the center section raise/lower button **(3)** on the joystick.
3. Lower the left-hand and the right-hand booms back into the transport saddles using the left and right raise/lower buttons **(1)** **(2)**. Lower until all tension is off the tilt cylinders.



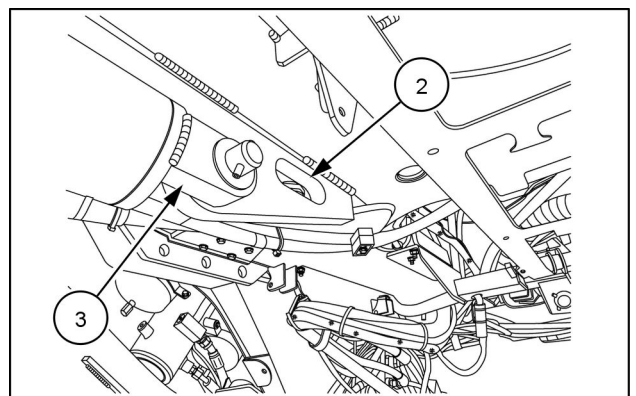
RAIL17SP00391AA 6

### Transport preparation final procedure

1. Rotate the amber rotating beacons in to the storage position.  
Loosen the retainer thumb screw located on the warning light post and rotate the entire post with beacon rearward. Tighten the thumb screw to hold the light in its stored position.
2. Drive the vehicle onto a properly sized trailer.
3. Place the joystick control in the neutral (N) position and apply the vehicle parking brake. Turn off the vehicle engine.
4. Secure the vehicle to a trailer. Tie down the vehicle to the trailer using the four corner tie down method. Refer to local law for tie down methods in your area. Secure tie downs to the provided tie down eyes and/or loops, but never to vulnerable areas such as cylinder rods or sheet metal areas. There are four tie down areas on the chassis; the rear tie down loops **(1)**, and the front tie down slots **(2)**. The front tie down slots are located near the lift arm cylinder base end **(3)**.



RAIL17SP00242AA 7

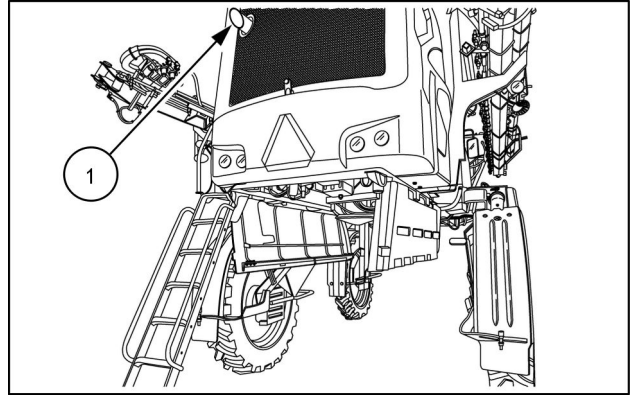


RAIL17SP00256AA 8

## 5 - TRANSPORT OPERATIONS

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5. Cover the exhaust opening **(1)** by taping over the opening with duct tape or use a exhaust pipe cover if available. This will keep the turbocharger from spinning without lubrication. Be sure to remove the tape or the cover from the exhaust before starting the engine.



RAIL17SP00272AA 9

## Recovery transport

### Towing the unit

**▲ DANGER**

**Loss of control hazard!**

**Make sure you use a towing vehicle with adequate weight. Towing with an underweight vehicle could cause a loss of control during transport or braking. Calculate the minimum towing vehicle weight required as instructed in this manual.**

**Failure to comply will result in death or serious injury.**

D0049A

**NOTICE:** Contact your dealer for proper towing procedure. Failure to do so can cause severe damage to the drive system.

This machine is not designed to pull a load.

If the vehicle must be towed and the vehicle has lost engine and/or hydraulic system power, the parking brakes will automatically apply. The parking brake is spring applied when hydraulic pressure is lost.

Contact your MILLER dealer for proper procedure to disable the parking brake. Tow the vehicle at very slow speeds and only for a very short distance.



# 6 - WORKING OPERATIONS

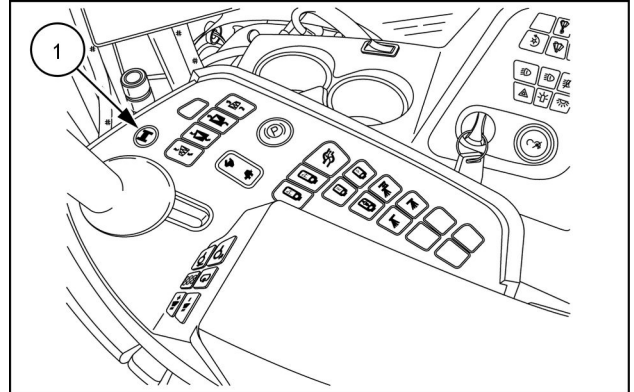
## General information

### Axle width adjust

The axle width is adjustable from **305 – 406 cm (120 – 160 in)** to the center of the tires depending on crop spacing requirements or transport requirements.

The axles move in or out on both sides at the same rate which keeps the operator in the center of the machine.

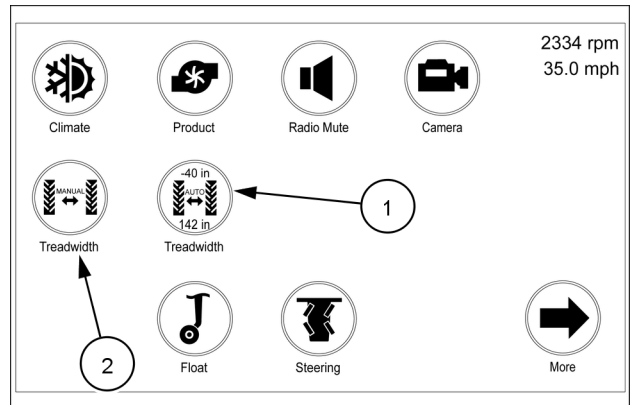
To move the axles in or out: press the auto leg widening button **(1)**. Select your desired width using the lower display. While slowly driving the vehicle, the leg width will automatically adjust.



RAIL17SP00287AA 1

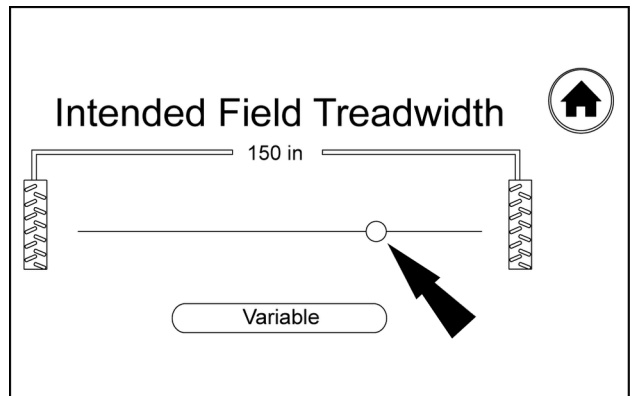
Tread width may also be selected from the arm rest display home page.

1. Press the “Tread Width Auto” button **(1)** to adjust the tread width to a preset width.
2. Press the “Tread width Manual” button **(2)** to manually adjust the tread width.



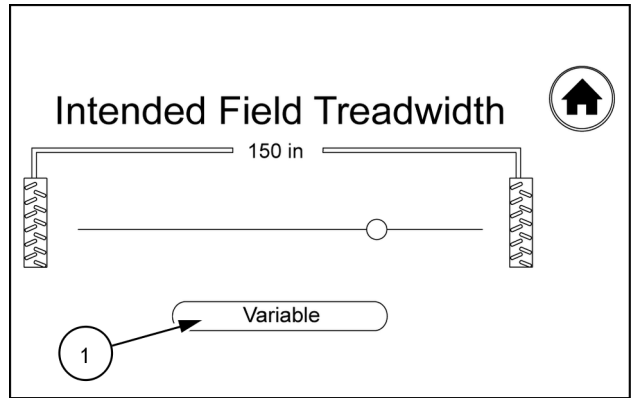
RAIL17SP00108FA 2

3. When the “Tread width Manual” button is pressed, the “Intended Field Width” pop-up screen displays.
4. Set the tread width using the slider bar on the screen.

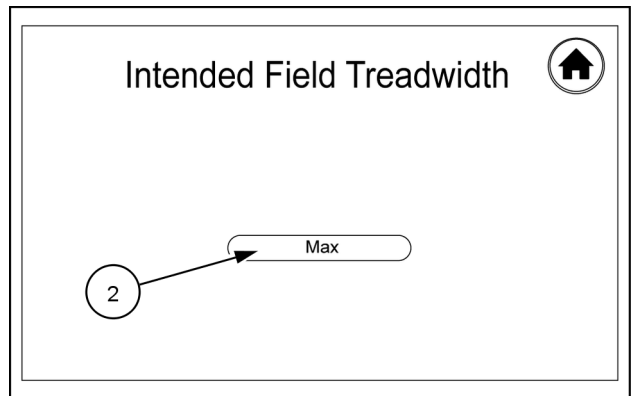


RAIL17SP00115AA 3

5. Press the Variable icon (1) on the screen to change the intended field width to Max (2). The Max mode moves the sliders all the way out.



RAIL17SP00115AA 4

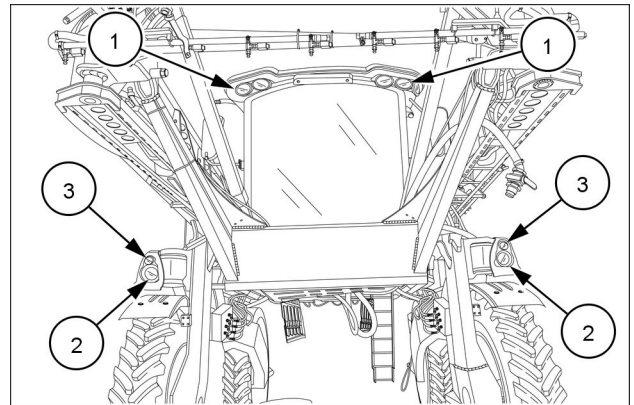


RAIL17SP00772AA 5

## Exterior lights

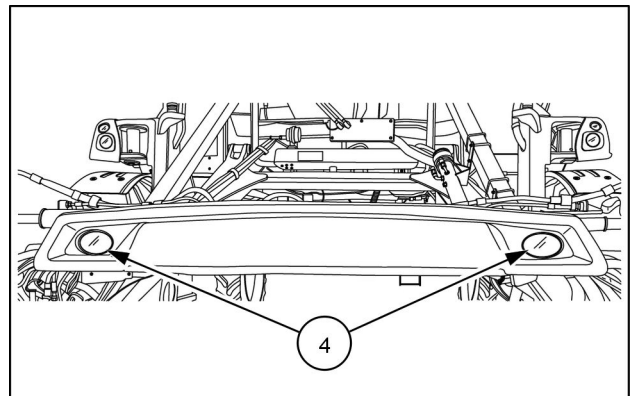
The following lamps are provided for field application:

- Stadium lights **(1)** (premium light option are hi intensity lights standard lights are not).
- Headlights and low beam lights **(2)**
- Directional and hazard lights **(3)**



RAIL17SP00220FA 1

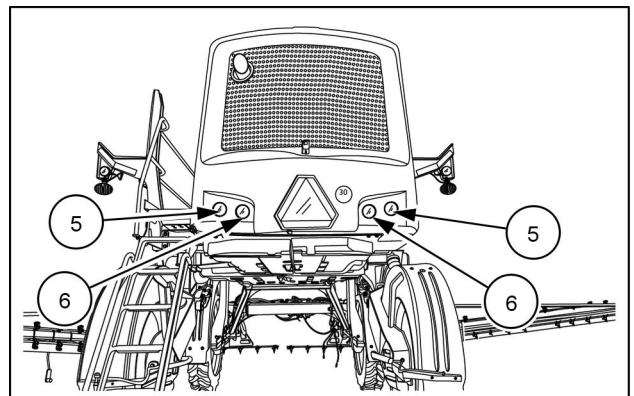
- Center boom lights **(4)** (premium light option are hi intensity lights standard lights are not).



RAIL17SP00251AA 2

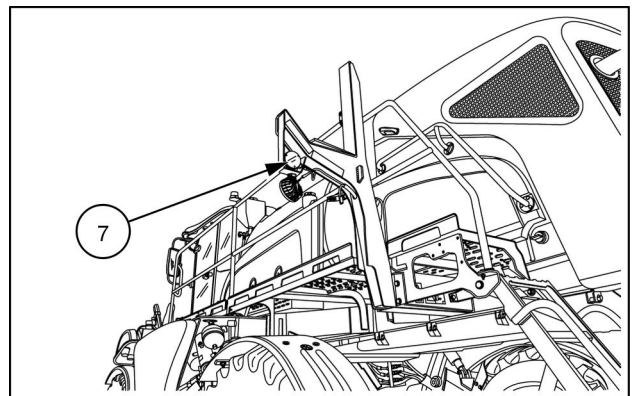
## Rear lights

- Red stop light and directional lights **(5)**
- Reverse lights **(6)**



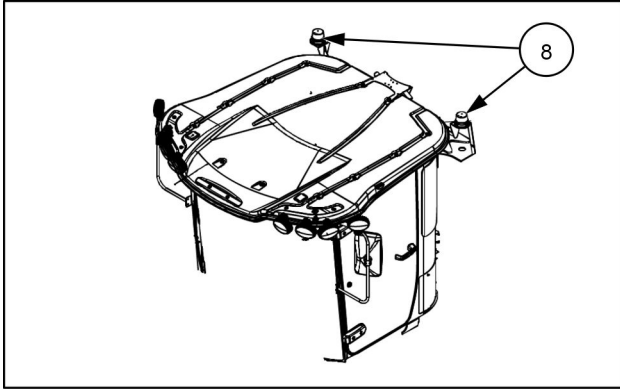
RAIL17SP01341AA 3

- Hazard lights, directional lights, and running lights **(7)** (mounted on the boom cradles).

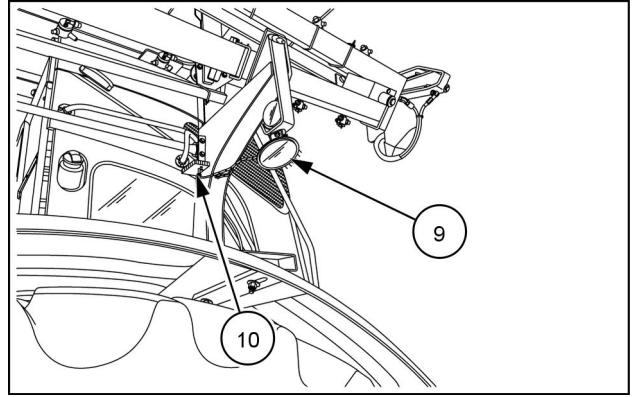


RAIL17SP00240AA 4

- Rotating beacon lights **(8)** (rear corners of cab)



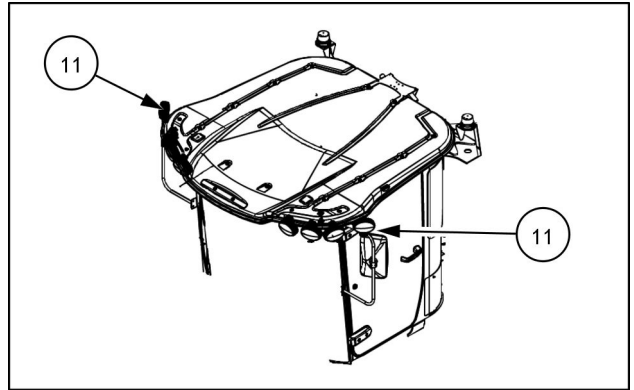
RAIL17SP01392AA 5



RAIL17SP00872AA 6

### Optional lights

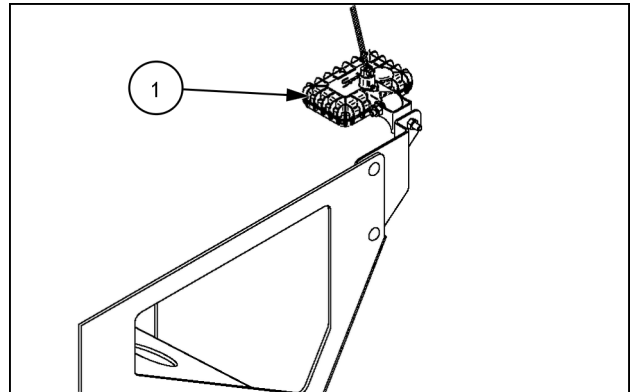
- Light Emitting Diode (LED) **(9)** (attached to the boom cradles). Premium light option are hi intensity lights standard lights are not.
- Light Emitting Diode (LED) **(10)** (attached to the boom cradles) used to light up the boom cradle for positioning the boom in the cradle.
- Light Emitting Diode (LED) spot light **(11)** (premium light option only are attached to each mirror bracket on the cab) can be positioned for operator preference..



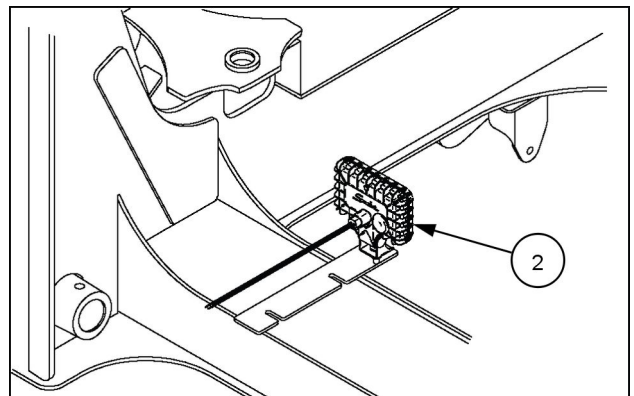
RAIL17SP01392AA 7

### Work lights (premium light option only)

- There is a work light **(1)** inside the engine compartment. This light is controlled by a push button switch on the side of the light. Be sure to turn this light off when not in use.
- There is a work light **(2)** inside the eductor/fast fills door. This light is controlled by a push button switch on the side of the light. Be sure to turn this light off when not in use.



RAIL17SP01390AA 8



RAIL17SP01391AA 9



## Boom operation

### Right side primary boom swing in/out — Mono boom

#### **⚠ DANGER**

##### **Electrocution hazard!**

**Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.**

D0024A

**NOTICE:** Before unfolding the right side boom, be sure to raise the boom out of the stored position on the transport saddles.

To Unfold the right side primary boom (swing away from the vehicle):

1. Raise the center section to full height by pressing the top of the center section button (1).

**NOTICE:** Be sure to remove the center section transport locks from the lift cylinders.

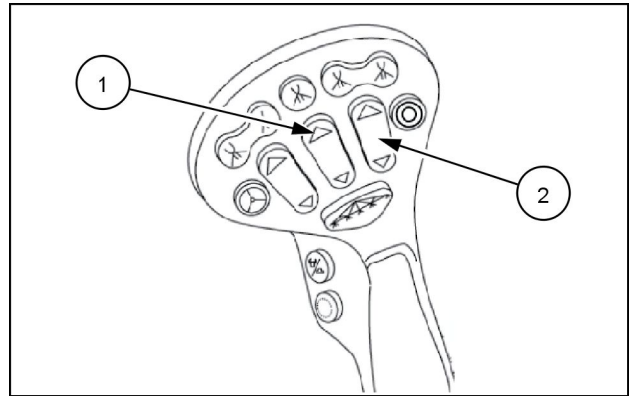
2. Raise the right wing tilt to full lift height by pressing the top of the right side boom tilt button (2).
3. Push and hold the top of the switch (3) to unfold the primary boom (move away from the vehicle).

**NOTE:** The right side boom fold switch is spring loaded to return to the center (Off) position when released.

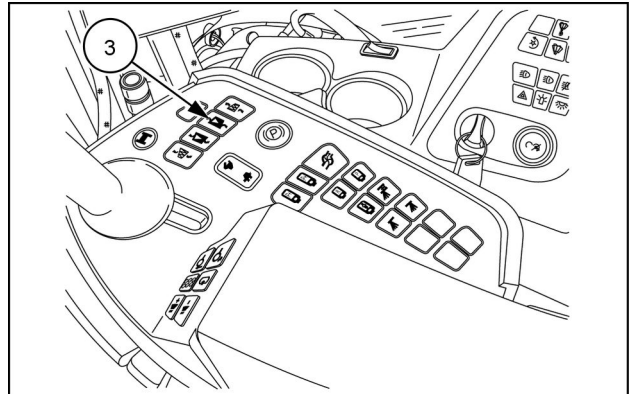
To fold the right side primary boom (swing toward the vehicle):

1. Raise the center section to full height by pressing the top of the center section button (1).
2. Raise the right wing tilt to full lift height by pressing the top of the right side boom tilt button (2).
3. Push and hold the bottom of the switch (3) to fold the primary boom (move back to the vehicle). Be careful that the boom does not go over the top of the boom rest back stop.
4. Press the bottom of the right side boom tilt switch (2) to lower the boom onto the boom rest.

**NOTE:** To change your joystick grip button preferences, use the arm rest display. Select "Op Preference" then "Grip."



RAIL17SP00391AA 1



RAIL17SP00287AA 2

## Right side secondary boom tip fold in/out — Mono boom

### **⚠ DANGER**

**Electrocution hazard!**

Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.

D0024A

**NOTICE:** Before unfolding the right side boom tip, be sure to unfold the right side primary boom.

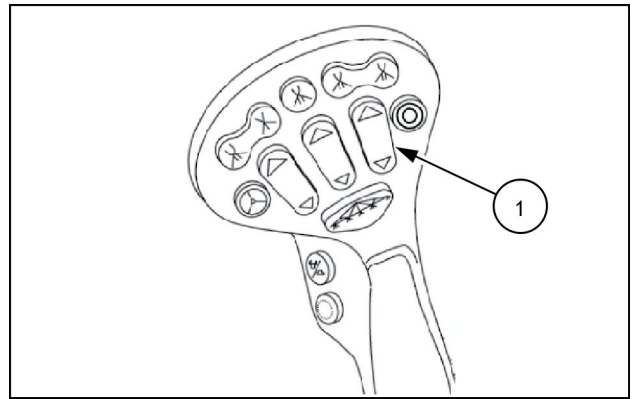
When folding or unfolding the secondary wing:

- Unfolding: Have the primary boom tilted slightly down with the right side boom tilt button to aid in the over center travel of the boom tip.
- Folding: Have the primary wing tilted up slightly with the right side boom tilt button to aid in bringing the boom back over center.

**NOTE:** The right side boom tilt switch (1) is spring loaded and will return to the center (Off) position when released.

To Unfold the right side secondary boom tip:

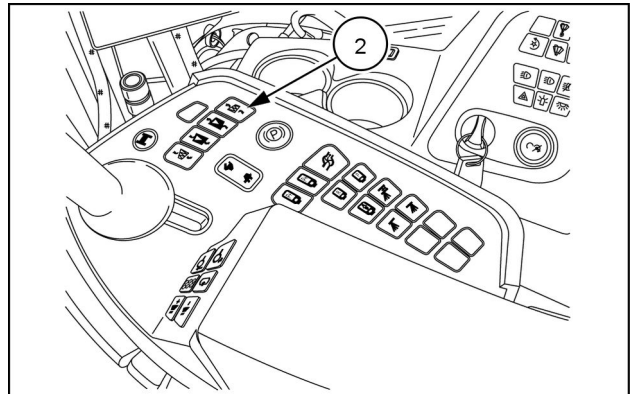
1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the top of the switch (2) to unfold the boom tip (move away from the primary boom). Switch will illuminate red when not active. Just as the boom tip reaches the 90° position, push and hold the bottom of the switch to finish unfolding the boom tip.



RAIL17SP00391AA 1

To fold the right side secondary boom tip:

1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the top of the switch (2) to fold the boom tip (move back to the primary boom). Switch will illuminate red when not active. Just as the boom tip reaches the 90° position, push and hold the bottom of the switch to finish folding the boom tip.



RAIL17SP00287AA 2

## Left side primary boom swing in/out — Mono boom

### **⚠ DANGER**

#### **Electrocution hazard!**

**Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.**

D0024A

**NOTICE:** Before unfolding the left side boom, be sure to raise the boom out of the stored position on the transport saddles.

To Unfold the left side primary boom (swing away from the vehicle):

1. Raise the center section to full height by pressing the top of the center section button (1).

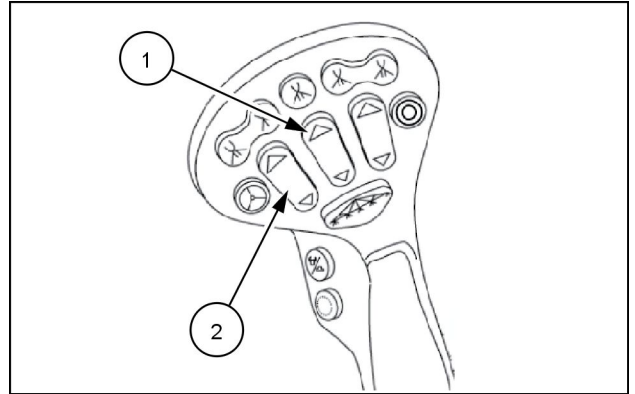
**NOTICE:** Be sure to remove the center section transport locks from the lift cylinders.

2. Raise the left wing tilt to full lift height by pressing the top of the left side boom tilt button (2).
3. Push and hold the top of the switch (3) to unfold the primary boom (move away from the vehicle).

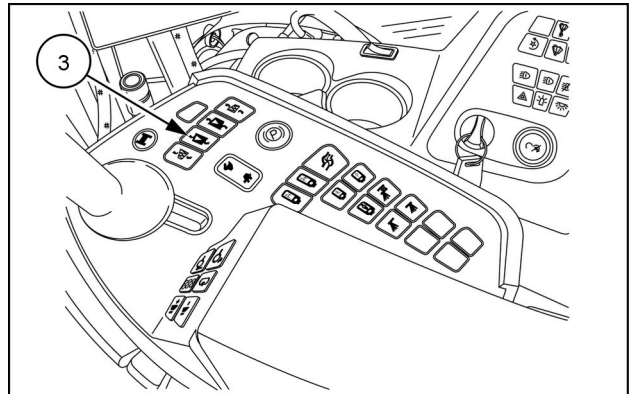
**NOTE:** The left side boom fold switch is spring loaded to return to the center (Off) position when released.

To fold the left side primary boom (swing toward the vehicle):

1. Raise the center section to full height by pressing the top of the center section button (1).
2. Press the top of the left side boom tilt button (2) to tilt the boom to full height.
3. Push and hold the bottom of the switch (3) to fold the primary boom (move back to the vehicle). Be careful that the boom does not go over the top of the boom rest back stop.
4. Press the bottom of the left side boom tilt switch (2) to lower the boom onto the boom rest.



RAIL17SP00391AA 1



RAIL17SP00287AA 2

## Left side secondary boom tip fold in/out — Mono boom

### **⚠ DANGER**

**Electrocution hazard!**

**Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.**

D0024A

**NOTICE:** Before unfolding the left side boom tip, be sure to unfold the left side primary boom.

Helpful Tip when folding or unfolding the secondary wing:

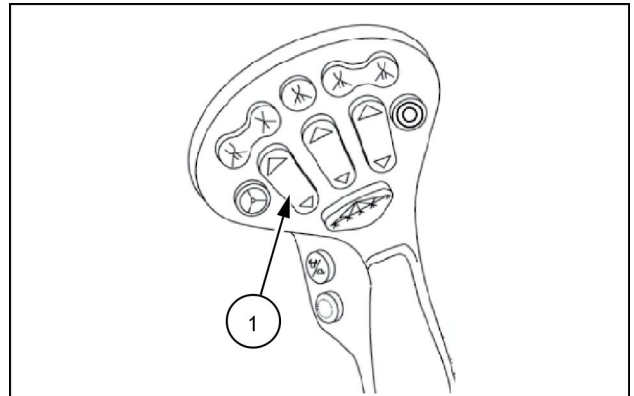
- When unfolding, have the primary boom tilted slightly down with the left side boom tilt button to aid in the over center travel of the boom tip.
- When folding, have the primary wing tilted up slightly with the left side boom tilt button to aid in bringing the boom back over center.
- The left side boom tilt switch (1) is spring loaded to return to the center (Off) position when released.

To Unfold the left side secondary boom tip:

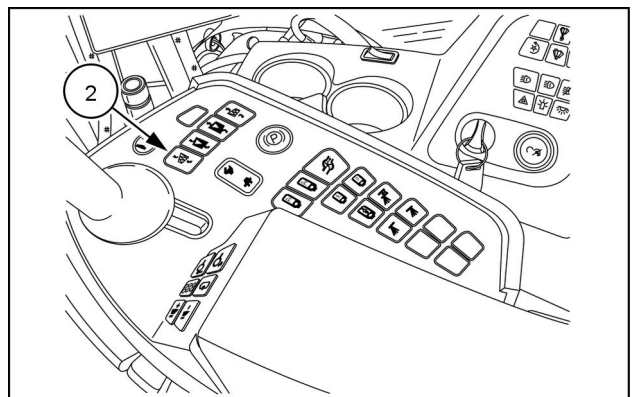
1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the top of the switch (1) to unfold the boom tip (move away from the primary boom). Switch will illuminate red when not active. Just as the boom tip reaches the 90° position, push and hold the bottom of the switch to finish unfolding the boom tip.

To fold the left side secondary boom tip:

1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the top of the switch (2) to fold the boom tip (move back to the primary boom). Switch will illuminate red when not active. Just as the boom tip reaches the 90° position, push and hold the bottom of the switch to finish folding the boom tip.



RAIL17SP00391AA 1



RAIL17SP00287AA 2

## Right side primary boom swing in/out — Truss boom

### **⚠ DANGER**

#### **Electrocution hazard!**

Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.

D0024A

**NOTICE:** Before unfolding the right side boom, be sure to raise the boom out of the stored position on the transport saddles.

Use the tilt control buttons on the joystick to tilt the booms all the way up before starting to unfold or fold the booms. When folding the booms, be sure to fold the secondary booms before folding the primary booms. Use the tilt buttons on the joystick to level the booms after they are folded and to position the booms correctly in the boom rest saddles.

To Unfold the right side primary boom (swing away from the vehicle):

1. Raise the center section to full height by pressing the top of the center section button **(1)** on the joystick.

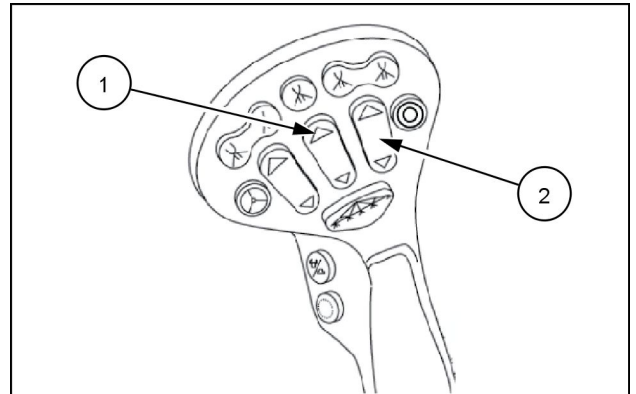
**NOTICE:** Be sure to remove the center section transport locks from the lift cylinders.

2. Raise the right wing tilt to full lift height by pressing the top of the right side boom tilt button **(2)** on the joystick.
3. Push and hold the top of the switch **(3)**, on the main console control panel, to unfold the primary boom (move away from the vehicle).

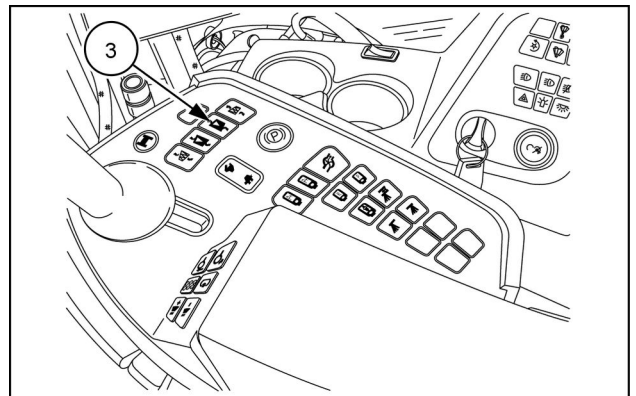
**NOTE:** The right side boom fold switch is spring loaded to return to the center (Off) position when released.

To fold the right side primary boom (move back to the vehicle):

1. Raise the center section to full height by pressing the top of the center section button **(1)**.
2. Raise the right wing tilt to full lift height by pressing the top of the right side boom tilt button **(2)**.



RAIL17SP00391AA 1



RAIL17SP00287AA 2

## Right side secondary boom tip fold in/out — Truss boom

### **⚠ DANGER**

#### **Electrocution hazard!**

**Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.**

D0024A

**NOTE:** *Unfold the right side primary boom before unfolding the right side secondary boom. Refer to 6-5*

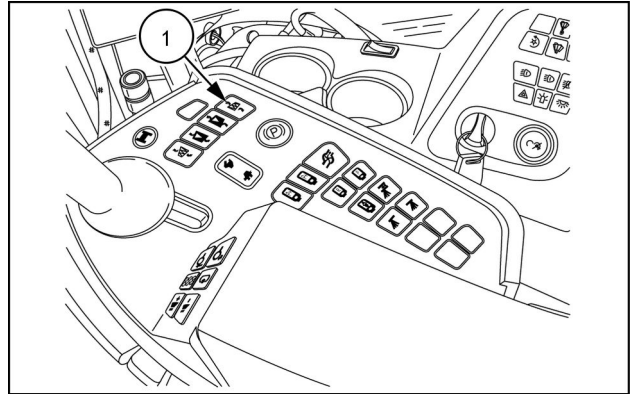
**NOTE:** *The right side secondary boom fold switch (1) is spring loaded to return to the center (Off) position when released.*

To Unfold the right side secondary boom tip:

1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the top of the right side secondary boom switch (1) on the main console control panel (move away from the primary boom). Switch will illuminate red when not active. Hold the switch position until the secondary boom is completely unfolded.

To fold the right side secondary boom:

1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the bottom of the right side secondary boom switch (1) (move back to the primary boom). Switch will illuminate red when not active. Hold the switch position until the secondary boom is completely folded.



RAIL17SP00287AA 1



## Left side primary boom swing in/out — Truss boom

### **⚠ DANGER**

**Electrocution hazard!**

Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.

D0024A

**NOTICE:** Before unfolding the left side boom, be sure to raise the boom out of the stored position on the transport saddles.

To Unfold the left side primary boom (swing away from the vehicle):

1. Raise the center section to full height by pressing the top of the center section button **(1)** on the joystick.

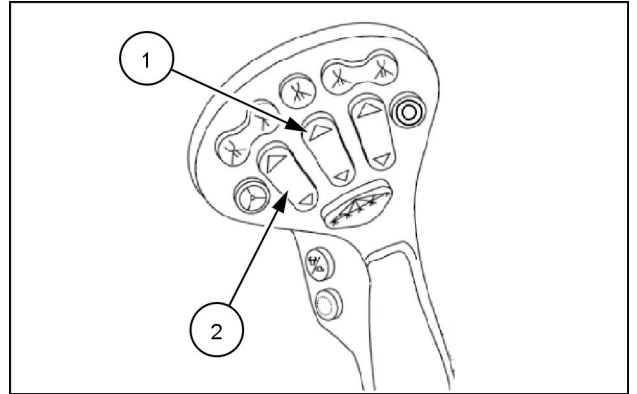
**NOTICE:** Be sure to remove the center section transport locks from the lift cylinders.

2. Raise the left wing tilt to full lift height by pressing the top of the left side boom tilt button **(2)** on the joystick.
3. Push and hold the top of the left side primary boom switch **(3)** on the main console control panel (move away from the vehicle).

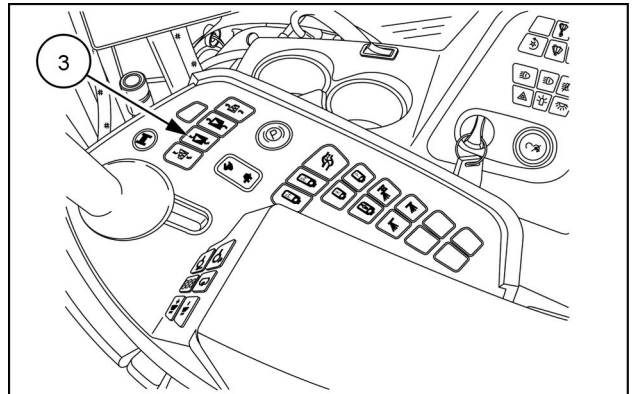
**NOTE:** The left side primary boom switch is spring loaded to return to the center (Off) position when released.

To fold the left side primary boom (swing toward the vehicle):

1. Raise the center section to full height by pressing the top of the center section button **(1)**.
2. Raise the left wing tilt to full lift height by pressing the top of the left side boom tilt button **(2)**.
3. Push and hold the bottom of the left side primary boom switch **(3)** (move back to the vehicle).
4. Press the bottom of the left side boom tilt switch **(2)** to lower the boom onto the boom rest.



RAIL17SP00391AA 1



RAIL17SP00287AA 2

## Left side secondary boom tip fold in/out — Truss boom

### **⚠ DANGER**

#### **Electrocution hazard!**

**Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.**

D0024A

**NOTE:** *Unfold the left side primary boom before unfolding the left side secondary boom.*

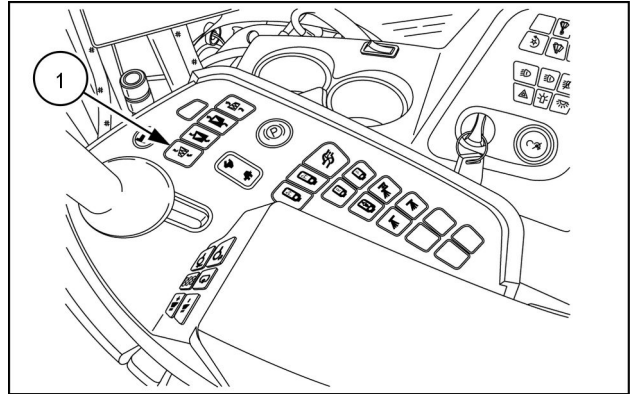
**NOTE:** *The left side secondary boom fold switch (1) is spring loaded to return to the center (Off) position when released.*

To Unfold the left side secondary boom tip:

1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the top of the left side secondary boom switch (1) on the main console control panel (move away from the primary boom). Switch will illuminate red when not active. Hold the switch position until the secondary boom is completely unfolded.

To fold the left side secondary boom:

1. Place the drive in neutral. System will not operate unless the joystick is in neutral.
2. Push and hold the bottom of the left side secondary boom switch (1) (move back to the primary boom). Switch will illuminate red when not active. Hold the switch position until the secondary boom is completely folded.



RAIL17SP00287AA 1



## Spray system

### Spraying safety rules

#### ⚠ WARNING

**Personal Protective Equipment (PPE) required.**  
**When assembling, operating, or servicing the machine, wear protective clothing and PPE necessary for the particular procedure. Some PPE that may be necessary includes protective shoes, eye and/or face protection, hard hat, heavy gloves, filter mask, and hearing protection.**  
**Failure to comply could result in death or serious injury.**

W0353A

Observe the following rules:

- Wash the sprayer after the application of any pesticides/herbicides/ fungicides, etc. Wash the sprayer to reduce the potential of operators coming in contact with the pesticides/herbicides/fungicides, etc.
- Be sure to clean and flush all residual chemicals from the sprayer before changing to another type of chemical. In some cases a decontamination solution is recommended by the chemical manufacturer.
- Always follow chemical manufacturers safety instructions when mixing and applying herbicides and chemicals to prevent serious harm to people or the environment.
- Observe all Federal and State EPA regulations and all Local, State and Federal codes and/or laws regarding licensing, handling, storage, transportation, application and waste disposal of herbicides or other chemicals.
- Do not use this equipment for fumigants.

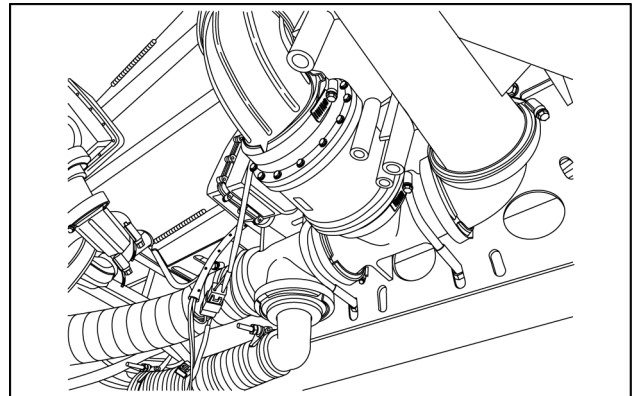
### Control valve locations

**NOTE:** Valves are closed when the handle is perpendicular to the flow. Valves are open when the handle is in line with the flow.

There are several valves located under the product tank and on the side of the frame. They are:

#### Product sump shut off valve

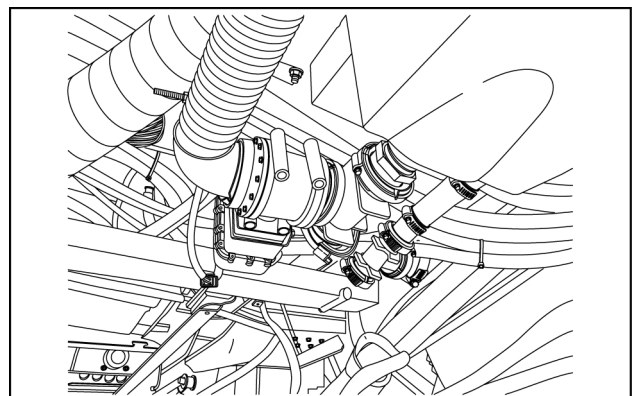
Electric product sump shut off valve.



RAIL17SP00280AA 1

#### Rinse water tank shut off valve

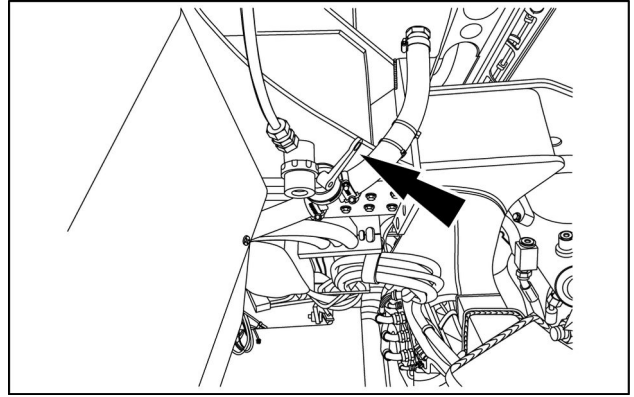
Electric rinse water tank shut off valve.



RAIL17SP00292AA 2

### Foamer line shut off valve (if equipped)

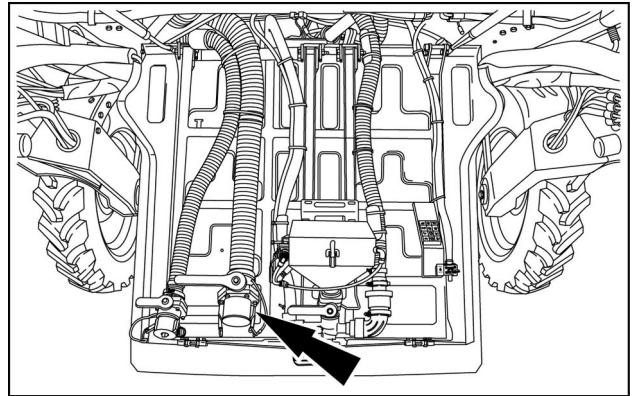
Located under rinse water tank



RAIL17SP00250AA 3

### Product tank fast fill

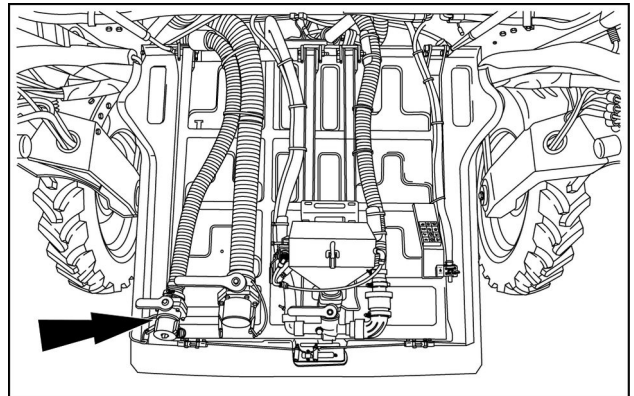
Left-hand hose on fill/educator door located at front side of vehicle.



RAIL17SP00868AA 4

### Rinse water tank fast fill

Right-hand hose on fill/educator door located at front side of vehicle.



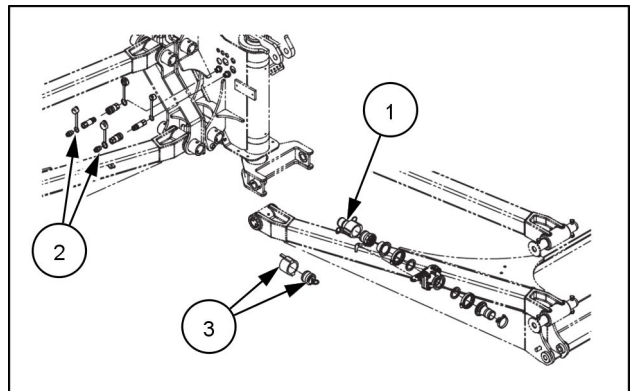
RAIL17SP00868AA 5

### Quick attach valves (if equipped)

There are several valves on the lift arms (depending on options installed). Be sure to close these valves before disconnecting the main product circuit disconnect (1). These valves should remain closed when the boom is removed. The hydraulic lines (2) are quick disconnects.

If your vehicle is equipped with the optional foamer, the foamer lines must be disconnected prior to boom removal.

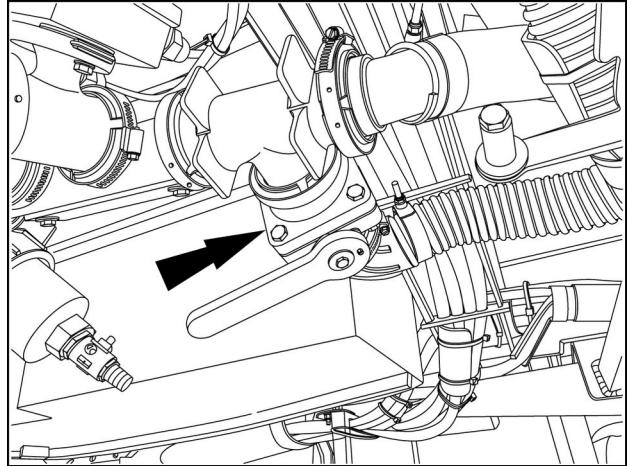
Be sure to install all protective caps (3) and plugs (3) when lines are disconnected.



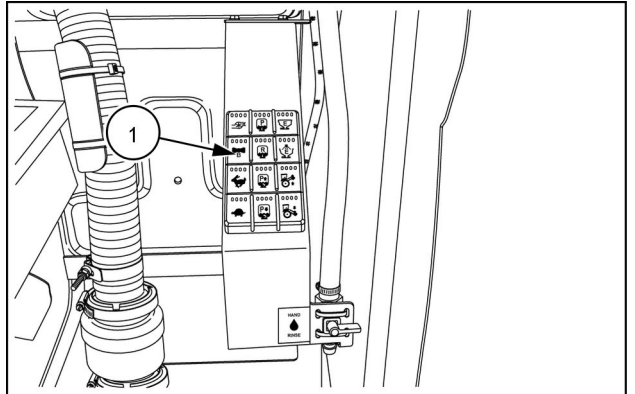
RAIL17SP01074AA 6

### Bypass valve

Manual bypass valve shown, may also be optional electric. Electric bypass valve is controlled by a button (1) on the remote key pad located on the fill/eductor door.



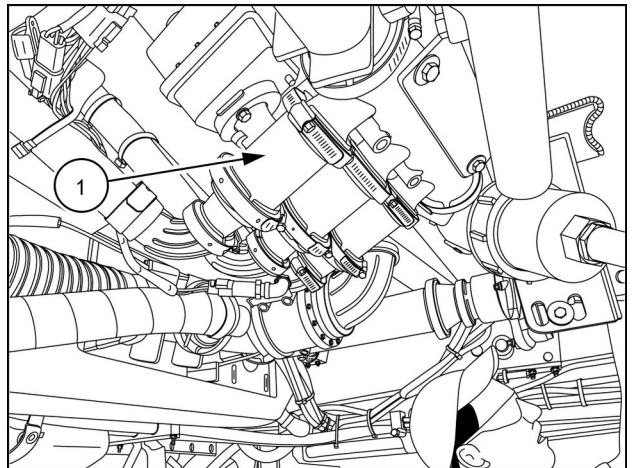
RAIL17SP01002AA 7



RAIL17SP00873AA 8

### Eductor valve (if equipped)

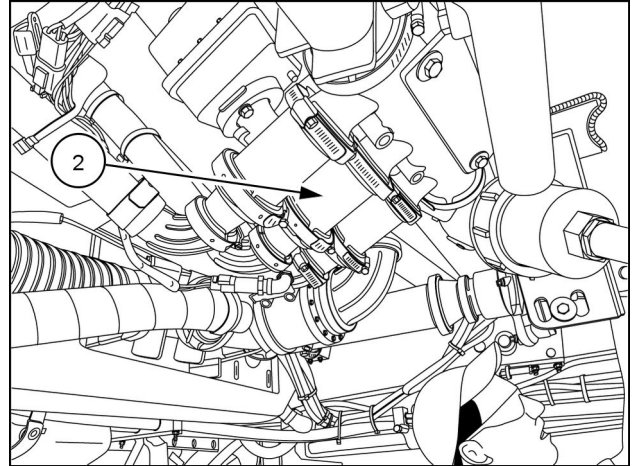
The eductor valve (1) is the first of three valves located under the product tank.



RAIL17SP01001AA 9

### Rinse valve

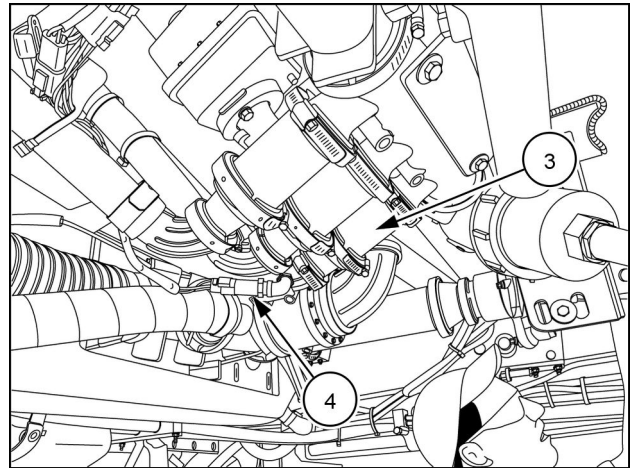
The rinse valve (2) is the center valve located under the product tank.



RAIL17SP01001AA 10

### Sparge valve

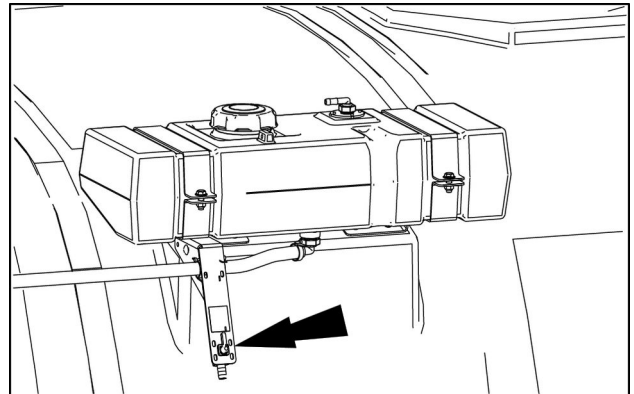
The sparge valve (3) is the rear valve located under the product tank. The sparge valve has a sparge transducer (4) attached to valve body.



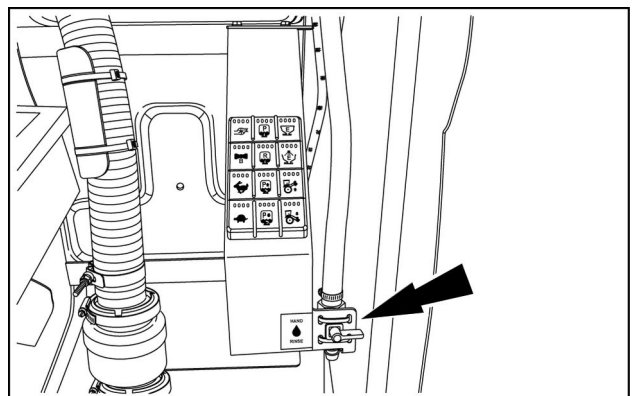
RAIL17SP01001AA 11

### Hand rinse water valves

There are two hand rinse water valves. One is located at the left-hand side of the rinse water tank and is a hand operated on/off valve. The second is located on the fill/educator door next to the key pad and is also a hand operated on/off valve



RAIL17SP00697AA 12



RAIL17SP00873AA 13

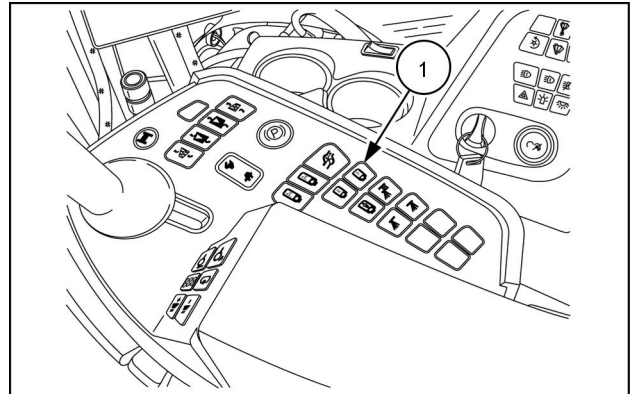
## Product tank sump valve switch

### Product tank sump valve on/off switch

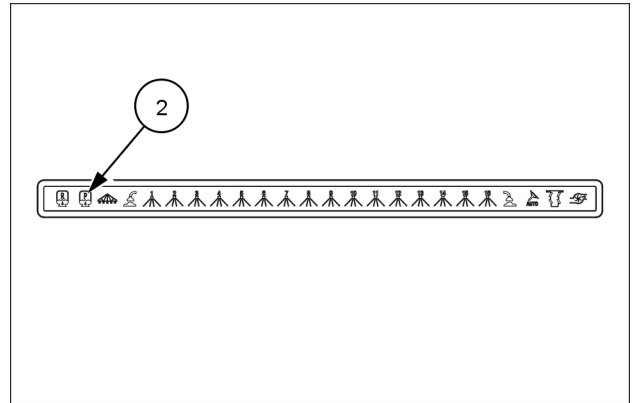
This momentary switch (1) allows the operator to open and close the product tank sump from the operator cab. Press the button once to open the sump. Press the button again to close the sump. Be sure to open the sump valve before starting any spraying operation. The product tank sump **MUST** be open before starting the product pump. The product tank sump can also be opened and closed from outside the operator cab using the remote sump control switch. The product tank sump icon (2) on the front overhead display will illuminate when the sump is open.

**NOTE:** Sump **MUST** be open when using the remote fast-fill

**NOTE:** When you shut the engine off with the sump open, the sump will remain open. However, when you restart the engine, the sump will close. You will need to re-open the sump before starting the product pump.



RAIL17SP00287AA 1

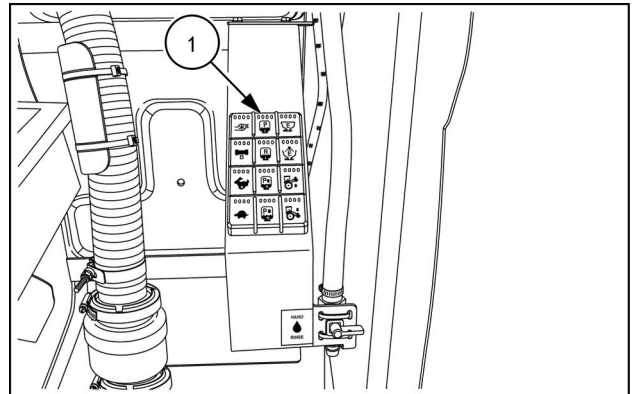


RAIL17SP00309FA 2

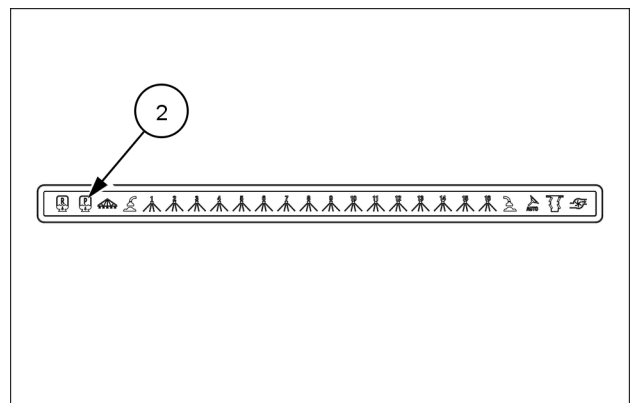
### Remote product tank sump valve open/close switch

The remote product tank sump switch (1) allows the operator to open and close the sump from outside the cab. The remote sump switch is located under the frame on the eductor/fast-fills door on the left-hand side. Press the switch on the key pad once to open the sump. Press the switch again to close the sump.

The “Sump is Open” light (2) in the front overhead display will also come on when opening the sump with this switch. When this feature is active with the remote key pad, the lights at the top of the switch will illuminate signifying that the sump is open.



RAIL17SP00873AA 3



RAIL17SP00309FA 4

6 - WORKING OPERATIONS

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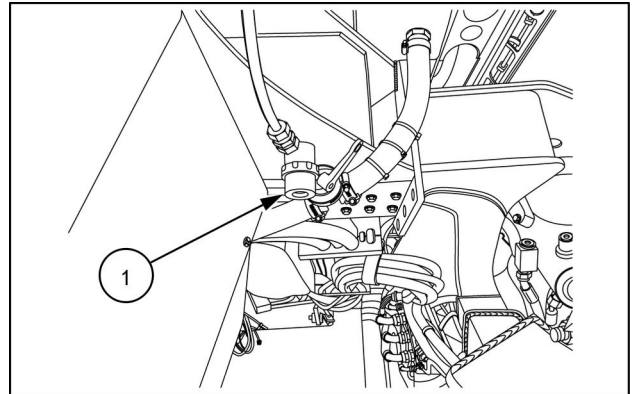
Light color combination	Percentage of sump open
Red	0-6%
Red and Yellow	7-23%
Yellow	24-41%
Yellow and Green	42-58%

Light color combination	Percentage of sump open
Green	59-77%
Green and Blue	78-99%
Blue	100%

## Foam marker system overview (if equipped)

The foam marking system needs little maintenance, but regular routine cleaning of the foam heads and filters is essential.

The foam heads have been designed so that the elements inside may be cleaned as necessary. The screens inside this unit should be washed periodically with hot water. The in-line filter element **(1)** should be cleaned occasionally to ensure sufficient liquid flow to the foam head assemblies.



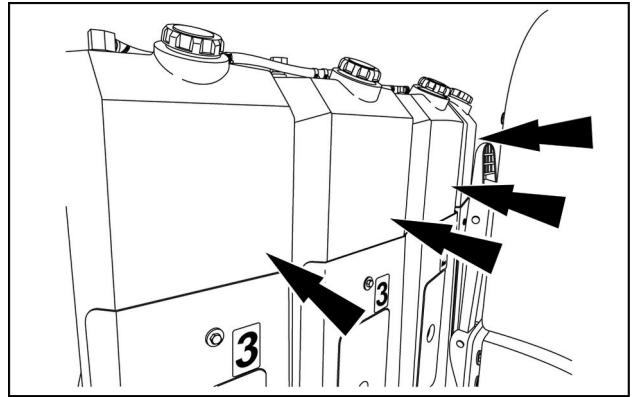
RAIL17SP00250AA 1

**VERSA TRAC™** model foam markers utilize a manifold style control module for routing and control of the air and liquid to each side. The control module is made of a durable plastic block with the solenoid valves mounted directly to the block. The unit should have hot water run through each side periodically to ensure proper flow. Be certain that all of the foam solution is removed from the control module before storing it for the winter. Refer to **7-93** for storage information.

**VERSA TRAC™** model foam markers are equipped with a relief valve that has been factory set at **20 psi**. This valve prevents over-pressurization of the system. Check its operation periodically. Do not attempt to operate the system or adjust the relief valve above **20 psi**.

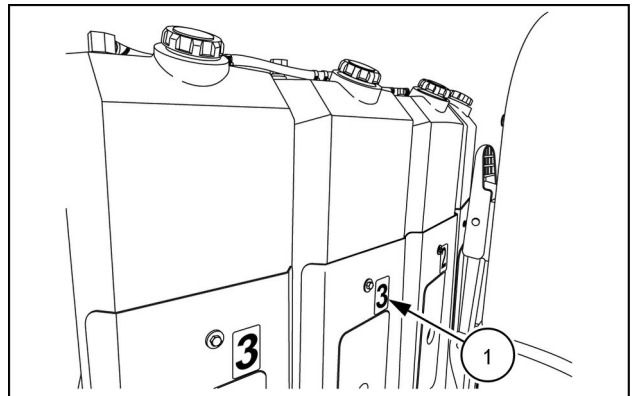
## Injection system (if equipped)

The injection system is comprised of up to four **189 L (50 US gal)** separate chemical tanks mounted between the product tank and the engine compartment.

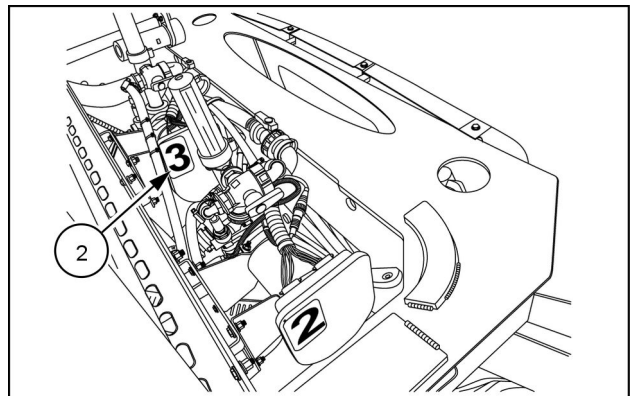


RAIL17SP00904AA 1

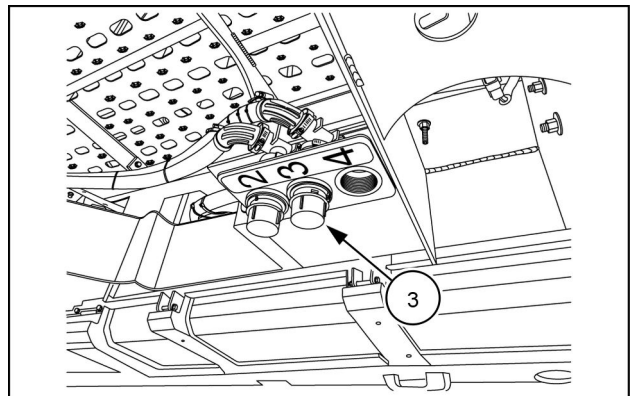
The tanks are numbered (1) to correspond with the pump number (2), the remote fill (located on the outside of the left frame rail) number (3) as well as the number as displayed on the spray monitor.



RAIL17SP00904AA 2



RAIL17SP00908AA 3

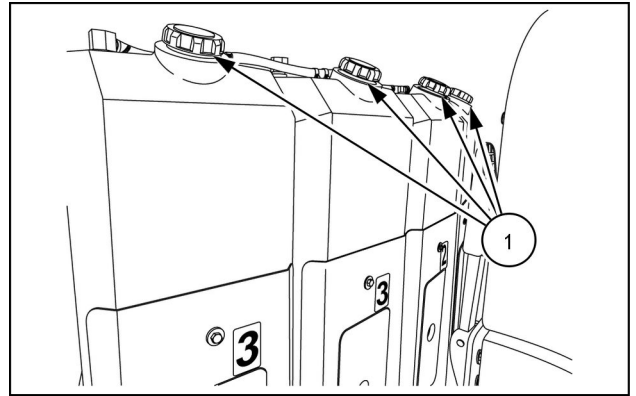


RAIL17SP00903AA 4



### Filling the injection tanks

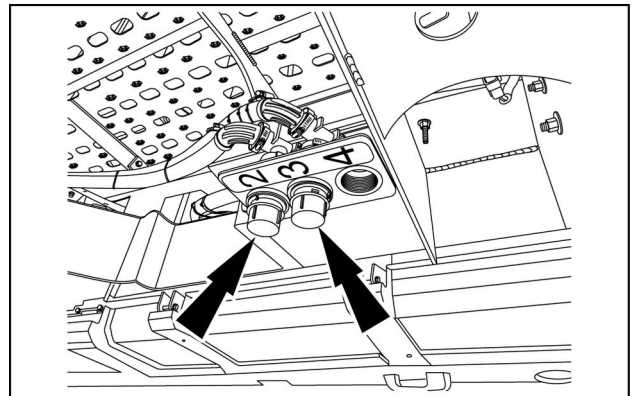
The injection tanks can be filled from the top by removing the fill cap (1) on the appropriate tank. After filling is complete reassemble the fill cap and tighten securely



RAIL17SP00904AA 5

The injection tanks can also be filled using the remote fill ports located on the outside of the left frame rail. They are numbered to correspond with the numbers on the injection tanks.

The quick connect fittings for the remote fills are located inside the cab. They will have to be assembled to your chemical delivery hose before assembling them to the remote fill. After the injection tank is full, remove the fill hose with quick connect from the remote fill.



RAIL17SP00903AA 6

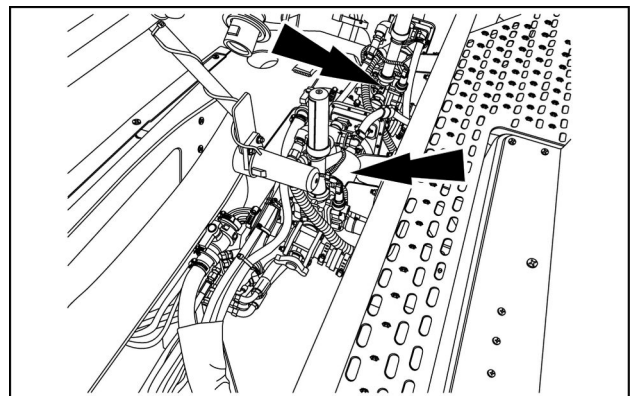
### Priming the injection pump

**NOTE:** Prime one pump at a time.

Prime the injection pump before calibration or regular operation to ensure the system is full of fluid and the air is removed from the injection system plumbing. Before starting an application using the injection system, perform the following procedures to ensure the system is properly calibrated and ready for chemical application.

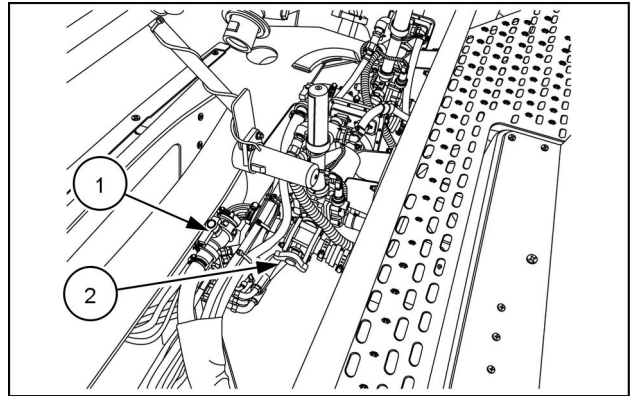
Ensure the chemical tank for the pump being primed has enough liquid in it for priming purposes.

**NOTE:** It may require **11 – 19 L (3 – 5 US gal)** of liquid in the chemical tank to ensure the system is primed properly.

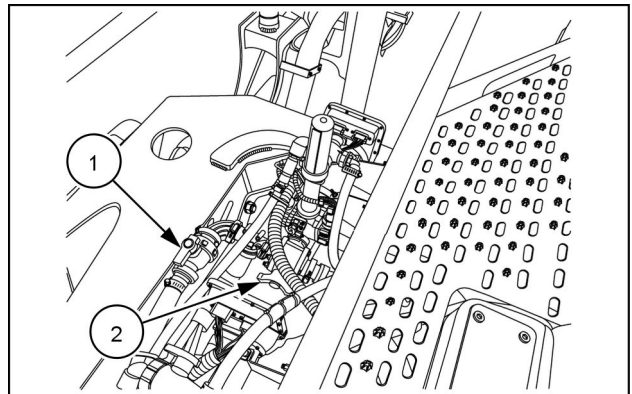


RAIL17SP00905AA 7

Open the main shut off hand valve(s) **(1)** between the supply tank and injection pump so that the valves direct flow from the tank towards the pump. Ensure any tank valves, fill station valves, rinse valves, and drain valves are in the correct position. Be sure that the tee handle valve **(2)** is pointed at the supply line.

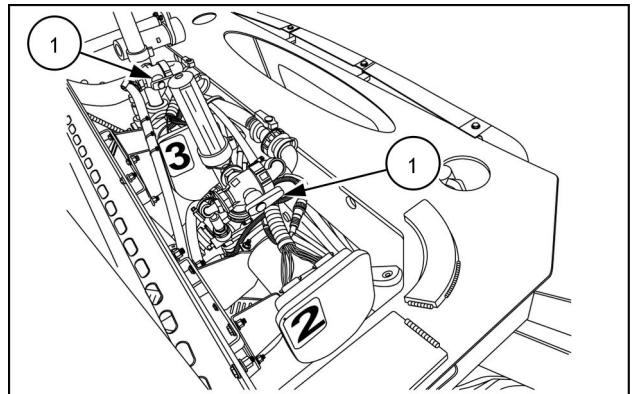


RAIL17SP00905AA 8



RAIL17SP00907AA 9

Set the hand valve **(1)** on the injection pump outlet to re-circulate chemical back to the supply tank.



RAIL17SP00908AA 10

Lift the plunger handle on the pump calibrator (if equipped) to the top of the calibration cylinder.

Verify the following conditions exist:

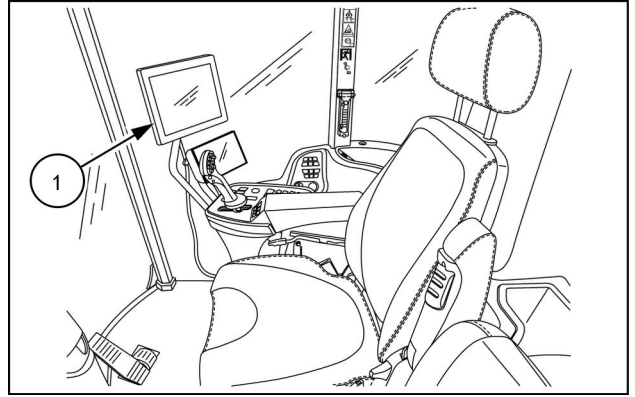
Injection pressure is less than **82.7 kPa (12.0 psi)**.

Pump is off.

Vacuum pressure is less than **29.2 cm (11.5 in)** of mercury.

**NOTE:** The vacuum switch on the pump will engage and a flow alarm will display if the product cannot be drawn into the pump e/g vacuum pressure at or above **29.2 cm (11.5 in)** of mercury. Check screens, chemical tank lids, hose diameter and any hand valves between the chemical tank and pump inlet. Also, verify that the product is flowing freely. Cold temperatures and high viscosity products may cause high vacuum pressures and cause the pump to not operate properly.

On the spray monitor screen (1), touch the VT ICD Menu icon.



RAIL17SP00310AA 11

Select the diagnostics icon.

Select the test icon

Select prime pump from the drop-down list.

Follow the on-screen prompts to complete pump priming. Allow the pump to prime. The priming procedure will run until the controller detects the pump is primed. If the pump is unable to prime, the console will end the priming procedure after two minutes and display an error.

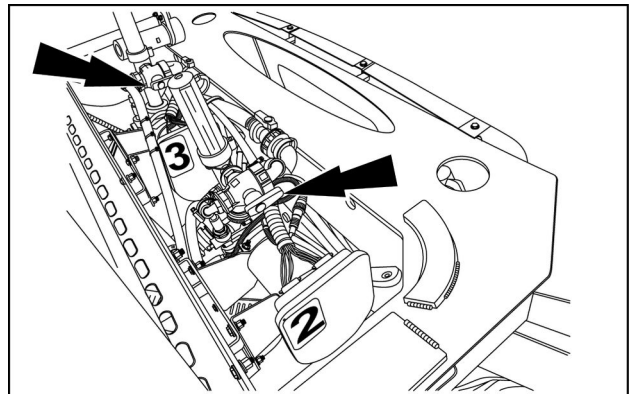
**NOTE:** *If the console displays an error message during the priming process, verify that the conditions listed above exist. Press the Stop softkey at any time to stop the priming procedure. If the pump fails to prime after the first attempt, restart the priming procedure. If the pump is still unable to prime successfully, check the system for leaks, verify the valves are turned on, and verify the hoses are filled with product. It may be necessary to recalibrate the pressure transducer.*

**Pump calibration**

Prior to starting a chemical injection application, verify the pump is calibrated and operational.

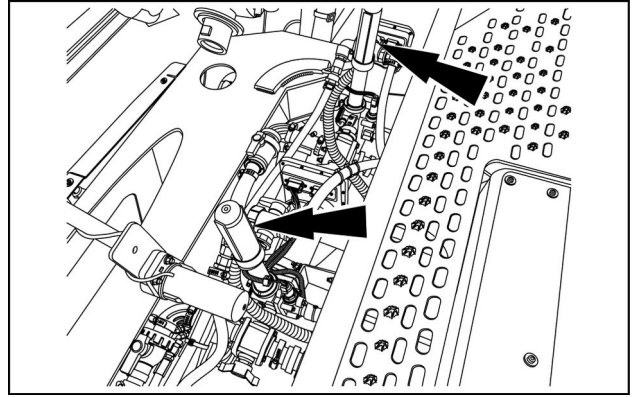
Prime the pump.

Set the hand valve on the injection pump outlet to recirculate the product back to the supply tank.



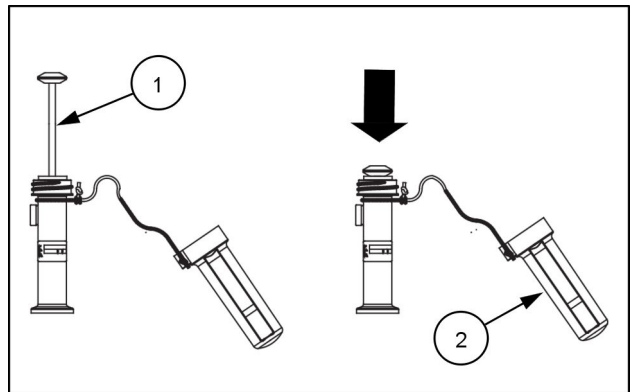
RAIL17SP00908AA 12

Remove the cover from the injection pump calibrator.



RAIL17SP00906AA 13

Press the calibrator (1) all the way down. Replace the calibrator cover (2). Do not over-tighten the cover.



RAIL17SP00917AA 14

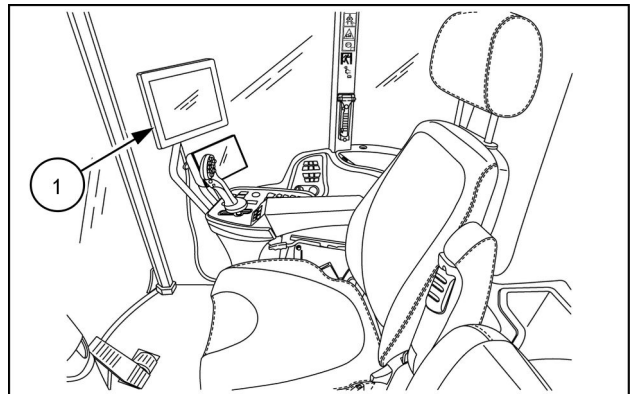
Verify the following:

Injection pressure is less than **82.7 kPa (12.0 psi)**.

Pump is off.

Vacuum pressure is less than **29.2 cm (11.5 in)** of mercury.

**NOTE:** The vacuum switch on the pump will engage and a flow alarm will display if the product cannot be drawn into the pump (e.g. vacuum pressure at, or above, **29.2 cm (11.5 in)** of mercury). Check screens, hoses diameter, and hand valves between the chemical tank and pump inlet. Also, verify that the product is flowing freely. Cold temperatures and low viscosity products may cause high vacuum pressures and cause the pump not to operate properly.



RAIL17SP00310AA 15

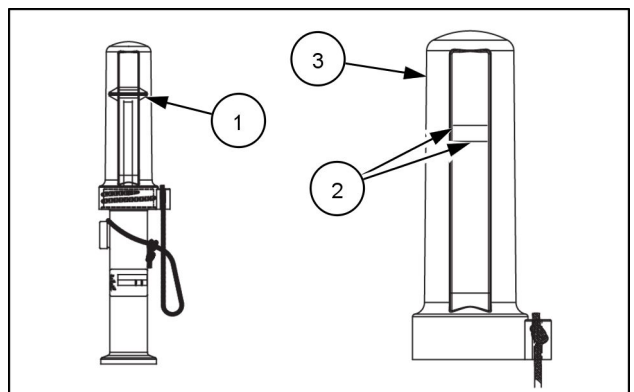
On the spray monitor screen (1), touch the VT ICD Menu icon.

Select the diagnostics icon on the spray monitor screen.

Select pump calibration from the drop down.

Follow the on-screen prompts to complete pump calibration. The pump will run until the ECU detects **0.3 dL (1.0 US fl oz)** of chemical has been passed through the pump and the "Calibration Complete" message displays.

Verify the calibrator plunger (1) on the injection pump. The black ring should stop within the window markings (2) on the calibrator cover (3) if calibration was successful. If the black ring stops outside of the calibration window, the flow correction% value may be adjusted to compensate.



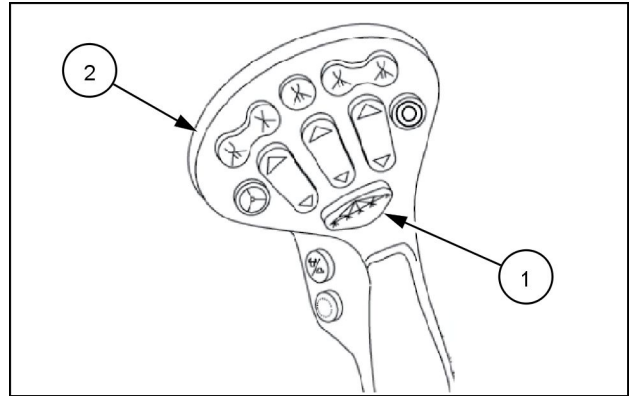
RAIL17SP00918AA 16

### Injection system operation

With the valve orientation to the boom, use the prime function until chemical reaches the mixing chamber.

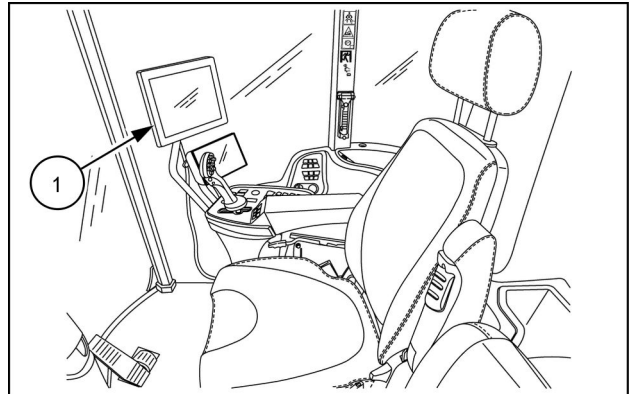
Once the pump is primed and calibrated, the system can now be used.

The injection system is turned on by pressing the master button **(1)** on the joystick **(2)**. Press the button again to turn the injection system off.



RAIL17SP00391AA 17

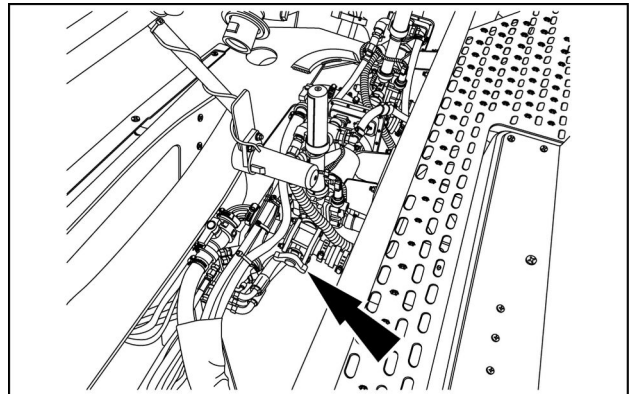
If desired the individual injection pumps can be turned on and off by touching the proper pump icon on the spray monitor screen **(1)**.



RAIL17SP00310AA 18

### Rinsing the injection system

Set the three way valve on the backside of each pump to allow rinse water from the rinse tank to flow through the pump(s). There is a three way valve for each pump. This procedure rinses the pump only not the lines from the tank or the tank itself.



RAIL17SP00905AA 19

## Spray system operation

### Begin spraying operation

#### **⚠ DANGER**

**Electrocution hazard!**

**Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between equipment and overhead power lines. Failure to comply will result in death or serious injury.**

D0024A

#### **⚠ WARNING**

**Loss of control hazard!**

**Travel speed should be such that complete control and machine stability is maintained at all times. Where possible, avoid operating near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces. Failure to comply could result in death or serious injury.**

W0233A

For factory supplied sprayer controllers, refer to the specific controller software operating guide for all set-up procedures.

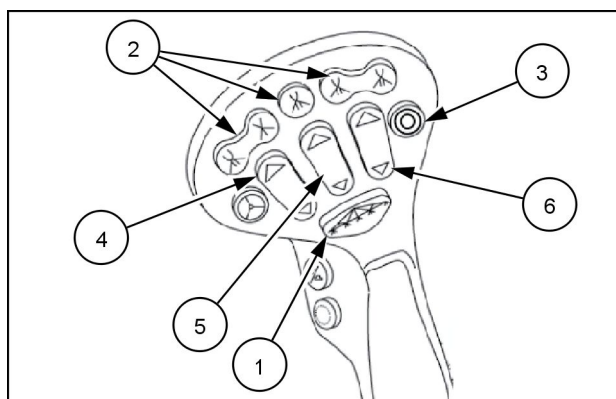
### Raven™ setting procedure

Refer to your **Raven™** Operator's Manual for information on how to program your **Raven™** console. The **Raven™** console has been pre-programmed at the factory. Use these procedures and settings in conjunction with the **Raven™** manual to reset it if needed.

**NOTE:** The sprayer cooling system operates most efficiently at high idle. It is recommended to operate at high idle to maximize cooling system.

**NOTE:** Maximum spraying speed 32 km/h (20 mph).

1. Open product tank sump.
2. Turn on the product pump and the spray monitor.
3. Turn on the boom sections (2). Generally all the boom sections will be on. When reaching the edge of the field it may be necessary to keep the outer sections off, to avoid over spraying. This is accomplished with the individual boom section on/off buttons on the joystick.
4. Use the center lift (5) and the right-hand (6) and left-hand (4) tilt cylinders to lower the boom to the height specified by the nozzles selected.
5. Turn on the foam marker (3) and select the desired side using the turn signal control lever or multi-function button. Adjust the frequency and/or the density as required on the display monitor.
6. Shut off all the boom sections with the master switch (1) when you reach the end of the field.
7. Turn off the foam marker.
8. After turning around and getting ready for the return pass, turn the master switch (1) back on to resume spraying. Any booms individually off before turning the master switch off, will remain off when spraying resumes.
9. Turn on the foam marker and select the correct side using the turn signal control lever.



RAIL17SP00391AA 1

**Spray monitoring operation**

1. The **IntelliView™** monitor regulates the application rate by continually monitoring your ground speed and adjusting the flow rate to correlate, resulting in a constant gallons/ acre application. This target rate is programmed into the monitor by the operator. Manual application rate can also be set on the monitor for spot spraying.
2. The monitor keeps track of many items for the operator. Some of these are total area applied, total volume applied, field area completed, distance, volume/minute and area/hour on current conditions.
3. If the actual application rate ever varies more than **30%** from the target rate for more than **30 s**, an audible alarm will sound. If you programmed a low tank alarm value into the monitor, then an intermittent alarm will sound every **15 s** when the value has been reached.
4. Complete details for programming and for operating this monitor are contained in the operator's manual for your specific monitor.

**MILLER ISO product control settings**

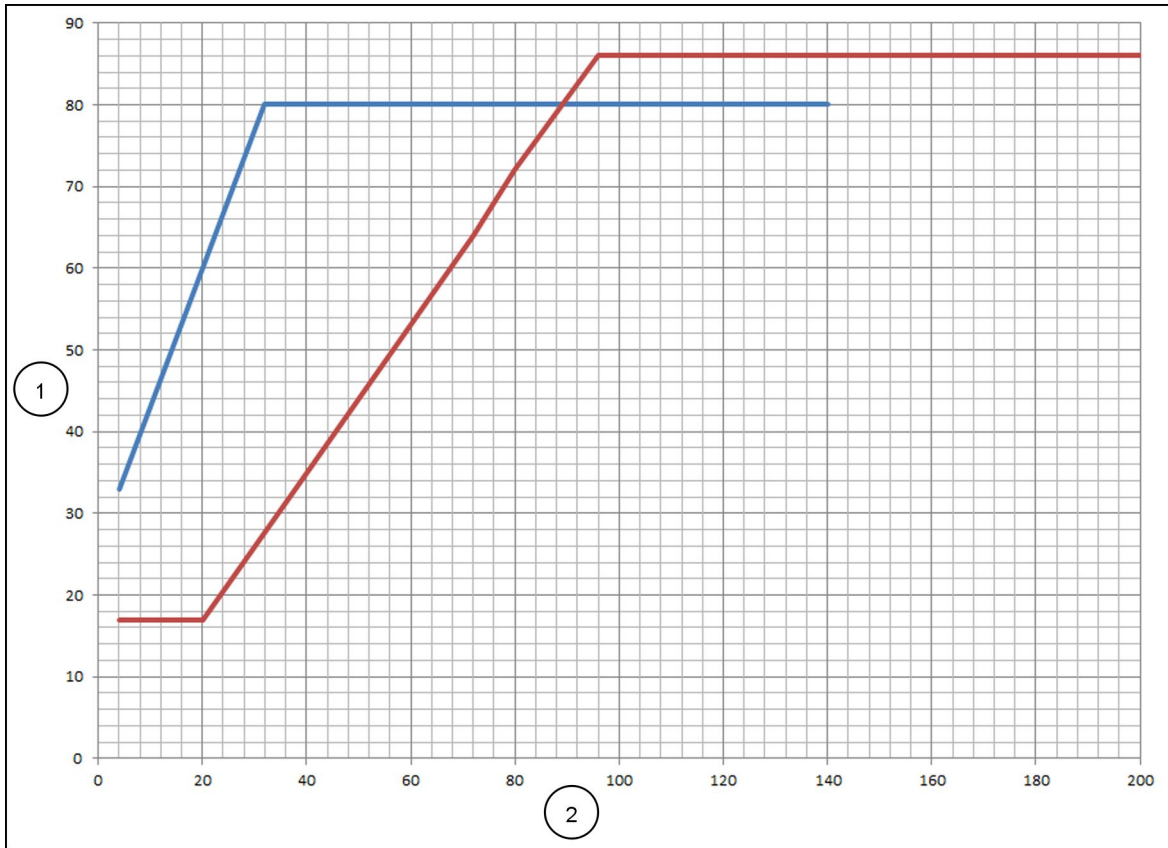
	IntelliSpray™		Conventional	
<b>User settings</b>				
Display smoothing	X		X	
Auto section control	X		X	
External/Rx control	X		X	
PWM/high side driver				
Enable turn compensation	X		X	
Enable wireless control				
Override seconds	15		15	
Speed cal	820		820	
Implement switch				
<b>Tank fill settings</b>				
Tank capacity	3028 L (800 US gal)		3028 L (800 US gal)	
Low tank limit	189 L (50 US gal)		189 L (50 US gal)	
<b>Alarm settings</b>				
Minimum pressure	X		X	
System change detection				
Off target pressure	X (20%)		X (20%)	
Off rate limit	X (20%)		X (20%)	
System efficiency limit				
Low tank limit	189 L (50 US gal)		189 L (50 US gal)	
Preset settings	47 L/ha (5 US gal/ac)	94 L/ha (10 US gal/ac)	47 L/ha (5 US gal/ac)	94 L/ha (10 US gal/ac)
Pressure presets	138 kPa (20 psi)	414 kPa (60 psi)		
Rate delta	19 L/ha (2 US gal/ac)		19 L/ha (2 US gal/ac)	
Pressure delta	34 kPa (5 psi)			
Gages toggle quick key selection	X		X	
<b>Product settings</b>				
Valve type	Pulse Width Modulation (PWM)		Pulse Width Modulation (PWM)	
Minimum pump PWM	36%		36%	
Maximum pump PWM	78%		78%	
Standby pump PWM	42%		42%	
Pump PWM frequency, Hz	50%		50%	
Minimum nozzle PWM	25%			
Flowmeter cal	User defined (reference tag on flowmeter)		User defined (reference tag on flowmeter)	
Response rate	20		17	
Deadband	1%		1%	
Product type	Water-based		Water-based	
<b>Pressure settings</b>				

6 - WORKING OPERATIONS



	<b>IntelliSpray™</b>	<b>Conventional</b>
Response rate**	70	24
Minimum pressure	<b>103 kPa (15 psi)</b>	<b>138 kPa (20 psi)</b>
Maximum pressure	<b>689 kPa (100 psi)</b>	<b>689 kPa (100 psi)</b>
Calibration summary		
Nozzle control Mode	Standard	Bypass
Section control	36 Virtual or nozzle level (if equipped)	Boom valve
Boom	vehicle specific	vehicle specific
NCV tip size	User defined	User defined
Bypass tip size	User defined	User defined
**Reference pressure response rate calibration recommendations chart		



**MILLER product control pressure response rate calibration recommendations**



RAIL16SP00412FA 2

1.	Pressure control 'response rate'
2.	Application flowrate, Gallons Per Minute (GPM)
	<b>IntelliSpray™</b> , standard and VP mode
	Conventional 'bypass, ON/OFF, and high-flow/high-flow VP mode

## Tank fill monitor operation (if equipped)

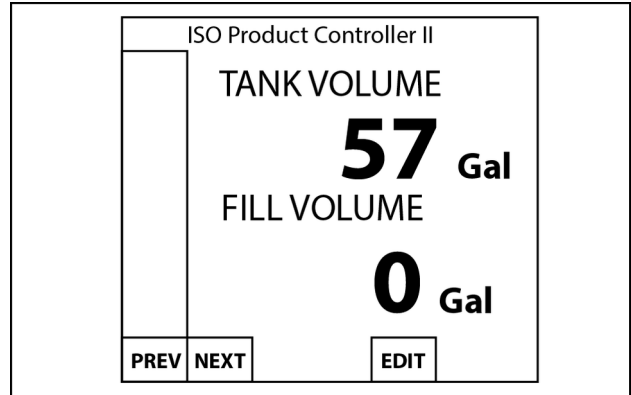
The tank fill monitor is an option that can be fitted to the vehicle and is used to monitor the filling of the product tank when using the snorkel fill system. This optional monitor does not communicate with the IntelliSpray™ monitor. Access the tank fill monitor by lowering the quick-fill door. The tank fill monitor is mounted to the topside of the quick-fill door frame. The tank fill monitor has four different screens that are accessible. They are: Home Screen, Fill Meter Cal Screen, Main Run Screen and Information Screen. The description of the screens is as follows:

### Home screen

**Tank Volume** - The amount of product currently in the tank.

**Fill Volume** - Amount of product added to the tank through the fill flow line.

**EDIT** - Press the EDIT button to open a screen to edit the tank volume.



RAIL16SP00239AA 1

### Main Run Screen

**Tank Capacity** - Displays the maximum tank capacity.

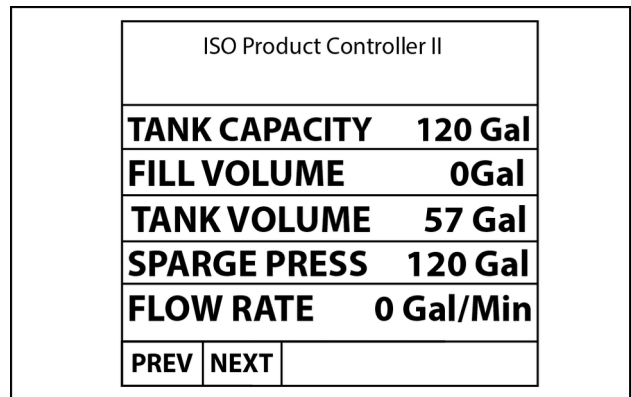
**Fill Volume** - Amount of product added to the tank through the fill flow line.

**Tank Volume** - The amount of product currently in the tank.

**Sparge Pressure** - Displays the product pump pressure (if available).

**Total Volume (not shown)** - The total amount applied. As the tank volume decreases, the total volume increases.

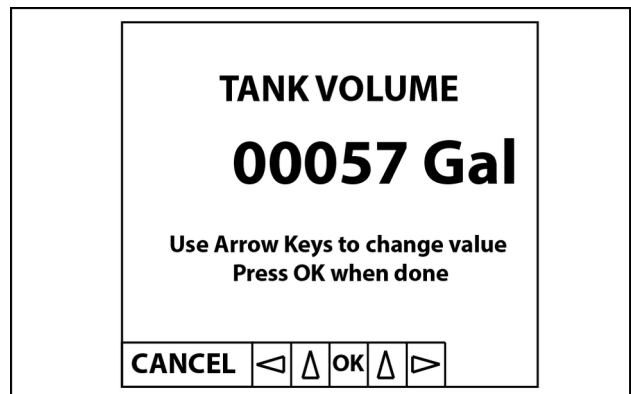
**Flow Rate** - Current flow rate of the product through the fill flow line.



RAIL16SP00241AA 2

### Fill Meter Cal Screen

Use the arrow keys to manually adjust the current tank volume. Press the OK button after adjusting.



RAIL16SP00240AA 3

### Information Screen

The information screen displays the hardware and software version information.

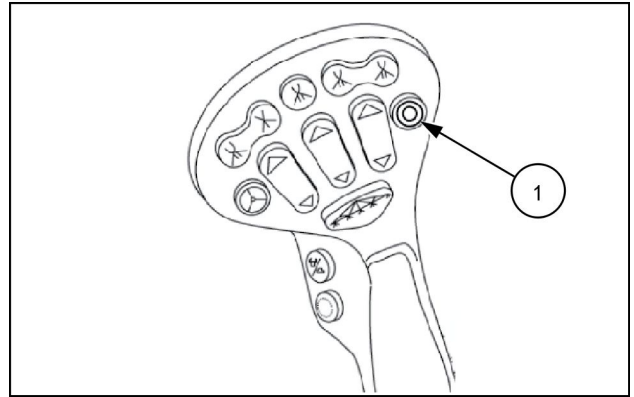
<u>MONITOR INFORMATION</u>	
<b>PART NUMBER</b>	<b>063-0173-638</b>
<b>SOFTWARE NUMBER</b>	<b>077-0171-392</b>
<b>SOFTWARE VERSION</b>	<b>1.1.4.1</b>
<b>MONITOR ADDRESS</b>	<b>0x15</b>
<b>SERIAL NUMBER</b>	<b>206995</b>
<b>INSTANCE</b>	<b>0</b>
<b>PREV</b>	<b>INST</b>

RAIL16SP00242AA 4

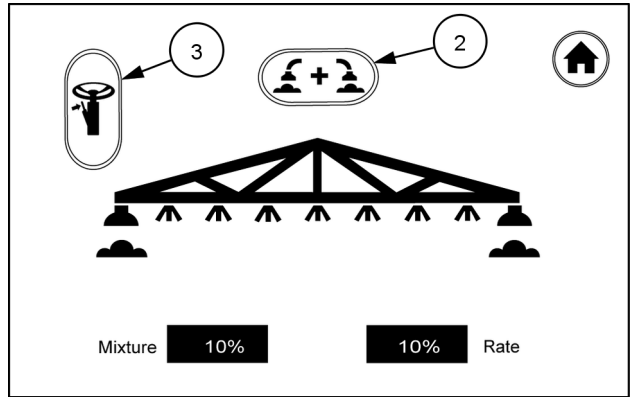
## Foam marker operation (if equipped)

The multi-function button (1) on the joystick will work as off-right-off-left-off by pressing in this order.

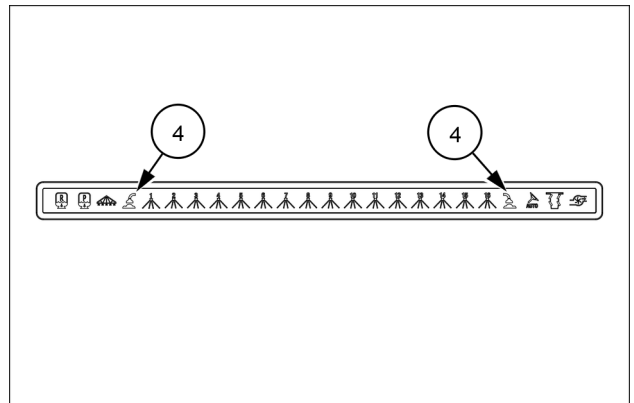
The multi-function button on the joystick will toggle both sides (off-both-off) when the dual foamer is turned on with the screen (2), and the turn signal lever icon on the screen has been activated (3). The appropriate foam marker icons (4) will illuminate in the front overhead display.



RAIL17SP00391AA 1

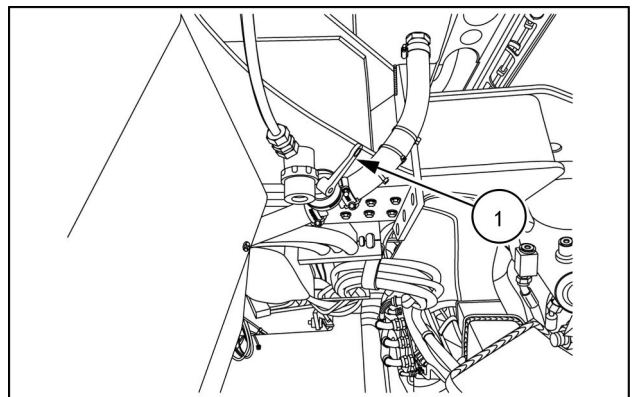


RAIL17SP00205AA 2



RAIL17SP00309FA 3

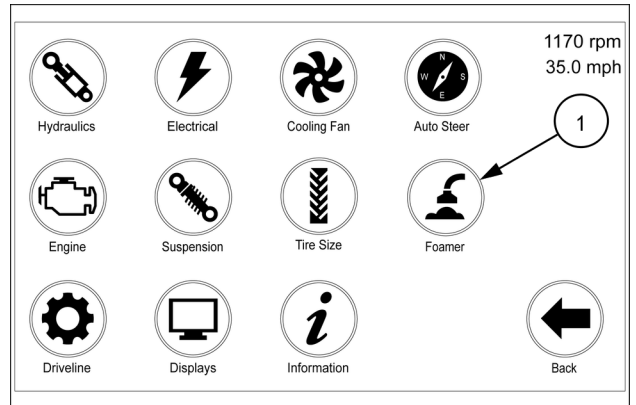
Turn on the foamer water supply valve (1) under the rinse water tank before operating the foamer. Turn the lever to open.



RAIL17SP00250AA 4

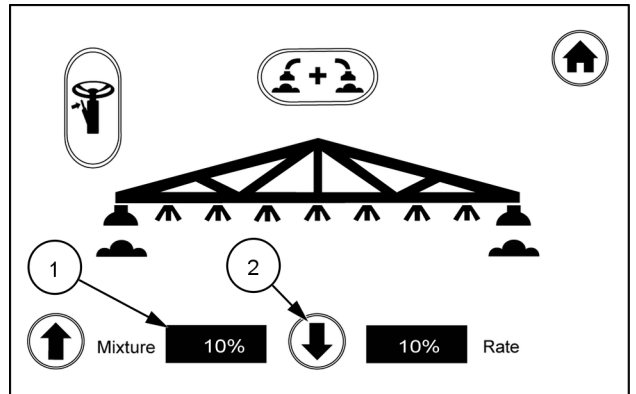
### Foamer Rate and Mixture

From the armrest display first home page touch the foamer icon (1). This will bring up the where you can select the turn signal lever control, dual foamer on/off icon, set the concentrate mixture and rate.



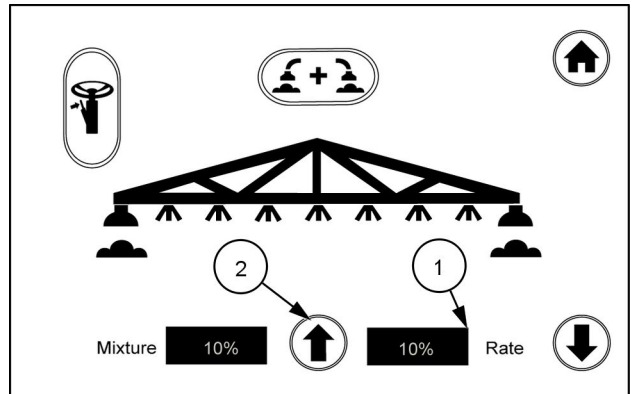
RAIL17SP00109FA 5

From the Foamer screen, touch the mixture icon (1), the up and down arrows will appear (2). Use the arrows to adjust the mixture from dry to wet, depending on conditions.



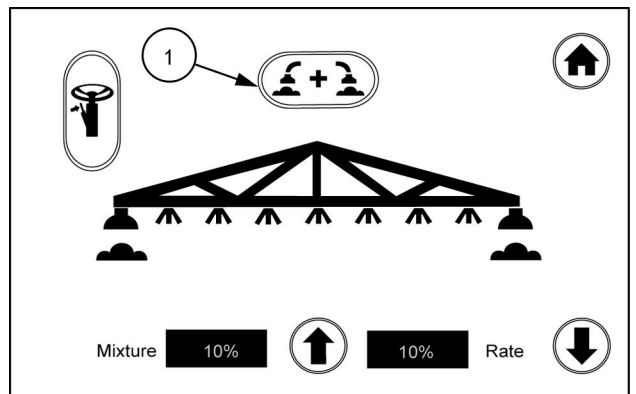
RAIL17SP00206AA 6

From the foamer screen, touch the rate icon (1) and the up and down arrows (2) will appear. Use the arrows to adjust the rate of the foam, depending on conditions.



RAIL17SP00207AA 7

From the foamer screen, touch the dual foamer (1) icon to turn the foamer on or off. With the dual foamer ON, the system ignores switch status (turn signal position) and continuously dispenses foam out both sides until button is cycled OFF.

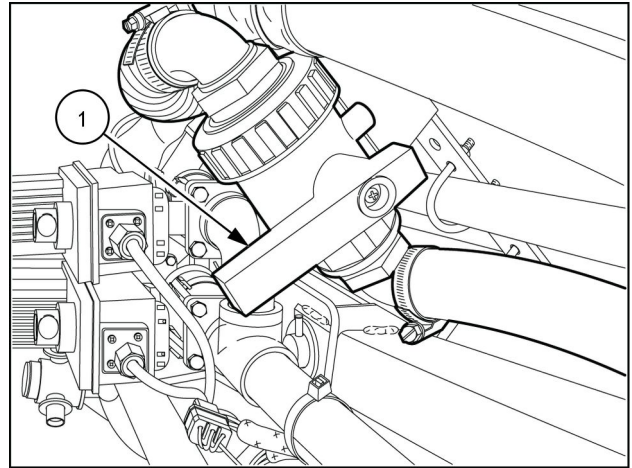


RAIL17SP00207AA 8

## 6 - WORKING OPERATIONS

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The second foam marker locations are turned on manually at the foam directional valve **(1)** on each boom. To direct foam to the second location (mid boom) the control valve has to be turned to direct foam to the second location. When foam is directed here the flow is shut off to the outer foam markers. The foam system is still controlled with the switches inside the cab.

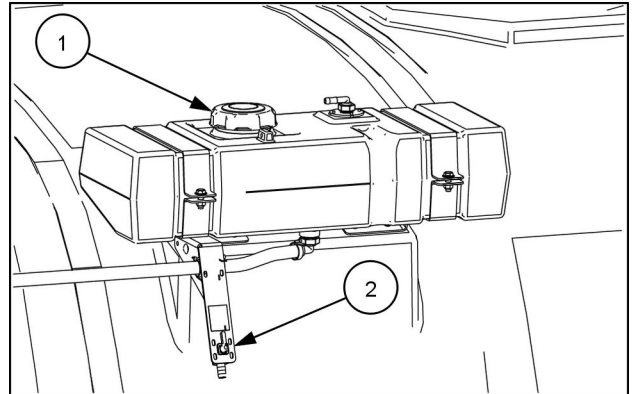


RCPH11SPR025BAM 9

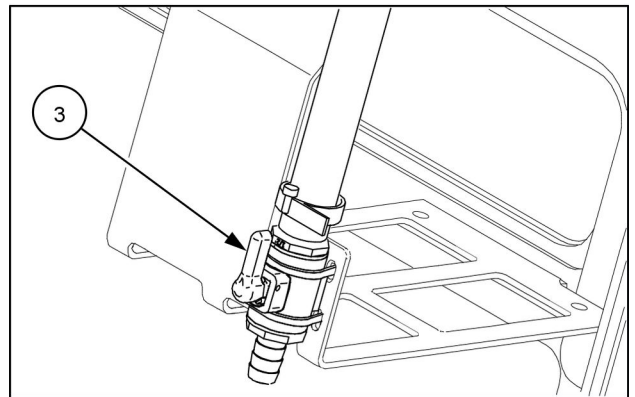
## Filling the tanks

### Hand rinse water tank

The hand rinse water tank is located on the rear left corner of the cab. Fill this tank with clean water only. Remove the lid (1), fill completely with clean water and replace the lid. The valve on the bottom of the tank (2) is used to dispense water for hand washing only. There is an additional dispensing valve (3) located on the Eductor door next to the remote control key pad.



RAIL17SP00697AA 1



RAIL17SP00699AA 2

### Rinse water tank

#### ⚠ WARNING

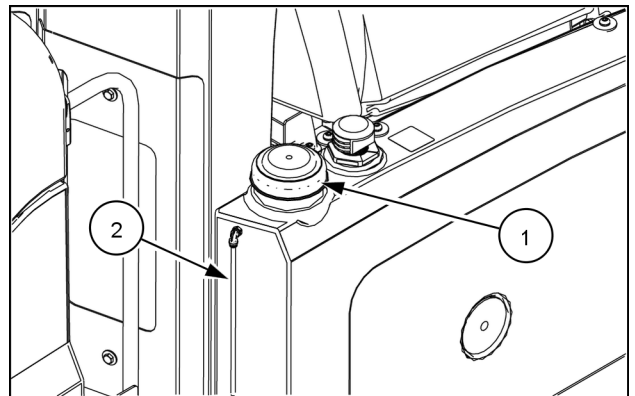
**Run-over hazard!**  
Place the hydraulic control in the neutral position and engage the parking brake before you fill the liquid tanks.  
Failure to comply could result in death or serious injury.

W1534A

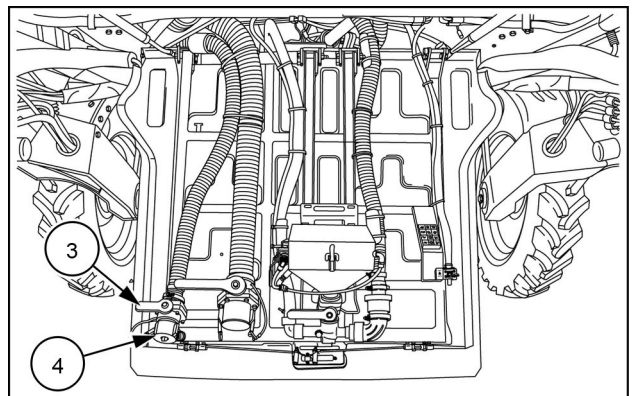
The 568 I (150 US gal) rinse water tank is used for rinsing of the product tank as well as supplying water to the foam marker system, chemical injection system rinse or eductor rinse. The tank is located on the right side of the product tank. The tank can be filled through the lid (1) at the top of the tank. The tank is equipped with a sight gauge (2) on the side of the tank for level of water in the tank. The fast-fill ball valve (3) for the rinse tank is located on the eductor/fast-fill (door) at the front of the frame. Close the product tank sump valve before filling. Attach the delivery hose to the rinse water hose coupling (4) to fill the tank. Be sure to close the fast-fill ball valve after filling.

**NOTE:** Do not fill through the larger line with the rinse sump open. Contamination of rinse tank may occur.

Be sure to close and latch the eductor/fast-fill (door) before operating.



RAIL17SP00700AA 3



RAIL17SP00868AA 4



**Product tank**

**⚠ WARNING**

**Misuse hazard!**  
 Your machine is equipped with an operator protective structure. **DO NOT** weld, drill holes, attempt to straighten, or repair the protective structure. Modification in any way can reduce the structural integrity of the structure. Failure to comply could result in death or serious injury.

W0001B

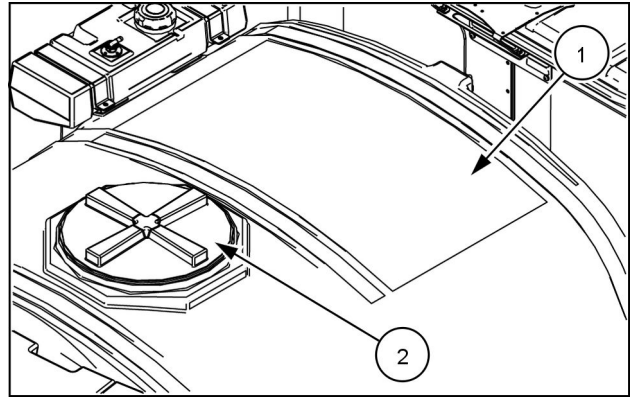
The product tank (1) is located at the mid point of the vehicle. The product tank can be filled through the product tank lid (2) at the top of the tank. Be sure to replace the lid when finished.

The product tank can also be filled using the product tank fast-fill valve (3) located on the eductor/fast-fill (door) at the front of the frame. Open the valve after the product delivery hose has been connected to the product tank hose coupling (4). Close the rinse water tank valve and open the product tank sump valve. Be sure to close the product tank sump valve and product tank fill valve before disconnecting the delivery hose.

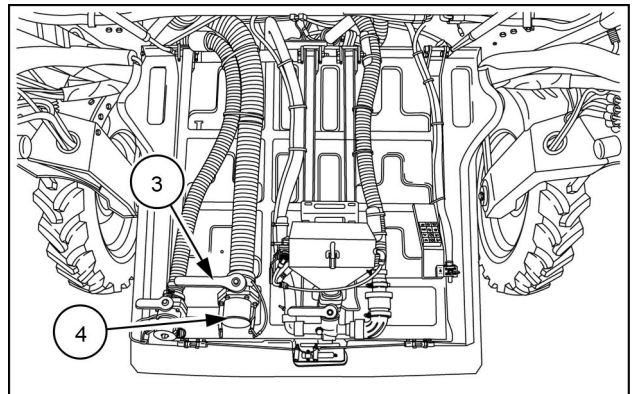
When filling from a nurse tank that does not have an on board pump, the bypass (valve) must be opened. The valve may be an electric valve using the key pad (5) or a manual valve (6). After the bypass (valve) is open press and hold the product pump button until the pump starts (approximately 5 seconds).

Close and latch the eductor/fast-fill (door) before operating.

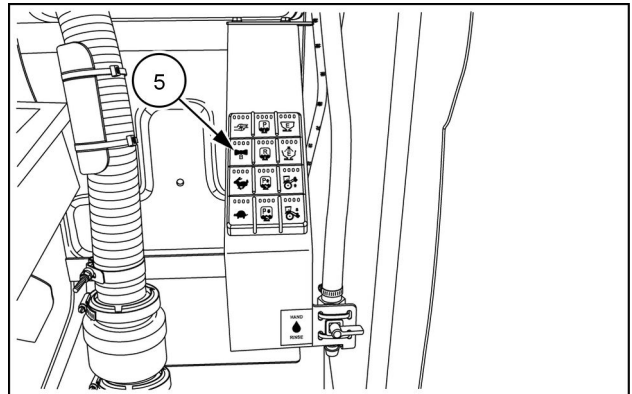
**NOTICE:** When traveling long distances between fields, be sure to close the product tank sump valve. Close this valve to prevent any accidental spilling of chemicals if a line should fail.



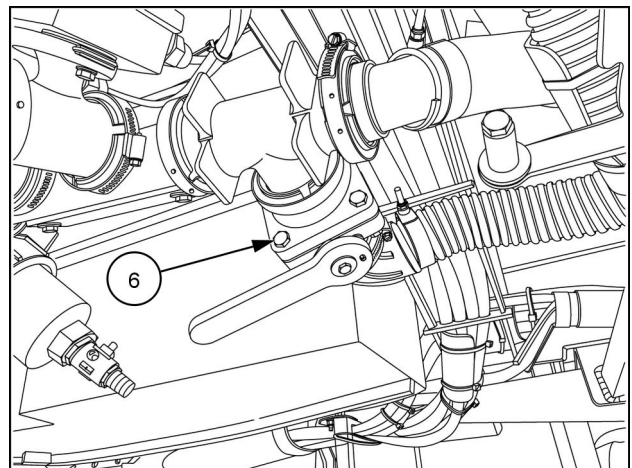
RAIL17SP00701AA 5



RAIL17SP00868AA 6



RAIL17SP00873AA 7



RAIL17SP01002AA 8



### Foam tank (if equipped)

1. Add foam concentrate only to the foamer unit tank through the foamer tank lid (1). The foamer will automatically mix the concentrate with water from the rinse water tank during application. Make sure the foamer water supply shut off valve (2) located under the rinse water tank is open.
2. An adjustment knob (3) and pressure gauge (4) is provided on the foamer unit/tank to regulate the pressure of the foaming system. Increasing the pressure will result in dryer foam.

**NOTICE:** The filter element in the strainer (5) under the rinse water tank may require periodic cleaning, depending on condition of the water inside the rinse tank. Clean as necessary.

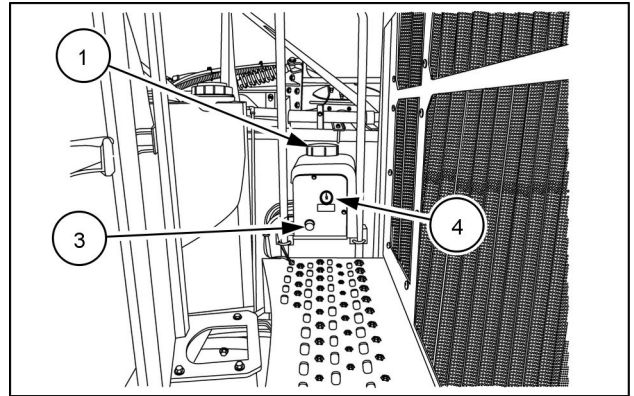
3. If hard water is a problem, commercial softening agents are available. You can make your own softening agent by dissolving a commercial water softening powder (available in most grocery stores) in hot water and adding a portion of this mixture to your tank each time you fill. Experimentation will reveal the correct amount to use. A good starting point is **44.4 mL (1.5 US fl oz)** per gallon of water.
4. Heat, humidity, wind and crop cover will also affect the life of foam. Using a good quality marking agent, such as **Goodmark™ Premium Foam Concentrate** may be very important.

**NOTE:** Always completely rinse the foam system before changing brands of foam marking concentrate.

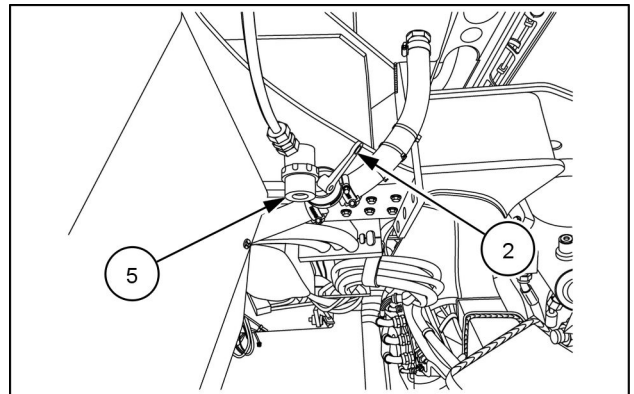
**NOTE:** **Goodmark™ Premium Foam Concentrate**, "hot weather" foam concentrate has up to one hour life in cooler weather, **20 – 40 min** in hot weather and has good hard water tolerance.

### Injection tanks (if equipped)

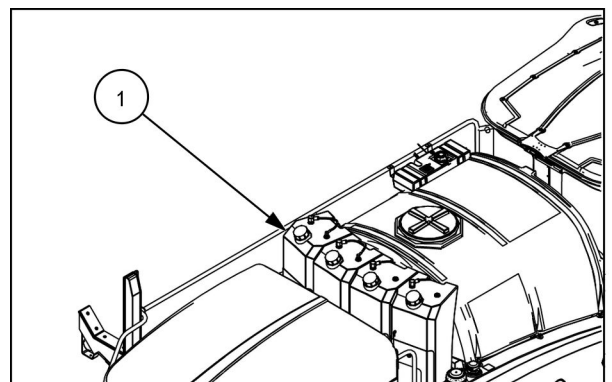
1. Vehicles equipped with the injection system will have different configurations for the injection system tanks (1). Up to four tanks may be present.



RAIL17SP00249AA 9



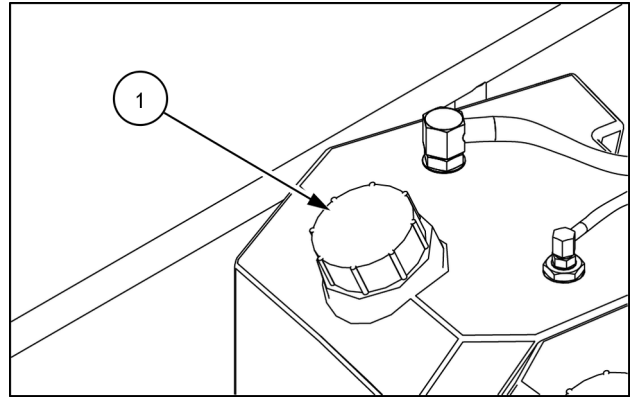
RAIL17SP00250AA 10



RAIL17SP01072AA 11

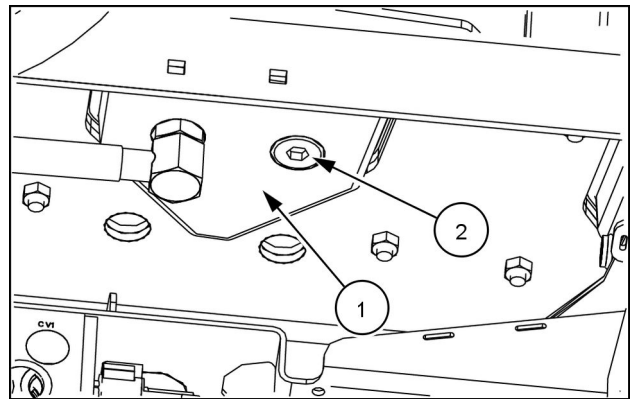
## 6 - WORKING OPERATIONS

2. Remove the tank cap **(1)** to fill the tank with the desired fluid. Replace the cap after filling. Each tank holds **189 L (50 US gal)**.



RAIL17SP01071AA 12

3. Drain the injection tanks by accessing the bottom side of the tank **(1)**. Remove the drain plug **(2)** and drain the tank fluid into a suitable container. Replace the drain plug after draining the fluid from the tank  
Repeat for all injection tanks present.



RAIL17SP01073AA 13

## Chemical eductor operation (if equipped)

### **⚠ WARNING**

**Chemical hazard!**

**Wear protective clothing and a face shield when working with chemicals. Do not allow chemicals to contact skin or eyes. Always follow the chemical manufacturer's instructions.**

**Failure to comply could result in death or serious injury.**

W0052A

### **⚠ WARNING**

**Inhalation hazard! Risk to operators and bystanders.**

**For protection against hazardous dust, aerosols, and vapors, refer to the instructions provided by the chemical agent supplier, the sprayer manufacturer, and the basic rules contained in this manual.**

**Failure to comply could result in death or serious injury.**

W0043A

### **⚠ WARNING**

**Chemical hazard!**

**Always wash your hands with clean water from the hand rinse tank after handling chemicals.**

**Failure to comply could result in death or serious injury.**

W1134A

### **⚠ WARNING**

**Chemical hazard!**

**Use caution when opening the eductor valve to avoid being splashed with agricultural chemicals.**

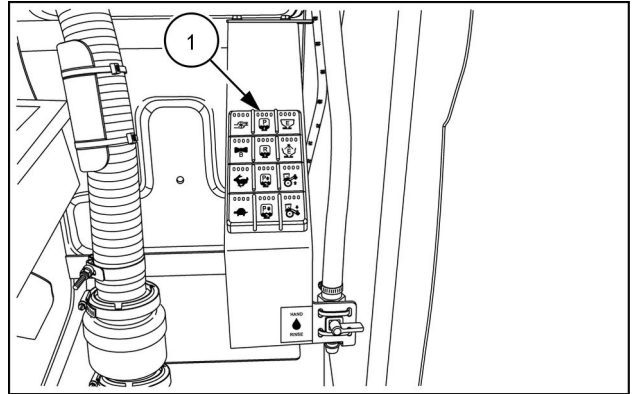
**Failure to comply could result in death or serious injury.**

W1135A

A chemical eductor is available for filling the product tank with the required chemicals from the ground level.

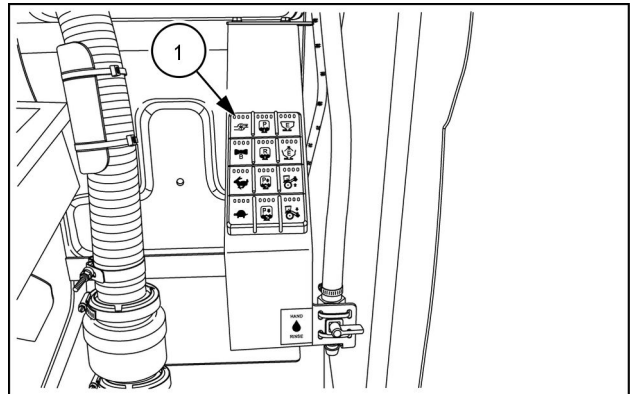
**NOTE:** Shut all the boom controls off before operating the chemical eductor.

1. Fill the product tank with **757 – 1893 l (200 – 500 US gal)** of water. Refer to **6-35**.
2. Unlatch and lower the chemical eductor door down to the operating position.
3. Press product tank sump button **(1)** to open the product tank sump.



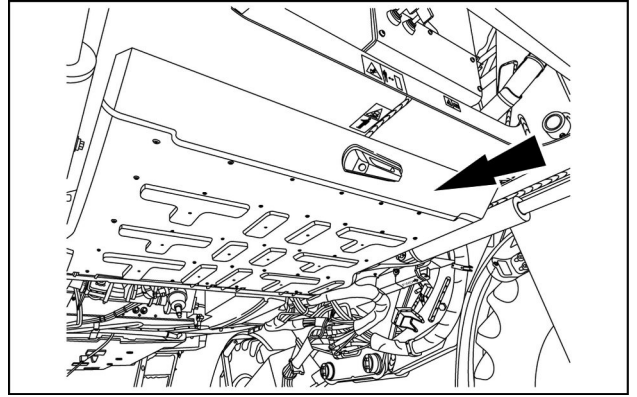
RAIL17SP00873AA 1

4. Press product pump button **(1)** to start the product pump and maintain at least **50 psi** system pressure.

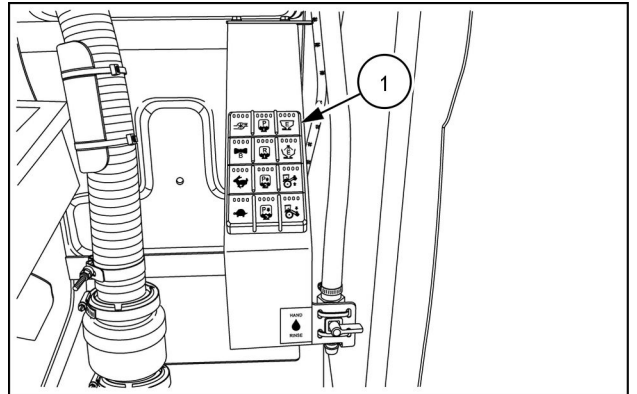


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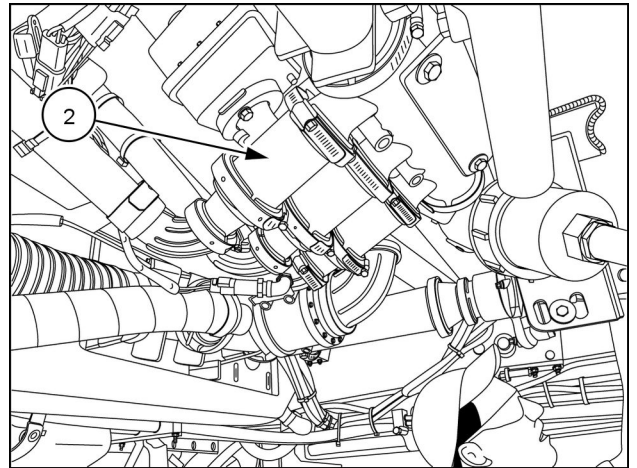
5. To operate the eductor, on the left-hand side of the eductor door, locate the eductor switch (1) on the key pad. Actuate the switch to close the dump valve, increase the hydraulic flow to the product pump to 100%, open the valve to the tank, and move the throttle to the mid range. The pressure side valve (2) for the eductor will open when the eductor switch on the key pad is activated located between the eductor and the product pump.



RAIL17SP00867AA 3

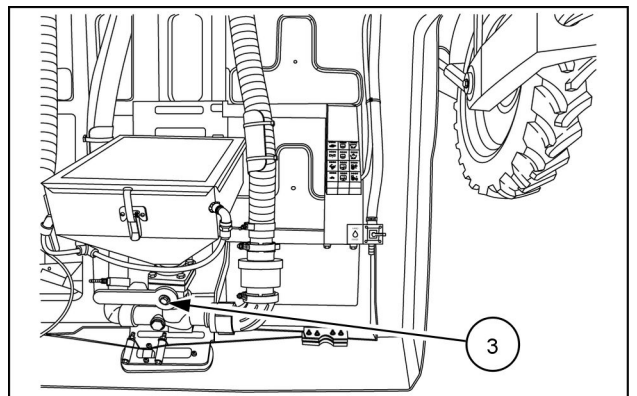


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RAIL17SP01001AA 5

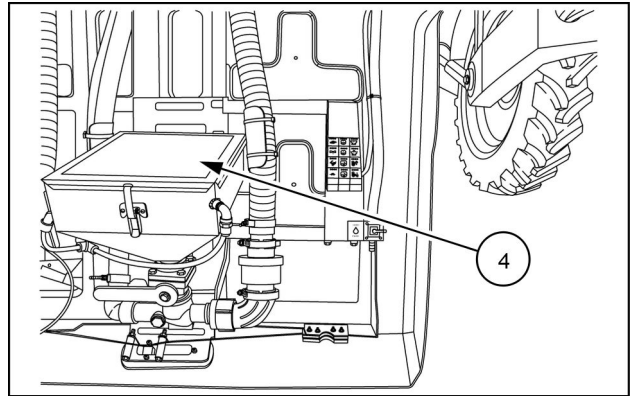
6. To transfer chemical from the eductor to the product tank, open the main valve (3) on the front of the eductor.



RAIL17SP00870AA 6

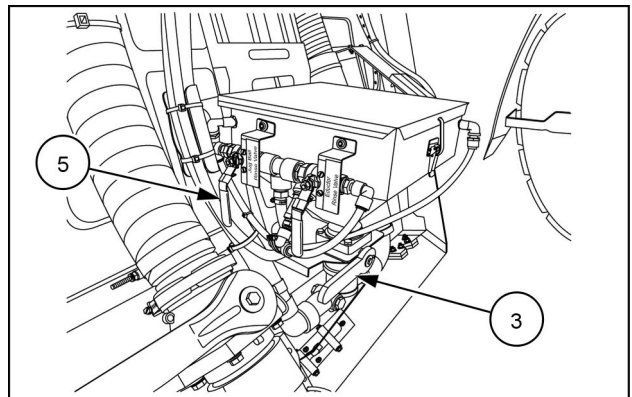
## 6 - WORKING OPERATIONS

7. Open the lid **(4)** of the eductor and carefully fill with required amount of chemical.



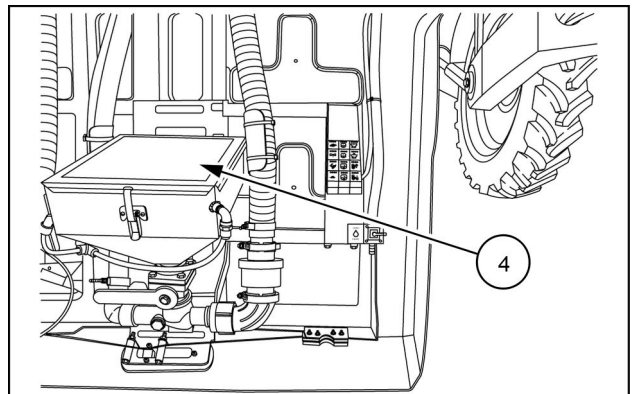
RAIL17SP00870AA 7

8. To rinse the chemical jug, place the jug over the rinse ball inside the eductor. With the pressure side valve and main eductor valve **(3)** open, use the jug rinse valve **(5)** to rinse the inside of the container.



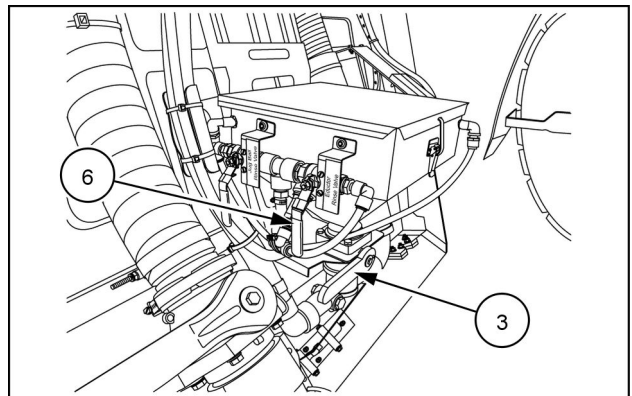
RAIL17SP00871AA 8

9. Close the eductor lid **(4)** when all chemicals have been transferred and for rinsing the inside of eductor.



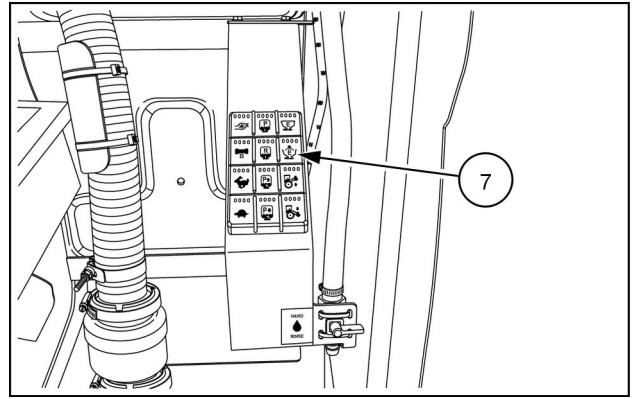
RAIL17SP00870AA 9

10. With the product pump running and the pressure side valve and main eductor valve **(3)** open, the inside of the eductor can be rinsed with the eductor rinse valve **(6)** on the side of the eductor. Be sure lid is closed during rinsing of eductor.



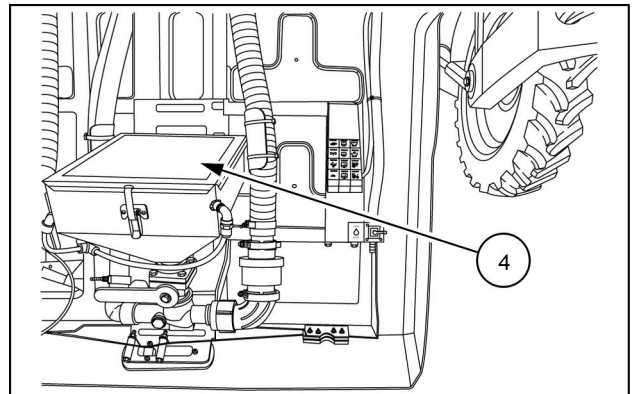
RAIL17SP00871AA 10

11. To supply clean water for rinsing, touch the eductor rinse button **(7)** on the key pad to turn the electric rinse pump (if equipped) on.

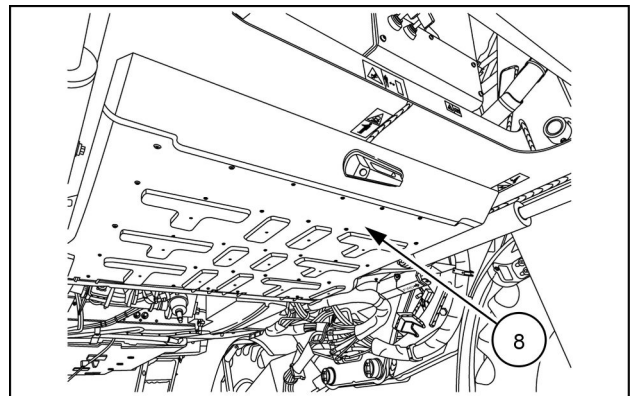


RAIL17SP00873AA 11

12. When transfer of chemicals and rinsing is complete, close all eductor valves. Turn off the eductor rinse on the key pad. Press the eductor button on the key pad to turn the eductor system off.
13. Close and latch the eductor lid **(4)**. Latch the eductor door **(8)** up in the transport position before moving the sprayer.



RAIL17SP00870AA 12

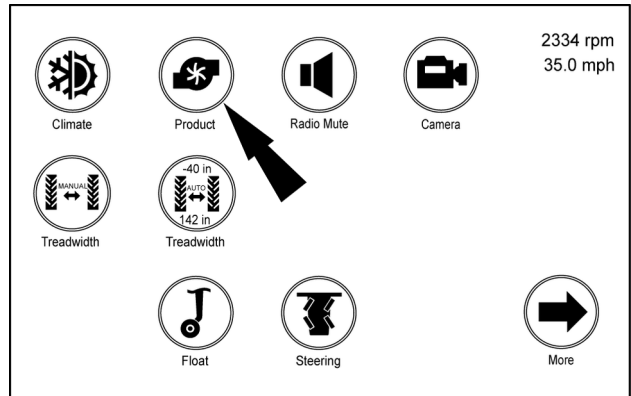


RAIL17SP00867AA 13

# Agitating the product tank

## Product circuit icon and screens

From the armrest first home display touch the product icon to bring up the product screen.

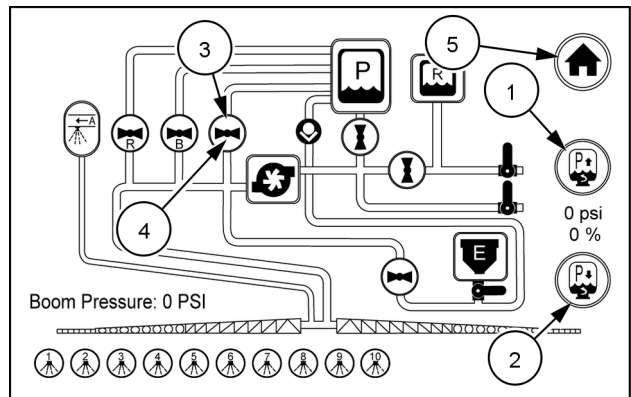


RAIL17SP00184AA 1

From this screen you can adjust the sparge pressure up or down as needed by touching the sparge up icon (1) or sparge down icon (2) to prevent foaming in the product tank and to keep the chemical in suspension. You can also adjust the sparge by touching the sparge valve icon (3) to open or close the valve.

When a valve is open, the icon will turn green and be parallel with the flow in that line. When a valve is closed (4) it will turn red and be perpendicular to the flow in that line.

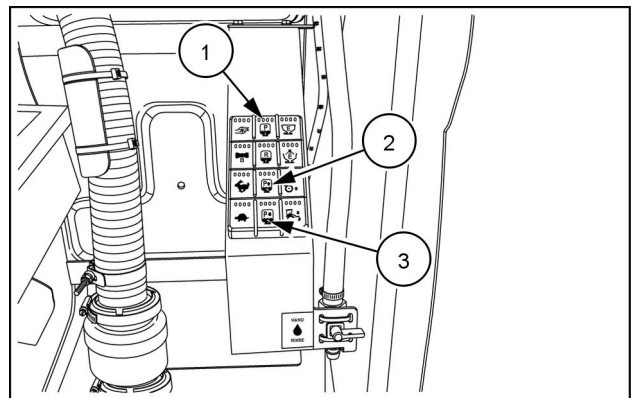
Once all the settings are complete, touch the "Home" icon (5) to return to the home page.



RAIL17SP00183AA 2

The sparge can also be adjusted up or down by using the remote key pad (1) mounted to the eductor/fast-fill door at the front of the frame. Touch the sparge increase button (2) to increase the sparge pressure. As the sparge increases the four lights at the top of the button will illuminate in sequence to show increase in pressure. These lights will correspond with the percentage on the screen.

Touch the sparge decrease button (3) to decrease the sparge pressure. As the sparge decreases the four lights at the top of the button will illuminate in sequence to show decrease in pressure. These lights will correspond with the percentage on the screen.



RAIL17SP00873AA 3



## IntelliSpray (optional)

**NOTE:** Refer to the software guide supplied with the system for full set-up and operating instructions.

**IntelliSpray™** uses pulse width modulation technology and standard spray tips. It works along with the rate controller to give the operator independent control of speed, flow rate and pressure. This technology provides for greater operator convenience and improved application practices.

**NOTICE:** Disconnect the power wires or pull the **IntelliSpray™** fuses at the battery before jump starting or welding on the sprayer to prevent damage to the **IntelliSpray™** components.

**NOTICE:** If the machine is equipped with **IntelliSpray™**, install 80 mesh boom strainer screens. Check boom strainers on a regular basis to keep them clean and flowing correctly.

**NOTICE:** Frequently wash the boom and valves with low pressure spray to remove dirt and fertilizer to help prevent corrosion of the valve housings. Do not wash the boom with high pressure spray; the high pressure spray can force fertilizer and other corrosive materials into connectors and housings, causing corrosion and failures.

### IntelliSpray™ Nozzle Control Valves (NCV)

Each nozzle body is equipped with a Nozzle Control Valve (NCV). The Nozzle Control Valves (NCV) control flow by varying the duty cycle (on time/off time) of the pulses, when used with a rate controller the flow control is done automatically.

Each Nozzle Control Valve (NCV) should make noticeable clicking sound and can be operated without flow to the boom section.

### Rate Controller settings

**IntelliSpray™** works with the rate controller. Use the rate controller settings as shown in Spray system operation for machines equipped with **IntelliSpray™**:

### Drift control

#### **▲ WARNING**

##### **Chemical hazard!**

**Wear protective clothing and a face shield when working with chemicals. Do not allow chemicals to contact skin or eyes. Always follow the chemical manufacturer's instructions.**

**Failure to comply could result in death or serious injury.**

W0052A

**IntelliSpray™** is designed to allow for independent flow and pressure control. This feature allows for pressures to be modified as necessary to allow droplet size changes on the go. It is best to select the target pressure to get the target droplet size desired for the product that is being used. Then, using the pressure set-point function, set the second pressure at a suitable pressure that offers coarser droplets for drift sensitive areas. This allows the target pressure and target droplet sizes to be used where efficacy is the priority and for lower pressure and larger droplets to be used when drift control is the priority.

### Coverage

**IntelliSpray™** overcomes skipping by several methods; one is that there are two control signals being used to control the pulsing Nozzle Control Valves (NCV). This allows for adjacent nozzles to be one half of a cycle out of phase. The second is to recommend **110°** tips for **100%** overlap. If **80°** tips are selected, the boom must be operated at a height which provides **100%** overlap. The third is the fact that the spray pattern fans out from the front to back as it moves from the tip to the ground, this coupled with the ground speed and wind turbulence combine to form "Blended Pulse Spraying".

### Tip selection for IntelliSpray™

Tip selection with **IntelliSpray™** is simple. **IntelliSpray™** will work with most common agricultural tips on the market with the exception of the air induction nozzles. The air venturi of these tips does not work with the rapid pulsing. Do not use air induction tips with **IntelliSpray™**.

Select the tip that allows you to spray the rate and speeds at the lowest desired spray pressure. It is important to remember that **IntelliSpray™** can only reduce the flow from a nozzle, so always oversize the nozzles. A good rule of thumb is, "Double the size (flow rate) of the spray tip you would have used, if spraying conventionally (without **IntelliSpray™**)".

Use the spray chart included in the documentation packet that came with your machine to select a spray tip for your application. Select the tip size based on rate and speed; select the tip style based on droplet size and coverage, then select tip.

Spray tip angle and tip overlap are always important; however, with **IntelliSpray™** and the pulsing nozzles they are even more important. It is recommended to use **110°** tips when possible. If **110°** tips are not available in the style you desire, **80°** tips can be used if the boom is set at a height that provides **100%** overlap of the spray pattern.

### **IntelliSpray™ start up/shut down procedures**

#### **⚠ WARNING**

##### **Chemical hazard!**

**Misuse including excessive application rate, uneven application, spray drift, and label violations can cause injury to crops, livestock, persons, and the environment. Follow all instructions on the container label. Always operate spray equipment according to the chemical manufacturer's instructions. Failure to comply could result in death or serious injury.**

W0053A

#### **⚠ WARNING**

##### **Avoid injury!**

**Use Personal Protective Equipment (PPE), including protective goggles, gloves, and safety footwear. Failure to comply could result in death or serious injury.**

W1036A

#### Start Up:

1. Start the sprayer.
2. Turn On the rate controller. Verify the Rate 1, Rate 2 and pressure response settings.
3. With the throttle at an idle, engage pump.
4. Confirm **IntelliSpray™** is in Automatic control mode.
5. Move the throttle to half.
6. Pressure should move to the pressure set point.
7. Touch the **IntelliSpray™** pressure gauge to activate soft keys on the right-hand side of the rate controller until increase (+)/decrease (-) buttons are shown. Press +/- to increase the pressure to set the desired pressure.
8. Touch the **IntelliSpray™** pressure gage again until the pressure set-point soft keys are displayed (default is **138 kPa (20 psi)** and **414 kPa (60 psi)**), pressure should move to the second pressure set point.
9. Touch the first pressure set-point soft key, the pressure should move back the first set pressure.
10. Touch the second pressure set-point soft key to return to the second set pressure.
11. Move the throttle to full, pressure should jump then return to the set point.
12. You are ready to spray. Turn On your booms and spray.

**NOTICE:** Flush the boom with clean water daily to insure proper operation of the **IntelliSpray™** Nozzle Control Valves (NCV).

#### Shut down:

1. Turn Off booms.
2. Turn the pump Off.
3. Turn the rate controller Off.
4. Shut Off the machine.

## Learning to use IntelliSpray™

Make sure to understand how to use the spray rate controller (see the controller operators manual).

Use the following procedure for testing the system:

1. Estimate the speed and application rate and desired spray pressure.
2. Check to see that the nozzle tips are oversized for the average rate at the above conditions.
3. Fill the tank with water, drive unit at average speed.
4. Set spray pressure at what is normally used.
5. See if the rate controller can maintain the desired rate. If not, change nozzle tips or adjust pressure to correct.
6. Use the controller to boost the application rate upward and downward to cover the desired control range. If you cannot achieve the desired range, change nozzle tips or pressure settings.
7. Once the range is set, go back to the average desired spray rate, drive along and vary the pressure to see the range of droplet sizes possible.
8. Once the pressures and rates are set, drive along and vary the ground speed. See that **IntelliSpray™** maintains the pressure and droplet size while making flow corrections for the speed changes.

## Nozzle Control Valves (NCV) troubleshooting

Plugged Nozzle Control Valves (NCV) can be classified into two categories; plunger blockage, and plunger stuck. Plunger blockage occurs when larger debris catches between the orifice and plunger seal. This is the smallest flow passage within the Nozzle Control Valve (NCV). Stuck plungers occur when smaller debris collects around the barrel of the plunger and binds the plunger in place. Symptoms of a blocked or stuck plunger are; constant spray, and dripping when the nozzle is shut off. Pinched or split O-rings will also cause the nozzles to drip when shutoff.

Operating a plugged Nozzle Control Valve (NCV) for an extended period of time may result in a Nozzle Control Valve (NCV) coil failure. Immediately clean any plugged Nozzle Control Valves (NCV). If plugged nozzles or nozzle valves are a frequent problem in a particular boom section, inspect the machine's boom filter screens for plugged or damaged screens. An 80 mesh screen is recommended to reduce occurrence of plugged valves. Check the mesh size of the strainers and replace strainers if they are too coarse or damaged. Reference **IntelliSpray™** operator manual for additional nozzle solenoid diagnostics and troubleshooting details.

## Nozzle Control Valve (NCV) cleaning

### ⚠ WARNING

#### Chemical hazard!

**Wear protective clothing and a face shield when working with chemicals. Do not allow chemicals to contact skin or eyes. Always follow the chemical manufacturer's instructions.**

**Failure to comply could result in death or serious injury.**

W0052A

### ⚠ WARNING

#### Pressurized system!

**System is still under pressure. Release pressure according to instructions in this manual.**

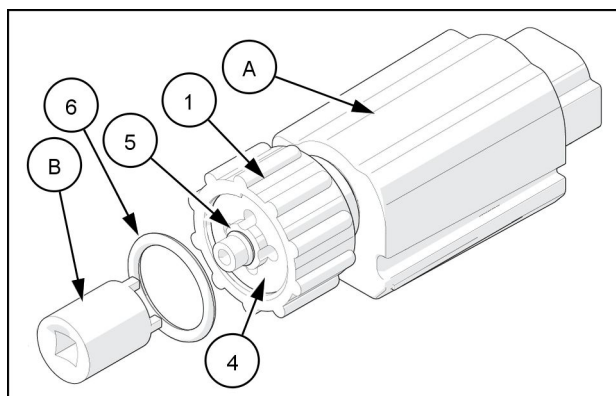
**Failure to comply could result in death or serious injury.**

W1044A

1. Turn the rate controller off.
2. Disengage the product pump.
3. Turn off the engine and remove the key from the unit.
4. Release the pressure from the sprayer lines by slowly loosening a sprayer bar end cap, opening a flushing valve, or similar fitting.

**NOTE:** Before removing or installing nozzle valves, ensure that the pressure has been released from the sprayer lines.

5. Loosen the fly nut (1) and remove the nozzle control valve (A) from the nozzle body.



RAIL16SP00353AA 1

6. Inspect the large O-ring **(6)** on the face of the valve body **(4)**. Replace if necessary.
7. Inspect the small O-ring **(5)** on the tip of the valve body **(4)**. Replace if necessary.
8. Using a valve body removal tool **(B)**, loosen and remove the valve body **(4)** from the nozzle control valve.
9. Inspect the O-ring **(3)** on the inside of the valve body. Replace if necessary.
10. Clean and inspect the plunger assembly **(2)**. Replace the plunger assembly if the rubber seal is worn or damaged. Refer to the following section on plunger seal inspection.
11. Inspect fly nut **(1)**. Replace if worn or damaged.
12. Remove any debris from the nozzle components by washing the components in clean water. Reassemble the nozzle components

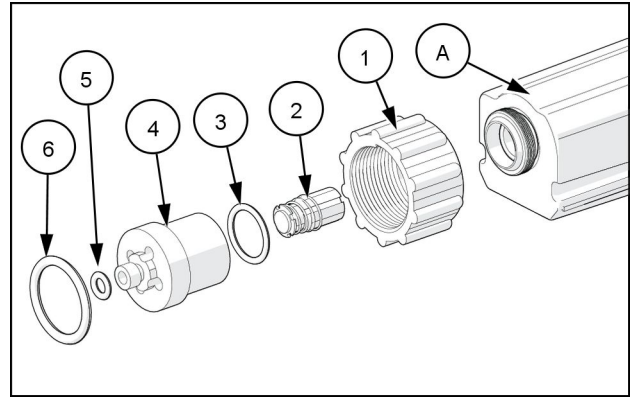
**NOTE:** Refer to ISO Product Control operation manual for additional maintenance and testing procedures.

### Plunger seal inspection

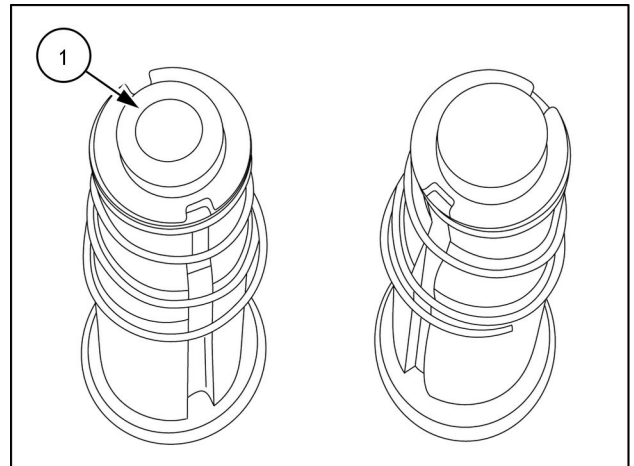
After extended use, the soft plunger seal **(1)** will develop a wear groove at the location where the seal impacts the hard orifice seat.

As the groove deepens, the pressure capacity of the valve will decrease until it interferes with the operating pressure of the sprayer.

The system will operate normally at lower pressures until replacement parts can be acquired. High operating pressures and abrasive spray solutions will accelerate the wear of the plunger seal material.



RAIL16SP00352AA 2



RAIL13SP04058AA 3

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## Clean up at end of operation

**NOTE:** It is recommended that the sprayer be washed after the application of any pesticides, herbicides, fungicides, etc. Wash the sprayer to reduce the potential of operators coming in contact with the pesticides, herbicides, fungicides, etc.

**NOTICE:** If using a pressure washer to clean the vehicle, be careful not to pressure wash the node areas under the cab or the electrical box containing nodes on the frame next to the engine. The node areas are identified by a decal stating do not pressure wash.

Chemicals cause corrosion. It is also dangerous to allow certain chemicals to contaminate each other. Therefore, thorough clean up is required at the end of each operation.

1. The first step to simplify clean up problems, is to plan to use up all the chemical in the tank at the end of the spraying job. If all the chemical is not used up, you must drain the product from the product tank. Connect a feeder hose to the "product tank fast-fill" coupler. Close the boom valves. Open the "product tank fast-fill" valve and drain the chemical back into a suitable sized tank or container. Small amounts of chemical can be drained back into containers/tank for temporary storage. Close the product tank fast-fill valve.
2. After the product tank is empty, Close the main product tank sump valve. Open the rinse tank valve, but leave the boom valve closed.
3. Open the rinse line valve and turn on the product pump. This will force clear water through the rinse tube to the top of the product tank and wash down the sides of the tank. Then close the rinse line valve and open the sparge valve to clean the sparge lines. When you have enough rinse water in circulation, shut off the rinse tank valve, eductor valve and by pass valve. Conserve the clean rinse water in the rinse tank because it may be necessary to repeat the rinse cycle several times.
4. Thoroughly rinse the chemical eductor if so equipped by opening the eductor valve and the pressure side valve between the product pump and eductor.
5. Shut off both the rinse and sparge lines and open the boom valve. Open the sump valve and pump the rinse water from the product tank, through the product pump, boom lines and nozzles. Always spray the rinse on the field. Keep the chemical product in the field where it was used.
6. Start over with Step 2 and rinse again. Do this thoroughly. Some chemicals cannot be contaminated with each other and it is usual in these cases to do the rinse procedure five to six times, using up all the water in the rinse tank.
7. If this is an end of the season clean up, drain the product tank sump completely by removing the drain plug or hose in the sump. Remove the bottom volute pipe plug from the bottom of the pump to drain the pump completely. Crack open the end drains on the boom pipes and remove the drain plugs in the boom line filters to remove all liquid. Remove the drain plug from the "Y" strainer to drain the strainer.
8. If conditions are freezing, you may want to charge the lines with **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F**. Add the antifreeze to the rinse tank, per label instructions. First pump the antifreeze with the rinse tank, sparge line and rinse lines, eductor lines and by pass lines open. Keep all the boom valves closed. Then open the boom valves and pump until the **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F** comes out of the spray nozzles. All wet system lines should now be charged. Close the boom valves.
9. Rinse the foamer reservoir with water and drain completely. Drain the complete foamer system.
10. If conditions are freezing, add **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F** to the tank. Do not use windshield washer fluid because it can clog the foamer. Turn on machine and system until antifreeze reaches each foam head.

## Flush product pump after use

**NOTICE:** To avoid damage to the pump, NEVER run the pump dry. Always be sure there is liquid in the pump before starting.

One of the most common causes for faulty pump performance is "gumming" or corrosion inside the pump. Flush the pump and entire system with a solution that will chemically neutralize the liquid pumped. Mix according to the manufacturer's directions. This will dissolve most residue remaining in the pump, leaving the inside of the pump clean for the next use.

After cleaning the pump as directed above, flush it with **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F**. Plug the ports to keep out air during storage. For short periods of idleness, noncorrosive liquids may be left in the pump, but air must be kept out. Plug the ports or seal the port connections.

## Auto-rinse operation (if equipped)

### ⚠ CAUTION

**Chemical hazard!**

Wear protective clothing and a face shield when working with chemicals. Do not allow chemicals to contact skin or eyes. Always follow the chemical manufacturer's instructions.

Failure to comply could result in minor or moderate injury.

C0101A

### ⚠ CAUTION

**Hazardous chemicals!**

Drain the machine only after it has been rinsed. Rinse the machine while still in the field. Never contaminate the farmyard or drainage system with rinse. Spray the rinse water thinly over the field you already sprayed.

Failure to comply could result in minor or moderate injury.

C0040A

**NOTICE:** Lower booms all the way down and completely unfold booms before rinsing.

**NOTICE:** The operator is responsible for the cleanliness of the sprayer circuit and for the full rinsing of the system.

**NOTICE:** The sprayer must have the engine running to perform any of the Auto-rinse functions.

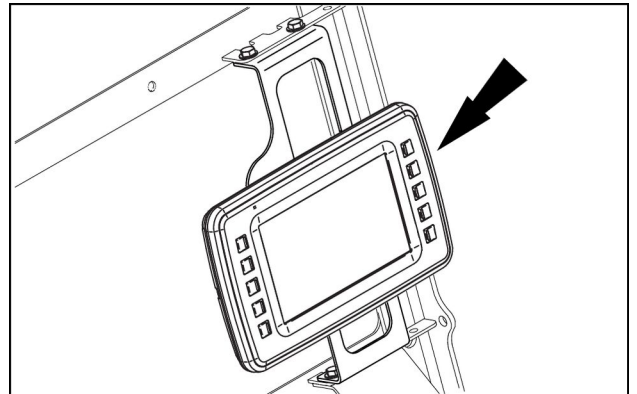
**NOTICE:** Fill the rinse tank with clean water before you perform the rinse functions.

**NOTICE:** When using the Auto-rinse display panel to perform rinsing functions, attach the product tank fill hose to appropriate supply/discharge equipment.

Emptying the rinse water from the product tank will be performed through the product tank fill hose.

### Auto-rinse display operation

The Auto-rinse display panel is attached to the quick-fill door frame located at the front underside of the vehicle.

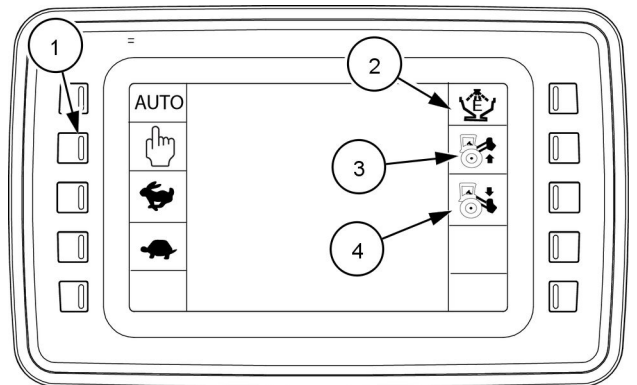


RAIL17SP01460AA 1

### Manual mode

Press the Manual mode auto-rinse button (1) to place the auto-rinse function into the manual mode. The Product circuit screen displays.

There are three icons on the right-hand side of the screen. They are eductor wash (2), remote lift arm raise (3), and remote lift arm lower (4). Refer to 3-50 for button operation.



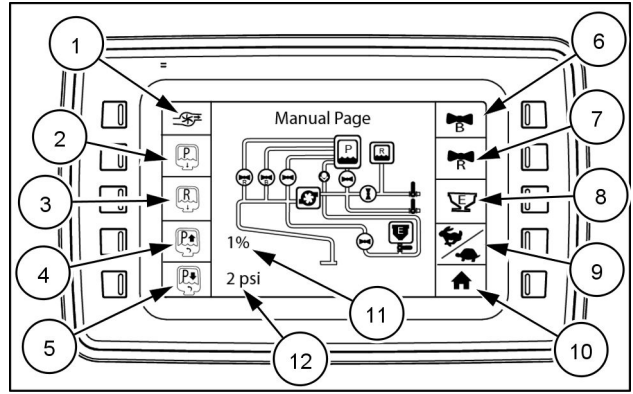
RAIL17SP01569FA 2

The Manual control mode product circuit page provides the operator with the means of controlling the rinsing system manually.

Press the desired rinse buttons to manually control product tank rinse or Eductor rinse.

The rinse function buttons present on the display control are:

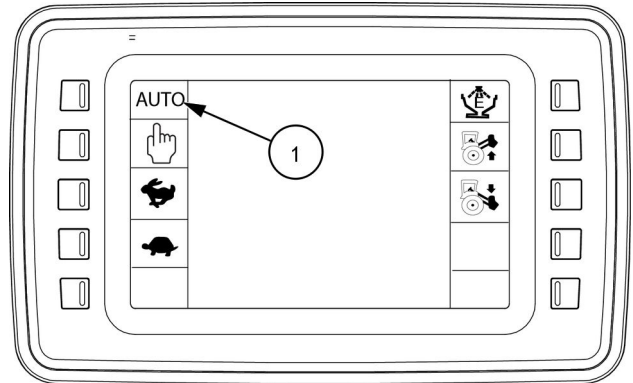
1. Product pump start/stop
2. Product tank sump valve
3. Rinse tank sump valve
4. Product tank sparge open
5. Product tank sparge closed
6. Bypass valve open/close (if equipped)
7. Rinse valve open/close
8. Eductor valve open/close
9. Throttle up/down
10. Home button
11. Sparge position (monitoring only)
12. Sparge pressure (monitoring only)



RAIL17SP01594AA 3

**Auto Mode**

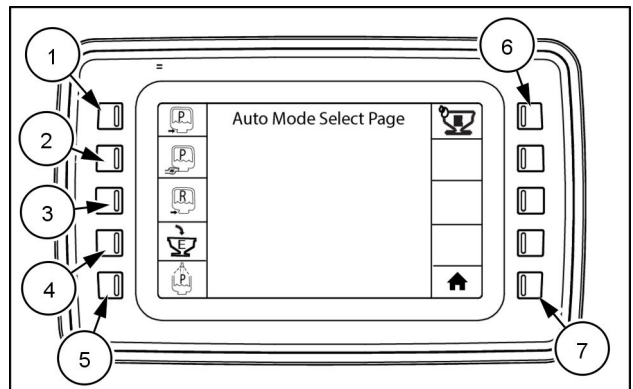
Operate the auto-rinse in the automatic mode by pressing the AUTO button (1) on the Auto-rinse display panel. The AUTO page displays.



RAIL17SP01569FA 4

The functions availability on the Auto Mode select page are:

1. Product tank filling with external pump
2. Product tank filling with product pump
3. Rinse tank filling with external pump
4. Eductor function (if equipped)
5. Product tank rinse
6. Eductor wash (if equipped)
7. Home button

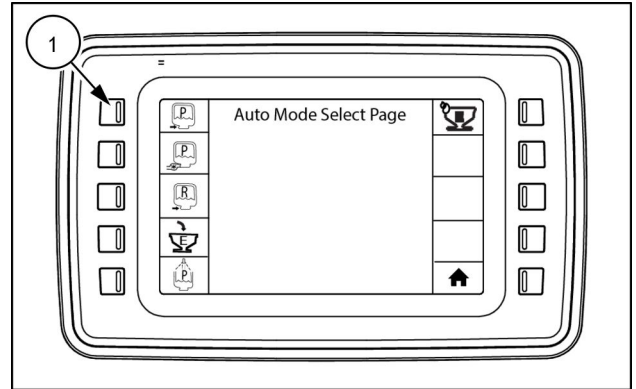


RAIL17SP01570AA 5



### Product tank filling with external pump

Press the Product Tank filling button (1). The Filling Product Tank screen displays.

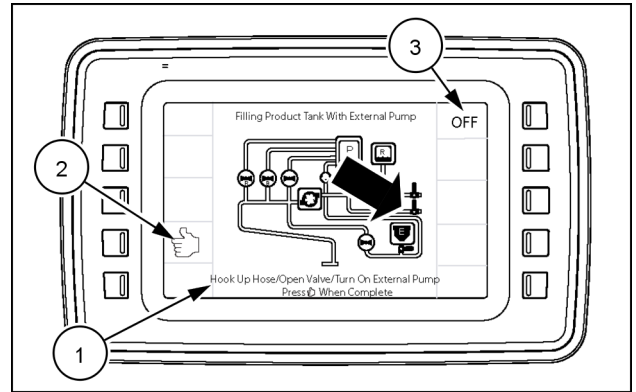


RAIL17SP01570AA 6

Filling the product tank will require the operator to hook a hose to the product tank fill hose, open the product tank fill valve, turn on the external pump.

The operator will be prompted on the screen to meet the conditions (1). Once the conditions are met, the operator must press the thumbs-up button (2).

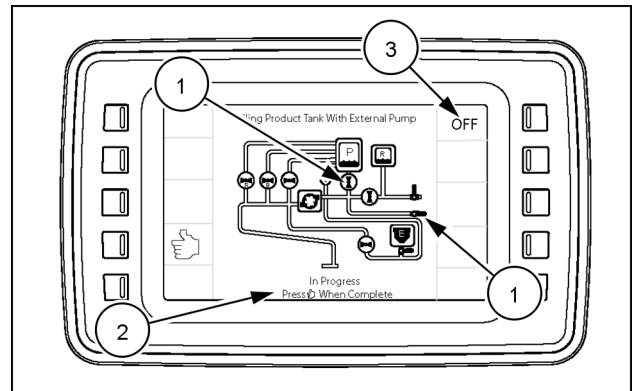
**NOTICE:** Pressing the OFF key (3) at any time will close all valves, stop the pump, and rev the engine down.



RAIL17SP01590AA 7

The product tank will begin filling from the external source. The screen will show the product tank valves open (1), as well as the "In Progress" note (2) indicating filling progression. Press the Thumbs-up button when the product tank is full. The Fill Complete screen appears.

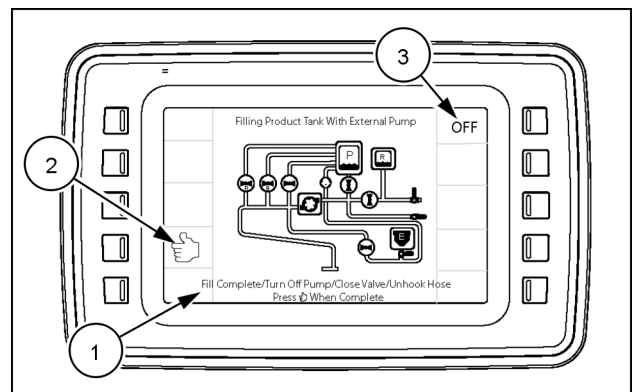
**NOTICE:** Pressing the OFF key (3) at any time will close all valves, stop the pump, and rev the engine down.



RAIL17SP01606AA 8

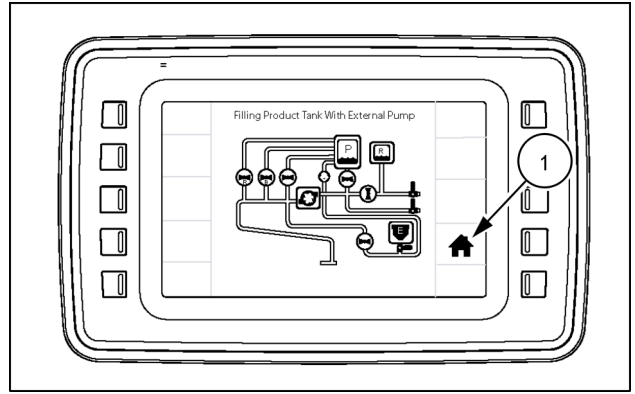
The screen will prompt the operator to turn off the pump, close the valve, unhook the hose (1), and then press the thumbs-up button (2) to indicate that the filling process is complete.

**NOTICE:** Pressing the OFF key (3) at any time will close all valves, stop the pump, and rev the engine down.



RAIL17SP01607AA 9

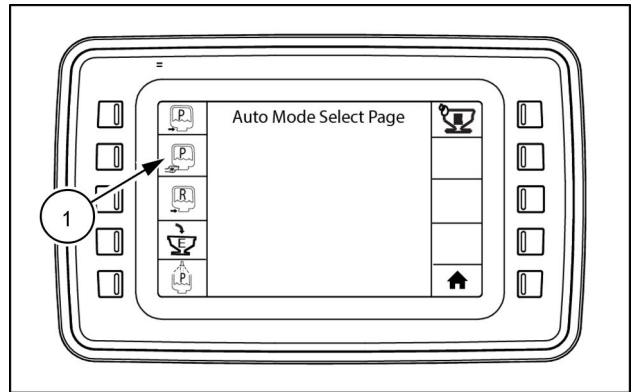
The display will return to the home state. Press the Home button (1) to return to the Auto-rinse screen.



RAIL17SP01608AA 10

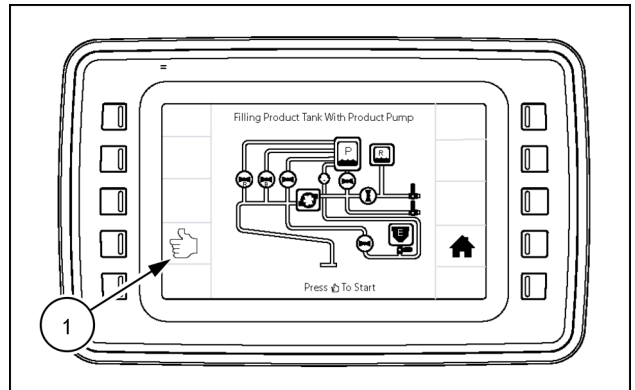
**Product tank filling with product pump.**

Press the fill with product pump button (1). The Filling Product Tank screen displays.



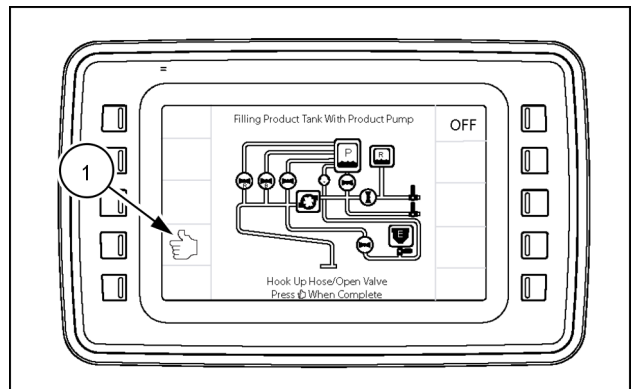
RAIL17SP01570AA 11

Press the thumbs-up button (1). The Prompt screen displays with the conditions listed at the bottom.



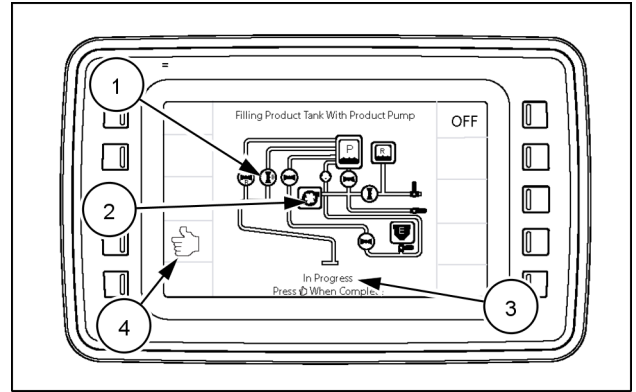
RAIL17SP01609AA 12

Once the conditions listed at the bottom of the screen are met, press the thumbs-up button (1).



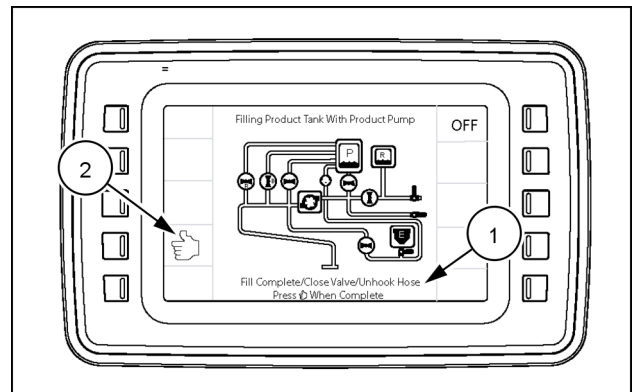
RAIL17SP01610AA 13

The display will indicate that the bypass valve is open (1), the pump (2) is on and process is in progress (3). When the process is complete, press the thumbs-up button (4). The process complete screen displays.



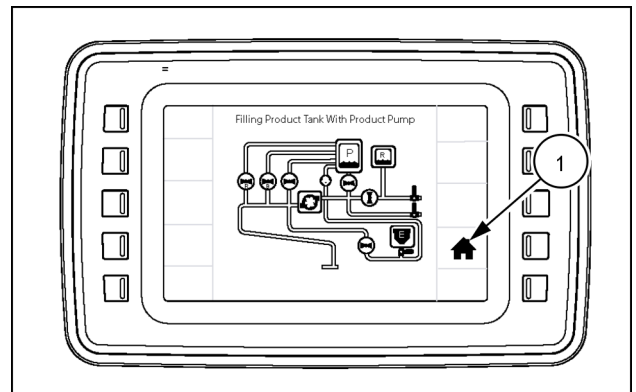
RAIL17SP01611AA 14

Be sure the pump is primed before self filling. The operator is prompted to complete the conditions listed at the bottom of the screen (1). Press the thumbs-up button (2) once the conditions are completed. The product page will display.



RAIL17SP01612AA 15

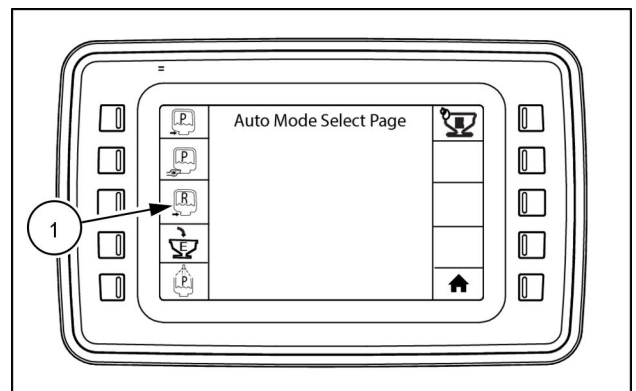
Press the Home button (1) to return the display to the Auto-rinse page.



RAIL17SP01613AA 16

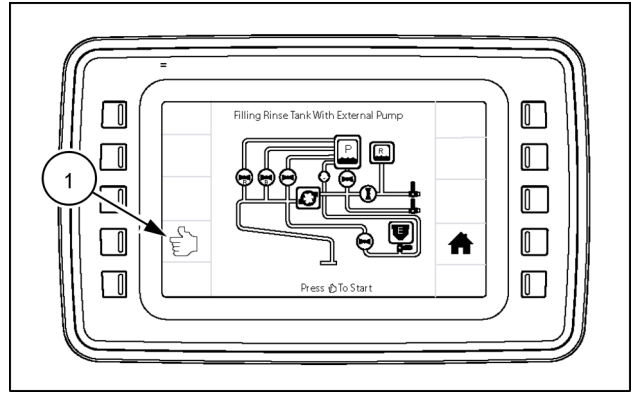
### Rinse tank filling with external pump

Press the fill with external pump button (1). The Filling Rinse Tank With External Pump screen displays.



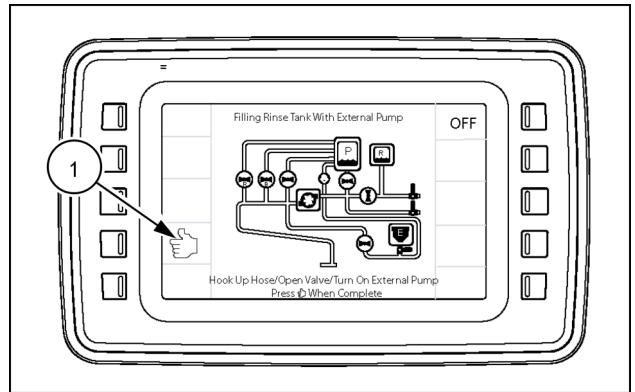
RAIL17SP01570AA 17

Press the thumbs-up button (1). The prompt screen displays with the conditions listed at the bottom.



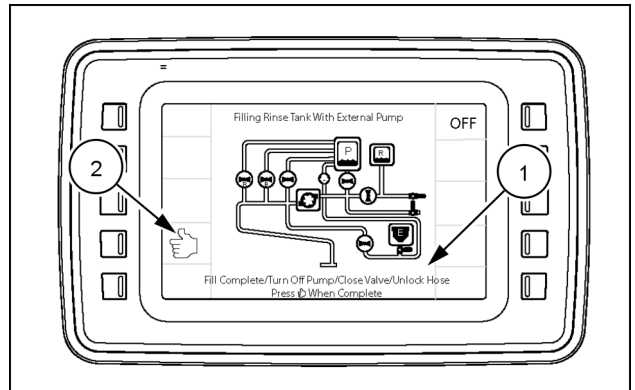
RAIL17SP01614AA 18

Once the conditions listed at the bottom of the screen are met, press the thumbs-up button (1).



RAIL17SP01615AA 19

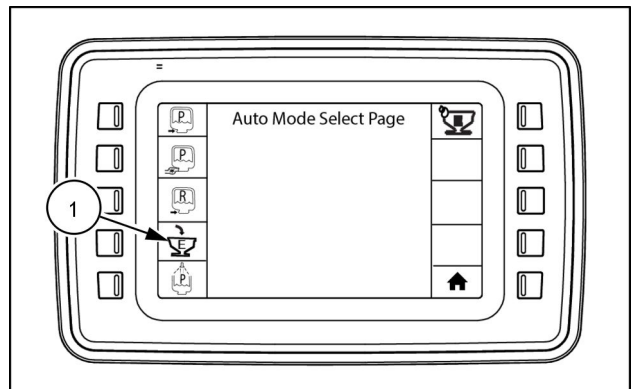
The operator is prompted to complete the conditions listed at the bottom of the screen (1). Press the thumbs-up button (2) once the conditions are completed. The Auto-rinse page will display.



RAIL17SP01616AA 20

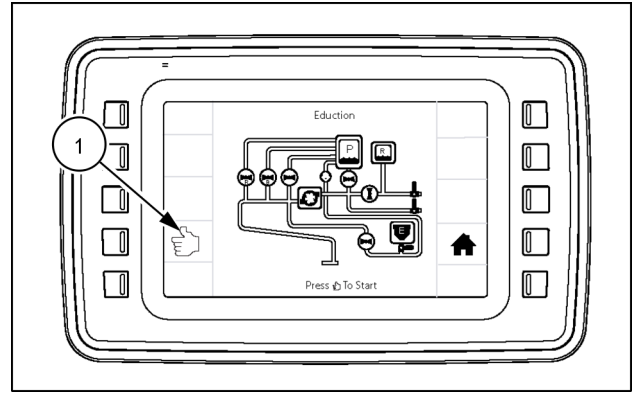
### Eductor function

Press the Eductor function button on the Auto-rinse page. The Eduction page displays.



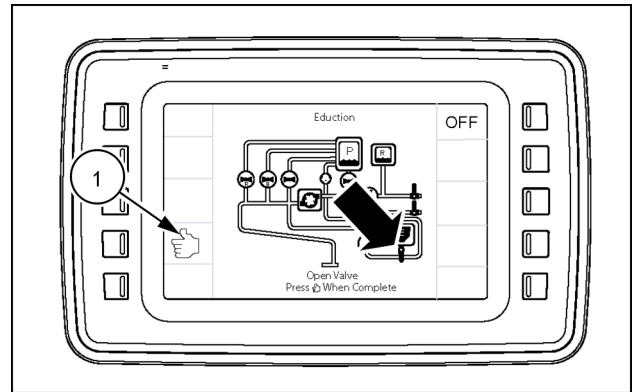
RAIL17SP01570AA 21

Press the thumbs-up button **(1)** to begin the education process. The prompt screen displays with the conditions listed at the bottom.



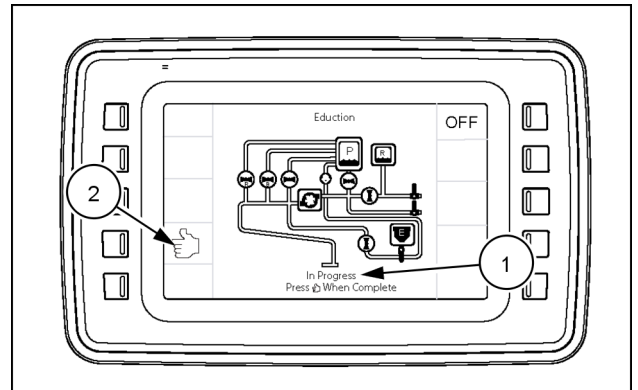
RAIL17SP01617AA 22

Once the conditions listed at the bottom of the screen are met, press the thumbs-up button **(1)**.



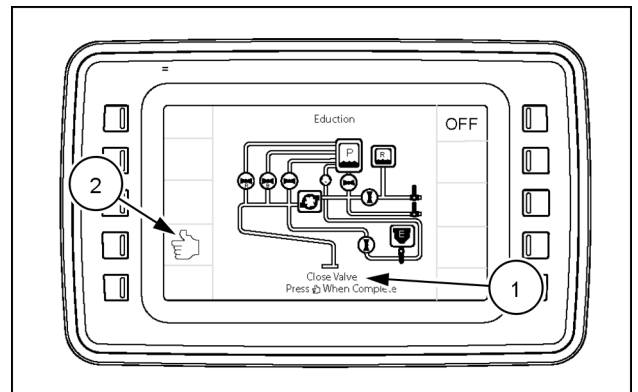
RAIL17SP01618AA 23

The display will show In Progress **(1)**. Press the thumbs-up button **(2)** when the process is complete.



RAIL17SP01619AA 24

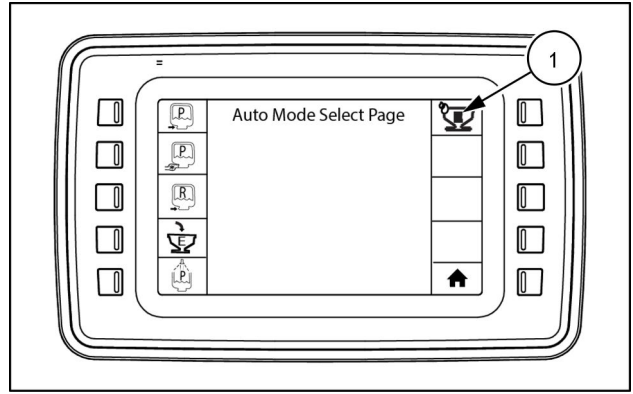
The operator is prompted to complete the conditions listed at the bottom of the screen **(1)**. Press the thumbs-up button **(2)** once the conditions are completed. The Auto-rinse page will display.



RAIL17SP01620AA 25

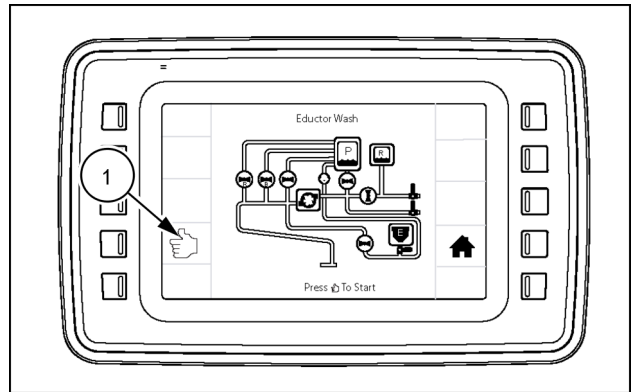
### Eductor wash

Press the eductor rinse button (1). The Eductor wash page displays.



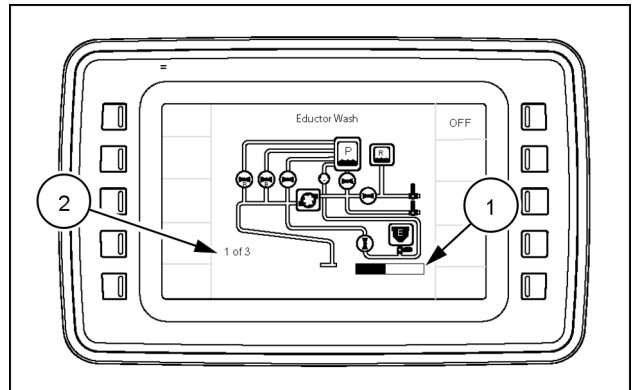
RAIL17SP01570AA 26

Press the thumbs-up button (1) to begin the process.



RAIL17SP01621AA 27

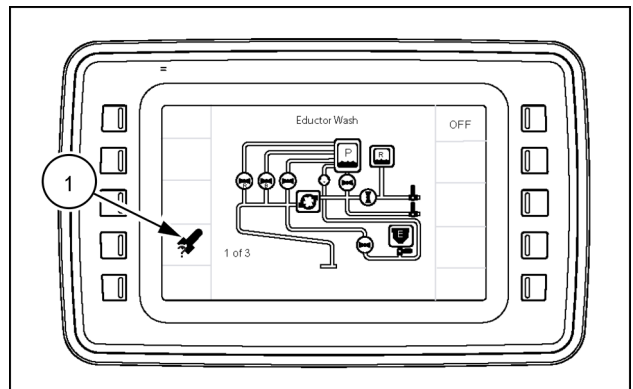
The progression page will display, showing the progression bar (1) and step 1 of 3 wash cycles (2).



RAIL17SP01622AA 28

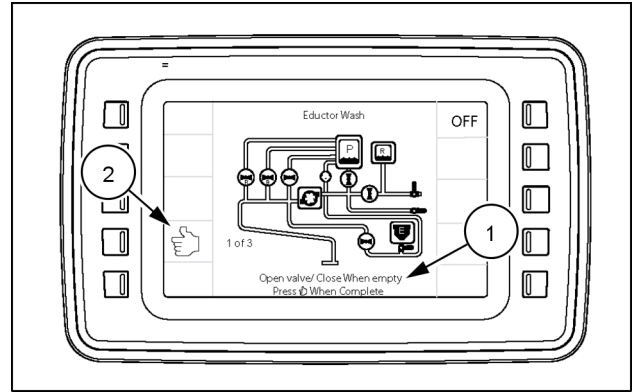
When the first wash cycle is complete, press the valve button (1). The prompt screen displays with the conditions listed at the bottom.

**NOTICE:** This operation will place potentially chemical filled water on the ground.



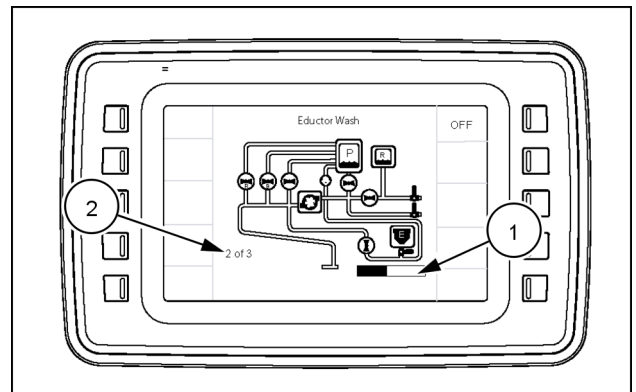
RAIL17SP01623AA 29

The operator is prompted to complete the conditions listed at the bottom of the screen (1)  
 Press the thumbs-up button (2) once the conditions are completed. The progression page will display.



RAIL17SP01624AA 30

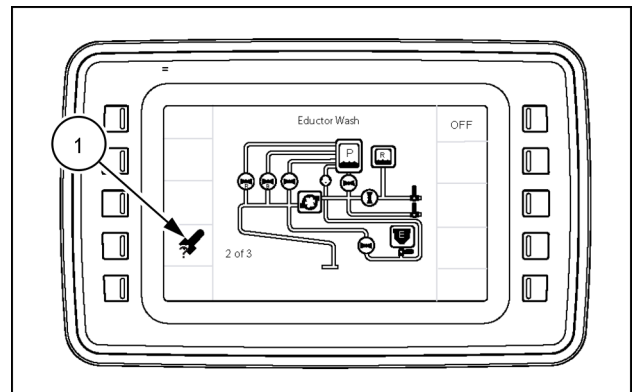
The progression page will display, showing the progression bar (1) and step 2 of 3 wash cycles (2).



RAIL17SP01625AA 31

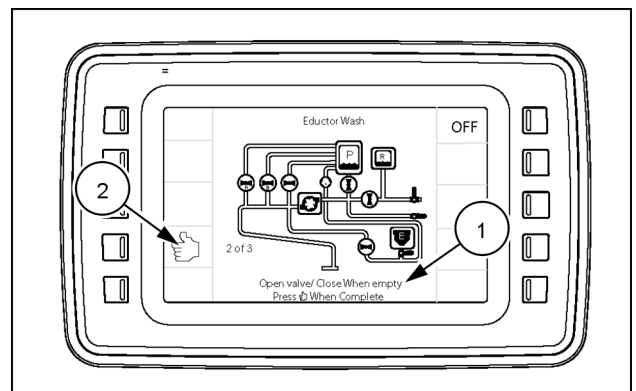
When the second wash cycle is complete, press the valve button (1). The prompt screen displays with the conditions listed at the bottom.

**NOTICE:** This operation will place potentially chemical filled water on the ground.



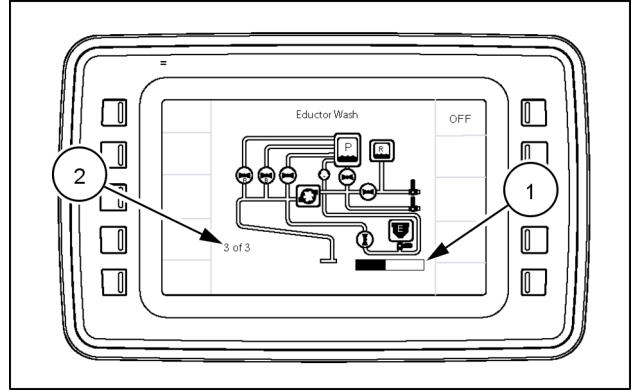
RAIL17SP01626AA 32

The operator is prompted to complete the conditions listed at the bottom of the screen (1)  
 Press the thumbs-up button (2) once the conditions are completed. The progression page will display.



RAIL17SP01627AA 33

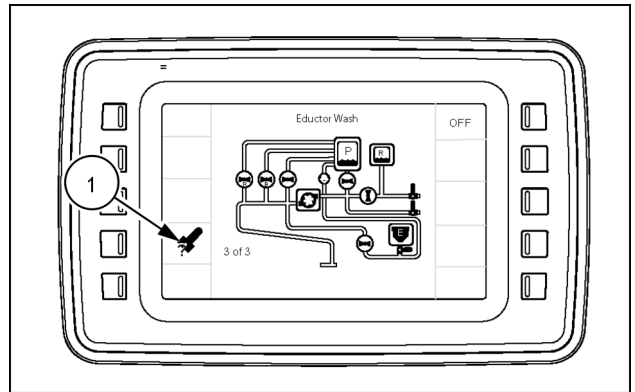
The progression page will display, showing the progression bar (1) and step 3 of 3 wash cycles (2).



RAIL17SP01628AA 34

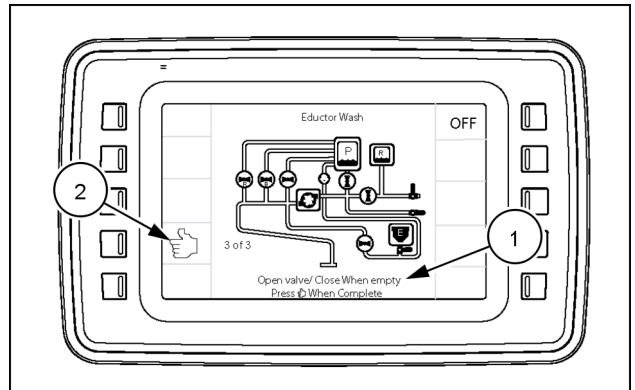
When the third wash cycle is complete, press the valve button (1). The prompt screen displays with the conditions listed at the bottom.

**NOTICE:** This operation will place potentially chemical filled water on the ground.



RAIL17SP01629AA 35

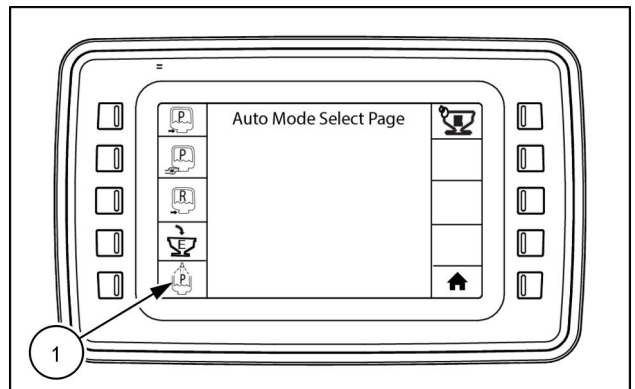
The operator is prompted to complete the conditions listed at the bottom of the screen (1)  
 Press the thumbs-up button (2) once the conditions are completed. The complete page will display.  
 Press the Home button to return to the Auto-rinse page.



RAIL17SP01630AA 36

### Product tank rinse

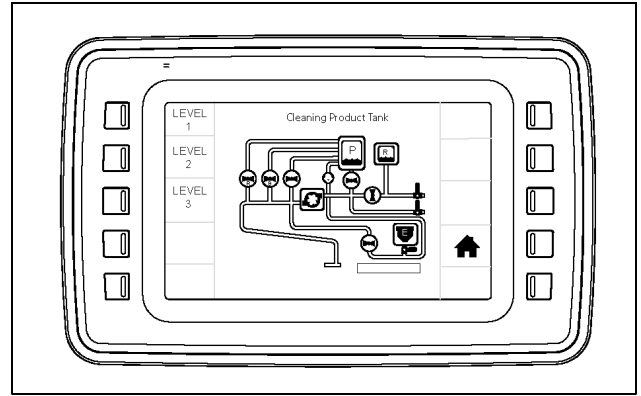
Press the product tank rinse button (1). The Product tank rinse page displays.



RAIL17SP01570AA 37

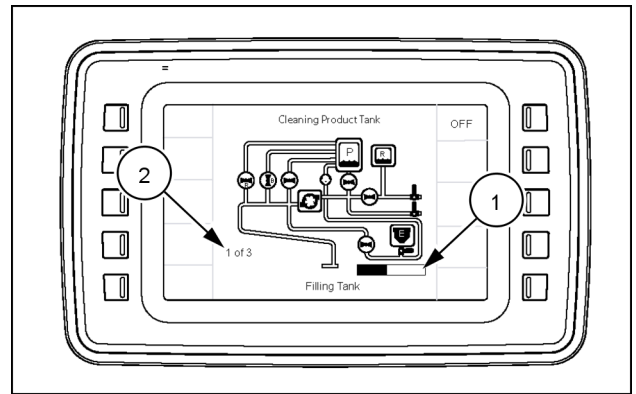


Select the preferred cleaning level 1, 2, or 3. Each level of cleaning is more intense than the next. Press the level one button. The time duration of each level can be changed. Refer to **6-69** for setting procedure.



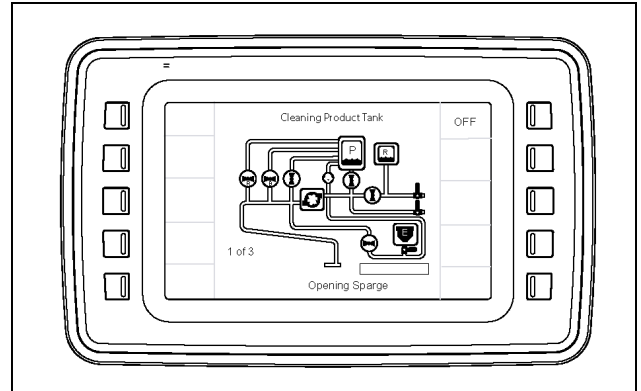
RAIL17SP01631AA 38

The progression screen will display showing progress bar **(1)** and step 1 of 3 rinse cycles **(2)**.



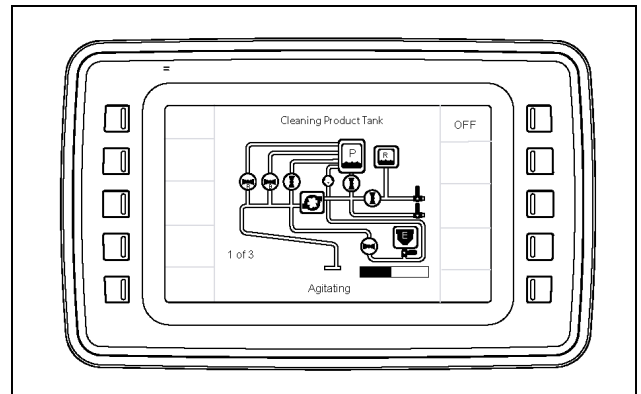
RAIL17SP01632AA 39

Once the rinse is complete, the open sparge process screen displays.



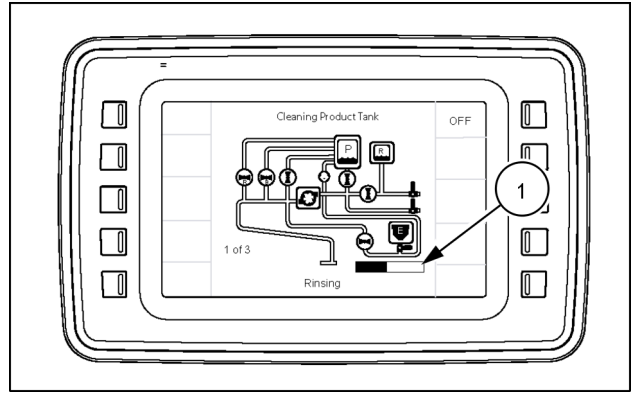
RAIL17SP01633AA 40

Once the tank is filled with clean water the cycle advances to the agitating cycle.



RAIL17SP01634AA 41

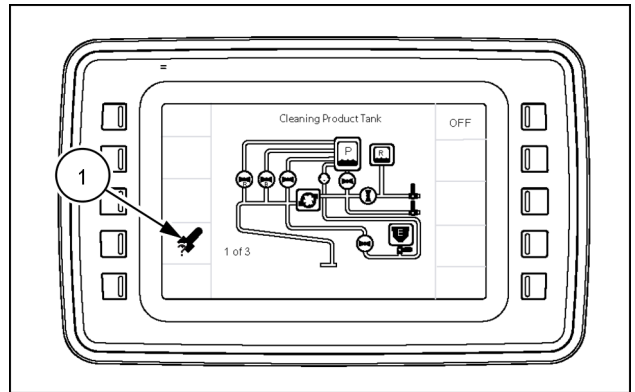
The cycle continues to the opening sparge step and then to the rinsing step of the cycle. The rinsing step progress is indicated by the progress bar (1).



RAIL17SP01635AA 42

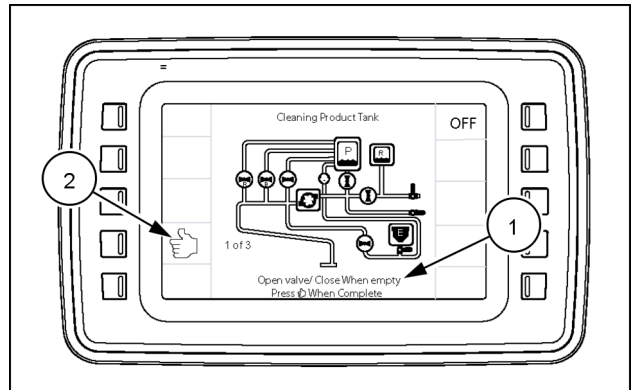
Once the rinse cycle is complete the cycle stops and the valve screen displays. Press the valve button (1). The prompt screen displays with the conditions listed at the bottom.

**NOTICE:** This operation will place potentially chemical filled water on the ground.



RAIL17SP01636AA 43

The operator is prompted to complete the conditions listed at the bottom of the screen (1). Press the thumbs-up button (2) once the conditions are completed.



RAIL17SP01637AA 44

Once the thumbs-up button is pressed, the system will cycle to the second cycle of the product tank rinsing. Follow the steps from the beginning of the first rinse cycle through to completion to perform the second rinsing cycle.

Once the thumbs-up button is pressed after the second rinse cycle, the system will cycle to the third cycle of the product tank rinsing. Follow the steps from the beginning of the first rinse cycle through to completion to perform the third rinsing cycle.

### Auto rinse using the armrest display

**NOTICE:** Lower booms all the way down and completely unfold booms before rinsing.

**NOTICE:** Fill the rinse tank with clean water before you perform the rinse functions.

**NOTICE:** The operator is responsible for the cleanliness of the sprayer circuit and for the full rinsing of the system.

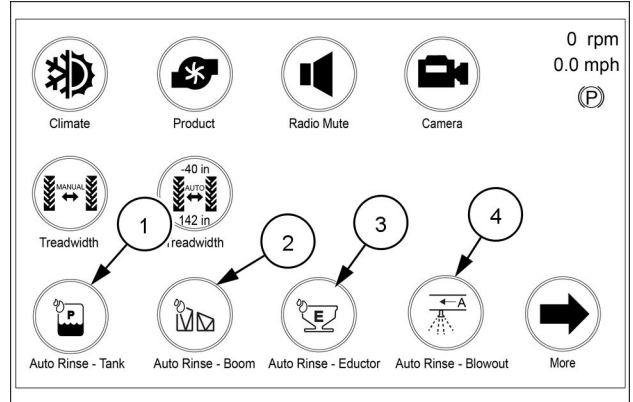
### Product tank auto rinse

From the arm rest display first home screen page, press the Auto Rinse – Tank button (1). The operator is responsible for the cleanliness of the sprayer circuit and for the full rinsing of the system.

The lower icons (1), (2), (3), and (4) will not appear without the lower display installed.

**NOTICE:** The PWM Pump value and the PWM Nozzle value must each be set at 50. Set each value through the spray control monitor.

**NOTICE:** When the Auto-rinse function is in operation the icons on the armrest switch panel will turn red indicating that the switches have no present function. This is because the sprayer circuit is in the automatic mode.



RAIL17SP01568FA 45

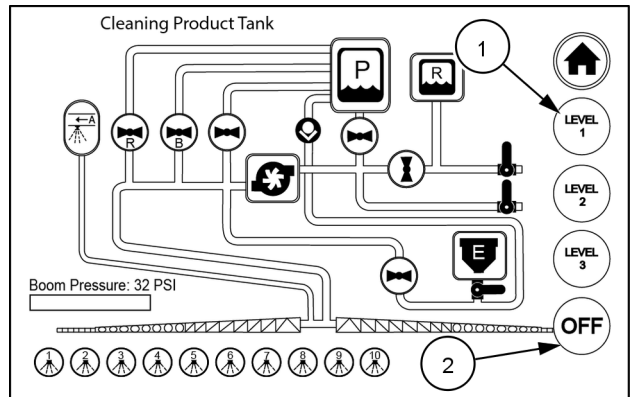
From the Cleaning Product Tank screen, press the desired rinsing level (1) button. The higher the Level number equals a longer rinsing cycle. The rinse level selection is dependant upon the chemical needing to be rinsed from the system.

The duration of each level can be changed. Refer to 6-69 for setting procedure.

When choosing the rinse level, the operator must be aware of the amount of rinse water in the rinse tank. Higher level rinsing will require more rinse water.

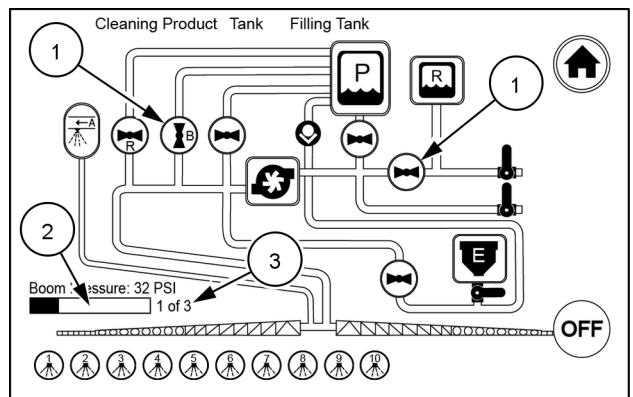
Press the Level 1 button (1). The Tank rinsing process will begin.

At any time, the operator may press the OFF button (2) to stop the rinsing process.



RAIL17SP01573AA 46

The Tank filling screen displays. The appropriate valves will open or close (1), the progress bar (2) will display the Level 1 process progression, and the process level (3) will be indicated as 1 of 3, meaning that the rinsing process is one of three rinsing cycles.

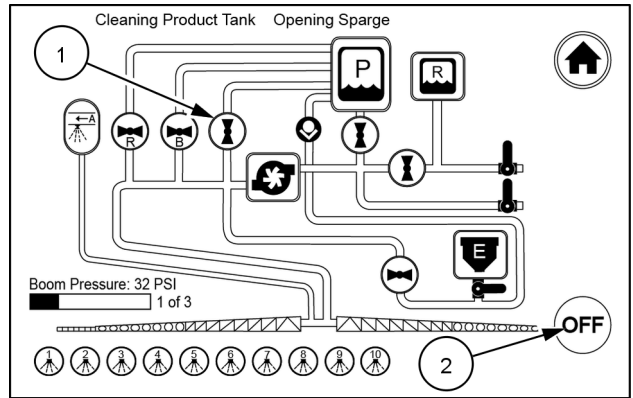


RAIL17SP01574AA 47

## 6 - WORKING OPERATIONS

After the rinse tank is filled, the Opening Sparge screen displays. The Sparge valve (1) will open.

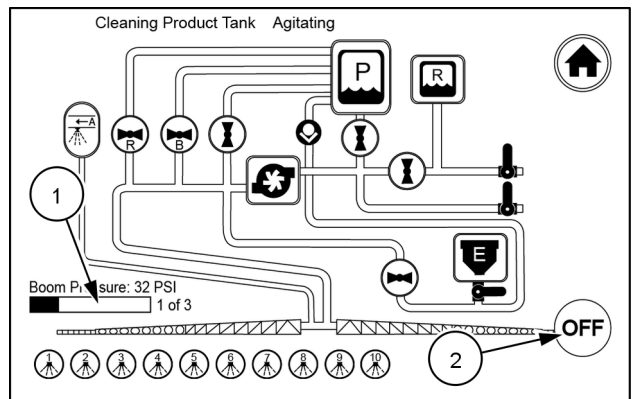
**NOTICE:** Pressing the OFF key (2) at any time will close all valves, stop the pump, and rev the engine down.



RAIL17SP01575AA 48

After the Sparge valve is opened the Agitating screen will display. The progress bar (1) will indicate the agitating, or rinsing, progress.

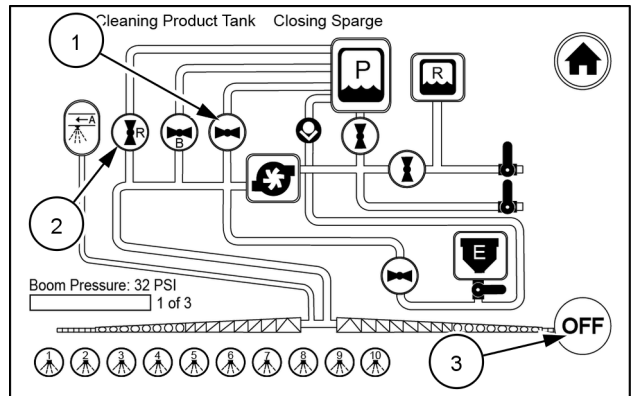
**NOTICE:** Pressing the OFF key (2) at any time will close all valves, stop the pump, and rev the engine down.



RAIL17SP01576AA 49

After the rinse water in the product tank has been agitated, the Sparge valve (1) will close and the Rinse valve (2) will open.

**NOTICE:** Pressing the OFF key (3) at any time will close all valves, stop the pump, and rev the engine down.



RAIL17SP01577AA 50

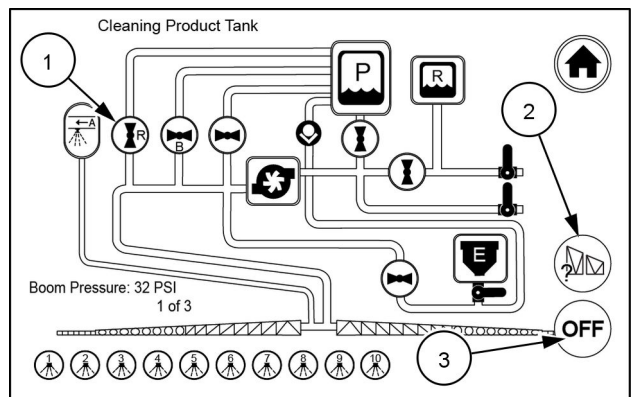
When rinsing is complete, the rinse valve (1) will close (shown as open in the illustration).

The operator will then press the boom button (2) in order to pass the rinse water from the tank through the booms.

Be sure to lower and unfold the booms before pressing the boom button.

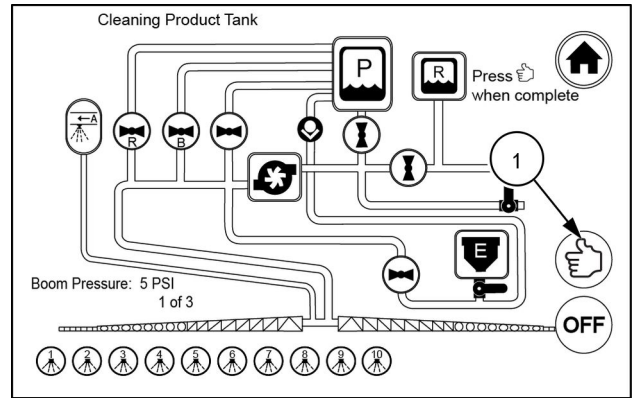
**NOTICE:** This operation will place potentially chemical filled water on the ground.

**NOTICE:** Pressing the OFF key (3) at any time will close all valves, stop the pump, and rev the engine down.



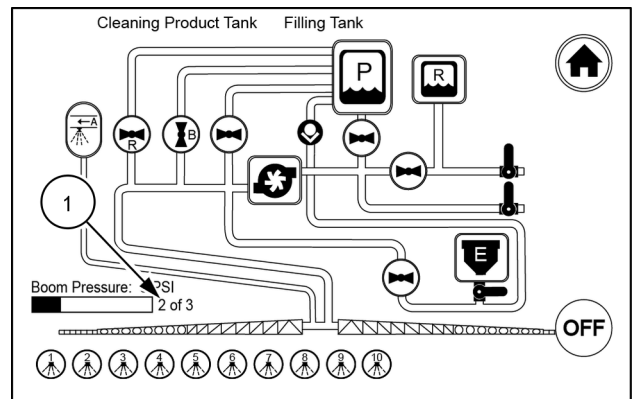
RAIL17SP01579AA 51

When the boom button is pressed, the Press when complete screen displays.  
 At this point, the rinse water will be removed from the system through the boom nozzles.  
 Be sure to lower and unfold the booms before pressing the boom button.  
 The operator must observe the rinse water being sprayed from the boom nozzles. When the rinse water is no longer spraying from the nozzles, the operator must press the Process Complete button (1) to stop the process.



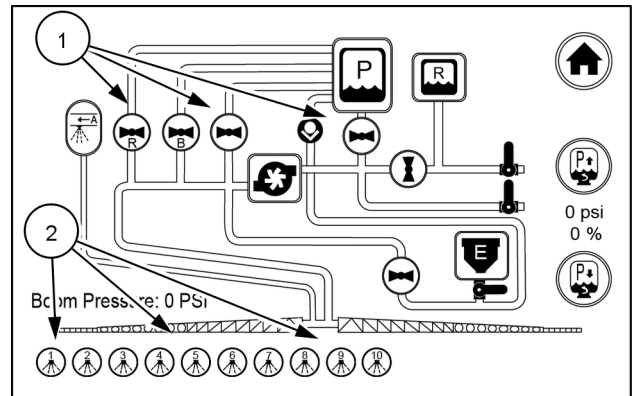
RAIL17SP01580AA 52

Once the Process Complete button is pressed, the tank rinsing process will advance to second rinsing process (1), and the tank rinsing process begins again. The second rinsing process will continue until finished and then the third rinsing process will begin.



RAIL17SP01581AA 53

When the third rinse cycle is complete, the screen will return to normal operation mode.

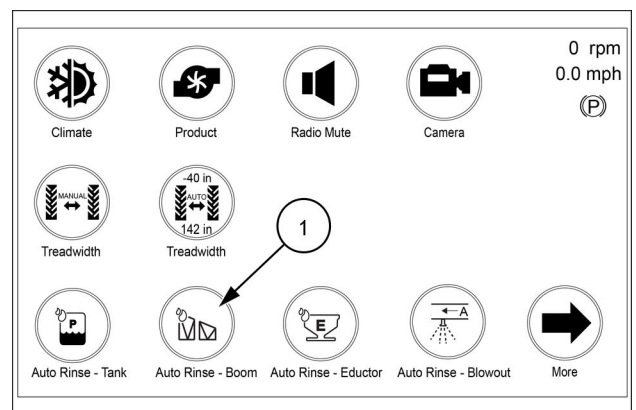


RAIL17SP01582AA 54

**Boom auto rinse**

From the arm rest display first home screen page, press the Auto Rinse – Boom button (1). The Cleaning Boom screen will display.

**NOTICE:** Operation will place potentially chemical filled water on the ground.



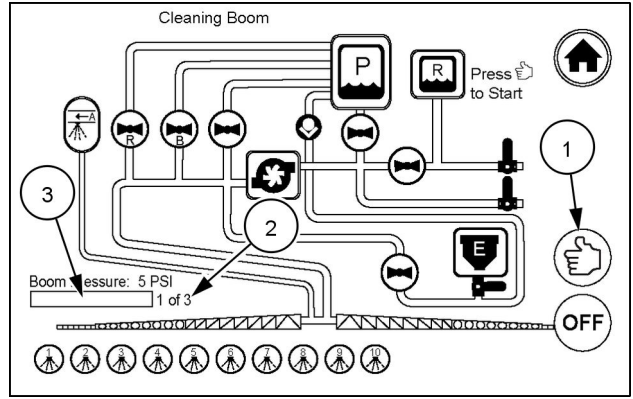
RAIL17SP01568FA 55

## 6 - WORKING OPERATIONS

Press the Start button **(1)** to begin the boom rinsing process.

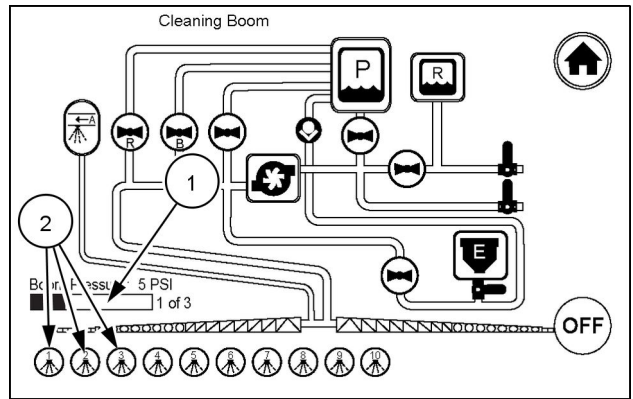
Be sure to lower and unfold the booms before pressing the boom button.

The 1 of 3 process indicator **(2)** will appear on the screen as well as the progress bar **(3)**.



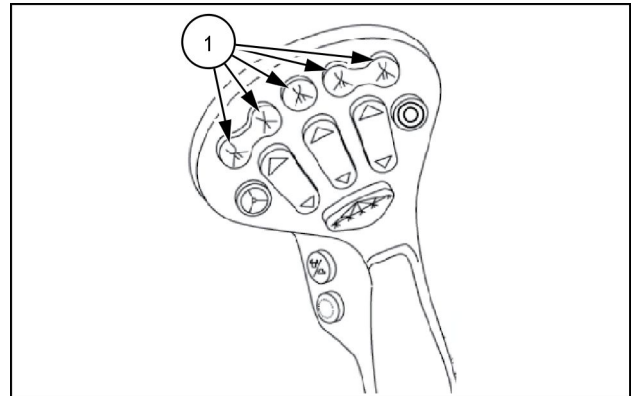
RAIL17SP01583AA 56

The boom rinsing time will be indicated by the progress bar **(1)**. Each boom section, one through ten **(2)**, will highlight green when that section is being rinsed.

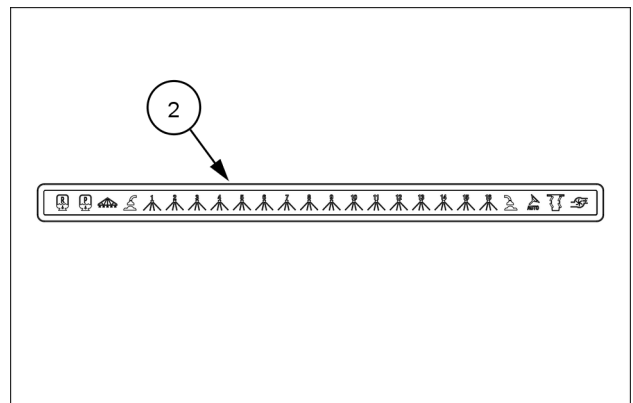


RAIL17SP01584AA 57

The individual section rinsing will also be displayed and sequenced on the joystick grip **(1)** and the overhead display **(2)**.



RAIL17SP00391AA 58

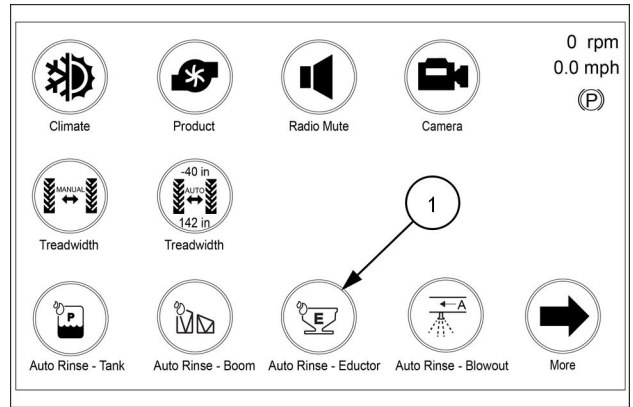


RAIL17SP00309FA 59



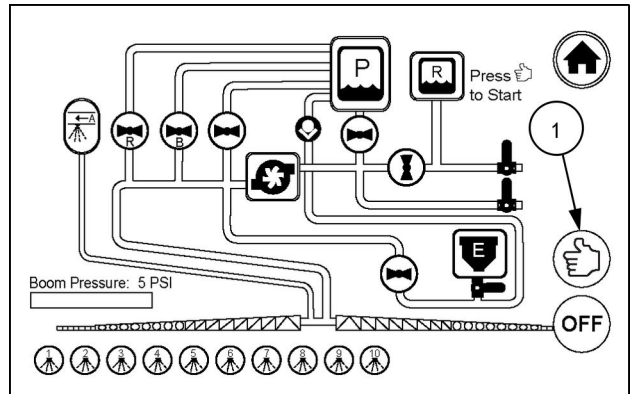
### Eductor auto rinse

Press the Auto Rinse – Eductor button (1). The product circuit screen displays.



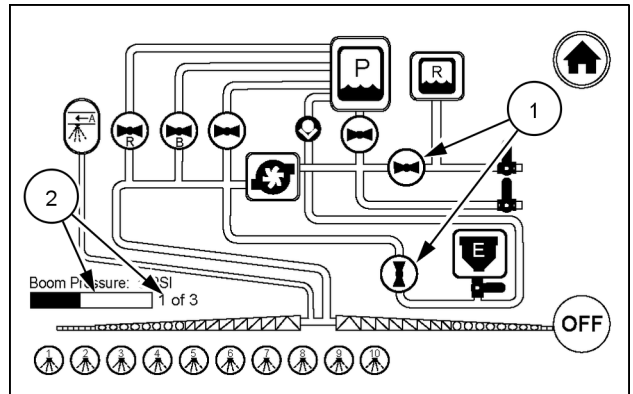
RAIL17SP01568FA 60

Press the start button (1) to begin the Eductor rinsing.



RAIL17SP01585AA 61

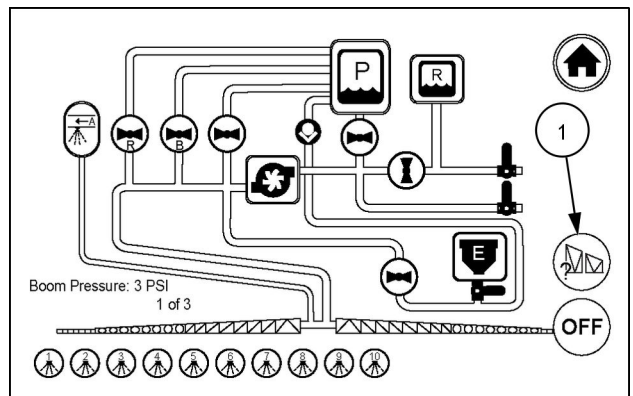
The valves (1) will open, and the Eductor rinsing progress bar and the rinsing cycles (2) will show progression of the rinsing cycle.



RAIL17SP01586AA 62

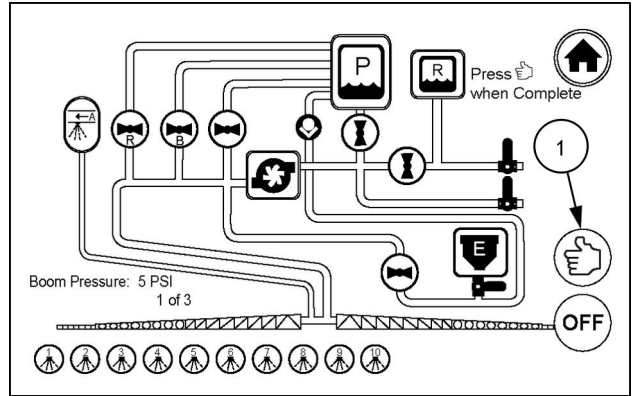
After the Eductor has been rinsed, the product circuit rinsing screen displays. The operator must press the Boom button (1) to completely rinse the product circuit.

**NOTICE:** This operation will place potentially chemical filled water on the ground.



RAIL17SP01587AA 63

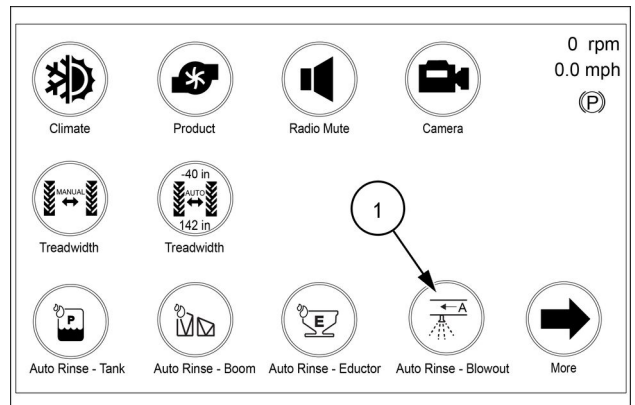
After the circuit rinse is complete the operator must press the Completed button (1) to take the system out of the rinse operation.



RAIL17SP01588AA 64

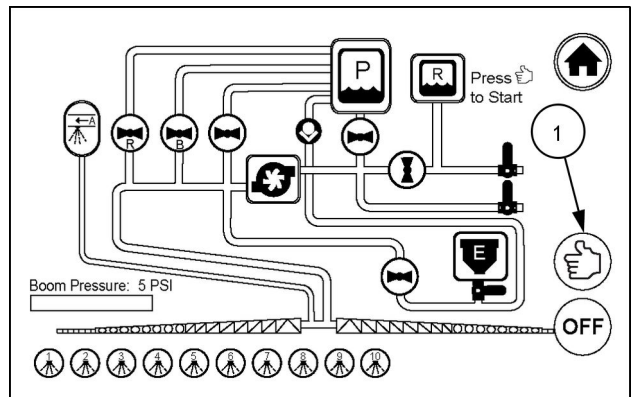
### Boom blow-out auto rinse

From the arm rest display first home page press the Auto-Rinse — Blowout button (1) to begin cleaning of the boom blowout operation. The product circuit screen displays.



RAIL17SP01568FA 65

Press the start button (1). The product screen displays blowout operation.



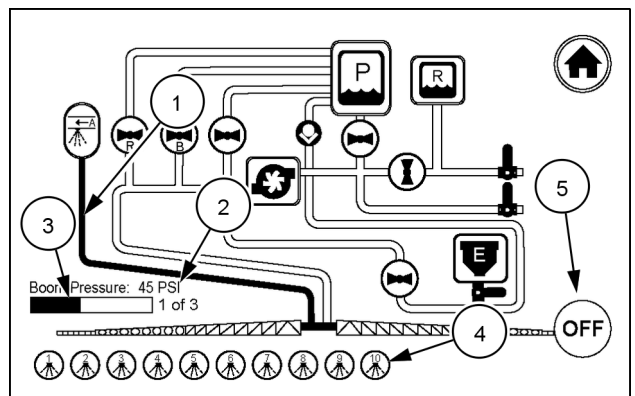
RAIL17SP01585AA 66

The blowout will be indicated as functioning (1), the air pressure will build (2), the progress bar (3) will indicate operation, and each boom section (4) will be sequenced as it is cleared.

The blowout of the boom will sequence two times for complete boom blowout clearing. Three times if all boom sections are on.

Press the OFF button (5) at any time to cancel the blowout function.

**NOTE:** The boom section icons on the joystick and the overhead display will also sequence as the rinsing progresses.



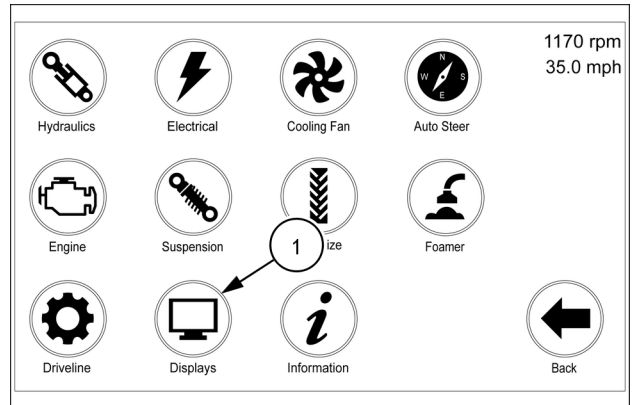
RAIL17SP01589AA 67



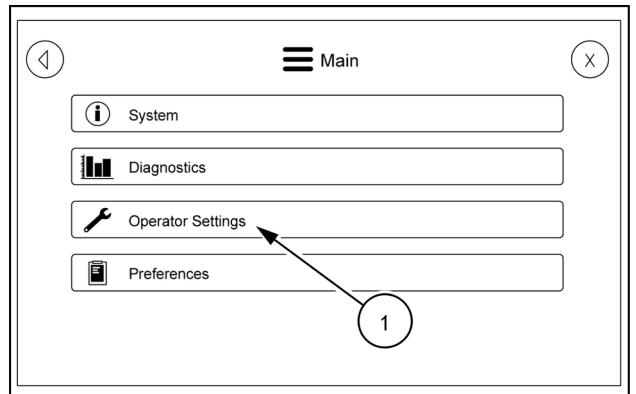
## Auto-rinse level duration setting

Each level duration can be increased or decreased according to length of rinse time needed and type of chemical used.

On the second arm rest home display page touch the Displays icon (1).

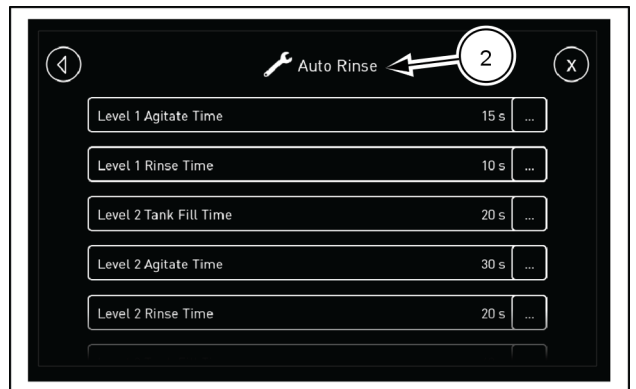
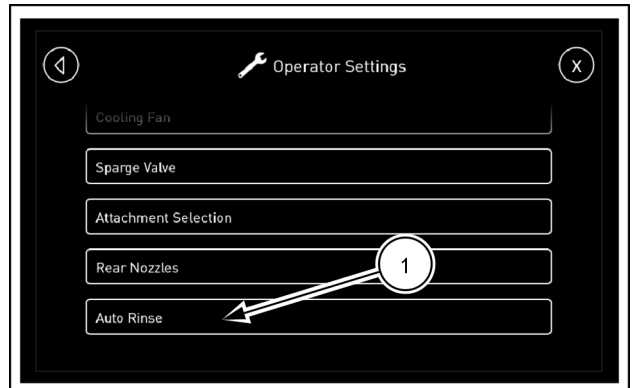


This will bring up the Main screen. On the Main screen touch the Operator Setting icon (1).



This will bring up the Operator Settings screen. The Operator Setting screen is a scroll screen. Use the finger swipe method to scroll through the menu until the Auto Rinse icon (1) appears.

Touch the Auto Rinse icon to bring up the Auto Rinse screen (2)



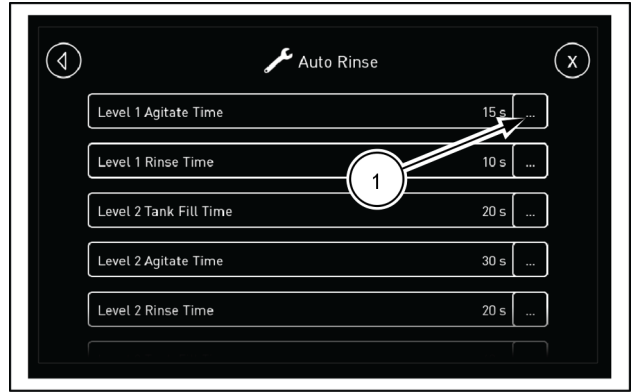
## 6 - WORKING OPERATIONS

The Auto Rinse screen is a scroll screen. Use the finger swipe method to scroll through the menu. When the level and category to be changed is located, touch that icon at the right-hand side **(1)** to change the duration.

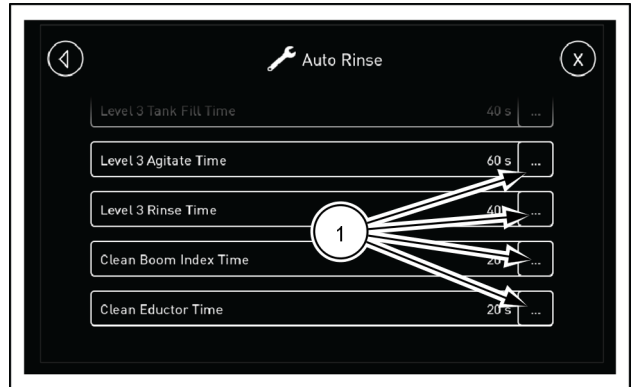
The changing screen will appear where the duration can be increased by touching the (+) **(2)** or decreased by touching the (-) **(3)**.

Touch the check mark **(4)** to lock the setting in.

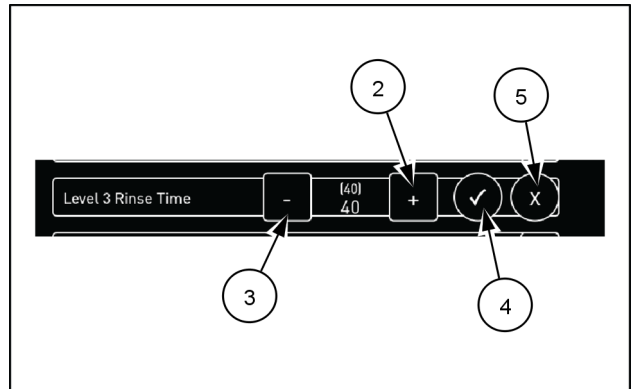
Touch the (X) icon **(5)** to close the setting screen



RAIL17SP01647AA 5



RAIL17SP01648AA 6



RAIL17SP01649AA 7

## **7 - MAINTENANCE**

### **General information**

### **Safety rules**

#### **Environment**

Before you service the machine and before you dispose of the old fluids, lubricants and filters, always remember the environment

- Do not pour oil or fluids on the ground, down drains or into containers that can leak.
- Dispose of all old fluids, lubricants and filters in accordance with local and federal regulations.
- Check with your local environmental recycling center or your local dealer for correct information.

#### **Plastic and resin parts**

- Avoid using gasoline, paraffin, paint thinner, etc.), when cleaning plastic, e.g.; console, instrument cluster, monitors and gauges, etc.)
- Use only water, mild soap and a soft cloth when you clean these parts.
- Using gasoline, paraffin, paint thinner, etc.), will cause color fading, cracking or deformation of the parts being cleaned.

## Maintenance advice

Regular maintenance is vital to dependable operation of the machine. To avoid down time, perform the maintenance and service scheduled in this section.

**NOTICE:** While any company can perform necessary maintenance or repairs on your equipment, MILLER strongly recommends that you use only authorized MILLER dealers and products that meet given specifications. Improperly or incorrectly performed maintenance and repair voids the equipment warranty and may affect service intervals.

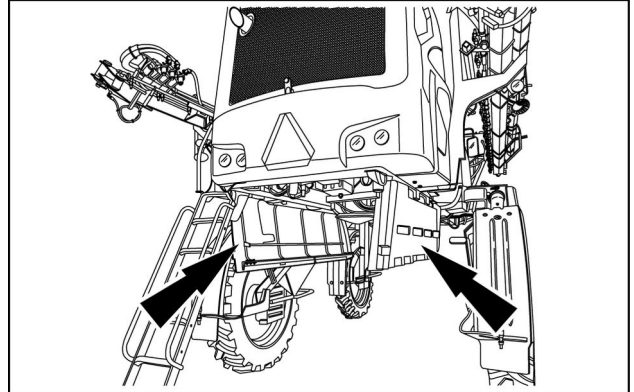
## Engine compartment access

### Lower access covers

The lower engine access covers are located on the underside of the vehicle at the engine mounting area.

The lower engine access covers each have a pull handle latch to open the covers. The covers are hinged on the opposite side of the latches. Unlatch and swing the covers down to access the fuel filters, fuse blocks and lower items on the engine.

Be sure to close and securely latch to the covers before operating the vehicle.



RAIL17SP00272AA 1

### Front Engine Compartment Access Doors

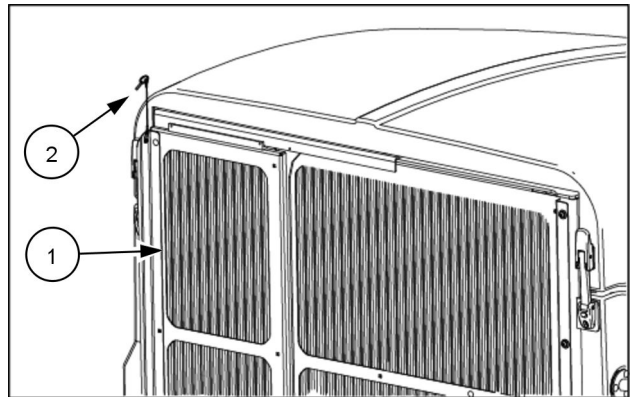
The front engine compartment access door (1) is located at the front of the engine compartment. Access the doors from the operators platform.

The access door is secured in place with a pin attached to a lanyard (2).

To open the door, remove the pin from its mounting hole and slide the door open.

The access door can also be removed by lifting up on the opened door and removing the door from its slide rail.

Be sure to reinstall the removed door within the slide rail and close and pin in place before operating the vehicle.



RAIL17SP00674AA 2

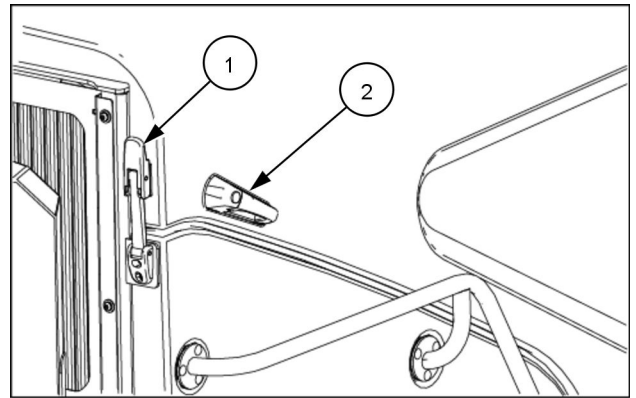
## Engine Compartment Hood

The engine compartment hood is located at the rear of the engine compartment.

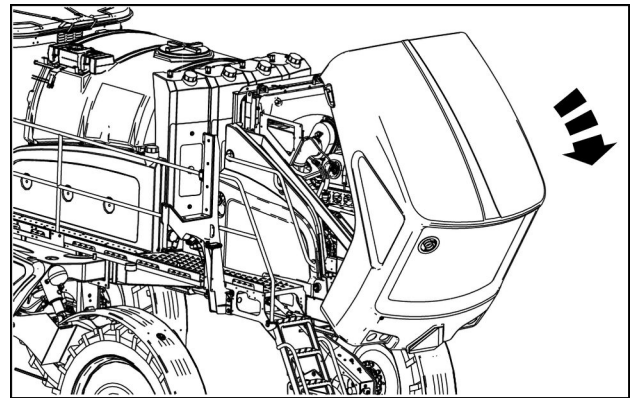
To open the hood, release the two latches **(1)** located on the front side of the hood. Pull the latches out and downward to release.

Grasp the hood handle **(2)** and pivot the hood open by pulling upward.

Be sure to lower and latch the hood before operating the vehicle.



RAIL17SP00675AA 3



RAIL17SP00694AA 4

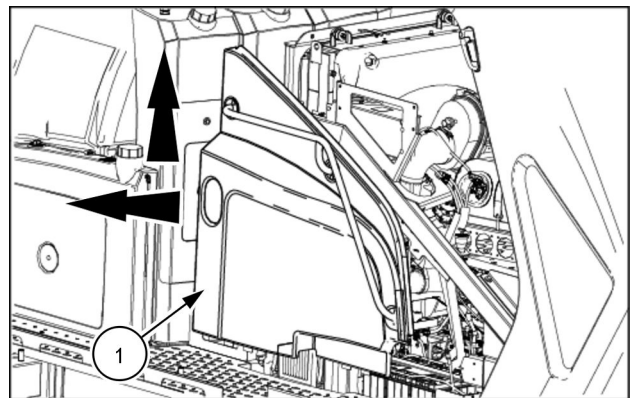
## Engine compartment side panel

The engine compartment side panel **(1)** is located on the left-hand side of the engine compartment.

To remove the panel, grasp the hand hold and pull the panel outward. When the side panel rubber mounting studs clear the mounting holes in the frame, pull upwards and remove the panel from the vehicle.

Reattach the side panel by lowering the panel into the slots. Align the rubber studs to the mounting holes and push the panel inward.

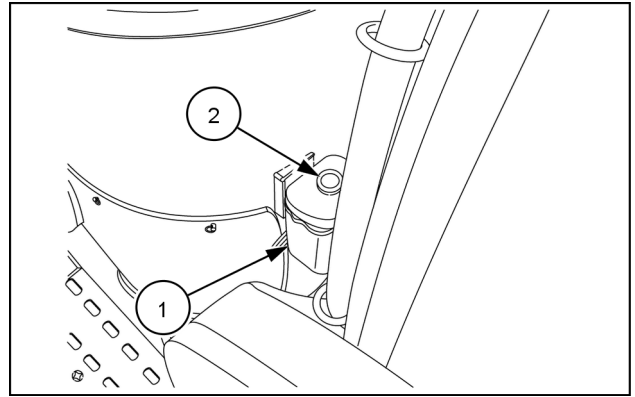
Secure the panel into place before operating the vehicle.



RAIL17SP00693AA 5

## Windshield washer reservoir

The windshield washer reservoir is located outside the left rear corner of the cab (1) .  
Remove the cap (2) to fill the reservoir. Install the cap after filling.



RAIL17SP00306AA 1

## General specification - Biodiesel fuels

### Biodiesel usage in MILLER products

#### Introduction to Fatty Acid Methyl Ester (FAME) biodiesel

FAME biodiesel, called biodiesel fuel in the following section, consists of a family of fuels derived from vegetable oils treated with methyl esters.

There are two main biodiesel fuel types: Rapeseed Methyl Ester (RME) and Soybean Methyl Ester (SME). RME is a blend of rapeseed and sunflower methyl ester, and is the preferred crop in Europe. SME is the preferred crop in the United States.

Biodiesel fuel is a renewable alternative fuel source. Its use and development is promoted worldwide, especially in Europe and in the United States.

**NOTICE:** *Your emissions control system is compatible with up to 5% biodiesel fuel (B5). Be aware that the use of biodiesel fuel that does not comply with the standards mentioned in this section could lead to severe damage to the engine, fuel system or aftertreatment system of your machine. The use of non-approved fuels may void MILLER Warranty coverage.*

Biodiesel can be used to run Tier 4B (final) and Stage IV diesel engines only when blended with standard diesel fuel:

- B5: indicates the blend of **5%** biodiesel and **95%** diesel fuels.
- B20: indicates the blend of **20%** biodiesel and **80%** diesel fuels. Do not use.

Biodiesel fuel has several positive features in comparison with diesel fuel:

- Biodiesel fuel adds lubricity to the fuel, which is beneficial in many circumstances, particularly as sulfur and aromatics are removed from the fuel.
- Biodiesel has a greater cetane number and burns cleaner.
- Biodiesel produces less particulate matter and reduces smoke emissions.
- Biodiesel is fully biodegradable and non-toxic.

#### Diesel and biodiesel fuel specifications

Tier 4B (final) and Stage IV diesel fuel specifications are covered by the following:

- **ASTM D975**, Standard Specification for Diesel Fuel Oils. (15 ppm sulfur maximum.)

Biodiesel blends are covered by:

- United States Diesel Fuel Specification **ASTM D975** allows up to **5%** biodiesel since 2009. United States fuel

suppliers are allowed to use up to **5%** biodiesel fuel (B5) to supply the network.

- United States Biodiesel Fuel Specification **ASTM D7467** provides specifications for diesel and biodiesel blends from B5 to B20.

Pure biodiesel blend stock (B100) specification is covered by the following requirements:

- **ASTM D6751** - Standard specification for biodiesel fuel blend stock (B100) for middle distillate fuels.

**NOTE:** *ASTM D6751 specification has been updated to improve the quality of biodiesel in the market place.*

Before raw oil can be converted into usable biodiesel fuel, it must undergo transesterification to remove glycerides. During the transesterification process, the oil reacts with an alcohol to separate the glycerine from the fat or vegetable oil. This process leaves behind two products: methyl ester (the chemical name for biodiesel) and glycerine (a byproduct usually sold for use in soaps or other products).

**NOTICE:** *Biodiesel fuels approved for use in the MILLER equipment must be transesterified and comply with the latest North America Standard **ASTM D6751**.*

**NOTICE:** *Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel, are fuels that are normally made from Rapeseed oil or similar high oil content crops. These kinds of fuel are not transesterified, so they do not fulfil the **ASTM D6751** requirements. There is no recognized quality standard available for these types of fuel. Therefore the use of Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel are **NOT APPROVED** at any blend in any MILLER product.*

**NOTICE:** *Any engine and fuel injection equipment fitted to a MILLER vehicle found to have run with any blend of **NON-APPROVED** fuel (fuel not fulfilling the specification described in the requirement **ASTM D6751**) will no longer be covered for Warranty by MILLER.*

#### Biodiesel fuel usage conditions

You must stringently follow the biodiesel fuel usage conditions. Incorrect application of the biodiesel fuel usage conditions could lead to severe damage to the engine, fuel injection equipment and aftertreatment system.

The main concerns related to operation with biodiesel fuels are:

- Filters and injector blockage caused by poor fuel quality.
- Wear and corrosion of internal components due to water content, which affects lubricity.
- Deterioration of some rubber sealing compounds in the fuel system.

- Biodiesel oxidation, which can lead to the formation of deposits that can harm the fuel injection system.

**NOTICE:** Any problem in the engine fuel injection equipment associated with non-compliance to the following conditions for biodiesel fuel handling and maintenance will not be covered for Warranty by MILLER.

Purchase biodiesel fuel from a trusted supplier who understands the product and maintains acceptable fuel quality. The National Biodiesel Board awards **BQ-9000®** accreditation to biodiesel marketers and producers that meet strict quality and consistency standards. Biodiesel users in North America are strongly encouraged to purchase biodiesel blends from the **BQ-9000®** Certified Marketers and sourced from the **BQ-9000®** Accredited Producers found on the **BQ-9000®** website.

The use of biodiesel blends up to B5 will not void the MILLER warranty as long as the following conditions for biodiesel fuel handling and maintenance are stringently followed:

Biodiesel fuel must be pre-blended by the supplier. Mixing biodiesel fuels on-site can result in an incorrect mixture that could damage the engine and/or fuel system.

**NOTICE:** MILLER may void your warranty if the problem is associated with poor fuel quality due to improper blending. It is the responsibility of the fuel supplier and/or yourself to ensure the right type of fuel and blend is delivered and used.

## Storage

The machine should not be stored for more than 6 months with biodiesel in the fuel system. For longer storage time, it is strongly suggested that only regular #2 diesel fuel is used.

**NOTE:** If storage for longer than 6 months is necessary, the engine must be run on regular #2 diesel for a minimum of 20 hours to flush the biodiesel fuel out of the fuel system prior to storage.

Biodiesel is highly hygroscopic and tends to collect water more than diesel fuel. This increases the risk of algae and bacteria growth which can cause severe damage to the fuel injection system. Keep the machine fuel tanks and on-site storage tanks as full as possible to limit the amount of air and water vapors inside the tank. Drain water from the tanks at least once a week.

**NOTICE:** Use only MILLER approved biocide additives on Tier 4B (final) and Stage IV engines with an exhaust aftertreatment system.

## Limited B10 biodiesel approval

MILLER approves the use of up to B10 on Tier 4B (final) and Stage IV engines only in Minnesota (or other States & Provinces) where the state legislation mandates its usage during the months of April to September only and the state legislation mandates strict compliance of the B10 to specification **ASTM D7467**. The B10 must consist of a blend of S15 #2D Diesel Fuel per **ASTM D975** and B100 blend stock per **ASTM D6751** only.



## General specification - Diesel fuel

Only use diesel fuel that conforms to North American standard **ASTM D975** Grade No. 2-D S15 or equivalent in your engine. Do not use any other low grade diesel fuel.

**NOTICE:** Use of other low grade diesel fuels will result in loss of engine power, high fuel consumption, and damage to the exhaust aftertreatment system (if equipped).

**NOTE:** When operating the machine in very cold climates, the use of winter blended fuel is permitted for a short period of time. See your fuel supplier for winter fuel requirements in your area.

## Fuel conditioner

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Diesel fuel conditioner is available from your MILLER dealer. Instructions for the use of the fuel conditioner is on the container.

The use of diesel fuel conditioner will:

- Clean fuel injectors, valves, and manifolds for increased service life
- Disperse insoluble gummy deposits that form in the fuel system

- Separate moisture from the fuel
- Stabilize fuel in storage

**NOTICE:** Use only MILLER approved biocide additives to prevent damage to the exhaust aftertreatment system (if equipped).

## Filling the fuel tank

### ⚠ WARNING

#### Fire hazard!

When handling diesel fuel, observe the following precautions:

1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.

Failure to comply could result in death or serious injury.

W0099A

**NOTICE:** Use only Ultra Low Sulfur Diesel (ULSD) Fuel. ULSD fuel must contain **15 ppm** or less sulfur content.

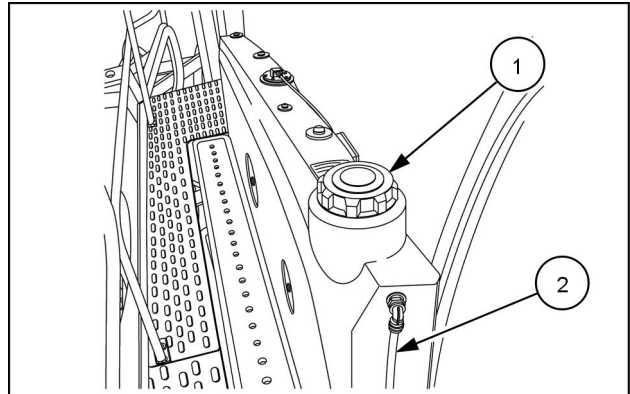
The fuel tank and cap (1) is located on the left side of the product tank. Make sure the fuel cap vent hole remains open at all times.

The fuel tank capacity is **553 L (146 US gal)** . A sight gauge (2) is located on the end of the fuel tank.

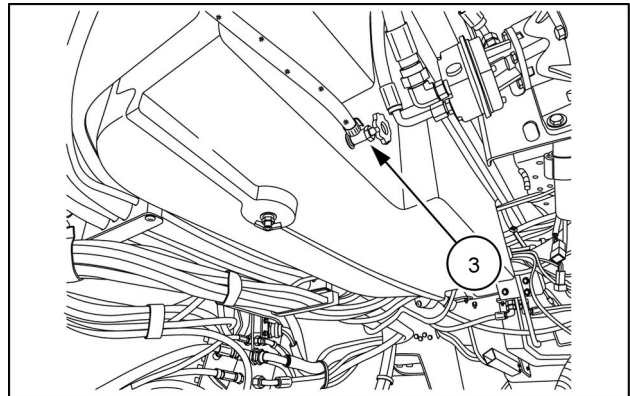
Replace fuel cap before operating. Wipe up any spilled fuel.

Check to be sure fuel cap vent hole remains open at all times.

Be sure the fuel shut off valve (3) is open before operating the vehicle. The fuel shut-off valve is located on the bottom side of the fuel tank.



RAIL17SP00257AA 1



RAIL17SP00258AA 2

## Fuel system air removal

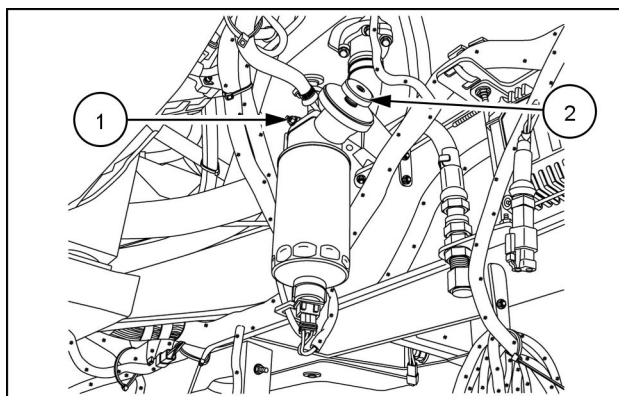
Air can enter the fuel system in the following situations:

- If the fuel tank becomes empty or is low on fuel.
- After fuel system parts have been removed for service or repairs.
- If the chassis has been in storage for a long period of time.

Use the following procedure to remove air from the fuel system:

1. Make sure there is fuel in the tank, check the gauge.
2. Loosen the air screw **(1)**.
3. Operate the hand primer pump **(2)** to fill the fuel filter. Tighten the screw when fuel with no air bubbles flows from the screw. Collect the fluids in a container and dispose of properly.
4. Pump hand primer pump until hard to pump, then crank engine for no more than 30 seconds.
5. Repeat the previous step until engine starts.

**NOTICE:** If engine will not start, it may be necessary to disconnect the low pressure fuel line at the feed pump on the engine and use the hand primer pump **(2)** until fuel with no air bubbles flows from the line. Collect the fluids in a container and dispose of properly. Reconnect fuel line and start engine. See your service representative if required.



RAIL17SP00279AA 1

## Filling the Diesel Exhaust Fluid (DEF)/AdBlue® tank

### Requirements

The operator must maintain appropriate **DIESEL EXHAUST FLUID (DEF)/ADBLUE®** levels at all times. No additional maintenance is required.

**NOTICE:** Prolonged idling of the machine with no load for more than **6 h** will cause damage to the SCR catalyst.

**NOTE:** See your MILLER dealer for replacement components and cleaning agents.

See “Engine oils” for recommended engine oils, their operating temperature ranges, and their maximum engine oil service change interval.

See “General specification - Biodiesel fuels” for details on biodiesel fuel usage in your MILLER machine.

**NOTICE:** While any company can perform necessary maintenance or repairs on your equipment, MILLER strongly recommends that you use only authorized MILLER dealers and products that meet the given specifications. Improperly or incorrectly performed maintenance and repair voids the equipment warranty and may affect service intervals.

### DIESEL EXHAUST FLUID (DEF)/ADBLUE® refilling

**NOTE:** Before removing the DEF tank cap, clean the area around the DEF cap.

**NOTICE:** If any **DIESEL EXHAUST FLUID (DEF)/ADBLUE®** spills or contacts any surface other than the storage

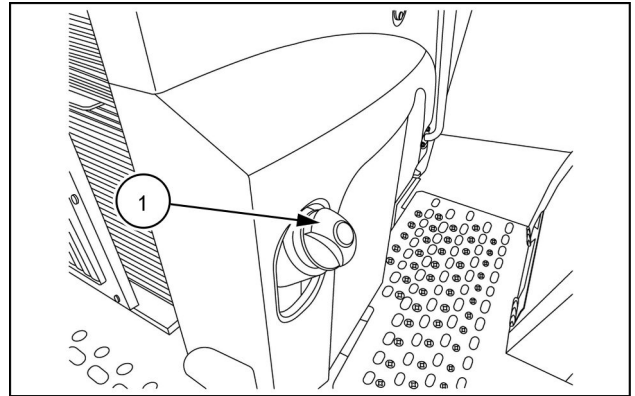
tanks, immediately clean the affected surface with clear water. **DIESEL EXHAUST FLUID (DEF)/ADBLUE®** will cause corrosion on painted and unpainted metallic surfaces, and may distort some plastic and rubber components.

Locate the blue colored DEF tank fill cap (1) located on the left side of the engine compartment cowling. Remove the cap to fill the DEF tank.

Refill the DEF tank when the DEF fluid level indicator on the A post display, indicates low level and the DEF level pop-up window on the arm rest display indicates. The pop-up warnings will continue indicating different levels in the DEF tank. After the tank is refilled the pop-up warnings will stop.

If the pop-up messages are avoided the engine will start to de rate, eventually to low idle.

DEF tank capacity is: **91 L (24 US gal)**



RAIL17SP00238AA 1

Reinstall the DEF fill cap when finished filling the tank.

It is recommended that **DEF/ADBLUE®** filling equipment should be used having a fill nozzle/pump with the correct length and diameter, triggered by the magnet in the tank filler neck, and with overflow flow cut out. This will ensure that:

- The screen in the filler neck will not be damaged.
- Impurities are not entering the **DEF/ADBLUE®** tank. The standardized **DEF/ADBLUE®** nozzle matches the filler neck diameter.
- The **DEF/ADBLUE®** tank is not overfilled, as the **DEF/ADBLUE®** pump will stop when the **DEF/ADBLUE®** tank is full.
- **DEF/ADBLUE®** is not pumped in the fuel tank, as the **DEF/ADBLUE®** nozzle cannot pump when the magnet is not sensed.

**NOTICE:** If a warning light has been triggered for low or empty **DEF/ADBLUE®**, the system must be reset by cycling the key switch OFF then ON after refilling the **DEF/ADBLUE®** tank.

**NOTICE:** Refilling with a funnel is not recommended, as this may lead to damage of the screen in the filler neck.

**NOTE:** The information above has been provided by the International Organization for Standardization (ISO), Document number **ISO 22241-4 Diesel engines - NOx reduction agent AUS 32 - Part 4: Refilling interface.**

## **DIESEL EXHAUST FLUID (DEF)/AdBLUE® consumption**

**DEF/AdBLUE®** consumption is figured against the amount of fuel consumed. Typical **DEF/AdBLUE®** consumption is approximately **6%** of fuel consumption when you operate the machine at rated engine speed. **DEF/AdBLUE®** consumption can be as high as **15%** when NOx output increases. The consumption rate of **DEF/AdBLUE®** and fuel also depends on:

- Engine load
- Ambient humidity
- **DEF/AdBLUE®** fluid concentration
- Gear selection
- Ground drive slip
- Engine RPM during operation

**NOTE:** The “typical” consumption is only a guideline to verify proper function of the SCR system. MILLER recommends to fill the **DEF/AdBLUE®** tanks at every fuel refilling interval.

## Tire and rim service

### Tire and rim repair

#### **⚠ WARNING**

**Explosion hazard!**

**Do not remove, install, or make repairs to a tire on a wheel rim. Take the tire and rim to a tire shop where persons with special training and special safety tools are available.**

**Failure to comply could result in death or serious injury.**

W0365A

Always have a qualified tire mechanic service the tires and rims on this machine. If the tire has lost all air pressure, take the tire and rim to a tire shop for service. The use of correct equipment and correct procedures will prevent accidents. Explosive separation of the tire can cause serious injury.

### Tire air pressure

Check the tire pressure daily. MILLER recommends that the tire manufacturer's tire pressure, as indicated on the side wall of the tire, be maintained. If your vehicle is equipped with the **Michelin® SprayBib™** 173 LI tires the maximum pressure is **441 kPa (64 psi)**.

### Tire inflation procedure

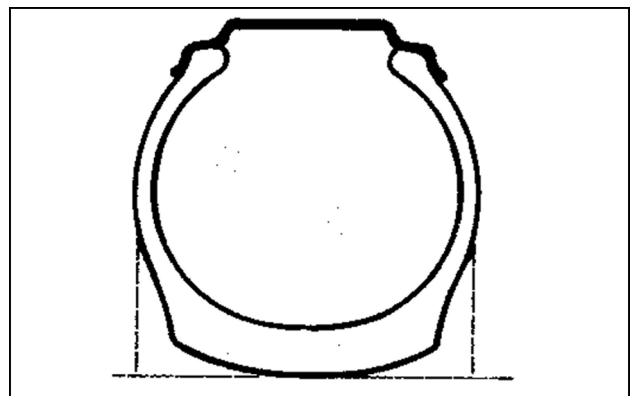
Do not inflate a tire that has had a complete loss of air. If the tire has lost all air pressure, have a qualified tire mechanic service the tire.

To add air to a partly inflated tire, use the following procedure:

1. Use an air hose with a remote shutoff valve and a self-locking air chuck.
2. Stand behind the tread of the tire and make sure all persons are away from the side of the tire before you start to add air.
3. Inflate the tire to the recommended air pressure. DO NOT inflate the tire more than the recommended pressure.

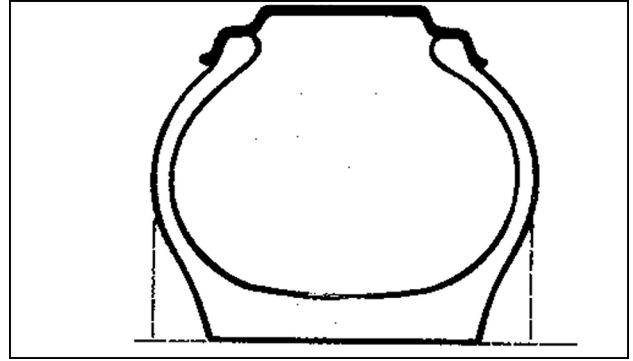
### Tire inflation examples

This example shows the cross section of a tire inflated for maximum load but with a minimum load on the tire. The tire tread is not making full contact with the ground which will give poor performance.



RCIL08CCH012AAB 1

This example shows the cross section of a tire with the inflated pressure correctly adjusted to the load on the tire. The tire tread is making full contact with the ground which will give maximum performance.



RCIL08CCH013AAB 2

**Tire size chart**

**⚠ WARNING**

**Explosion hazard!**  
**Always maintain correct tire pressure as indicated in this manual. DO NOT inflate tires above the recommended pressure. Excessive pressure could result in tire failure. Failure to comply could result in death or serious injury.**

W0109A

The following chart lists the tire sizes recommended for the vehicle.

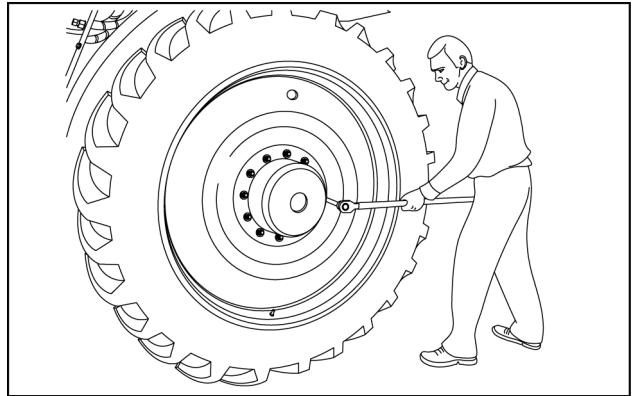
**NOTICE:** Do not drive or load tires beyond their rated speed and load capabilities. Check the tire manufacturers specifications for load and speed ratings for your particular tire.

Tire Size	Tire Brand	Air Pressure	Load Rating	Load capacity (per tire)	Speed	Models	Rolling Circumference
320/90R50	Goodyear®	441 kPa (64 psi)	IF 161	4627 kg (10200 lb)	64 km/h (40 mph)	7310	5563 mm (219 in)
380/90R46	Goodyear®	441 kPa (64 psi)	IF 168	5579 kg (12300 lb)	64 km/h (40 mph)	7310	5563 mm (219 in)
380/90R46	Michelin®	441 kPa (64 psi)	VF 173	6486 kg (14300 lb)	64 km/h (40 mph)	7310	5504.2 mm (216.7 in)
380/90R50	Goodyear®	441 kPa (64 psi)	IF 170	5987 kg (13200 lb)	64 km/h (40 mph)	7310	5842 mm (230 in)
380/90R50	Michelin®	441 kPa (64 psi)	175D	6900 kg (15212 lb)	64 km/h (40 mph)	7310	5842 mm (230 in)
480/80R42	Goodyear®	400 kPa (58 psi)	166A8	5307 kg (11700 lb)	64 km/h (40 mph)	7310	5613 mm (221 in)
520/85R42	Goodyear®	241 kPa (35 psi)	169A8	5806 kg (12800 lb)	64 km/h (40 mph)	7310	5715 mm (225 in)
650/75R42	Goodyear®	317 kPa (46 psi)	170	5987 kg (13200 lb)	48 km/h (30 mph)	7310	5740 mm (226 in)

### Wheel lug nut torque

Check the wheel lug nut torque. Torque the lug nuts to **610 N·m (450 lb ft)**.

Re-torque the wheel lug nuts each time a wheel is re-installed onto the vehicle. Check and re-torque the lug nuts again after one hour of use.



RAIL15SP00828AA 3



## Hydraulic system

### ⚠ WARNING

Pressurized fluid can penetrate the skin and cause severe injuries. Keep hands and body away from any pressurized leak. **DO NOT** use your hand to check for leaks. Use a piece of cardboard or paper. If fluid penetrates the skin, seek medical attention immediately. Failure to comply could result in death or serious injury.

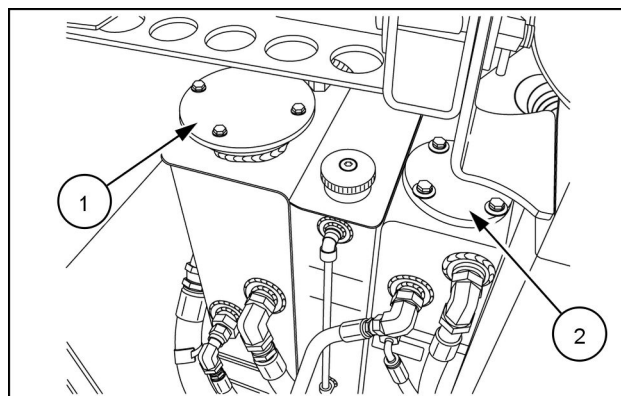
W0158A

### Hydraulic oil filter system

Two hydraulic tank oil filters are attached to the top of the hydraulic oil tank. There are two filters; the hydraulic oil return filter **(1)** located on the top of the hydraulic oil reservoir and the case drain filter **(2)** located on the top of the hydraulic oil reservoir close to the front of the tank.

Unlatch the right side sliding screen engine access door and slide open to access the hydraulic oil reservoir and filters.

Close the door before operating the vehicle.



RAIL17SP00262AA 1

### Hydraulic system cleanliness

The greatest contributor to hydraulic component failure is contamination of the oil with dirt and other debris. Keep all hydraulic access areas completely clean, such as around the hydraulic filter and filler cap. Immediately repair any fittings, hoses or other components where leakage is observed. Wipe up any leakage.

If the hydraulic system should be disconnected for service, protect the ends of hoses, tubing and ports of components from contamination with clean lint free towels or clean plastic bags, plugs or caps.

Before installing any replacement hose, flush the inside of the hose with clean diesel fuel or unused commercial petroleum cleaning solvent. Do not use water, water soluble cleaners or compressed air.

## Propel system

The propel system contains 1 electronically controlled hydrostatic pump and 4 electronically controlled wheel motors. The propel system is controlled by an electronic driveline controller which determines the displacement of the hydrostatic pump and motors based on the operators command. The system is a closed loop circuit which combines the flow of hydrostatic pump and distributes it to the four wheel motors. The hydrostatic pump has an integral charge pump. The purpose of the charge pump is to supply oil into the closed loop propel circuit which is lost due to inefficiencies of the pump, motors and provide make-up oil which is removed by a loop flushing valve in each motor.

The oil in the hydraulic reservoir is pulled into the charge pump where it is pressurized to approximately **3447 kPa (500 psi)**. The oil is then pushed through the propel pump. From there it goes into the low pressure side of the hydrostatic pump (return flow). From the propel pump (**44816 kPa (6500 psi)** or greater) the oil is pumped according to demand (the amount of displacement by the joystick in the cab) to the wheel drive motors. The displacement of the electronically controlled wheel motors is controlled by the electronic driveline controller.

The pressure in the charge pressure circuits is also monitored with two identical pressure transducers. These pressure transducers trigger lights and alarms in the cab if the pressure drops below **1379 kPa (200 psi)** in their respective circuits. Loss in charge pressure could be due to a number of items: a burst hose, or a failure in a charge pump, a valve or propel pump. Propel system damage can occur if a charge pressure warning is ignored.

Extra flow from the charge pump (as it is positive displacement) is emptied into the case of the hydrostatic pump (propel). A set amount of oil is also drained off the propel circuit (low pressure side) to allow new oil into the system (this is accomplished by the loop flushing valve in each wheel motor). This allows clean, filtered oil to enter the system via the charge pump. The oil which is drained off the propel loop is then directed through a heat exchanger and then combines with the hydrostatic pump case flows to a return filter located inside the oil reservoir.

Since the park brakes are pressure released, a minimum of **2586 kPa (375 psi)** is required in the parking brake circuit to prevent the park brakes from engaging. When the pressure drops below this value, the parking brakes will start to engage. Continued use with the park brake light on may damage the brakes and other components. The brakes are protected with a pressure switch which monitors pressure in the brake circuit. The parking brake circuit is feed by the parking brake/ladder valve which in part of the auxiliary hydraulic circuit.

## Auxiliary circuit

The auxiliary circuit operates at **20684 kPa (3000 psi)**. The pump senses how much flow is needed for the auxiliary circuit. Oil is drawn from the oil reservoir into the pump, which maintains **20684 kPa (3000 psi)** at all times. The oil flows from the pump to the priority valve. The priority valve gives the steering system priority over all other functions. Only after the steering circuit oil needs are satisfied, is any oil passed through the priority valve to the other functions: spray pump motor, park brake, ladder cylinder, lift and boom cylinders, leg widening, etc. All of the oil in this circuit returns to a return filter located in the oil reservoir.

## Hydrostatic Pressure

The hydrostat pressure can be monitored on the armrest home display by accessing the Hydraulics diagnostics page.

## Charge pressures

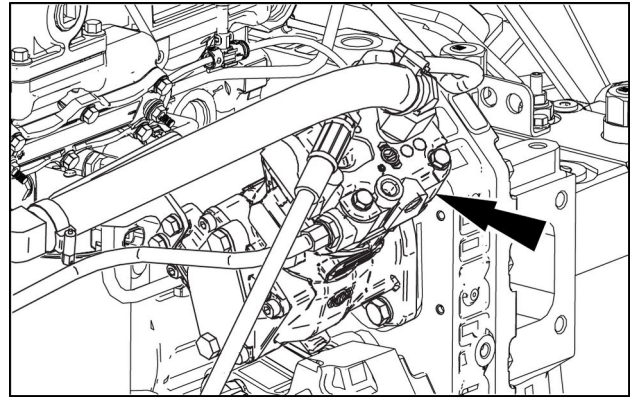
The individual charge pressures can be monitored on the arm rest display by accessing the chassis diagnostic page. The following table lists the pressure setting values for the machine.

<b>Pressure settings</b>			
	Minimum	Nominal	Maximum
Priority pressure	<b>15341 kPa (2225 psi)</b>	<b>15858 kPa (2300 psi)</b>	<b>16375 kPa (2375 psi)</b>
Auxiliary pump — Running (high)	<b>20340 kPa (2950 psi)</b>	<b>20684 kPa (3000 psi)</b>	<b>20684 kPa (3000 psi)</b>
Auxiliary pump — Cranking (low)	<b>1207 kPa (175 psi)</b>	<b>1379 kPa (200 psi)</b>	<b>1551 kPa (225 psi)</b>
UltraFlo auxiliary. pump — Running (high)	<b>19650 kPa (2850 psi)</b>	<b>19995 kPa (2900 psi)</b>	<b>20340 kPa (2950 psi)</b>
UltraFlo auxiliary. pump — Cranking (low)	<b>1207 kPa (175 psi)</b>	<b>1379 kPa (200 psi)</b>	<b>1551 kPa (225 psi)</b>
Charge pressure	<b>3172 kPa (460 psi)</b>	<b>3378 kPa (490 psi)</b>	<b>3585 kPa (520 psi)</b>
Park brake pressure	<b>2586 kPa (375 psi)</b>	<b>2758 kPa (400 psi)</b>	<b>2930 kPa (425 psi)</b>
High pressure forward	<b>44126 kPa (6400 psi)</b>	<b>44816 kPa (6500 psi)</b>	<b>44816 kPa (6500 psi)</b>
High pressure reverse	<b>36542 kPa (5300 psi)</b>	<b>37231.7 kPa (5400.0 psi)</b>	<b>37921 kPa (5500 psi)</b>
Air pressure	<b>793 kPa (115 psi)</b>	<b>827 kPa (120 psi)</b>	<b>862 kPa (125 psi)</b>
Boom tilt accumulators — 60 ft — 100 ft Mono boom	<b>12066 kPa (1750 psi)</b>	<b>12411 kPa (1800 psi)</b>	<b>12755 kPa (1850 psi)</b>
Boom tilt accumulators — 120 ft Mono boom	<b>14134 kPa (2050 psi)</b>	<b>14479 kPa (2100 psi)</b>	<b>14824 kPa (2150 psi)</b>
Boom tilt accumulators — Truss boom	<b>7239 kPa (1050 psi)</b>	<b>7584 kPa (1100 psi)</b>	<b>7929 kPa (1150 psi)</b>
Brake accumulator	<b>9480 kPa (1375 psi)</b>	<b>9653 kPa (1400 psi)</b>	<b>9825 kPa (1425 psi)</b>
Boom lift accumulators	<b>7929 kPa (1150 psi)</b>	<b>8274 kPa (1200 psi)</b>	<b>8618 kPa (1250 psi)</b>
Suspension cylinder accumulators	<b>5688 kPa (825 psi)</b>	<b>5861 kPa (850 psi)</b>	<b>6033 kPa (875 psi)</b>
Charge pressure accumulators	<b>1034 kPa (150 psi)</b>	<b>1207 kPa (175 psi)</b>	<b>1379 kPa (200 psi)</b>
Fan compensator pressure setting (reference)	<b>18650 kPa (2705 psi)</b>	<b>18995 kPa (2755 psi)</b>	<b>18995 kPa (2755 psi)</b>

## Pneumatic system (if equipped)

### Air compressor

An air compressor is available as an option. The air compressor is located on the right side of the engine. The air compressor is used for the foam marker system and the boom blow-out option.

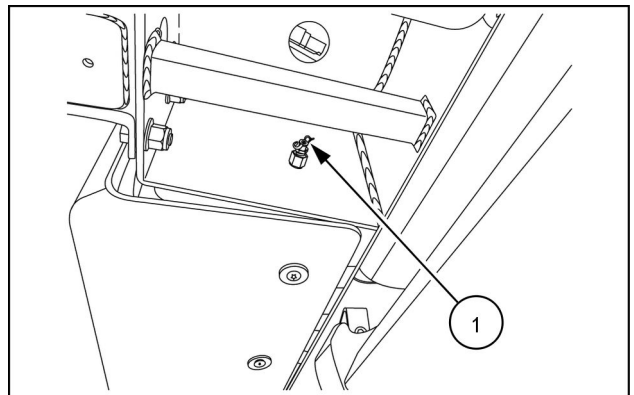


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### Air compressor discharge inspection

All air compressors have a small amount of lubricating oil carry over which lubricates the piston rings and moving parts. When this lubricating oil is exposed to normal air compressor operating temperatures over a period of time, the lubricating oil will form varnish or carbon deposits. If the following inspections are not done, the air compressor piston rings will be affected by high operating temperatures and pressures and will not seal correctly. Locate the air system tank located inside the right rear corner of the engine compartment.

Open the remote petcock **(1)** located on the right side frame just in front of the air tank. Drain the air system to remove all air pressure from the system.

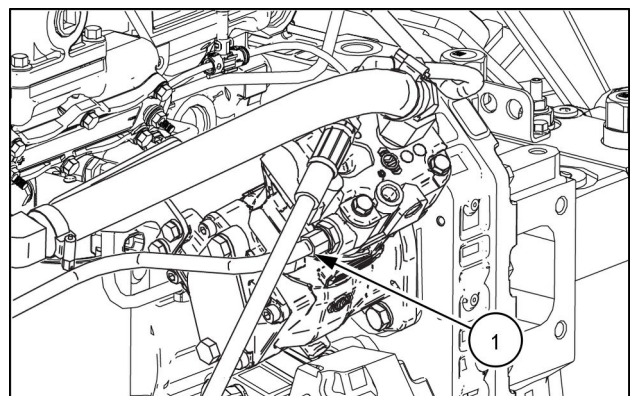


RAIL17SP00286AA 2

Remove the air discharge line **(1)** from the air compressor. Measure the total carbon deposit thickness inside the air discharge line.

If the total carbon deposit thickness exceeds **2 mm (0.08 in)**, clean and inspect the air compressor cylinder head, the valve assembly and the discharge line. Replace if necessary.

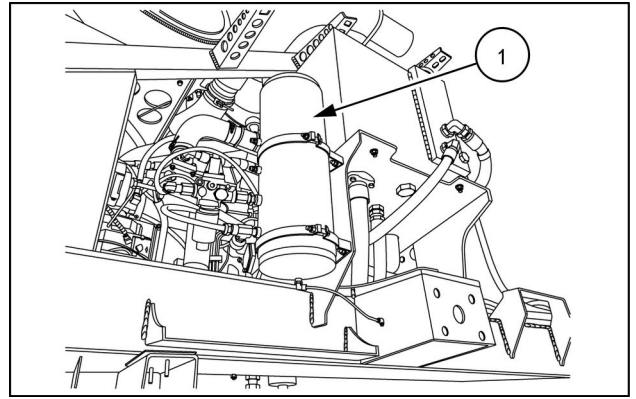
Contact your dealer for proper procedures.



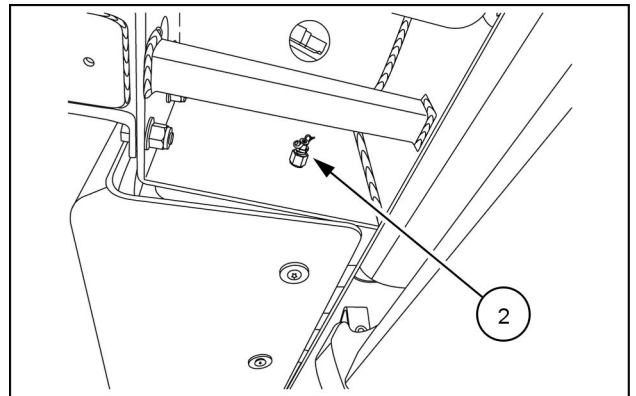
RAIL17SP00785AA 3

## Air tank

Drain the water from the air tank **(1)** daily to prevent corrosion inside the tank. Open the remote petcock **(2)** located on the right side frame just in front of the air tank. Open the remote petcock to remove moisture. Close the petcock after all moisture has been removed.



RAIL17SP00222AA 4



RAIL17SP00286AA 5

## Fluids and lubricants

<b>Engine</b>	
Oil type	<b>NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4 SAE 10W-40</b>
Oil Capacity	<b>15.9 L (4.2 US gal)</b> Without oil filter <b>17.0 L (4.5 US gal)</b> With oil filter
Diesel Exhaust Fluid (DEF)	<b>DEF/AdBLUE® ISO 22241-1</b>
DEF capacity	<b>91 L (24 US gal)</b>
<b>Cooling system</b>	
Coolant type	<b>NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT</b>
Coolant capacity	Approximately <b>51.1 L (13.5 US gal)</b> (does not include the heater core or cab plumbing).
<b>Hydraulic system</b>	
Oil type	<b>NEW HOLLAND AMBRA HYDROSYSTEM 68</b>
Tank capacity	Approximately <b>132 l (35 US gal)</b>
<b>Planetary hub</b>	
Oil type	<b>TUTELA 50 HD</b>
Hub capacity	<b>1479 mL (50 US fl oz)</b>
<b>Air conditioning system</b>	
Refrigerant type	<b>CNH REFRIGERANT HFC-134A</b>
<b>Lubricating grease</b>	
Grease type	<b>NEW HOLLAND AMBRA GR 75 MD</b>

## Engine oils

MILLER prefers the use of **NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4** engine oil in your engine. This multi-viscosity oil will lubricate your engine correctly under all operating conditions. **NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4** engine oil has a maximum service change interval of **600 h**.

You may also use **NEW HOLLAND AMBRA MASTERGOLD™ HSP ENGINE OIL** in your engine. **NEW HOLLAND AMBRA MASTERGOLD™ HSP ENGINE OIL** has a maximum service change interval of **400 h**.

You may use other engine oils if the engine oils meet **API CJ-4** performance requirements. The maximum service change interval for these engine oils is **300 h**.

MILLER engine oils exceed **API CJ-4** performance requirements.

See the following chart for recommended viscosity at varying ambient air temperature ranges.

**NOTE:** Do not put performance additives or other oil additive products in the engine crankcase. MILLER develops the oil change intervals given in this manual from tests with MILLER lubricants.

### For machines with Tier 4B (final) engines

	(H)	0W-40 CJ-4 UNITEK to CNH MAT3521									
	(H)	0W-40 API CJ-4*									
		(H)	10W-40 CJ-4 UNITEK to CNH MAT3521								
		(H)	10W-40 API CJ-4*								
			(H)	15W-40 CJ-4 to CNH MAT3522**							
			(H)	15W-40* API CJ-4*							
-40 °C -40 °F	-30 °C -22 °F	-20 °C -4 °F	-10 °C 14 °F	0 °C 32 °F	10 °C 50 °F	20 °C 68 °F	30 °C 86 °F	40 °C 104 °F	50 °C 122 °F		
<p>(H) MILLER recommends the use of an engine oil pan heater or coolant block heater in this range.</p> <p>* Maximum engine oil service change interval is <b>300 h</b></p> <p>**Maximum engine oil service change interval is <b>400 h</b></p>											

## Engine coolant system

### ⚠ WARNING

**Entanglement hazard!**

**Do not attempt any inspection or adjustment with the machine running.**

1. Set the parking brake.
2. Turn off the engine.
3. Remove key from key switch.

**Failure to comply could result in death or serious injury.**

W0103A

### ⚠ WARNING

**Maintenance hazard!**

**Never try to service the air-conditioning system yourself. Contact your dealer for service.**

**Failure to comply could result in death or serious injury.**

W0268A

### ⚠ WARNING

**Burn hazard!**

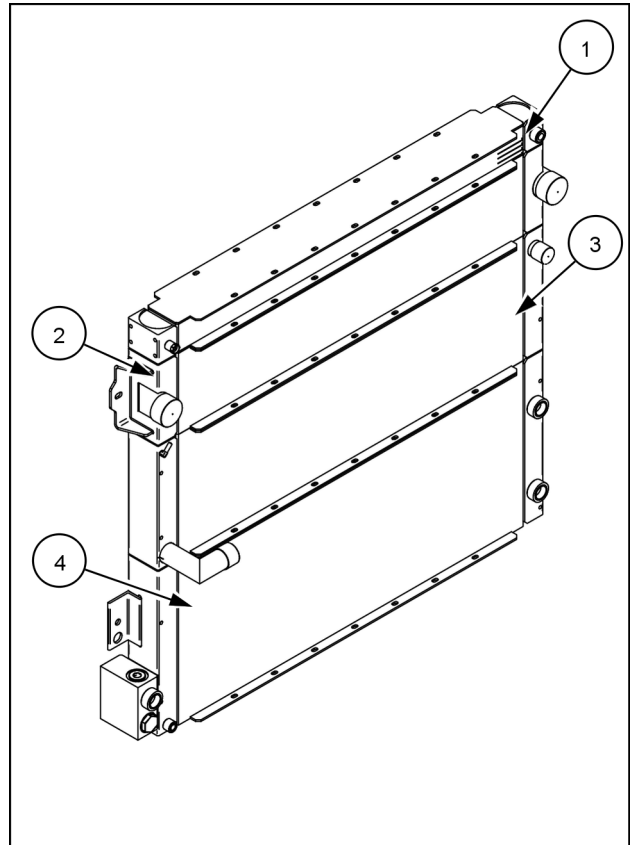
**Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released.**

**Failure to comply could result in death or serious injury.**

W0367A

The air conditioning condenser (1), charge air cooler (2), engine radiator (3), and the hydraulic oil cooler (4) are in a top to bottom stacked arrangement.

The cooling fan pulls air through the coolers from the front side and out to the rear of the vehicle.

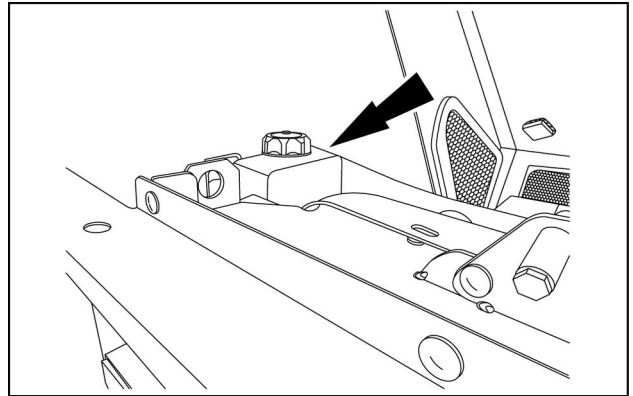


RAIL17SP00436BA 1



## Coolant overflow bottle

The coolant overflow bottle is located inside the engine compartment on the right-hand side and should not be used to add coolant to the surge tank. The bottle is used to catch overflow from the surge tank. The overflow bottle is not to be used as a coolant level check.

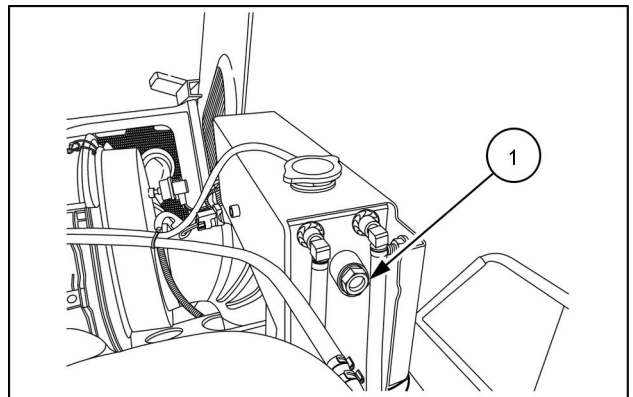


RAIL17SP00235AA 2

## Coolant level sensor

Your sprayer is equipped with a coolant level sensor which will automatically detect and warn the operator when the coolant level is too low.

The coolant level can also be checked by using the sight gauge (1) attached to the surge tank.



RAIL17SP00236AA 3

## Surge tank

The surge tank can be accessed by unlatching the engine compartment hood at the front left-hand corner and pivot the hood to open.

The surge tank (1) allows for hot coolant expansion and keeps the expanded coolant volume within the cooling system.

The level of coolant in the system can be checked by observing the sight gauge (2) attached to the front surface of the surge tank.

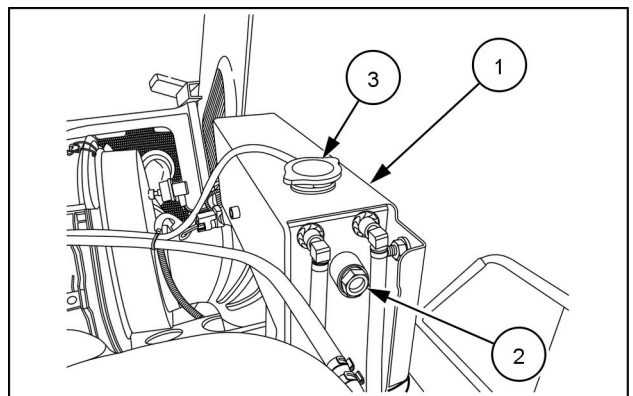
Coolant is added to the system through the filler neck on the surge tank.

If the coolant level is low, allow the engine and radiator to cool before attempting to open the surge tank cap (3). Add the proper coolant as needed to bring the coolant level up to the fill neck of the surge tank. Replace cap when finished adding coolant to the system.

The capacity of the cooling system is **51.1 L (13.5 US gal)**. This capacity does not include the heater core or cab plumbing.

Refer to **7-25** for coolant specifications.

**NOTICE:** Do not mix different coolant types.



RAIL17SP00236AA 4

### **Adding coolant to the system**

Your vehicle is filled with Organic Acid Technology (OAT) coolant at the factory. Never mix OAT coolant with conventional coolant.

Refer to **7-34** for coolant adding procedure.

## Organic Acid Technology (OAT) coolant

MILLER requires the use of a fully formulated Organic Acid Technology (OAT) based coolant. **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT** is preferred. The coolant must meet the specifications outlined in the CNH Industrial material specification **MAT3624**. Use of coolant not meeting this specification is not allowed. Mixing of different coolant brands is not recommended.

**NOTICE:** OAT coolant is mandatory for all FPT engines compliant to Tier 4B (final) emissions using Selective Catalytic Reduction (SCR). NEVER mix OAT coolant with conventional coolant. Under no circumstances should you top off a cooling system with only water. You can use a refractometer to check the concentration level. You should not use Supplemental Coolant Additives (SCA) when using **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT**. Change the coolant solution at the recommended change interval.

You can identify OAT coolant by its yellow color. Also, the decal shown is located near the fill point of the cooling system whenever the factory fill is **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT**. This decal is available in three different sizes. See the table below for the associated part numbers.

CNH Industrial part number	Size
47757330	50 mm x 50 mm
47757331	75 mm x 75 mm
47757332	100 mm x 100 mm

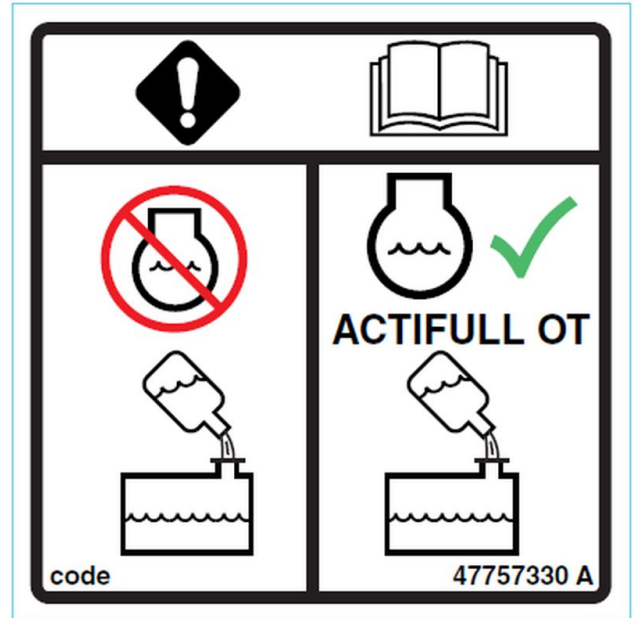
### Definitions

Conventional coolant:

A coolant that relies on inorganic inhibitors such as silicates, nitrites, and phosphates for corrosion and cavitation protection.

Organic Acid Technology (OAT) coolant:

A coolant that relies on inhibitors such as organic acid salts for corrosion and cavitation protection.



47757330 1

## General battery maintenance

### ⚠ WARNING

#### Chemical hazard!

Battery posts, terminals, and related accessories contain lead and lead compounds. Wash hands after handling.

Failure to comply could result in death or serious injury.

W0349A

### ⚠ WARNING

#### Hazardous chemicals!

Battery electrolyte contains sulfuric acid. Contact with skin and eyes could result in severe irritation and burns. Always wear splash-proof goggles and protective clothing (gloves and aprons). Wash hands after handling.

Failure to comply could result in death or serious injury.

W0006A

### ⚠ WARNING

#### Explosion hazard!

If battery electrolyte is frozen, attempting to charge the battery or jump-start the engine can cause the battery to explode. Always keep batteries at full charge to prevent frozen battery electrolyte. Never charge a frozen battery.

Failure to comply could result in death or serious injury.

W0203A

## Batteries

There are three batteries installed into the vehicle. The batteries are connected in series. The batteries are of sealed type construction.

Battery specifications are as follows:

Nominal Voltage – **12 V**

Cold Cranking Amps — 1000 A SAE CA **0 °C (32 °F)**

Reserve capacity ( **25 A** at **27 °C (80 °F)** — 200

Battery type — Flooded

Electrolyte specific gravity range – 1.270 – 1.300

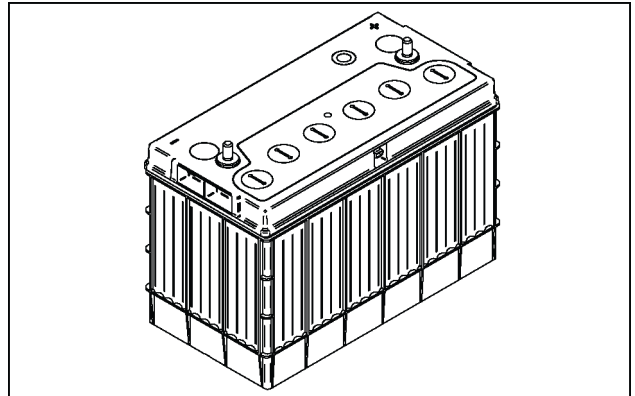
Float voltage ( **27 °C (80 °F)** ) – **13.5 – 13.8 V**

Cycling voltage ( **27 °C (80 °F)** ) – **14.5 – 14.9 V**

Maximum discharge current – **1400 A ( 5 s)**

Approximate weight – **26 kg (58 lb)**

Battery terminal type – 3/8-16 Stud



RAIL17SP00991AA 1

## Battery maintenance

The three batteries are located inside the engine compartment and are accessed through the left side panel of the rear engine compartment.

Keep your batteries in good operating condition as follows:

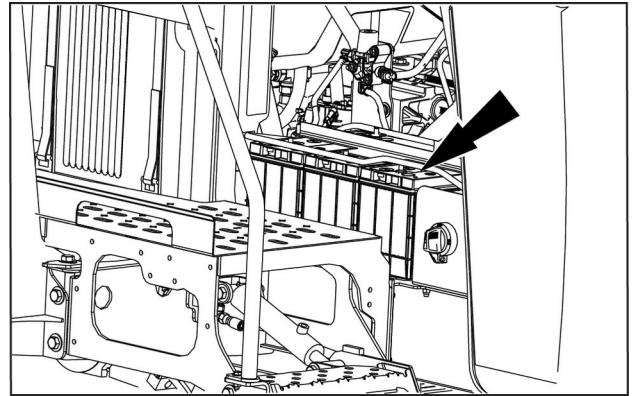
1. Keep the batteries with a full charge.
2. Keep the batteries clean and dry.
3. Keep the batteries fastened into their mounting position.
4. If a battery will not keep a charge, install a new battery that has the specifications given in this manual.
5. When using a battery charger, charge at the lowest rate possible to reduce gas formation. Do not charge a frozen battery.
6. The batteries will discharge when the machine is not in use. Charge the batteries every six weeks. A discharged battery can freeze at low ambient temperatures and cause battery damage.

**NOTE:** The full charge specific gravity will usually be shown on the battery. Cold temperatures of approximately  $-17.8\text{ }^{\circ}\text{C}$  ( $0.0\text{ }^{\circ}\text{F}$ ) will cause freezing of a battery with a specific gravity of 1.175.

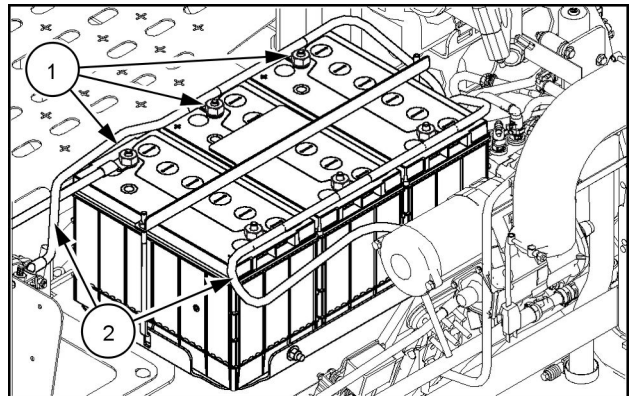
## Battery terminals and cables

The battery cable terminals must be kept clean and tight. Keep your battery cable terminals in good operating condition as follows:

1. Tighten loose connections by tightening the nuts (1) attaching the battery cable lugs to the batteries.
2. Inspect the battery cables (2) for damage. Replace any battery cable that has damage.
3. Remove all corrosion with a wire brush, then wash with a weak solution of baking soda or ammonia.
4. Put some petroleum jelly or light grease on terminals to prevent more corrosion.



RAIL17SP00628AA 2



RAIL17SP01017AA 3

## Battery jump starting posts

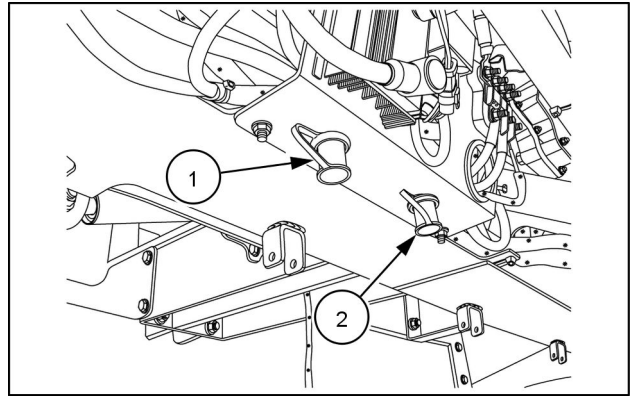
The battery jump starting posts are located inside the rear frame on the left-hand side next to the frame rail.

Negative post (1) , Positive post (2)

Access the posts by unlatching and opening the left-hand side engine door.

Remove the rubber caps from the posts before connecting to the posts.

Replace the rubber caps after using the posts. Close and latch the left-hand side engine door before operating the vehicle.



RAIL17SP00265AA 1

## Battery disconnect switch

**NOTICE:** After turning the ignition off, wait at least 2 minutes before turning the battery disconnect off.

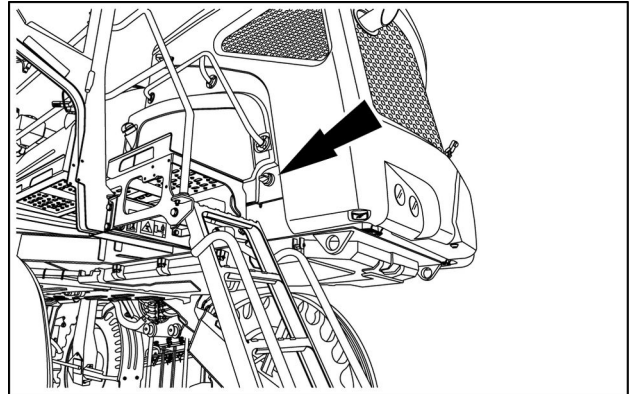
The battery disconnect switch is located on the rear left side of the engine cowling just below the ladder grab rail. Turning the switch off (vertical) will disconnect the batteries from the vehicles electrical system.

Turn the switch on (horizontal) to enable the entire electrical system.

The electrical system can be disconnected when the vehicle is left for extended periods of time or if there is a drain on the batteries.

The switch can be locked (with a pad lock) when the vehicle is left unattended.

**NOTE:** If vehicle is allowed to stand for long periods of time with the battery disconnect off, electrical devices that have an internal power supply may have to be reset after the power is turned on.



RAIL17SP00242AA 1

## Fuse locations

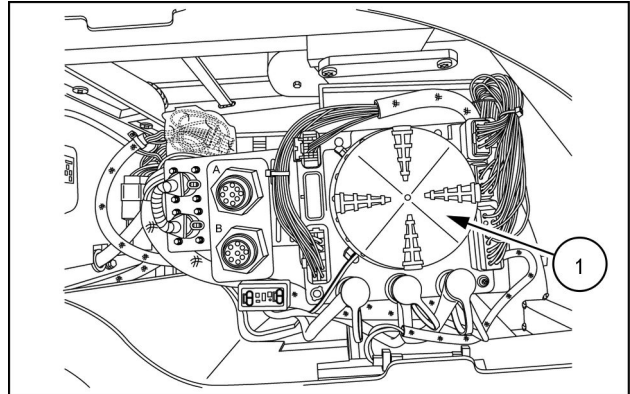
Fuses and relays for the vehicle are located in either the Cab fuse/relay block or the Engine fuse/relay block.

### Cab fuse/relay block

The Cab fuse/relay block (1) is located under the storage bin behind the training seat.

Remove the bin to access the fuse block. Remove the fuse block cover to access the fuses.

Reinstall the fuse block cover and the storage bin before operating the vehicle.



RAIL17SP01408AA 1

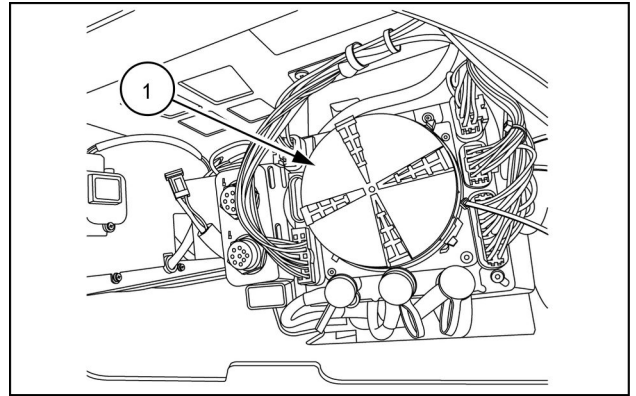
The fuses and relays located on the Cab fuse/relay block are listed in the table.

Fuse number	Relay number	Amperage	Description
F1	K1	20 A	Stadium Lights 1 and 6
F2	K2	20 A	Stadium Lights 2 and 5
F3	K3	20 A	Stadium Lights 3 and 4
F4	K4	10 A	Beacons
F5	K5	20 A	Boom Lights
F6	K6	30 A	Wiper Low
F7	K7	20 A	Low Beams
F8	K8	20 A	High Beams
F9	K9	30 A	Wiper High
—	K10	-	Spare
—	K11	-	Spare
—	K12	-	Pressure Fan Relay
—	K13	-	Door Switch Relay
—	K14	-	Wiper Fluid Relay
—	K15	-	Egress Lighting Relay
F10	—	10 A	Switched Display Power
F11	—	10 A	Switched Radio Power
F12	—	15 A	Switched Driveline Control Power
F13	—	10 A	110 V Outlet Power
F14	—	20 A	Auto Steer Valve Power
F15	—	30 A	Switched Outlet Power
F16	—	30 A	Evaporator Blower Power
F17	—	20 A	Seat Power
F18	—	15 A	Switched Field Computer Power
F19	—	10 A	HVAC Pressure Blower
F20	—	10 A	HVAC Pressure Sensor
F21	—	10 A	Switched HVAC Control Power
F22	—	10 A	Constant HVAC Control Power
F23	—	10 A	Cooler Power
F24	—	10 A	Wiper Fluid Pump Power
F25	—	30 A	Constant Outlet Power
F26	—	10 A	Constant Display Power
F27	—	10 A	Powered Mirrors
F28	—	10 A	Steering Column
F29	—	10 A	Spare



### Engine fuse/relay block

The Engine fuse/relay block (1) is located behind the left-hand side panel of the engine compartment. Remove the panel by pulling the grab handle outward, and then lifting the panel upward to remove from the vehicle. Reinstall the panel before operating the vehicle.



RAIL17SP00370AA 2

The fuses and relays located on the Engine fuse/relay block are listed in the table.

Fuse number	Relay number	Amperage	Description
F1	K1	10 A	Boom Rest — Up Lights
F2	K2	10 A	Boom Rest — Left Out Light
F3	K3	20 A	Spare
F4	K4	10 A	Boom Rest — Right Out Light
F5	K5	20 A	Spare
F6	K6	10 A	Engine Control Module (ECM) Switched Power
F7	K7	20 A	Spare
F8	K8	15 A	Spare
F9	K9	15 A	Air-conditioning clutch
—	K10	-	Spare
—	K11	-	Spare
—	K12	-	Spare
—	K13	-	Spare
—	K14	-	Engine Auxiliary Relay
—	K15	-	Spare
F10	—	20 A	Spare
F11	—	10 A	Foamer Power
F12	—	15 A	Sensor Power
F13	—	25 A	Product Valves
F14	—	15 A	Node Power
F15	—	15 A	Boom Valves
F16	—	20 A	Control Nodes High Current power
F17	—	15 A	Spare
F18	—	10 A	Alternator Exciter
F19	—	30 A	Injection High Current Power #2
F20	—	30 A	Injection High Current Power #3
F21	—	30 A	Injection High Current Power #1
F22	—	30 A	Engine Control module (ECM) Constant power
F23	—	20 A	ISOBUS Constant power
F24	—	10 A	Egress Lights
F25	—	25 A	<b>IntelliSpray™</b> High Current Power #1
F26	—	25 A	<b>IntelliSpray™</b> High Current Power #2
F27	—	25 A	<b>IntelliSpray™</b> High Current Power #3
F28	—	20 A	Engine Auxiliary Relay Power
F29	—	25 A	<b>IntelliSpray™</b> High Current Power #4

**Maintenance planning**

**Maintenance chart**

Maintenance action	Adjust				Calibrate				Page no.
	Drain fluid	Replace	Cleaning	Check	Tighten	Lubricate	Grease	Change fluid	
At warning message display									
Fuel filter/water separator		x							7-34
Engine coolant level		x							7-34
As required									
Remove trash/debris from chassis and engine area			x						7-36
Clean the cooling package			x						7-36
Cab air filters - Replace				x					7-38
Flow meter					x				7-39
Flow meter sensor				x					7-41
Flow meter calibration						x			7-41
Flow meter cable		x							7-42
Steam clean the engine			x						7-43
Boom cylinder speed					x				7-44
Boom strainer filters			x						7-45
Hydraulic oil change and oil strainer cleaning			x						7-46
First 10 hours									
Wheel lug nuts						x			7-47
Every 10 hours or daily									
Check engine oil level		x							7-48
Check the coolant level		x							7-48
Check the hydraulic oil level		x							7-49
Lubricate the boom							x		7-49
Lubricate the steering king pins							x		7-58
Lubricate the suspension components							x		7-59
Lubricate ladder pivot								x	7-61
Fuel filter water drain		x							7-62
Check engine air filters		x							7-62
Air intake - Check		x							7-63
Cooling fan		x							7-64
Air intake lines		x							7-64
SCR exhaust piping connections		x							7-65
Air filter dust valve		x							7-66
Remove trash/debris from chassis and engine area			x						7-66
First 50 hours									
Wheel lug nuts						x			7-67
Planetary gear lube - change								x	7-67
Every 50 hours									
Foam marker mixing filters and screens			x						7-68
Foamer tank filter			x						7-68
Leg widening axle slide pads							x		7-69
Planetary hub oil level		x							7-69
First 100 hours									
Change engine oil and filter				x					7-70
Every 100 hours									
Tire pressure		x							7-72
Primary fuel filter / Secondary fuel filter replace			x						7-72

7 - MAINTENANCE

Maintenance action	Adjust				Calibrate				Page no.
	Drain fluid	Replace	Check	Cleaning	Tighten	Lubricate	Grease	Change fluid	
		Adjust							
		Calibrate							
		Replace							
		Check							
Every 250 hours									
Air compressor air line (if equipped)		x							7-74
Air intake - Check		x							7-75
Replace the air filter elements			x						7-75
Charge air cooler		x							7-77
Radiator hoses		x							7-77
Air cleaner restriction indicator		x							7-77
Cleaning the radiators		x							7-78
Hydrostat filter replacement			x						7-79
Grease engine hood pivots							x		7-81
Every 400 hours									
Replace hydraulic oil filter			x						7-82
Hydraulic oil breather filter element			x						7-83
Every 500 hours									
Change engine oil and filter								x	7-84
Primary fuel filter / Secondary fuel filter replace			x						7-84
Check the battery and cable connection		x							7-84
Radiator surge tank		x							7-84
Planetary gear lube								x	7-85
Once a year									
Cab air filters - Replace			x						7-86
Every 1000 hours									
Change the hydraulic oil								x	7-87
Serpentine belt and belt tensioner check		x							7-88
Every two years									
Air compressor discharge lines (if equipped)			x						7-89
Every 1800 hours									
Change the engine breather filter			x						7-90
Every 3600 hours									
Change the DEF/AdBlue® supply module main filter			x						7-90
Every 4 years									
Change the engine coolant								x	7-91

## At warning message display

### Fuel filter/water separator

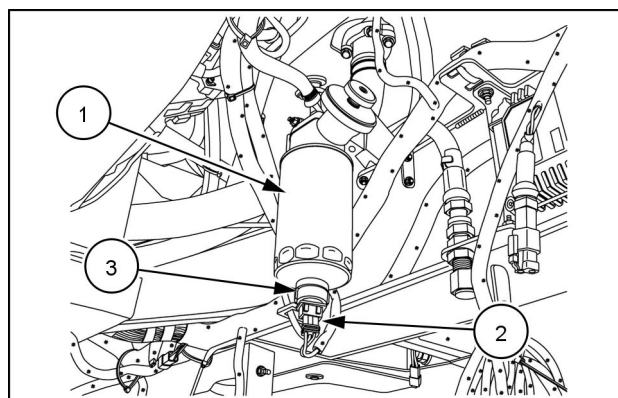
#### ⚠ WARNING

**Hot surface possible!**  
**Wait for all components to cool before performing any operation.**  
**Failure to comply could result in death or serious injury.**

W0251A

**NOTE:** A water-in-fuel sensor is installed in the bottom of the primary fuel filter (water separator). When water covers the sensor, the Armrest display will show a water in fuel warning.

1. Drive the vehicle onto a hard level surface.
2. Stop the vehicle and apply the park brake.
3. Turn off the engine and remove the key from the ignition.
4. Allow the engine to cool before performing the maintenance.
5. Access the underside of the engine bay area. Unlatch and open the engine belly pan doors to access the filter. The primary fuel filter/water separator (1) is mounted inside the right frame rail next to the engine.
6. Disconnect the wire harness connector (2) from the sensor located at the bottom of the filter housing. Press the retainer clip inward and pull down on the connector to disconnect.
7. Turn the drain housing (3) to the left approximately one turn until liquid comes out of the drain pipe. Collect the fluids in an appropriate container. Dispose of the fluid properly.
8. Once the fluid has drained, turn the drain housing to the right to tighten. Reconnect the wire harness connector to the sensor.



RAIL17SP00279AA 1

### Engine coolant level

#### ⚠ WARNING

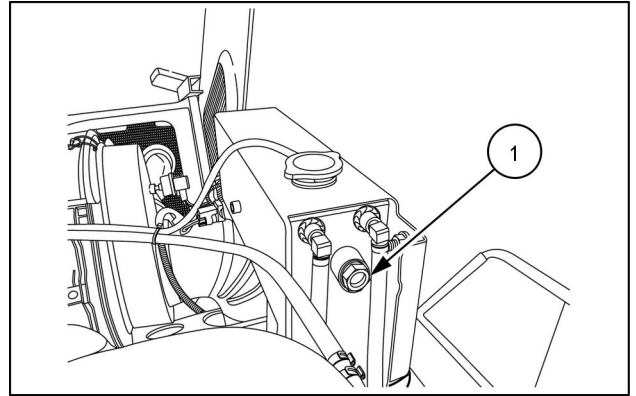
**Burn hazard!**  
**Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released.**  
**Failure to comply could result in death or serious injury.**

W0367A

**NOTE:** Your vehicle is equipped with a coolant level sensor, which will automatically detect and warn the operator when the coolant level is too low. The following procedure is an alternate way to check the coolant level

1. Drive the vehicle onto a hard level surface.
2. Stop the vehicle and apply the park brake.
3. Turn off the engine and remove the key from the ignition.
4. Allow the engine and cooling package to cool before performing the maintenance.

5. Access the engine bay and open the engine hood. Access the radiator surge tank.
6. Observe the coolant level indicated on the sight gauge (1) mounted to the front surface of the surge tank. Coolant should be visible in the sight gauge
7. Add **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT** through the surge tank cap if the coolant level is below the sight gauge level. Radiator coolant capacity is **51.1 L (13.5 US gal)**.



RAIL17SP00236AA 1

**NOTE:** Your vehicle is also equipped with a coolant level sensor which will automatically detect and warn the operator when the coolant level is too low.

As required

## Remove trash/debris from chassis and engine area

Inspect for and remove all trash and debris from around and on any hot components such as the exhaust, engine, turbocharger, batteries and cooling system at least once during each day and at the end of the day. Inspect and clean more often if operating conditions are severe. Keep these areas clean to avoid the possibility of fire and over-heating.

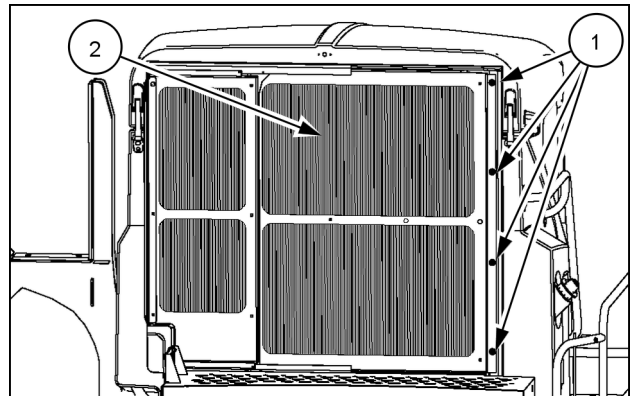
## Clean the cooling package

### **⚠ WARNING**

**Hot surface possible!**  
**Wait for all components to cool before performing any operation.**  
**Failure to comply could result in death or serious injury.**

W0251A

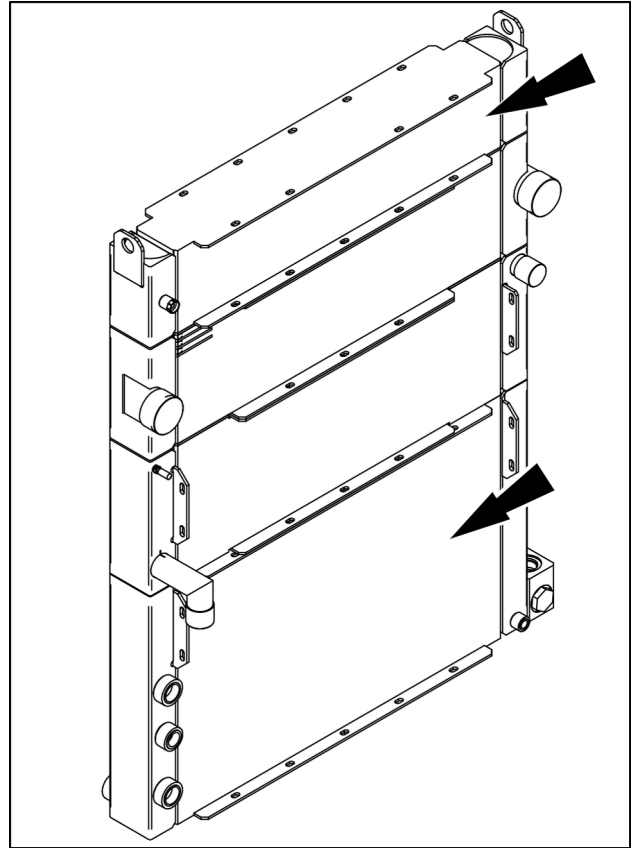
1. Remove the bolts (1) of the engine compartment screen (2) to access the cooling package. Remove the door from the mounting track.



RAIL17SP01031AA 1

2. Cleaning should be directed at the fins of the cooling package. Use a pressure washer or compressed air to clean the fins.

**NOTICE:** Be careful not to bend the fins.

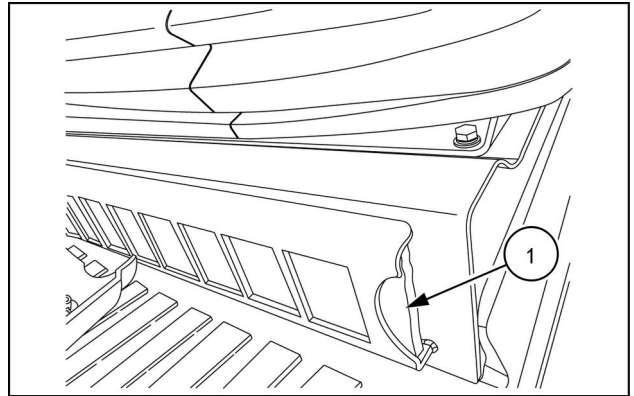


RAIL17SP00219BA 2

## Cab air filters - Replace

### Recirculation filter

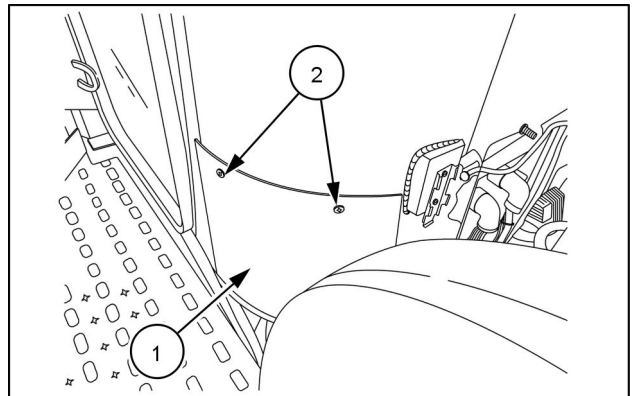
1. Remove the recirculation filter (1). The filter is located on the right side of the operators seat support. Remove the filter from the retainer by pulling the filter out the front of the retainer. Replace the filter with a new filter.



RAIL17SP00285AA 1

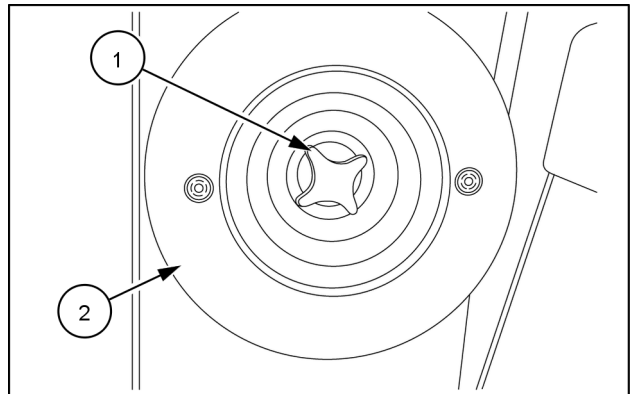
### Cab pressurization filter (charcoal)

1. Replace the cab pressurization filter. Locate the access cover (1) on the left rear corner of the cab. Remove the cover by loosening the two quarter turn fasteners (2).



RAIL17SP00231AA 2

2. Remove the cab pressurization filter. Remove the plastic knob (1) which holds the filter in place, then remove the filter (2).
3. Install a new cab pressurization filter. Reinstall the plastic knob and tighten the knob to hold the filter in place.
4. Reinstall the access cover by placing the cover on to the cab mounting area and turning the two quarter turn fasteners. Be sure to secure the access cover in place before operating the vehicle.



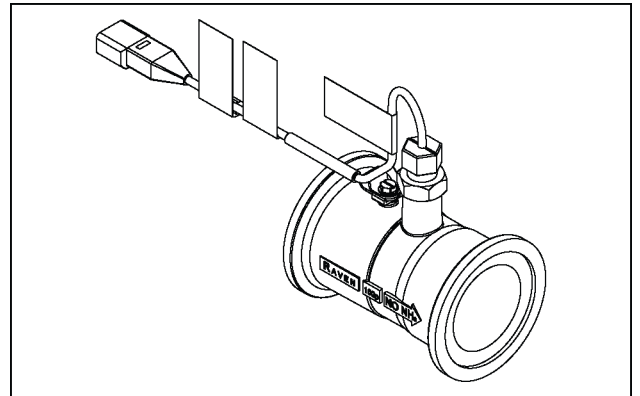
RAIL17SP00232AA 3



## Flow meter

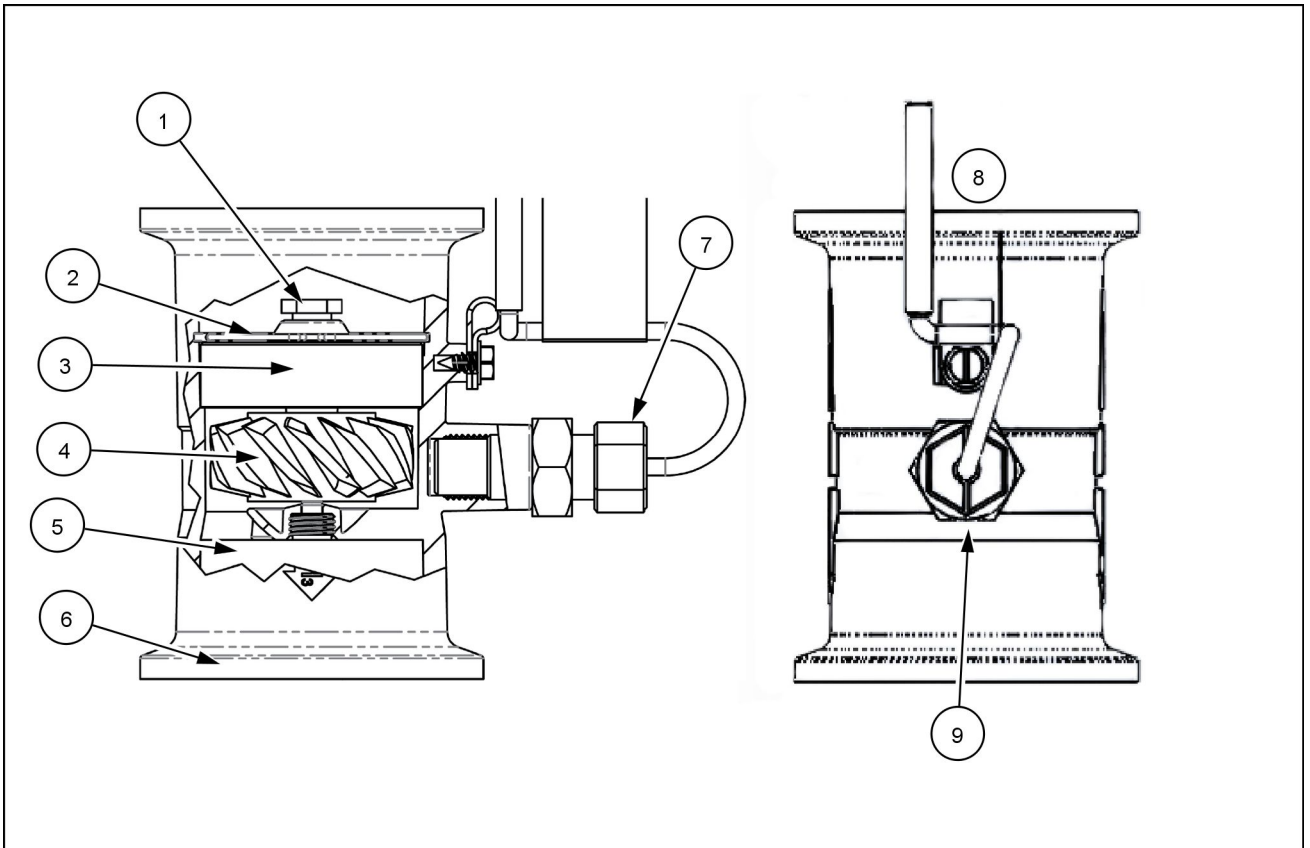
Cleaning the flow meter internal components and/or adjusting the flow meter turbine bearing is necessary on an as-needed basis and is part of normal operational maintenance of the sprayer. The frequency of cleaning and/or adjustment depends on the type of products applied.

Good indications that it is time to clean and/or adjust the flow meter are when your rates are not accurate or there is a lot of fluctuation in the application rate or the machine is spraying but no rate is displayed on the application rate controller.



RAIL17SP01388AA 1

**NOTICE:** Use low pressure **34 kPa (5 psi)** compressed air to clean components. High pressure air can cause damage.



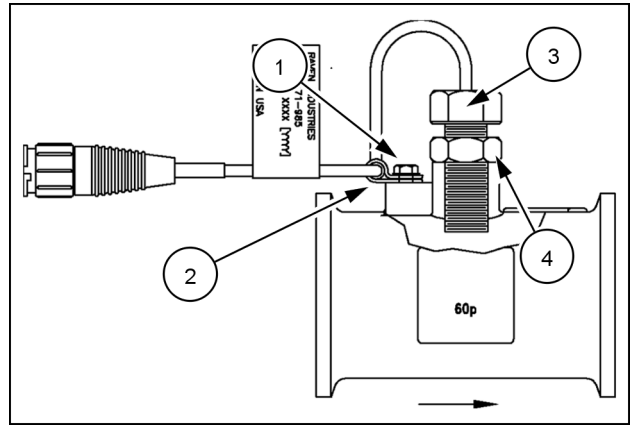
RAIL17SP01153FA 2

1	Bearing hub stud	6	Flow meter body
2	Retaining ring	7	Sensor assembly
3	Bearing hub	8	Sensor detail
4	Turbine	9	Orientation groove
5	Turbine hub		

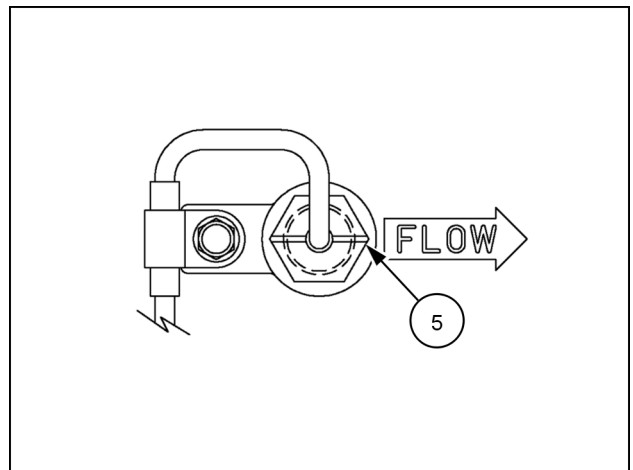
1. Remove the flow meter from sprayer.
2. Brush away debris and flush the flow meter with clean water to remove foreign material.
3. Carefully remove the retaining ring **(2)** by removing the bearing hub stud **(1)**.
4. Remove the bearing hub **(3)**, turbine **(4)**, and turbine hub **(5)** from inside the flow meter housing.
5. Clean the turbine, bearing hub, and turbine hub of metal filings and other foreign material. Use pressurized air to blow metal filings and debris out of both hubs and the turbine.
6. Confirm that the turbine blades are not worn. Hold the turbine and bearing hub in your hand and spin the turbine. It should spin freely with very little drag.
7. If the bearing hub stud is adjusted or replaced, verify the turbine fit before reassembling by:
  - A. Installing the turbine hub and retaining ring.
  - B. Put the bearing hub with the turbine against the turbine hub in the flow meter housing. Make sure the stud keys inside the flow meter housing are lined up in the groove on the hub.
  - C. Put the retaining ring in the groove to lock the hub in place.
  - D. Blow on the turbine to spin it.
  - E. Tighten the bearing hub until the turbine stalls.
  - F. Loosen the bearing hub stud 1/3 of a turn. The turbine should spin freely.
8. Use a low pressure **34 kPa (5 psi)** jet of air through the flow meter in the direction of flow and against the flow to verify the turbine spins freely. If there is drag, loosen the stud on the bearing hub 1/16 of a turn until the turbine spins freely.
9. If the turbine spins freely and the cables have checked okay, but the flow meter is not totalizing properly, verify that the sensor assembly is threaded all the way into the flow meter body, and the orientation groove on top of the sensor is parallel with the flow meter body (refer to **7-41** for procedure). If the flow meter still does not totalize, replace the sensor assembly.

## Flow meter sensor

1. Remove bolt (1) and washer holding cable strain relief (2) on flow meter.
2. Loosen locknut (4) holding sensor (3). Unscrew the sensor (3) from the flow meter.
3. Clean threads on flow meter and install new sensor assembly.
4. Sensor must be adjusted to insure proper operation of flow meter. Thread sensor (3) down into flow meter until it reaches the bottom of the hole.
5. Loosen the sensor (3) (no more than 1/4 of a turn) until the scribe marks (5) on top of the sensor are parallel with the flow meter body.
6. Hold sensor (3) in this position and tighten locknut (4). Replace cable strain relief (2), washer, and bolt (1). Tighten bolt (1) to secure strain relief (2) into position.



RCPH11BEN050AAM 1



RCPH11BEN051BAM 2

## Flow meter calibration

**NOTE:** For flow meter calibration, refer to MILLER ISO product control operation manual.

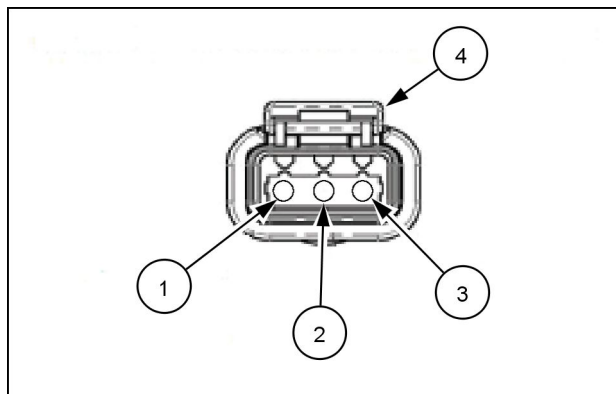
### Specifications based on water

Flow meter size	RFM 100P	
	Metric	U.S.
Pressure rating	<b>1034 kPa</b>	<b>150 psi</b>
Normal flow rate	<b>11 – 379 L/min</b>	<b>3 – 100 US gpm</b>
kPa/PSI drop	<b>379 L/min = 28 kPa</b>	<b>100 US gpm = 4 psi</b>
Maximum flow range	<b>11 – 946 L/min</b>	<b>3 – 250 US gpm</b>
May reduce flow meter life	kPa drop at <b>946 L/min = 172 kPa</b>	PSI drop at <b>250 US gpm = 25 psi</b>

## Flow meter cable

Disconnect the cable from the flow meter. Hold flow meter cable so that the “locking tab” **(4)** is at the top.

- (1)** = Signal
- (2)** = Ground
- (3)** = Power



RAIL17SP01389AA 1

### Cable check procedure

1. Find the METER CAL on the console and record that number. Enter a METER CAL number of one (1) in the console.
2. Depress the key on the console labeled “Total Volume” on lower row of key pad.
3. Place boom switches power and master switch to ON.
4. With a small jumper wire, create a short between the **(1)** and **(2)** sockets with a “short - no short” motion. Each time a contact is made, the TOTAL VOLUME should increment up 1 or more counts.
5. If TOTAL VOLUME does not count up, remove the section of cable and repeat the test at the connector next closest to the console. Replace defective cable as required.
6. Perform all voltage checks.
7. If all cables test good, replace the flow meter.

**NOTE:** After testing is complete, re-enter correct METER CAL numbers before application. The meter calibration number will be located on the tag attached to the flow meter wires.

## **Steam clean the engine**

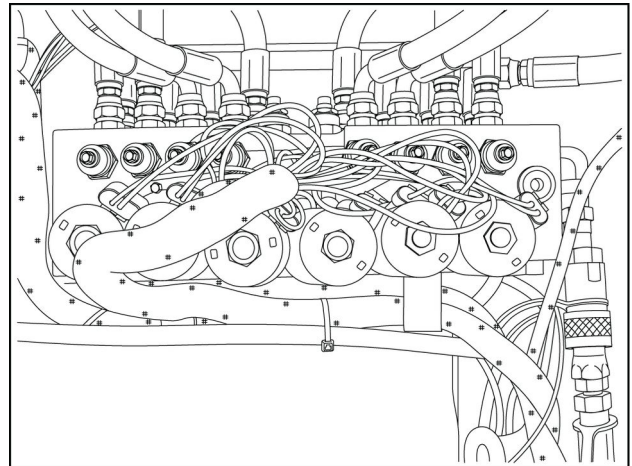
1. Steam clean the engine as needed. Visually inspect the engine for areas of extreme buildup of dirt and other contamination. Use a steam pressure washer to remove any buildup. Ensure that the steam is kept away from any components attached to the engine which may be damaged from high temperature steam and pressure.

## Boom cylinder speed

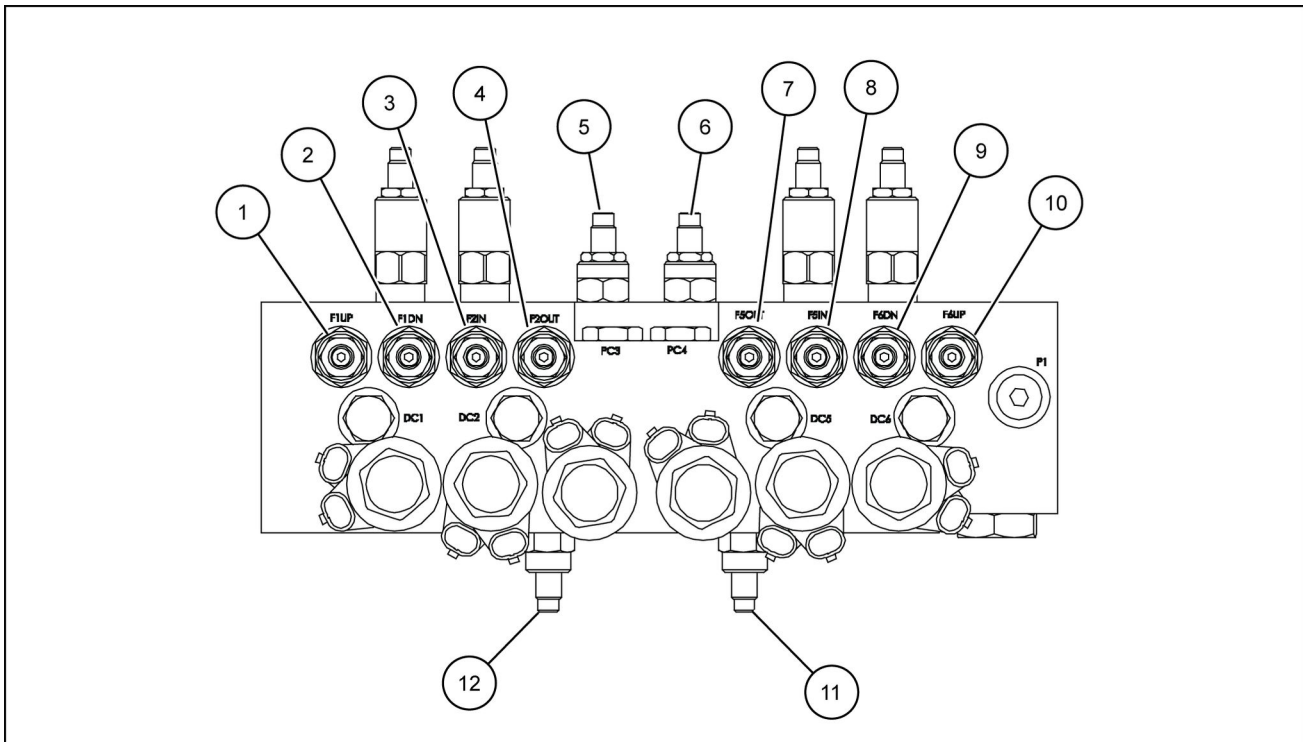
1. Drive the vehicle on to a hard level surface.
2. Turn off the vehicle engine and remove the key from the ignition.
3. Access the boom valve attached to the backside of the center boom.
4. Loosen the jam nut of the adjuster for the cylinder that is to be adjusted.

**NOTICE:** When adjusting the speed of a cylinder, use care not to over adjust on the speed. If the cylinders move at too high a speed, damage could occur from rapid movement and sudden stops.

5. Turn the appropriate adjustment stud in or out 1/8 turn or less at a time.
6. Check the speed of the cylinder being adjusted.
7. Retighten the jam nut after adjustment is complete.



RCPH11SPR132BAM 1



RAIL12SP00843EA 2

### Boom cylinder adjustment points identification

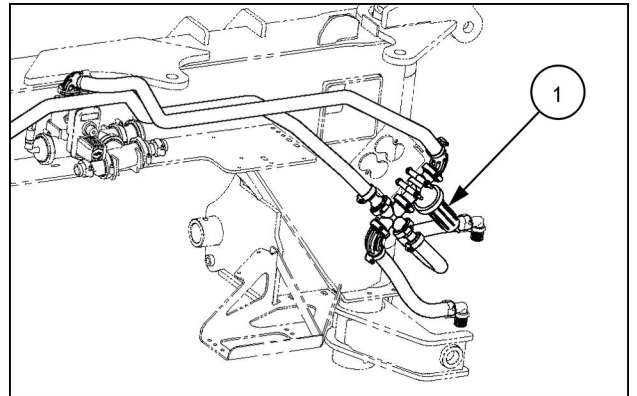
1. F1 Up — left side fold cylinder up	7. F4 Dn (top of valve) - right side tilt cylinder down
2. F1 Dn — left side fold cylinder down	8. F4 Up (bottom of valve) - right side tilt cylinder up
3. F2 In - left side swing cylinder in	9. F5 Out - right side swing cylinder out
4. F2 Out - left side swing cylinder out	10. F5 In - right side swing cylinder in
5. F3 Dn (top of valve) - Left side tilt cylinder down	11. F6 Dn - right side fold cylinder down
6. F3 Up (bottom of valve) - Left side tilt cylinder up	12. F6 Up - right side fold cylinder up

**NOTICE:** All cylinder speeds have been preset at the factory. Locate the valve block mounted to the front-side of the center boom. Each cylinder for the boom, with the exception of the center section lift cylinders, are adjusted from this valve.

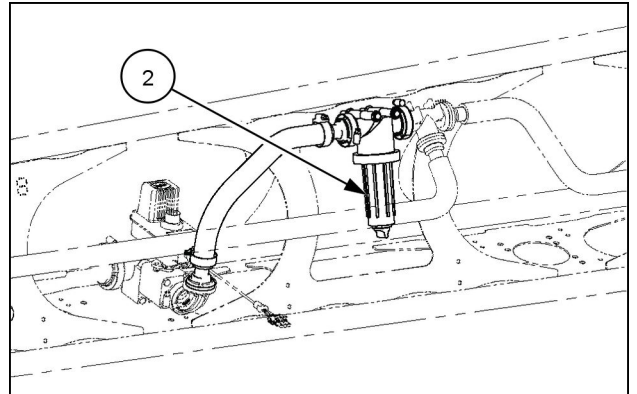
**NOTICE:** Relief valve settings are set by the manufacturer. Do not adjust the relief valve set point. If the relief valve setting is changed, damage could occur from the boom folding joint being too rigid.

## Boom strainer filters

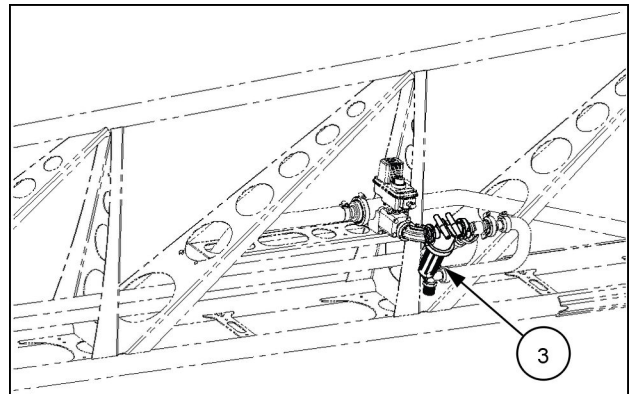
1. Remove and clean the boom strainers present on your machine.  
The number and type of strainers on your machine is dependant upon your boom setup.
2. Locations for the strainers are as follows:
  - (1) Center section
  - (2) Secondary boom section
  - (3) Primary boom section



RAIL17SP01480AA 1

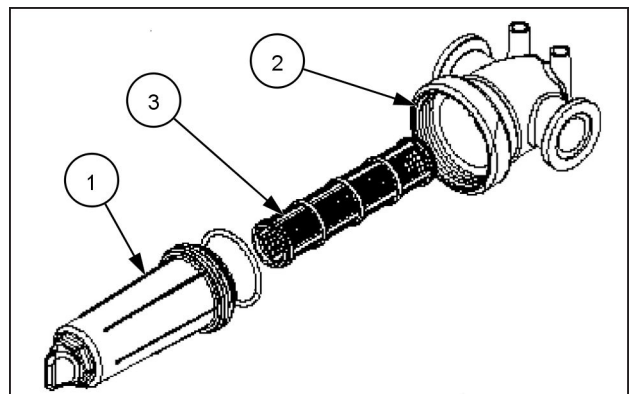


RAIL17SP01481AA 2



RAIL17SP01482AA 3

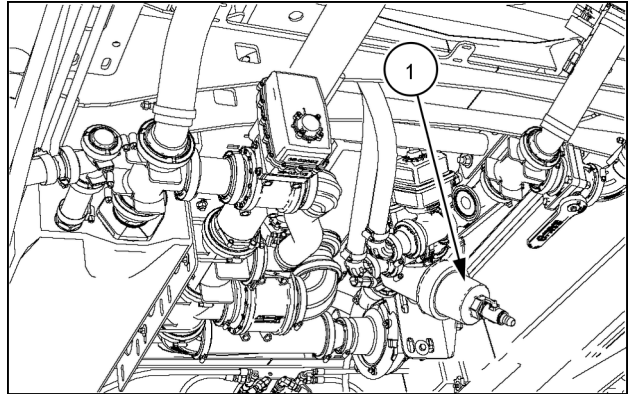
3. Remove the strainer by removing the strainer housing (1) from the strainer head (2) and pull the strainer (3) from the housing.  
Rinse the strainer in clean water.
4. Reassembly the strainer onto the strainer body.  
Tighten securely.



RAIL17SP01497AA 4

## Hydraulic oil change and oil strainer cleaning

1. Remove the strained from the “Y” Stainer by loosening the strainer body (1) .  
Remove the strainer and clean with fresh water.  
Reinstall the stainer after cleaning.  
An optional 80 mesh strainer is available.



RAIL17SP01069AA 1

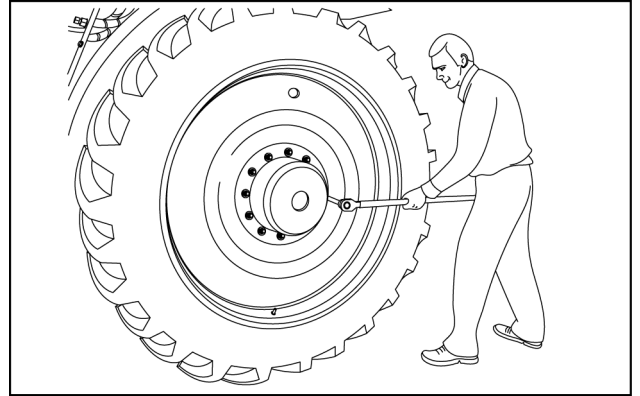


## First 10 hours

### Wheel lug nuts

1. Check the wheel lug nut torque.  
Torque the lug nuts to **610 N·m (450 lb ft)**.

**NOTE:** When a wheel is replaced, retorque the lugs nuts after the first hour of initial use.

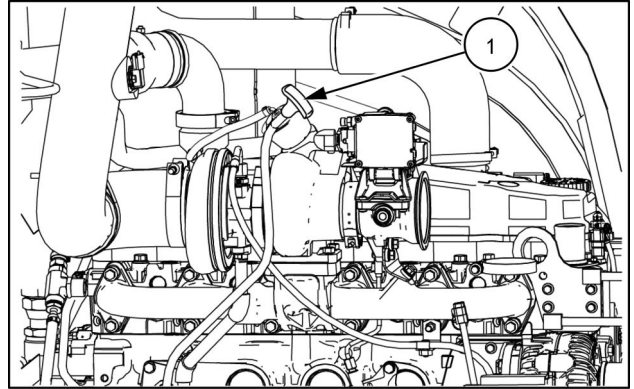


RAIL15SP00828AA 1

Every 10 hours or daily

## Check engine oil level

1. The dipstick (1) is mounted on the left-hand side of the engine. Access the dip stick by lifting the engine hood open.
2. To check the engine oil level, the vehicle should be on level ground. Check the oil before starting the unit.
3. Make sure the dipstick (1) is pushed in completely.
4. If the oil level is below the add mark, add **NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4 SAE 10W-40** engine oil through the fill cap to raise the oil level to the full mark. Do not raise the level above the full mark.  
Engine oil capacity is **17.0 L (4.5 US gal)**.



RAIL17SP01019AA 1

## Check the coolant level

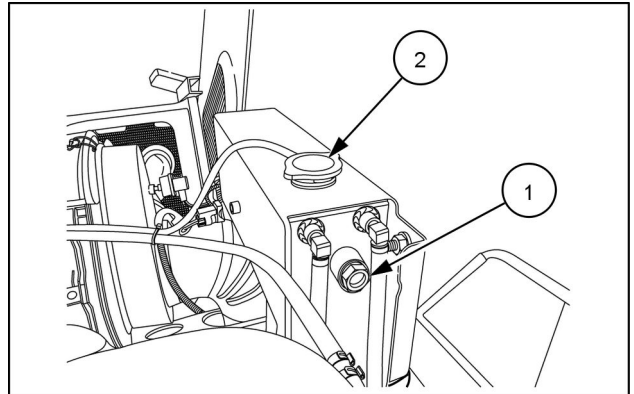
### ⚠ WARNING

#### Burn hazard!

Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released. Failure to comply could result in death or serious injury.

W0367A

1. Refer to 7-34 for checking and adding coolant to the system.

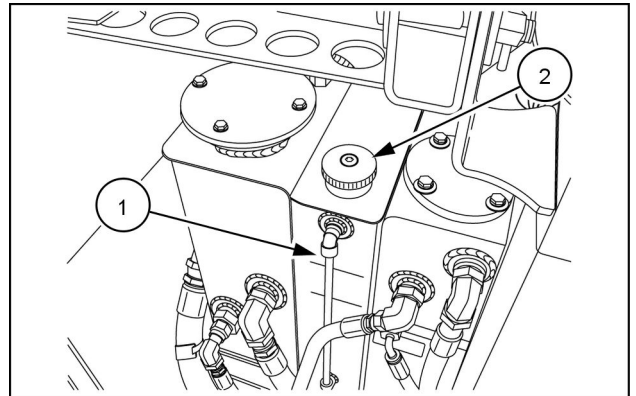


RAIL17SP00236AA 1

**NOTE:** Your vehicle is equipped with a coolant level sensor which will automatically detect and warn the operator when the coolant level is too low.

## Check the hydraulic oil level

1. With the engine shut off and the key removed, check the hydraulic oil level on the sight gauge (1).  
If the oil is not to the full mark, add **NEW HOLLAND AMBRA HYDROSYSTEM 68** through the fill cap (2).  
Hydraulic oil tank capacity is **132 L (35 US gal)**.  
Use a filter cart to filter all hydraulic oil before it enters the reservoir.



RAIL17SP00262AA 1

## Lubricate the boom

### ⚠ DANGER

**Pinch hazard!**  
Keep your hands, feet, and body clear of all moving parts and oscillating points.  
Failure to comply will result in death or serious injury.

D0206A

### ⚠ WARNING

**Crushing hazard!**  
The boom may drop suddenly without warning. Always install the cylinder stops to hold the boom in the raised position during storage, transport, and service.  
Failure to comply could result in death or serious injury.

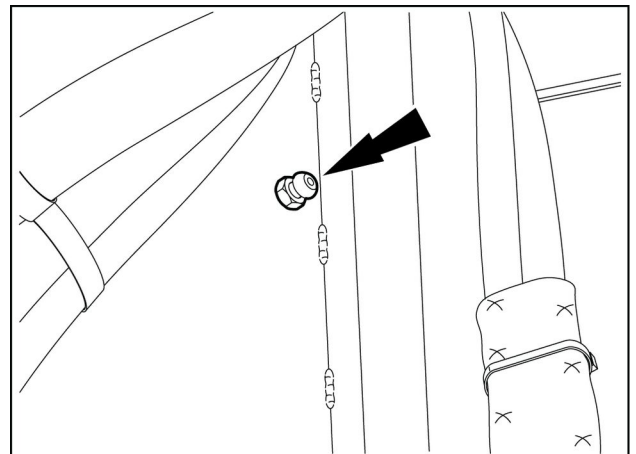
W1532A

**NOTE:** To lubricate the boom fittings it may be necessary to lower, move and/or unfold the boom. Use **NEW HOLLAND AMBRA GR 75 MD** on all fittings.

## Mono boom

### Lubricate the primary boom pivots

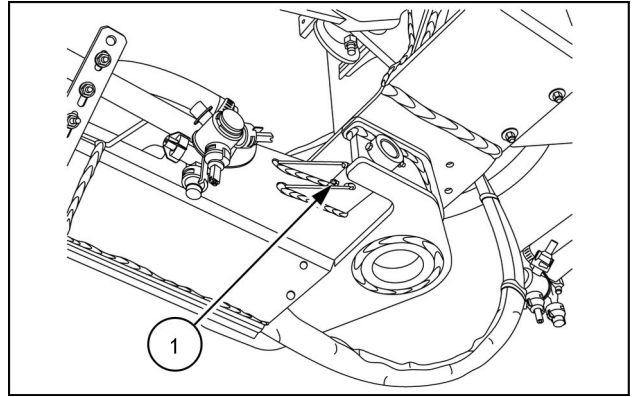
Locate the (four grease fittings) two grease fittings per side (one in the top bushing and one in the lower bushing).  
Clean off the grease fittings before attaching the grease gun.  
Grease until grease comes out of the top and bottom of the pivot. Wipe up any excess grease.



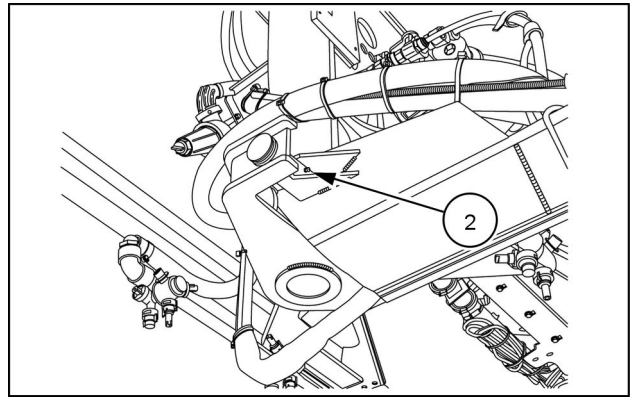
RCPH11SPR081BAM 1

**Lubricate the primary boom tilt pivots**

Locate the inner boom tilt pin (1) and the outer primary boom tilt (2) pin grease fittings on each primary boom. Clean off the grease fittings before attaching the grease gun. Grease until grease comes out of the pivot. Wipe up any excess grease.



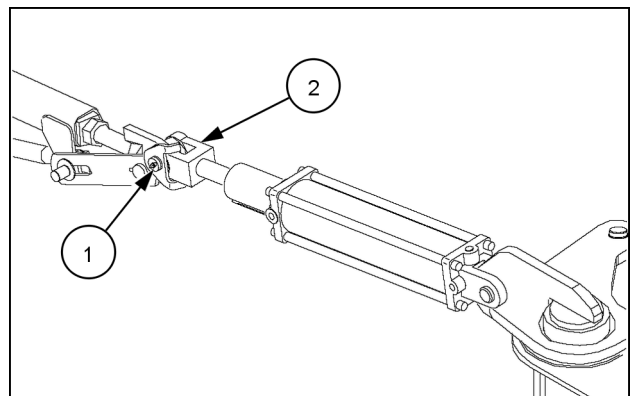
RAIL17SP00277AA 2



RAIL17SP00278AA 3

**Lubricate primary boom tilt cylinder rod end pin (120 foot boom only)**

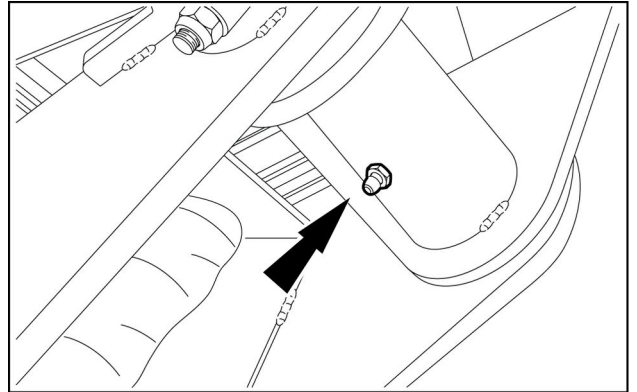
Locate the grease fitting (1) for the tilt cylinder rod end (2) pin where it mounts to the primary boom. Clean off the grease fitting before attaching the grease gun. Grease until grease comes out of the pivot. Wipe up any excess grease. Repeat for the other side of the boom.



RAIL17SP01026AA 4

### Lubricate the secondary boom pivots

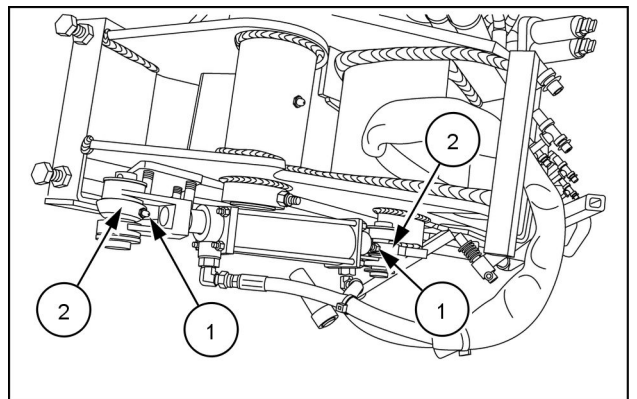
Locate the grease fitting on the pivot pin between the primary and secondary booms.  
 Clean off the grease fitting before attaching the grease gun.  
 Grease until grease comes out of the pivot. Wipe up any excess grease.  
 Repeat for the other side of the boom.



RCPH11SPR084AAM 5

### Lubricate the secondary fold cylinder pivot pin bearings (120 foot boom only)

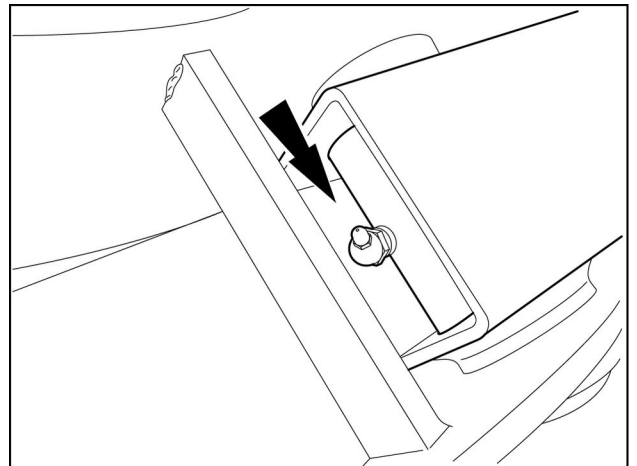
Locate the grease fittings (1) for the secondary boom fold cylinder (rod and base end) located in the bearing hubs (2) on the side of the secondary and primary boom sections.  
 Clean off the grease fitting before attaching the grease gun.  
 Grease until grease comes out of the pivot. Wipe up any excess grease.  
 Repeat for the other side of the boom.



RAIL17SP01032AA 6

### Lubricate the boom breakaway pivots

Locate the grease fitting on the pivot pin between the secondary boom and the boom breakaway.  
 Clean off the grease fitting before attaching the grease gun.  
 Grease until grease comes out of the pivot.  
 Wipe up any excess grease. Repeat for the other side.

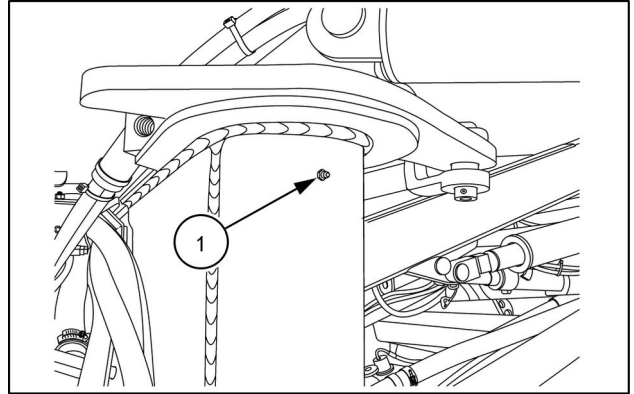


RCPH11SPR085BAM 7

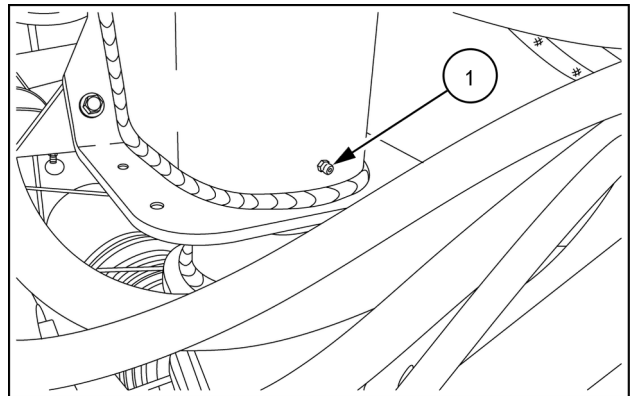
## Truss boom

### Lubricate the primary boom swing pivots

Locate the primary boom swing pivots on each side of the center boom section. Locate the two grease fittings (1) per side (one in the top bushing and one in the lower bushing). Clean off the grease fittings before attaching the grease gun. Grease until grease comes out of the top and bottom of the pivot. Wipe up any excess grease.



RAIL15SP00901AA 8



RAIL15SP00902AA 9

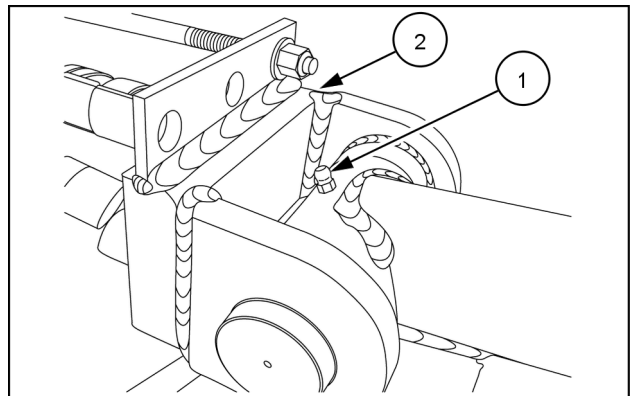
### Lubricate the primary boom tilt pivots

Locate the grease fitting (1) on each primary boom upper and lower tilt pins.

The upper tilt pin is the rod end of the tilt cylinder (2) where it is pinned to the primary boom assembly.

Clean off the fitting before attaching the grease gun. Grease until grease comes out of the pivot.

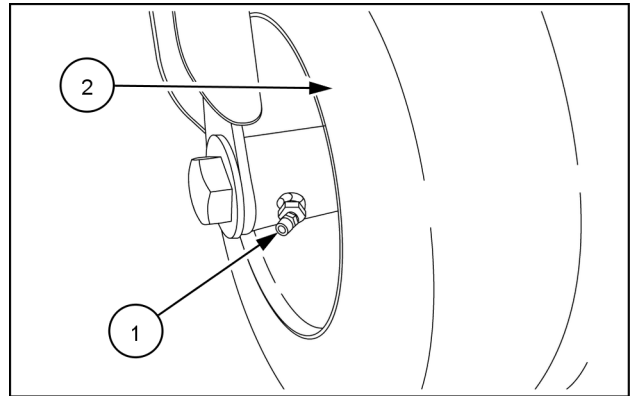
Remove any excess grease. Repeat for the other side.



RAIL15SP00903AA 10

**Lubricate the boom guide wheel**

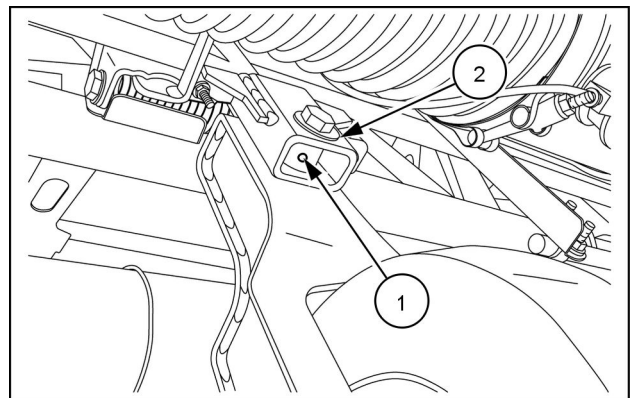
Locate the grease fitting (1) on the guide wheel (2). Clean off the grease fitting before attaching the grease gun. Grease until grease comes out of the center of the wheel. Wipe up excess grease. Repeat for the guide wheel on the other boom.



RAIL15SP00905AA 11

**Lubricate the boom guide wheel pivot**

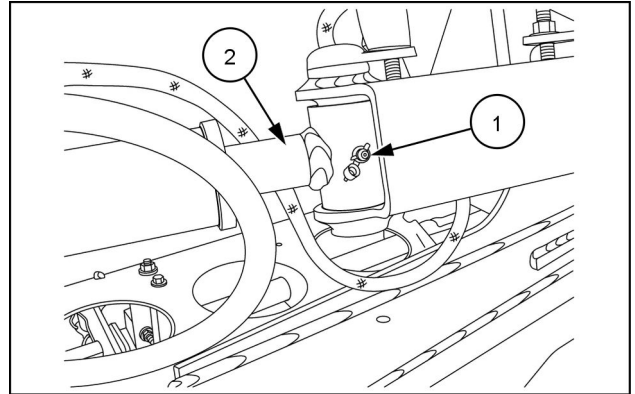
Locate the grease fitting (1) on the guide wheel pivot tube (2). Clean off the grease fitting before attaching the grease gun. Grease until grease comes out of the pivot. Wipe up excess grease. Repeat for the guide wheel pivot on the other boom.



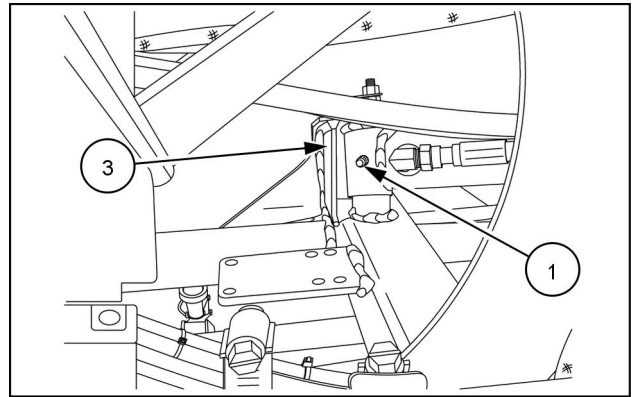
RAIL15SP00906AA 12

**Lubricate the secondary boom cylinder rod end and base end pivots**

Locate the grease fittings (1) on the cylinder rod end (2) and the cylinder base end (3) between the primary and secondary booms. Clean off the grease fittings before attaching the grease gun. Grease until grease comes out of the pivots. Wipe up excess grease. Repeat for the secondary boom cylinder pivots on the other boom.



RAIL15SP00907AA 13



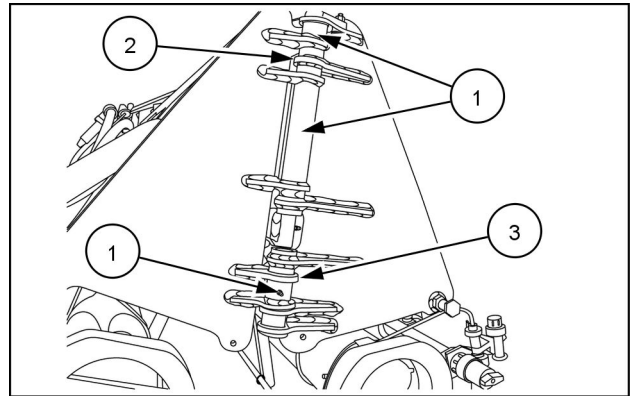
RAIL15SP00908AA 14



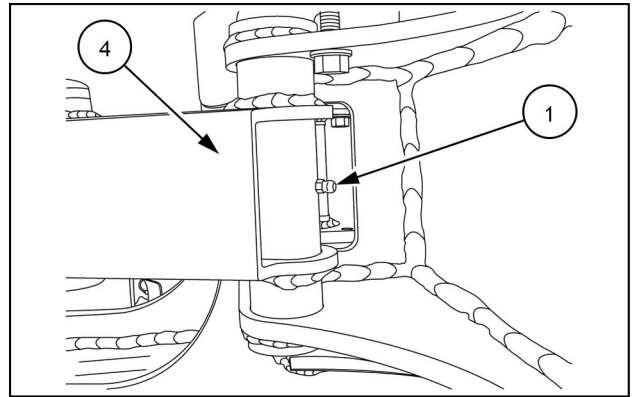
## Lubricate the secondary boom pivots

Locate the six grease fittings on the pivot between the primary and secondary booms. Two fittings (1) are on the upper pivot rod (2) between the primary and secondary booms. One fitting (1) is on the lower pivot rod (3) between the primary and secondary boom.

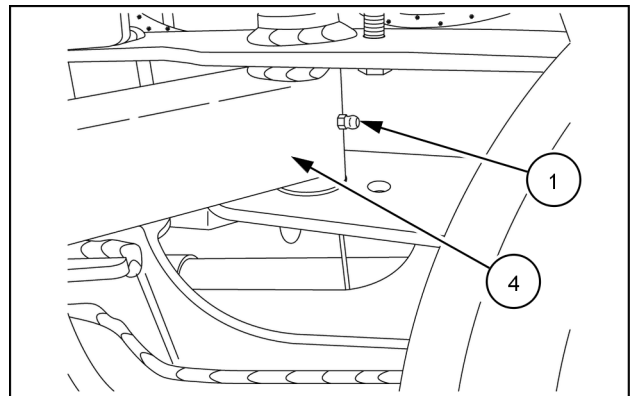
There are three fittings (1) on the pivot linkage plates (4) between the primary and secondary booms. Clean off the grease fittings before attaching the grease gun. Grease until grease comes out of the pivot. Wipe up excess grease. Repeat for the secondary boom pivot on the other boom.



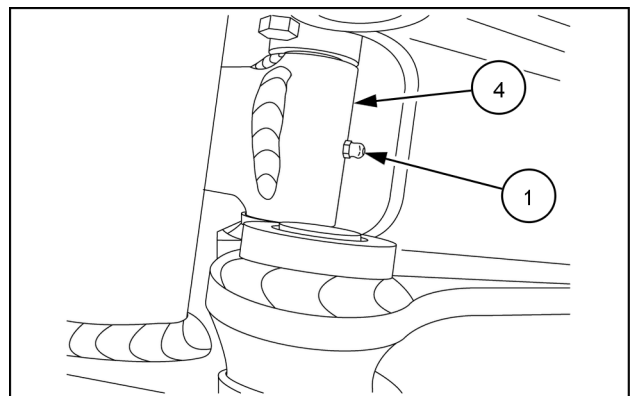
RAIL15SP00909AA 15



RAIL15SP00910AA 16



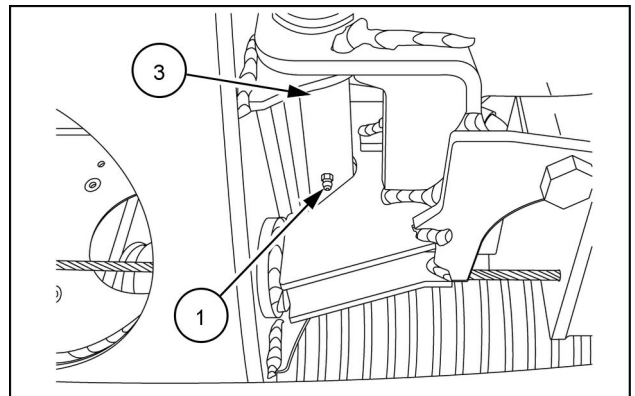
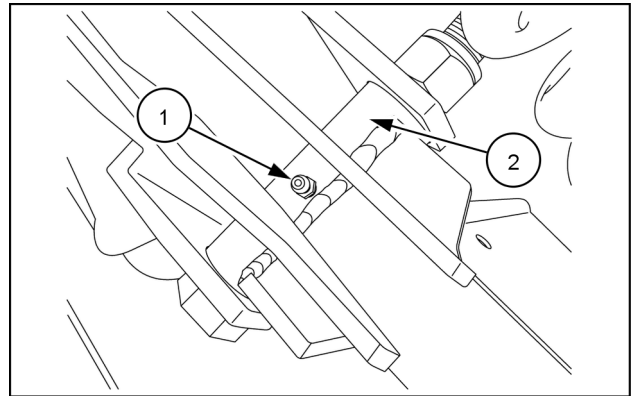
RAIL15SP00911AA 17



RAIL15SP00912AA 18

**Lubricate the boom breakaway pivots**

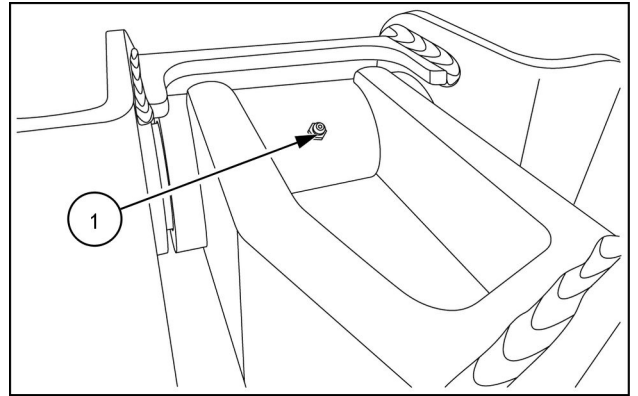
Locate the two grease fittings (1) on the pivot pins between the secondary boom and the boom breakaway. One fitting is on the horizontal pivot (2) and one is on the upper surface of the vertical pin (3). Clean off the fittings before attaching the grease gun. Grease until grease comes out of the pivots. Remove any excess grease. Repeat for the other side.



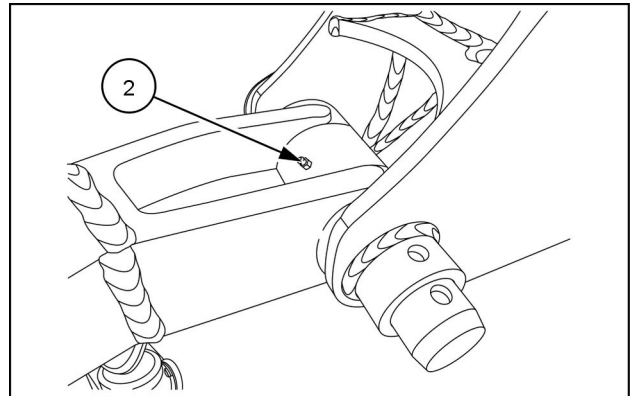
## Center boom and chassis attachment points

### Lubricate the Lower lift arm assembly pivots

Locate the grease fitting on the frame end of the lower lift arm (1) and the center boom end of each side of the lower lift arms (2). Clean off the grease fitting before attaching the grease gun. Grease until grease comes out of each pivot. Wipe up any excess grease. Repeat for the other lower lift arm.



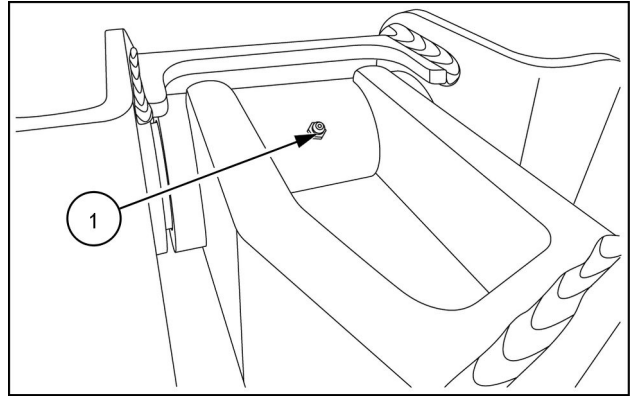
RAIL17SP00304AA 21



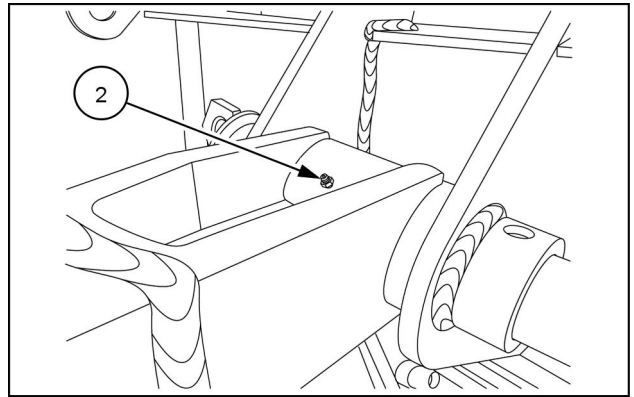
RAIL17SP00273AA 22

### Lubricate the upper lift arm assembly pivots

Locate the grease fitting on the frame end of upper lift arm assembly (1) and the center boom end of each side of the upper lift arm assembly (2). Clean off the grease fitting before attaching the grease gun. Grease until grease comes out of each pivot. Wipe up any excess grease. Repeat for the other side of the upper lift arm assembly.



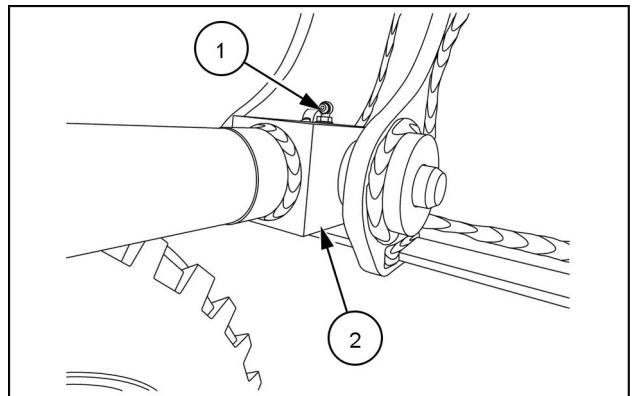
RAIL17SP00304AA 23



RAIL17SP00305AA 24

### Lubricate lower lift arm cylinder pins

Locate the grease fittings (1) on the rod ends of the lower lift arm cylinders (2) where they attach to the lower lift arm. Clean off the grease fitting before attaching the grease gun. Grease until grease comes out of each pivot. Wipe up any excess grease. Repeat for the other cylinder.



RAIL17SP00271AA 25

### Lubricate the steering king pins

#### **⚠ DANGER**

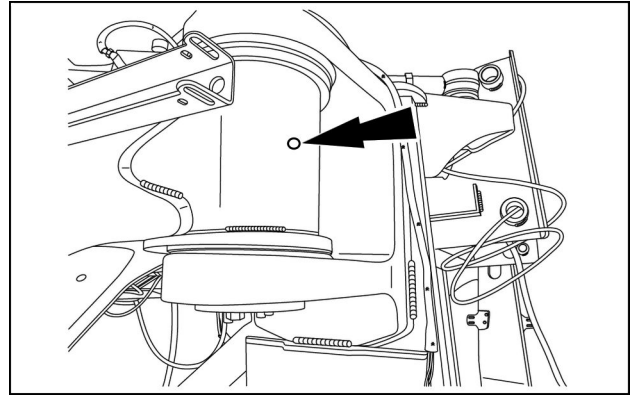
**Pinch hazard!**

**Keep your hands, feet, and body clear of all moving parts and oscillating points.**

**Failure to comply will result in death or serious injury.**

D0206A

1. Locate the grease fitting on each of the front steering pivot king pin tubes and rear steering pivot king pin tubes on a 4 wheel steer model..
2. Clean off grease fittings before attaching the grease gun.
3. Use **NEW HOLLAND AMBRA GR 75 MD**. Grease all the fittings until grease comes out of the king pin tube.
4. Wipe up excess grease.



RAIL17SP00255AA 1

## Lubricate the suspension components

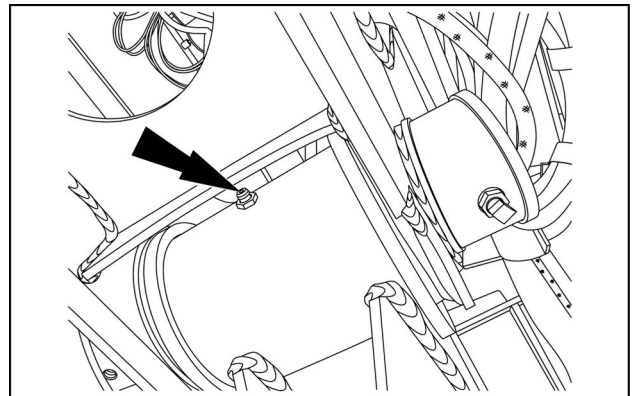
### **⚠ DANGER**

**Pinch hazard!**

**Keep your hands, feet, and body clear of all moving parts and oscillating points.  
Failure to comply will result in death or serious injury.**

D0206A

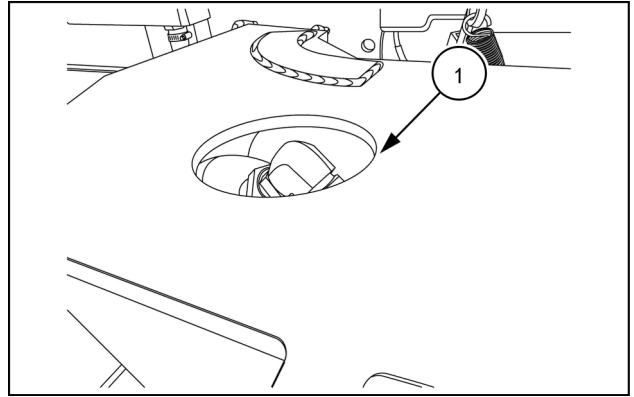
1. Locate the grease fitting on each of the swing arm pin tubes (total of 4 per machine).
2. Clean off grease fittings before attaching the grease gun.
3. Use **NEW HOLLAND AMBRA GR 75 MD** and lubricate all the fittings until the grease comes out of the pivot pin tube.
4. Wipe up excess grease.



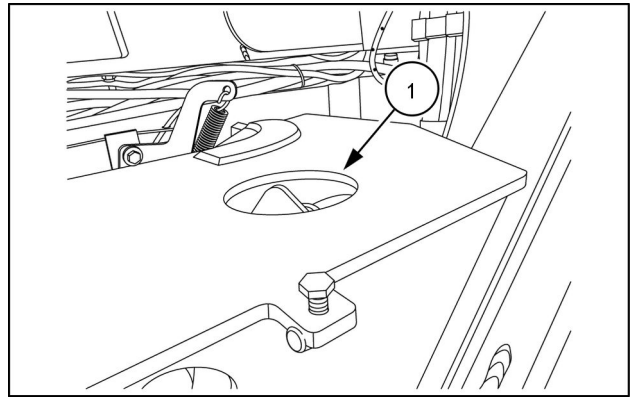
RAIL17SP00301AA 1

### Suspension cylinder rod and base end

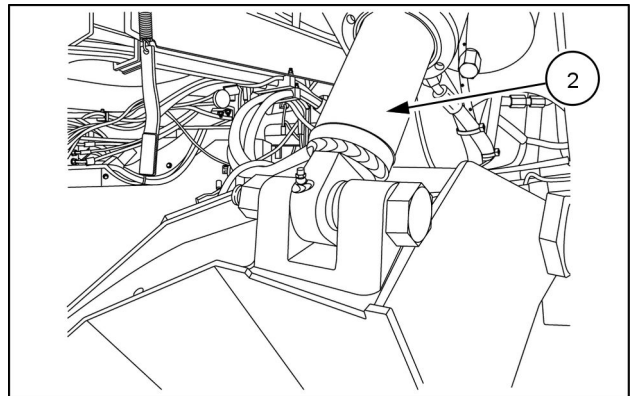
1. Locate the grease fittings on the suspension cylinder rod (lower) and base (upper) end pivots on each side of the vehicle.  
The base (upper) grease fitting are accessed through the access openings above each cylinder (1). The lower (rod end) of the front cylinder is accessed through an opening in the frame behind the sheet metal between the wheels (2). The suspension should be raised to access the fittings.
2. Clean off grease fittings before attaching the grease gun.
3. Grease the fittings until grease comes out of each pivot. Wipe up excess grease



RAIL17SP00283AA 2



RAIL17SP00252AA 3



RAIL17SP00260AA 4

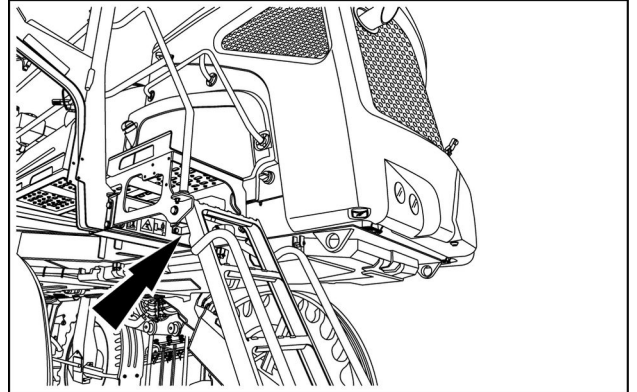
## Lubricate ladder pivot

### **⚠ WARNING**

**Unexpected movement!**  
**Stay clear when lowering the ladder.**  
**Failure to comply could result in death or serious injury.**

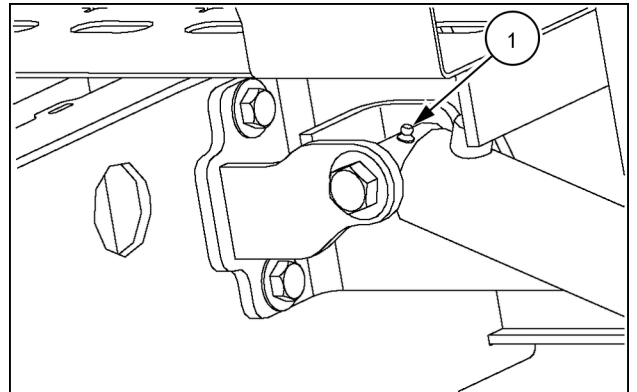
W0911A

1. Locate the ladder lift cylinder. The cylinder is located under the walkway platform at the top end of the ladder.



RAIL17SP00242AA 1

2. Locate the grease fitting (1) attached to the base end of the ladder lift cylinder.
3. Clean the grease fitting before attaching a grease gun.
4. Use **NEW HOLLAND AMBRA GR 75 MD**. Lubricate until grease comes out of the pivot joint.
5. wipe up any excess grease.



RAIL17SP01023AA 2

## Fuel filter water drain

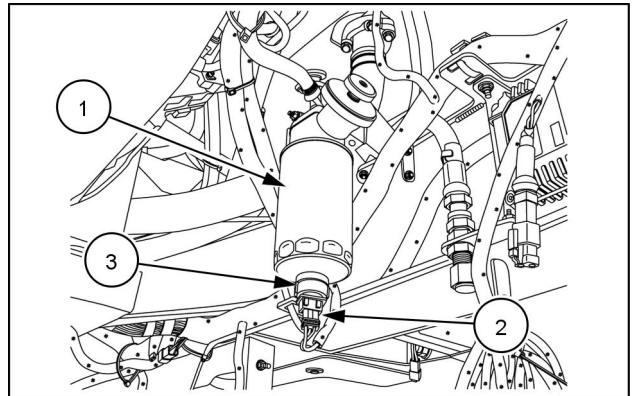
### ⚠ WARNING

**Hot surface possible!**  
**Wait for all components to cool before performing any operation.**  
**Failure to comply could result in death or serious injury.**

W0251A

**NOTE:** A water-in-fuel sensor is installed in the bottom of the primary fuel filter (water separator). When water covers the sensor, the Chassis Monitor display panel will show a water in fuel warning.

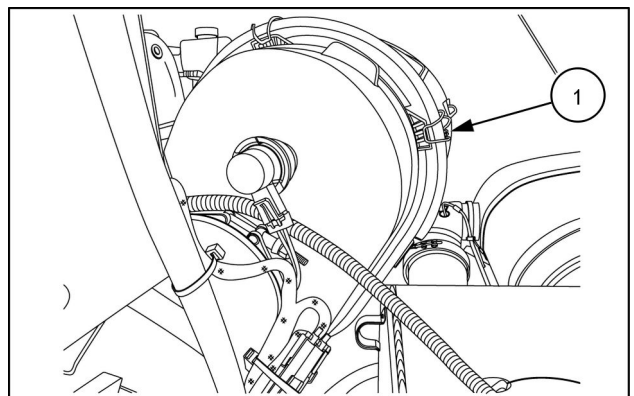
1. Drive the vehicle onto a hard level surface.
2. Stop the vehicle and apply the park brake.
3. Turn off the engine and remove the key from the ignition.
4. Allow the engine to cool before performing the maintenance.
5. Access the underside of the engine bay area. Unlatch and open the engine belly pan doors to access the filter. The primary fuel filter/water separator **(1)** is mounted inside the right frame rail next to the engine.
6. Disconnect the wire harness connector **(2)** from the sensor located at the bottom of the filter housing. Press the retainer clip inward and pull down on the connector to disconnect.
7. Turn the drain housing **(3)** to the left approximately one turn until liquid comes out of the drain pipe. Collect the fluids in an appropriate container. Dispose of the fluid properly.
8. Once the fluid has drained, turn the drain housing to the right to tighten. Reconnect the wire harness connector to the sensor.



RAIL17SP00279AA 1

## Check engine air filters

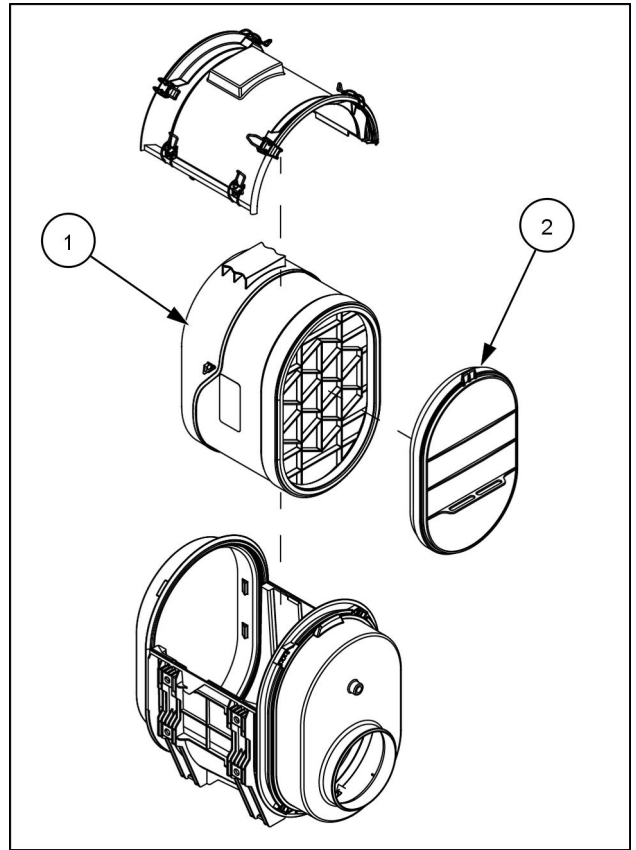
1. Drive the vehicle on to a hard, level surface.
2. Shut off the vehicle engine and remove the key from the ignition.
3. Allow the engine to cool before servicing the air cleaner.
4. Access the engine air cleaner. The air cleaner is mounted above the engine inside the engine cowl.
5. Release the four locks **(1)** holding the cover. Remove the cover.



RAIL17SP00221AA 1

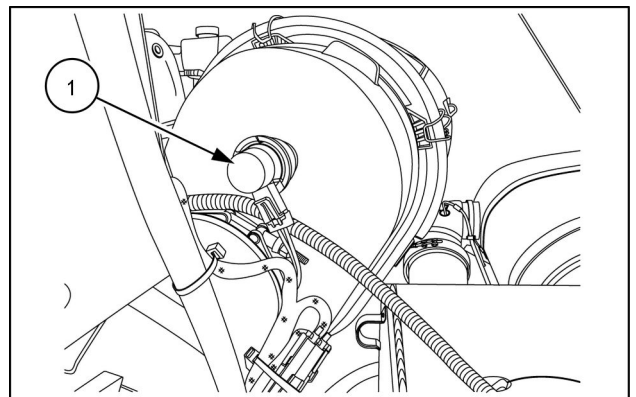


6. Pull the primary filter (1) out of the housing. Do not remove the inner (secondary) filter (2) unless it is to be replaced.
7. With the secondary filter in place, use a rag to wipe the inside of the filter housing and cover clean.
8. Check the primary filter for any damage and replace if any is discovered. Do not clean the primary filter, always replace the filter when the indicator indicates replacement.
9. After servicing is complete, reinstall cover onto the air cleaner housing and lock in place. Lock the cover in place with the locking tabs.



RAIL17SP00312BA 2

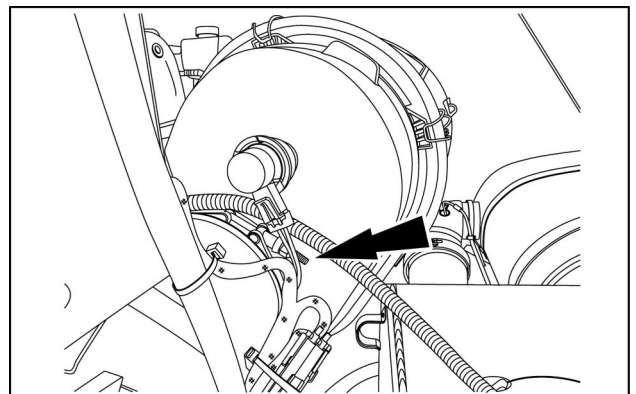
10. Reset the restriction indicator (1) (located on the end of the air cleaner body) after filters are replaced. Press the yellow button on the indicator to reset.



RAIL17SP00221AA 3

## Air intake - Check

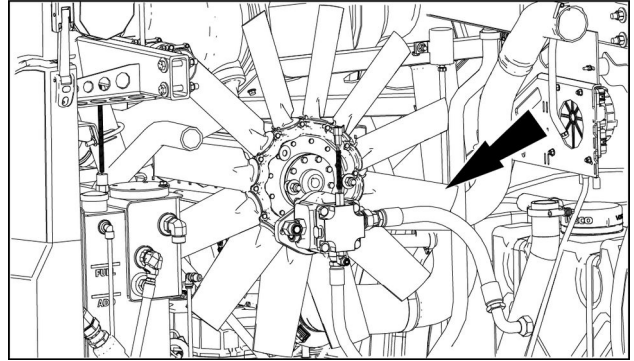
1. Check the connections for the air intake lines. Ensure that all clamps are tightened and that the air intake tubing is properly attached.



RAIL17SP00221AA 1

## Cooling fan

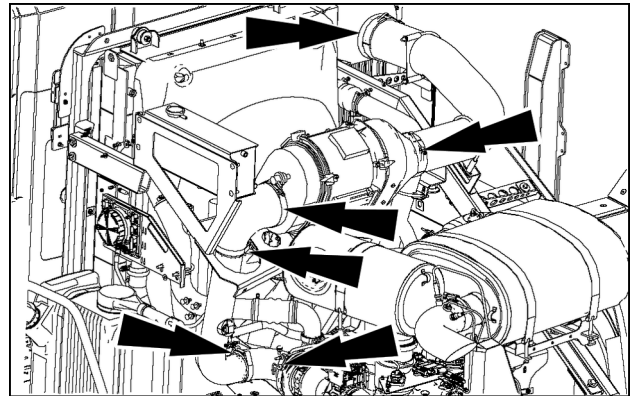
1. The engine cooling fan is located behind the cooling package in the engine compartment. The cooling fan is covered by a protective shroud. Access to the cooling fan can be made by lifting open the engine hood, or by opening the belly pan doors from the bottom. Keep the fan free of debris and trash. Keep the door screens clean, free of debris and trash



RAIL17SP00652AA 1

## Air intake lines

1. Locate the engine air cleaner in the engine compartment. Check the connections for the air intake lines. Ensure that all clamps are tightened and that the air intake tubing is properly attached.



RAIL17SP01025AA 1

## SCR exhaust piping connections

### **⚠ WARNING**

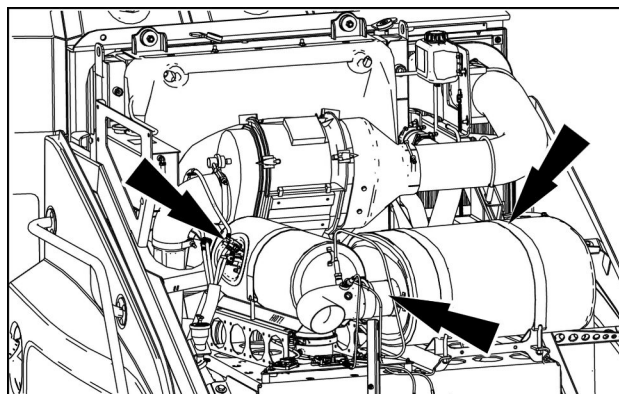
**Hot surface possible!**

**Wait for all components to cool before performing any operation.**

**Failure to comply could result in death or serious injury.**

W0251A

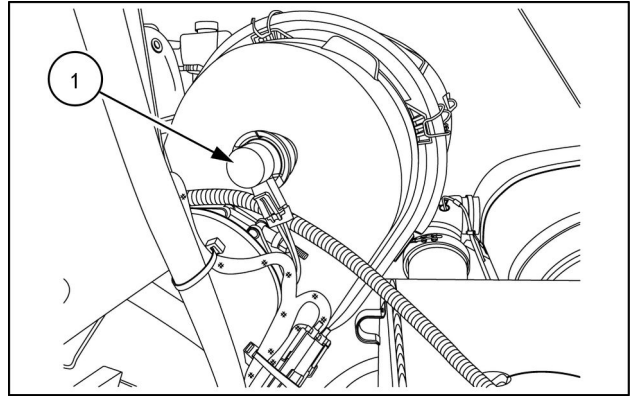
1. Check the components, and the piping connections of the Selective Catalytic Reduction (SCR) exhaust treatment system. Tighten any loose connections. Access the SCR system by opening the engine hood. The system is mounted above the engine.



RAIL17SP00671AA 1

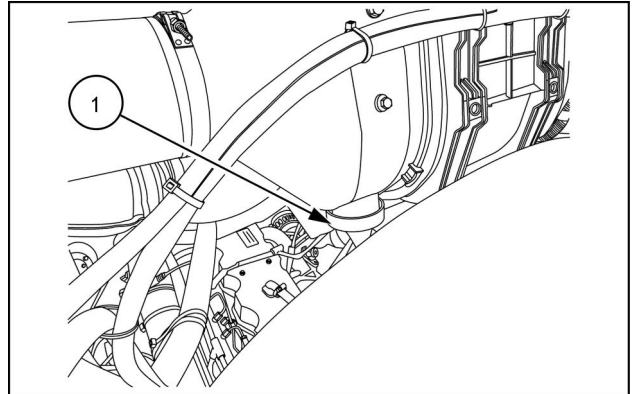
## Air filter dust valve

1. Check the air cleaner restriction indicator **(1)** mounted to the air cleaner housing. Press the yellow button on the indicator to reset the indicator if required.



RAIL17SP00221AA 1

2. Check the evacuator valve **(1)** on the lower part of the air cleaner to make sure it is closing and sealing when the engine is running. If the evacuator valve does not close and seal properly it must be replaced. Also check the evacuator valve to be sure it is not stuck in the closed position. It must open and close freely.



RAIL17SP00248AA 2

## Remove trash/debris from chassis and engine area

Inspect for and remove all trash and debris from around and on any hot components such as the exhaust, engine, turbocharger, engine compartment door screens, batteries, and cooling system at least once during each day and at the end of the day. Inspect and clean more often if operating conditions are severe. Keep these areas clean to avoid the possibility of fire and over-heating.

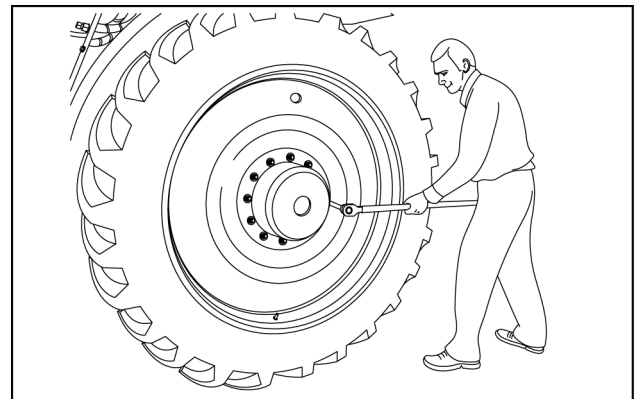
Keep the door screens clean, free of debris and trash

## First 50 hours

### Wheel lug nuts

1. Check the wheel lug nut torque.  
Torque the lug nuts to **610 N·m (450 lb ft)**.

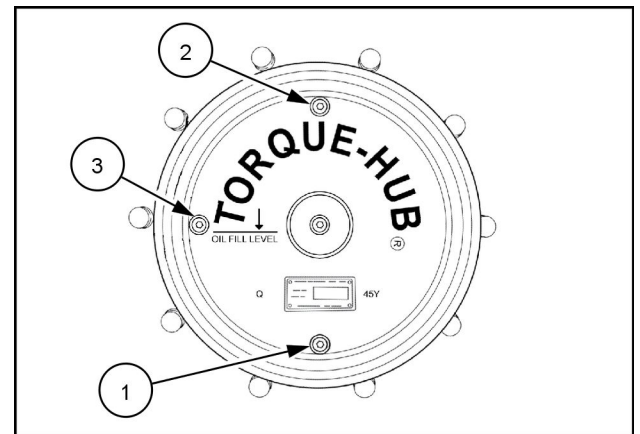
**NOTE:** When a wheel is replaced, retorque the lugs nuts after the first hour of initial use.



RAIL15SP00828AA 1

### Planetary gear lube - change

1. Drive the vehicle onto a hard, level surface. Turn off the engine and remove the key from the ignition.
2. Ensure that the planetary drive hub is positioned with the drain plug **(1)** in the 6 o'clock position.
3. Place a container under the drain plug to catch the gear lube when draining.
4. Remove the drain plug **(1)** and the upper plug **(2)**. Allow the planetary to drain completely.
5. Clean and reinstall the drain plug and the upper plug after all gear lube has been drained from the planetary drive hub.
6. Remove the level plug **(3)** from the planetary drive.
7. Fill the planetary drive hub with **TUTELA 50 HD** until the level of gear lube is at the bottom of the level plug hole. The planetary drive hub oil capacity is **1479 mL (50 US fl oz)**.
8. Install the level plug **(3)** into the planetary drive hub.
9. Repeat for the gear lube change for the remaining planetary drive hubs.
10. After the planetary drive hubs have been filled to the proper level, drive the vehicle for a short distance. Stop the vehicle and recheck the level in each planetary drive hub.

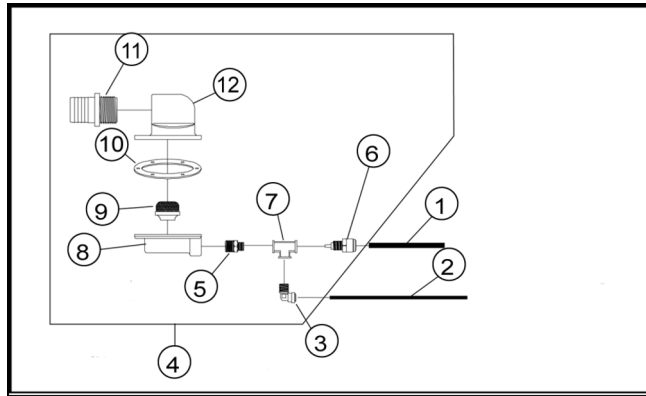


RAIL15SP00883AA 1

**Every 50 hours**

**Foam marker mixing filters and screens**

The foam heads have been designed so that the elements inside may be cleaned. The screens inside the unit should be washed periodically with hot water. The in-line filter element should be cleaned to ensure sufficient liquid flow to the foam head assemblies.

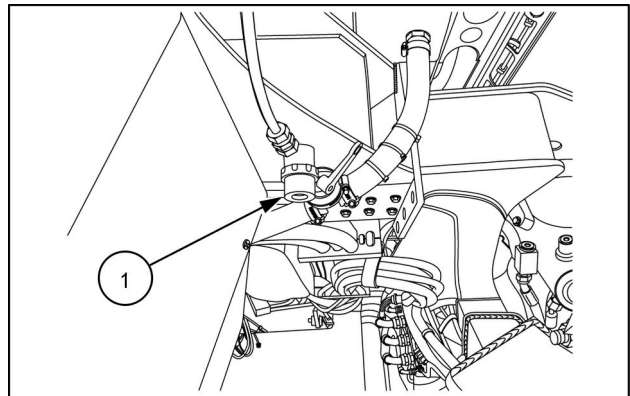


RCPH11SPR199AAM 1

1. 3/8 black poly tubing	7. Brass tee
2. 1/4 black poly tubing	8. Base housing
3. Elbow	9. 3/8 screen
4. Foam head assembly	10. Gasket
5. Brass reducer	11. Nipple
6. Venturi	12. Top housing

**Foamer tank filter**

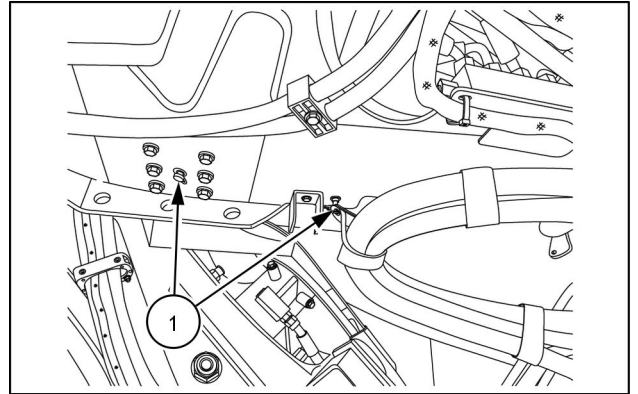
1. The water supply line to the foamer tank has an inline filter strainer. The filter element is located in the strainer which is located under the rinse water tank.
2. Remove the filter housing and clean the element. Re-install the filter element after servicing.



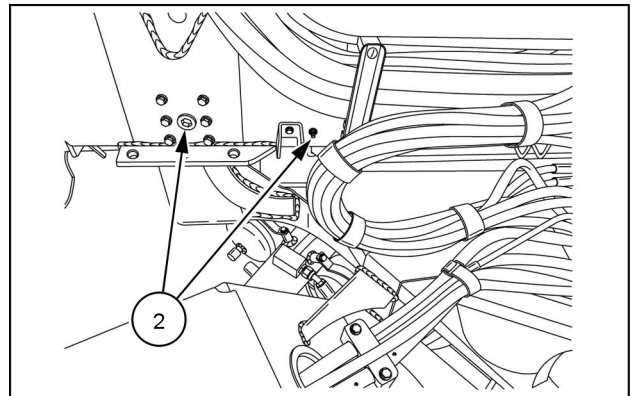
RAIL17SP00250AA 1

## Leg widening axle slide pads

1. Locate the two remote mounted grease fittings on each front slider tube (1), and each rear slider tube (2). The fittings are mounted below each slider.



RAIL17SP00253AA 1

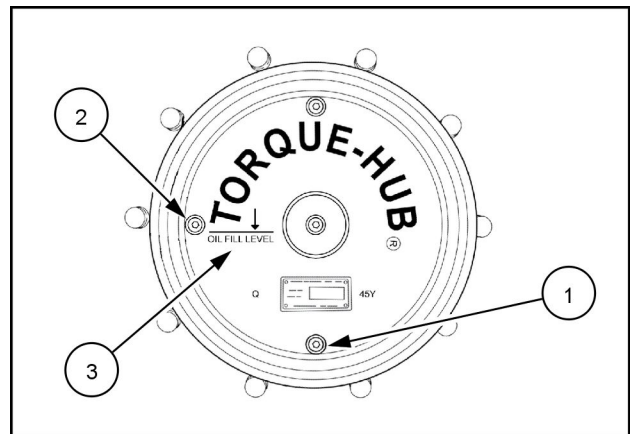


RAIL17SP00284AA 2

2. Clean off grease fittings before attaching the grease gun.  
Use **NEW HOLLAND AMBRA GR 75 MD** and lubricate each fitting.

## Planetary hub oil level

1. Drive the vehicle onto a hard, level surface. Turn off the engine and remove the key from the ignition.
2. Ensure that the planetary drive hub is positioned with the drain plug (1) in the 6 o'clock position.
3. Remove the level plug (2) from the planetary drive.
4. Observe the oil level in the planetary housing by looking into the level plug hole. The oil level should be at the level line (3) indicated on the planetary housing.
5. If required, fill the planetary to the proper level. Use **TUTELA 50 HD**. Planetary hub oil capacity is **1479 mL (50 US fl oz)**.
6. Install the level plug (2) into the planetary drive hub.
7. Perform the gear lube level inspection for the remaining planetary drive hubs.



RAIL15SP00883AA 1

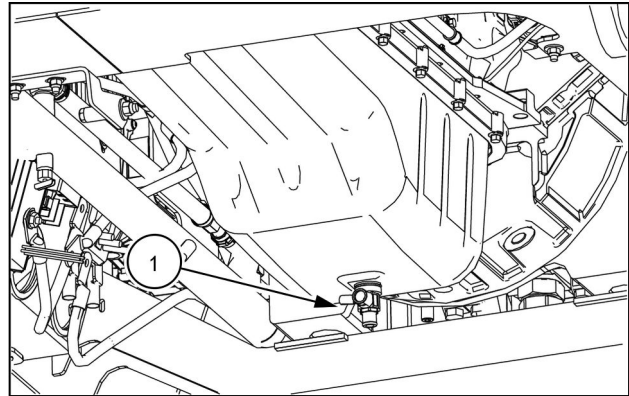
First 100 hours

Change engine oil and filter

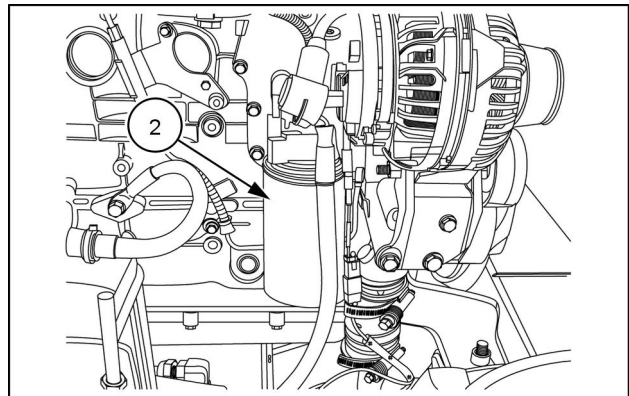
**⚠ WARNING**  
**Hot surface possible!**  
**Wait for all components to cool before performing any operation.**  
**Failure to comply could result in death or serious injury.**

W0251A

1. Drive the vehicle on to a hard, level surface.
2. Shut off the vehicle engine and remove the key from the ignition.
3. Allow the engine to cool before replacing the engine oil and filter.
4. Access the underside of the vehicle and open the belly pan doors to gain access to the engine oil drain plug petcock (1) and the engine oil filter (2). The engine oil filter is located on the left-hand side of the engine behind the alternator.
5. Open the oil drain petcock and drain the oil from the oil pan. Close the petcock when all the oil has drained.
6. Remove the engine oil filter using a filter wrench. Dispose of the filter properly.
7. Install a new engine oil filter. Apply clean oil or grease to the oil filter gasket. Hand tighten the filter to the engine. Do not use a filter wrench to tighten the filter

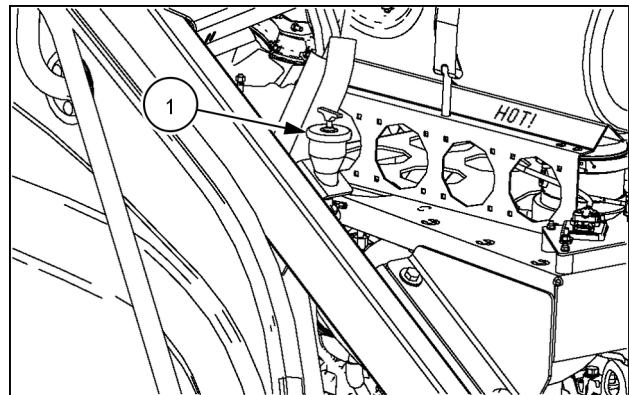


RAIL17SP00672AA 1



RAIL17SP00247AA 2

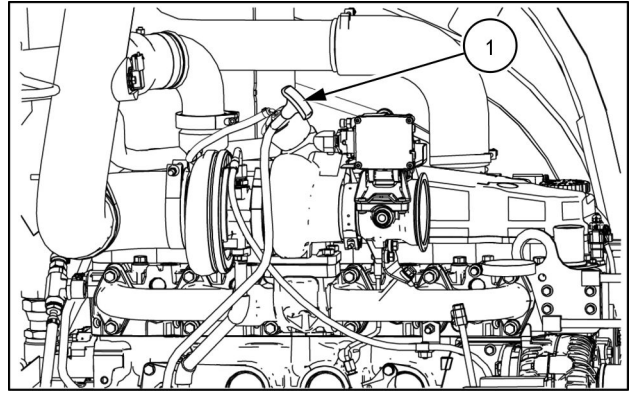
8. Fill the engine with **NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4 SAE 10W-40** engine oil. Open the engine compartment hood and remove the left-hand side panel from the engine compartment.
9. Access the engine oil filler tube (1) located on the left-hand side of the engine. Remove the cap and fill the engine with **17.0 L (4.5 US gal)** of oil.



RAIL17SP01024AA 3



10. Check the level of oil in the engine with the dip stick. The dip stick (1) is located on the left-hand side of the engine.
11. Start the engine and allow the engine oil to circulate.
12. Stop the engine and recheck the engine oil level. Add oil if needed.
13. Attach the side panel and close the engine compartment hood.



RAIL17SP01019AA 4

## Every 100 hours

### Tire pressure

MILLER recommends that the tire manufacturer's tire pressure, as indicated on the side wall of the tire, be maintained. Check the tire pressure daily. If your vehicle is equipped with the **Michelin® SprayBib™** 173 LI tires the maximum pressure is **441 kPa (64 psi)**.

Refer to 7-12.

### Primary fuel filter / Secondary fuel filter replace

#### **⚠ WARNING**

Fuel vapors are explosive and flammable.

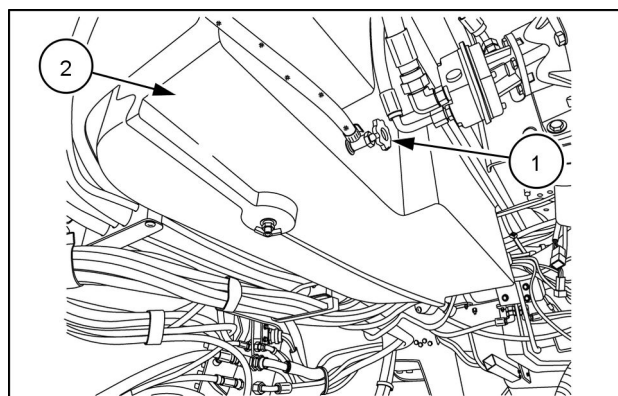
Do not smoke while handling fuel. Keep fuel away from flames or sparks. Shut off engine and remove key before servicing. Always work in a well-ventilated area. Clean up spilled fuel immediately.

Failure to comply could result in death or serious injury.

W0904A

#### Primary fuel filter

1. Drive the vehicle on to a hard, level surface.
2. Shut off the vehicle engine and remove the key from the ignition.
3. Allow the engine to cool before replacing the fuel filters.
4. Locate the fuel supply valve (1). The valve is located on the right-hand underside of the fuel tank (2). Turn OFF the fuel supply valve.

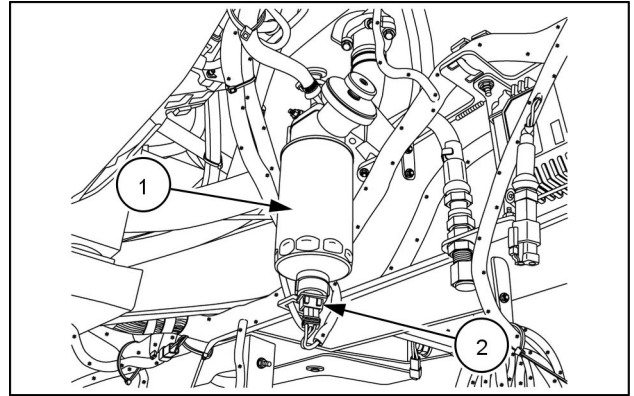


RAIL17SP00258AA 1

5. Access the primary fuel filter **(1)** located on the right-hand side of the engine.  
Open the belly pan doors to access the filter.  
Disconnect the wire harness connector **(2)** to the primary fuel filter.
6. Place an appropriate container under the filter. Use a filter wrench and turn the filter counterclockwise as viewed from the bottom, in order to loosen. Remove the primary fuel filter and dispose of properly.

**NOTICE:** Do not use a filter wrench to tighten the filter, damage to the gasket and the filter could result.

7. Install a new filter. Apply clear oil or grease to the gasket on the new filter. Turn the filter clockwise as viewed from the bottom until the filter gasket comes in contact with the filter head. Use your hand to tighten 1/2 turn. To get a correct seal, loosen filter and again tighten 1/2 to 3/4 turn after the gasket comes in contact with the filter head.
8. Connect the wire connector to the primary fuel filter. Refer to 7-9 to remove air from the system.



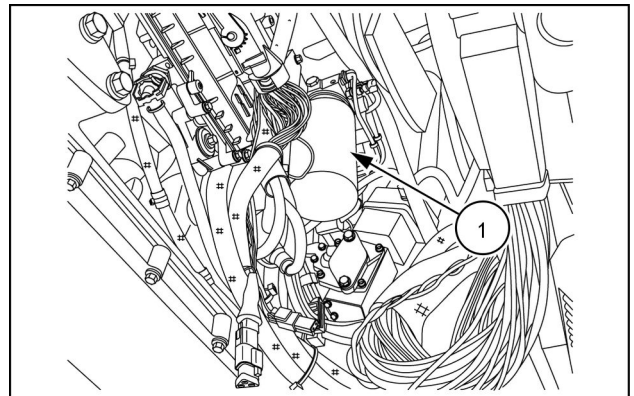
RAIL17SP00279AA 2

### Secondary fuel Filter

9. Access the secondary fuel filter **(1)** mounted to the engine on the right-hand side.
10. Place an appropriate container under the filter. Use a filter wrench and turn the filter counterclockwise as viewed from the bottom, in order to loosen. Remove the secondary fuel filter and dispose of properly.

**NOTICE:** Do not use a filter wrench to tighten the filter, damage to the gasket and the filter could result.

11. Install a new filter. Apply clear oil or grease to the gasket on the new filter. Turn the filter clockwise as viewed from the bottom until the filter gasket comes in contact with the filter head. Use your hand to tighten 1/2 turn. To get a correct seal, loosen filter and again tighten 1/2 to 3/4 turn after the gasket comes in contact with the filter head.
12. Turn the fuel shut off valve to the ON position. Refer to 7-9 to remove air from the system.



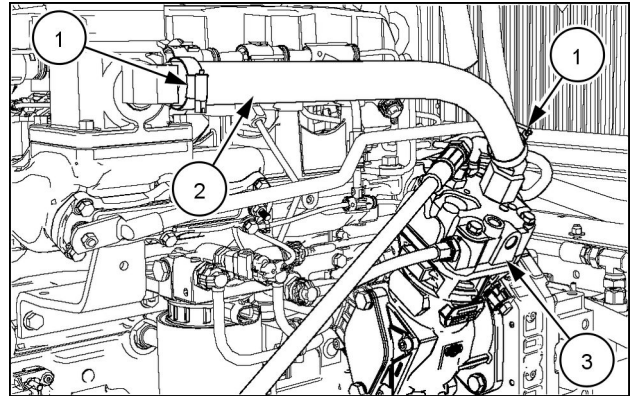
RAIL17SP00298AA 3

Every 250 hours

## Air compressor air line (if equipped)

Check to make sure that the hose clamps (1), attaching the air line (2) from the air compressor (3) to the engine, are secure.

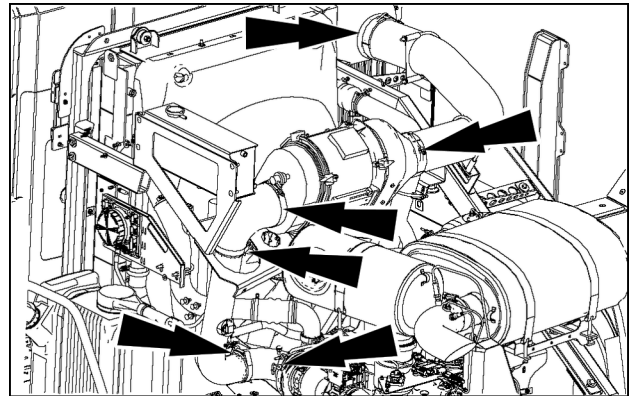
Tighten loose clamps to a torque of **3 – 4 N·m (27 – 35 lb in)** all mounting hardware on the air compressor is tight.



RAIL17SP01066AA 1

## Air intake - Check

1. Locate the engine air cleaner in the engine compartment. Check the connections for the air intake lines. Ensure that all clamps are tightened and that the air intake tubing is properly attached. Connections points are at the Intake, the air cleaner housing, and the turbo charger.
2. Tighten the clamps to a torque of **3.0 – 4.0 N·m (26.6 – 35.4 lb in)**



RAIL17SP01025AA 1

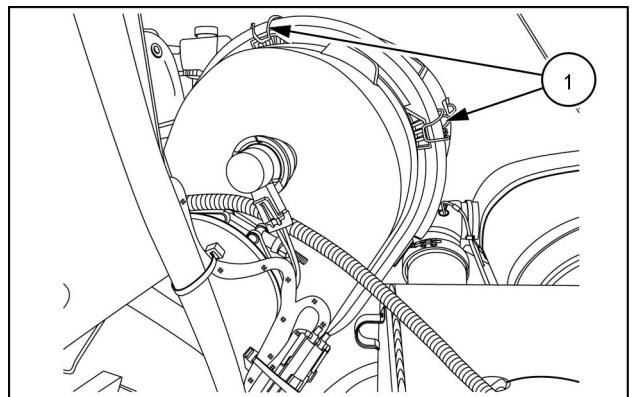
## Replace the air filter elements

### ⚠ WARNING

**Hot surface possible!**  
**Wait for all components to cool before performing any operation.**  
**Failure to comply could result in death or serious injury.**

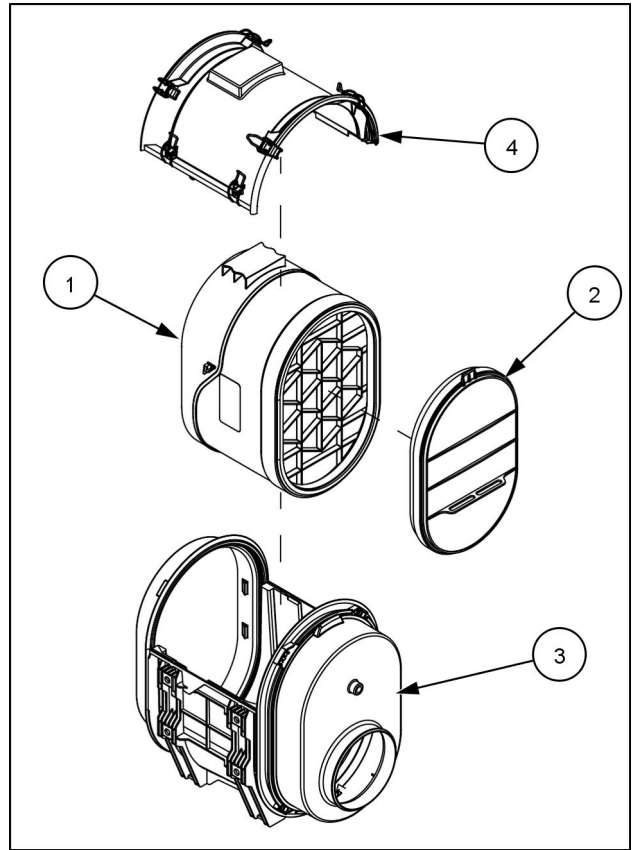
W0251A

1. Drive the vehicle on to a hard, level surface.
2. Shut off the engine and remove the key from the ignition.
3. Open the engine compartment hood. Locate the engine air cleaner housing on the top side of the engine.
4. Release the four locks **(1)** holding the cover. Remove the cover.



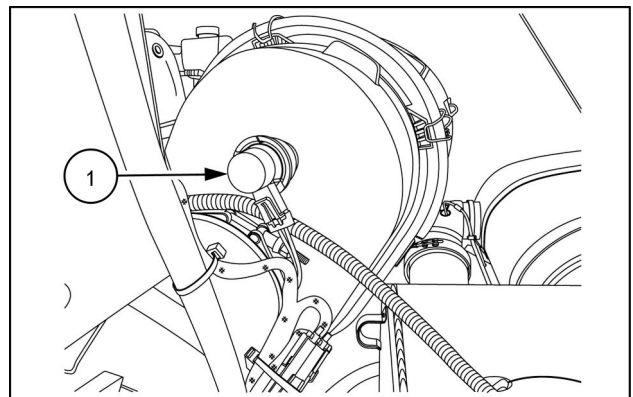
RAIL17SP00221AA 1

5. Pull the primary filter **(1)** out of the housing.
6. Do not remove the inner (secondary) filter **(2)** unless it is to be replaced.
7. With the secondary filter in place, use a clean cloth to wipe clean the inside of the filter housing **(3)** and cover **(4)**.
8. If the secondary filter is being replaced, replace it after the housing has been cleaned.
9. When installing the secondary filter, be sure the locating tab is to the bottom and seats into the slot in the housing.
10. After servicing is complete, reinstall cover onto the air cleaner housing and lock in place. Lock the cover in place with the locking tabs.



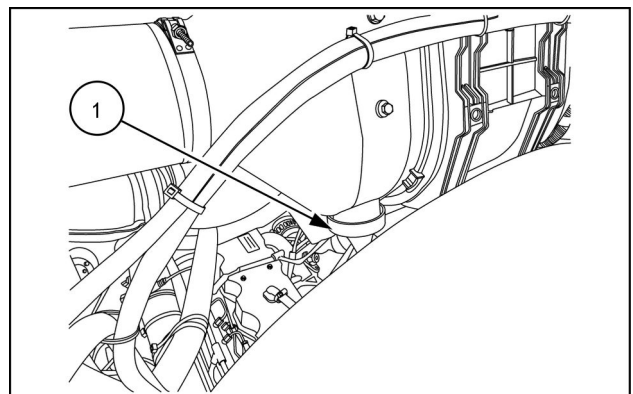
RAIL17SP00312BA 2

11. Reset the restriction indicator **(1)** after filters are replaced. Press the yellow button on the indicator to reset.



RAIL17SP00221AA 3

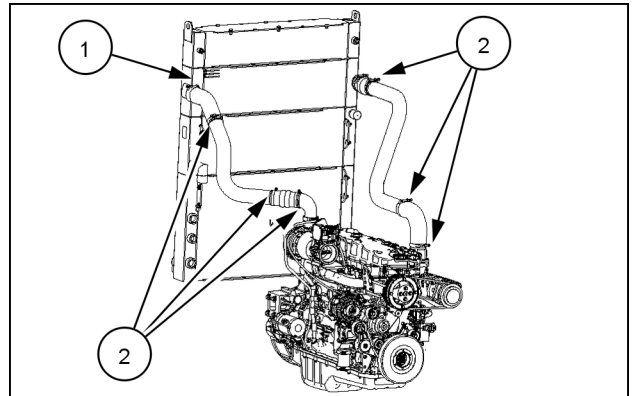
12. Visually check the evacuator valve **(1)** on the lower part of the air cleaner to make sure it is closing and sealing when the engine is running. If the evacuator valve does not close and seal properly it must be replaced. Also visually check the evacuator valve to be sure it is not stuck in the closed position. It must open and close freely.  
Do not use your hand to check the evacuator valve with the engine running.



RAIL17SP00248AA 4

## Charge air cooler

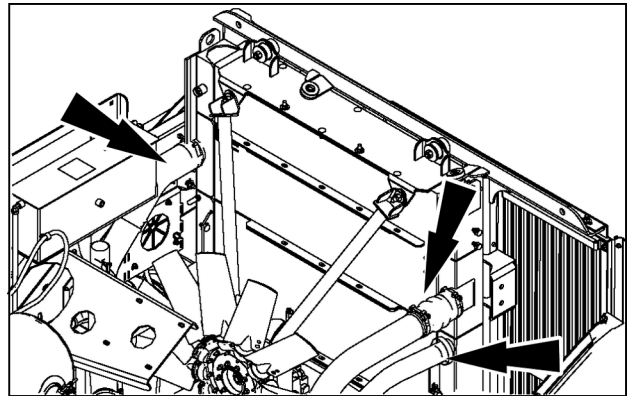
Inspect the charge air cooler (1) for debris or damage. Tighten all hose clamps (2) to a torque of **3.0 – 4.0 N·m** (**26.6 – 35.4 lb in**) as required.



RAIL17SP01030AA 1

## Radiator hoses

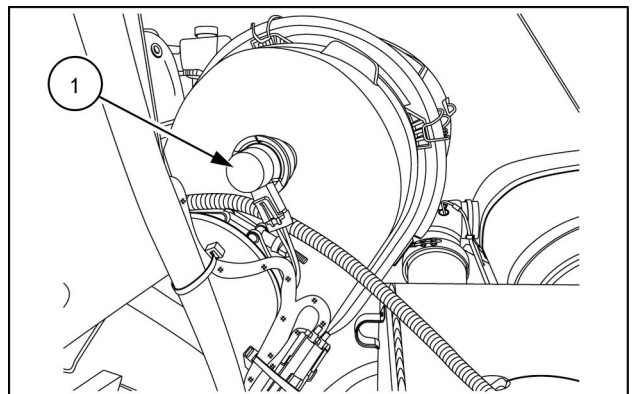
Check the radiator hoses for cracks and or leaks. If cracked or leaking hoses are found,, contact your MILLER dealer.



RAIL17SP01274AA 1

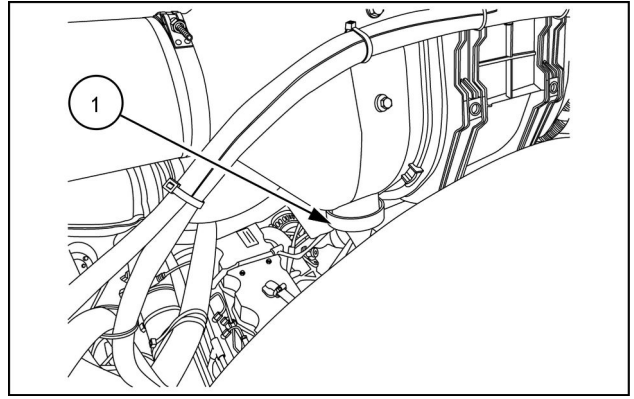
## Air cleaner restriction indicator

1. Check the air cleaner restriction indicator (1) mounted to the air cleaner housing. Press the yellow button on the indicator to reset the indicator if required.



RAIL17SP00221AA 1

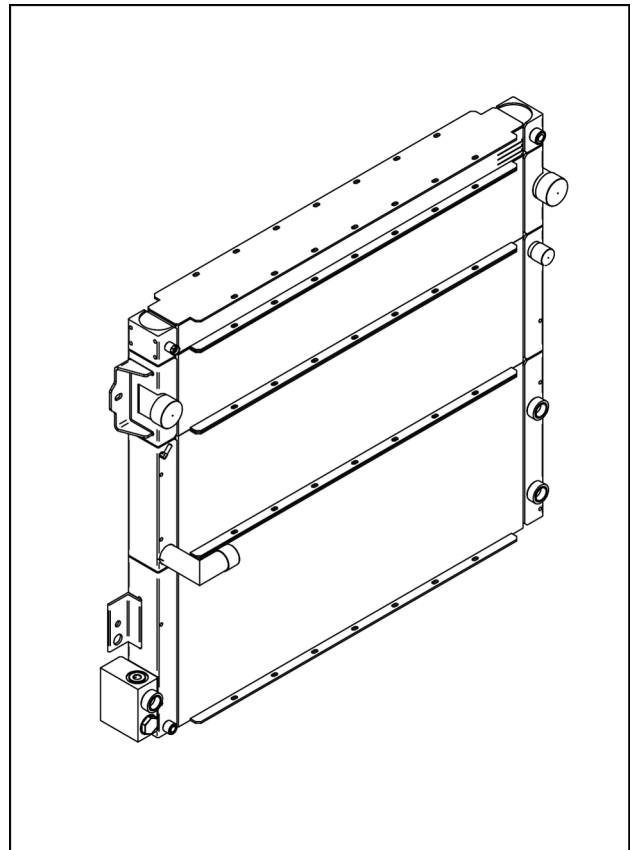
2. Visually check the evacuator valve **(1)** on the lower part of the air cleaner to make sure it is closing and sealing when the engine is running. If the evacuator valve does not close and seal properly it must be replaced. Also visually check the evacuator valve to be sure it is not stuck in the closed position. It must open and close freely.  
Do not use your hand to check the evacuator valve with the engine running.



RAIL17SP00248AA 2

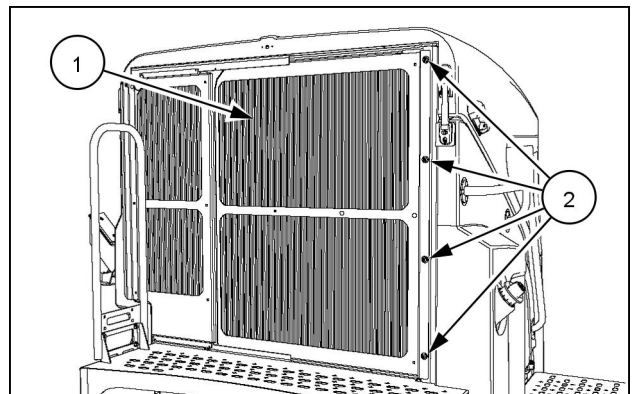
## Cleaning the radiators

1. Inspect the cooling package for debris, and any leakage of the fittings. Inspect more often if operating in adverse conditions. Repair any leaks immediately.



RAIL17SP00436BA 1

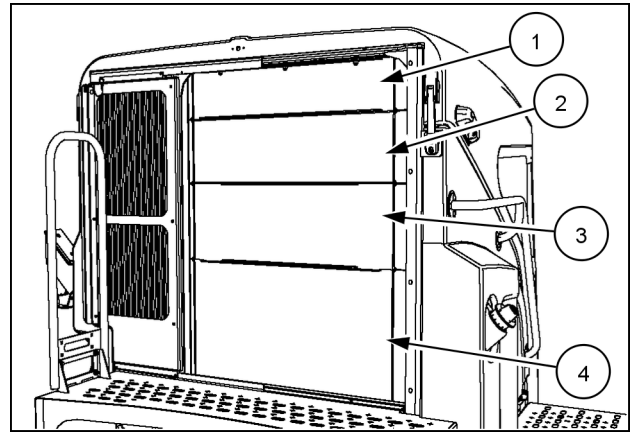
2. Inspect the cooling package. Remove the cooling package screen **(1)** by removing the bolts and washers **(2)** attaching the screen to the engine enclosure.



RAIL17SP01067AA 2



3. Straighten any dented or damaged cooling fins. Inspect the air conditioner condenser (1), the charge air cooler (2), the engine radiator (3), and the hydraulic oil cooler (4) for any debris. Remove any debris and dirt.
4. Reattach the screen after cleaning the cooling package.



RAIL17SP01068AA 3

## Hydrostat filter replacement

### ⚠ WARNING

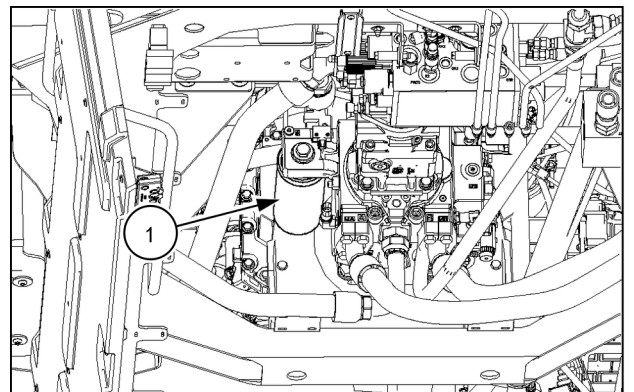
#### Escaping fluid!

Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately.

Failure to comply could result in death or serious injury.

W0178A

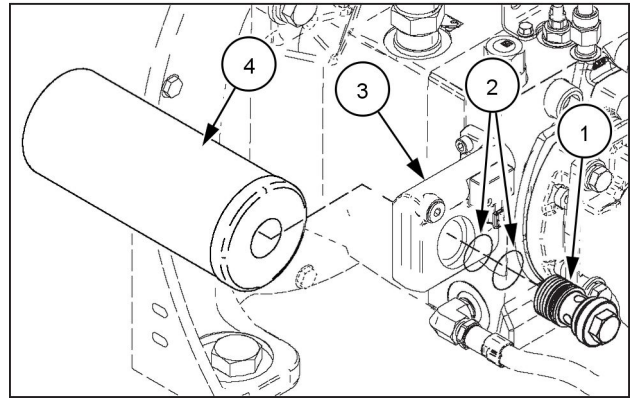
1. Drive the machine onto a hard, level surface.
2. Turn off the engine. Remove the key from the ignition.
3. Allow the engine and surrounding components to cool before servicing the machine.
4. Open the engine compartment doors to access the hydrostat filter (1). The filter is located on the right-hand side of the hydrostat pump.
5. Thoroughly clean the area around the filter (1) before removing the filter.
6. Place a container under the filter in order to capture any escaping fluids.



RAIL17SP01018AA 1

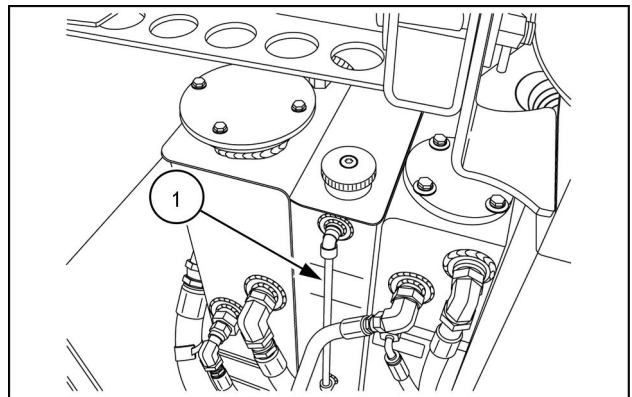
7. Remove the filter adapter (1) and O-Rings (2) from the filter adapter housing (3).  
Remove the filter (4) from the pump.
8. Attach new O-Rings onto the filter adapter.
9. Lightly oil the seal on the new filters.  
Install the filter by inserting the filter adapter into the filter adapter housing and securing the filter to the adapter. Tighten by hand.

**NOTICE:** Do not use a filter wrench to install the filter or overtightening will occur.



RAIL17SP01020AA 2

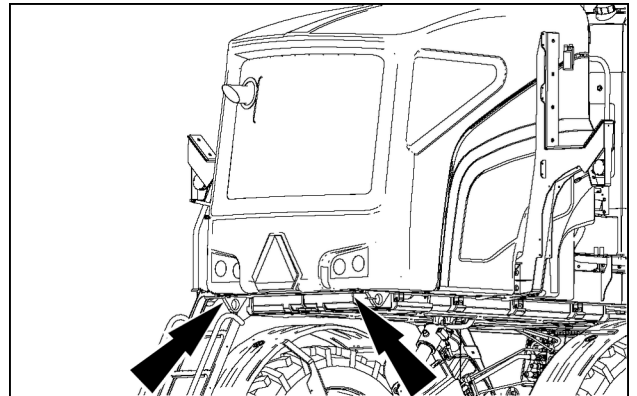
10. Start the unit and check for leaks at the filter. Shut the vehicle engine off and allow the hydraulic oil to cool. Check the hydraulic oil level (1) at the reservoir. Fill as needed.
11. Close the engine compartment doors after filter replacement.



RAIL17SP00262AA 3

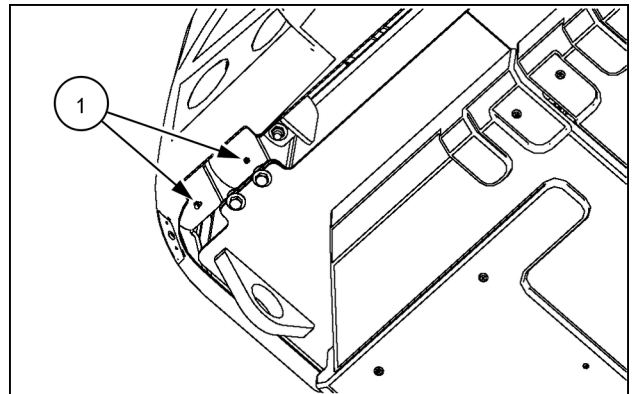
## Grease engine hood pivots

1. Locate the pivot points for the engine hood. The pivots are located at the bottom rear of the engine hood.



RAIL17SP01021AA 1

2. Locate the grease fittings (1) attached to a pivot.
3. Clean the grease fittings before attaching the grease gun.
4. Grease the pivot until grease comes out of the pivot joint.
5. Wipe up any excess grease.
6. Repeat greasing for the second pivot point.



RAIL17SP01022AA 2

Every 400 hours

## Replace hydraulic oil filter

### ⚠ WARNING

#### Burn hazard!

Do not handle any service fluid (engine coolant, engine oil, hydraulic oil, etc.) at temperatures that exceed 49 °C (120 °F). Allow fluids to cool before proceeding.

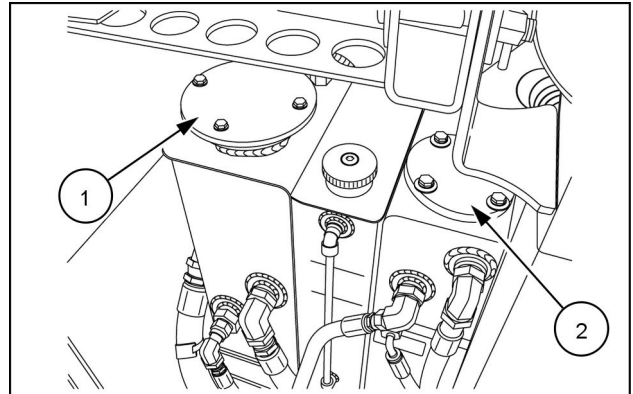
Failure to comply could result in death or serious injury.

W0330B

This procedure is valid for both the return filter (1) and the case drain filter (2).

1. Drive the vehicle on to a hard, level surface.
2. Shut off the vehicle engine and remove the key from the ignition.
3. Allow the engine and surrounding components to cool before servicing.
4. Access the hydraulic oil tank through the engine compartment sliding door. The oil filters are attached to the top of the hydraulic tank.
5. Remove the bolts around the filter cap. Remove the filter element from the filter housing.
6. Replace the element with a new element. Be sure to reinstall all gaskets. If gaskets or O-rings are deteriorated, replace with new parts.
7. Replace the filter assembly into the housing, being careful to line it up to properly seat the filter assembly in the housing.
8. Place the holding spring on the hub of the cap. Make sure to reinstall the O-ring seal. Reinstall the cap and tighten the bolts, being sure the spring and O-ring are properly seated so the suction filter seals to the face of the filter housing.

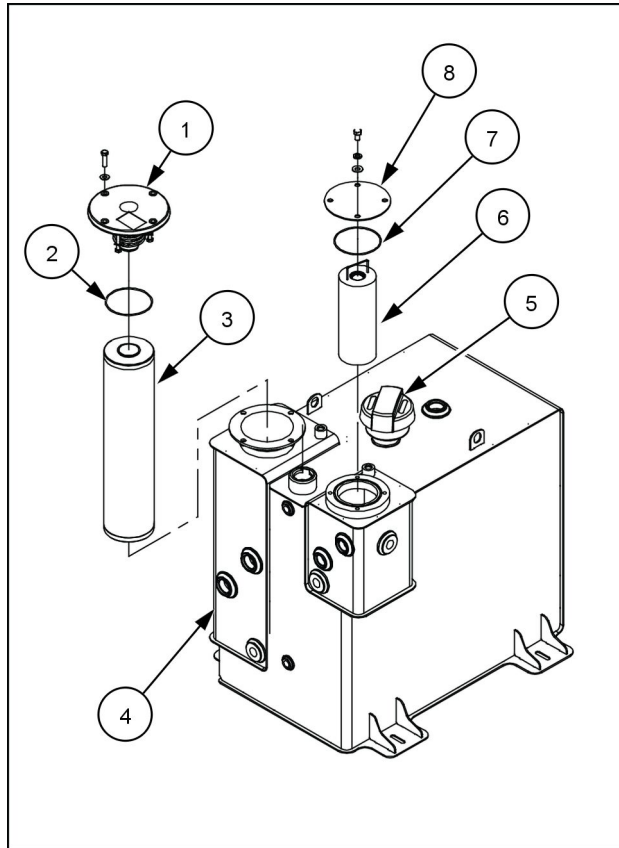
Torque the 5/16 inch bolts to: **19 N·m (170 lb in)**. Torque the 3/8 inch bolts to: **34 N·m (25 lb ft)**



RAIL17SP00262AA 1

**Hydraulic reservoir filter components**

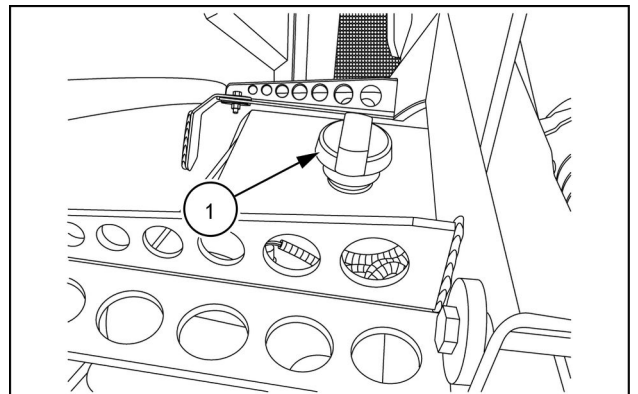
- (1) Filter cap
- (2) O-Ring
- (3) Main return filter element
- (4) Hydraulic oil reservoir
- (5) Breather filter element (inside cap)
- (6) Case drain filter element
- (7) O-Ring
- (8) Cover



RAIL14SP01015BA 2

**Hydraulic oil breather filter element**

1. Drive the vehicle on to a hard, level surface.
2. Shut off the vehicle engine and remove the key from the ignition.
3. Allow the engine and surrounding components to cool before servicing.
4. Access the hydraulic oil breather filter element through the engine compartment sliding doors. The breather filter is attached to the top of the hydraulic tank.
5. To change the filter breather element, remove the cover (1) from the breather by unscrewing the cover.
6. Remove the paper element and replace with a new one.
7. Replace the element cover and tighten.



RAIL17SP00261AA 1

## Every 500 hours

### Change engine oil and filter

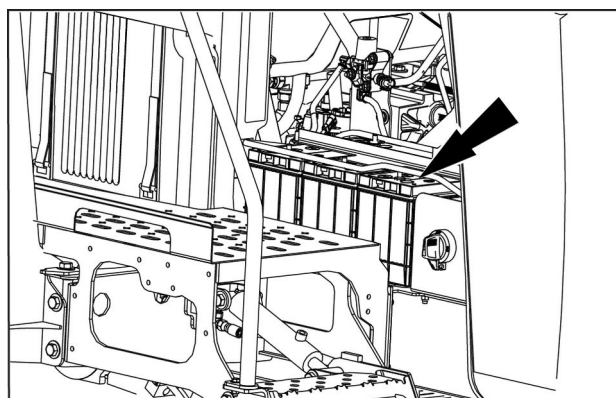
1. Change the engine oil and filter. Refer to 7-70.

### Primary fuel filter / Secondary fuel filter replace

1. Change the primary fuel filter and the secondary fuel filter. Refer to 7-72 for proper procedures.

### Check the battery and cable connection

Check the condition of the battery and the battery cables. Refer to 7-26.



RAIL17SP00628AA 1

### Radiator surge tank

#### **⚠ WARNING**

##### **Burn hazard!**

Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released.

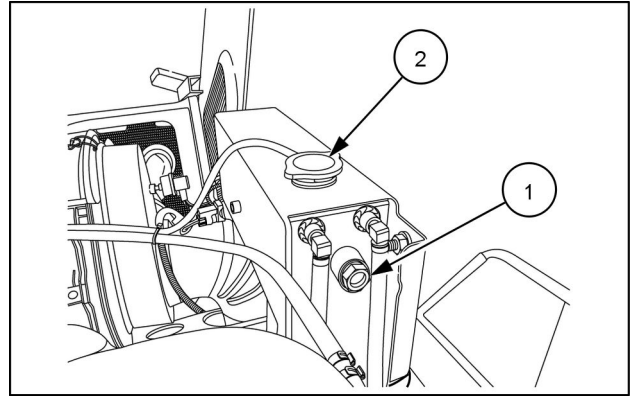
Failure to comply could result in death or serious injury.

W0367A

**NOTE:** Your vehicle is equipped with a coolant level sensor, which will automatically detect and warn the operator when the coolant level is too low. The following procedure is an alternate way to check the coolant level

1. Drive the vehicle onto a hard level surface.
2. Stop the vehicle and apply the park brake.
3. Turn off the engine and remove the key from the ignition.
4. Allow the engine and cooling package to cool before performing the maintenance.

5. Access the engine compartment and open the engine hood. Access the radiator surge tank.
6. Observe the coolant level indicated on the sight gauge (1) mounted to the front surface of the surge tank. Coolant should be visible in the sight gauge
7. Add **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT** through the surge tank cap (2) if the coolant level is below the sight gauge level. Radiator coolant capacity is **51.1 L (13.5 US gal)**.

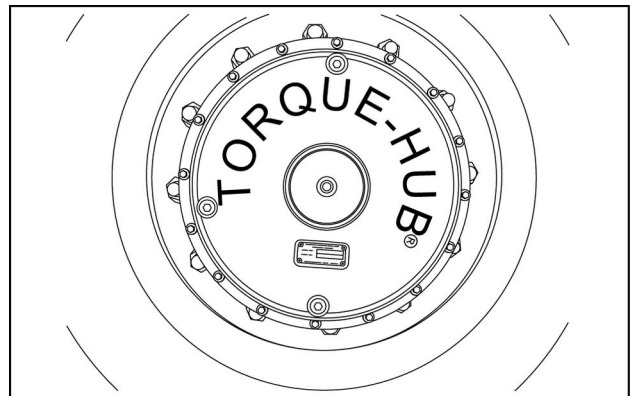


RAIL17SP00236AA 1

**NOTE:** Your vehicle is also equipped with a coolant level sensor which will automatically detect and warn the operator when the coolant level is too low.

## Planetary gear lube

Change the planetary gear lube. Refer to 7-67.



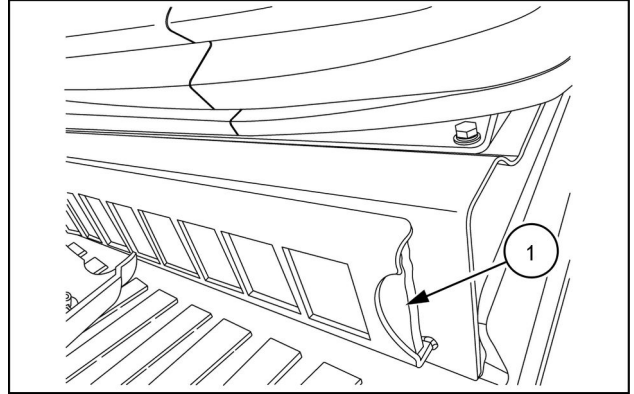
RAIL17SP00276AA 1

Once a year

## Cab air filters - Replace

### Recirculation filter

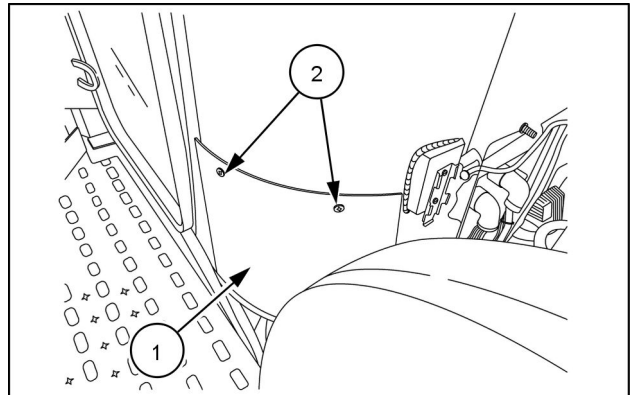
1. Remove the recirculation filter (1). The filter is located on the right side of the operators seat support. Remove the filter from the retainer by pulling the filter out the front of the retainer. Replace the filter with a new filter.



RAIL17SP00285AA 1

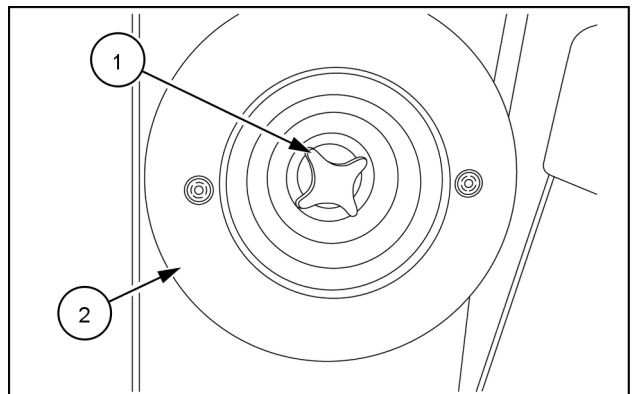
### Cab pressurization filter (charcoal)

1. Replace the cab pressurization filter. Locate the access cover (1) on the left rear corner of the cab. Remove the cover by loosening the two quarter turn fasteners (2).



RAIL17SP00231AA 2

2. Remove the cab pressurization filter. Remove the plastic knob (1) which holds the filter in place, then remove the filter (2).
3. Install a new cab pressurization filter. Reinstall the plastic knob and tighten the knob to hold the filter in place.
4. Reinstall the access cover by placing the cover on to the cab mounting area and turning the two quarter turn fasteners. Be sure to secure the access cover in place before operating the vehicle.



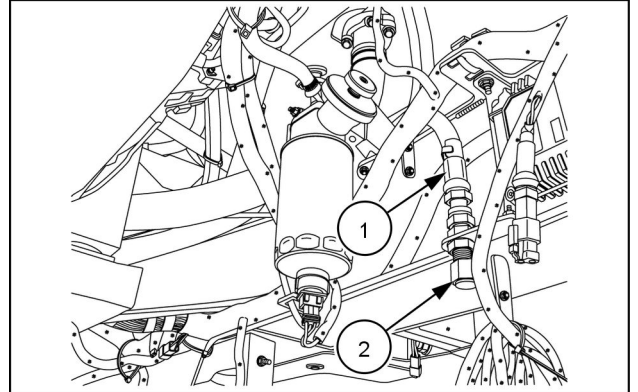
RAIL17SP00232AA 3



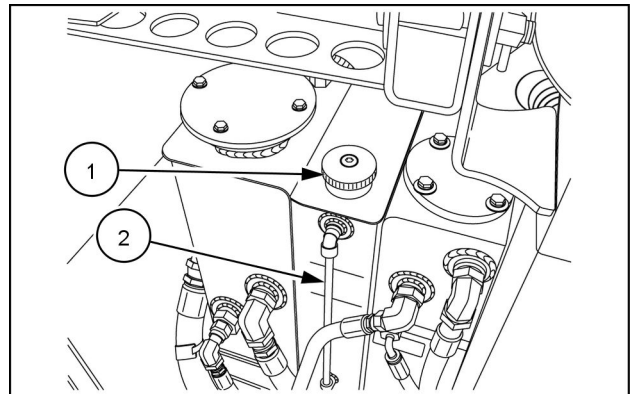
## Every 1000 hours

### Change the hydraulic oil

1. Drive the vehicle on to a hard, level surface.
2. Shut off the engine and remove the key from the ignition.
3. Allow the hydraulic oil to cool before proceeding.
4. Shut the engine off and remove the key from the ignition.
5. Access the bottom side of the hydraulic reservoir by opening the belly pan doors. Locate the hydraulic oil reservoir drain hose (1) with cap (2) mounted to a tab on the inside of the right side frame rail. Remove drain cap and drain the oil from the hydraulic oil reservoir into an empty container. The reservoir capacity is approximately **132 L (35 US gal)**. Dispose of used oil properly.
6. Clean and replace the drain cap.
7. Hydraulic oil filters should always be changed the same time the hydraulic oil is replaced. Refer to **7-82** for procedure.
8. Use a filter cart to filter all hydraulic oil before it enters the reservoir. Remove the fill cap (1) from the hydraulic oil reservoir and refill with clean **NEW HOLLAND AMBRA HYDROSYSTEM 68**. Fill reservoir until the oil reaches the "FULL" mark in the sight gauge (2). Do not over fill.  
Hydraulic reservoir capacity is **132 L (35 US gal)**.



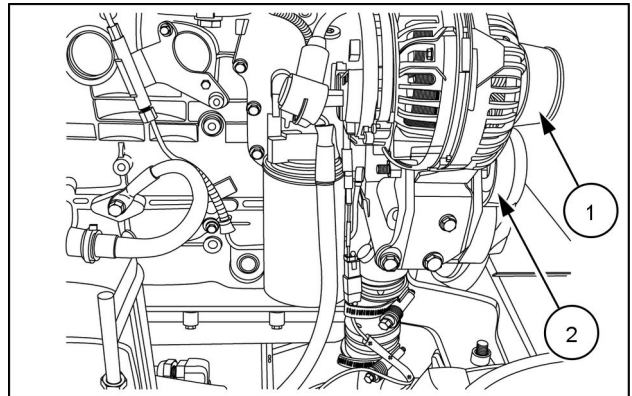
RAIL17SP00279AA 1



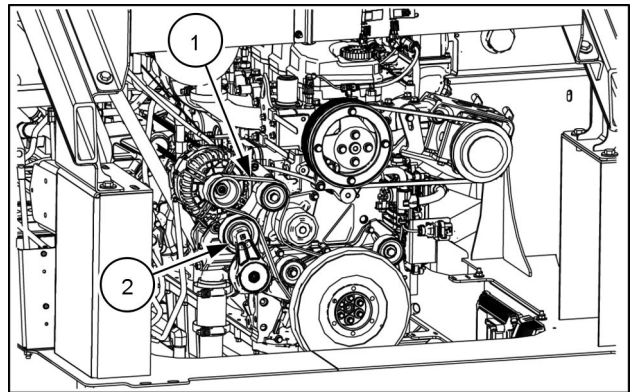
RAIL17SP00262AA 2

## Serpentine belt and belt tensioner check

1. Check the serpentine belt (1) condition. Check for any cracking or wear of the belt.
2. Check the belt tensioner (2) to be sure it is pivoting freely and providing tension. Check the tensioner pulley to be sure it spins free and rests square on the belt.



RAIL17SP00247AA 1



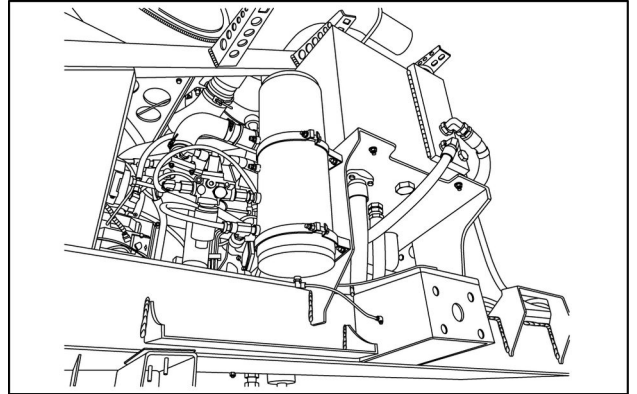
RAIL17SP01027AA 2

3. Replace the cracked or worn belt., or malfunctioning belt tensioner. MILLER dealer for service.

## Every two years

### Air compressor discharge lines (if equipped)

All air compressors have a small amount of lubricating oil carry over which lubricates the piston rings and moving parts. When this lubricating oil is exposed to normal air compressor operating temperatures over a period of time, the lubricating oil will form varnish or carbon deposits. If the following inspections are not done, the air compressor piston rings will be affected by high operating temperatures and pressures and will not seal correctly. Locate the air system tank located inside the right rear corner of the engine compartment.



RAIL17SP00222AA 1

1. Drain the air system to remove all pressure.
2. Remove the air discharge line from the air compressor.
3. Measure the total carbon deposit thickness inside the air discharge line.  
Total carbon deposits must not exceed **2.03 mm (0.08 in)**. clean and inspect the air compressor cylinder head, the valve assembly and the discharge line. Replace if necessary. Contact your dealer for proper procedures.
4. Contact your MILLER for service to the air compressor..

## Every 1800 hours

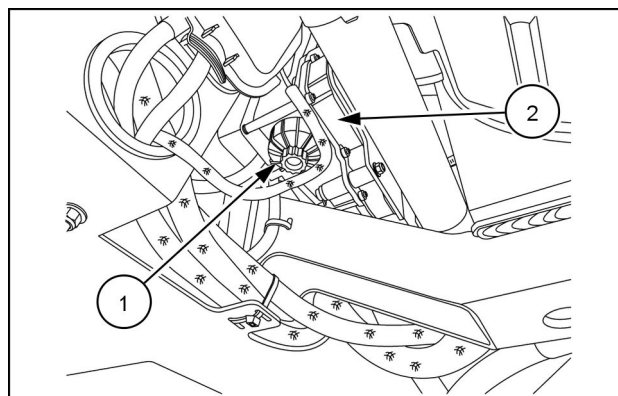
### Change the engine breather filter

Replace the engine breather filter at the specified time interval. See your MILLER dealer to have this service performed.

## Every 3600 hours

### Change the DEF/AdBlue® supply module main filter

1. Drive the vehicle on to a hard, level surface.
2. Shut off the engine and remove the key from the ignition.
3. Allow the engine and surrounding components to cool before proceeding.
4. Open the engine compartment belly pan doors.
5. Locate and remove the filter cover **(1)** from the diesel exhaust fluid pump **(2)** located on the left side of the vehicle, almost directly beneath the DEF tank.
6. Remove the filter element from the pump
7. Install the new filter into the pump.
8. Replace the filter cover and tighten securely.
9. Wipe up any excess diesel exhaust fluid.



RAIL17SP00237AA 1

Every 4 years

## Change the engine coolant

### ⚠ WARNING

#### Burn hazard!

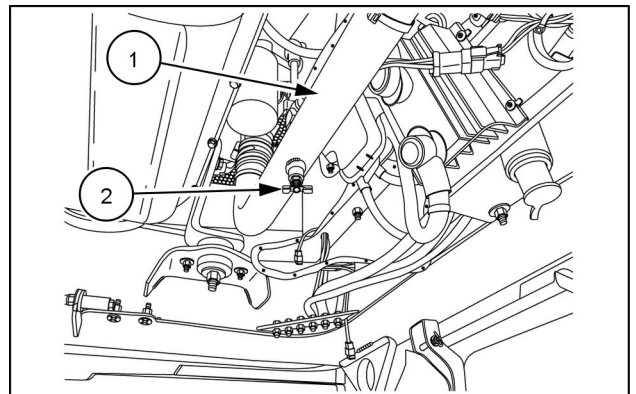
Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released. Failure to comply could result in death or serious injury.

W0367A

1. Drive the vehicle on to a hard, level surface.
2. Shut off the engine and remove the key from the ignition.
3. Allow the engine and surrounding components to cool before proceeding.
4. Access the lower radiator tube (1) by opening the belly pan doors. The tube is located next the engine on the right-hand side.
5. Drain the engine cooling system by draining the coolant into a suitable container. Open the petcock drain (2), in the lower radiator tube, to drain the system.
6. Close the drain petcock in the lower radiator tube.
7. Fill the system with distilled water.
8. Start the engine and run the engine for at least **30 min.**

**NOTE:** Make sure to activate the heating system and place on high, in order to circulate fluid through the heater core.

9. Repeat steps 4 through 8 for a total of two rinses.



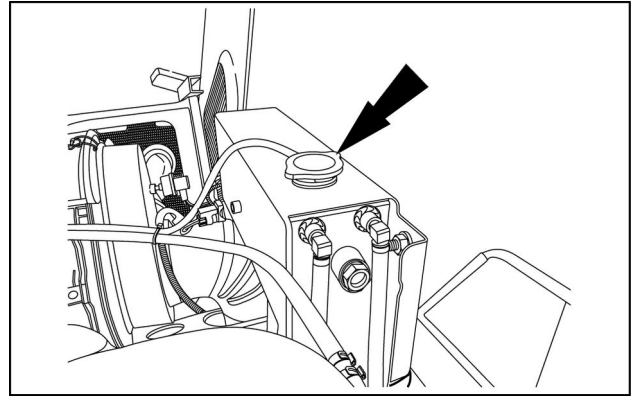
RAIL17SP00274AA 1

10. Open surge tank and fill the surge tank with **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT**. Add coolant as needed to bring the level up to the fill neck of the surge tank. Coolant capacity is **51.1 L (13.5 US gal)**.

**NOTE:** *Never mix different types of coolant.*

11. Open cab heater control valve.
12. Let the cooling system fill for 2-3 minutes.
13. Refill surge tank.
14. Leave the surge tank cap off and run engine at idle for several minutes.
15. Let the cooling system fill for 2-3 minutes and then top off the surge tank.
16. With surge tank cap off, run at high idle until thermostats open.
17. Inspect the cooling system for leaks. If no leaks are found, shut off engine and top off surge tank.
18. Leave the surge tank cap off and run the engine up to operating temperature.
19. Shut off the engine and allow to cool.
20. Top off the surge tank and reinstall the surge tank cap.

**NOTE:** *Be sure the OAT decal is attached to the machine when OAT coolant is used. This will indicate the use of OAT coolant in the cooling system*



RAIL17SP00236AA 2

## Storage

### Storing the machine

#### **▲ WARNING**

##### **Crushing hazard!**

**The boom may drop suddenly without warning. Always install the cylinder stops to hold the boom in the raised position during storage, transport, and service. Failure to comply could result in death or serious injury.**

W1532A

The following steps must be followed when storing the vehicle for extended periods of time.

1. Change engine oil and filter. Refer to **7-70**
2. Wash the vehicle thoroughly taking special care to remove all chemicals, fertilizer, grease and oil. Rinse the outside of the tank thoroughly. Clean mud from axle legs and pivots, and planetary hub areas. Wash the boom and center section.
3. Do NOT leave the boom partly unfolded. With the vehicle at a complete stop, completely fold the boom and place into the transport cradles.
4. Install the safety stops onto the lift cylinders.
4. Park the machine in a cool, dry area. Position the vehicle as it will be stored.
5. Apply **WD-40®**, as a rust preventative, to the exposed areas of the cylinder rods.
  - Identify all exposed cylinder rod areas.
  - Remove all dirt, grease or other contaminants from the rod surface by using a soft cloth dampened with an appropriate oil based solvent.
  - Exposed rod surfaces should be cleaned prior to coating.
  - Inspect the rod surface for any noticeable surface defects.
  - Apply a coating of **WD-40®**, as a rust preventative, to all exposed rod surfaces.
  - Periodically, inspect the rod surfaces and apply additional **WD-40®** as needed.
6. Lubricate the machine before placing into storage. Refer to the following lubrication procedures listed below:
  - **7-61**
  - **7-59**
  - **7-58**
  - **7-69**
  - **7-49**
  - **7-81**

6. Remove batteries and store in safe area.

**NOTICE:** *If the batteries are not used for more than four months, they should be periodically recharged to keep them fully charged.*

7. Change hydraulic oil and filters. See **7-87** for the proper hydraulic and filter change procedures.

8. Drain the water from the fuel filter. See **7-62**

9. Fill the fuel tank with a premium grade diesel fuel. If premium grade diesel fuel grade has not been used regularly, drain the fuel tank and fill with premium grade diesel fuel. Run the engine for five minutes to circulate the fuel through the fuel injection system.

**NOTICE:** *Biodiesel fuel does not have long term stability and should not be left in engines or stored for more than four months. Prior to storing your machine for more than 4 months, the engine should be flushed by running for a minimum of **30 min** with conventional diesel fuel.*

9. Clean the engine air filter and body. See **7-62** for the cleaning procedure.

10. Drain, flush and fill the cooling system with **NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT**. See **7-91** for the proper procedure.

11. Check for any parts that need replacing. Order and change any worn, damaged, or missing items.

12. Sand and clean any rusty metal areas and repaint with a metal primer and a finish coat. Paint will cover and protect the metal surfaces and retard further corrosion.

13. Inspect and clean the flow meter at the end of each spraying season. See **7-39** for the proper procedure.

15. The following areas of the sprayer must be prepared if storing during freezing temperatures:

- Sprayer plumbing - open valves and remove drain plug from pump to drain system, reinstall pump drain plug and add **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F** to the pump station plumbing.
- Foam marker - Flush and drain all liquid from the foam marker system.
  - Remove the in-line filter at the bottom of the tank.
  - Completely flush the tank with warm water.
  - Replace in-line filter.
  - Turn on machine and allow to operate until no foam is generated.
  - Add anti-freezing solution such as windshield washer solvent or **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F** to the tank.
  - Turn on machine until and run the foamer unit until the **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F** is visible at the foam heads.
  - Check the airlines and liquid lines for holes and replace as required.

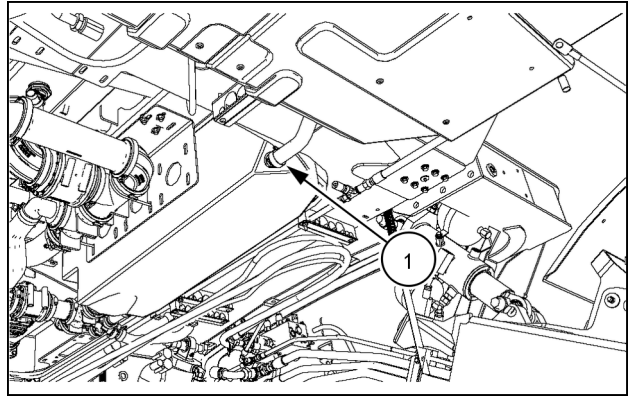
**NOTICE:** *Glycol antifreeze should never be used in the foam marker, it will damage the foam marker system.*



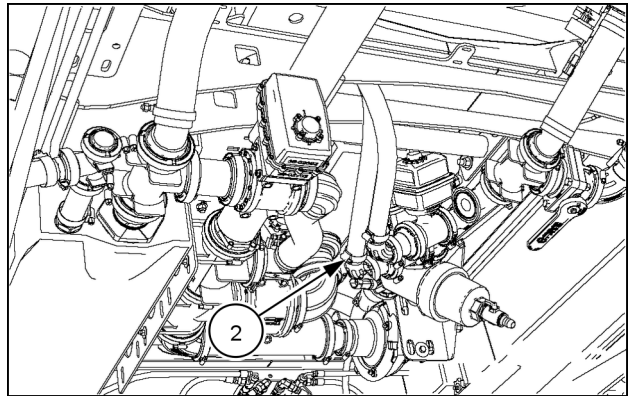
- Air Tank — Blow air through lines and drain water from the air tank.
- Eductor — If your machine has a chemical eductor, drain the plumbing.

- Rinse tank - Drain all fluid from the rinse tank.
  - Remove line (1) at the bottom of the rinse tank and drain the water from the tank into a suitable container
  - Remove the clamp attaching the Sparge line to the valve (2). Drain the water from the Sprage line into a suitable container
  - Reconnect the removed lines after fluid has drained.

**NOTICE:** The use of **PRO PERFORMANCE RV/MARINE ANTIFREEZE -50 °F** is suggested for the rinse tank.

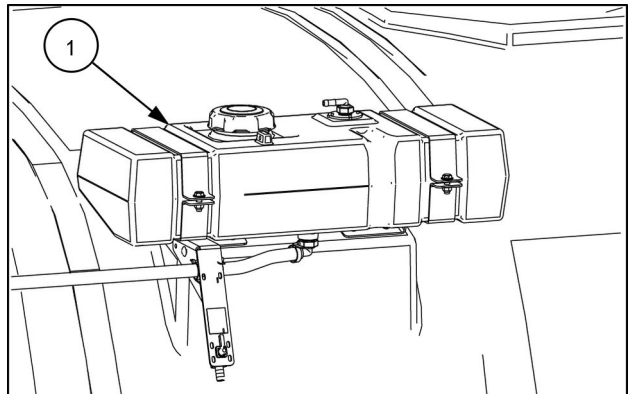


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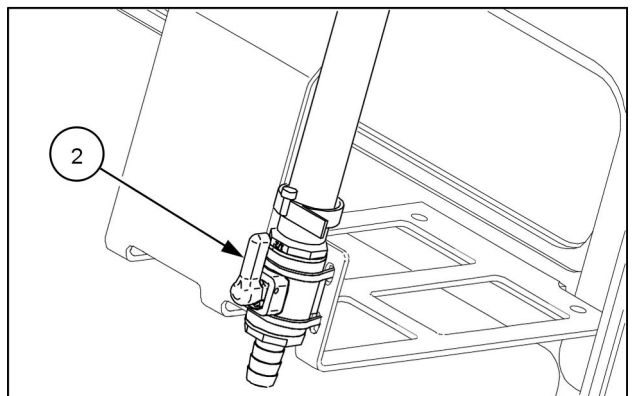


RAIL17SP01069AA 2

16. Hand rinse tank — Drain all fluid from the hand rinse tank. (1) of any remaining water.
- Access the hand rinse tank (1) located on the left-hand side of the product tank.
  - Open the lower valve (2) attached to the eductor door and allow the water to drain.
  - Close the lower valve after all fluid has drained from the tank.



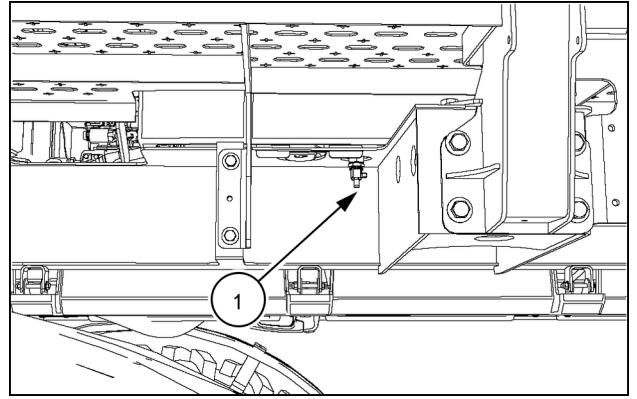
RAIL17SP00697AA 3



RAIL17SP00699AA 4

17. Drain the **DIESEL EXHAUST FLUID (DEF)/AdBLUE®** tank.

Access the tank drain valve (1) from the underside of the machine. Open the valve and drain the remaining **DIESEL EXHAUST FLUID (DEF)/AdBLUE®** into an appropriate container.



RAIL17SP01393AA 5



# 8 - TROUBLESHOOTING

## Fault code resolution

## Fault code retrieval

### Engine

The engine fault codes are listed in the engine service manual. Contact your MILLER dealer for information on fault codes.

The engine has onboard diagnostic capabilities built into it to troubleshoot the engine fault codes.

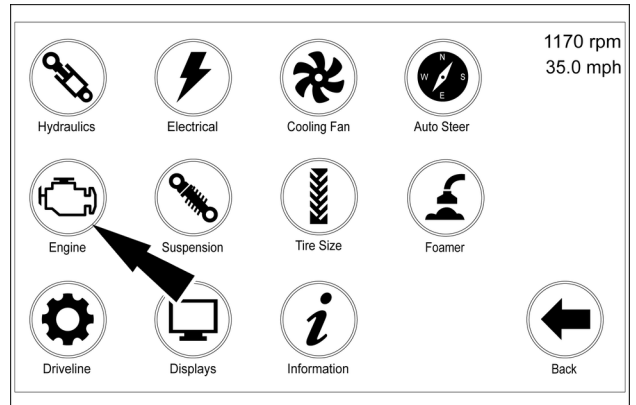
**FAULT DETECTION:** Engine fault codes can be detected while the engine is running. If a fault occurs, the engine computer takes a snapshot of engine operating parameters and logs the fault code into memory.

The arm rest display will display active fault codes as they occur.

To access the engine diagnostic page, press the engine icon on the arm rest display. Press the modules key on the info page, press the armrest display on the modules page, press the engine key on the armrest display page to bring up the errors page.

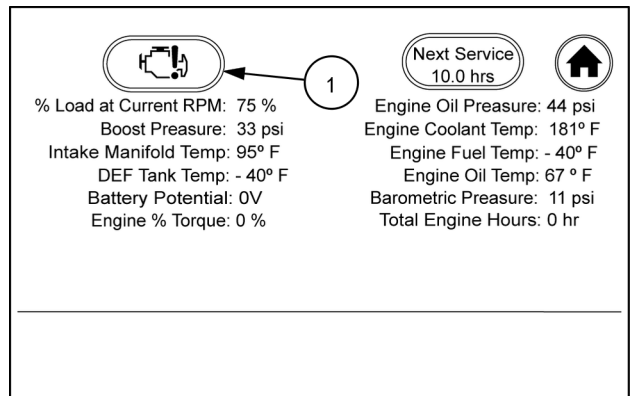
The armrest display panel will display fault codes with a Suspect Parameter Number (SPN) and the Fault Mode Indicator (FMI) code.

1. Press the engine icon button located on the armrest display second home page. The engine faults and service timer screen appears.



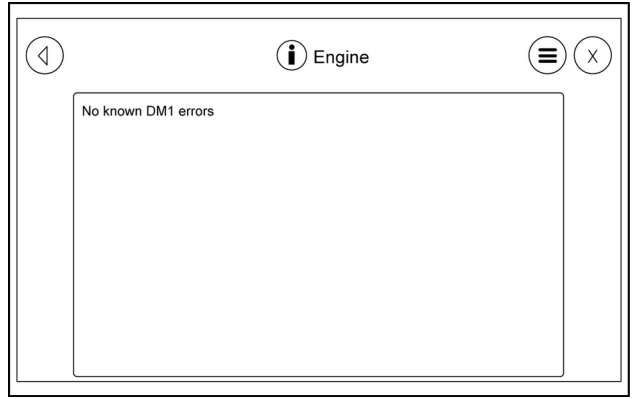
RAIL17SP00109FA 1

2. Touch the engine icon (1) to bring up several screens that show new faults or stored faults. The engine faults screen appears.



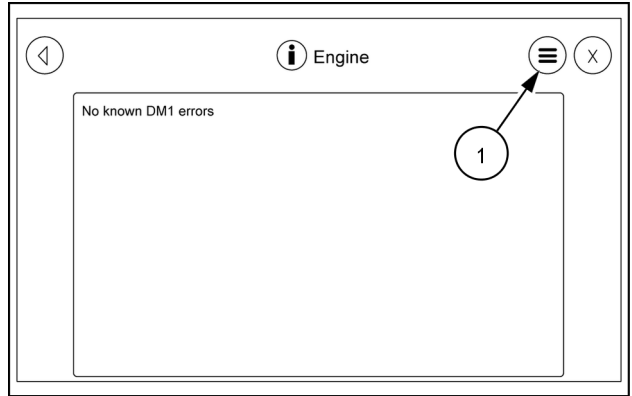
RAIL17SP00200AA 2

3. Any current engine faults that have occurred will be displayed.



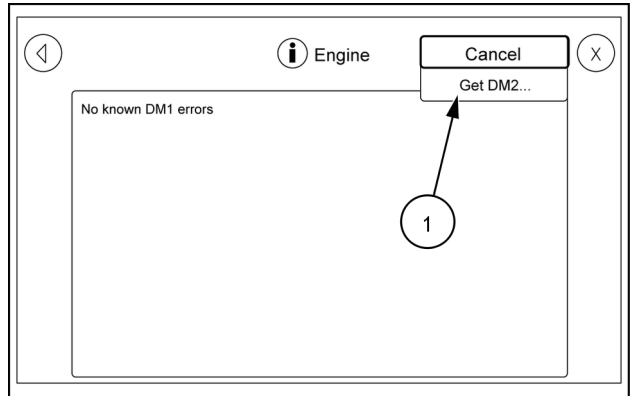
RAIL17SP00135AA 3

4. Touch the icon (1) in the upper right—hand corner (next to the X) of the screen to bring up stored faults.



RAIL17SP00135AA 4

5. The stored engine faults screen displays any stored engine fault codes. Press the Get DM2 button (1) to retrieve the stored codes.



RAIL17SP00136AA 5

## Hydraulic system

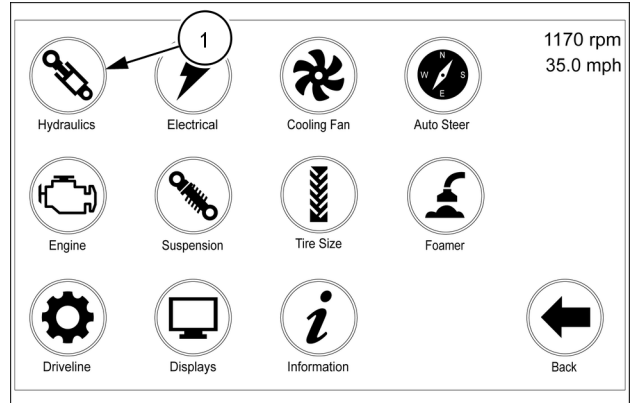
If the hydraulic pressure indicator on the Armrest Monitor comes on, check the hydraulic oil level and/or replace the filter. If the Armrest Monitor indicator continues to come on, contact your local dealer.

Chassis fault codes are available for viewing on the arm rest display.

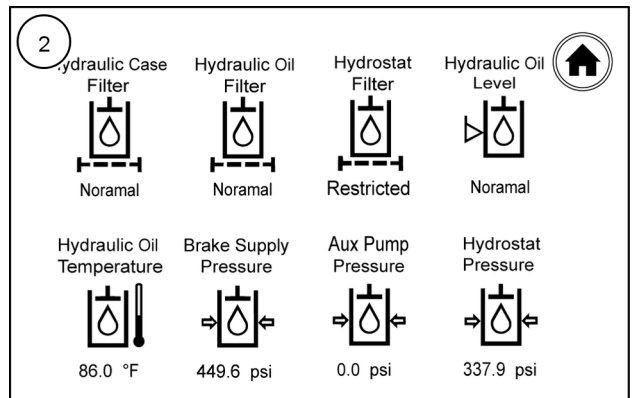
From the armrest home display touch the hydraulics icon (1).

The hydraulics screen displays (2). This screen is a monitoring screen only and has no selectable features.

When a fault is detected the corresponding icon will turn red.



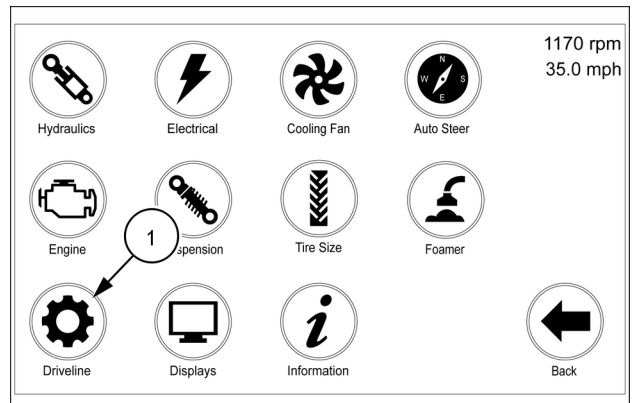
RAIL17SP00109FA 6



RAIL17SP00189AA 7

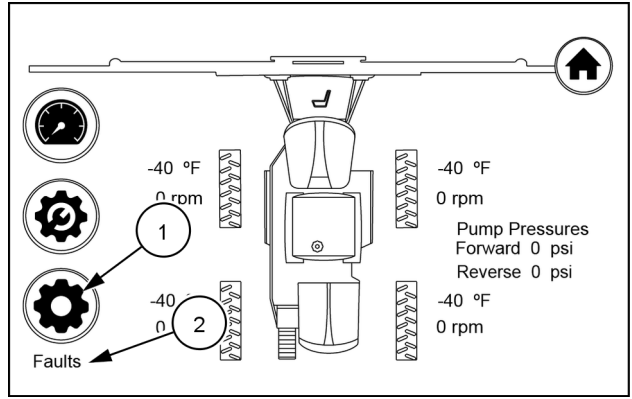
## Driveline

From the home screen, press the Driveline icon (1). The Driveline page will display



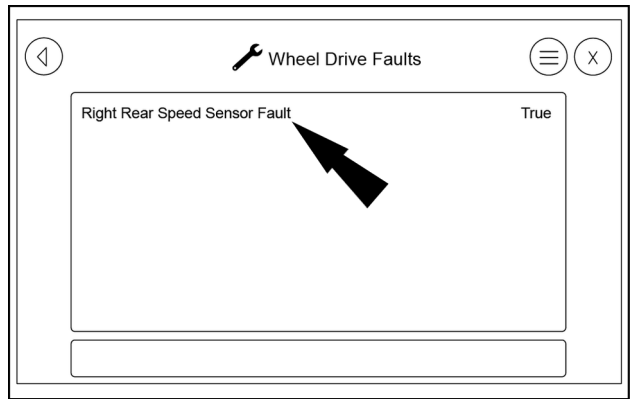
RAIL17SP00109FA 8

When a driveline fault is present on the machine, the Faults icon (1) will display in red, and the "Faults" message (2) will be present. Press the fault icon. The Wheel Drive Faults page displays.



RAIL17SP01457AA 9

The Wheel Drive Faults page will display the fault that is active on the machine. Take corrective action as required. Press the back arrow button to return to the previous screen.



RAIL17SP01458AA 10



## Troubleshooting procedures

The troubleshooting listings are theoretical, systematic searches for malfunctions in your vehicle. If all symptoms are known and properly diagnosed, it is relatively easy to determine what component is malfunctioning and what corrective action is required to restore your machine to proper operation.

Your sprayer consists of five major components not including optional equipment:

- Engine
- Hydraulic system
- Driveline
- Foam marker
- Product pump

The sprayer has the following self-diagnostic equipment installed to simplify troubleshooting of the machine.

- Display monitor
- Battery voltmeter
- Fuel gauge
- Engine temperature gauge and digital display
- Engine oil pressure gauge and digital display
- Air cleaner restriction indication
- Blocked fuel filter indication
- Hydraulic oil tank level sight gauge and lamps
- High hydraulic oil temperature indicator light
- High hydraulic oil return pressure light
- Water in fuel indication
- Engine intake manifold temperature digital display

### Symptom(s)

## Engine troubleshooting

If engine performance is unsatisfactory, check the following troubleshooting guide for possible problems and solutions.

Engine will not crank	Check that the drive control lever is in Neutral.
	Check that Neutral start switch is working properly.
	Check that Starter Relay in fuse box is working properly.
	Check that the Operator Presence Switch is working properly.
	Check that battery disconnect switch is turned to on.
Coolant temperature too high	Clean air inlet screens.
	Clean debris out of radiator, oil cooler and AC condenser fins.
	Check coolant level.

## Hydraulic system troubleshooting

### **⚠ WARNING**

#### **Escaping fluid!**

Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately.

Failure to comply could result in death or serious injury.

W0178A

If hydraulic system performance is unsatisfactory, check the following troubleshooting guide for possible problems and solutions.

<b>Suspect parameter</b>	<b>Failure mode</b>	<b>Course of action</b>
Hydraulic Oil Level	Oil Level Low	Refer to <b>7-49</b> .
Hydraulic Oil Temperature	Oil Temperature High	See your MILLER dealer.
Brake Supply Pressure	Pressure Low	See your MILLER dealer.
Hydrostat Pressure	Pressure Low	See your MILLER dealer.
Case Filter Pressure	Filter Needs Replacement	Refer to <b>7-82</b> .
Hydraulic Oil Filter	Filter Needs Replacement	Refer to <b>7-82</b> .
Hydrostat Filter	Filter Needs Replacement	Refer to <b>7-79</b>
Auxiliary Pump Pressure	Filter Needs Replacement	See your MILLER dealer.

## Driveline troubleshooting

If the driveline performance is unsatisfactory, check the following troubleshooting guide for possible problems and solutions.

Alarm/Fault code	Possible cause	Symptom	Corrective action
Brake Signal 1	Loss of Brake Sensor Signal 1	None on Performance	See your MILLER dealer
Brake Signal 1 not Calibrated	Brake Pedal not Calibrated	None on Performance	See your MILLER dealer
Brake Signal 2	Loss of Brake Sensor Signal 2	None on Performance	See your MILLER dealer
Brake Signal 2 not Calibrated	Brake Pedal not Calibrated	None on Performance	See your MILLER dealer
Brake Signal 3	Loss of Brake Sensor Signal 3	None on Performance	See your MILLER dealer
Brake Signal 3 not Calibrated	Brake Pedal not Calibrated	None on Performance	See your MILLER dealer
Brake Signal 1 not Calibrated Brake Signal 2 not Calibrated	Brake Pedal not Calibrated	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Brake Signal 1 not Calibrated Brake Signal 3 not Calibrated	Brake Pedal not Calibrated	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Brake Signal 2 not Calibrated Brake Signal 3 not Calibrated	Brake Pedal not Calibrated	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Brake Signal 1 not Calibrated Brake Signal 2 not Calibrated Brake Signal 3 not Calibrated	Brake Pedal not Calibrated	Drive Disabled	See your MILLER dealer
Brake Signal 1 Brake Signal 2	Loss of Brake Sensor Signal 1 and 2	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Brake Signal 1 Brake Signal 3	Loss of Brake Sensor Signal 1 and 3	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Brake Signal 2 Brake Signal 3	Loss of Brake Sensor Signal 2 and 3	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Brake Signal 1 Brake Signal 2 Brake Signal 3	Loss of Brake Sensor Signal 1, 2 and 3	Drive Disabled	See your MILLER dealer
Left Front H1 Motor Coil/Wiring Fault	Detection of Left Front Motor Coil Fault	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Right Front H1 Motor Coil/Wiring Fault	Detection of Right Front Motor Coil Fault	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Left Rear H1 Motor Coil/Wiring Fault	Detection of Left Rear Motor Coil Fault	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Right Rear H1 Motor Coil/Wiring Fault	Detection of Right Rear Motor Coil Fault	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Left Front H1 Motor Coil/Wiring Fault Right Front H1 Motor Coil/Wiring Fault	Detection of Left Front Motor and Right Front Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Left Front H1 Motor Coil/Wiring Fault Left Rear H1 Motor Coil/Wiring Fault	Detection of Left Front Motor and Left Rear Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer

8 - TROUBLESHOOTING

Alarm/Fault code	Possible cause	Symptom	Corrective action
Left Front H1 Motor Coil/Wiring Fault Right Rear H1 Motor Coil/Wiring Fault	Detection of Left Front Motor and Right Rear Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Right Front H1 Motor Coil/Wiring Fault Left Rear H1 Motor Coil/Wiring Fault	Detection of Right Front Motor and Left Rear Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Right Front H1 Motor Coil/Wiring Fault Right Rear H1 Motor Coil/Wiring Fault	Detection of Right Front Motor and Right Rear Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Left Rear H1 Motor Coil/Wiring Fault Right Rear H1 Motor Coil/Wiring Fault	Detection of Left Rear Motor and Right Rear Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Left Front H1 Motor Coil/Wiring Fault Right Front H1 Motor Coil/Wiring Fault Left Rear H1 Motor Coil/Wiring Fault	Detection of Left Front Motor, Right Front and Left Rear Coil Faults	Drive Disabled	See your MILLER dealer
Left Front H1 Motor Coil/Wiring Fault Right Front H1 Motor Coil/Wiring Fault Right Rear H1 Motor Coil/Wiring Fault	Detection of Left Front Motor, Right Front and Right Rear Coil Faults	Drive Disabled	See your MILLER dealer
Left Front H1 Motor Coil/Wiring Fault Left Rear H1 Motor Coil/Wiring Fault Right Rear H1 Motor Coil/Wiring Fault	Detection of Left Front Motor, Left Rear and Right Rear Coil Faults	Drive Disabled	See your MILLER dealer
Right Front H1 Motor Coil/Wiring Fault Left Rear H1 Motor Coil/Wiring Fault Right Rear H1 Motor Coil/Wiring Fault	Detection of Right Front Motor, Left Rear and Right Rear Coil Faults	Drive Disabled	See your MILLER dealer
Left Front H1 Motor Coil/Wiring Fault Right Front H1 Motor Coil/Wiring Fault Left Rear H1 Motor Coil/Wiring Fault Right Rear H1 Motor Coil/Wiring Fault	Detection of Left Front Motor, Right Front, Left Rear and Right Rear Coil Faults	Drive Disabled	See your MILLER dealer
Hydrostatic Pump Forward Coil/Wiring Fault	Detection of Front Pump Forward Motor Coil Fault	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Hydrostatic Pump Reverse Coil/Wiring Fault	Detection of Front Pump Reverse Motor Coil Fault	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Hydrostatic Pump Forward Coil/Wiring Fault	Detection of Front Pump Forward an Rear Pump Forward Motor Coil Faults	Drive Disabled	See your MILLER dealer
Hydrostatic Pump Reverse Coil/Wiring Fault	Detection of Front Pump Reverse an Rear Pump Reverse Motor Coil Faults	Drive Disabled	See your MILLER dealer
Hydrostatic Pump Forward Coil/Wiring Fault Rear Pump Reverse Coil/Wiring Fault	Detection of Front Pump Forward an Rear Pump Reverse Motor Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Hydrostatic Pump Reverse Coil/Wiring Fault Rear Pump Forward Coil/Wiring Fault	Detection of Front Pump Reverse an Rear Pump Forward Motor Coil Faults	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Steer Angle Signal 1	Loss of Steering Angle Sensor Signal	Reduced Performance to Approximately <b>29 km/h (18 mph)</b> After Reset to Neutral	See your MILLER dealer

## 8 - TROUBLESHOOTING

<b>Alarm/Fault code</b>	<b>Possible cause</b>	<b>Symptom</b>	<b>Corrective action</b>
Steer Angle Signal 1 not Calibrated	Steering Sensor Not Calibrated	Reduced Performance to Approximately <b>29 km/h (18 mph)</b> After Reset to Neutral	See your MILLER dealer
Joystick Signal 1	Loss of Joystick Signal 1	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Joystick Signal 1 not Calibrated	Joystick Signal 1 Not Calibrated	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Joystick Signal 2	Loss of Joystick Signal 2	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Joystick Signal 2 not Calibrated	Joystick Signal 2 Not Calibrated	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Joystick Signal 1 Joystick Signal 2	Loss of Joystick Signal 1 and 2	Drive Disabled	See your MILLER dealer
Joystick Signal 1 not Calibrated Joystick Signal 2 not Calibrated	Joystick Signal 1 and 2 Not Calibrated	Drive Disabled	See your MILLER dealer
Joystick Compare Difference Error	Joystick Signal 1 and 2 Comparison Error	Drive Disabled	See your MILLER dealer
Hydrostatic Pump Forward Pressure Transducer Fault	Loss of Front Pump Forward Press Transducer Signal	None on Performance	See your MILLER dealer
Hydrostatic Pump Reverse Pressure Transducer Fault	Loss of Front Pump Reverse Press Transducer Signal	None on Performance	See your MILLER dealer
Hydrostatic Pump Forward Pressure Transducer Fault	Loss of Front Pump and Rear Pumps Forward Press Transducer Signals	Drive Disabled	See your MILLER dealer
Hydrostatic Pump Reverse Pressure Transducer Fault	Loss of Front Pump and Rear Pumps Reverse Press Transducer Signals	Drive Disabled	See your MILLER dealer
Hydrostatic Pump Forward Pressure Transducer Fault	Loss of Front Pump Forward and Rear Pumps Reverse Press Transducer Signals	None on Performance	See your MILLER dealer
Hydrostatic Pump Reverse Pressure Transducer Fault	Loss of Front Pump Reverse and Rear Pumps Forward Press Transducer Signals	None on Performance	See your MILLER dealer
Creep Speed Enabled	Machine Speed is Limited to <b>5 km/h (3 mph)</b> Due to Fault(s)	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Left Front Speed Sensor Fault	Loss of Left Front Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Right Front Speed Sensor Fault	Loss of Right Front Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Left Rear Speed Sensor Fault	Loss of Left Rear Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Right Rear Speed Sensor Fault	Loss of Right Rear Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer

8 - TROUBLESHOOTING

<b>Alarm/Fault code</b>	<b>Possible cause</b>	<b>Symptom</b>	<b>Corrective action</b>
Driveline Control Sensor Power Fault	Loss of Sensor Power at Driveline Controller	Drive Disabled	See your MILLER dealer
SAE J1939 Fault	Loss of J1938 Communication	Drive Disabled	See your MILLER dealer
Front Left Frequency Fault	Loss of Left Front Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Front Right Frequency Fault	Loss of Right Front Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Rear Left Frequency Fault	Loss of Left Rear Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
Rear Right Frequency Fault	Loss of Right Rear Speed Sensor Signal	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	Check Speed Sensor, Sensor Connections/Wiring
Steer Angle Fault Speed Enabled	Loss of Steering Angle Sensor Signal	Reduced Performance to Approximately <b>29 km/h (18 mph)</b> After Reset to Neutral	See your MILLER dealer
IQAN Lost CAN message Fault	IQAN Lost CAN Communication	Drive Disabled	See your MILLER dealer
Park Brake Release Coil	Detection of Park Brake Coil Fault	Drive Disabled	See your MILLER dealer
Front CCO Valve	Detection of Front Pump CCO Coil Fault	Reduced Performance to Approximately 1/2 Speed	See your MILLER dealer
Rear CCO Valve	Detection of Rear Pump CCO Coil Fault	Reduced Performance to Approximately 1/2 Speed	See your MILLER dealer
Front CCO Valve Rear CCO Valve	Detection of Front and Rear Pump CCO Coil Faults	Drive Disabled	See your MILLER dealer
No Propel Speed Fault	Machine is Disabled Due to Fault(s)	Drive Disabled	See your MILLER dealer
No Propel Fault	Machine is Disabled Due to Fault(s)	Drive Disabled	See your MILLER dealer
Brake Not Pressed	Brake Pedal was not Pressed Fully before Releasing Park Brake	Drive Disabled	Depress Brake Pedal before Releasing Park Brake
Brake Signal Compare Fault	2 of the 3 Brake Sensor Signals are in Error	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	See your MILLER dealer
FL Motor Temp Fault	Detection of Front Left Motor Temperature Sensor Fault	None on Performance	See your MILLER dealer
FR Motor Temp Fault	Detection of Front Right Motor Temperature Sensor Fault	None on Performance	See your MILLER dealer
RL Motor Temp Fault	Detection of Rear Left Motor Temperature Sensor Fault	None on Performance	See your MILLER dealer
RR Motor Temp Fault	Detection of Rear Right Motor Temperature Sensor Fault	None on Performance	See your MILLER dealer
Joy Neutral Value and Switch Not equal	Joystick Neutral Signal Does not Match Neutral Switch	Drive Disabled	See your MILLER dealer

8 - TROUBLESHOOTING

<b>Alarm/Fault code</b>	<b>Possible cause</b>	<b>Symptom</b>	<b>Corrective action</b>
Joy Held out of Neutral to long and no park brake release	Joystick was out of Neutral Position without First Releasing Park Brake	Drive Disabled	Return Joystick to Neutral and Release Park Brake
Rear Steer No Calibration	Rear Steering not Calibrated on 4WS Model	Reduced Performance to Approximately <b>29 km/h (18 mph)</b> After Reset to Neutral	See your MILLER dealer
Rear Steer Signal Fault	Loss of Rear Steering Sensor Signal	Reduced Performance to Approximately <b>29 km/h (18 mph)</b> After Reset to Neutral	See your MILLER dealer
Depress Brake Pedal before Releasing Park Brake	Brake Pedal was not Pressed Fully before Releasing Park Brake	Drive Disabled	Depress Brake Pedal before Releasing Park Brake
Cold Weather Protection Active - Please Wait For Oil To Warm	Hydraulic Oil is less than <b>2 °C (36 °F)</b>	Reduced Performance to <b>5 km/h (3 mph)</b> After Reset to Neutral	Allow Hydraulic Oil to rise above <b>2 °C (36 °F)</b>
Motor Case Over <b>115 °C (239 °F)</b> .	Case Drain Temperature of One or More Wheel Motors is over <b>115 °C (239 °F)</b>	Reduced Performance to <b>16 km/h (10 mph)</b>	Reduce Speed

## Foam marker troubleshooting

If foam marker performance is unsatisfactory, check the following troubleshooting guide for possible problems and solutions.

Symptom	Possible cause	Corrective action
You do not get foam.	Air supply not properly connected.	To be sure the air line and liquid lines do not have a hole in them or are not pinched. Remove air and liquid tubing at each foam head and check for flow.
	Not enough foam concentrate.	Very hard water may require a greater amount of concentrate to produce good foam. Not having enough foam concentrate may make good foam, but not make enough of it. Use a high quality foam concentrate. Adjust foam concentrate with in cab switch.
	In-line filter dirty or clogged.	Check and clean the in-line filter.
	Shut off valve closed.	Open shut off valve near filter.
Not enough foam.	Not enough foam concentrate.	Adjust foam concentrate with in cab switch.
	Hole in air line. Pinched air or liquid lines.	Check air and liquid lines.
	Clogged in-line filter/foam heads.	Check and clean filter/foam heads.
Wet foam.	Not enough foam concentrate.	Adjust foam concentrate with in cab switch.
	Dirty in-line filter/foam heads.	Check and clean filter/foam heads.
Foam does not last on the ground.	Too little concentrate being used.	Use higher quality foam concentrate or increase concentrate with in cab switch.
Blowing foam in windy weather.	Foam too light or dry.	Decrease concentrate with in cab display panel.



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## Product pump troubleshooting

If spraying performance is unsatisfactory, check the following troubleshooting guide for possible problems and solutions.

Symptom	Possible cause	Corrective action
Low discharge.	Pump not primed.	Remove top most vent plug from face of pump and run pump to expel trapped air.
	Air leaks in suction line.	Check and reseal inlet fittings.
	Blocked or clogged line strainer.	Inspect strainer and clear any debris from screen.
	Impeller plugged.	Inspect and clear obstruction.
	Clogged or collapsed hose(s).	Replace hose(s).
	Eye of impeller rubbing on volute.	Remove volute (front cover) and inspect the impeller. If wear detected, sand the impeller eye outside diameter with emery cloth.



## 9 - SPECIFICATIONS

### General specification - 7310

Model 7310	
Engine	FPT NEF 6.7L Tier 4B <b>212 kW ( 310 Hp)</b>
Fuel capacity and type	<b>553 L (146 US gal)</b> Ultra low sulfur diesel
Diesel Exhaust Fluid (DEF) Capacity	<b>91 L (24 US gal)</b>
Cooling package	Stacked top down single pass design, hydraulically driven fan
Coolant capacity (total system)	<b>51.1 L (13.5 US gal)</b>
Engine/transmission	Located in rear - ISO mounted
Transmission	Torq-Trac® hydrostatic drive system with one <b>Danfoss®</b> heavy duty pump
Hydro pump displacement	165cc
Final drives	Planetary drives
Parking brake	4 wheel
Service brake	4 wheel internal wet disc
Steering	
Standard front wheel	Hydrostatic with two steering cylinders, no tie rods, <b>5.5 m (18.0 ft)</b> turn radius
Optional 4 wheel steer	<b>4.1 m (13.5 ft)</b> turn radius in 4 wheel steer mode, <b>5.5 m (18.0 ft)</b> turn radius in 2 wheel steer mode
HYDRALINK™ Suspension	Full suspension travel of <b>51 cm (20 in)</b> . 4-wheel independent with integrated hydraulic leveling/shock absorbers, auto leveling for each wheel leg.
Crop clearance	<b>183 – 198 cm (72 – 78 in)</b>
Wheel width adjustment	<b>300 – 406 cm (118 – 160 in)</b> , hydraulic adjust, wheels move in/out equally on both sides. Operator remains centered.
Air system	Direct engine driven, water cooled air compressor and air storage tank.
Auxiliary hydraulic circuit	<b>193 L/min (51 US gpm)</b> closed center
Product tank options	
Stainless steel	<b>3785 L (1000 US gal)</b>
Stainless steel	<b>4542 L (1200 US gal)</b>
Chemical injection tank	<b>189 L (50 US gal)</b> . Up to four tanks per machine is possible.
Product pump standard	<b>Hypro® 9306C - 795 l/min @ 5.5 bar ( 210 US gpm @ 80 psi)</b>
Product pump optional	<b>Hypro® 9307C high capacity - 795 l/min @ 5.5 bar ( 210 US gpm @ 80 psi)</b>
Rinse tank standard	<b>568 l (150 US gal)</b> , Poly
Boom options	Mono Boom: <b>80 ft/ 60 ft, 90 ft/ 60 ft, 100 ft/ 60 ft, 120 ft/ 70 ft, 27 m/ 18 m, 30 m/ 18 m, 32 m/ 18 m, 36 m/ 22 m</b> Truss Boom (non-air): <b>120 ft, 132 ft. 135 ft</b>
Boom lines	Standard <b>2.54 cm (1 in)</b> stainless steel
Cab	Deluxe cab or Luxury cab
Height	<b>384 cm (151 in)</b> maximum
Width (transport)	<b>465 cm (183 in)</b> maximum
Working height suspension set at <b>191 cm (75 in)</b>	<b>427 cm (168 in)</b>
Wheel base	<b>384 cm (151 in)</b>
Boom travel	Lowered <b>57.2 cm (22.5 in)</b> — Raised <b>312 cm (123 in)</b>
Weight (approximate)	<b>13154 kg (29000 lb)</b>



## 10 - ACCESSORIES

### Portable cooler

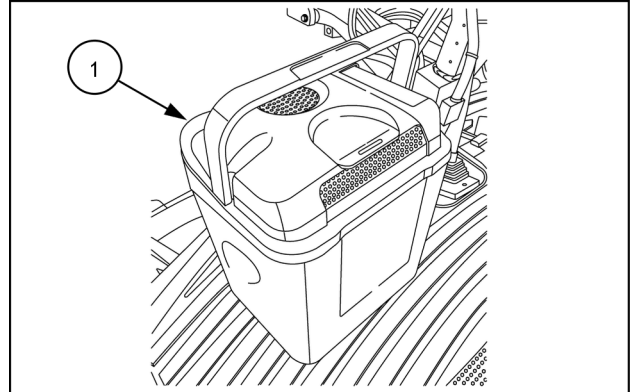
#### Portable cooler (luxury cab only)

A portable electric cooler (1) is available for use in your vehicle.

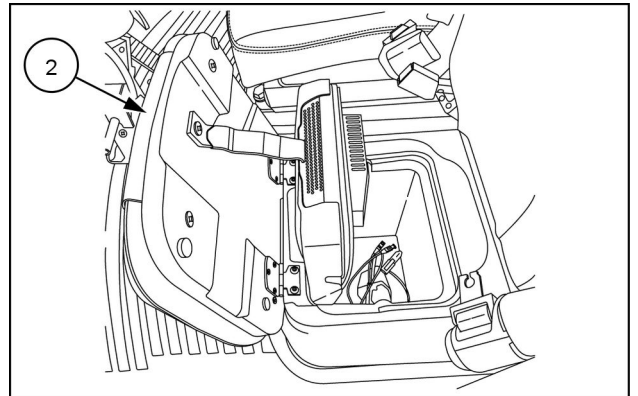
The cooler can be stored in the compartment under the instructional seat (2).

Lift the seat cushion to access the cooler compartment.

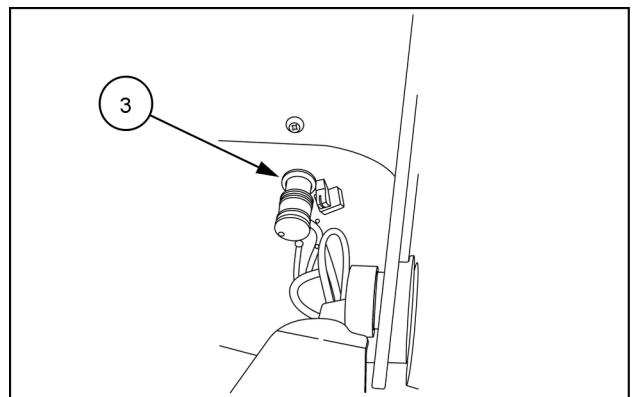
The cooler can be connected to the power port (3), located between the operators seat and the instructional seat, to keep the cooler contents cold.



RAIL17SP00372AA 1



RAIL17SP00371AA 2



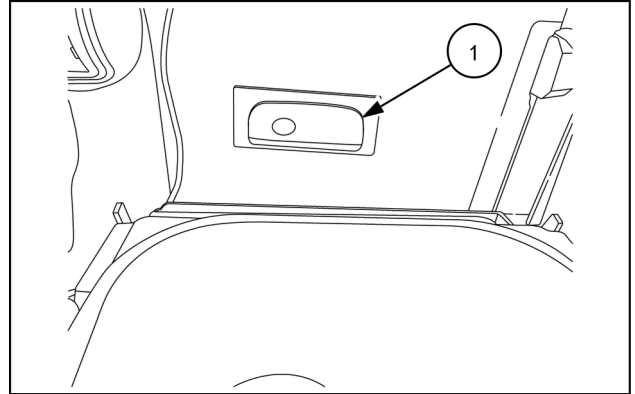
RAIL17SP00375AA 3

## Flashlight

### Rechargeable flashlight (luxury cab only)

A rechargeable flashlight is available for the vehicle. The flashlight is stored in the compartment **(1)** between the operator's seat and the instructional seat. Open the compartment door to access the flashlight.

When you store the flashlight, be sure the charging prongs are seated properly. The flashlight will always charge when the vehicle is in use or the battery disconnect switch is on.

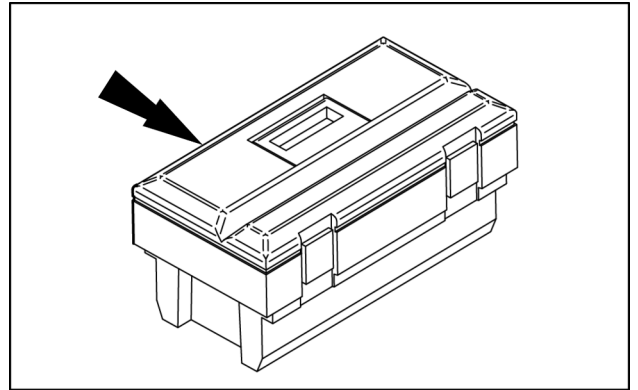


RAIL17SP00376AA 1

## Toolbox

The optional tool box is mounted to the outside of the walkway near the ladder.

The tool box can be removed and taken to the job site.

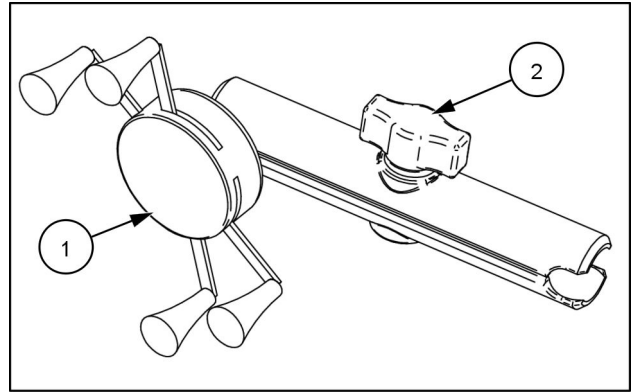


RAIL17SP00944AA 1

## Cellular phone holder (if equipped)

A cellular phone holder (1) is provided to hold your cellular phone at a convenient location for easy viewing. The four feet of the holder are spring loaded to hold any size cellular phone in place.

The cellular phone mount can be adjusted to any height or angle. Loosen the knob (2) on the mounting tube, adjust to the desired height, and retighten the knob.

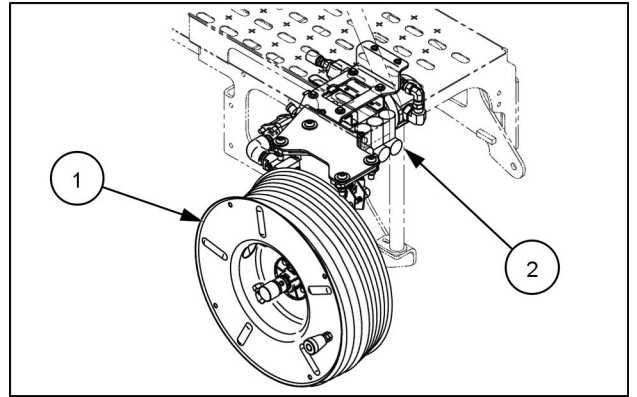


RAIL17SP01075AA 1



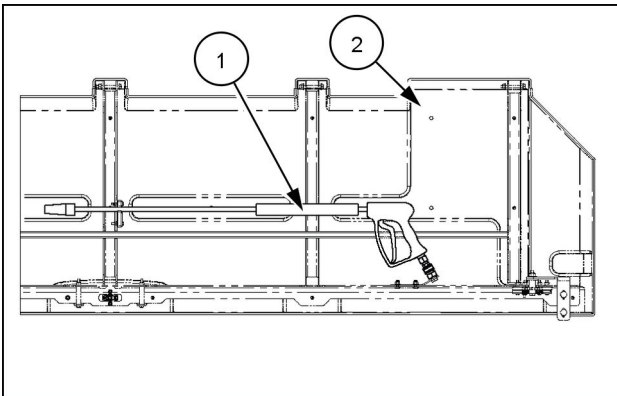
## Pressure washer (if equipped)

A pressure washer is available for the machine as an option. The pressure washer hose reel (1) and pump (2) are mounted to the machine walkway, near the boarding ladder.



RAIL17SP01478AA 1

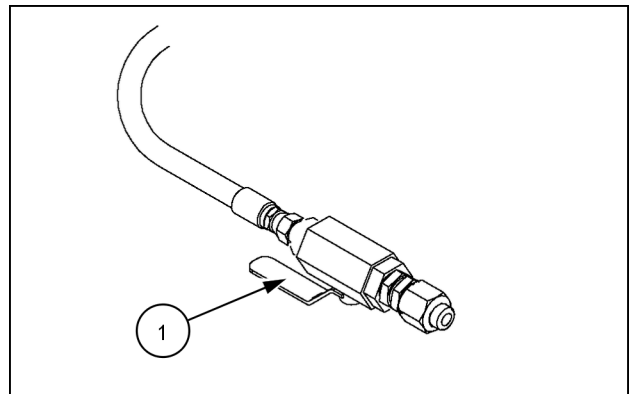
The spray gun (1) for the pressure washer is attached to the engine compartment lower door.



RAIL17SP01479AA 2

Remove the spray gun from the engine compartment door and attach the spray gun to the quick attach coupler of the hose.

Activate the pressure washer by turning the ball valve handle (1) to the open position. The ball valve is mounted to the pressure washer pump unit. The ball valve can be accessed from the underside of the walkway.

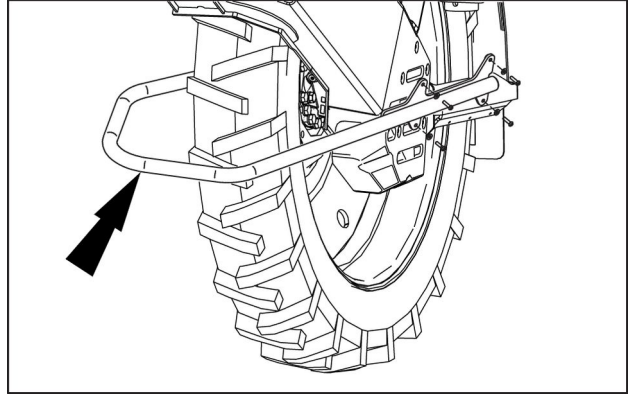


RAIL17SP01498AA 3

Depress the handle of the spray gun to begin pressure washing.

## Crop guide bars (if equipped)

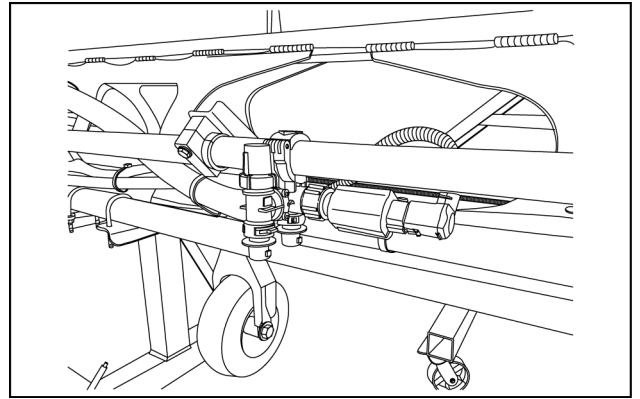
The crop guide bars are installed around the front of the tires from the inside. The crop guide bars deflect crop away from the vehicle tires as well as the vehicle wheel legs.



RAIL17SP00744AA 1

## Boom caster wheel (if equipped)

The boom caster wheel mounted to the outer edge of the mono boom break away, prevents the outer edge of the boom break away from hitting the terrain. The caster wheel will guide the break away tip, over the contour of the terrain.



RAIL17SP00635AA 1



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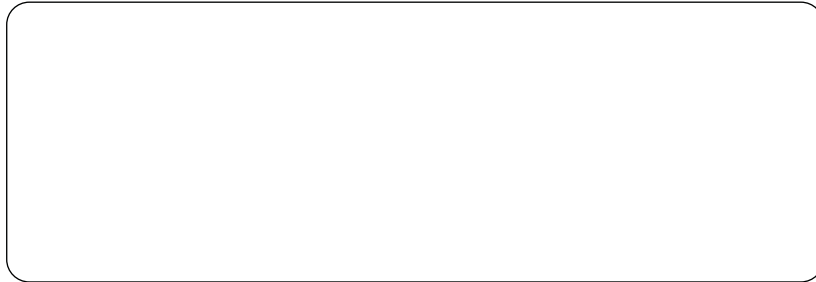
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Dealer's stamp



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