AccuMix™

AM1000S

Operator Manual

www.highlinemfg.com

Highline MANUFACTURING
A DIVISION OF BOURGAULT INDUSTRIES LTD.

E16204_D

AccuMix™ 1000S

Self Propelled Vertical Feed Mixer

Operator Manual

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Highline Team Message

Congratulations on your purchase of the AccuMix 1000S *manufactured by Highline Manufacturing. We are excited about you feeding with the technically advanced feed mixer that is self- propelled self loading. You will find flexibility and maneuverability of operation with this product.*

This Operator Manual has been prepared to provide information necessary for the safe and efficient operation of your AccuMix 1000S. In the manual you will find safety procedures, maintenance routines and detailed operational instructions.

If you find that you require information not covered in this manual, please feel free to consult your local dealer. Your dealer is always able to contact Highline for this technical information.

Highline Manufacturing thanks and congratulates you for selecting the AccuMix 1000S as your machine of choice.

Highline Manufacturing

Main General Table of Contents

Note: Click on The Section Below for Detailed Contents in that Section

GENERAL DESCRIPTION OF THE ACCUMIX 1000S

The AccuMix 1000S is a self propelled and self loading total mixed ration machine. It is intended to load, cut and mix various types of feed products to prepare a mixed ration for feeding livestock.

The power for the machine is provided by a mounted diesel engine that drives hydraulic pumps. The hydraulics are used for the driving of the wheels, the operation of the milling head and loading conveyor, the mixing screws in the tub and the unloading conveyors.

The operator drives and controls the machine from the cab. There are 3 steering modes. Large tires and leveling suspension allow loading and travel over uneven terrain to the unloading site. There are 2 ranges of speed available through a switchable transfer case.

The self-loading arm is controlled by the operator in the cab. There is a milling head and auger that moves material onto a transfer conveyor to place the material into the mixing tub. The milling head provides some initial cutting of materials and therefore reduces the cutting time in the tub.

The loading arm can be moved up and down to load from silage pits while leaving a smooth and uniform face that is resistant to weathering and degradation.

The milling head can also cut and load other materials such as hay bales, grains or other materials sitting in a pile or on the ground. The loading arm also has a door for placing minerals or other additives into the mixing tub. The adding of these additives is done with the arm lowered and the operator standing on the ground.

The loading arm conveyor moves the cut material from the milling head and loads it into the mixing tub where there are 2 mixing screws that perform additional cutting of the material while mixing all the materials. The speed of the mixing screws is adjusted by the operator in the cab.

The screws are powered by a hydraulic motor connected with a driveline. A planetary gearbox located under each screw center post provides rotation to the screw The planetary gearbox is equipped with a remote oil reservoir.

The mixing tub is mounted on weigh scales that give readout of the weight of material in the tub to a display to the operator in the cab. The weigh scales can also be used to know the weight of material being loaded. When the desired weight has been loaded the milling head and conveyor can be reversed to unload any additional feed materials that are on the loading conveyor.

It is recommended that the proportions of the feed materials in the ration be determined in consultation with an animal feed nutritionist. The operator regulates the amount of material that is added according to the ration mix prescribed by the nutrionist.

While traveling to the feeding site the mixing screws in the tub agitate the product to form a uniform mix while also doing additional cutting.

Only one operator is needed to do all the loading and mixing functions. Because the machine is self propelled the same operator drives the machine to the unloading site where it is discharged to the front of the cab in plain view of the operator. The front discharge conveyor can be moved to unload to the left or right or with the optional bunk unloader. Material can also be

discharged to the left at the rear of the tub. All the loading, transporting of feed materials and feeding discharge is controlled by one operator in the cab of the machine.

The main source of noise when using the machine is the diesel engine and the loading arm when loading materials. The diesel engine noise is not under the control of Highline. Hydraulic motors and gearboxes are used on the machine which generate minimal noise.

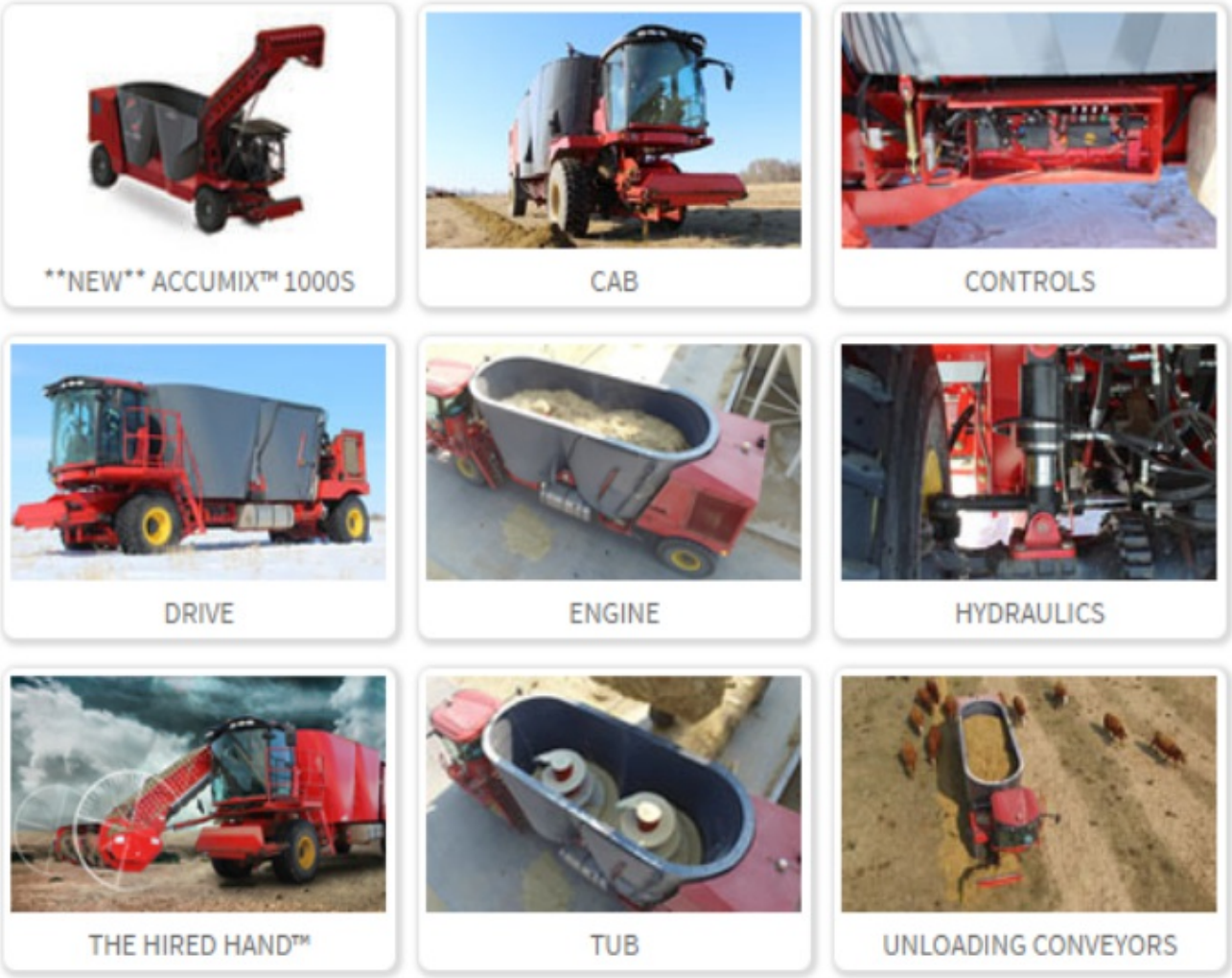
INTENDED USE OF THE ACCUMIX 1000S

The AccuMix 1000S is designed to load, process, mix various animal feeds and to unload animal feed suitable for feeding livestock in a ration that is designed by an animal nutritionist.
The AccuMix 1000S is intended for use in farming applications.
The AccuMix 1000S is intended for off road use though can be used on road when moving between mixing sites.

Any uses of the AccuMix 1000S other than the above stated Intended Uses shall be considered misuse of the AccuMix 1000S. This misuse shall include (but not limited to):

- Using the AccuMix 1000S in non-farming applications
- Processing materials other than animal feed materials

Always use the AccuMix 1000S according to the instructions contained in this Operator Manual and the safety and instruction decals on the machine.
Perform regular maintenance and repair to ensure that the AccuMix 1000S operates safely and efficiently.



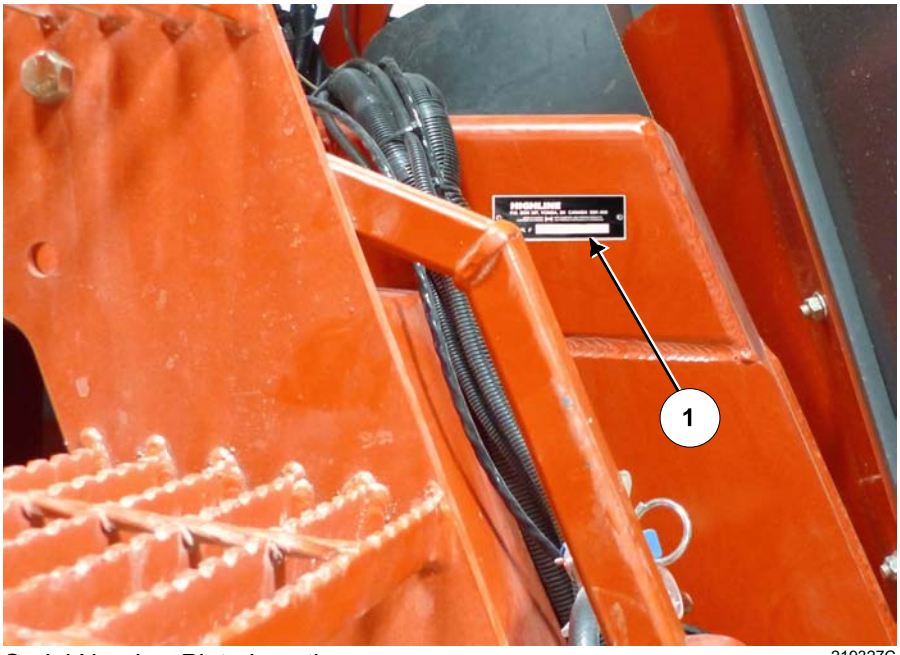
Views of the Accumix 1000S

220123

Table of Contents for Section 1 - Accumix 1000S Safety

SERIAL NUMBER

Your serial number is found on the serial number plate (1) attached to the AccuMix1000S on the frame near the front tub and the ladder going to the cab.



Serial Number Plate Location 219327C

It is important to record the serial number for proof of ownership and for any service or maintenance assistance.

Serial Number _____

Owner _____

Model _____

Date of Purchase _____

SAFETY SIGN-OFF FORM

Highline Manufacturing follows the general Safety Standards specified by the American Society of Agricultural and Biological Engineers (ASABE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the AccuMix 1000S should read and clearly understand all Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow someone to operate this equipment until this information has been reviewed. This information should be reviewed by all operators.

This sign-off sheet is provided for record keeping to indicate that the person working with the equipment has read and understood the information in the Operator Manual and has been instructed in the safe operation of the equipment.

Date	Employee's Signature	Employer's Signature

SAFETY ALERT SYMBOL

The Safety Alert Symbol means:

ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

The Safety Alert Symbol combined with a Signal Word alert to the presence of a hazard and the degree of possible injury.

Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR SERIOUS INJURY. The color is Red with White lettering.

Indicates a potentially hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY, and includes hazards that are exposed when guards are removed or unsafe practices. The color is Orange with Black lettering.

Indicates a potentially hazardous situation that, if not avoided, MAY result in MINOR INJURY. The color is Yellow with Black lettering.

GENERAL SAFETY

1. Ensure that anyone who is going to operate, maintain or work near the AccuMix 1000S is familiar with the recommended operating, maintenance procedures and safety information contained in this manual and follows all the safety precautions.

2. In addition to the design and configuration of the equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of the machine.

3. The AccuMix 1000S shall not be operated without all the guards in place.

Emergency Cab Exit

- There is a small hammer device in the cab to break the glass if the cab door is not able to be opened.

Emergency Cab Exit Hammer 219322

Fire Extinguisher

There is a fire extinguisher located near the cab exit ladder.

The fire extinguisher a dry chemical type extinguisher and is effective on:

- CLASS A fires that result from ordinary combustible materials, including wood, cloth, paper, and many plastics.

- CLASS B fires that involve burning in flammable liquids, combustible liquids, petroleum greases, oils, alcohols, and flammable gases.

- CLASS C fires involving energized electrical equipment.

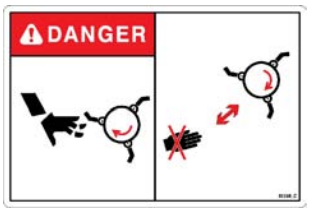
Fire Extinguisher 219323

Check the following on the fire extinguisher:

- Confirm the extinguisher is visible, unobstructed and in its designated location.
- Verify the locking pin is intact and the tamper seal is unbroken.
- Examine the extinguisher for obvious physical damage, corrosion, leakage, or clogged nozzle.
- Confirm the pressure gauge indicator is in the operable range and lift the extinguisher to ensure it is full.
- Make sure the operating instructions on the nameplate are legible and facing outward.
- Check the last professional service date on the tag.
    - A licensed fire extinguisher maintenance contractor should inspect the extinguisher every 12 months.

SAFETY DECALS

1. Keep decals and signs clean and legible at all times.
2. Replace decals and signs that are damaged, missing or have become illegible.
3. Replaced parts that displayed a decal should also display the current decal.
4. Decals are available from the Highline Parts Department.
5. Be familiar with the decals, the type of warning and the area or function(s) related to the area(s) that requires your awareness.



KEEP PEOPLE AND ANIMALS BACK WHEN LOADING WITH THE MILLING HEAD

Contact with moving milling teeth and auger will cause serious injury or death.

Keep hands out of the cutting area of the loading arm when the drum is rotating.

Always set the park brake, lower the loading arm to the ground, shut off the engine, remove the key, and wait for all parts to stop turning before servicing.

Keep guards in place and in good condition.

Do not operate within 100 ft (30m) of any person.

STAND CLEAR OF LOADING ARM WHEN IT IS LOWERING

Contact with the loading arm while lowering will result in death or serious injury.

Never stand under the loading arm when lowering or raising.
Do not allow people near the loading arm when being moved.

The arm can lower unexpectedly and crush people underneath.

STAY CLEAR OF FRAME AND TIRES

Suspension can move automatically during operation creating pinch points Which will result in death or serious injury.

Before service or inspection ensure suspension is completely lowered, battery is disconnected and locked out.

DO NOT ENTER THE TUB WHILE THE MIXERS ARE TURNING

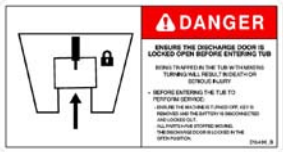
Entering the tub when the mixers are turning will result in death or serious injury.
Do not lean over the mixing tub while the screws are turning to avoid the danger of falling into the tub.

DO NOT CONTACT THE ROTATING SCREWS

Never attempt to manually remove debris while the screws are rotating.

DO NOT ENTER THE TUB WITH MATERIAL IN THE TUB

The material is unstable and may cause entrapment.
There is no means of exiting the tub when the tub is full.



ENSURE THE DISCHARGE DOOR IS LOCKED OPEN BEFORE ENTERING THE TUB

Being trapped in the tub with mixers turning will result in death or serious injury.

Before entering an empty tub to perform service:
- Ensure the machine is turned off, the key is removed and the battery is disconnected and locked out.
- All parts have stopped moving.
- The discharge door is locked in the open position.

STAND CLEAR OF THE DISCHARGE DOOR DURING OPERATION

A lowering discharge door will result in death or serious injury.

Ensure the door is locked open before entering the tub.

Before entering an empty tub to perform service:
- Ensure the machine is turned off, the key is removed and the battery is disconnected and locked out.
- All parts have stopped moving.
- The discharge door is locked in the open position.

STAND CLEAR OF THE UNLOADING CONVEYOR

Keep body and clothing away from moving parts to prevent serious injury or death.

Shut off the machine and remove the key before performing any maintenance on the conveyor.

STAY CLEAR OF THE UNLOADING CONVEYOR

Contact with the conveyor could result in death or serious injury.

Do not stand near the conveyor when the engine is running. The unloading conveyor could swing to the side suddenly and cause serious injury.

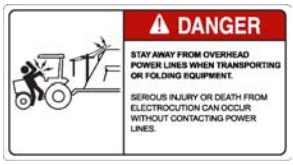
STAND CLEAR OF THE TIRES

Tires can steer towards the frame causing death or serious injury.

Tires can begin moving and run over a person resulting in death or serious injury.

Before servicing area near the tires:

- Ensure the machine is turned off, the key is removed and the battery disconnect switch is turned off and locked out.
- Ensure machine is on level ground
- Ensure all tires are chocked.
- Have a qualified tire technician service the tires and wheels



STAY AWAY FROM OVERHEAD POWER LINES

Serious injury or death from electrocution can occur without contacting power lines.

Stay away from overhead power lines when transporting and operating equipment.

DO NOT ALLOW RIDERS ON THE OUTSIDE OF THE MACHINE

Falling from the moving machine can cause serious injury or death.

Falling from the operating machine can cause being entangled under the machine or being injured by the machine.

KEEP STEPS AND WALKWAYS CLEAN

Dirty or slippery steps, walkways and platforms can cause falls. Make sure these surfaces remain clean and free of debris. Injury may result from slippery surfaces.

Face the machine when mounting and dismounting.

USE PAPER OR CARDBOARD TO CHECK FOR HYDRAULIC OR DIESEL FUEL LEAKS

The hydraulic system operates under extremely high pressure. Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin, causing serious injury or infection.

Wear proper hand and eye protection when searching for leaks. 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 connecting or disconnecting, repairing or adjusting fluid lines.

Make sure all components are in good condition and tighten all connections before starting the engine or pressurizing 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.

Do not attempt any makeshift repairs to the hydraulic fittings or hoses. The hydraulic system operates under extremely high pressure. Such repairs will fail suddenly and create a hazardous and dangerous condition.

ACCUMULATORS CONTAIN HIGH PRESSURE OIL

Contact with high pressure oil may cause death or serious injury.

Shut off the machine, remove the key, disconnect the battery and safely drain accumulators before performing any maintenance on the hydraulic system.

Note: Some hydraulic circuits are pressurized a significant amount and need to be relieved with special methods before servicing.

DO NOT OPERATE WITH SHIELDS MISSING

Make sure all guards and shields are in good condition and properly installed before operating the machine.

Contact with the moving belt or sheaves may cause serious injury or death.
Keep shields fastened in place.
Keep away from moving parts.

DO NOT OPEN THE ENGINE RADIATOR CAP WHILE THE ENGINE IS HOT. THE RADIATOR CONTAINS HOT FLUID UNDER PRESSURE.

Contact with hot fluid could result in serious injury.

Shut off the engine.

Wait until radiator is cool. Hot coolant can spray out if a cap is removed while the system is hot.

Loosen cap slowly to relieve pressure.

TURN OFF BATTERY DISCONNECT SWITCH BEFORE DOING ANY MAINTENANCE

Machine starting or parts moving could result in death or serious injury.

Turn off the battery switch
- Before welding.
- Before storing the machine for long periods of time.
- Before servicing or maintaining the machine or engine.

Lock the switch to the Off position when servicing the engine or machine. The lock will prevent another person from starting the machine while performing service.

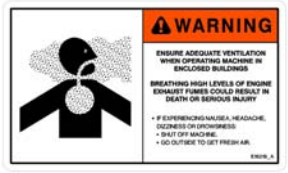
KEEP ENGINE CABINET DOORS CLOSED

Keep the engine cabinet doors closed during operation as moving parts could cause injury.

Contact with the moving parts could result in death or serious injury.
Keep away from moving parts.

Shut off the machine, remove the key, disconnect the battery before performing any maintenance on the engine.

All components in the engine area may be hot.
Allow cool down time before touching or servicing.



ENSURE ADEQUATE VENTILATION WHEN OPERATING THE MACHINE IN ENCLOSED BUILDINGS

Breathing high levels of engine exhaust fumes could result in death or serious injury.

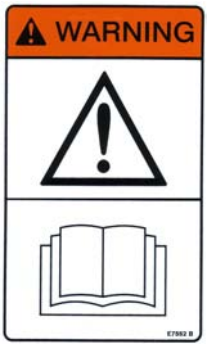
If experiencing nausea, headache, dizziness or drowsiness:
- Shut off machine.
- Go outside to get fresh air.

STAY CLEAR OF HOT ENGINE EXHAUST GAS AND HOT EXHAUST SYSTEM

Contact with the hot exhaust could result in death or serious injury.

Exhaust temperature can reach 650° C and cause severe burns.
Keep area around the exhaust system free of debris to prevent fires.
Allow the system to cool before touching or servicing.

READ, UNDERSTAND AND FOLLOW SAFETY INSTRUCTIONS



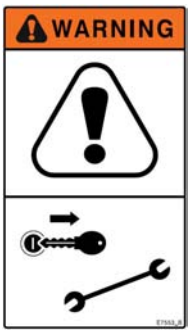
Read, understand and follow all instructions and safety messages included in this manual and on decals attached to the machine. These instructions and safety messages contain important information.

Allow only responsible, properly instructed individuals to operate and service the machine.

Failure to follow the instructions and safety messages in this manual and on the decals attached to the machine could result in serious injury or death.

Keep all safety and instruction decals in good condition. Replace any missing or damaged decals.

SHUT DOWN THE ENGINE BEFORE DISMOUNTING MACHINE



Shut down the engine and remove the key before repairing, servicing, lubricating or cleaning 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.

DO NOT CONTACT A MOVING CHAIN

Contacting a moving chain or parts could cause serious injury or death.
Loose clothing and other loose or hanging items can become entangled in moving parts

Never attempt to manually remove material while hydraulic motors are moving the chain.

Always shut off the engine, remove key, set park brake and wait for all parts to stop moving before servicing.

AVOID CONTACT WITH HOT SURFACES

Contact may result in minor injury.

Heat from the hydraulic oil causes surfaces to be hot.
Do not touch pump, motors, oil tank, oil cooler or hydraulic hoses while using the machine.

Engine, transmission, exhaust components, and hydraulic lines may become hot during operation.

Allow surfaces to cool before handling, disconnecting or servicing these items.

DO NOT WELD ON THE MACHINE

Sensitive electronic devices and hydraulic hoses may be damaged by welding and could cause serious injury when operating the machine.

Disconnect the battery cables before welding on the machine or other repairs.

Disconnect all computers and electrical monitors from the unit to prevent damage.

Before performing any service on the engine, consult the engine manufacturer's manual and understand and follow all safety practices given.

Always wear eye protection when working with batteries.
Do not create sparks or have open flame near battery.
Ventilate when charging or using in an enclosed area.

Battery acid causes burns. Batteries contain sulfuric acid.
Avoid contact with skin, eyes, or clothing.

Battery post, terminals, and related accessories contain lead and lead compounds. Wash hands after handling.

Electrolyte is an acid. Electrolyte can cause personal injury. Do not allow electrolyte to contact the skin or the eyes. Always wear protective glasses for servicing batteries. Wash hands after touching the batteries and connectors. Use of gloves is recommended.

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. Always have a qualified tire mechanic service the tires and rims on this machine.

Failure to comply could result in death or serious injury.

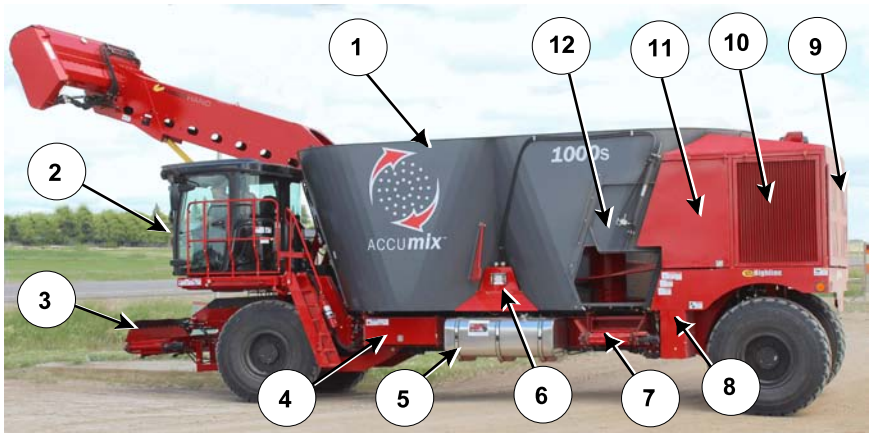
ENSURE SLOW MOVING VEHICLE SIGN IS IN PLACE

Ensure the Slow Moving Vehicle sign is in place, clean and easily visible.

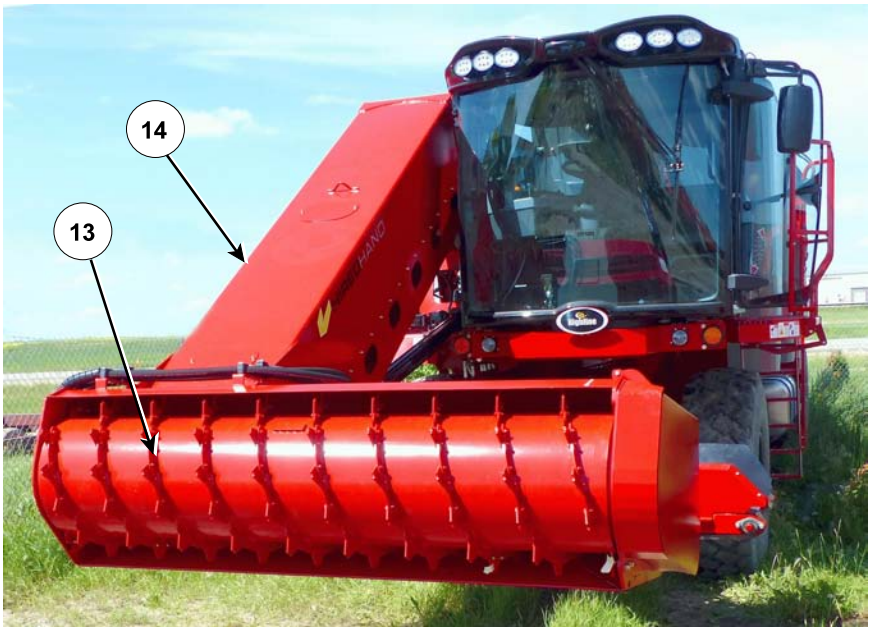
Ensure the reflectors are in place, clean and easily visible.

Table of Contents for Section 2 - Orientation to the Accumix 1000S

Orientation to the AccuMix



1. 1000 Cubic Foot Mixing Tub with Dual Mixing Screws
2. Cab
3. Front Unloading Conveyors
4. Fuse Box
5. Fuel Tank
6. Mixing Screw Oil Level
7. Rear Unload Conveyor
8. Batteries Storage
9. Engine and Pumps Access Door
10. Engine Cooling Radiators
11. Air Compressor and DEF Tank Access
12. Rear Discharge Door



13. Milling Head
14. Loading Arm and Conveyor

15. Knives on Screws (Optional)

Knives On Screws 219259

16. Adjustable Aggression Bars on Tub

Aggression Bar 219256

17. Front Discharge Door

Front Discharge Door 219265

18. Front Unloading Discharge Conveyors

    - Under cab
    - Left or right

Front Unload Conveyors 220212

19. Optional High Bunk Front Discharge

Optional High Bunk Front Discharge 222040

20. Rear Discharge Door

    Rear Left Unload Conveyor

Rear Discharge Door and Unload Conveyor 220129

21. Engine and Hydraulic Pumps

Engine and Hydraulic Pumps 219320

22. Hydraulic Oil Tank and Cooler

Hydraulic Tank and Cooler 219321

23. Diesel Exhaust Fluid (DEF) Tank Location

    Battery Shutoff/Lockout and boosting location.

DEF Tank, Battery Shutoff 219390

24. Tub View Camera

Tub View Camera 219335

25. Rear Backup Camera

Backup Camera 219336

Controls in the Cab

1. Steering Column, Turn Signals, Column Adjust

Steering Column, Adjust, Turn Signal 219330

2. Mirror Angle and Heat Control (Upper Left)

Mirror Angle and Heat Control 219329

3. Lights Controls (Upper Front Left)

Lights Control 219331

4. Cab Temperature Controls (Upper Front Center)

Cab Temperature Control 219332

5. Windshield Wiper Controls (Upper Front Right)

Windshield Wiper Control 219333

6. Sound System (Radio/MP3/Phone Pairing)

Sound System 219334

7. Foot Control Pedals

    - Automotive Mode Accelerator
    - Brake

Foot Control Pedals 219269

8. Control Console

    - Forward/Neutral/Reverse Control
    - Joystick buttons
    - Display
    - Parking Brake Switch
    - Engine Throttle Control

Control Console 219260

9. Weigh Scale Monitor

    - See the weigh scale supplier's operating instructions.

10. Backup Camera Display

Weigh Scale Monitor and Backup Camera Display 220041

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Table of Contents for Section 3 - AccuMix 1000S Display, Joystick & Cameras

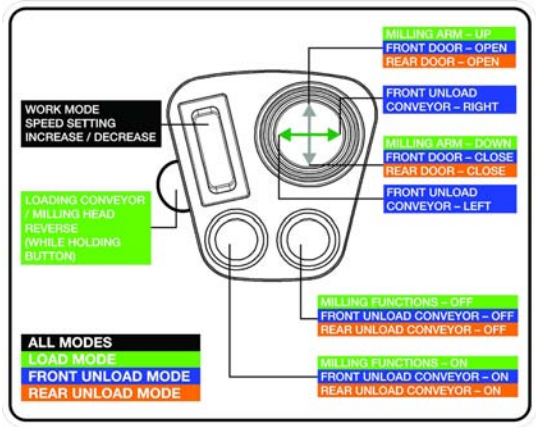
AccuMix Display

The AccuMix display is used in the cab for making operation choices and viewing the status/operation of the machine.

The display can be used as a touch screen to make selections but also has buttons on the side that can be used for making screen choices.
There is a selector wheel that can be turned for selecting values and pushed to enter the value.

The Home page button is located above the selector wheel.
To move back one screen press button below the selector wheel.

AccuMix Display 218205



Joystick Button Functions

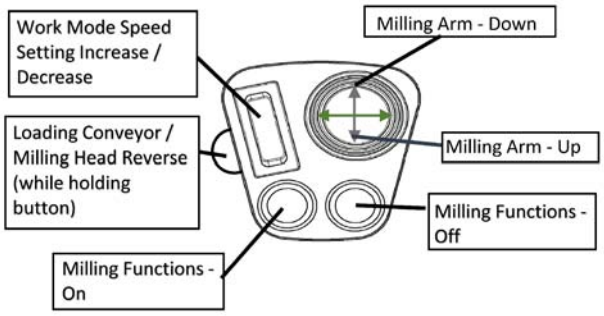
Joystick

Joystick Buttons
The AccuMix uses a joystick which the operator uses in the cab.

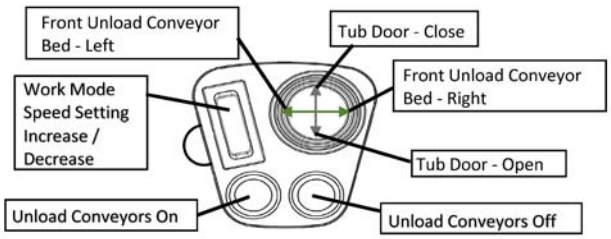
Some of the joystick buttons change functions depending if the loading or unloading mode is chosen on the display.

See the diagrams for descriptions of what the joystick buttons do in the Load and Unload modes.

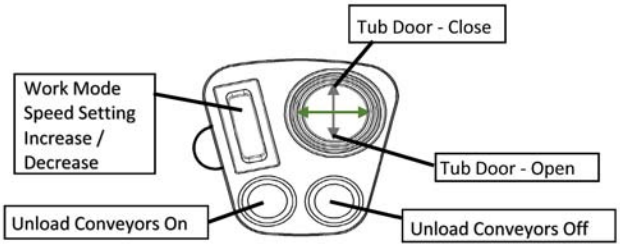
Note: The Loading Conveyor/Milling Head reverse (while holding the button) can be activated even if the Milling Functions are turned off.



Joystick Button Load Mode Functions 219230



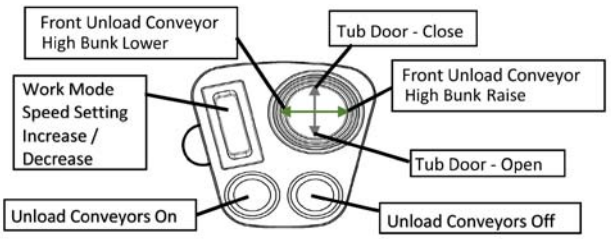
Joystick Buttons Front Unload Mode Functions 219211



Joystick Buttons Rear Unload Mode Functions 219291

- If the Front Unload High Bunk Option is installed the front conveyor does not move to the left or right.

    - The joystick buttons that were the front conveyor left/right are now used to raise and lower the conveyor for the bunk height.



Joystick Buttons Front Unload High Bunk Option 220127

Operation information is given in Section 6 "Operating the AccuMix" for all the Load and Unload conditions.

<u>Machine Movement with the Joystick</u>

- Work Mode Joystick Movement

When the machine is set to Work Mode the joystick controls the direction and speed of machine movement.

Work Console, Joystick and Display 220055

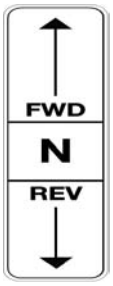
- The engine speed is controlled by the engine throttle control dial.

- Moving the joystick forward will move the machine forward. The more the joystick is moved forward the faster the machine will go depending on the Drive Control range selected.

- Moving the joystick backwards will move the machine backward. The more the joystick is moved backward the faster the machine will go depending on the Drive Control range selected.

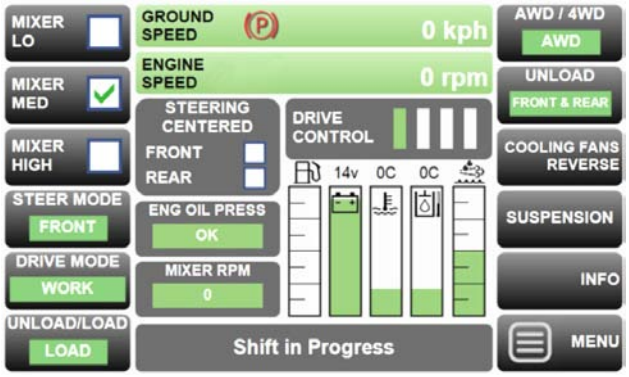
- The a notch in the middle of the joystick travel slot is the neutral position with no movement of the machine.

Engine Speed Control



Joystick Travel

- The Drive Control settings determine the amount of effect the joystick movement has.
  - The Drive Control range is chosen with the rocker switch on the joystick.
  - The indicator bars under Drive Control on the display show which of the 4 ranges has been chosen.
    - See the Menu Section, Operating Settings for information on setting the Work Mode Drive Control.

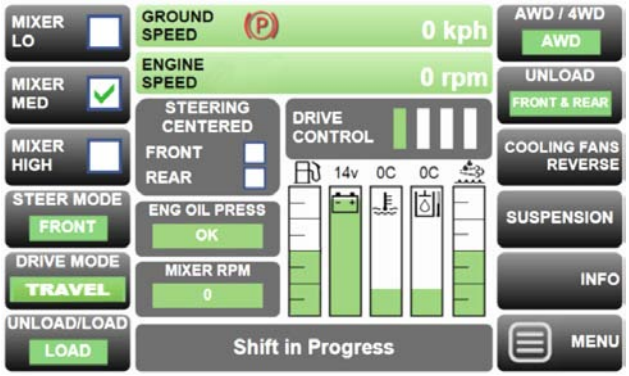


Work Drive Mode
220081

- Travel Mode Joystick Movement

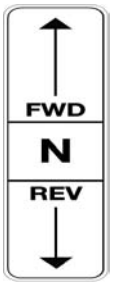
When the machine is set to Travel Mode the joystick controls the direction and speed of movement of the machine.

- The engine speed is controlled by the engine throttle control dial.
- Moving the joystick forward will move the machine forward. The more the joystick is moved forward the faster the machine will go.
- Moving the joystick backwards will move the machine backward. The more the joystick is moved backward the faster the machine will go.
- The notch in the middle of the joystick travel slot is the neutral position with no movement of the machine.



Travel Drive Mode
220082

Engine Speed Control



Joystick Travel

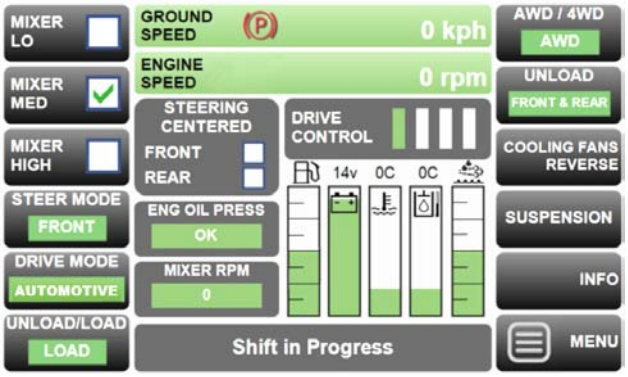
- Automotive Mode Joystick Movement

When the machine is set to Automotive Mode the joystick only controls the direction of movement.

- The speed of movement is controlled by the foot throttle pedal.

- The joystick needs to be moved at least 80% of the full movement range in the direction of travel.

- The notch in the middle of the joystick travel slot is the neutral position with no movement of the machine.



Automotive Drive Mode 220083

Joystick Travel

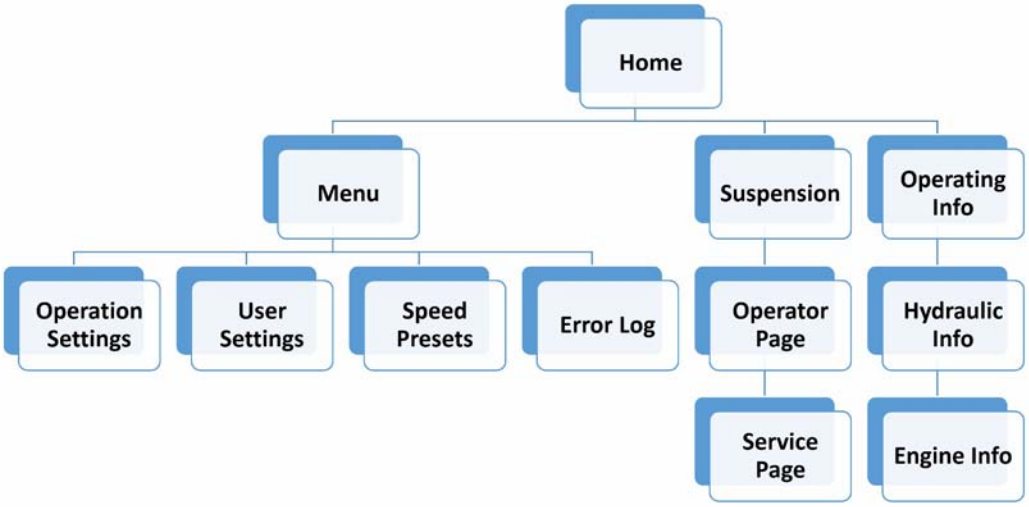
Software Menu Tree

The software in the Display is designed to show a number of screens. The screens offer operational choices with the option to advance to additional screens.

The software menu tree is a visual representation of the display screens.

This menu tree can be used as a reference to navigate to the various screens.

The information given below gives further information about each screen and the choices made on that screen.



Software Menu Tree

220067

Machine Settings from Last Use

The machine will remain in the same modes it was in before the key switch was turned off.

- If in Work Mode or Travel Mode the dash throttle will be active.
- If in Automotive Mode the foot pedal throttle will be active. The dash throttle must be ignored.
- The controller will send a message to the engine for the operating speed.
- The Steering Mode will be in the same mode it was before the key switch was turned off.
- The transfer case AWD/4WD mode will be the same it was before the key switch was turned off.

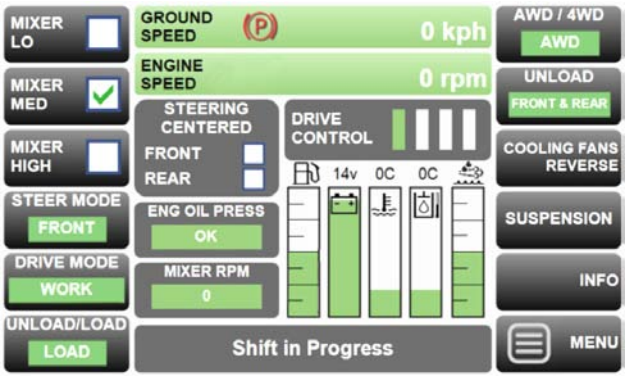
Home Screen

The Home Screen is available from any screen by pushing the Home button located above the selector wheel.

Left Column - Home Screen

- Mixer Speed Selection is made by touching the desired speed.
  - A checkmark will appear to confirm the speed has been chosen.

  The speed of Mixer Lo, Mixer Med and Mixer High is set in the Menu Screen.
  - See the Menu section, Operating Settings for information on setting the mixer speeds.



Home Screen

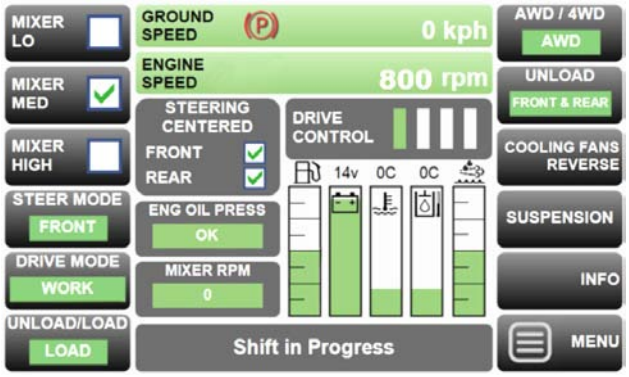
220084

- Steer Mode

Pressing the Steer Mode button brings a pop-up screen to choose a steering mode.

Note: To shift into a different steer mode the front and rear steering must be centered as shown on the Display

- Front steer uses only the front wheels for steering.
  - This steering is available in the Work, Travel and Automotive drive modes.
- All Wheel users the front and rear wheels to steer in a circle.
  - This steering is only available in Work drive mode.
- Crab steer moves the wheels to give some sideways steering.
  - This steering is only available in Work drive mode.



Steer Mode 220085

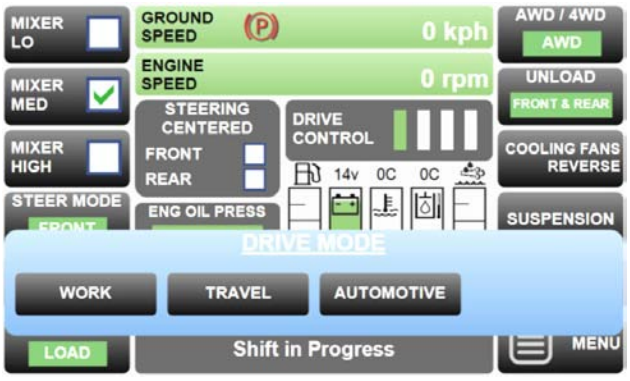
Steer Mode Selection PopUp 218208

- Drive Mode

Pressing Drive Mode button will bring a popup screen to choose one of the modes.

Note: To shift the Drive mode the machine must be stopped, joystick in neutral and the parking applied. Allow the machine to idle roward until the shirt is complete before accelerating normally.

- Work is for when loading the machine.
  - The transfer case is set to low gear. 4WD and AWD are available.
- Travel is used when moving the machine to the unloading site or loading site.
  - The transfer case is set to low gear. Only AWD is available.
- Automotive is for traveling on public roads and having the speed controlled by the foot pedal.
  - The transfer case is set to high gear. Only AWD is available.

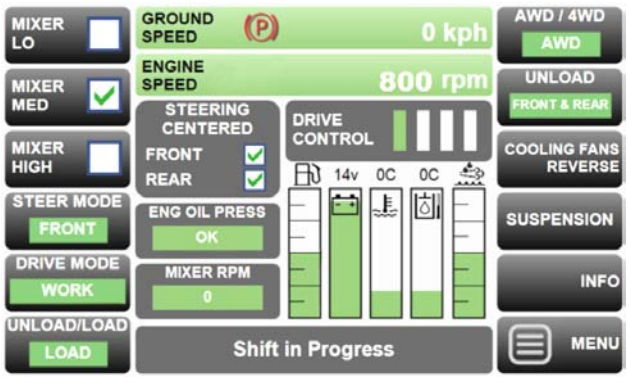


Drive Mode Popup 220086

- Unload/Load

Pressing this button will toggle the machine into Load or Unload mode.

- Load mode will allow the milling head and conveyer to be activated for loading materials into the tub.
  - The Load functions of the joystick will be enabled.
- Unload mode will allow operation of the front door and conveyors, rear door and conveyor or both front and rear doors and conveyors.
  - The Unload functions of the joystick will be enabled.



Home Screen 220085

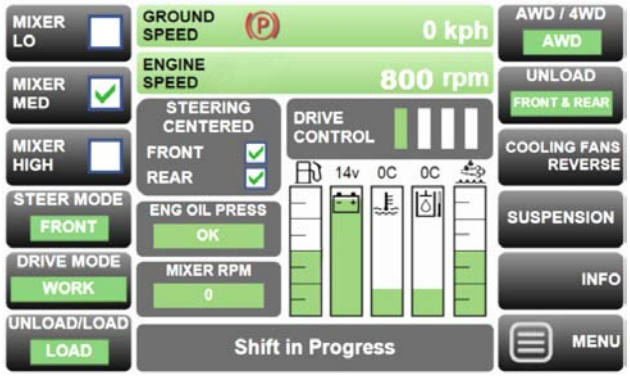
Center Column - Home Screen

The center column is used to give information on the operation of the machine.

- Ground Speed

This gives an indication of how fast the machine is traveling.

- When the Parking Brake is active the symbol will show in the Ground Speed bar.

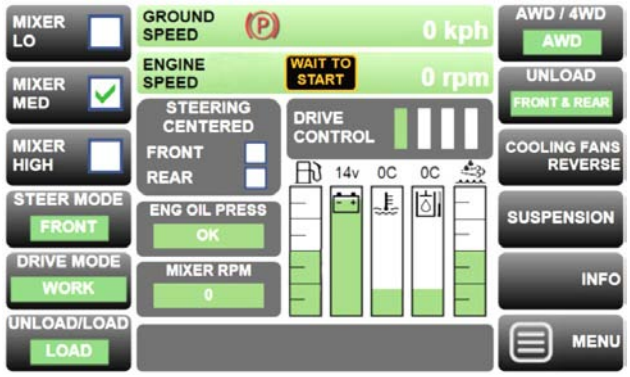


Ground Speed/Parking Brake & Engine Speed 220085

- Engine Speed

This gives an indication of what RPM the engine is operating at.

- "Wait To Start"
  - This message shows in the Engine Speed section when starting the engine.
  - The Wait To Start means that the engine cylinder pre-heaters are working and need time to heat the air in the cylinder.



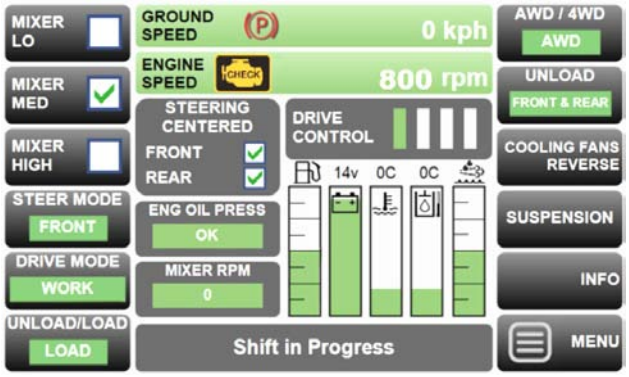
Wait to Start Engine 220093

- "Check Engine"
  - The Check Engine symbol appears in the Engine Speed bar.
  - The symbol indicates that there is something that needs to be addressed in the operation of the engine.

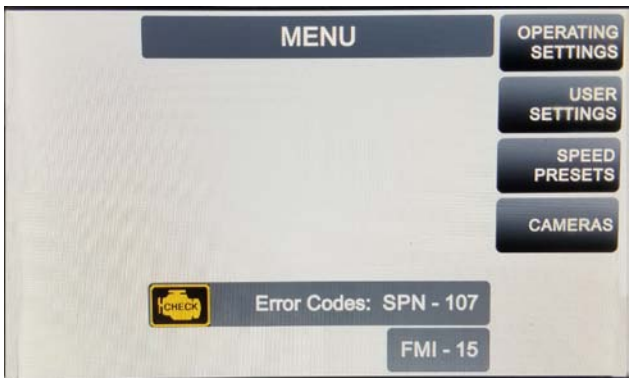
  - The first things to check are the engine oil level, coolant level, air filter condition and water in the fuel.

  - If further assistance is needed, the engine Error Code is displayed by pressing the Menu button.
    - The Error code SPN and FMI numbers can be used by the engine technician to determine what is happening in the engine.

  Note: The error code shown in the image indicates the engine air filter is restricted and needs attention.



Check Engine Light 220094



Engine Error Codes on Menu Screen (Example Only shown) 220095

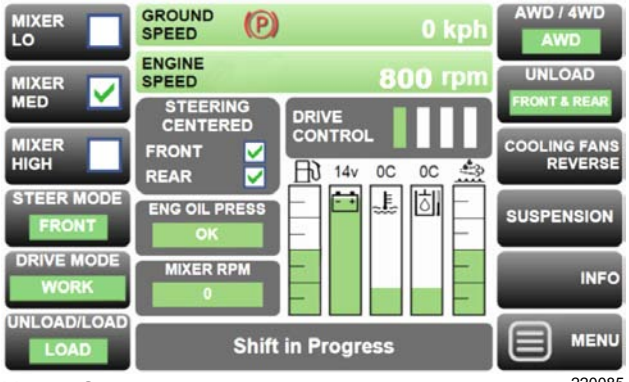
- There are 4 views available in the center column. Pressing the INFO button and using the rotating wheel will move between the following screens:

  - Overall Information
    - More Information given below.

  - Operating Information
    - Info screens are described below.

  - Hydraulic System Information
    - Info screens are described below.

  - Engine Information
    - Info screens are described below.



Home Screen 220085

Center Column- Overall Information

- Steering Centered

The check mark indicates when the front wheels and rear wheels are centered.

  - The wheels must be centered to switch to a different steer mode.

- Engine Oil Pressure

The display gives an indication if the oil pressure of the engine is OK or LOW.

  - If the oil pressure shows LOW, take action to prevent damage to the engine.

- Mixer RPM

The display shows the RPM the mixing screws are turning at.

  - The preset RPM selection of LO, MED and HIGH is made at the Menu Screen under Operating Settings.

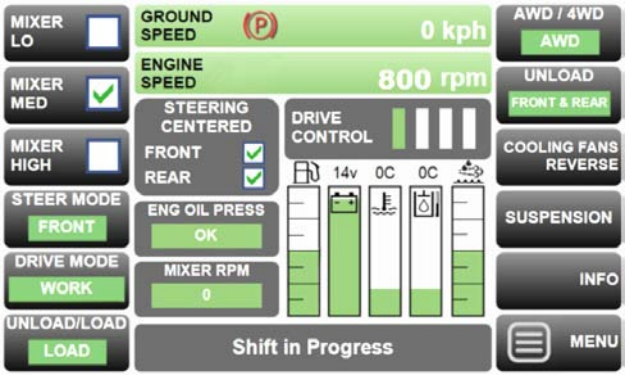
- Drive Control

When loading the machine, often only a small amount of machine movement is desired.

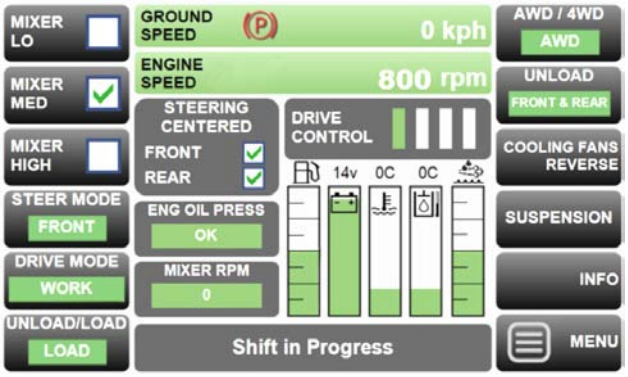
When in Work Drive Mode the amount of effect the joystick has in moving the machine forward or backward can be controlled by toggling the rocker switch on the joystick.

  - The switch will move to the Drive Control speed presets.
  - The indicator bars show which speed preset has been chosen.

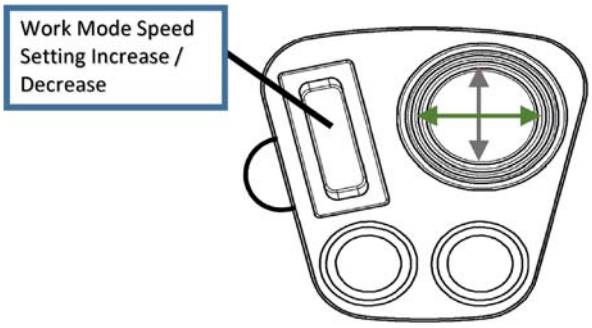
  - The speed presets are set under the Menu Screen Speed Presets.
    - See the Menu Section, Operating Settings for information on setting the Work Mode Travel Speeds.



Center Column - Overall Information 220085



Drive Control 220085



Work Drive Speed Control 219205

- Fuel Level 

The vertical bar gives a visual indication of the amount of diesel fuel in the tank.

- Battery Voltage 

The numeric readout shows the the voltage and the vertical bar gives a visual indication of the battery voltage.

Note: The 24 volt engine system is not displayed.

- Engine Temperature 

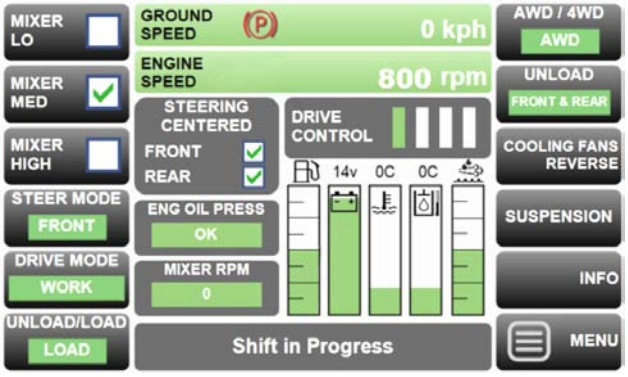
The numeric readout shows the temperature of the engine coolant. The vertical bar gives a visual indication of the coolant temperature.

- If the vertical bar reaches a high point take action to prevent damage to the engine.

- Hydraulic Oil Temperature 

The numeric readout shows the temperature of the hydraulic oil in the oil tank. The vertical bar gives a visual indication of the temperature of the hydraulic oil.

- If the vertical bar reaches a high point take action to prevent damage to the hydraulic pumps and motors.



Home Screen

220085

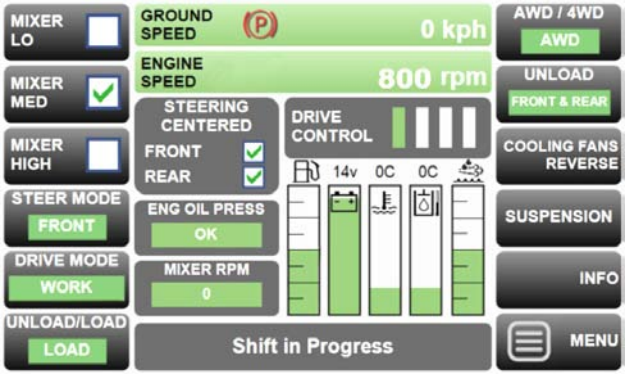
- DEF (Diesel Exhaust Fluid) Fluid Level 

The vertical bar gives a visual indication of the level of DEF in the tank.

- It is important to keep sufficient DEF in the tank. The engine requires DEF to operate correctly.

- If the DEF level goes below 20% level a warning will appear on the screen.

Note: The engine will derate if DEF runs out completely.



- Message Bar

This will show messages that require action or give additional information on the operation of the machine.

<u>Some Message Bar Messages</u>

- Shift in Progress
  - When shifting to a different transfer case speed there may be a small time lag. This message indicates the shift is happening.

- Arm Too High
  - When attempting to go forward/backward in automotive/travel mode and arm is too high.
    - Lower the arm.

- Arm Too Low
  - When attempting to move the unload conveyor to the right and arm is too low and would interfere with the arm.
    - Raise the arm to move the conveyor to the right.

- Conveyor Too Far Right
  - When attempting to lower the arm and the unload conveyor switch is on.
  - When the front unload conveyor is moved to the right and it would interfere with the lowering of the arm.
    - Move the front conveyor to the center.

- Must Be in Work Mode
  - When the AWD/4WD button is pressed while in travel or automotive mode.
  - AWD/4WD is only available in Work Mode.
    - Press the Work Mode button.

- Must Be in AWD
  - When the travel or automotive mode button is pressed while in Work Mode and it is in 4WD.
    - Press the AWD button.

- Must Be in Front Wheel Steer
  - When the travel or automotive mode button is pressed while in work mode and it is in circle or crab steer mode.

- Rear axle is not centered
  - When in Front Wheel steer mode and the rear axle is not centered.
    - Switch to All Wheel Steer and move the steering wheel until the there is a check mark beside Rear Steering Centered.
    - Switch back to Front wheel steer.

- Brake pedal must be depressed
  - When trying to turn off the parking brake the brake pedal must be depressed.

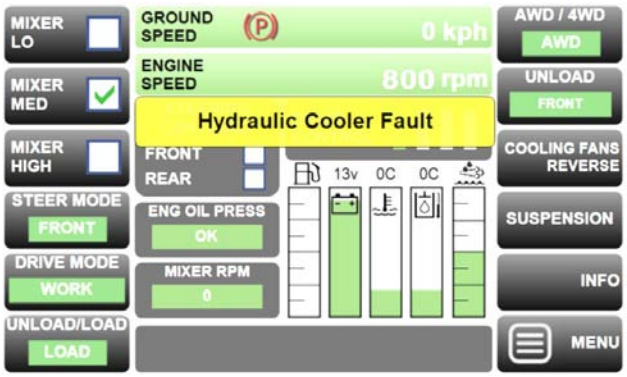
- Warning Message Popup

When there are conditions in the machine that should be given attention a Warning popup will appear on the Display screen in a yellow bar.

  - The Warning messages give an indication as to why the machine is not doing what it is expected to do.

  - Take action to correct the situation causing the Warning message.

  - Tap on the Warning popup to remove the message from the Display.

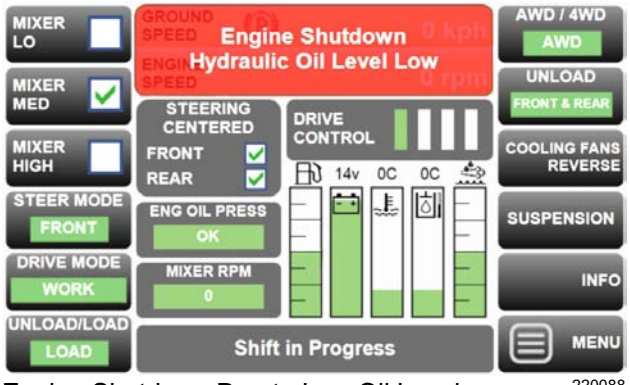


Example of a Warning Message Popup 220087

- Engine Shutdown
  - This RED warning indicates an immediate automatic engine shutdown to protect the hydraulic pumps from insufficient oil in the hydraulic tank.

    - This warning comes after the Hydraulic Tank Level Low warning message if the oil level in the hydraulic tank continues to go down.

  - If driving when the Engine Shutdown message comes on, immediately pull into a safe place as the machine will come to an abrupt stop.



Engine Shutdown Due to Low Oil Level 220088

Right Column - Home Screen

- AWD/4WD

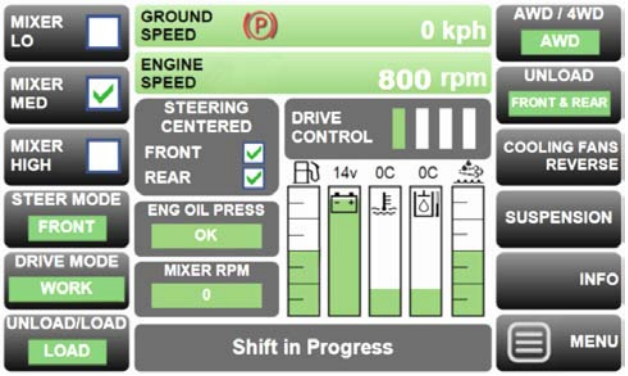
All-wheel drive (AWD) varies the amount of power to each wheel.

- All-wheel drive sends power to all the wheels in a 60/40 split of power.
  - 60% of the power goes to the front wheels while 40% goes to the rear wheels.
  - Limited slip differentials prevent power going to wheels that are slipping.
  - AWD can be used in Work, Travel and Automotive Drive Modes

- Four wheel drive (4WD) sends equal power to all the wheels.
  - 4WD mode provides greater traction for muddy, slippery or snowy conditions.

  Note: 4WD should not be used on dry surfaces that grip the tires. These surfaces cause excessive wear on the tires.

  - 4WD is only available when in the Work Drive Mode.
    - It is recommended to select All Wheel Steer to prevent scrubbing of the tires.



Home Screen 220085

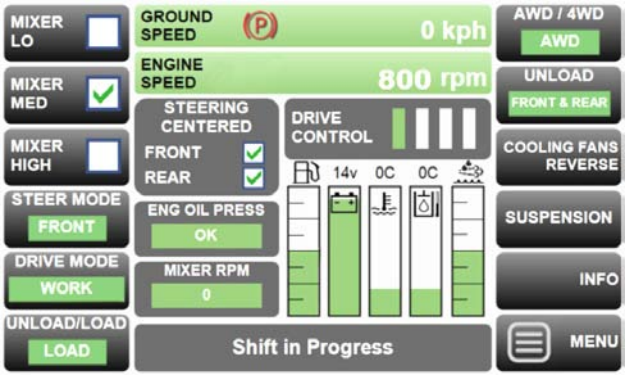
- Unload

Touching this button toggles between:

- FRONT is for discharging feed from the front tub discharge door onto the front discharge conveyors.

- REAR is for discharging feed from the left rear tub discharge door.

- FRONT & REAR is for discharging from both the front tub door/conveyors and from the left rear tub door/conveyor.



Home Screen 220085

- Cooling Fans Reverse

  - Hydraulic Oil Cooling Fan
    - Every 20 minutes of accumulated operating time the controller reverses the hydraulic oil cooling fan for 2 minutes to blow dust and debris out of the cooler. The fan then returns to the cooling mode.

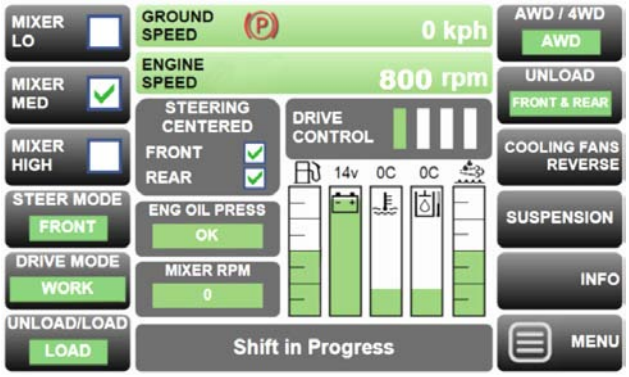
    - Pressing the Cooling Fans Reverse button will manually initiate the reversing fan cycle.

    - The light beside the reverse button is turned on each time the fan reverses, whether it is automatic or manual.

  - Engine Cooling Fan
    - The engine coolant is cooled with a variable pitch controlled fan which can go to negative pitch to reverse flow to clear debris. An engine controller reverses the fan periodically to blow dust and debris from the cooler.

    - Pressing the Cooling Fans Reverse button will initiate the reversing fan cycle manually.

    - The light beside the reverse button is turned on each time the fan reverses, whether it is automatic or manual.



Home Screen
220085

Cameras

There are cameras in various locations of the machine.

The cameras are viewed in:

- Separate Camera Monitor
- Backup Camera shown in Display

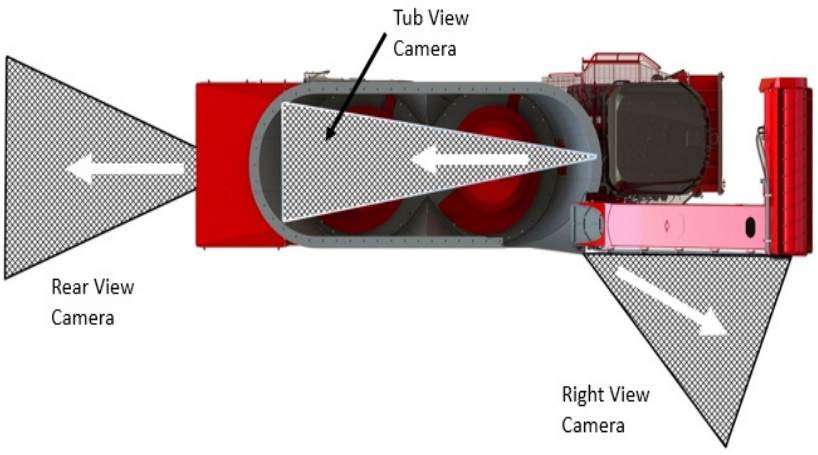
1. Separate Camera Monitor.

    - The separate camera monitor is located beside the weigh scale monitor.

    - The monitor view can be adjusted to show the different cameras mounted on the machine.

      Note: Refer to the camera Monitor Operation manual for control information.

Separate Camera Monitor 220041



Camera Views 220042P2

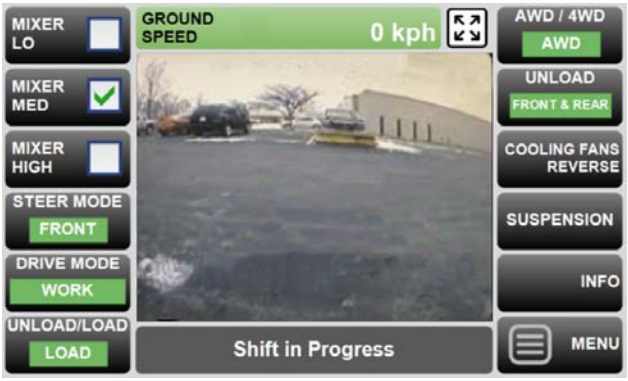
- The Right View Camera is a forward looking camera to allow for greater visibility when driving and approaching intersections.

- The Tub View Camera is a rearward looking camera to show the tub while material is loading and mixing.

- The Rear View Camera is to show the rear view when the machine is placed in to reverse using the joystick control. This view is used when backing up or to check if anything or anyone is behind the machine.

Camera Display - Right View and Tub View 220065

2. Backup Camera shown on the Display.
   - When the joystick is moved to the reverse position, the backup camera view is also shown on the display.



Backup Camera Displayed 220089

   - The backup camera can be made to show full screen by pressing the ⛶ button.

Full Screen Backup Camera 219295

- Suspension

The suspension of the machine will adjust the ride height of the machine to the settings as material is added to the tub.

Note: The suspension becomes active after the Parking brake is released.

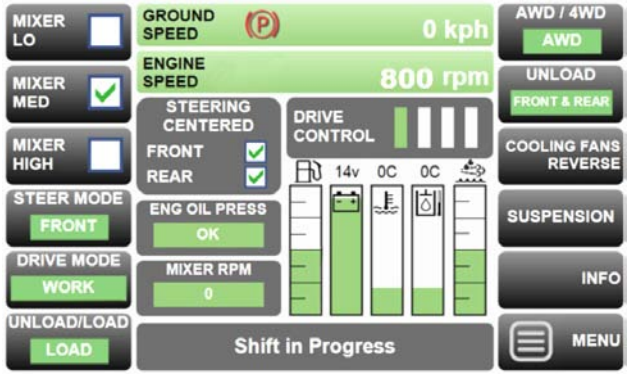
Keep people away from the tires when the Parking brake is released. The machine might change height causing crushing between the tire and machine that could result in death or serious injury.

Suspension Operator Page

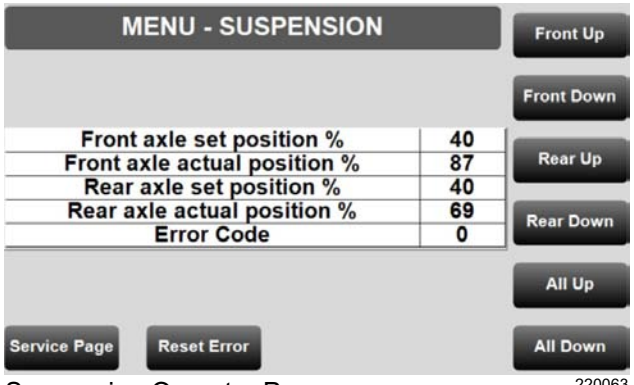
The Suspension Display button brings up the Suspension Operators Screen. This screen allows manual height adjustments of the front, rear and all suspension cylinders.

Note: It is best to use a 50% ride height most of the time. (Front and Rear Axle Position of 50%).

- Adjusting the height of the suspension is often used when moving the machine through a low door opening.
  - Front/Rear Axle Set Position % shows the amount of change in height is being initiated. It is shown as a percentage of total movement of the suspension cylinder.
    - Total movement of the cylinder is 4 1/2".
  - Front/Rear Axle Actual Position % shows feedback of the actual percentage of the suspension cylinder movement.



Home Screen 220085



Suspension Operator Page 220063

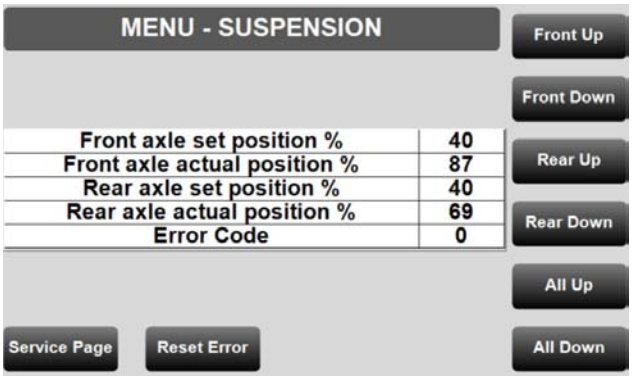
- Front Up/Down Buttons
  - Pushing these buttons will cause the front axle suspension cylinders to move.

- Rear Up/Down Buttons
  - Pushing these buttons will cause the rear axle suspension cylinders to move.

- All Up/Down Buttons
  - Pushing these buttons will cause both the front and rear axle suspension cylinders to move.

- Error Code
  - Error codes will be displayed to indicate that something needs attention.
    - Once the error has been corrected press the Reset Error button.

  Note: When an error code occurs, press Reset Error Code button to clear the error.
    - Often the errors are temporary and will be removed when reset.
  - If the error code continues check the suspension system components for tightness, good wire connections and that there is no damage.
  - If an error code persists, contact your dealer for assistance.



Suspension Operator Page 220063

Suspension Service Page

The Service Page is used to set the top and bottom positions of the suspension cylinders and to calibrate the suspension sensors.

- If a cylinder sensor needs to be replaced the calibration is done on the Service Page.

To Calibrate the Suspension:

Keep people away from the tires when the Parking brake is released. The machine might change height causing crushing between the tire and machine that could result in death or serious injury.

1. Move the cylinders to the Top.
   - Hold down the "Move Top" button until the machine is all the way up then release the button.

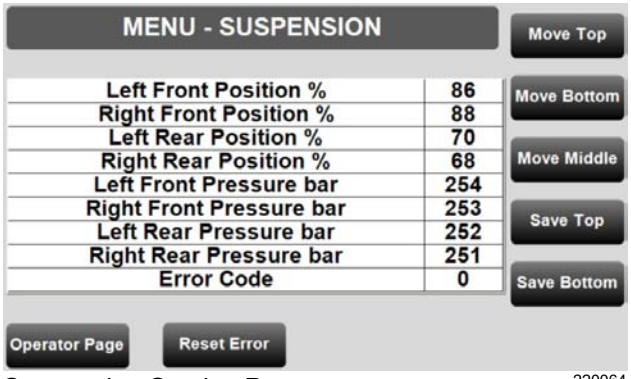
2. Save the Top position by pushing the “Save Top” button.

3. Move the cylinders to the Bottom.
   - Hold down the "Move Bottom" button until the machine is all the way down then release the button.

4. Save the Bottom position by pushing the “Save Bottom” button.

5. After saving the top and the bottom perform a move middle to prepare suspension for operational mode.
   - Hold down the "Move middle" button for about 5-10 seconds until the suspension is roughly centered.

6. Go back to the operator page which will immediately begin operational mode.



Suspension Service Page 220064

- Info Button

Pressing the INFO button and using the rotating wheel.

Info Screen - Operating Information

Press the Info button and rotate the selector wheel for the Operating Info screen.

- Mixer Speed
- Loading Arm Position
- Transfer Case Range
- AWD/4WD
- Air System Pressure status

Info Screen - Hydraulic System Information

Press the Info button and rotate the selector wheel for the Hydraulic System Info screen.

- Drive Pump Filter status
- Mixer Pump Filter status
- Milling Pump Filter status
- Return Filter status
- Hydraulic Oil Level status
- Hydraulic Oil Temperature

  Note: The hydraulic oil temperature should be above 40C for a valid indication of the filter condition.

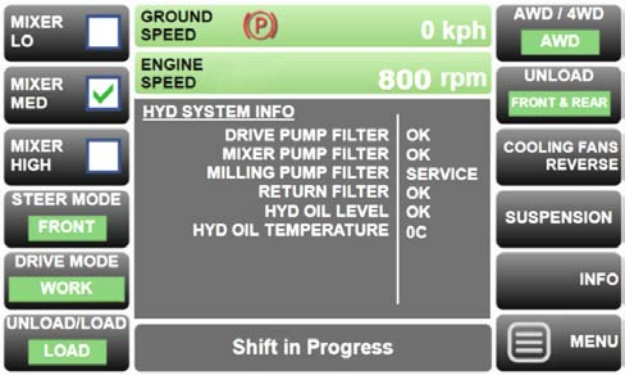
Info Screen - Engine Information

Press the Info button and rotate the selector wheel for the Engine Info screen.

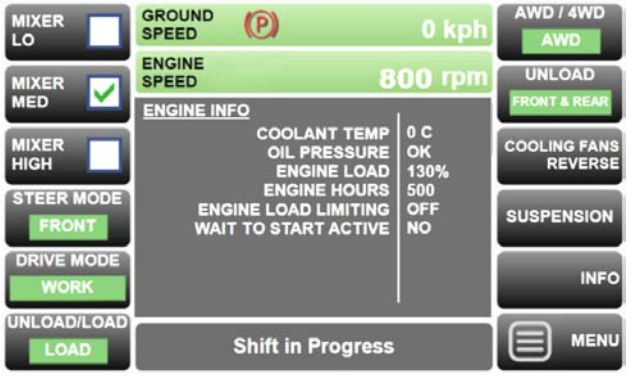
- Coolant Temperature
- Oil Pressure
- Engine Load percentage
- Engine Hours
- Engine Load Limiting status
- Wait to Start Active status

To return to the Home page press the Home button which is located above the selector wheel.

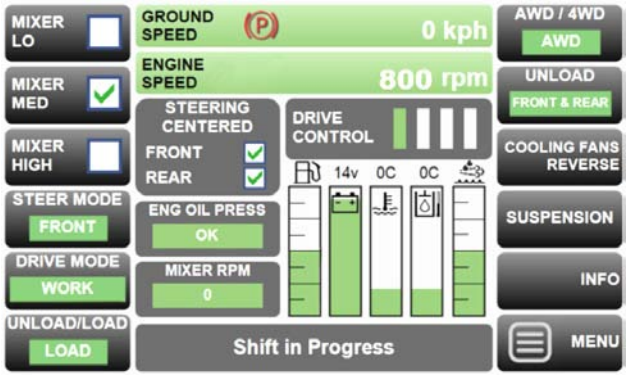
Operating Information 220092



Hydraulic System Information 220091



Engine Information 220090

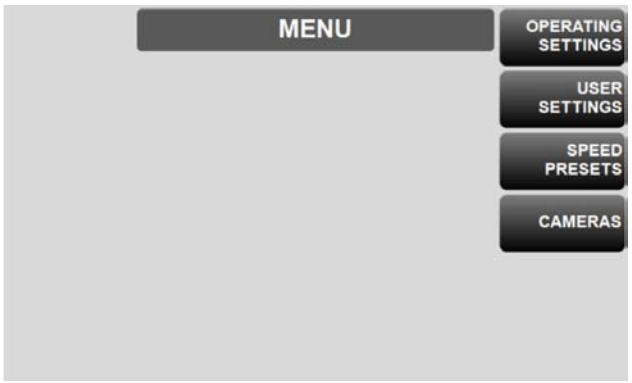


Home Page 220085

Menu Screen

The Menu button brings up options to adjust:

- Operation Settings
- User Settings
- Speed Presets



Menu Screen 218214

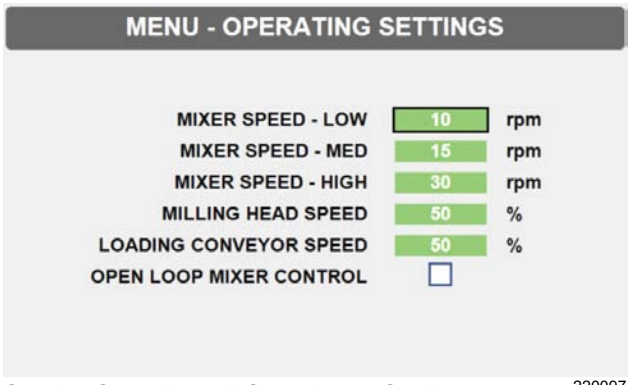
Operating Settings

- Press one of the mixer speed settings to adjust the rpm.
  - Use the adjustment wheel to the right to set the speed. Push the wheel to enter the value.
  - Press the Home button to return to the Home Screen.

- Press the milling head speed to adjust the percentage of the full speed.
  - Use the adjustment wheel to set the percentage of full speed. Push the wheel to enter the value.
  - Press the Home button to return to the Home Screen.

- Press the loading conveyor speed to adjust the percentage of the full speed.
  - Use the adjustment wheel to set the percentage of full speed. Push the wheel to enter the value.
  - Press the Home button to return to the Home Screen.

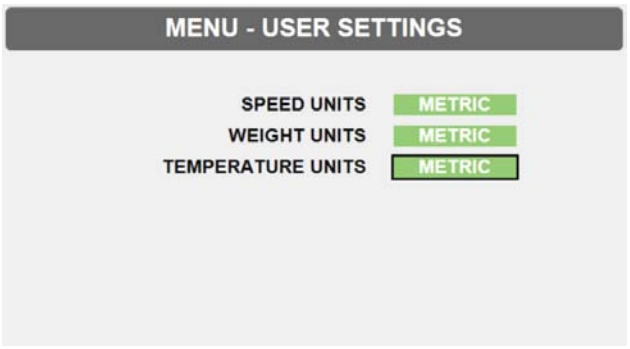
- The mixing screws are normally in closed loop control.
  - If there is a faulty sensor this option in the display allows open loop control mode.
  - Press the Home button to return to the Home Screen.



Set the Speeds and Open Loop Setting 220097

User Settings

- Press the Speed Units to toggle between Metric or Imperial readouts.
- Press the Weight Units to toggle between Metric or Imperial readouts.
- Press the Temperature Units to toggle between Metric or Imperial units.



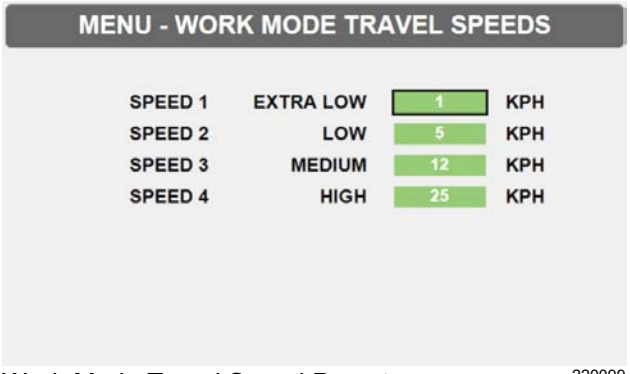
User Settings 220098

Work Mode Travel Speed Presets

Adjusting the Work Mode speed presets determines the top speed for each speed range.

To set the Work Mode drive travel speed presets:

- Press Menu.
- Press Speed Presets.
- Use the wheel to choose which speed to adjust.
  - Press to select.
- Press the Speed to adjust.
  - Use the adjustment wheel to the right to set the speed.
- Press the wheel to set.
- Press the Home button to return to the Home Screen.



Work Mode Travel Speed Presets 220099

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Table of Contents for Section 4 - Preparing to Use the AccuMix 1000S

Operator Orientation

The directions left, right, front and rear are as seen from the driver's seat facing forward.

Preparing to Use the AccuMix 1000S

1. Engine and pump area access doors.

    - Left front door gives access to the diesel exhaust fluid tank (DEF) and battery shut off switch.

    - Left rear door has screens for the engine cooling system, air conditioner and fuel cooling system.
        - Lifting the left rear door gives access to the front of the radiators.

    - The rear door gives access to the engine, pump drive and pumps.

    - The right rear door gives access to the pumps, oil cooling radiator and oil tank.

    - Be sure to close and latch all doors before operating.

Left Front Door Access 219390

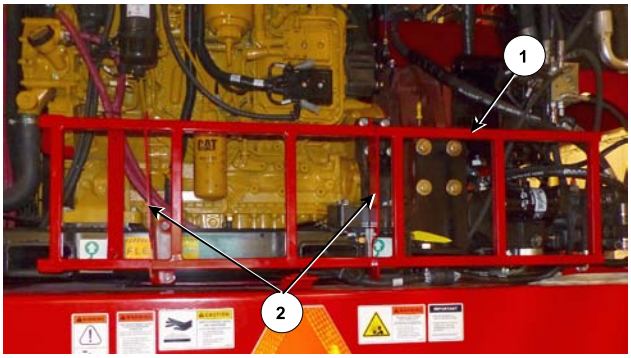
Left Rear Door Access 220112

Rear Door Access 219320

Right Rear Door Access 219321

2. Use the ladder (1) in the rear compartment to access the engine and pump area.

   - Lift the ladder (1) from the ladder supports (2) located at the rear of the engine.



Access Ladder in Storage 220016C

   - Place the ladder into the left notches in the frame to access the engine.


Ladder Left for Engine Access 220017

   - Place the ladder into the right notches to access the pumps.


Ladder Right for Pump Access 220022

3. Trash and debris

   Each day remove all trash and debris from around and on any hot components such as the exhaust, engine, turbocharger, batteries, oil tank, pumps and cooling system.

   Keep these areas clean to avoid the possibility of fire and overheating.

4. Check the engine oil level.
   - Open the engine doors at the rear of the machine.
   - After the engine has stopped, wait for 10 minutes to allow the oil to drain into the pan.
   - Use the dipstick (1) to check the oil level.
     - Maintain the oil level between the "l" and "H" marks.
     - Do not fill the crankcase above the "H" mark.

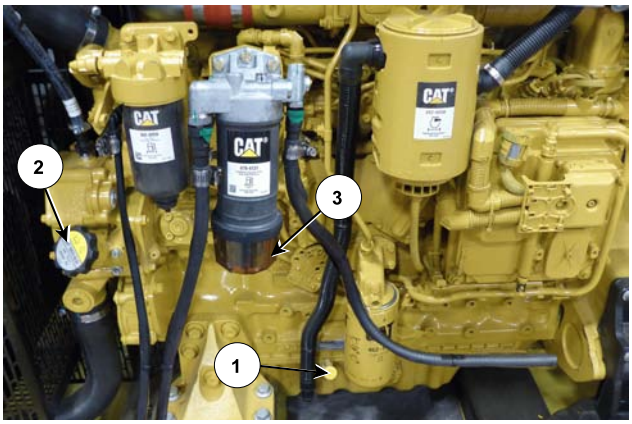
   - Fill with diesel engine oil at the fill cap (2).

   Note: Refer to Section 7 - "Maintenance" for determining the viscosity of the oil to use based on weather conditions.

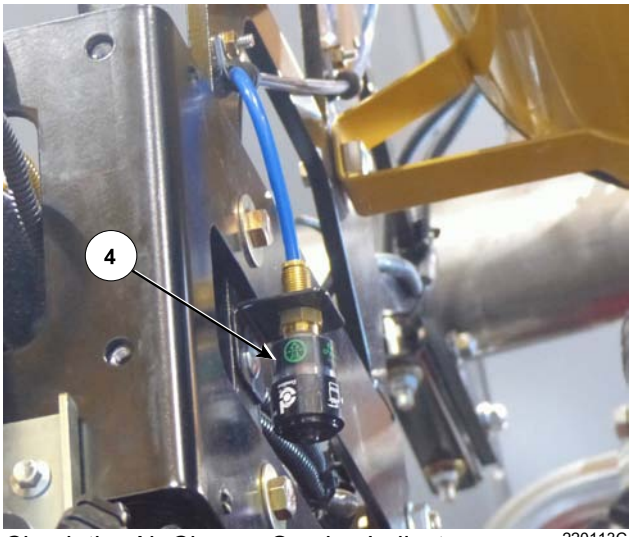
5. Drain the fuel system primary filter/water separator (3).
   - Remove water that has collected in the lower bowl.

6. Check the air cleaner restriction indicator (4).
   - If the indicator shows a red band in the middle then the air filters need to be changed.

   - The air cleaner filter also has a Air Filter Restriction sensor that will send an message to the Display if the filters need to be replaced.



Check the Engine Oil Level
Drain Water Separator 219244C



Check the Air Cleaner Service Indicator 220113C

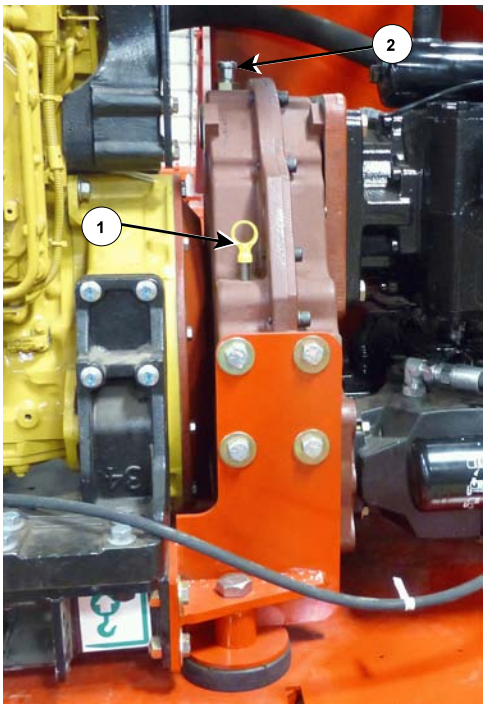
Air Filter Restriction Message 220215

Note: Refer to Section 7 - "Maintenance" for instructions on changing the air filters and resetting the indicator after the filters are changed.

7. Check the oil level in the pump drive gearbox case.

   - Use the yellow handled dipstick (1) to check the oil level.

   - Fill with 85w90 type oil through the air breather (2).



Check Oil Level in Pump Gearbox 219225C

8. Visually check the hydraulic oil level in the oil tank by looking at the oil level sight glass (5).

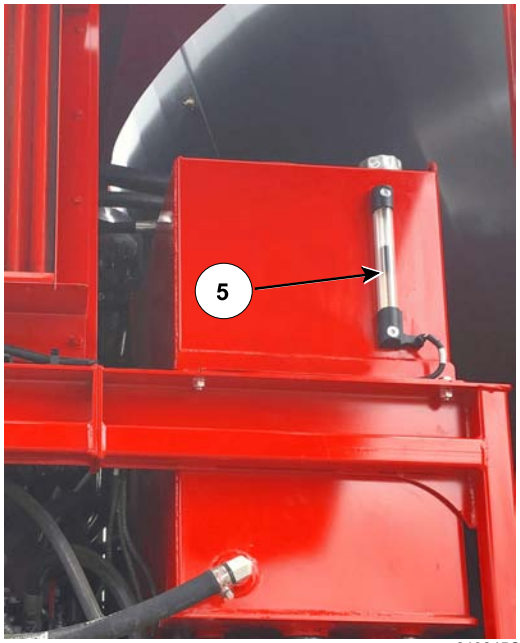
   - Check the level when the oil is cold.

   - Ensure the oil level is at least halfway up the sight glass.

     Note: The display in the cab will give a notification if the oil level goes to low level.

     Note: If the oil level in the tank continues to drop below a sensor in the tank, the machine will immediately shut down the engine to protect the hydraulic pumps. The machine will come to an abrupt stop. The display will give a large red notice that the engine has shut down.

   - Fill with hydraulic oil if needed.

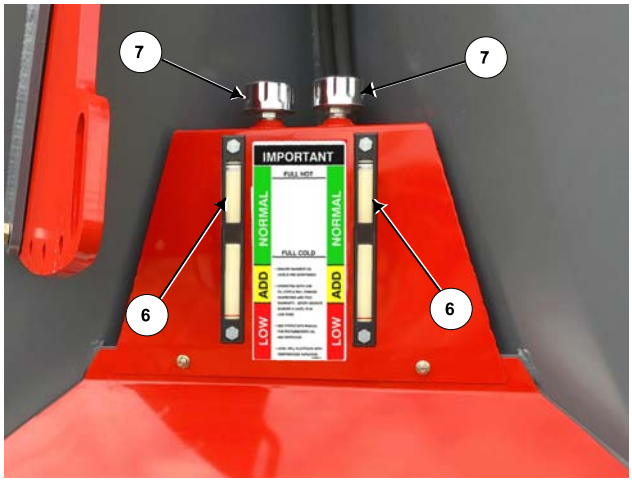


Check the Oil Tank Level 219245C

9. Visually check the oil level of the screw drive boxes.
   - Oil level indicators (6) are located on the left side of the tub.
   - Check the level when the oil is cold.

   Note: The oil level will fluctuate with temperature variation.

   - Compare the oil level with the decal.
     - The best operating level is indicated by the green "NORMAL" color on the decal.
     - When the oil level is in yellow "ADD" zone, add oil.
     - If the oil level is in the red "LOW" zone, add oil immediately.
       - Also check as to why there has been a loss of oil.
     - Fill with oil through the removable fill cap (7).



Screw Drive Oil Levels and Fill 220062C

10. Filling the fuel tank.

Do not refuel the machine while smoking or near an open flame or sparks.
Do not fill the fuel tank when the engine is running.
Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

The fuel tank and cap are located on the left side of the machine just under the tub.
- Keep the area around the fuel tank filling hole clean of debris in order to prevent contamination of the fuel tank.


Fill Fuel Tank - Ultra Low Sulfur Fuel 219249

- Fuel grades for the CAT Engine:
  No. 1 is ASTM D975 grade 1D S15
  No. 2 is ASTM D975 grade 2D S15
  Consult with the local fuel distributor for properties of the diesel fuel available.
  Note: Refer to the CAT Operation and Maintenance manual for additional information.

- Only use ultra low sulfur fuel. Diesel fuel quality and sulfur content must comply with all existing emissions regulations.

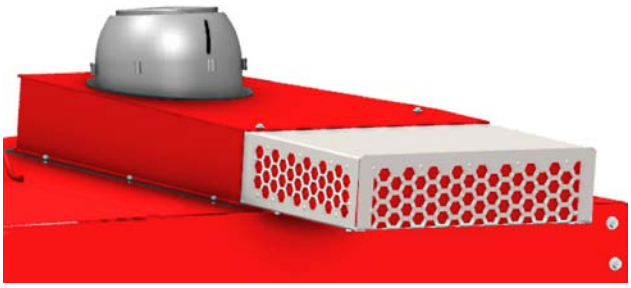
Note: Fill the DEF tank each time the fuel tank is filled.
- The DEF tank has a 1:1 fill rate with the fuel tank.
- If fuel is added, DEF needs to be added.

- Replace the fuel cap before operating to prevent moisture from entering.

- Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing.

Fill DEF Tank at Each Fuel Fill 219390

11. Clean the screens of the engine combustion air inlet pre-cleaner located on top of the engine cabinet.



Clean Debris from the Engine Air Pre-cleaner Inlet Screens 222031

12. Clean the screens of the engine cooler.

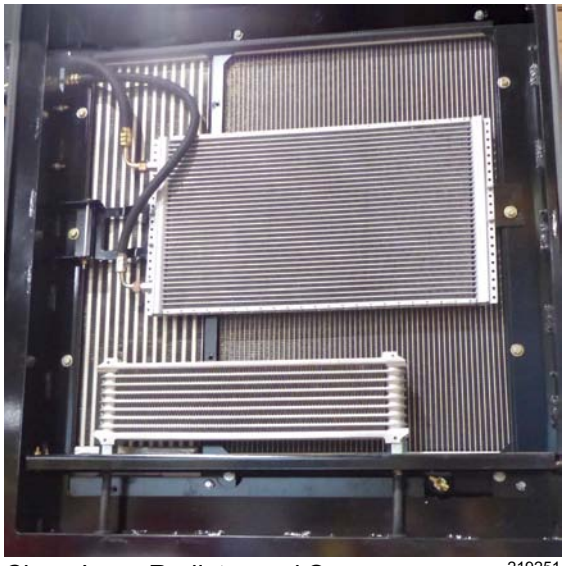
    Note: After 15 minutes of operating time the engine cooler fan will reverse to blow dust and debris out of the cooler.

    The operator can initiate the fan reversing manually by pressing the Cooling Fans Reverse button on the display. It is recommended to increase the engine speed before reversing the fan to increase the air flow. The engine fan is driven by the engine.

    - Clean the outer engine cooler screen on the left side of the machine.
      - Use a broom, low pressure air and pressure washer to clean the screens.
        - Be careful not to bend the fins of the radiators.

    - Lift the left door and clean the radiator and other coolers of any debris.
      - Use a broom, low pressure air and pressure washer to clean the screens.

Clean Outer Engine Cooler Screen 219250


Clean Inner Radiator and Screens 219251

13. Check that the fan on the rear engine door is clear of debris.


Check Fan on Rear Engine Door 220103

14. Clean screen of the oil cooler on the right side of the machine.

    Note: After 20 minutes of operating time the oil cooler fan will reverse to blow dust and debris out of the cooler and then turn forward for normal cooling.

    The operator can also initiate the fan reversing manually by pressing the Cooling Fans Reverse button on the display.

- Clean the outer oil cooler screen on the right side of the machine.
  - Use a broom, low pressure air and pressure washer to clean the screen.

- Lift the right door and clean any debris.

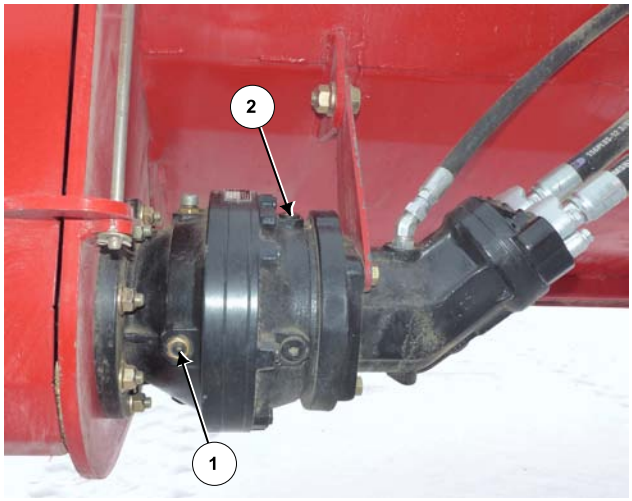
- Clear debris from the fan mounted on the backside of the oil cooler.
  - If additional material needs to be removed, blow air through the fan and through the cooler.

Clean Oil Cooler Screen 219252


Lift Oil Cooler Door and Clean Debris 219253

15. Check the oil level in the milling head drivebox.

- Lower the milling head so that the gearbox has its fill plug (2) facing up and the sight glass (1) is on the side.
- Check the oil level by viewing the sight glass (1).
- Add oil through the top plug (2).



Check Milling Head Drivebox Oil Level 220024C

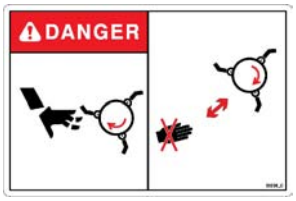
16. Check that the milling head and auger are in good condition.

Contact with the moving milling teeth and auger will cause serious injury or death.

Keep hands out of the cutting area of the loading arm when the drum is rotating.

Set the park brake, lower the loading arm to the ground, shut off engine, remove key, and wait for all parts to stop turning.

- Check the milling head teeth.
- Remove any built up materials from the milling head.
- Check the auger area behind the milling drum is clear.



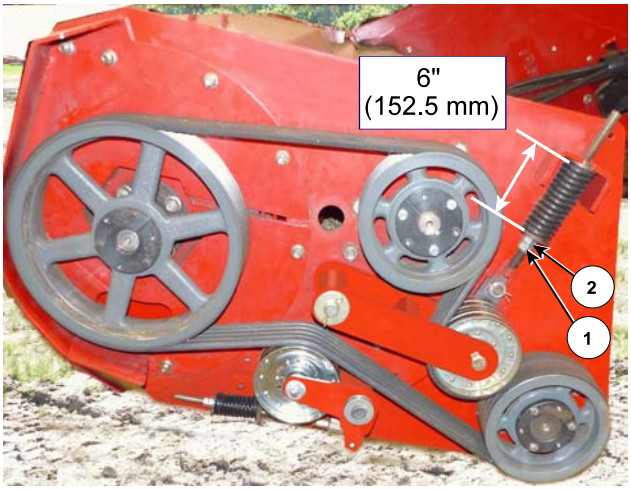
Check the Condition of the Milling Head 219227

17. Check the milling head belt drive area.

Contact with the moving belt or sheaves may cause serious injury or death.
Keep away from moving parts.

- Unlock the guard door and swing it open.
  - Check that the area is free of material.
  - Check that the drive belt is in good condition.

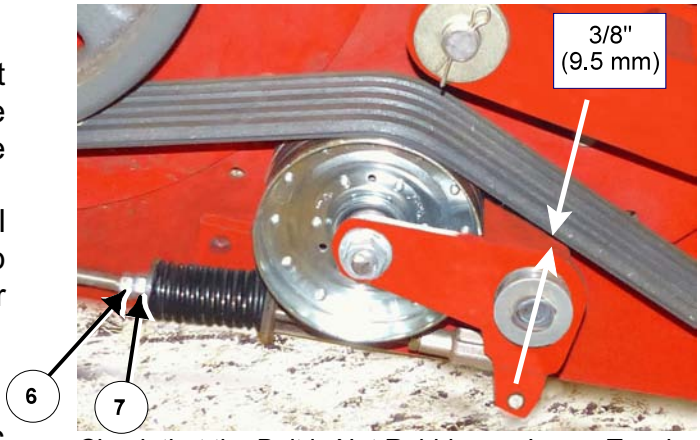
  - Check the tension of the upper tensioner to prevent slipping.
    - The length of the upper tension spring should be 6" (152.5 mm) measured between the 2 spring washers.



Check Condition and Tension of Belt 220149C

  - Check that the belt is not rubbing on the lower tensioner pivot tube.
    - There should be about 3/8" clearance from the bottom of the belt and the lower idler pivot

    Note: There is a special process for setting up the tension of the lower spring.



Check that the Belt is Not Rubbing on Lower Tension Pivot Tube 220150C

See Section 7 "AccuMix 1000S Maintenance" for Adjusting the Belt Tension and Changing the Belt.

18. Check the condition of the loading arm conveyor belt.

    Note: See Section 7 "AccuMix 1000S Maintenance" for adjusting the tightness and tracking of the loading conveyor.

    - With the conveyor not moving:
        - Look for separation of the lugs from the conveyor belt.
            - Any lugs that are almost completely separated from the conveyor fabric can be cutoff. Be careful to not harm the conveyor fabric.
        - Check the condition of the conveyor web connection.
            - Look through the side of the loading arm to inspect the belt web connection.
            - Check that the cable through the connection loops is in good condition.
            - Check that the web loops are not tearing out of the conveyor fabric.

Check Condition of the Loading Arm Belt 220005

Check the Conveyor Web Connections 219266

19. Check the condition of the milling head auger and loading paddles.

    - Open the mineral loading hatch located on the top of the loading arm.
        - Lift the hatch lid to see the auger and loading paddles.

Lift Mineral Loading Door for Access to Auger and Loading Paddles 220071

- Check the condition of the auger.
- Check that the loading paddles are securely fastened.
- Remove any twine/wrap or other buildup wrapped around the auger.

Check the Auger and Loading Paddles. Remove Twine/Wrap Buildup 220151

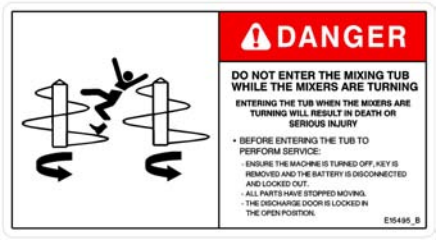
20. Visually check that the tub does not have any build up or foreign material in it.

Do not enter the tub while the mixers are turning.

Entering the tub when the mixers are turning will result in death or serious injury.

Do not lean over the mixing tub while the screws are turning to avoid the danger of falling into the tub.

Do not enter the tub with material in the tub.
The material is unstable and may cause entrapment.
There is no means of exiting the tub when the tub is full.



Check for Build Up in the Tub and Condition of the Screws (Optional Knives Shown) 219255

21. Visually check that the screws are in good condition

22. If it is desired for the screws to do additional cutting of long material, move the aggression bars (1) into the tub and fasten in place.

Adjust Aggression Bars 219256C

23. If the optional cutting knives are installed on the screws, check the condition of the knives.

Do not enter the tub while the mixers are turning.
Entering the tub when the mixers are turning will result in death or serious injury.

- Check that they are fastened tightly to the screws.

Note: See Section 7 "AccuMix 1000S Maintenance" for more information on the knives.

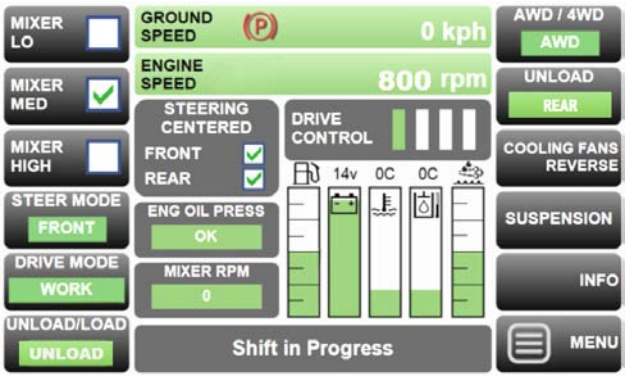
Check the Optional Knives on the Screws 219259

24. If it is required to enter the tub, do the following:

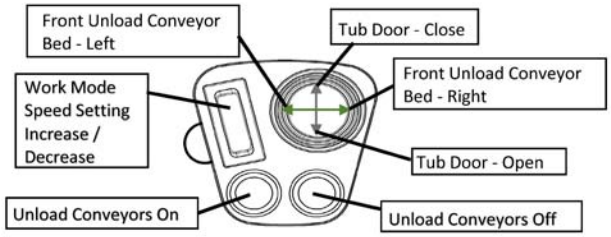
Being trapped in the tub with mixers turning will result in death or serious injury.

Before entering an empty tub to perform service ensure all parts have stopped moving.

- Start the engine.
- Select Unload on the Display.
- Select Unload Rear.



Select the Rear Door 220100



Joystick Unloading Functions 219211

Raise the Rear Door to Enter Tub 219257

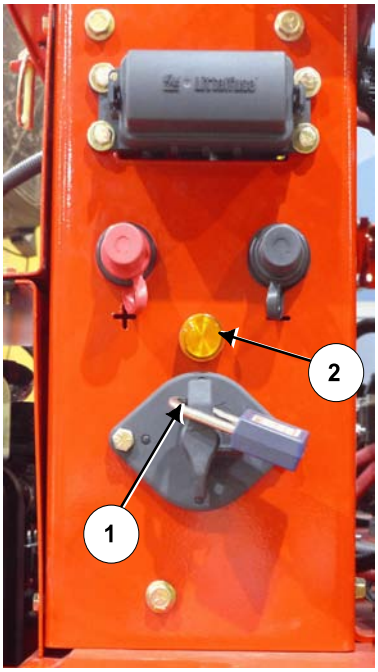
- Turn the machine off and remove the key.

- Turn the battery disconnect switch to the Off position and fasten in place with a lock (1).

  Note: If the engine has been running, wait until the amber light (2) has gone out before turning the battery switch to "Off".
  - The engine needs to complete an emissions cycle.
  - When the amber light (2) goes out then the cycle is complete.

  - Lock out the battery switch (1) to prevent accidental starting of the machine that might cause the lowering of the tub door with someone in the tub.

  - Wait until all parts of the machine have stopped moving before entering the tub.



Turn Off Battery Switch
Lock in the Off Position 219391C

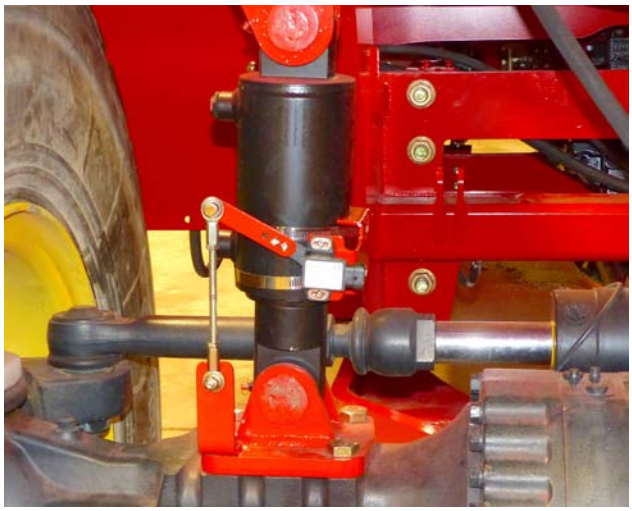
25. Check the condition of the tub height ride suspension cylinders, connectors and sensors.
    - The tub ride height suspension system adjusts as material is being added to ensure an adequate height.

    - Check all four ride height cylinders and linkages located on the axles.

    - Clear debris from the area.

    - Check that the cable to the rotary sensor is connected and in good condition.

    - Check that the hose clamps are tight.


Check Ride Height Cylinders and Connectors 219315

26. Check the condition of the tires.

Ensure the machine is turned off and the key is removed.
Tires can steer towards the frame causing death or serious injury.
Tires can begin moving and run over a person resulting in death or serious injury.

- Check that the tire sidewalls and treads are in good condition.

- Fill with air to 76 psi (524 kPa).
  - If the optional large lug tire is installed fill the tire to 54 psi (372 kPa).

Check the Condition of the Tires 219219

27. Turn the key to the run position.

- Do not start the engine.

Turn Key to the Run Position 219261

28. Check that the Display is working.

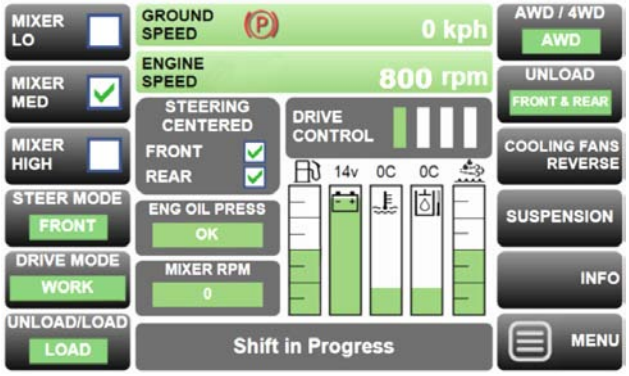
- Check all the screens of the Display.

Check the Display is Working 219263

29. Check the diesel exhaust fluid (DEF) level on the display.

- The Display in the cab has a gauge to indicate the amount of DEF in the tank.
  - The Display also has a low DEF level warning indicating there is less than 20% fluid in the tank.

Note: If the DEF tank runs out of fluid it will lead to different stages of derating of the engine.



Check DEF Fluid Level 220085

When filling the DEF tank:

Use caution when handling DEF:
- Do not breathe DEF vapor or mist.
- Do not spill on hot components which may cause the release of ammonia vapors.
- Do not eat, drink or smoke when using DEF.
- Avoid DEF contact with eyes, skin and clothing.
- Wash thoroughly after handling DEF.

Open the left front door to access the DEF tank.
- Fill with DEF that is compatible with Tier IV diesel engines.

- Fill the tank through the fill cap (1).
  - Be careful to not spill DEF fluid.

Note: Wipe up any DEF spills immediately and rise with water.
  - When the water that is contained in DEF evaporates it will leave material that is corrosive to paint and metal.

Fill the DEF Tank 219390C

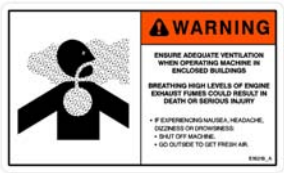
30. Check that the weigh scale monitor is working.
    - Refer to the Weigh Scale Manual for Information.
    - Refer to the Weigh Scale Manual for the load cell calibration procedure.

31. Check the camera display is working.

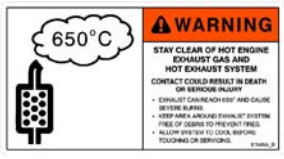
Check the Weigh Scale Monitor Is Working 220041

32. Start the AccuMix engine.

Ensure adequate ventilation when operating the machine in enclosed buildings.
Breathing high levels of engine exhaust fumes could result in death or serious injury.



Stay clear of hot engine exhaust gas and hot exhaust system.
Contact with the hot exhaust could result in death or serious injury.



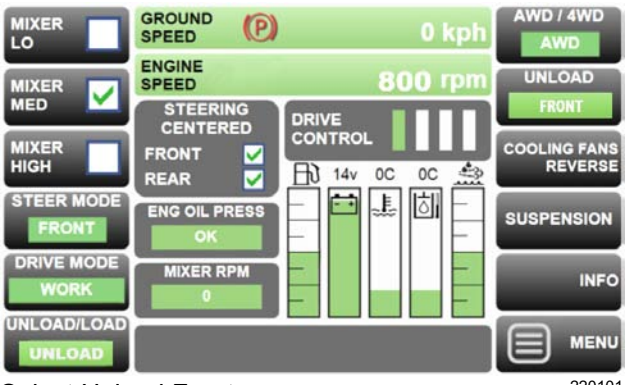
Refer to Section 5 "Engine Startup" for information.
- For cold weather starting procedure refer to the "Engine Startup" Section in Section 5.

Note: Also refer to the CAT Operation and Maintenance Manual for information.

33. Check that the front unloading tub door works.

Stand clear of the discharge door during operation.
A lowering discharge door will result in death or serious injury.

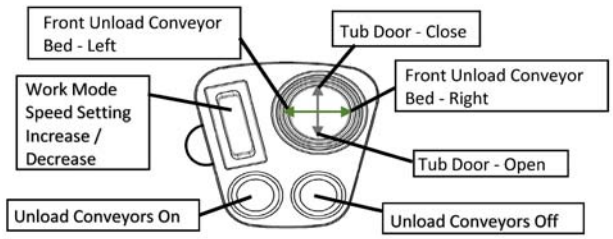
- Press Unload on the Display.
- Press Front Unload on the Display.



Select Unload Front 220101

- Press the joystick button to open the tub door.

- Press the joystick button to close the tub door.



Joystick Unloading Functions 219211

Check the Front Tub Door Works 219265

34. Clean out the spill collector of the conveyor located under the cab.

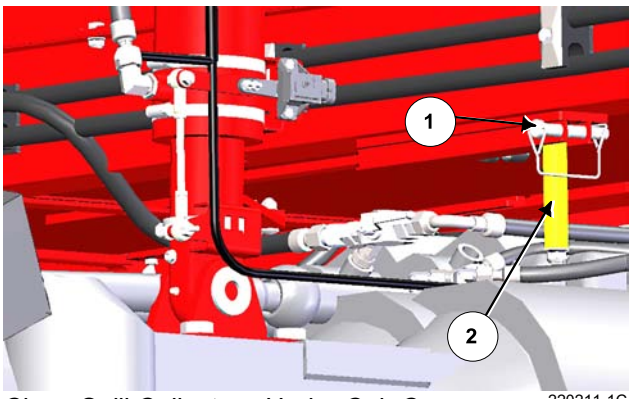
- Near the front right tire remove the lock pin (1) from the spill guard handle track.

- Pull the spill guard door handle (2) towards the front of the machine. This will open the spill guard door (3) to allow any built up material to be emptied.

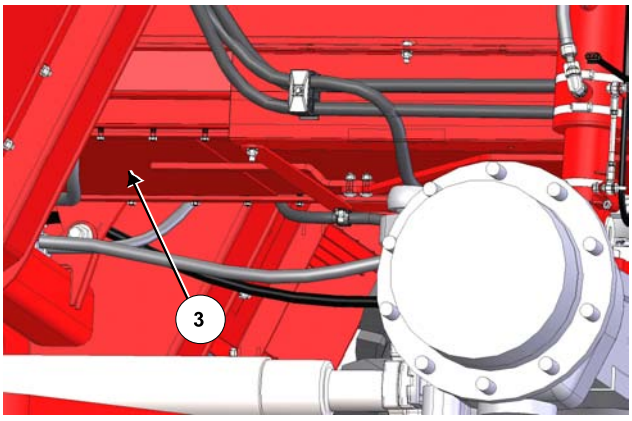
- Clean the conveyor chain sprockets by reaching up through the spill guard door (3).

- Move the spill guard door handle (2) back to close the spill door.

- Place the lock pin (1) back into the spill guard handle track.



Clean Spill Collector - Under Cab Conveyor 220211-1C



Clean Conveyor Sprockets (Front Wheel Removed for Clarity) 220210C

35. Clean the spill guard located under the front left/right conveyor.
    - Use compressed air or a broom to remove any material located on the spill guard sheet that is under the left/right conveyor.

36. Check that the front unloading conveyor moves to the left and right.

    Note: If the high bunk conveyor option is installed, the conveyor does not move left or right.

    - Press the joystick button to move the front unloading conveyor bed to the left.

    Stay clear of the unloading conveyor.
    The unloading conveyor could swing to the side suddenly and cause serious injury.
    Contact with the conveyor could result in death or serious injury.

    - Press the joystick thumb button to move the front unloading conveyor bed to the right.
      - If the conveyor will not move to the right it may be because the milling arm is not raised up.
        - There is an interlock to prevent the unload conveyor from hitting the milling arm.
      - Press the Load button and raise the milling arm.
      - Press the Unload button and move the conveyor to the right.

Clean Spill Guard Under Conveyor
Move the Front Unloading Left and Right
Check Both Conveyors Operate

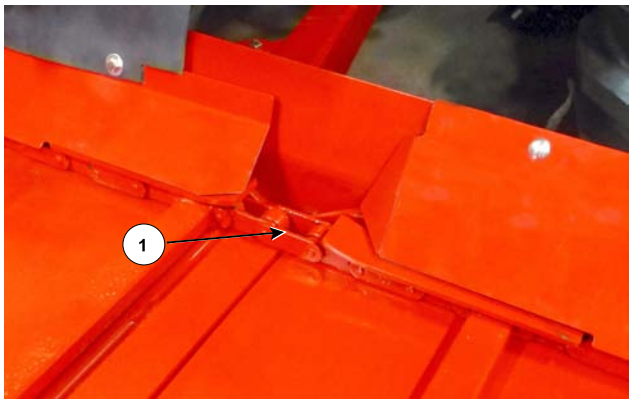
220212

37. Check that the front unloading conveyor under the cab and the left/right conveyor are operating.

Stand clear of the unloading conveyor.
Keep body and clothing away from moving parts to prevent serious injury or death.

- Press the joystick button to turn the Unload Conveyors On.

38. If the High Bunk unload conveyor option is installed, check that the pivot points (1) on both sides are clear of debris.
    - Check there is no debris lodged in the chains.



Check the High Bunk Conveyor is Free of Debris 220200C

39. On the High Bunk unload conveyor remove the conveyor end cap (2) to access the spill guard.
    - Remove any material under the conveyor.
    - Clean the conveyor chain sprockets.
    - Replace the conveyor end cap (2).

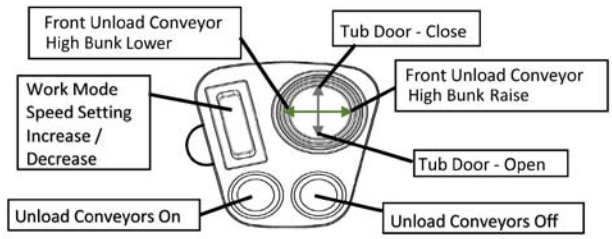
Clean the Conveyor Spill Guard.
Use the Joystick Buttons to Raise/Lower the High Bunk Section of the Front Conveyor 220213C

40. On the High Bunk unload conveyor check that the end of the conveyor raises/lowers for bunk height adjustment.

    - With the high bunk option, the front conveyor does not move to the left or right.
        - The joystick buttons that were the front conveyor left/right are now used to raise/lower the conveyor for the bunk height.

    - On the Display switch to Unload Front Unload.

    - Use the joystick buttons to raise and lower the conveyor to ensure it works.

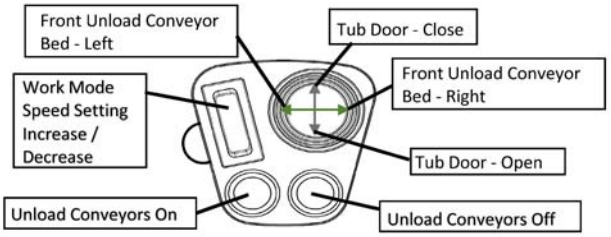


High Bunk Raise Lower on the Joystick 220127

41. Check that the rear unloading tub door works.

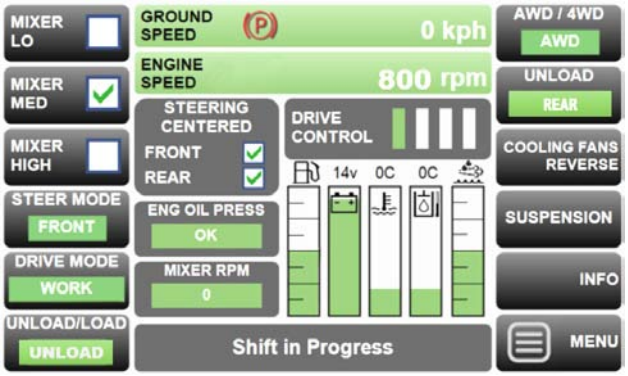
Stand clear of the discharge door during operation.
A lowering discharge door will result in death or serious injury.

- Press the joystick button to open the tub door.



Joystick Unloading Functions 219211

- Press Unload on the Display.
- Press Rear Unload on the Display.



Select Rear Unload 220100

- Press the joystick buttons to open and close the tub door.

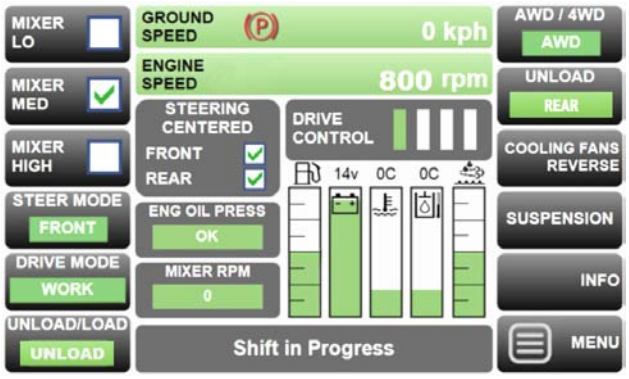
Check the Rear Unload Door Works 219257

42. Check that the rear unload conveyor works.

Stay clear of the unloading conveyor.
The unloading conveyor could move suddenly and cause serious injury.

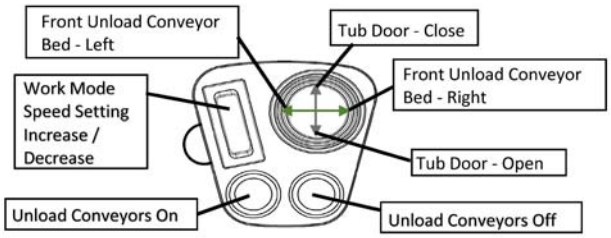
Keep body and clothing away from moving parts to prevent serious injury or death.

- Press Unload on the Display.
- Press Rear Unload on the Display.



Select Rear Unload 220100

- Press the joystick button to turn on the rear unload conveyor.
  - The conveyor will extend as the conveyor chain begins to rotate.



Joystick Unloading Functions 219211

Check the Rear Unload Conveyor Works 219267

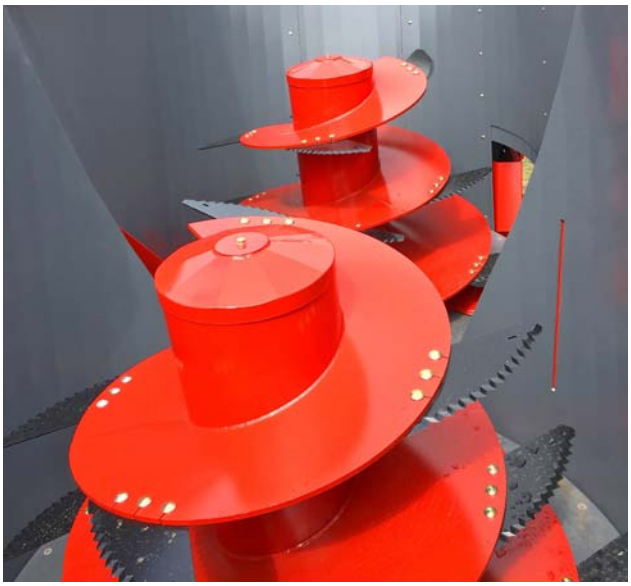
43. Check that the mixing screws in the tub operate normally.

- The mixing screws must be able to turn before loading any material.

Do not enter the tub while the mixers are turning.
Entering the tub when the mixers are turning will result in death or serious injury.

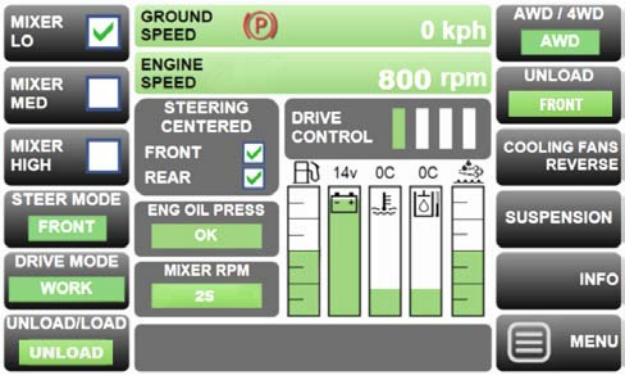
Do not lean over the mixing tub while the screws are turning to avoid the danger of falling into the tub.

Do not contact the rotating screws.



Check that the Mixing Screws Turn 219264

- Press the Mixer Lo button on the display to engage the screws.



Check the Mixers are Working 220102

44. Check the tub camera is working.

- Check the camera monitor for a clear image of the tub area.

Tub Camera View (and Right View Shown) 220104

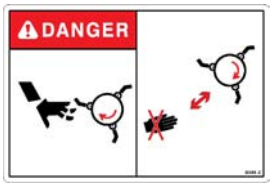
45. Operate the milling head to check that it operates normally.

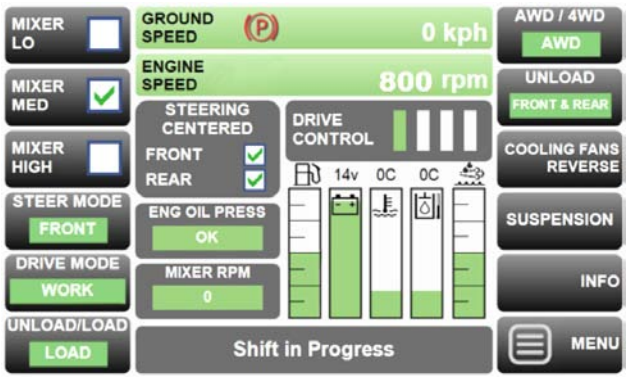
Do not operate the milling head within 100 ft (30m) of any person.
Contact with moving milling teeth and the auger will cause serious injury or death.

Keep hands out of the cutting area of the loading arm when the drum is rotating.

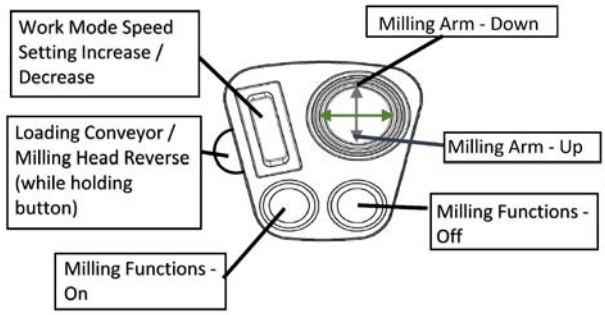
- Press Load on the display to activate the Load functions on the joystick.

- Press the joystick button for Milling Functions On.





Press Load to Activate Joystick Functions 220085



Joystick Loading Functions 219230

46. Check that the loading conveyor operates freely while the milling head is operating.

- Press the momentary button on the side of the joystick to reverse the milling head and loading conveyor.

Operate the Milling Head Raise/Lower the Arm 219227

47. Press the joystick buttons to raise and lower the milling arm to ensure that it operates freely.

Never stand under the loading arm when lowering or raising.
Do not allow people near the loading arm when being moved.
Contact with the moving loading arm will result in death or serious injury.

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Table of Contents for Section 5 - Accumix 1000S Engine Startup

Engine Start Up

Note: Also refer to the "CAT Operation and Maintenance Manual" for additional information.

Before Starting the Engine

1. Check that the machine has an adequate fuel supply.
   - Fill the tank if needed.
   - Use fuel appropriate to the outside temperature conditions.

Fill Fuel Tank as Needed 219249

2. Check that the there is an adequate supply of diesel exhaust fluid (DEF).

   Note: Fill the DEF tank each time the fuel tank is filled.
   - The DEF tank has a 1:1 fill rate with the fuel tank.
   - If fuel is added, DEF needs to be added.

Ensure Adequate DEF in Tank 219230

3. Check the level of the engine oil.
   - Check the level with the dipstick (1).
   - Fill through the cap (2).

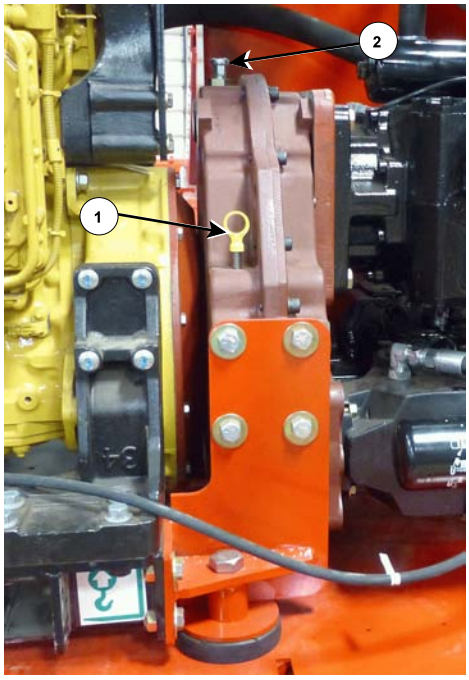
Check/Fill Engine Oil 219244C2

4. Check the oil level in the pump drive gearbox.

    - Check the level with the dipstick (1).

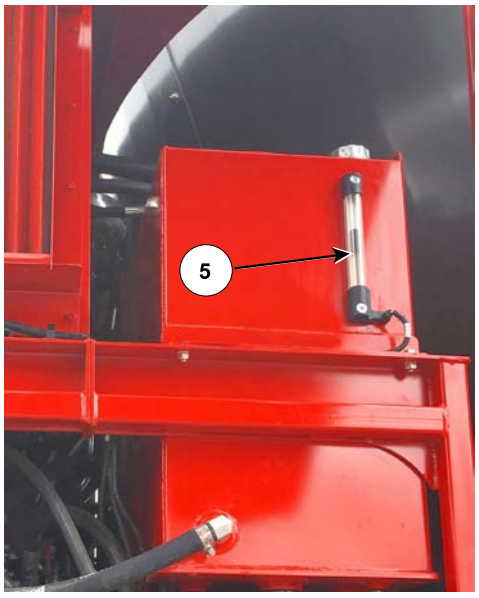
    - Fill through the breather (2).

    - Check that the breather (2) is clean and able to allow air to pass out.



Check Oil Level Pump Gearbox 219225C

5. Check the oil level in the oil tank through the sight glass (5).



Check Hydraulic Oil Level 219245C

6. Check the oil level in the screws oil tank through the sight glasses.

Check Oil Level in Screw Oil Tank 219247

Normal Engine Starting

Note: In cold weather (at or below -7C (20F) follow the steps listed in the "Cold Weather Starting and Operation" section below.

Also refer to the CAT manual for additional information.

1. Open the left side door to access the electrical disconnect switch.

Electrical System Switch

Note: The 12 volt batteries are connected in series to provide 24 volts for the engine, the DEF system, the fuel lift pump and the air exchange fan located at the rear of the engine cabinet.

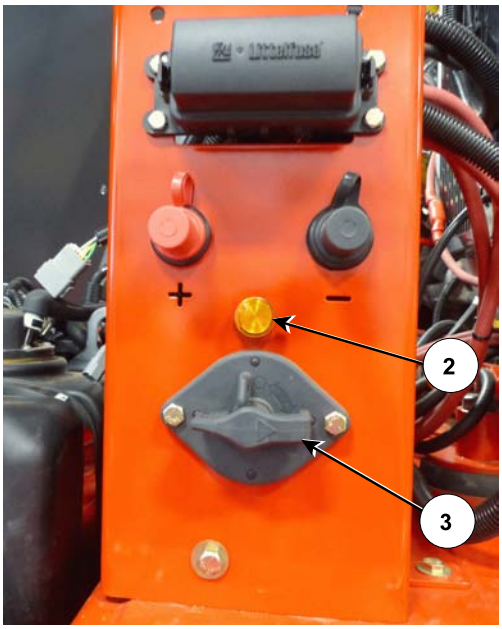
- The voltage at the posts located above the battery switch is 24 volts.
- There is an equalizer to balance the electrical draw on the batteries.

The remainder of the electrical system on the machine is run on 12 volts.

The electrical system can be disconnected by a bateery switch when the vehicle is left for extended periods of time or if there is a drain on the batteries.

- Turn the switch on (horizontal) (3) to allow electrical power to the system and the machine to operate.

- The amber light (2) will be on.



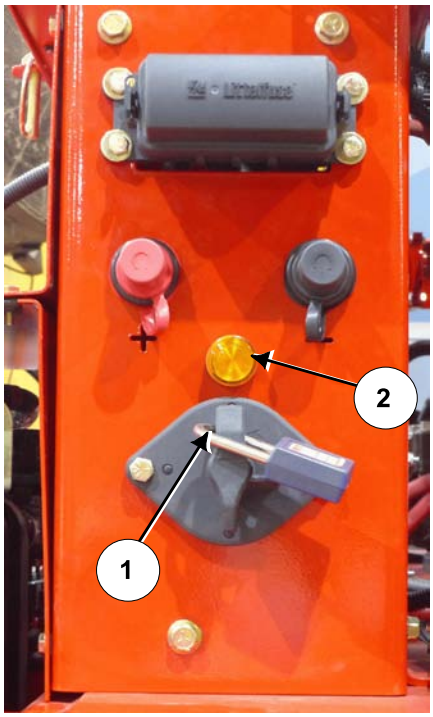
Turn On Battery Switch 219262C

- The switch can also be turned off (vertical) and locked (with a pad lock) when the vehicle is left unattended or when service is being performed.

  - Turn the switch off (vertical) (1) to disconnect the batteries from the vehicle electrical system.

  - The amber light (2) will be off.

  Note: If the engine has been running, wait until the amber light (2) has gone out before turning the battery switch to "Off".
  - The engine needs to complete an emissions cycle.
  - The amber light (2) goes out when the cycle is complete.



Turn Off & Lock Battery Switch 219391C

Machine Settings from Last Use

The machine will remain in the same modes it was in before the key switch was turned off.

- If in Work Mode or Travel Mode the dash throttle will be active.

- If in Automotive Mode the foot pedal throttle will be active. The dash throttle must be ignored.

- The controller will send a message to the engine for the operating speed.

- The Steering Mode will be in the same mode it was before the key switch was turned off.

- The transfer case AWD/4WD mode will be the same it was before the key switch was turned off.

Before the engine will start these conditions must be in place :

- Seat Switch Active - operator sitting in seat.
- Park Brake On.
- Joystick in Neutral.

2. Sit in the drivers seat to be able to start the engine.
   - There is a switch in the seat that senses if the driver is present.

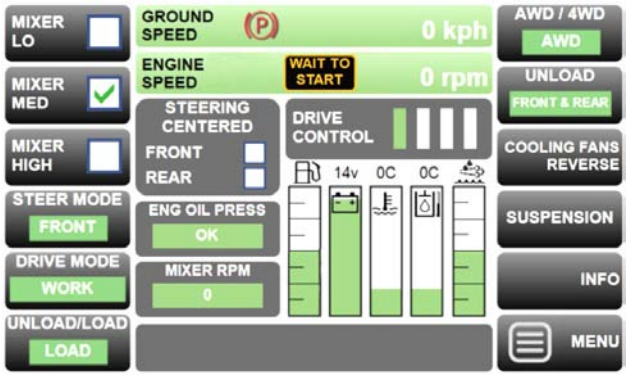
   Note: If the seat switch is deactivated for more than 5 seconds during travel, the drive will come to a stop at the maximum deceleration.

3. Turn on the parking brake switch (2).
   - The display will indicate that the Parking brake is active in the Ground speed bar.
     Note The engine starter will not engage unless the parking brake is turned on.

4. Place the joystick control handle (1) into the "Neutral Position".
   Note The engine starter will not engage unless the joystick is in Neutral.

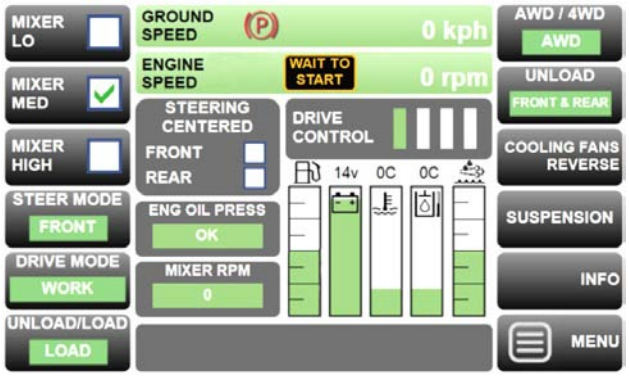
5. Turn the throttle position (3) to a slow idle position.

6. Turn the key to the Run position to allow power to the display.
   - Do not crank the engine.
   - A "Wait to Start" message will appear beside the Engine Speed.
     - Pre-heaters at each cylinder are warming the intake air.
   - The message will remain on the Display until the preheat temperature has been satisfied.



"Wait to Start" Before Cranking Engine 220093

Joystick to Neutral, Park Brake On, Throttle Low Speed 219206C

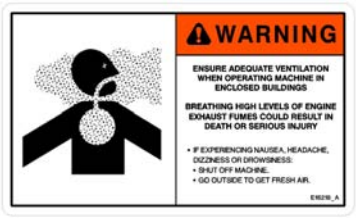


"Wait to Start" Before Cranking Engine 220093

7. Sound the horn to alert others who may be near the machine that the engine is going to be started.
   - Be sure all persons are clear of the machine before starting it.

8. When the "Wait to Start" message goes out on the Display, turn the key to Start and crank the engine.

Ensure adequate ventilation when operating the machine in enclosed buildings.
Breathing high levels of engine exhaust fumes could result in death or serious injury.



Note: Do not use the starter motor for more than 30 seconds without stopping.
   - Wait 2 to 3 minutes between starting attempts to allow the starter motor to cool.

Note: If the engine starts and then stops, wait for the starter motor to stop turning before turning the key to the "Start" position again.

Stay clear of hot engine exhaust gas and hot exhaust system.
Contact with the hot exhaust could result in death or serious injury.

9. If the engine fails to start check the following:

    - Fuel quality and quantity.
    - Electrical system.
    - Troubleshooting section for additional information.
    - Check the CAT manual for additional information.

After Starting the Engine

1. Maintain a engine at a low speed to allow the engine systems to stabilize.
    - The duration of the low speed will depend on the ambient temperature and the time since the engine was last run as well as other factors.

    Note: In ambient temperatures from 0°C to 60°C (32°F to 140°F) the warm-up time may be up to 3 minutes.

    In temperatures below 0°C (32°F) additional warm-up may be required.

Cold Weather Starting of the Engine

Note: Also refer to the “CAT Operation and Maintenance Manual" for additional information on Cold Weather Starting.

Do not use ether or other starting fluids. Serious engine damage could occur.
Using ether fluid could result in explosion leading to death or serious injury.

1. Pre-warm the engine.
   - The engine is equipped with an electric engine coolant heater.
   - Engine starting will be improved from the use of the engine coolant heater when temperatures are below -18°C (0°F).
   - Warm the engine for several hours with the electric heater before attempting a cold weather start.
     - Plug the electrical heater into a circuit that is least 15 amps.

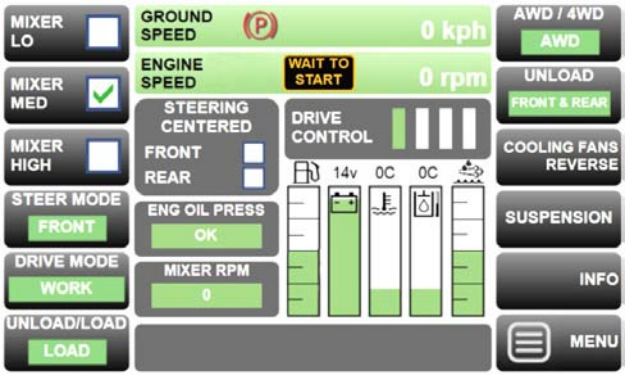
     Note: To avoid electrical shock or fire, use a three-wire, 14 AWG (14 gauge), heavy-duty electrical cord with a 15 amp rating suitable for outdoor use.

2. Turn off all electrical accessories to reduce the electrical drain on the battery.

3. Turn on the parking brake switch (2).
   - The display will indicate that the Parking brake is active in the Ground speed bar.

     Note The engine starter will not engage unless the parking brake is turned on.

Joystick to Neutral, Park Brake On, Throttle Low Speed 219206C



Parking Brake Turned On 220093

4. Place the joystick control handle (1) into the "Neutral Position".
   Note The engine starter will not engage unless the joystick is in Neutral.

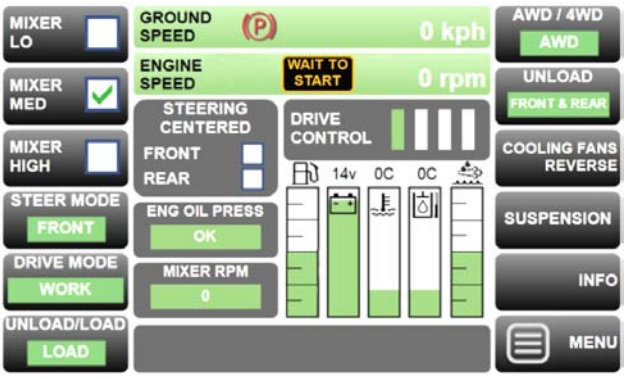
5. Turn the throttle position (3) to a slow idle position.

Joystick to Neutral, Park Brake On, Throttle Low Speed 219206C

6. Turn the key to the Run position to allow power to the display.
   - Do not crank the engine.
   - A "Wait to Start" message will appear beside the Engine Speed.
     - Pre-heaters at each cylinder are warming the intake air.
   - The message will stay on while the cylinder heaters (glow plugs) warm the engine.
     - The length of time the message stays on will be dependant on how cold the cylinder block is.


Turn Key to Run - Wait to Start 220070

7. When the “Wait to start” message goes out on the Display, turn the ignition key to the start position and crank the engine until it starts.



"Wait to Start" Before Cranking Engine 220093

Ensure adequate ventilation when operating the machine in enclosed buildings.
Breathing high levels of engine exhaust fumes could result in death or serious injury.

Stay clear of hot engine exhaust gas and hot exhaust system
Contact with the hot exhaust could result in death or serious injury.

8. If the engine does not start, repeat the pre-heat process by turning the key to Off and then to the On position.

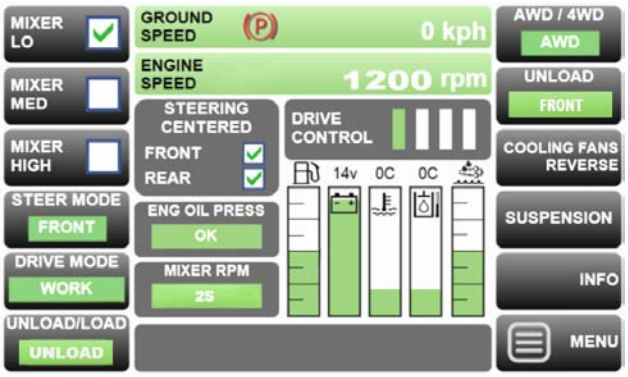
   - When the "Wait to start" message goes out on the Display, turn the ignition key to the start position and crank the engine until it starts.

9. After starting the engine speed will be governed for a period of time.
   - Slowly increase the engine rpm to around 1200 rpm.

   - Allow sufficient warm up time to allow lubricant to reach the turbo charger bearings and engine parts.

   - In severe cold temperatures it may be necessary to warm up for additional time.

   - If the engine is operated at high throttle while it is cold it will run rough.
     - Allow more time for the engine to warm up.



Allow Time for Engine Warmup 220110

10. Continue to run the engine until the coolant temperature is 80°C (176°F) minimum to keep the engine parts in good condition.

    - Check the engine coolant temperature on the display .

    - Damage to engine valve control components can result from engine operation for short intervals if the engine is not allowed to warm completely.

Machine Operation In Cold Weather

- When the machine is started in cold weather, the hydraulic system may create a whining noise.

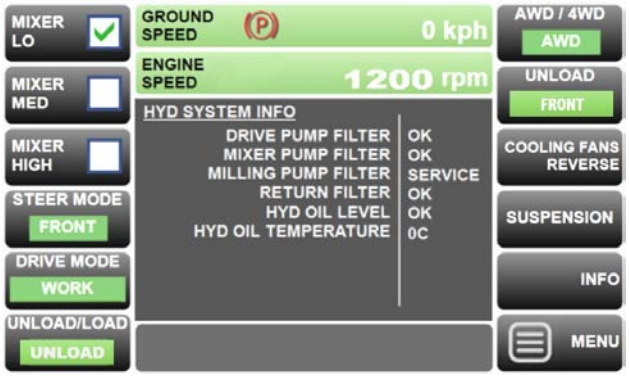
- The noise should stop after a few minutes.
  - If the noise continues, the viscosity of the oil may be too high for operation at cold temperatures and a different oil viscosity required.

  - Idle the engine to warm up the hydraulic oil.

  - Check the condition of the oil filters on the monitor under the "Hyd System Info" section of the monitor.

Note: The hydraulic oil temperature should be above 40C for a valid indication of the filter condition.

- Drive at a low speed to allow time for the oil in the axles to warm up.



Hydraulic System Information 220111

Considerations for Cold Weather Starting and Operation

Note: Also refer to the “CAT Operation and Maintenance Manual" for additional information on Cold Weather Starting.

- Use Winter Grade Fuel.
  - When temperatures fall below 0°C (32°F), winter grade fuel is best suited for cold weather operation.
  - See your fuel dealer for cold weather fuel requirements in your area.

- Remove condensation in the fuel tank.
  - Fill the fuel tank after each operating day to prevent condensation in the fuel tank and water entering the fuel system.
  - Open the fuel tank drain valve to remove water from the fuel tank.
    - See Section 7 for procedures to drain water from the fuel tank.

- Use engine oil with a viscosity suitable for the temperature range.
  - See Section 7 for a suggested Oil Viscosity chart.

- Keep batteries at full charge and kept warm.
  - Battery posts should be clean and able to make a good electrical connection to cables.

- Cooling system has a minimum of 50% ethylene glycol solution for protection to -37°C (-34°F).
    - 60% solution will give protection to -51°C (-60°F).
  - See Section 7 for more coolant information.
  - Also check the CAT manual for more information.

- Check the crankcase breather.
  - Crankcase ventilation gases contain water vapor that can freeze in cold temperatures.
    - A plugged ventilation hose can damage the system.

- Winterfronts
  - Use of fabric, cardboard, or solid winterfronts is <u>not</u> recommended.

- Remove snow buildup that may have accumulated on the radiator screens. The snow will restrict the air flow through the radiators.

Engine Starting with Jump Start Cables

Note: The engine uses a 24 volt electrical system. Jump start only with an electrical system of 24 volts.

- Do not use a power source with a voltage other than 24 volts. Using a higher voltage power source will damage the machine electrical system.

- Using a lower voltage source could damage the electrical system of the power source.

- Batteries can give off flammable fumes that can explode resulting in personal injury.
- Prevent sparks near the batteries. Sparks could cause vapors to explode. Do not smoke when checking battery electrolyte levels.
- Battery electrolyte is an acid and can cause personal injury if it contacts skin or eyes. Always wear eye protection when starting a machine with jump start cables. Use of gloves is recommended.
- Improper jump start procedures can cause an explosion resulting in personal injury.
  Do not allow the jump start cable ends to contact each other or the machine.

1. Engage the parking brake (2) on the machine needing the jump start.

2. Place the joystick (1) into the neutral position.
3. Turn the machine start switch in the cab to the OFF position.

4. Turn off all lights and accessories on the machine.

Park Brake On, Joystick to Neutral, Throttle Low Speed
219206C

5. Turn the battery disconnect switch (1) of the stalled machine to the OFF position to prevent damage to electrical components while connecting the battery cables.
   - The amber light (2) should be off.

6. When starting from another machine, make sure that the machines do not touch.

7. Stop the engine of the machine that is being used as an electrical source.
   - If using an auxiliary power source, turn off the charging system.

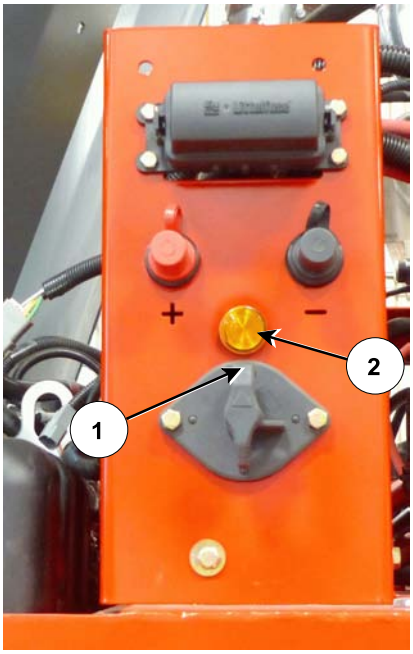
8. Remove the plastic covers on both jump starting posts of the mixer.

9. Connect the 24 volt battery positive (+) to the positive (+) jump post located on the machine.

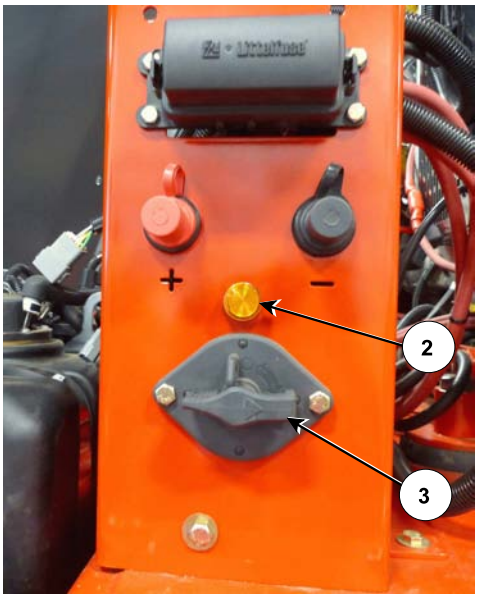
10. Connect the 24 volt battery negative (-) to the negative (-) jump post. Connect the negative cable last.

    Improper jump start cable connections can cause explosion of the batteries resulting in personal injury.

11. Turn the battery disconnect switch (3) on the stalled machine to the ON position.



Turn Off Battery Switch 219258C



Turn On Battery Switch 219258C

12. Start the engine of the machine that is being used as an electrical source or energize the charging system on the auxiliary power source.

13. Wait at least two minutes before attempting to start the stalled machine.
    - This time will allow the batteries in the stalled machine to partially charge.

14. Start the stalled engine.

    Ensure adequate ventilation when operating the machine in enclosed buildings
    Breathing high levels of engine exhaust fumes could result in death or serious injury.

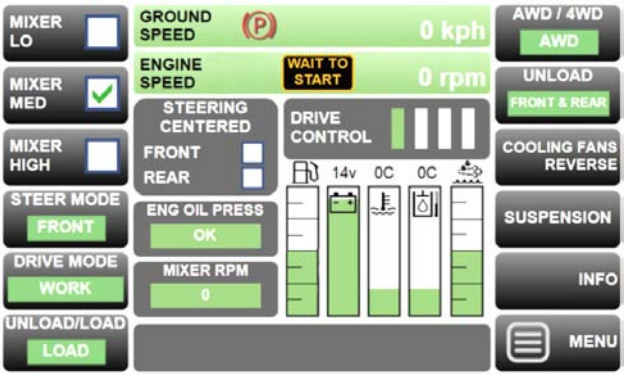
    Stay clear of hot engine exhaust gas and hot exhaust system
    Contact with the hot exhaust could result in death or serious injury.

    - Turn the key switch to the "On" position.
    - A "Wait to Start" message will appear on the Engine Spped bar on the Display.
      - Pre-heaters at each cylinder are warming the intake air.
    - The message will remain on the Display until the preheat temperature has been satisfied.

15. When the "Wait to Start" message goes out, turn the key to Start and crank the engine.

16. Immediately after you start the stalled engine, disconnect the jump start cables.

17. Install the plastic covers on both jump starting posts.



Wait To Start 220093

Install Post Covers 219258

Starting After Running Out of Fuel

1. Fill the fuel tank.

2. Check the level of the DEF in the DEF tank.
   - Fill if necessary.

3. Turn the key switch to the Run position to start the electric fuel prime pump and bleed air from the fuel system.

   - Allow the pump to run for 30 seconds to 1 minute before restarting.
     - The fuel pump will turn off after 1 minute.

4. Turn the key to the Off position.

5. Turn the key to the Run position.
   - The "Wait to Start" message will be on the display.

6. Crank the engine when the "Wait to Start" message goes out.

Fill the Fuel Tank 219249

Check DEF Tank Level and Add If Needed 219390

Table of Contents for Section 6 - Operating the AccuMix

Operating the AccuMix

Cutting and Mixing - General Considerations

Note: It is highly recommended to consult with a feed nutritionist when planning the rations, the mixing time and cut length. A feed nutritionist is able to provide the information needed to optimize the ration mix that is best suited for the herd. Follow the nutritionist's recommendations to ensure the best results with the AccuMix 1000S.

Note: It is the operator's responsibility to ensure that the materials in the feed mix are suitable for livestock feeding.

The cutting and mixing of materials with the AccuMix 1000S will differ with the various feeds and the weather conditions. Mixing times will vary depending on the mix of materials.

Using the milling head will partially cut material before it enters the mixing tub. The milling head reduces the overall cutting time required in the tub. Additional cutting does occur during the mixing cycle so caution should be used to not over cut the materials. Follow the nutritionist's recommendations for mixing times to ensure the best results with the AccuMix 1000S.

When mixing beyond a certain amount of time the mix quality may deteriorate. An extended mixing time or a high speed of rotation causes heating of the product because of the contact with the surface of the screws and tub walls.

The ideal mix will be light, fluffy and uniform. Hays/straws will be cut cleanly at short lengths and no clumping of feed will be visible.

The regular use of a particle separator helps to ensure accuracy of the mix.

Transporting the AccuMix

Transporting On Public Roads

1. On the Display choose:

   - Select Front as the Steer Mode.
     - Center the Front and Rear wheels before selecting the Steer Mode.
     - Select Front Wheel from the pop-up.

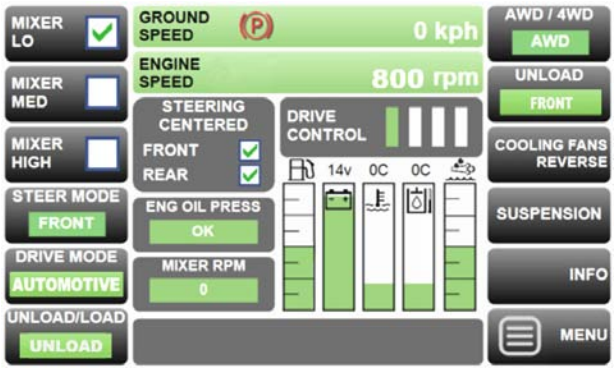
   - Select AWD
     - 4WD cannot to be used when in Automotive Drive Mode.

   - Ensure that the milling functions are turned off with the joystick button.
     - Electronic interlocks check this before switching to the Automotive Drive mode.

   - Ensure that unloading functions are turned off with the joystick button.
     - Electronic interlocks check this before switching to the Automotive Drive mode.

   - Raise the milling arm to the Travel position range.
     - Electronic interlocks require the arm to be raised to be within the Travel position range before switching to the Automotive Drive mode.

   - Select the Drive Mode as Automotive to use the foot pedal for speed control.
     - Engage the Parking brake switch.
     - Press Drive Mode and a pop-up will give the option of Automotive.
       - The transfer case will shift into the higher gear.
       - The speed control through the joystick is disabled.
       - The joystick is only used to choose the direction of travel.



Driving on Public Roads 220105

Steer Mode Selection PopUp 218208


Raise Arm to Travel Position 219286

Drive Mode Selection PopUp 218213


Move Joystick for Direction of Travel 220055

2. Drive according to the road conditions.

Do not allow riders ride on the outside of the machine.
Falling from the moving machine can cause serious injury or death.

Note: If the seat switch is deactivated (driver not in the seat) for more than 5 seconds during travel the machine will come to a stop at the maximum deceleration.

- Reduce speed when driving on icy, wet or graveled surfaces.

- Avoid holes, ditches, sharp turns, hill sides and obstructions.
- Always operate the flashing lights when traveling on a highway or public roads, except where prohibited by law.

- Follow local regulations for equipment lighting and marking.

Drive According to Conditions 219328

3. Maximum travel speed:

- The maximum speed is 25 mph (40 kph) with an unloaded tub.
  - with the small lug tires.
  - with the large lug tires.

- The small lug tires have a speed rating up to 25 mph (40 kph) for tub loads from empty to 24,000 lbs (5600 kg).

- The large lug tires have a speed rating based on the size of load in the mixing tub.
  - The maximum travel speed rating is 25 mph (40 km/h) with a load of 12,500 lbs (5600 kg).
  - Refer to the chart for speeds for other tub loads.

Speed	Max. Tub Load
10 mph (16 kph)	24,000 lbs. (11,000 kg)
15 mph (25 kph)	18,000 lbs. (8,100 kg)
20 mph (32 kph)	14,000 lbs. (6,500 kg)
25 mph (40 kph)	12,500 lbs. (5,600 kg)

Large Lug Tires Speed/Load Rating

Transporting To the Loading or Unloading Site (not on Public roads)

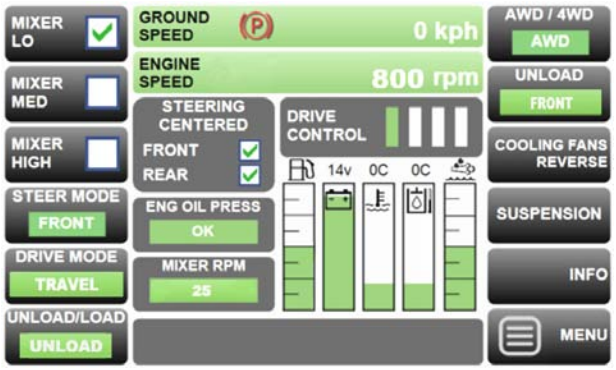
1. On the Display:

   - Select Front as the Steer Mode.
     - Center the Front and Rear wheels (as indicated on the display) before selecting the Steer Mode.
     - Select Front Wheel from the pop-up.

   - Select AWD.
     - 4WD cannot to be used when in Travel Drive Mode.

   - Raise the milling arm to the Travel position range.
     - Electronic interlocks require the arm to be raised to be within the Travel position range before switching to the Travel drive mode.

   - Select Travel as the Drive Mode.
     - Fully stop the machine.
     - Engage the Parking brake switch.
     - Press Drive Mode and a pop-up will give the option of Travel.
       - The transfer case will shift into the lower gear.
       - The speed control through the joystick is enabled.
         - The joystick is also used to choose the direction of travel.



Travel to Loading/Unloading Site 219290

Steer Mode Selection PopUp 218208


Raise Arm to Travel Position 219286

Drive Mode Selection PopUp 218213


Move Joystick for Direction & Speed of Travel 220055

2. Move the joystick forward to drive and control the speed of forward travel.

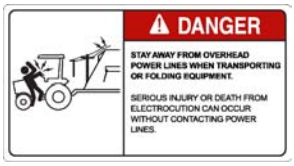
Do not allow riders ride on the outside of the machine.
Falling from the moving machine can cause serious injury or death.

Note: If the seat switch is deactivated (driver not in the seat) for more than 5 seconds during travel the machine will come to a stop at the maximum deceleration.

- Move the joystick backward to drive and control the speed of backward travel.

3. Drive according to the conditions.

Stay away from overhead power lines.
Serious injury or death from electrocution can occur without contacting power lines.



- Reduce speed when driving on icy, wet or graveled surfaces.
- Avoid holes, ditches, sharp turns, hill sides and obstructions.

4. Maximum travel speed:

- The small lug tires have a speed rating up to 25 mph (40 kph) for tub loads from empty to 24,000 lbs (5600 kg).

- The large lug tires have a speed rating based on the size of load in the mixing tub.
  - The maximum travel speed rating is 25 mph (40 km/h) with a load of 12,500 lbs (5600 kg).
  - Refer to the chart for speeds for other tub loads.

Speed	Max. Tub Load
10 mph (16 kph)	24,000 lbs. (11,000 kg)
15 mph (25 kph)	18,000 lbs. (8,100 kg)
20 mph (32 kph)	14,000 lbs. (6,500 kg)
25 mph (40 kph)	12,500 lbs. (5,600 kg)

Large Lug Tires Speed/Load Rating

Loading Materials With the Milling Arm

Loading from a Silage Pile

1. Ensure the front and rear unloading doors on the tub are closed.

    - On the Display select Unload.

    - Use the joystick buttons to lower the front and rear doors.

Ensure Front Tub Door Is Closed 219274

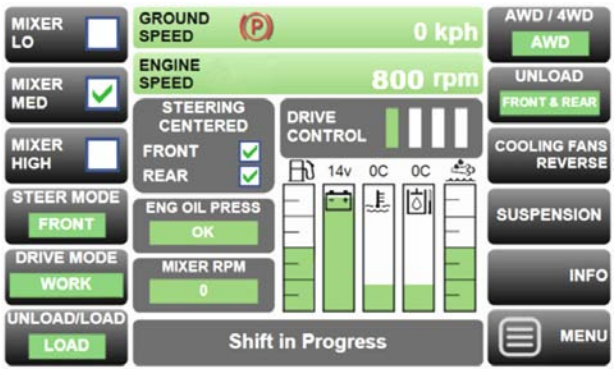
Ensure Rear Tub Door Is Closed 220129

2. Select Work as the Drive Mode.

    - Fully stop the machine.

    - Engage the Parking Brake switch.

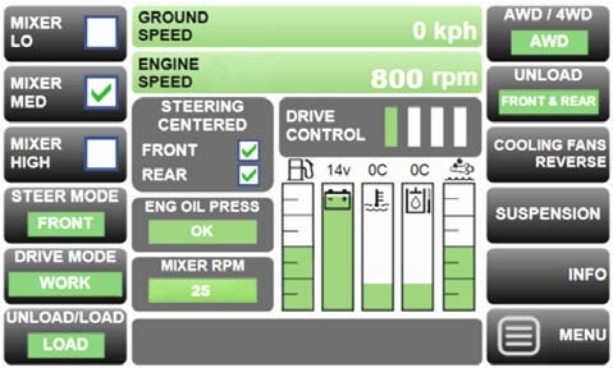
    - Press Drive Mode and a pop-up will give the option of Work.
        - The transfer case will shift into the lower gear.
        - The speed control through the joystick is enabled.
            - The joystick is also used to choose the direction of travel.



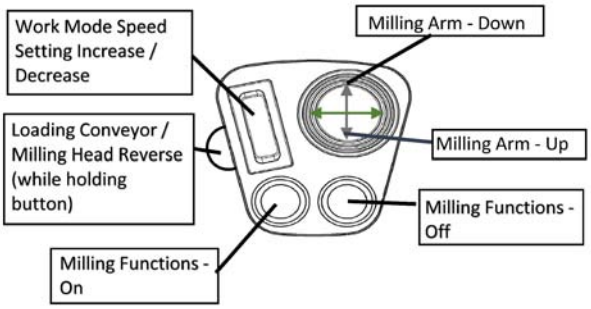
Select Drive Mode 220106

Drive Mode Selection PopUp 218213

3. On the Display select Load to activate the joystick Load functions.



Select Load 220107



Joystick Button Load Mode Functions 219230

4. Release the Parking Brake.

5. Raise the milling arm to about 3 feet from the ground.

6. Drive up to the silage pile.
   - Stay back about 3 feet.

7. Position the machine so the milling head is parallel to the face of the pile.
   - This will reduce the damage to the surface of the product and leave a uniform and compact wall.

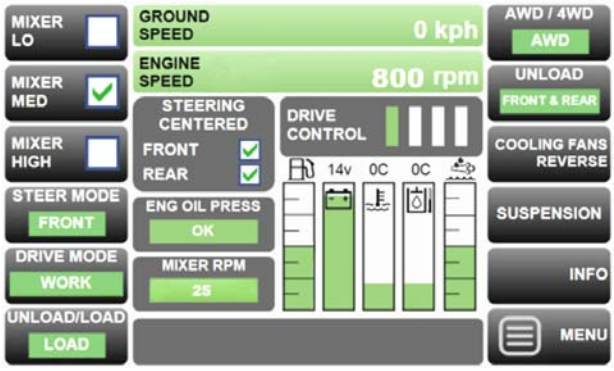
   Note: It is the operator's responsibility to ensure that the materials in the feed mix are suitable for livestock feeding. Some of the silage cover material will be discharged with the feed if the cover material is contacted by the rotating milling head.

Position Milling Head 219276

8. Select one of the mixing screws speeds on the display.

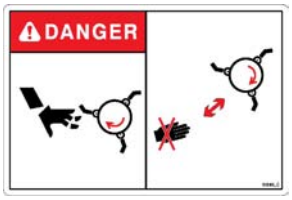
Do not enter tub while the mixers are turning. Entering the tub when the mixers are turning will result in serious injury or death.

- The mixer speed rpm presets can be adjusted.
  - See the Display Control Section, Menu, Operation Settings.
- The Mixer RPM for the chosen setting will be shown on the display.



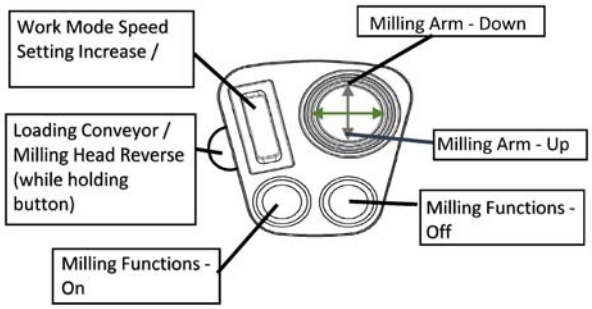
Start the Mixing Screws 220107

9. Start the milling head and loading conveyor.



Keep people back from the milling arm.
Contact with moving milling teeth and auger will cause serious injury or death.
Keep hands out of the milling area of the milling arm when the drum is rotating.

- Push the joystick button to start the of the milling head and the loading conveyor functions.



Joystick Load Functions 219212

- The milling head speed can be adjusted.
  - See the Display Control Section, Menu, Operation Settings.
- The loading conveyor speed can be adjusted.
  - See the Display Control Section, Menu, Operation Settings.

10. Raise the milling arm to the top of the silage feed pile.

11. Drive up to the silage pile until the material starts to move onto the loading conveyor and into the tub.

12. Stop driving forward and apply the brakes to keep machine stationary.

13. Lower the arm at a rate that maintains a consistent flow of material into the mixing tub.

Stand clear of the milling arm when it is lowering.
Contact with the milling arm while lowering will result in death or serious injury.
Do not allow people near the milling arm when being moved.

- Take about 3 or 4 inches from the face of the pile with each pass.
  - If the loading is too aggressive the milling head may stall.
    - If the milling head stalls, back away from the pile to allow the milling head to start again.
- If a large amount of wet material is loaded onto the conveyor it may stall.
  - If the conveyor stalls, reverse the conveyor to clear it and get the conveyor moving again.
    - Press the milling head reverse button on the side of the joystick.
  - The loading conveyor speed may need to be increased to clear material faster during loading.
    - The loading conveyor speed can be adjusted in Menu, Operating Settings.

14. After each pass clean up the material that falls down.
    Note: If on a non-paved surface avoid picking up dirt or debris.

Raise Milling Arm to Top of Pile 219278

Lower Arm While Loading 219280

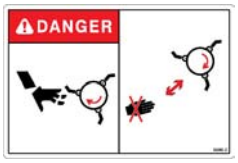
15. Check the tub camera display to ensure material is going into the tub and landing near the center of the tub.
    - Adjust the loading conveyor speed if needed to have material land near the center of the tub.
        - The loading conveyor speed can be adjusted in Menu, Operating Settings.

Check Tub Camera for Material Landing Near the Center of Tub 220073

<u>If the milling head plugs:</u>

- Use the momentary switch on the joystick to reverse and then forward the milling head/conveyor a number of times until the milling head/conveyor moves and the plug is removed.

- If reversing the milling functions does not clear the plug it will need to be removed manually.



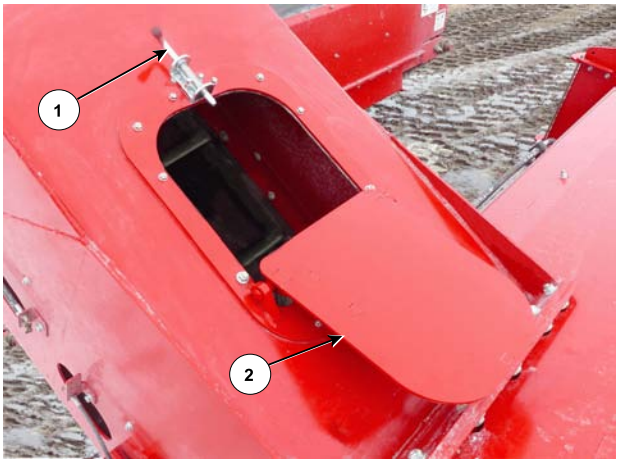
Contact with moving milling teeth and auger will cause serious injury or death.

<u>To Manually Remove Plugging of the Milling Head</u>:

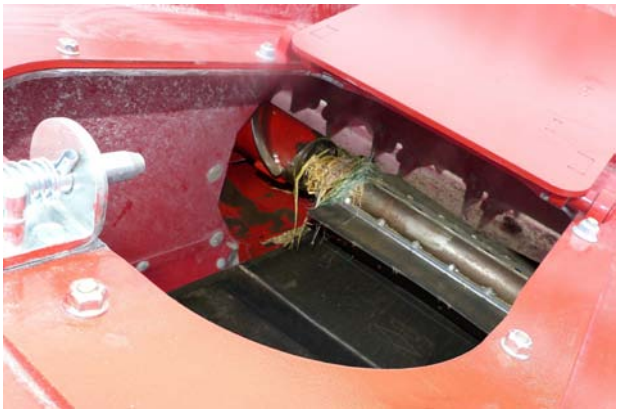
- Lower the loading arm to the ground.
- Shut the machine off.
- Remove the key.
- Shut off and lock the battery switch.

- Open the loading arm access panel (2) upwards.
    - Pull the spring loaded lever (1) and move the panel upwards.
- Remove the material from around the auger area behind the milling head.

- If frequent plugging is occurring adjust the milling head and loading conveyor speed.
    - See Section 3 "AccuMix Display/ Control" on adjusting speeds.



Open the Loading Access Panel 220071C



Clear Plugging from the Milling Auger Area 220152

16. Monitor the weight of material loading by watching the weigh scale display.
    Note: Refer to the weigh scale manual for information on using the weigh scale monitor.

    - Add materials according to the ration recommended by the animal nutrionist.

17. When at the bottom of the pile, raise the milling arm to the top of the pile and drive forward.
    - Lower the arm to load more material.

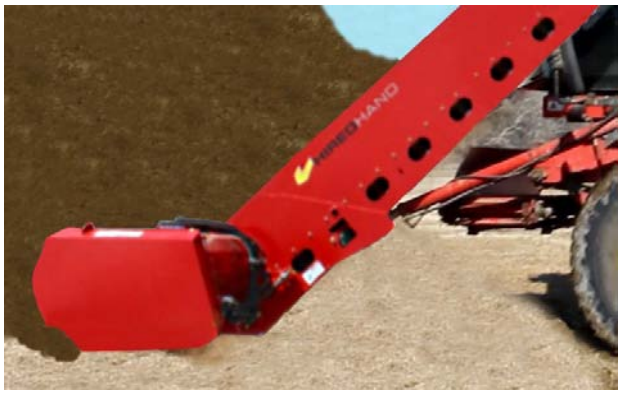
Monitor Weight While Loading 220041

18. Before the total weight of the ration has been loaded, lower the arm and drive forward to collect material that has fallen to the ground.
    Note: If on a non-paved surface avoid picking up dirt or other debris.

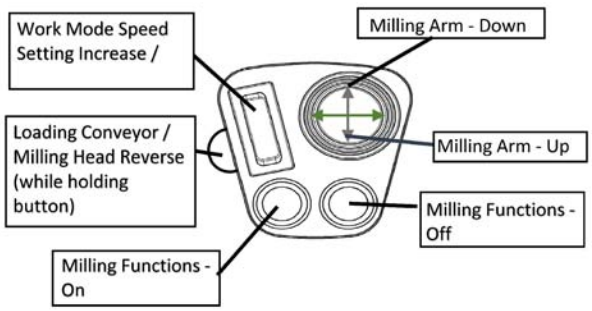
19. As material is loaded the machine suspension will rise to maintain a minimum ride height as preset through the display.

20. When the weight of material has been achieved as shown on the weigh scale display, reverse the milling head and the loading conveyor to move material back into the pile.
    - Press the momentary switch on the joystick to reverse the milling head and loading conveyor.
      - Release the button to resume milling the head and conveyor movement.

21. To stop the milling functions push the joystick button for milling functions off.



Collect Material That Has Fallen 220075-2



Joystick Load Functions 219212

Loading Bales with the Milling Head

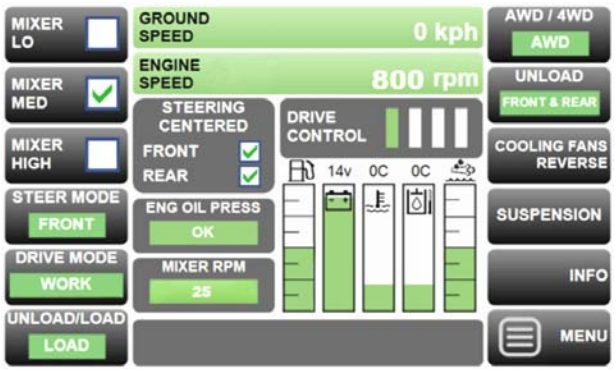
1. Have the bales positioned on the ground in a stable manner.

2. Before loading bales remove the twine/wrap or other materials from the bales to prevent the twine/wrap or other material from being in the ration mix or becoming entangled in the machine.

   Note: It is the operator's responsibility to ensure that the materials in the feed mix are suitable for livestock feeding. Some of the wrapping material (twine, net wrap, silage plastic wrap or other materials) will be discharged with the feed if the wrapping materials are not removed prior to loading.

3. On the Display select Load to enable the joystick for milling functions.

Loading Bales from the Ground 219281



Select Load and Mixer Speed 220107

4. Start the mixing screws by selecting a mixing screw speed on the Display.

Do not enter the tub while the mixers are turning. Entering the tub when the mixers are turning will result in death or serious injury.

- The mixer speed rpm presets can be adjusted.
  - See the Display Control Section, Menu, Operation Settings.

- The Mixer RPM will be shown on the display.

5. Start the milling functions.
   - Push the joystick button to turn the milling functions on.

Keep people back when loading with the milling arm.
Do not operate within 100 ft (30m) of any person.
Contact with moving the milling teeth and auger will cause serious injury or death.
Keep hands out of the milling area of the milling arm when the drum is rotating.

   - The milling head speed can be adjusted.
     - See the Display Control Section, Menu, Operation Settings.

   - The loading conveyor speed can be adjusted.
     - See the Display Control Section, Menu, Operation Settings.

6. Drive up to the bales.

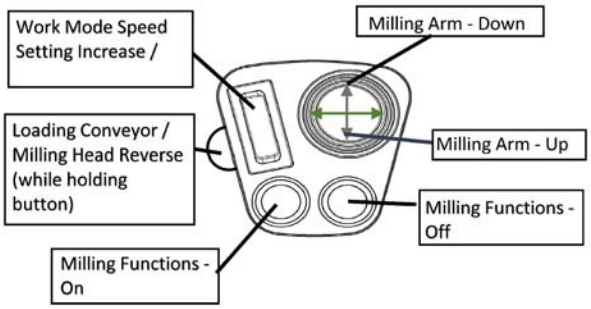
   - The bale can be loaded by lowering the arm after 3-4 inches of engagement.

   - The bale can also be loaded by taking layers off the bale by driving forward along the bale then backing up and moving the arm down to take off another layer.

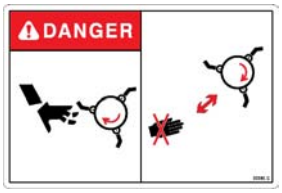
<u>If the milling head plugs</u>:

   - Back the machine away from the material.

   - If the head fails to restart, use the momentary switch on the joystick to reverse and then forward the milling head/conveyor a number of times until the plug is removed.



Joystick Load Functions 219212



Milling Bales 219282

- If the loading conveyor stalls, stop loading and either back away or lift the milling head.
  - Use the momentary button on the joystick to reverse and then forward the milling head/conveyor a number of times until the plug is removed and the conveyor starts moving freely.

- If reversing the milling functions does not clear the plug it will need to be removed manually.

Contact with the moving milling teeth and auger will cause serious injury or death.

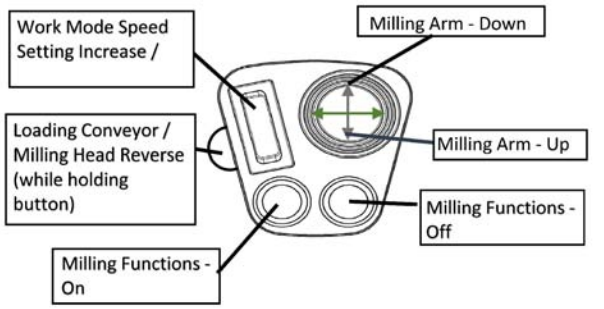
<u>To Manually Remove Plugging of the Milling Head</u>:

- Lower the loading arm to the ground.
- Shut the machine down.
- Remove the key.
- Shut off and lock the battery switch.

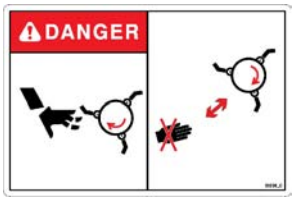
- Open the access panel (2) on the top of the arm.
  - Pull the spring loaded lever (1) and move the panel <u>upwards</u>.

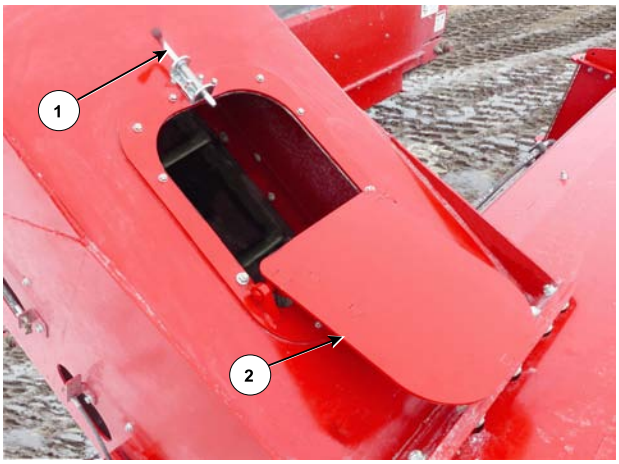
- Remove the packed material from around the auger area and loading conveyor.

- If frequent plugging is occurring try increasing the loading conveyor speed.
  - See Section 3 "AccuMix 1000S Display/Control" for information on adjusting speeds.

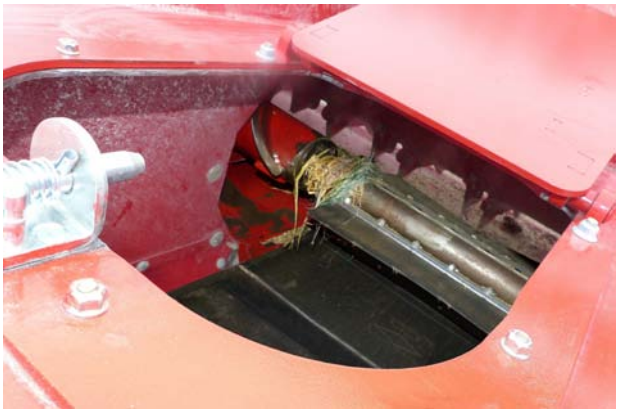


Joystick Load Functions 219212





Open the Loading Access Panel 220071C



Clear Plugging from Milling Conveyor Area 220152

7. Monitor the weight of material loading by watching the weigh scale display.

   Note: Refer to the weigh scale manual for information on using the weigh scale monitor.

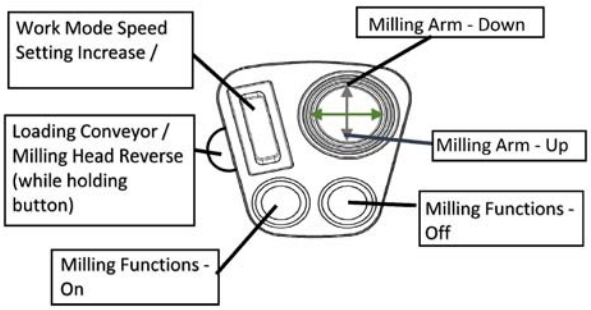
   - Add materials according to the ration mix recommended by the animal nutrionist.

8. As material is loaded the machine suspension will rise to maintain a minimum ride height as preset through the display.

Monitor Weight While Loading 220041

9. When the weight of material has been achieved as shown on the weigh scale display, reverse the milling head and the conveyor to move material back into the pile.

   - Press the momentary joystick button on the left side of the joystick to reverse the milling head and loading conveyor.
     - Release the button to resume milling head and conveyor movement.



Joystick Load Functions 219212

Loading Chopped Forage or Loose Grain with the Milling Head

1. On the Display select Load to enable the joystick for milling functions.

2. Start the mixing screws by selecting a mixing screw speed on the Display.

Do not enter the tub while the mixers are turning. Entering the tub when the mixers are turning will result in death or serious injury.

- The mixer speed rpm presets can be adjusted.
  - See the Display Control Section, Menu, Operation Settings.
- The Mixer RPM will be shown on the display.

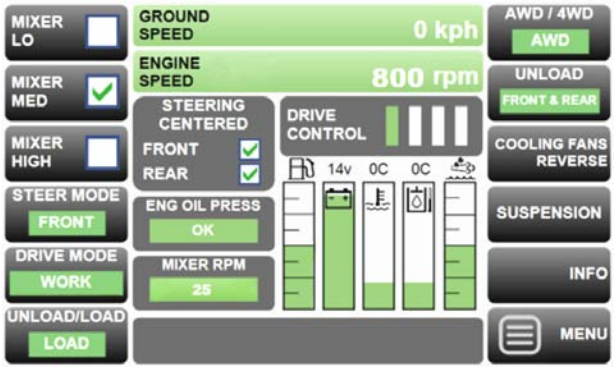
3. Start the milling functions.

Keep people back when loading with the milling arm.
Do not operate within 100 ft (30m) of any person.
Contact with moving milling teeth and auger will cause serious injury or death.
Keep hands out of the milling area of the milling arm when the drum is rotating.

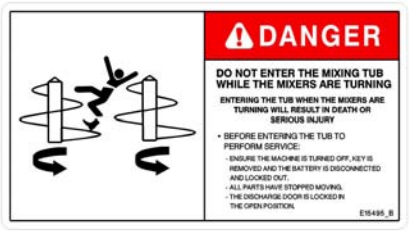
- Push the joystick button to turn the milling functions on.

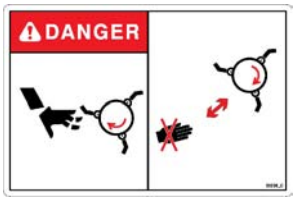
Note: It is the operator's responsibility to ensure that the materials in the feed mix are suitable for livestock feeding.

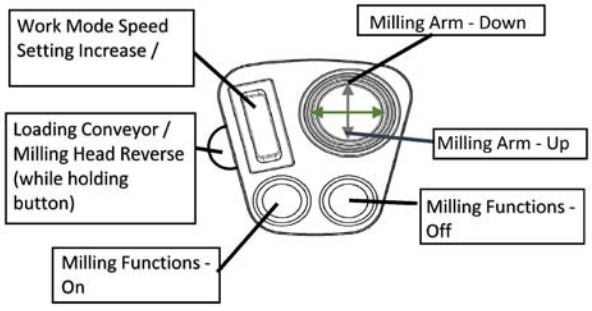
- The milling head speed and loading conveyor speed can be adjusted.
  - See the Display Control Section, Menu, Operation Settings.



Select Load and Mixer Speed 220107







Joystick Load Functions 219212

- For chopped forage:

  - Drive into the pile so that material does not go over the top of the milling head.

  - Back up and lower the milling head and drive in again.

  - Check the tub camera to ensure material is going into the tub and landing near the center of the tub.
    - Adjust the loading conveyor speed if needed to have the material land near the center of the tub.
      - The loading conveyor speed can be adjusted in Menu, Operating Settings.

    - Once the weight has been reached reverse the milling head and loading conveyor to clear the material out.

Check Tub Camera for Material Landing Near the Center of Tub 220073

- For loose grain or fine material:

  - Drive into the pile but do not have material go over the top of the milling head.

  - Stop and let the material feed into the head.
    - If there is too much dust or material being blown forward, reduce the milling head speed until it loads better.
      - The milling head speed can be adjusted in Menu, Operating Settings.

    - If the material is loading too fast into the tub, reduce the loading conveyor speed to get a manageable weight gain.
      - The loading conveyor speed can be adjusted in Menu, Operating Settings.

4. Monitor the weight of material loading by watching the weigh scale display.

   Note: Refer to the weigh scale manual for information on using the weigh scale monitor.

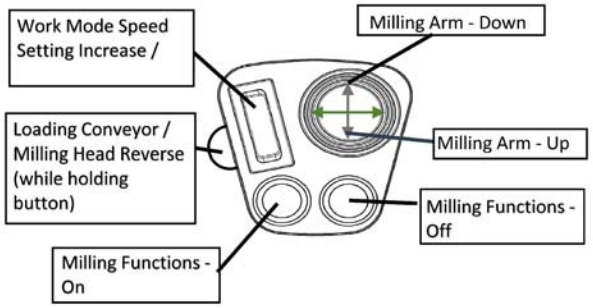
   - Add materials according to the ration mix recommended by the animal nutrionist.

Monitor Weight While Loading 220041

5. When the weight of material has been achieved as shown on the weigh scale display, reverse the milling head and the conveyor to move material back into the pile.

   - Press the momentary joystick button on the left side of the joystick to reverse the milling head and loading conveyor.
     - Release the button to resume the milling head and conveyor movement.

   - Once the weight has been reached, reverse the milling head and loading conveyor to remove the grain and light material.



Joystick Load Functions 219212

Adding Mineral or Supplements

1. Load bags/pails of minerals or supplements with the loading arm.

Contact with moving milling teeth and auger will cause serious injury or death.

Before working around the milling head:
- Park the machine on level ground.
- Engage the parking brake.
- Ensure the milling head is not rotating.
- Lower the loading arm to the ground.
- Have the mixing screws turning.

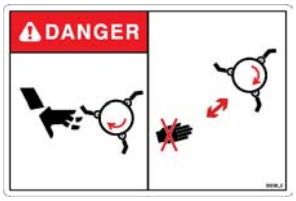
2. Open the access panel (2) on the top of the arm.
   - Pull the spring loaded lever (1) .
   - Move the panel (2) downwards to help direct the material onto the conveyor.

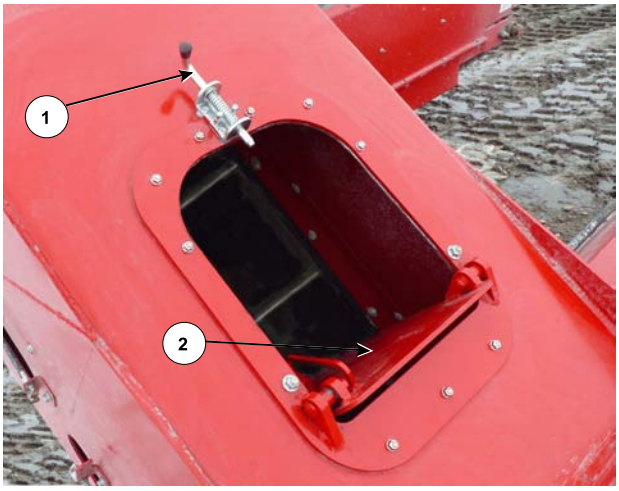
3. Press the switch on the side of the loading arm near the loading door to start the loading conveyor.
   - The loading conveyor will run for a set time and then stop.

4. Pour the minerals/supplements through the access panel opening according to the ration mix.

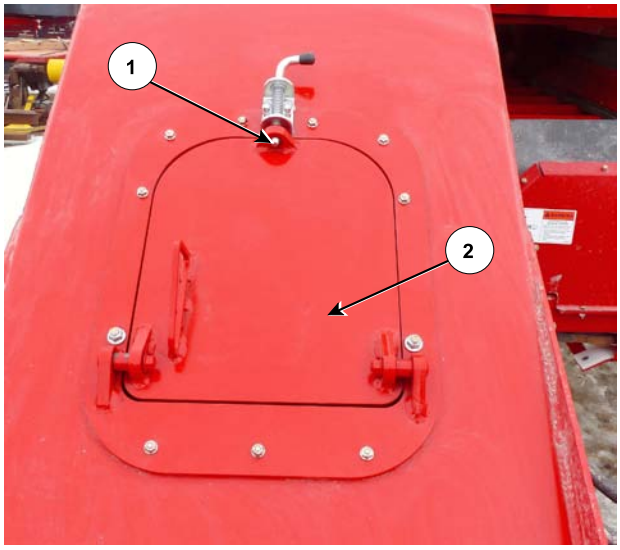
   Note: It is the operator's responsibility to ensure that the materials in the feed mix are suitable for livestock feeding. The mineral/supplement packaging material will be discharged with the feed if the packaging materials are allowed to enter the loading arm.

5. Close the access panel (2) and fasten with the spring loaded lever (1).





Open Access Panel for Adding Minerals 220076C



Close and Fasten the Access Panel 220077C

Adding Materials Using Another Machine or Under Augers or Piping

Materials can be added over the edge of the tub wall or from a bin.

1. Start the mixing screws by selecting a mixing screw speed on the Display.

   Do not enter the tub while the mixers are turning. Entering the tub when the mixers are turning will result in death or serious injury.

   - The mixer speed rpm presets can be adjusted.
     - See the Display Control Section, Menu, Operation Settings.

   - The Mixer RPM will be shown on the display.

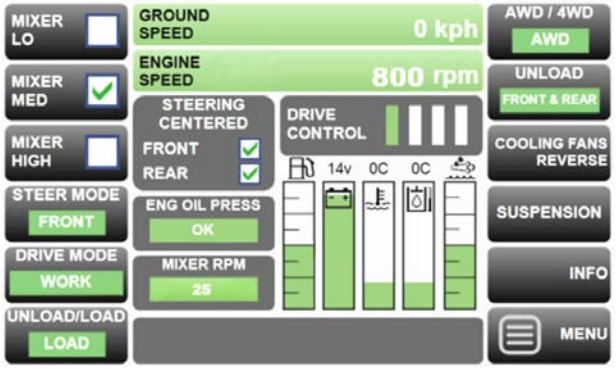
2. Have materials added by the other machine or from the bins.

   Note: It is the operator's responsibility to ensure that the materials in the feed mix are suitable for livestock feeding.

3. When loading from overhead augers or piping, drive under the output so that the material will land near the center of the tub.

   - CRAB steering can be utilized to get closer to the output.
     - Have the front and rear steering centered as shown on the Display
     - Press Steer Mode on the Display
     - Select CRAB from the popup.

4. As material is loaded the machine suspension will rise to maintain a minimum ride height as preset through the display.



Select a Mixing Screw Speed 220107


Materials Loaded from Another Machine 219283

Loading From Overhead Augers 219284

5. Monitor the weight of material as it is added by watching the weigh scale display.

   Note: Refer to the weigh scale manual for information on using the weigh scale monitor.

   - Add materials according to the ration mix recommended by the animal nutrionist.

6. When the weight of material has been achieved as shown on the weigh scale display, signal the operator of the loading machine that sufficient material has been added.

Monitor Weight While Loading 220041

Driving to the Feeding Site
(Not Public Roads)

1. Raise the milling arm to the Travel position.
   - Electronic interlocks require the arm to be raised to be within the Travel position range before switching to the Travel Drive mode.

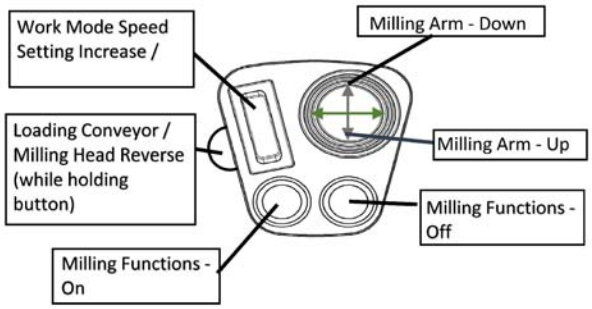
Raise Milling Arm to Travel Position 219286

Stand clear of the milling arm. Contact with the milling arm will result in death or serious injury.

- Select Load on the Display for the joystick to raise the arm.

- Use the joystick button to raise the milling arm to the travel position.

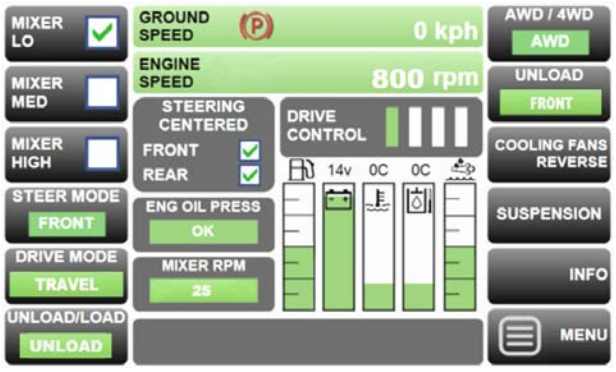
- Press the Info button on the display until the Operating Info is displayed for an indication when the milling arm is in the travel position.



Joystick Load Functions 219212

2. Select Front Wheel as the steer mode.

- Press Steer Mode on the Display.
  - The wheels must be centered to switch to Front Wheel Mode.
  - When the wheels are centered it will show check marks beside front and rear.



Center The Steering 219290

- A pop-up will display to select Steer Mode
  - Press the Front Wheel steer mode button.

Steer Mode 218208

3. Select AWD on the display.
   - 4WD is not available when in Travel Drive Mode.

4. Select Travel as the Drive mode which moves the transfer case into high gear.

   - Stop the machine with a foot on the brake.
   - Place the joystick in the Neutral position.
   - Engage the Parking brake switch.

   - On the Display press Drive Mode.
     - From the pop-up choose Travel mode.

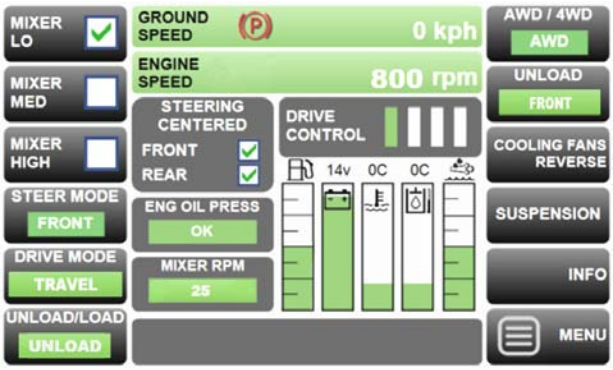
5. Set the engine speed with the dash throttle knob.
   - The foot throttle is not operational in Travel Mode.

6. Select a mixer speed to have the mixers turning while driving to the feeding site
   - To completely mix the materials.
   - To prevent the load from settling and compacting.

   Note: If traveling long distances to the unloading site, be aware that having the screws turning may:
   - Cut the material more than desired.
   - Cause material to separate out from the mix.

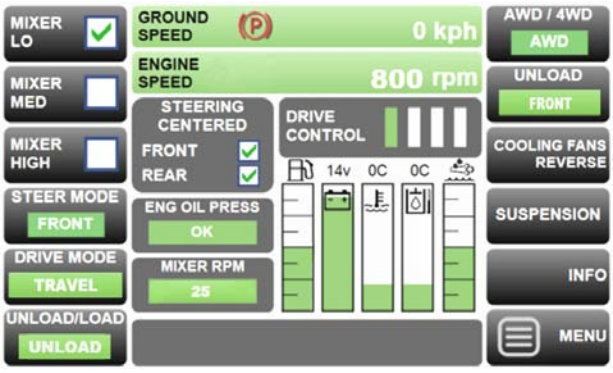
   - Consult with the animal nutrionist for the appropriate mixing time.

   - If the screws are turned off while traveling, be aware that the load may settle, especially with larger loads.
   - Load settling may make it more difficult for the screws to begin rotating again.



Select Travel Mode and AWD. 219290

Drive Modes 218213




Keep Mixing Screws Turning 219285

7. Use the joy stick to control direction of travel and speed of travel.

   - Push the joystick forward for forward travel.
     - The more the joystick is pushed forward the faster the machine will travel up to the throttle setting.
     - When the joystick is pulled back the machine will slow down.

   - To backup pull the joystick backward.
     - The more the joystick is pulled backward the faster the machine will travel up to the throttle setting.
     - When backing up the backup camera will show on the Display and the camera monitor.

   - Adjust the speed according to the terrain to maintain control and have the machine stable at all times.

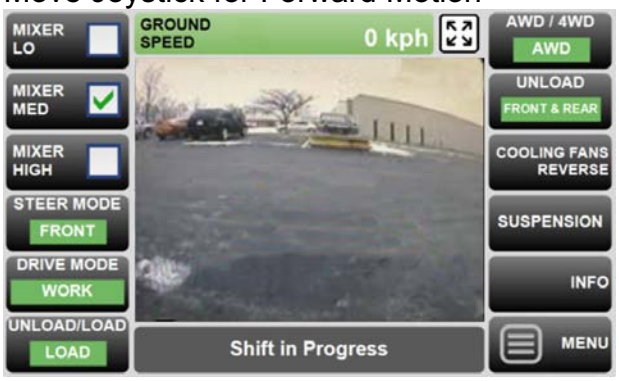
   Note: It is the operator's responsibility to decide if the weather, road or ground conditions permit safe operation on a hillside, slope, rough, slick or muddy surfaces.

8. Maximum travel speed:

   - The small lug tires have a speed rating up to 25 mph (40 kph) for tub loads from empty to 24,000 lbs (5600 kg).

   - The large lug tires have a speed rating based on the size of load in the mixing tub.
     - The maximum travel speed rating is 25 mph (40 km/h) with a load of 12,500 lbs (5600 kg).
     - Refer to the chart for speeds for other tub loads.

Move Joystick for Forward Motion 220055



Backup Camera on the Display 220089

Travel to Unloading Site 219287

Speed	Max. Tub Load
10 mph (16 kph)	24,000 lbs. (11,000 kg)
15 mph (25 kph)	18,000 lbs. (8,100 kg)
20 mph (32 kph)	14,000 lbs. (6,500 kg)
25 mph (40 kph)	12,500 lbs. (5,600 kg)

Large Lug Tires Speed/Load Rating

Unloading the Mix

Front Unloading

1. Leave the milling arm in the travel position to give visibility when driving.

2. Drive into the feeding lane or field with the mixing screws turning.

3. Stop the machine with a foot on the brake.

4. Place the joystick into the Neutral position.

5. Apply the Parking Brake switch.

6. Press Drive Mode on the display.
   - Select Work from the Drive Mode popup.

7. Select Unload on the display.

8. Select Unload Front on the Display.
   - This will enable joystick control of the front tub door and the front conveyors.

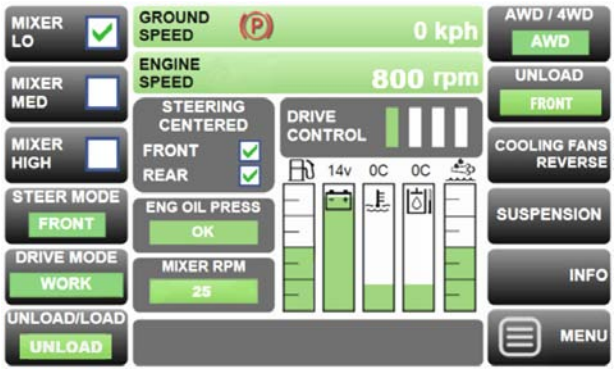
9. Use the joystick thumb control to move the unloading conveyor for left or right unloading.

Stay clear of the unloading conveyor.
Contact with the conveyor could result in death or serious injury.
Do not stand near the conveyor when the engine is running
The unloading conveyor could swing to the side suddenly and cause serious injury.

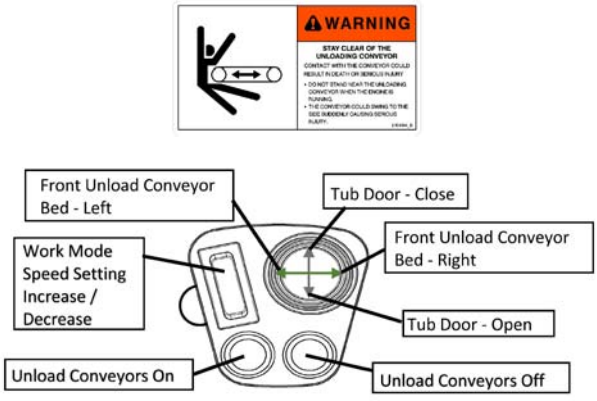
- If the arm is not raised high enough a sensor will prevent the conveyor from moving to the right.

Raise Arm to the Travel Position 219286

Drive Modes 218213



Choose Unload from Front 220102



Joystick Unload Functions 219211

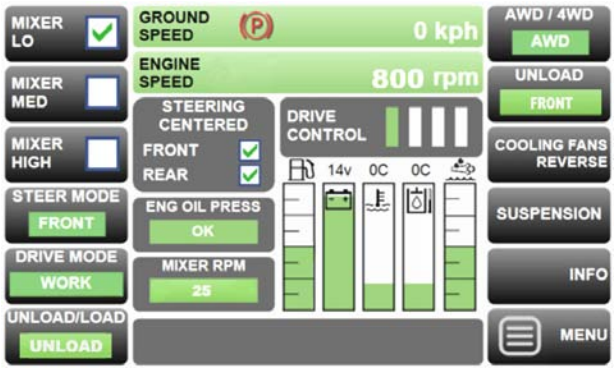
10. If the Optional High Bunk discharge is installed then only unloading to the left is available.
    - The front conveyor does not move to the right.

    - On the Display switch to Unload Front.

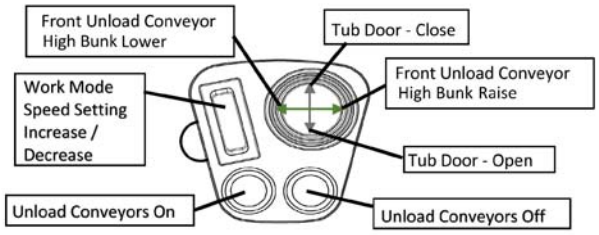
Stay clear of the bunk unload table when it is lowering.
Crushing could cause serious injury or death.

- The joystick buttons that were to move the front conveyor left/right are now used to raise and lower the conveyor for the bunk height.

    - Use the joystick buttons to raise the conveyor so that the material is unloaded into the bunk.



For High Bunk - Choose Unload from Front 220102



High Bunk Raise & Lower on the Joystick 220127

High Bunk Raised for Bunk Unloading 222040

11. Turn on the unloading conveyors with the joystick button Unload Conveyors On.

Start the Front Unload Conveyors 220212

Stand Clear of the Unloading Conveyor

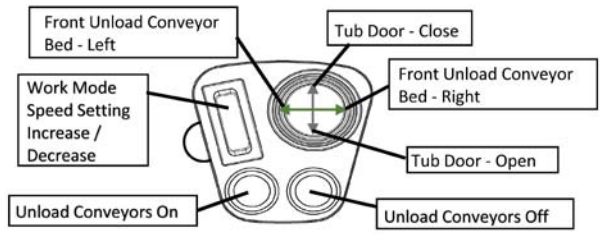
Keep body and clothing away from moving parts to prevent serious injury or death.

- The conveyor speed preset can be adjusted.
  - See the Display Control Section, Menu, Operation Settings.

12. Use the joystick thumb control to raise the front tub door

- The amount the door is opened will control the amount of feed exiting the mixing tub.

13. Drive forward to distribute the feed.



Joystick Unload Functions - Front Unload 219211

14. Control the amount of feed discharged by adjusting the following:

- Tub door opening
- Mixer speed
- Driving speed

Unload at the Feeding Stalls or in Field 219288

15. Monitor the scale indicator readings to evaluate the ration distribution to the unloading areas.

    Note: Refer to the weigh scale manual for information on using the weigh scale monitor.

Monitor the Ration with the Weigh Scale 220041

16. At the end of feeding empty any feed in the mixing tub to prevent it from settling and compacting.

Unload According to the Ration 219289

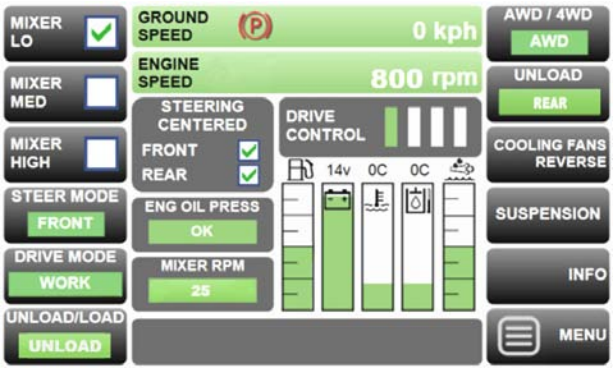
Rear Unloading to the Left

1. Leave the milling arm in the travel position to give visibility when driving.

Raise Arm to the Travel Position 219286

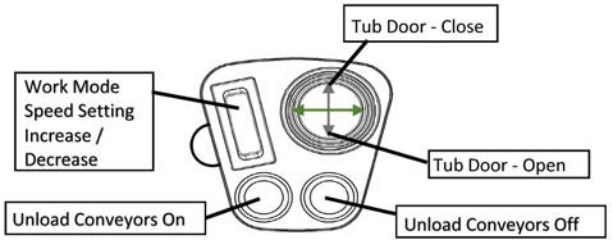
2. Continue to have the mixing screws turning.

3. Select Unload on the display.



Select Rear Unload 220108

4. Select Unload Rear on the Display.
   - This will enable joystick control of the rear tub door and the rear conveyor.



Joystick Unload Functions - Rear Unload 219291

5. Start the rear unloading conveyor by using the joystick button.
   - The conveyor will extend and then begin to rotate.

Start the Rear Unload Conveyor 219191

6. Use the joystick thumb control to raise the rear tub door to control the amount of feed exiting the tub.
   - There are number indications on the side of the tub to give a reference point for how much the rear tub door is open.

Raise Rear Tub Door 219292

7. Drive forward to distribute the feed.

8. Adjust the amount of feed discharged at each feeding stall by adjusting the following:

    - Tub door opening
    - Mixer speed
    - Driving speed

Feed Exiting Rear Tub Door 219192

9. Monitor the scale indicator readings to evaluate the ration distribution to the unloading areas.

    Note: Refer to the weigh scale manual for information on using the weigh scale monitor

10. At the end of feeding empty any feed in the mixing tub to prevent it from settling and compacting.

Monitor the Ration with Weigh Scale 219209

Stopping the Engine

Before stopping the engine after operating under load, idle the engine at a slower speed to cool hot engine parts.

- This idling time allows the engine and turbo charger temperature to decrease gradually.

- If the engine stops when operating under a load, start the engine immediately to prevent heat build up which is caused by the lack of oil flow for cooling and lubrication.

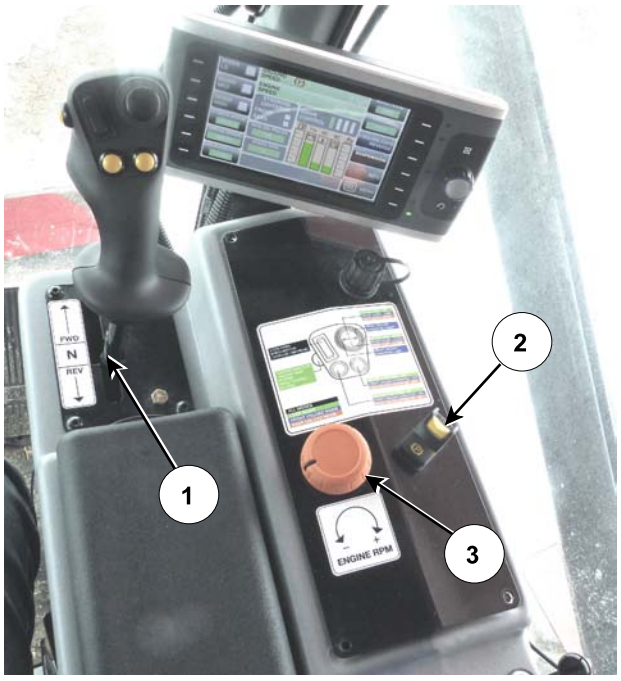
1. Slow the unit and bring the machine to a complete stop by moving the joystick control handle to the neutral position (1).

2. Press on the brake pedal.

3. Apply the parking brake switch (2).

4. Decrease the speed of the engine with the engine speed control knob (3) to 1200 rpm.
   - Idle the engine for 3 to 5 minutes.

5. Turn the key switch to the Off position to stop the engine. Remove the key from the switch.



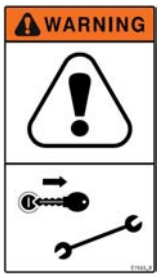
Joystick to Neutral, Park Brake On, Throttle Low Speed 220055C

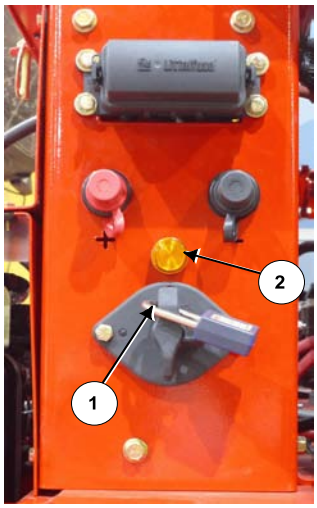
Engine Speed Control

Removing Settled Material That Is Causing the Mixing Screws To Not Turn

Shut down the engine before dismounting machine. Remove the key before doing this procedure.

1. Turn off the battery switch (1) and lock it to prevent accidental starting of the machine.
    - If the engine has been running wait until the amber light (2) goes out before turning the battery switch to ensure the engine emission cycle is complete.
2. Block the wheels of the machine to prevent any movement.

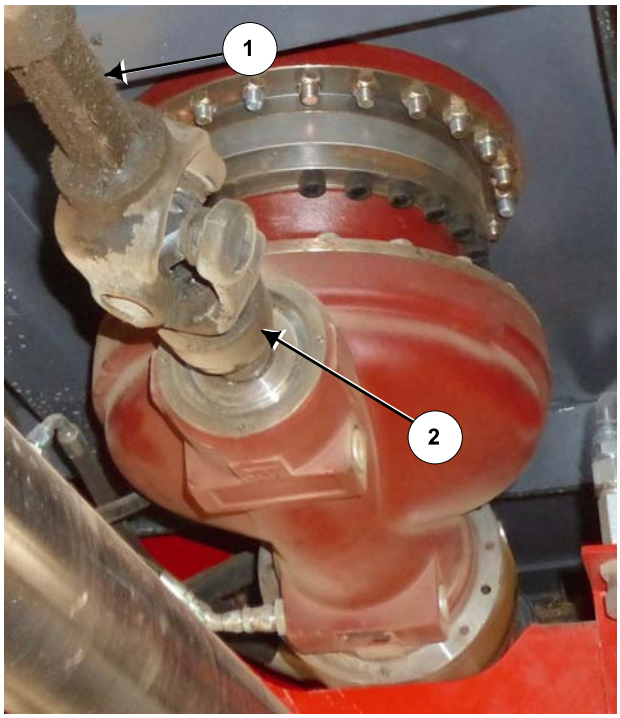




Turn Off Battery Switch and Lock 219258C

Disconnect the rear screw:

1. From underneath the machine disconnect the driveline coming out of the front screw gearbox.
    - This will allow the front screw to turn by itself.
    - Place a pipe wrench on the square sliding portion (1) of the drive line going to the rear screw.
        - Remove any torque that may be preventing the driveline quick connect (2) from being released.
    - Release the driveline quick connect (2) from the front screw gearbox.
        - Slide the driveline back.
        - Support the driveline going to the rear screw drive.



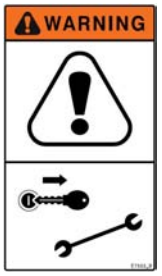
Disconnect Rear Screw Driveline 219375C2

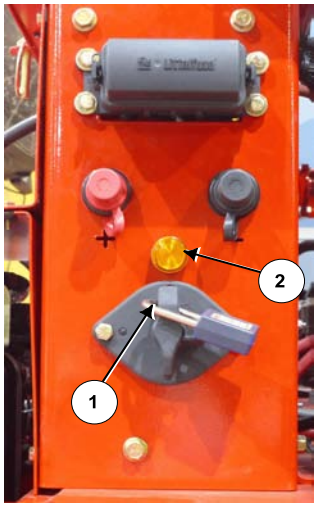
2. Turn on the battery switch.
3. Start the engine of the machine.
4. Select Unload Front on the display.
5. Open the front tub door using the joystick.
6. Start the front conveyors using the joystick.
7. Start the front mixing screw to remove material in the tub.

Reconnect the rear screw:

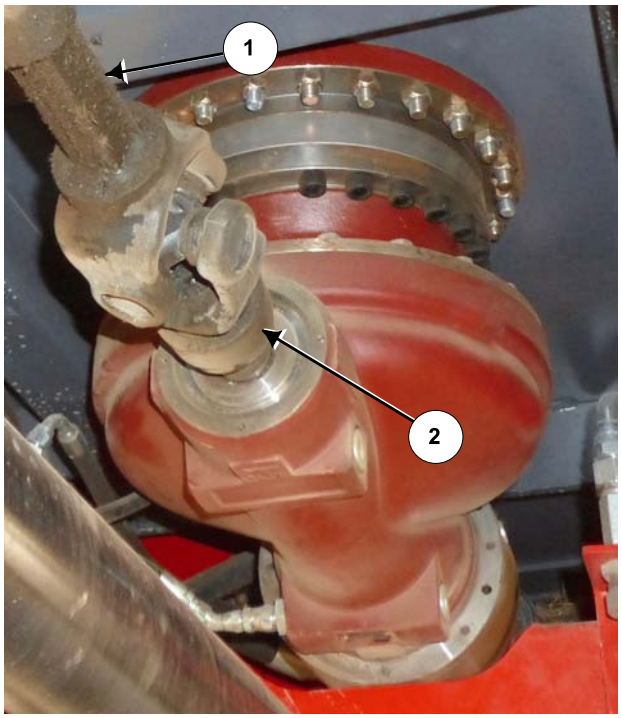
Shut down the engine before dismounting machine. Remove the key before doing this next procedure.

1. Turn off the battery switch (1) and lock it to prevent accidental starting of the machine.
   - If the engine has been running wait until the amber light (2) goes out before turning the switch to ensure the engine emission cycle is complete.
2. From underneath the machine reconnect the driveline at the front gearbox going to the rear screw gearbox.
   - Attach the driveline quick connect (2) to the front screw gearbox.
3. Start the engine of the machine.
4. Select Unload Front on the display.
5. Open the front tub door using the joystick.
6. Start the front conveyors using the joystick.
7. Start the mixing screws to remove the remaining material in the tub.





Turn Off Battery Switch and Lock 219391C



Reconnect the Driveline to Rear Screw 219375C2

Align the screws in the tub:

After all the material is removed from the tub the screws need to be positioned in the same orientation to each other.

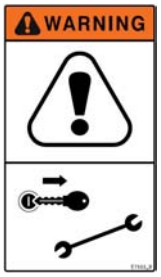
Shut down the engine before dismounting the machine. Remove the key before doing this next procedure.

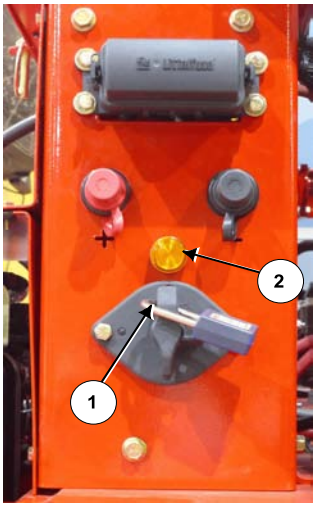
1. Turn off the battery switch (1) and lock it to prevent accidental starting of the machine.
   - If the engine has been running wait until the amber light (2) goes out before turning the switch to ensure the engine emission cycle is complete.

2. From underneath the machine disconnect the driveline coming out of the front screw gearbox.
   - This will allow the front screw to turn by itself.

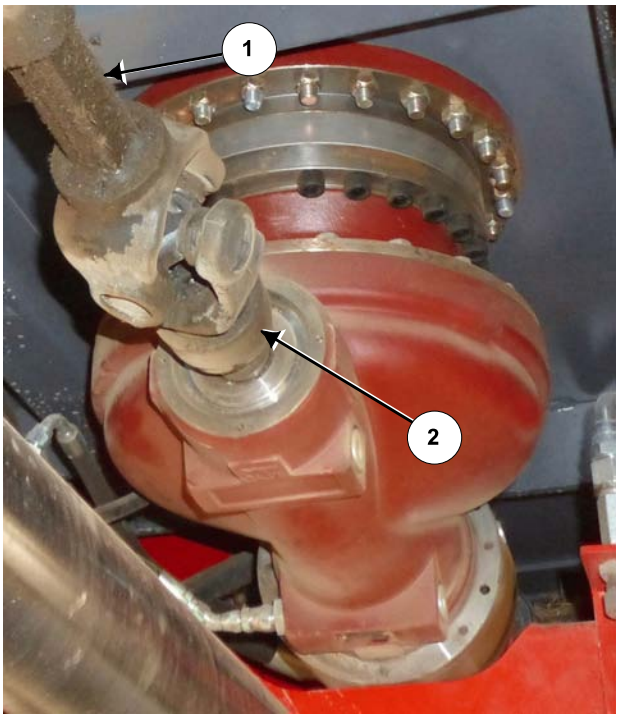
   - Place a pipe wrench on the square sliding portion (1) of the drive line going to the rear screw.
     - Remove any torque that may be preventing the driveline quick connect (2) from being released.

   - Release the driveline quick connect (2) from the front screw gearbox.
     - Slide the driveline back.
     - Support the driveline going to the rear screw drive.



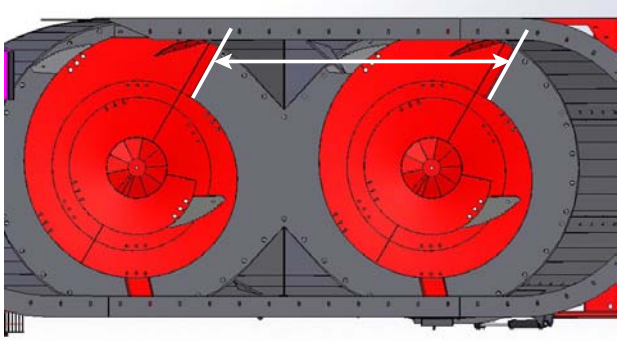


Turn Off Battery Switch and Lock 219391C



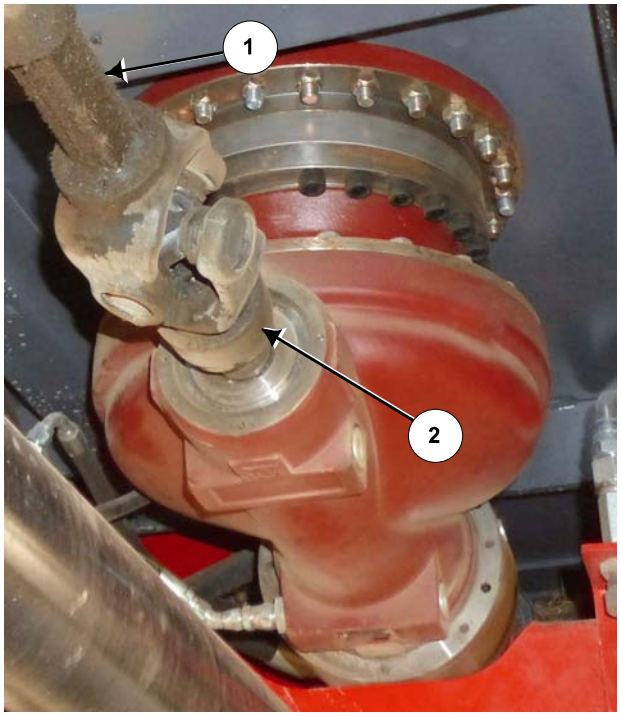
Disconnect Rear Screw Driveline 219375C2

3. Use a pipe wrench on the front gearbox shaft to turn the screw so that the leading edge of the front screw is in the same rotational position as the rear screw leading edge.
   - Take care to not harm the splines on the gearbox shaft.



Leading Edge of Screws in Same Position 219342C

4. From underneath the machine reconnect the driveline at the front gearbox going to the rear screw gearbox.
   - Attach the driveline quick connect (2) to the front screw gearbox.



Reconnect the Driveline to Rear Screw 219375C2

Towing the Accumix

If the Accumix needs to be towed :

With the Engine Running

- The engine will provide oil pressure for the steering valve and the brakes.

1. Block the wheels so the vehicle will not move.
2. Connect an appropriate rated towing chain to the front (1) or rear (2) towing cut out in the axle support.
3. Connect to the towing vehicle.
4. Tow at a slow speed to maintain control.

Without the Engine Running

- The steering can be used but it will not be power steering. A fair amount of force will be needed to steer.

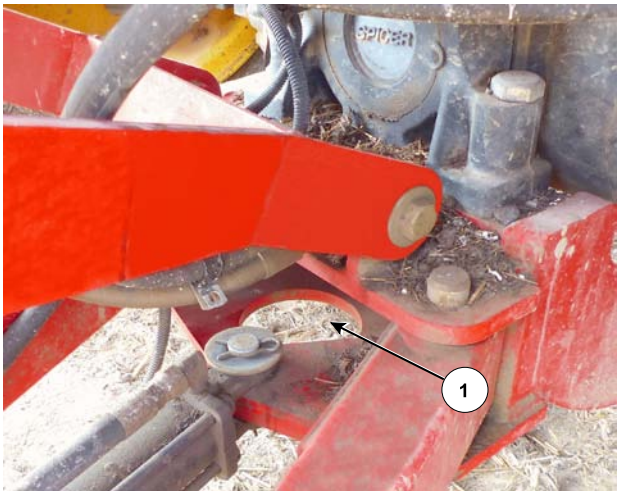
1. Block the wheels so the vehicle will not move.
2. Connect an appropriate rated towing chain to the front towing cut out (1) in the axle support.
3. Connect to the towing vehicle.

4. Release the parking brake with the manual hand pump located on the frame near the ladder going into the cab.
   - Press in the small round plunger (3) and keep it held in.
   - Pump with the large handled plunger (4) until there is pressure resistance.
     - This pumping action will release the parking brake inside the axles.

5. Release the small plunger (3).

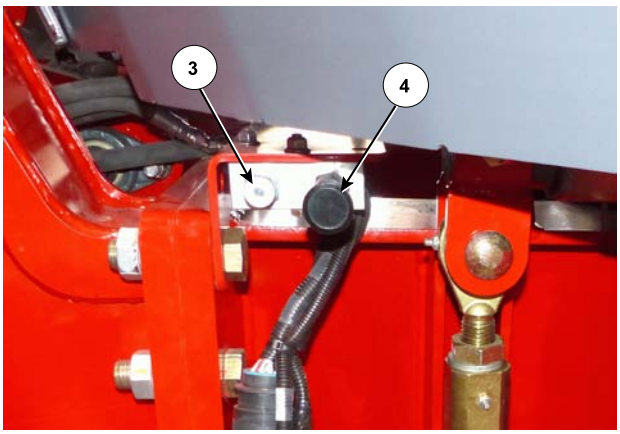
6. Remove the wheel blocks.

7. Tow at a slow speed to maintain control.



Front Towing Point 220115C

Rear Towing Point 220116C



Manual Hand Pump to Release Parking Brake 220117C

Table of Contents for Section 7 - Accumix 1000 Maintenance

Shut down the machine, disconnect the battery and lock it out before repairing, servicing, lubricating or cleaning the machine.

Before service or inspection ensure the suspension is completely lowered, the battery Is disconnected and locked out.

Engine Air Filters

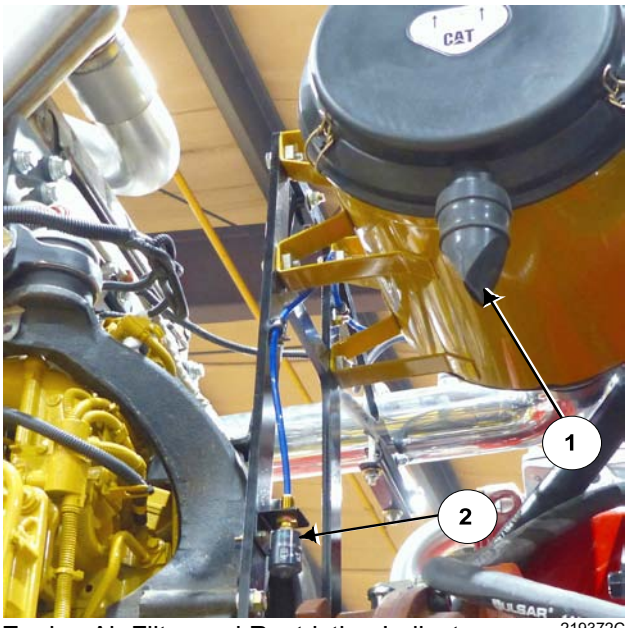
The engine uses a system of two air filters inside the air intake tank.

Note: The air for the air compressor is taken from the air supply to the engine.

- Squeeze the rubber nozzle (1) on the front of the air cleaner to remove large particles and moisture.

- Check the air restriction indicator (2).

  Note: The air cleaner filter also has an Air Filter Restriction electronic sensor that will send a message to the display if the filter needs to be replaced.

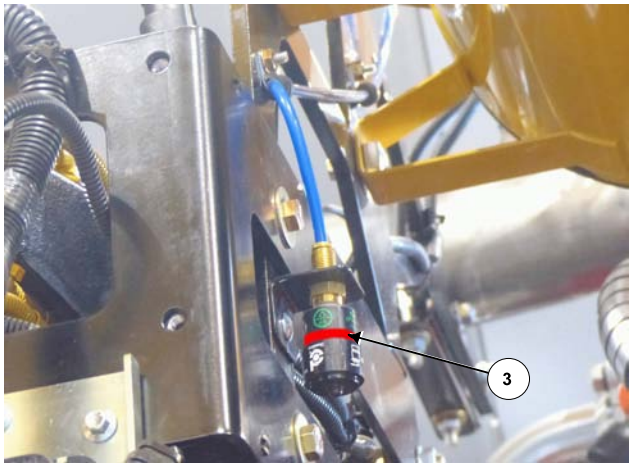


Engine Air Filter and Restriction Indicator 219372C

Avoid contact with hot surfaces.
Allow a cool down time before touching or servicing.
Failure to comply could result in death or serious injury.

- If the air restriction indicator (2) shows red in the middle band (3) the filters are restricted and need servicing.

- Replace both filters using the instructions given below.



Check the Air Restriction Indicator 220122-1C

To replace the air filters:

Note: Both primary and secondary filters must be replaced at the same time.

- Release the over center clamps on the air filter canister cover.

- Remove the primary air filter element.
  - The primary filter is a rubber friction fit.

- Remove the secondary air filter element.
  - The secondary filter is a rubber friction fit.

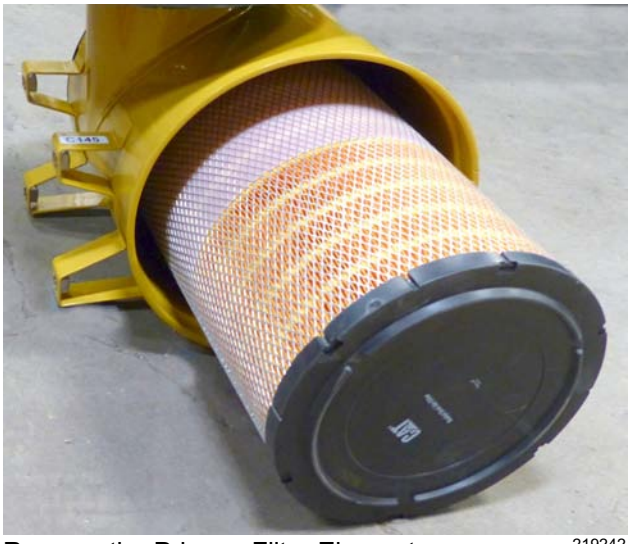
- Wipe the inside of the filter cannister with a rag to remove any built up dust.
  - Clean the cover.

- Insert the new secondary filter.

- Insert the primary filter.

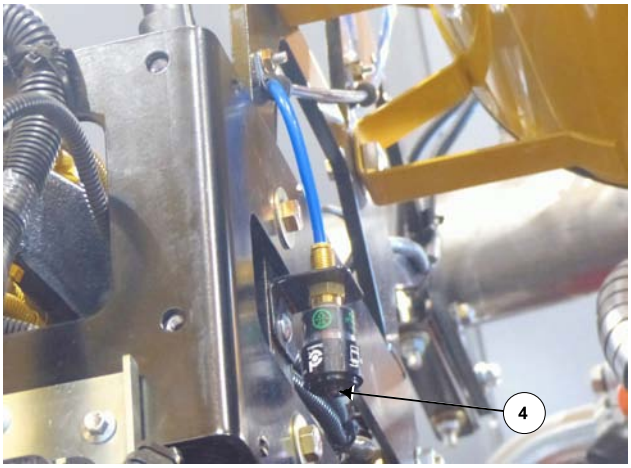
- Replace the canister cover and fasten with the over center clamps.
  - Position the cover with the rubber nozzle pointing down.

- Reset the air restriction indicator after filters are replaced.
  - Press the bottom button (4) on the indicator to reset.
    - The red should be gone from the middle band when the reset button is pushed.



Remove the Primary Filter Element 219242

Remove the Secondary Filter Element 219243



Push to Reset Air Indicator - Red Band Gone 220122C

- If a Air Filter Restriction warning message has been sent to the display, the message can be reset by turning off the main battery switch located near the DEF tank.

Reset Warning Message by Turning Off Main Battery Switch 220215

Engine Fuel Tank

1. Drain the fuel tank sump.

   Water in the fuel can cause wear on the fuel system.
   - Water may get into the tank when the tank is being filled.
   - Condensation occurs with the heating and cooling of fuel.

   - After the fuel tank has been filled, allow the fuel to settle for ten minutes.
     - This will allow the water and sediment to separate from the fuel.

   - Drain the water and sediment from the tank.

   <u>To drain the water and sediment</u>:

   The bottom of the fuel tank has a nut (1) with a removable plug.
   - Inside the nut is a ball check valve.

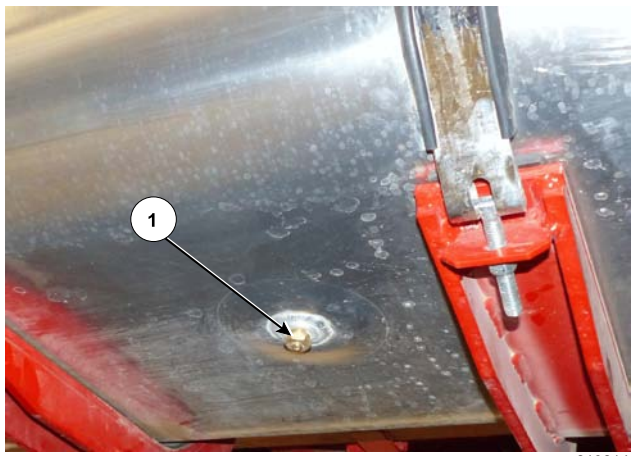
   - Remove the plug from inside the nut with an allen wrench.

   - Use the allen wrench to push up into the plug to release the ball check valve so that water and sediment will drain from the tank.

   - Drain until clean fuel flows from the tank.

   - Replace the plug into the nut (1).

Fill Fuel Tank - Ultra Low Sulfur Fuel 219249



Drain Water and Sediment from the Fuel Tank 219214

Engine Fuel Filters

Change the engine fuel filters as specified in this manual to protect the engine from debris and water.

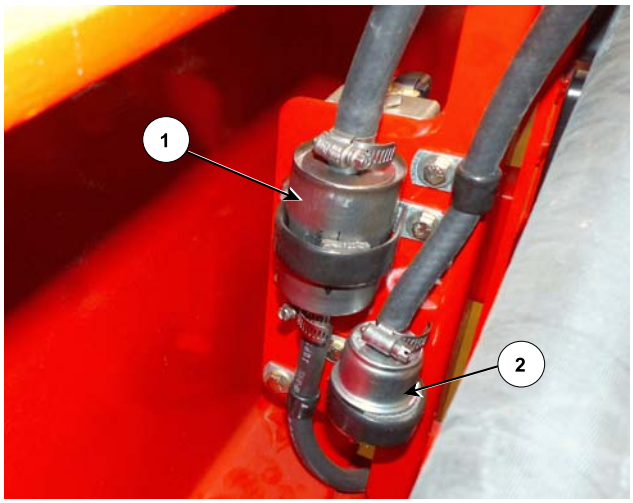
1. Fuel Strainer
   - The fuel strainer (1) Is located on the inside of the frame near the fuel tank.
   - Change the strainer at the recommended intervals. (See the Maintenance Interval Chart).

2. The fuel tank breather (2) filters air that is going into the fuel tank.

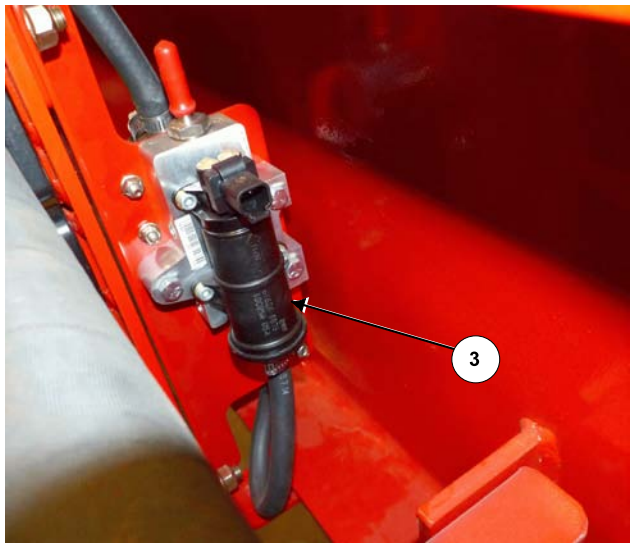
3. Fuel Lift Pump
   - On some machines the fuel lift pump (3) is located on the inside of the frame near the fuel tank.
     - If the lift pump is not on the frame then it is located on the engine near the engine control unit.
   - The lift pump moves the fuel up to the fuel filters.

4. Primary Fuel Filter
   - The primary fuel filter (4) is mounted on the engine near the engine radiator.
     - Change the primary fuel filter at the recommended intervals. (See Maintenance Interval Chart).
     - The new filter must be filled with fuel through the lift pump.

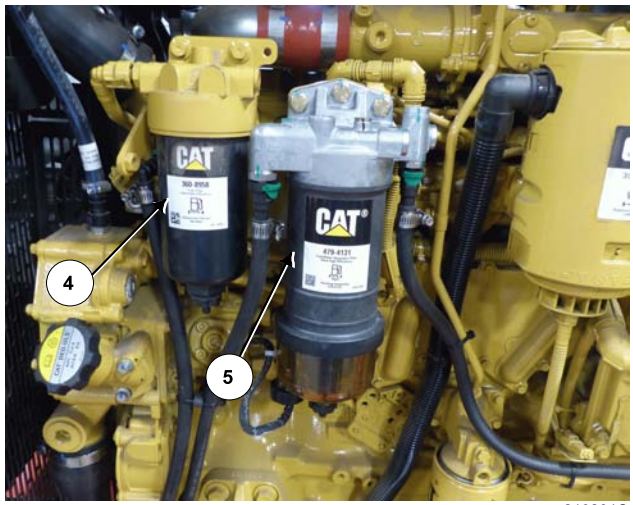
5. Fuel/Water Separator Filter
   - The fuel/water separator filter (5) is mounted on the engine next to the primary fuel filter.
   - A water-in-fuel sensor that is at the bottom of the fuel filter will show a “water in fuel” warning on the display.
     - Refer to the CAT Engine manual for the procedure to drain the water from the separator.



Fuel Strainer and Tank Breather Filter 219353C



Fuel Lift Pump 219354C



Primary and Water Separator Filters 219201C

6. Crankcase Breather

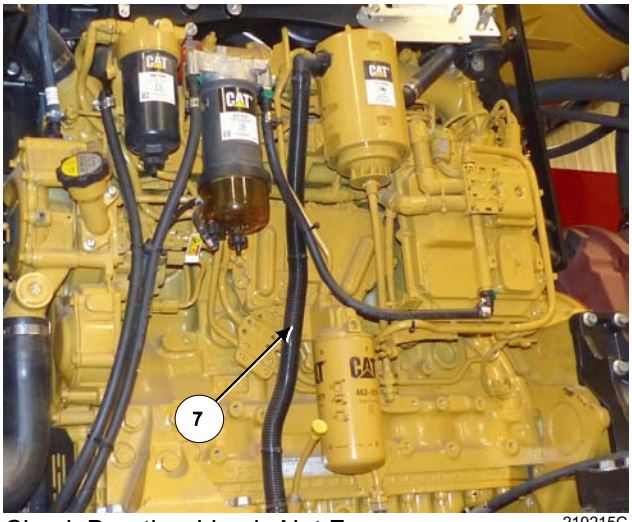
   - The crankcase breather (6) is mounted on the engine next to the fuel/water separator filter.

   - Change the breather element at the recommended intervals. (See the Maintenance Interval Chart).

     - Refer to the CAT Engine Manual for the procedure to change the crankcase breather element.

   Note: In cold weather operation check that the breather line (7) has not frozen with moisture from the crankcase.

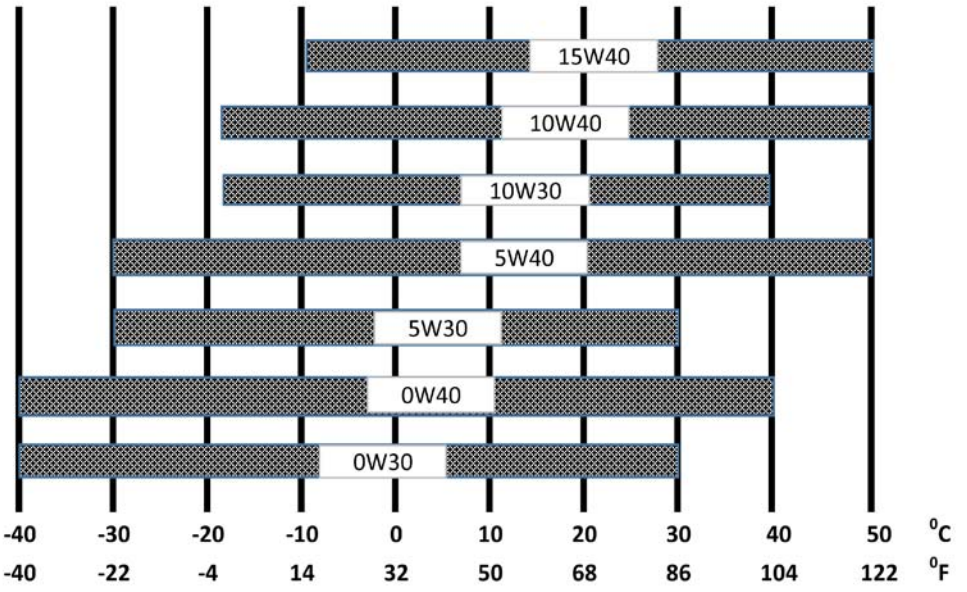
Crankcase Breather 219201C2



Check Breather Line is Not Frozen 219215C

Engine Oil

1. Engine oil viscosity.
   - Use the oil viscosity appropriate for the ambient temperature the machine will be used in. See the chart below.



Engine Oil Viscosities (Adapted from the CAT Engine Manual) 219216

2. Changing Engine Oil

   Note: Refer to the CAT engine manual for more information on changing the engine oil and filter.

   - The standard engine oil and filter change period is 500 hours. (See the Maintenance Interval Chart)
     - When operating under severe service applications the recommended oil and filter change period is 250 hours.

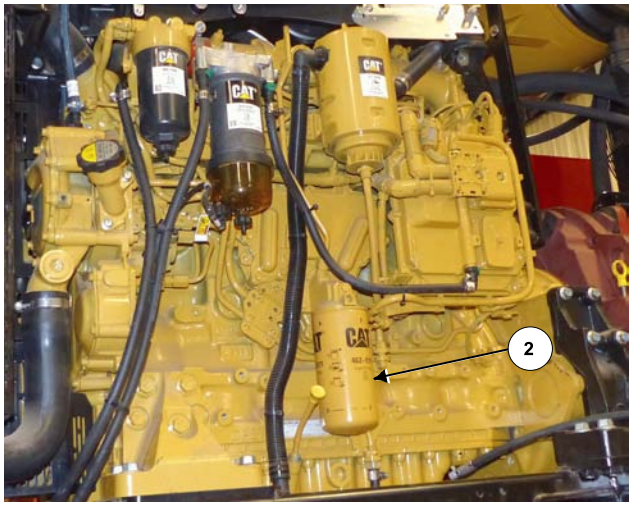
     Note: An engine that operates outside of the normal conditions (ie. Cold weather starts, inlet air which has a combustible content and other factors) is considered to be operating under severe conditions.

Refer to the CAT engine manual for more information on Severe Service Application.

- The engine oil drain valve (1) is located at the bottom of the oil pan toward the rear of the machine.
  - Drain the oil when it is warm to remove any waste particles that are suspended in the oil.
  - Position an oil catch basin with at least a 16.5L (4.36 US gallons) capacity.
  - Turn the valve to catch the oil for proper disposal.

Engine Oil Drain Valve 219217

- The engine oil filter (2) is located on the side of the engine. The filter must be changed with every oil change.
  - Spin off the filter.
  - Replace the filter with the type recommended by CAT.
    - (See the CAT engine manual for recommendations.)
  - Place some oil on the filter's rubber seal before installing the new filter.



Replace Engine Oil Filter 219215C2

3. Adding Engine Oil
    - Refer to the viscosity chart above for the oil to use for the ambient temperature ranges.
    - Use the type of oil recommended in the CAT engine manual.

- Add oil through the filler cap (3).

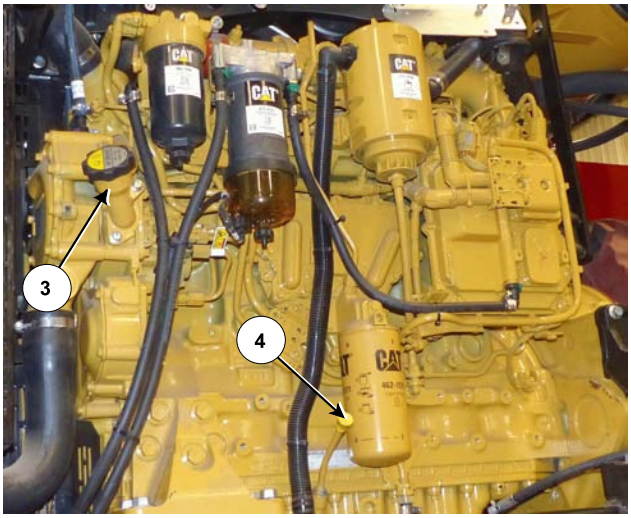
    - Add oil to the "H" mark on the oil level gauge.
        - Oil capacity will be between 13.5 L (3.56 US gal) to 16.5 L (4.36 US gal).

    - Start the engine and run at a low idle for two minutes to ensure that the lubrication system has oil and the oil filters are filled.

    - Stop the engine and allow the oil to drain into the oil pan for 10 minutes.

    - Remove the oil level gauge (4) to check the level.
        - Maintain the oil level between the "L" and "H" marks on the gauge.

    Note: Do not fill the crankcase above the "H" mark on the level gauge.



Adding Engine Oil 219215C3

Engine Coolant

1. An engine coolant mix of water and ethylene glycol must be used in all climate conditions to provide both freeze and boil point protection and prevent cylinder liner pitting.

    - Always use at least the minimum 50% glycol base engine coolant, even when operating in geographic areas where freeze protection is not required.

    - Protect the engine to the lowest outside (ambient) temperature.
        - See the CAT engine manual for more engine coolant recommendations.

    - Only use diesel coolant in the engine.
        - Do not use automotive-type coolants which do not contain the correct additives to protect heavy-duty diesel engines.

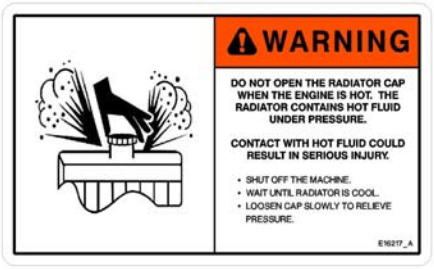
2. If the coolant level is low an alarm will appear on the display in the cab.

    Do not open the engine radiator cap while the engine is hot. The radiator contains hot fluid under pressure.
    Contact with hot fluid could result in serious injury.

    Wait until the radiator is cool. Loosen the cap slowly to relieve pressure.

Ethylene Glycol	
Concentration	Freeze Protection
50 Percent	−37°C (−34°F)
60 Percent	−51°C (−60°F)

CAT Engine Coolant Recommendations 219218
(Adapted from the CAT Operation Manual)



3. Change the engine coolant at the recommended change interval.(See the Maintenance Interval Chart)

   - The heat generated by the diesel engine causes a natural change in the inhibitors in the coolant which results in loss of protection.

   - Refer to the CAT Service Interval list for coolant change recommendations.

   - Refer to the Capacities Chart for the amount of coolant required.

Replenish Coolant Additives

Some coolant additives will gradually deplete during engine operation. Periodic replenishment of inhibitors is required.

Note: Refer to the CAT engine manual for information regarding coolant additives.

Batteries

The batteries are located inside a compartment (1) located between the rear conveyor and rear left tire.

- To check on the batteries remove the cover panel.

Note: The 12 volt batteries are connected in series to provide 24 volts for the engine, the DEF system, the fuel lift pump and the air exchange fan located at the rear of the engine cabinet.

- There is an equalizer to balance the electrical draw on the batteries.

The remainder of the electrical system on the machine is run on 12 volts.

Battery Location Ahead of Rear Wheel 219219C

1. Battery terminals and cables
   - The battery cable terminals must be kept clean and tight. Remove all corrosion with a wire brush, then wash with a weak solution of water and baking soda or ammonia.

   - Inspect the battery cables for damage. Replace any battery cable that has damage.

2. Battery fluid level
   - Add distilled water as needed to keep separators under water.

Batteries 219344

3. If needing to charge the batteries, only use a 24 volt battery charger.

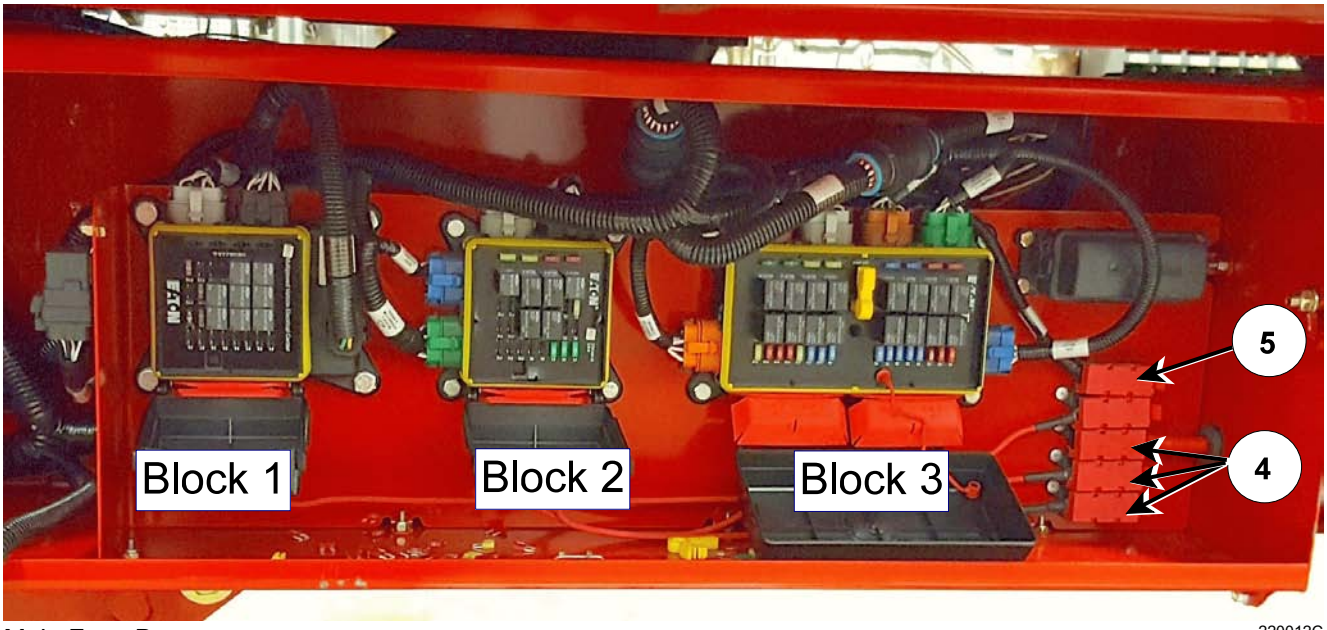
   - Charge at the lowest rate possible to reduce gas formation.
   - Do not charge a frozen battery.

Explosion hazard!
Keep batteries at full charge to prevent frozen battery electrolyte.

Never charge a frozen battery.

Do not attempt to jump-start the engine if the battery is frozen. Attempting to do so may cause the battery to explode that could result in death or serious injury.

Fuses



Main Fuse Box 220012C

Note: The 12 volt batteries are connected in series to provide 24 volts for the engine, the DEF system, the fuel lift pump and the air exchange fan located at the rear of the engine cabinet.

- There is an equalizer to balance the electrical draw on the batteries.

The remainder of the electrical system on the machine is run on 12 volts.

12 Volt Fuses

Turn off the battery switch before changing any fuse.

Power to Fuse Blocks - use fuses that are rated for the listed amperage.			
Fuses (4)	Power Supply to Fuse Block 1, 2, 3	Keyed	100A
Fuse (5)	Power Supply to Cab		50A

Fuse Block 1 - use fuses that are rated for the listed amperage.			
Fuse	**Name**	**Activation**	**Size**
F1	Relay 1, Tub Door up	Canbus	5A
F2	Relay 4, Tub Door down	Canbus	5A
F3	Relay 7, Unload Conveyor on (Front)	Canbus	5A
F4	Relay 2, Unload Conveyor Move Left	Canbus	5A
F5	Relay 8, Unload Conveyor Move Right	Canbus	5A
F6	Relay 6, Crab Steering	Canbus	5A
F7	Relay 3, Circle Steer	Canbus	5A
F8	Relay 5, Unload Conveyor on (Rear)	Canbus	5A
F9	Pwr 12v Electronics	Always on	5A
F10	Pwr 12v Display Always on	Always on	5A
F11	Pwr 12v Eaton canbus	Always on	5A
F12	Pwr 12v Suspension	Always on	10A
F13	Pwr Unload Reverser	Always on	5A
F14	Pwr 12v Heater for the Air Dryer	Always on, but has keyed relay	30A
F15	Lighter in Console	Always on	10A
F16	12v Power for the Key	Always on	10A

Fuse Block 2 - use fuses that are rated for the listed amperage.			
Fuse	**Name**	**Activation**	**Size**
F1	Power Outlets 1-2	Always on	30A
F2	Power Outlets 3-4	Always on	30A
F3	Relay 1, Power Outlets 1-2	Keyed	30A
F4	Signal Module	Always on	10A
F5	Positive Source for Negative Switched Valves	Always on	10A
F6	Unused		

F7	Relay 3, Hvac	Keyed	20A
F8	Relay 2, Power Outlets 3-4	Keyed	30A
F9	Relay 4, Running Lights	Keyed	10A
F10	Relay 5, Unused		
F11	Unused		
F12	Unused		
F13	Unused		
F14	Unused		
F15	Unused		
F16	Unused		

Fuse Block 3 - use fuses that are rated for the listed amperage.			
Fuse	**Name**	**Activation**	**Size**
F1	Relay 1, Seat, Washer, Mirror	Accessory position (and key)	10A
F2	Relay 2, Low Power Keyed	Keyed	10A
F3	Relay 3, Light Switch Power Supply	Always on except when cranking	10A
F4	Relay 4, Wiper Motor	Accessory position (and key)	15A
F5	Relay 5, Headlights	Road light switch, Always on[1]	15A
F6	Relay 6, Cab Work Lights mid Pair	Work light low switch, Always on[1]	15A
F7	Relay 7, Cab Work Lights Outer Pair	Work light high switch, Always on[1]	15A
F8	Relay 8, Rear Facing Work Lights	Field light switch, Always on[1]	15A
F9	Relay 9, Beacon Power	Beacon switch Always on[1]	15A
F10	Unused	Aux switch	15A
F11	Relay 11, Mirror Heat	Mirror switch, Always on[2]	15A

F12	Relay 12, Radio	Accessory position (and key)	10A
F13	Unused	Rear light switch, Always on[1]	10A
F14	Unused	Back flood switch, Always on[1]	10A
F15	Relay 15, Aux Cab Power	Keyed	10A
F16	Relay 16, Positive Pressure Fan	Keyed	15A

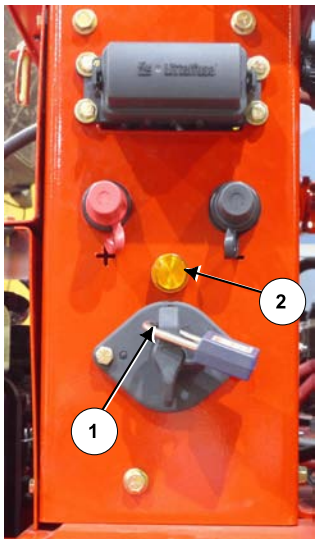
[1]Always on except while cranking because its switch has no power while engine cranks
[2]Always on except controlled by device on Relay 1 which is accessory position

24 Volt Fuses - use fuses that are rated for the listed amperage.

Turn off the battery switch before changing any fuse.

To Change the 24 Volt High Current Fuses:

1. Turn off the battery switch (1) and lock it to prevent accidental starting of the machine.
   - If the engine has been running wait until the amber light (2) goes out before turning the switch to ensure the engine emission cycle is complete.



Turn Off Battery Switch and Lock 219258C

2. Remove the cover (1) that is between the DEF tank and the upper compartment.

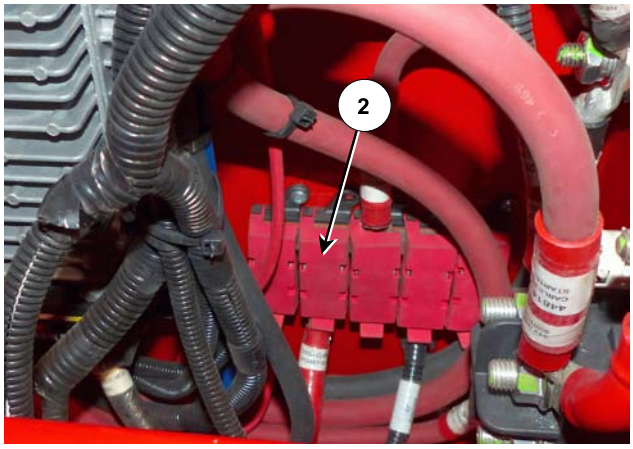
    - Remove the 4 bolts and washers holding the cover (1).

Remove Panel for 24 Volt High Current Fuses 219390C3

3. Access the fuses by lifting the rubber cover (2).

4. Replace the fuse with the same amperage fuse.

5. Replace the cover and fasten with the 4 bolts and washers.



24 Volt High Current Fuses
Access Fuses By Lifting Rubber Cover 219013C

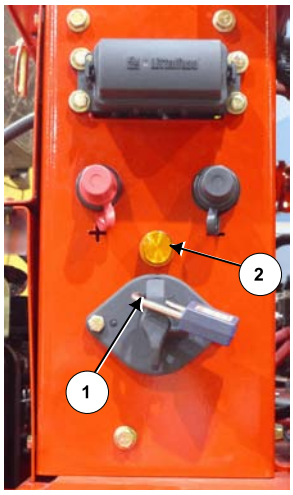
24V High Current Panel - use fuses that are rated for the listed amperage.			
Fuse	**Name**	**Activation**	**Size**
F1	Power Equalizer Supply		80A
F2	Glowplugs		40A
F3	Center Supply Position		
F4	Low Power 24V Supply		40A
F5	Unused		

Turn off the battery switch before changing any fuse.

To Change the 24 Volt Low Current Fuses:

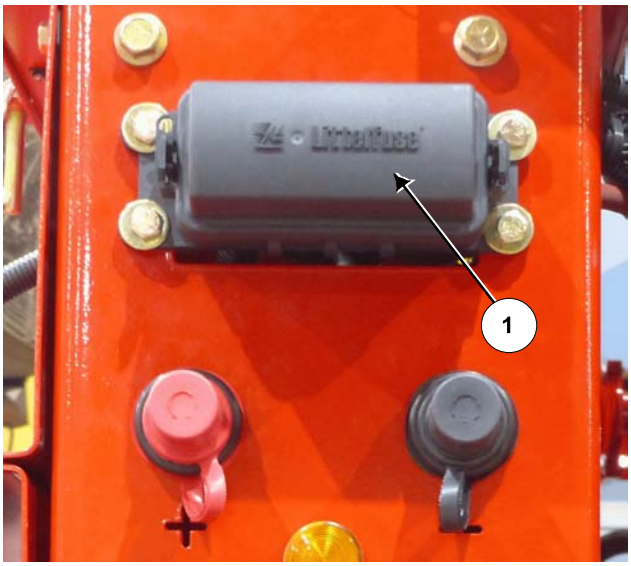
1. Turn off the battery switch (1) and lock it to prevent accidental starting of the machine.

    - If the engine has been running wait until the amber light (2) goes out before turning the switch to ensure the engine emission cycle is complete.



Turn Off Battery Switch and Lock 219258C

2. Remove the cover (1) from the fuse box located above the battery charging posts.



Remove the Low Current Fuse Box Cover 220015C

3. Replace the fuse with the same amperage fuse.

4. Replace the fuse box cover (1).

24 Volt Low Current Fuses 220014

24V Low Current Panel - use fuses that are rated for the listed amperage.			
Fuse	**Name**	**Activation**	**Size**
F1	24V Power for R1 & R3		2A
F2	24V Power for R2	Constant Power	30A breaker
F3	24V Petu (Def Tank System)	Constant Power	25A
F4	24V Engine Ecu	Constant Power	25A
F5	24V Power for R4	Constant Power	10A
R1	Key on 12V to 24V Converter Relay	Upper Left	
R2	Engine Compartment Fan Relay	Upper Right	
R3	Starter Engage 12V to 24v Converter Relay	Lower Left	
R4	A/C Converter Relay	Lower Left	

Lubrication - Grease

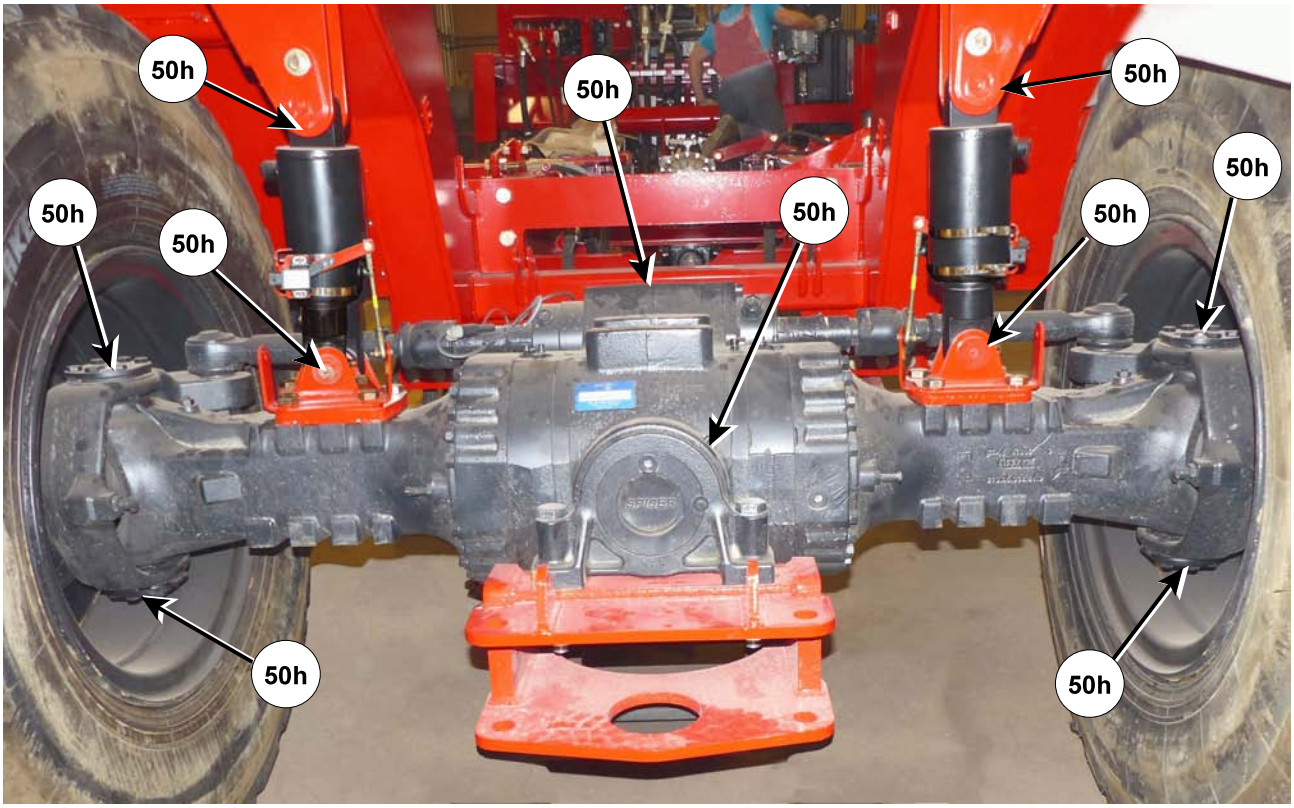
Lubricate all grease fittings with a quality lithium soap compatible E.P. grease meeting the N.L.G.I. #2 specifications and containing no more than 1% molybdenum disulfide.

- At each grease fitting clean off the fitting before attaching the grease gun.

Every 50 Hours

1. Axle Grease Points - Typical for front and rear axles.

    - Steering Pinions
        - 8 points total - Grease front and rear axles.
            - 2 points on the left pinion
                - Upper and lower points
            - 2 points on the right pinion
                - Upper and lower points
    - Front and Rear Axle Trunnion
      - 4 points total
        - 1 point on front of axle trunnion
        - 1 point on rear of axle trunnion
    - Suspension cylinder
        - 8 points total - Grease front and rear axles
            - 2 points on the left cylinder
                - Top and bottom of cylinder
            - 2 points on the right cylinder
                - Top and bottom of cylinder



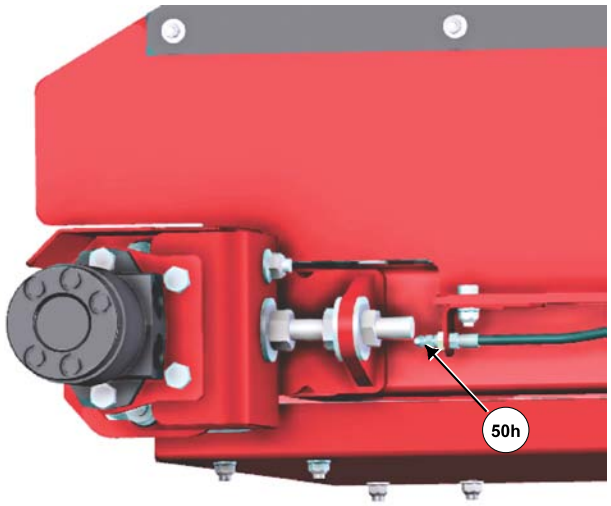
Axle Grease Points - Typical for Front and Rear Axles (Rear Axle Shown) 291360C

- Front Conveyor Under Cab

  - Front of conveyor bearings - 2 points

Front Conveyor Under Cab Bearings 219362C

  - Rear of conveyor bearings - 2 remote grease points near the front of the conveyor.
    - One remote point on each side of conveyor.

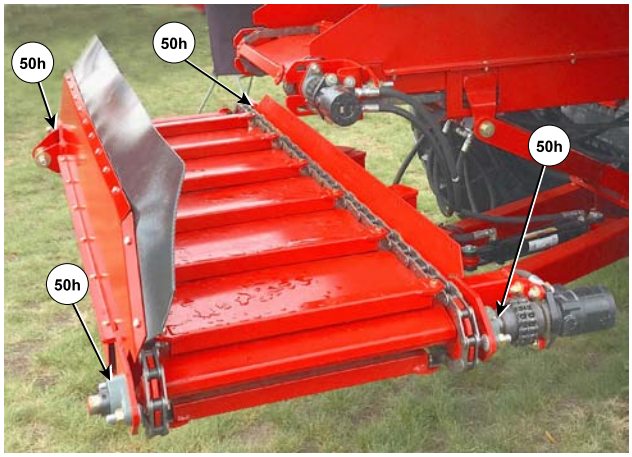


Remote Grease Point for Rear of Conveyor Bearings (Left Side Shown) 222010C

3. Front Left/Right Conveyor

  - Motor side bearings - 2 points
  - Right side bearings - 2 points

  Note: The grease points are the same for the optional High Bunk front conveyor.



Front Right/Left Conveyor Bearings 219361C

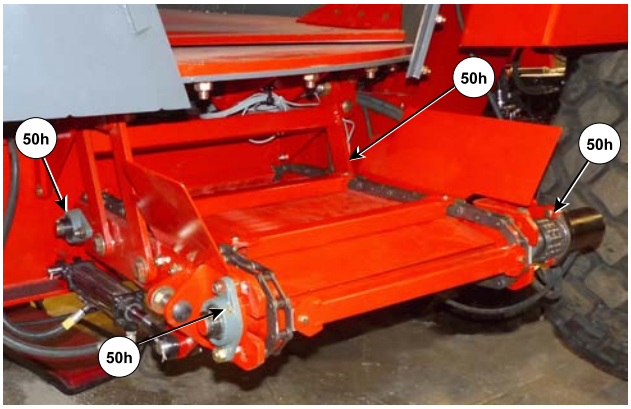
4. Rear Tub Conveyor

   - Front conveyor bearings - 2 points
   - Rear conveyor bearings - 2 points

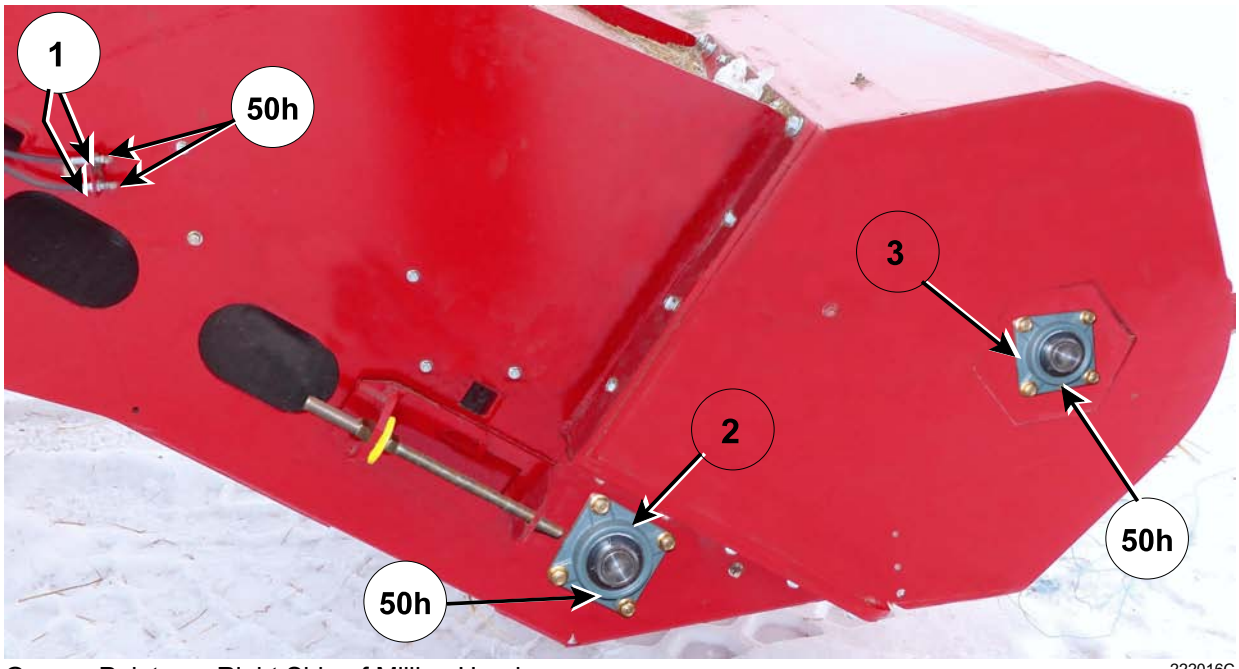
5. Loading Arm

   Right side of loading arm and milling head.

   - (1) The remote grease points send grease to the right and left upper loading conveyor bearings - 2 points.
   - (2) Loading conveyor right bearing - 1 point
   - (3) Milling head right bearing - 1 point



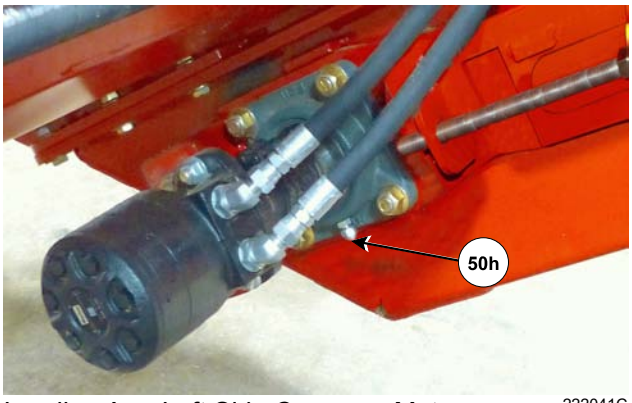
Rear Tub Conveyor Bearings 219363C



Grease Points on Right Side of Milling Head 222016C

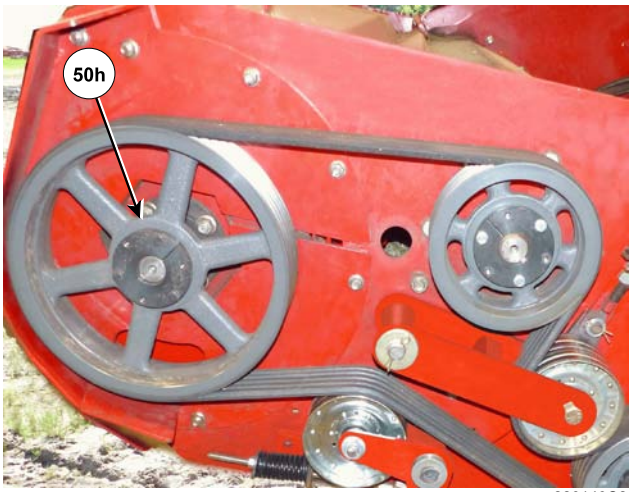
Left side of loading arm and milling head.

- Conveyor Motor Bearing - 1 point



Loading Arm Left Side Conveyor Motor 222041C

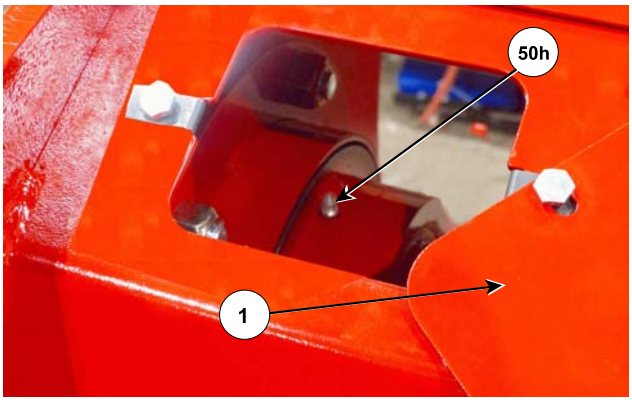
- Milling Head Sheave Bearing - 1 Point
  - Open the milling head left side door to access the grease point.



Milling Head Sheave Bearing -Right Side 220149C2

5. Milling head auger bearing

   - Loosen the auger grease cover (1) on the top of the milling head housing.
     - Rotate the cover for access to the auger.
   - Rotate the auger to find the grease point for the auger bearing.
   - 1 point on the auger.
   - Replace the cover (1) on the top of the milling head housing.

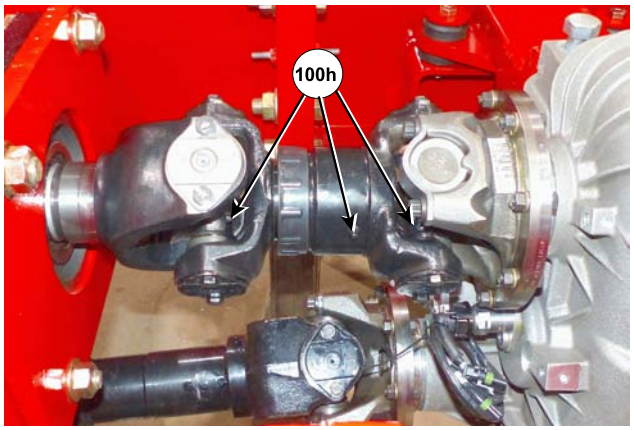


Remove the Auger Grease Cover
Rotate Auger to Grease the Auger Bearing 220120C

Every 100 Hours

1. Driveline from the Drive Motor to the Transfer Case

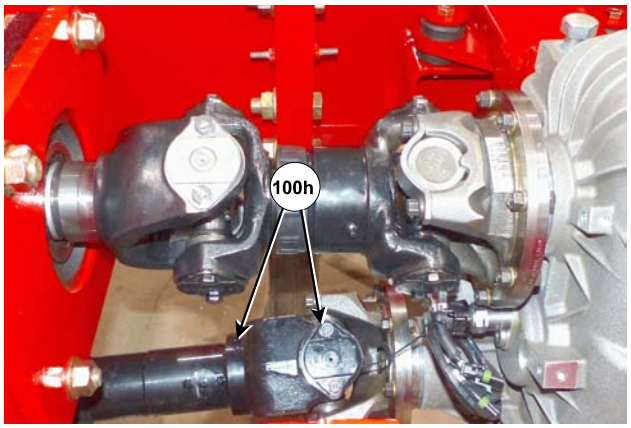
    - 1 point at the motor joint.
    - 1 point at the transfer case joint.
    - 1 point at the slip joint.



Joints at Drive Motor to Transfer Case 219359C

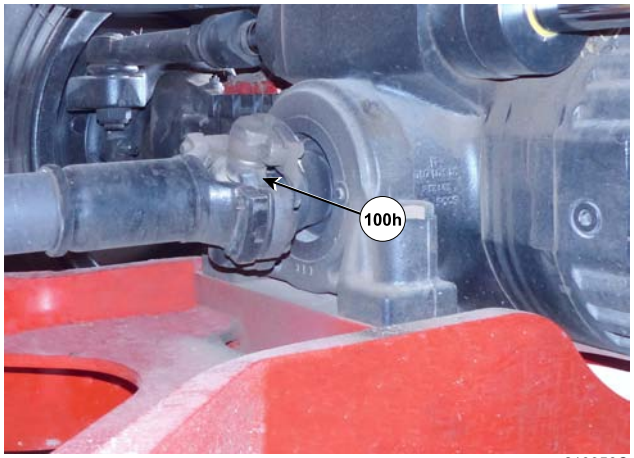
2. Rear Axle Drivelines

    - 1 point at the joint at the transfer case to rear axle.
    - 1 point at the slip joint on the rear axle driveline.



Driveline Transfer Case To Rear Axle 219359C2

    - 1 point at the joint at the rear axle.

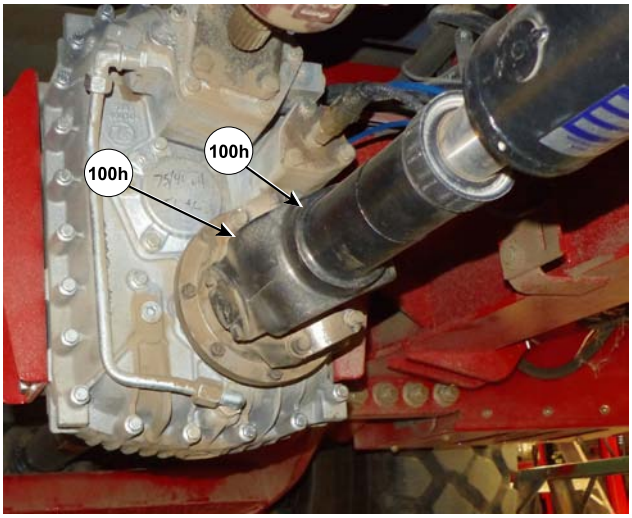


Driveline At Rear Axle 219356C

3. Front Axle Drivelines

- 1 point at the joint at the rear of the transfer case.

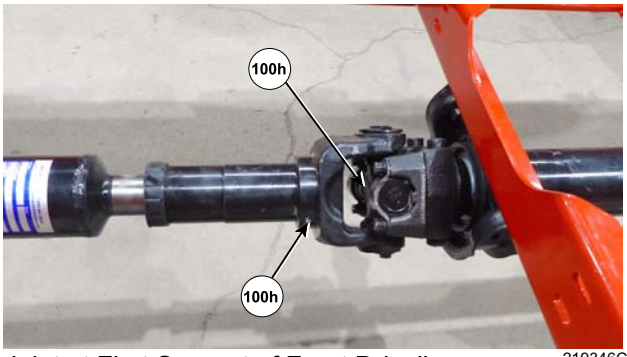
- 1 point at the slip joint of the driveline at the rear of the transfer case.



Driveline at Rear of Transfer Case 219345C

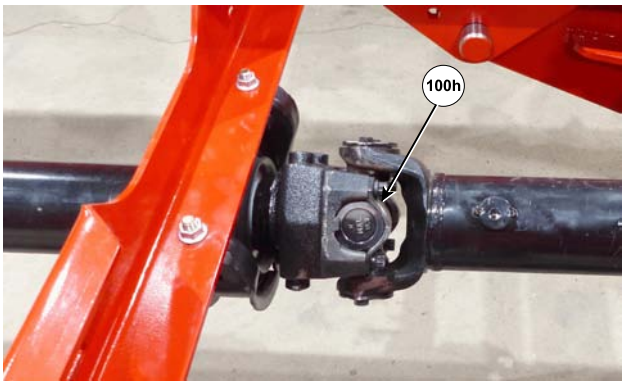
- 1 point at the joint at the first support of the front driveline.

- 1 point at the slip joint of the driveline.



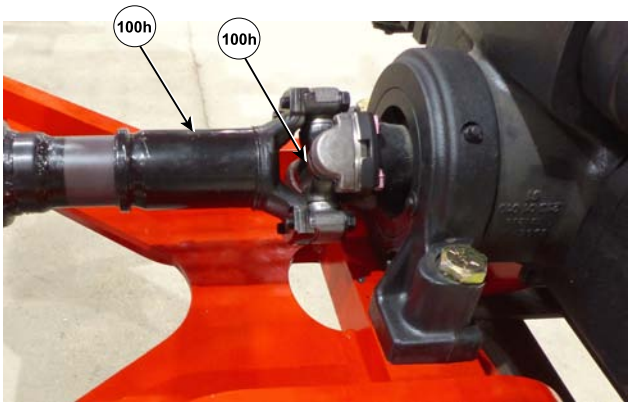
Joint at First Support of Front Driveline 219346C

- 1 point at the joint at the second support of the front driveline.



Joint at Second Support of Front Driveline 220141C

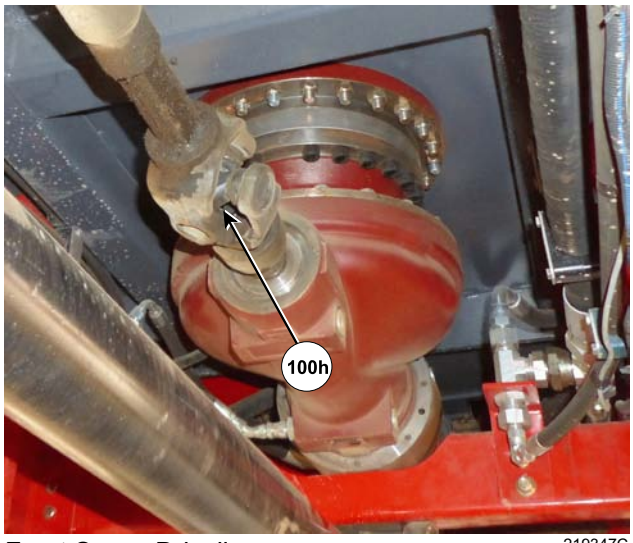
- 1 point at the joint at the front axle.
- 1 point at the slip joint of the driveline.



Driveline At Front Axle 220142C

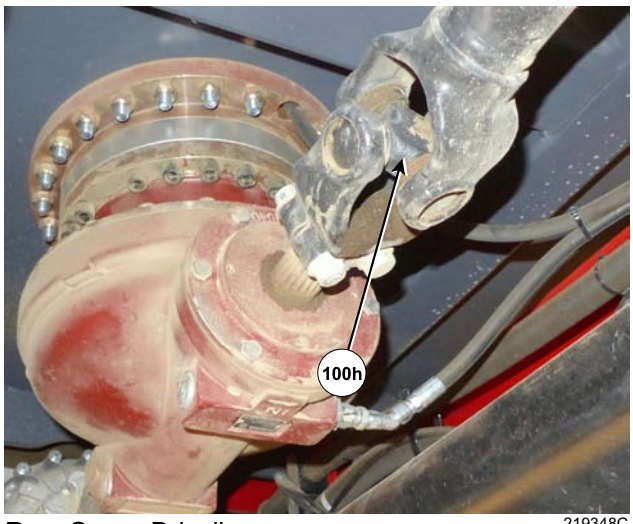
4. Mixing Screw Drivelines

- 1 point on the joint at the front screw drivebox.



Front Screw Driveline 219347C

- 1 point on the joint at the rear screw drivebox.



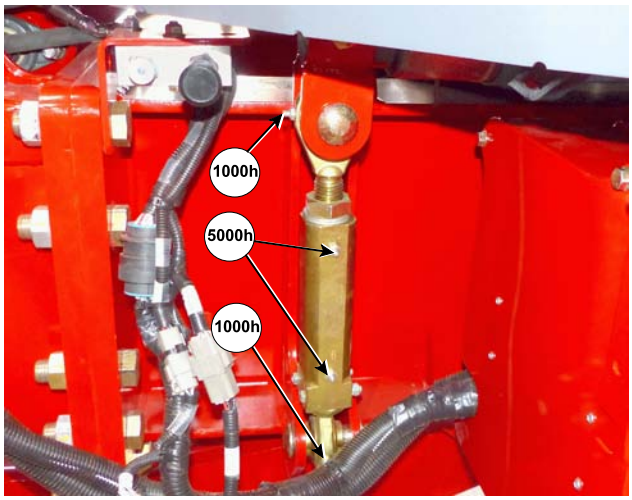
Rear Screw Driveline 219348C

Every 1000 Hours

- 2 points on each of the 4 swivel control assemblies that hold the tub to the weigh load cells.

Every 5000 Hours

- 2 points on each of the 4 swivel control assemblies that hold the tub to the weigh load cells.



Swivel Control Assemblies - Weigh Load Cells 220114C

Mixing Screw Drivebox Oil

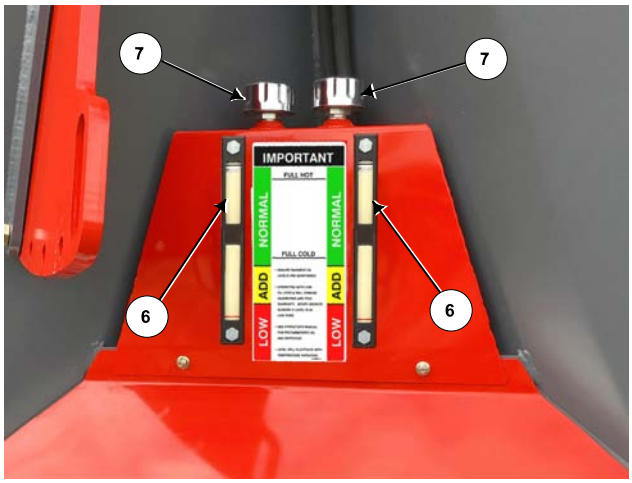
- The oil level and fill location for the mixing screw gears is located on the left side of the tub.

- Check the oil level as shown in the level tubes (6).
  - Check the level when the machine is cold.

  - Fill to each side comparing the oil level in the level tube to the decal.
    - Fill with EP150 synthetic oil.

  Note: Pour in oil in small amounts while giving time for the oil to run down the hoses into the gearbox and register in the level tube.

  Note: Do not overfill to prevent the breather port of the gearbox from being blocked.



Mixing Screw Drivebox Oil Level 220062C

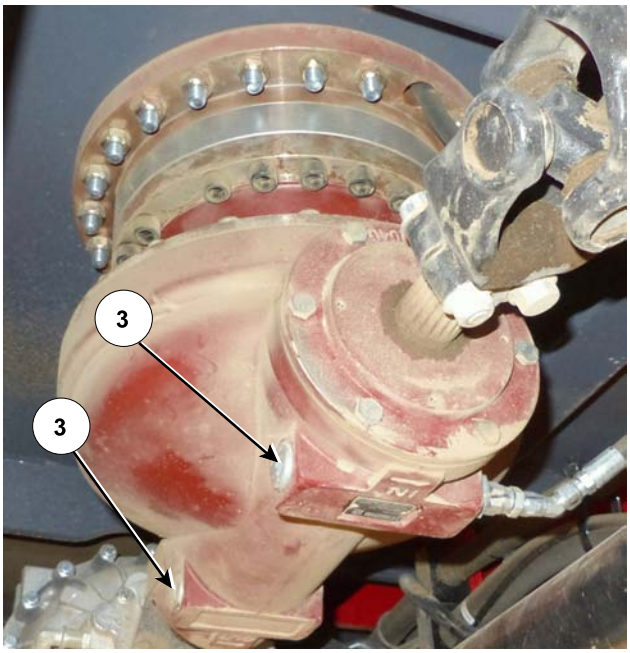
Changing Oil in the Screw Drivebox

1. Change the oil in the front and rear screw driveboxes according to the Maintenance Interval Schedule listed later.

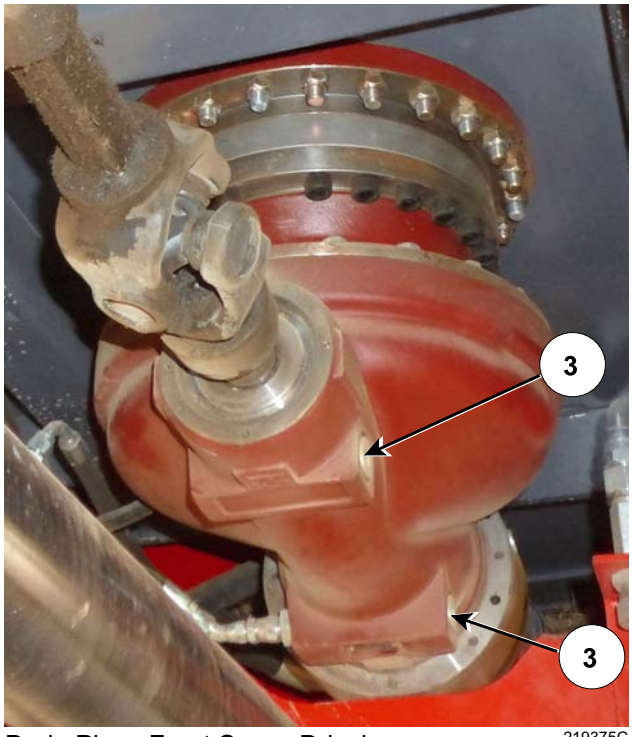
2. Remove the 2 drain plugs (3) on the bottom of the screw drivebox to fully remove all the oil in the drivebox.

   - Catch the oil so it can be disposed of in a proper way.

3. Replace the drain plugs.



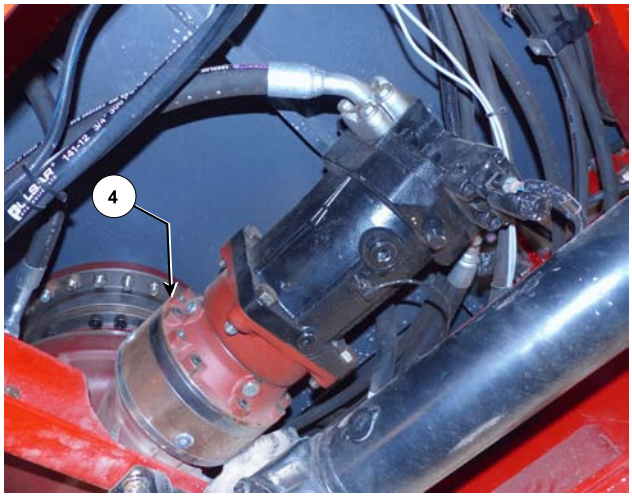
Drain Plugs Rear Screw Drivebox 219376C



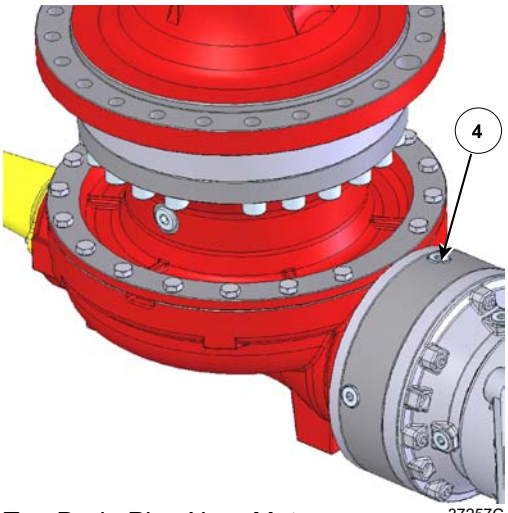
Drain Plugs Front Screw Drivebox 219375C

Filling the Front Gearbox with the Motor (Front Screw):

1. Remove the top drain plug (4) next to the motor to allow air to escape while being filled.



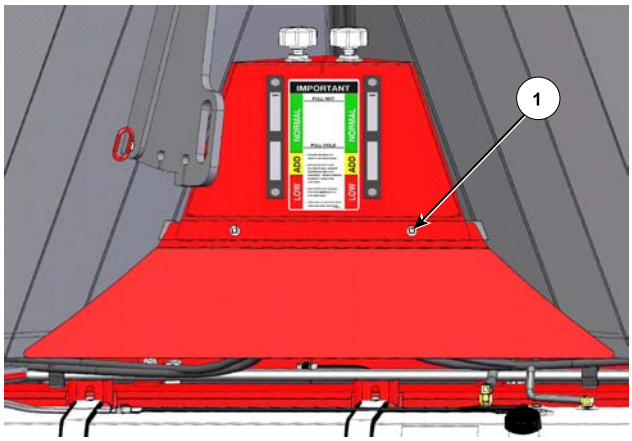
Remove Top Drain Plug Near Motor 220130C



Top Drain Plug Near Motor 37257C

2. Remove the lower panel of the screw gearbox oil reservoir.

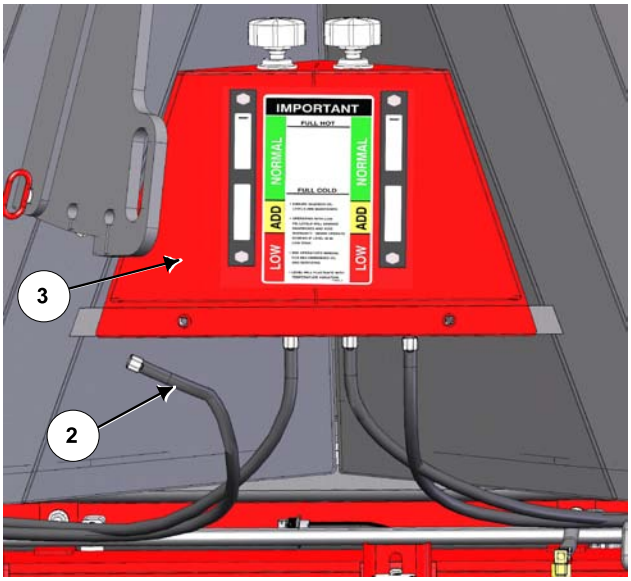
   - Remove the fasteners (1) to remove the panel.



Remove the Lower Panel of Reservoir 220132C

3. Remove the gearbox filler hose (2) (outer hose) from the front reservoir (3).

    - Install a plug/cap into the bottom of reservoir.



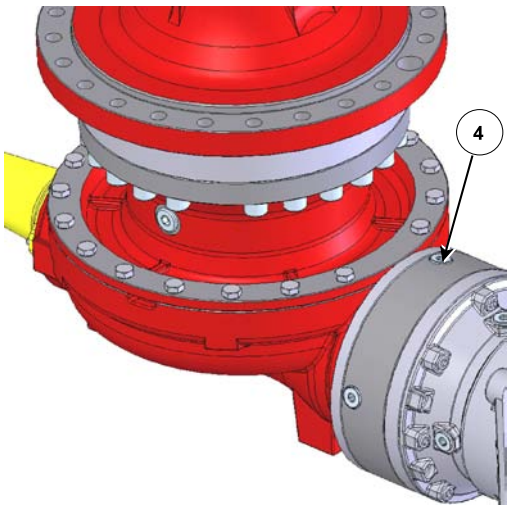
Remove the Outer Hose from the Front Tank Install Plug in Bottom of Tank 220133C

4. Attach a 5 gallon pail pump (or similar) with adapters to the end of the filling hose (2).

Attach Pail Pump to Filler Hose 220131

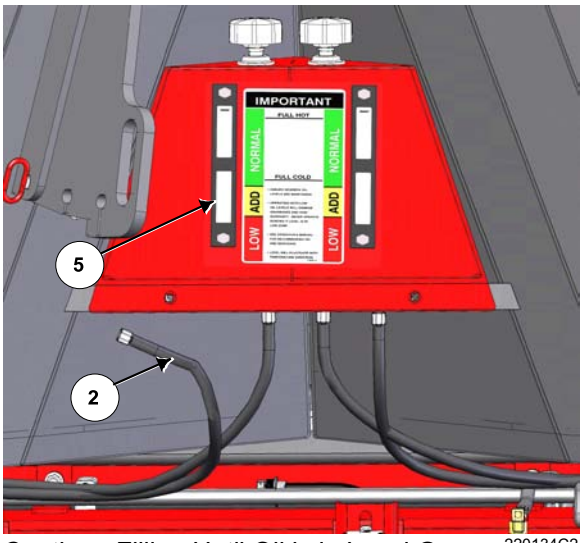
5. Pump EP150 synthetic oil into the gearbox until oil starts to come out of the front top drain plug (4) indicating that air has been removed.

    - Replace the plug (4).



Fill Until Oil Comes Out of Plug 37257C

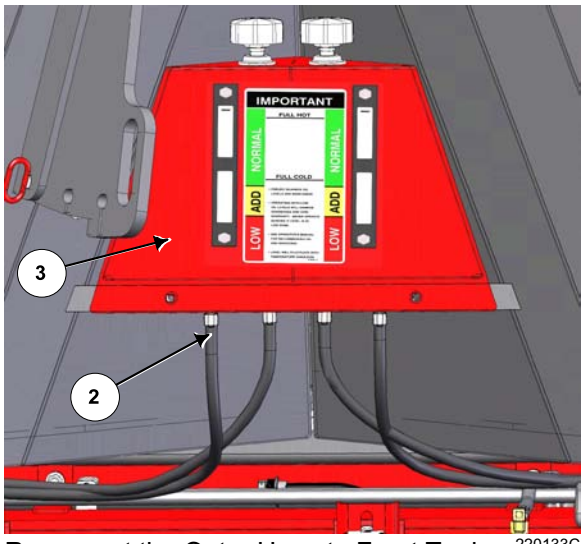
6. Continue filling with the pail pump attached to the filler hose (2) until oil is visible in the level gauge glass (5).



Continue Filling Until Oil is in Level Gauge 220134C2

7. Remove the plug/cap from the bottom of the front tank (3) and reinstall the filling line (2).

8. Remove the front tank fill cap to fill the screw drivebox and tank.
   - Fill the level to the normal range.



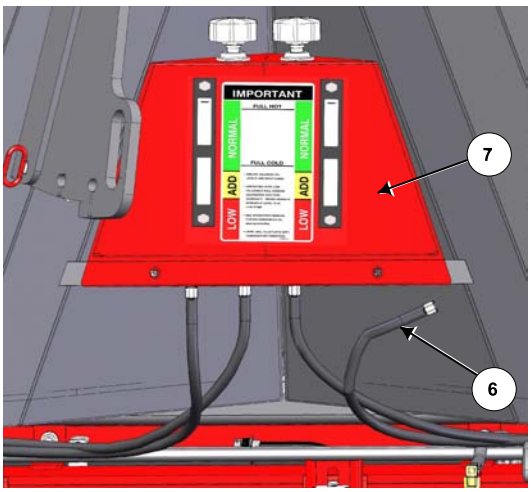
Reconnect the Outer Hose to Front Tank 220133C

<u>Filling the Rear Gearbox (Rear Screw):</u>

1. Remove the gearbox filler hose (6) (outer hose) from the rear reservoir (7).

   - Install a plug/cap into the bottom of reservoir.

   Note: No plug needs to be removed from the rear gearbox for filling.

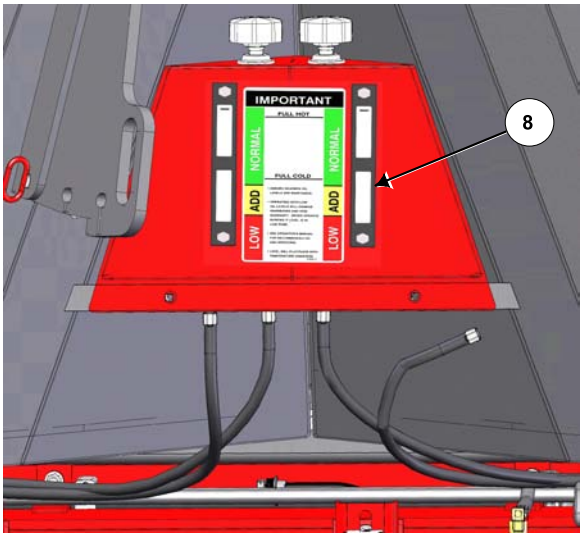


Remove the Outer Hose from the Rear Tank
Install Plug in Bottom of Tank 220135C

- Attach a 5 gallon pail pump (or similar) with adapters to the end of the filling hose (6).

Attach Pail Pump to Filler Hose 220131

2. Pump EP150 synthetic oil into the gearbox until oil is visible in the level gauge sight glass (8).

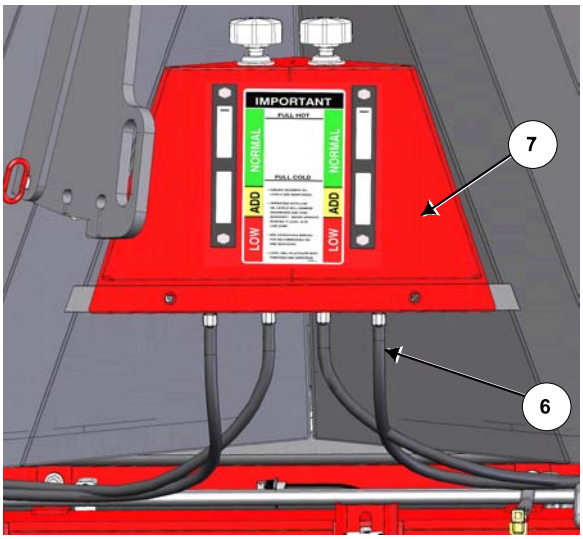


Continue Filling Until Oil is in Level Gauge 220135C2

3. Remove the plug/cap from the bottom of the rear tank (7) and reinstall the filling line (6).

4. Remove the rear tank fill cap to fill the screw gearbox and tank.
   - Fill the level to the normal range.

5. Replace the lower tank panel and fasten in place.



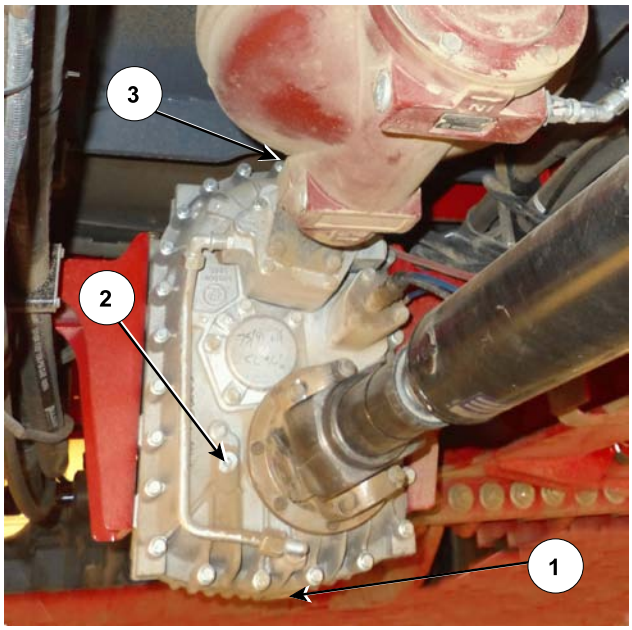
Reconnect the Outer Hose to Front Tank 220133C3

Transfer Case

Note: Refer to the Maintenance Interval Schedule for the timing of changing the oil.

Checking the Oil Level

- Remove the filler/level plug (2) on the back of the case.
  - Oil should be level with the bottom of the filler hole (2).
  - If necessary fill with oil through the filler hole (2).
    - Use 75W90 synthetic oil.
  - Replace the plug with a new seal.



Checking and Changing the Transfer Case Oil 219349C

Changing the Oil

6. Change the oil in the transfer case according to the Maintenance Interval Schedule listed later.

7. Change the oil when it is warm.

8. Drain the gear oil at the drain plug (1) located on the bottom of the transfer case.
   - Clean the magnet of the drain plug.
   - Replace drain plug (1) using a new seal.

9. Fill with new 75W90 synthetic oil API GL5 at filler/level plug (2) until it flows out. (approximately 5 liters).

10. Replace level plug (2) using a new seal.

11. Unscrew the breather (3) located on the top front right side.
    - Clean and replace it.

Axles

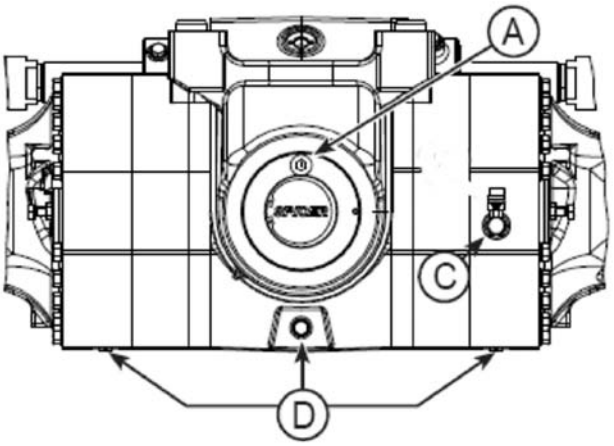
Central Axle Housing

Note: Refer to the Maintenance Interval Schedule listed later for the timing of changing the oil.

Note: Before draining oil it is important to loosen the oil filling plug (A) to release any internal pressure.

- Remove the center plug (C).

- Remove the 3 oil draining plugs (D) and drain the oil.



Changing the Axle Oil 219231

Filling the Center Axle with Oil

- Replace the 3 drain plugs (D).
  - Tighten to 50 - 60 N·m (37- 44 lbf).

- Fill with oil through the filling plug (A) until the oil is level with the bottom of the plug hole C.
  - Use 75W90 synthetic oil API GL5 with LS additive.

  - When filling the axle with oil, wait for 15 minutes for the oil to flow through the differential and the brakes into the axle arms.

- Check the oil level and top up if necessary.

- Replace the center plug C.

- Replace the level plug (A).
  - Tighten to 50 - 60 N·m (37- 44 lbf).

Checking Oil Level at the Wheel Gear Drive

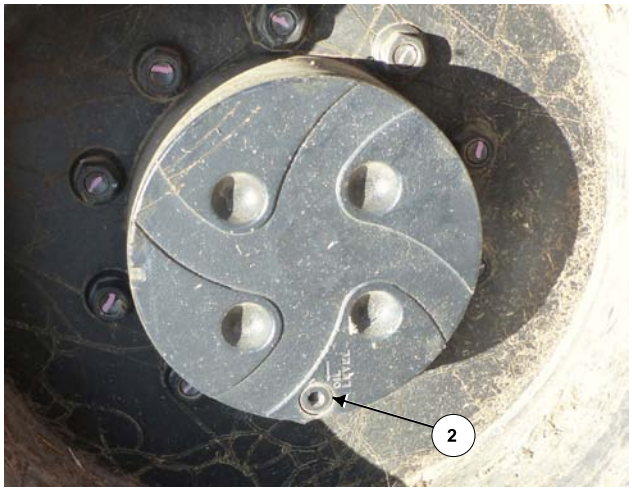
1. Rotate the hub until the arrow on the hub and the oil fill/drain plug (1) is horizontal.
2. Remove the oil fill plug.
3. The oil should be level with the bottom of the plug hole.
4. To fill add use 75W90 synthetic oil API GL5 until the oil is level with the bottom of the plug hole.
5. Replace the drain plug.

Check Oil Level with Drain Plug Horizontal 219299C

Changing the Oil in the Gear Wheel Drive

Note: Refer to the Maintenance Interval Schedule for the timing of changing the oil.

1. Rotate the hub so the drain hole (2) is at the bottom.
2. Remove the drain plug and catch the oil.
3. Rotate the hub until the oil fill/drain plug (1) is horizontal.
4. Fill with Use 75W90 synthetic oil API GL5 until the oil is level with the bottom of the plug.
5. Replace the plug (1).



Drain Plug at Bottom for Draining Oil 219300C

Drain Horizontal - Fill with Oil - Replace Plug 219299C

Wheel Nut Torque

Place the wheel nuts with the flange of the nut against the rim.

Torque the wheel nuts to 480 lb-ft (650 Nm).

Note: Do not lubricate the wheel nuts.

Torque the Wheel Nuts 219308

Tires

Tires can steer towards the frame causing death or serious injury.
Tires can begin moving and run over a person resulting in death or serious injury.

Stay clear of frame and tires. Suspension can move automatically during operation creating pinch points Which will result in death or serious injury.

- Before service or inspection ensure suspension is completely lowered, battery is disconnected and locked out.
- Ensure machine is on level ground.
- Ensure all tires are chocked.

- Check the tires wheels for low pressure, cuts, bubbles.
- Check for damaged rims or missing lug bolts and nuts.
  - Have a qualified tire technician service the tires and wheels.

- Fill with air to 76 psi (524 kPa).
  - If the optional large lug tire is installed fill to 54 psi (372 kPa).

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 to have a qualified tire mechanic service the tires and rims.
Failure to comply could result in death or serious injury.

To change tires:

For maximum safety, before changing a tire set the axle suspension to 0% under the Suspension Menu of the Display. Also pull the fuse for the suspension system from the fuse box
- (See Page 16 for suspension fuse location.)

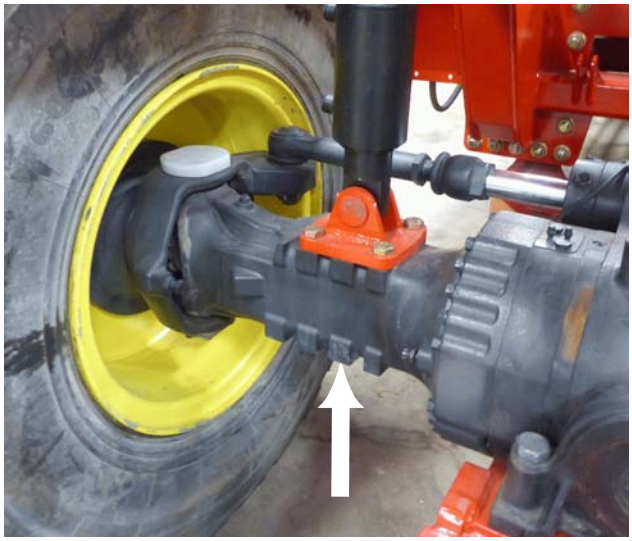
- Block the other tires to prevent movement of the machine.

- Place a support under the jack when on soft ground.

- Use a jack with a least a 20 ton capacity.
  - Place the jack under the axle in line with the tub suspension cylinder.

- Remove the tire.

- Install the new tire.
  - Torque the wheel nuts to 480 lb-ft (650 Nm)



Place Jack Under the Cylinder on the Axle 219301C

Cabin Air Filter

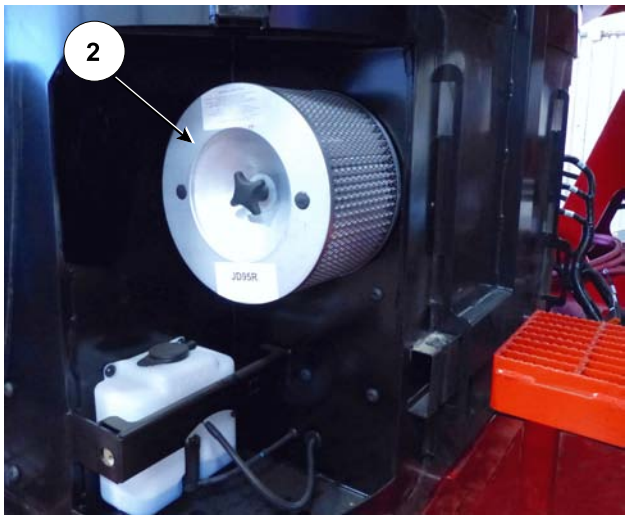
The cabin air filter is located behind a panel on the left rear side of the cab.

- Remove the 2 twist handles (1) on the cab panel for access to the cabin air filter.

- Remove the filter (2) by removing the twist handle.
  - Replace the filter and fasten with the twist handle.

- Replace the cab panel and fasten with the twist handles (1).

Cab Panel for Access to Cabin Air Filter 219302C



Cabin Air Filter 219303C

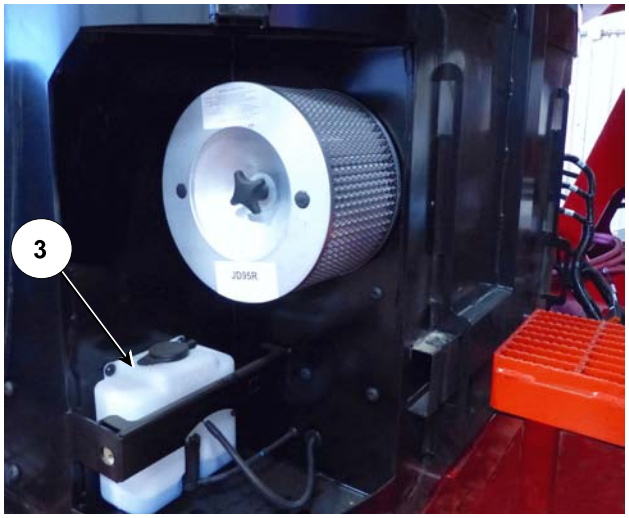
Windshield Washer Fluid

The windshield washer fluid container (3) is located behind the panel on the left rear side of the cab.

- Remove the 2 twist handles (1) on the cab panel for access to the windshield washer fluid container.

- Replace the cab panel and fasten with the 2 twist handles (1).

Cab Panel for Access to Windshield Washer Fluid 219302C



Cabin Air Filter and Windshield Washer Fluid 219303C2

Hydraulic System

The hydraulic system consists of a hydraulic oil tank for 5 pumps, several motors and hydraulic cylinders.

The hydraulic tank, pumps and filters are accessed by opening the door on the right rear side of the machine.

Hydraulic System on Right Side of Machine 219304

The hydraulic system operates under extremely high pressure. Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin, causing serious injury or infection.

Wear proper hand and eye protection when searching for leaks. DO NOT use your hand to check for leaks. Use a piece of cardboard or paper.

Stop the engine, remove key and relieve the pressure before connecting or disconnecting, repairing or adjusting fluid lines.

Accumulators in the hydraulic system contain high pressure oil.

Note: Some hydraulic circuits are pressured a significant amount.
Those circuits retain pressure even after the machine is turned off.
Those circuits need the pressure to be relieved with special methods before servicing.

Contact with high pressure oil may cause death or serious injury.

Hydraulic System Cleanliness

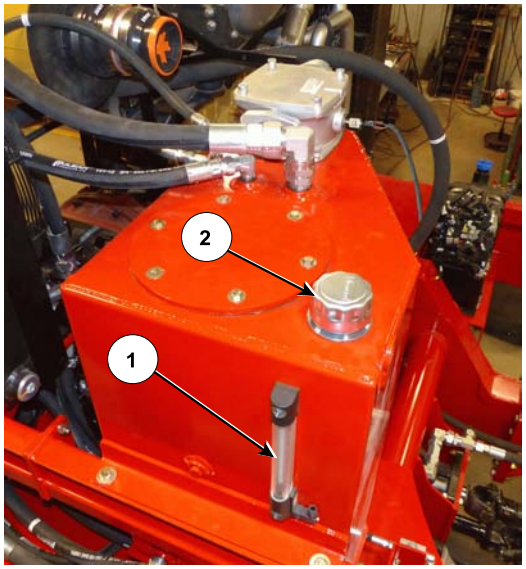
A filter cart is recommended to filter all hydraulic oil before it enters the tank.

Keep all areas clean around the hydraulic filter and filler cap (2).

Immediately repair any fittings, hoses or other components where leaking is observed. Wipe up any leakage.

If the hydraulic system should be disconnected for service, protect the ends of hoses and the ports of components from contamination by using 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.

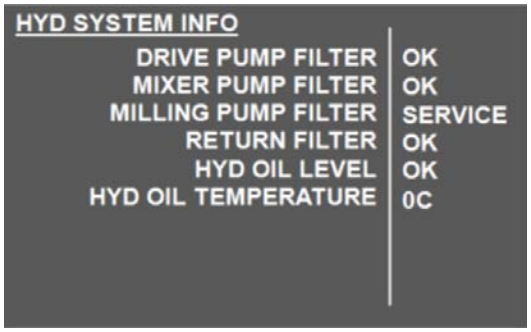


Oil Tank Level and Fill 219222C

Hydraulic Oil Tank

- Maintain the level in the hydraulic oil tank as shown by the oil level indicator (1) mounted on the side of the tank.

- The Hyd System Info screen on the Display also shows if the hydraulic oil level is okay.



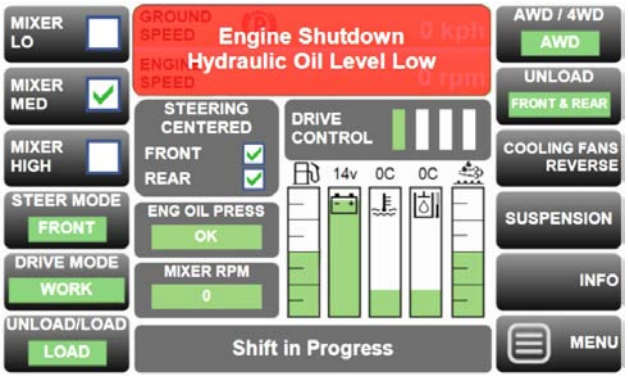
Hyd System Info on Display 219233

Note: When the oil in the tank drops below a certain level a warning message will appear on the display.

- Determine the cause of the oil leak. Add oil.

Note: The engine will immediately shutdown if the oil in the hydraulic tank drops below the minimum level needed to protect the oil pumps from damage.

- An Engine Shutdown warning will appear on the display.
- If the warning comes on while driving, immediately pull over to a safe place because the machine will come to an abrupt stop.

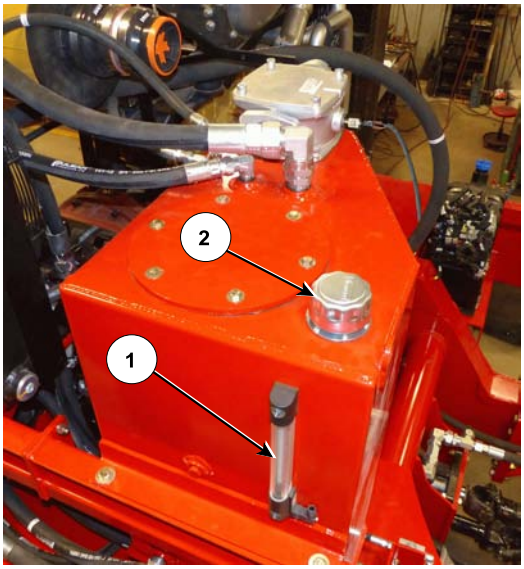


Engine Shut Down from Low Oil Level 220088

- Fill the hydraulic oil tank through the fill cap. (2).

Note: Keep the area around the filler cap and the hydraulic filter clean to prevent oil contamination which will lead to hydraulic component failure.

- Fill with Hydrex MV-32 type oil or equivalent.



Oil Tank Level and Fill 219222C

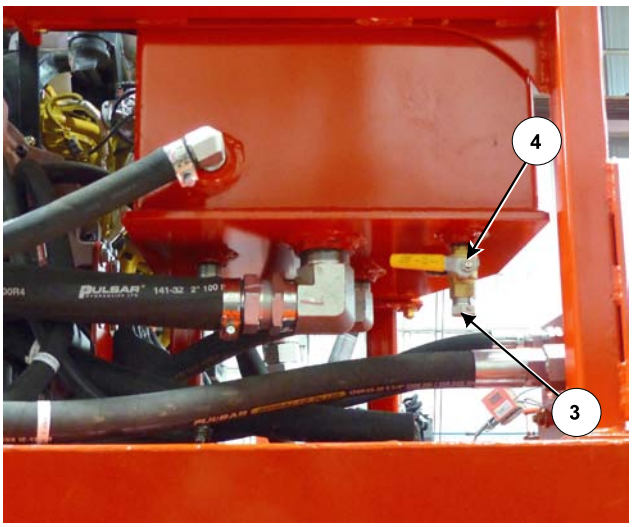
Changing the Hydraulic Tank Oil & Filter

Note: Refer to the Maintenance Interval Schedule for the timing of changing the hydraulic oil.

<u>Draining the Tank Oil</u>

- Ensure the handle of the tank drain valve (4) is closed.
- Remove the plug (3) at the bottom of the drain valve.
  - Connect a drain hose to the drain valve to direct the oil into a container.
  - The container will need to hold about 160 liters of oil.
- Open the drain valve (4).

After the tank is drained:
- Close the tank valve (4).
- Remove the drain hose.
- Replace the valve plug (3).

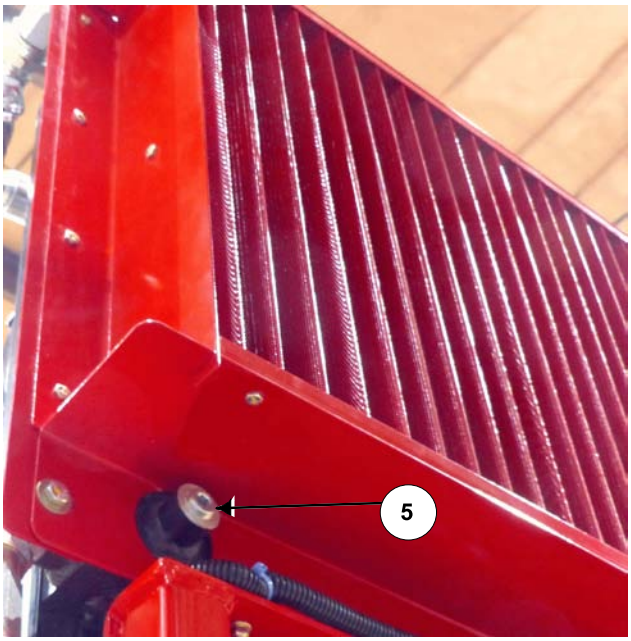


Drain Hydraulic Oil Tank 219223C

Draining the Oil Cooler

- Remove the drain plug (5) at the bottom of the oil cooler.
  - Collect the oil into a container.
    - The container will need to hold about 27 liters of oil.

- After the oil cooler is drained:
  - Replace the drain plug (5) at the bottom of the oil cooler.



Drain the Oil Cooler 219289C

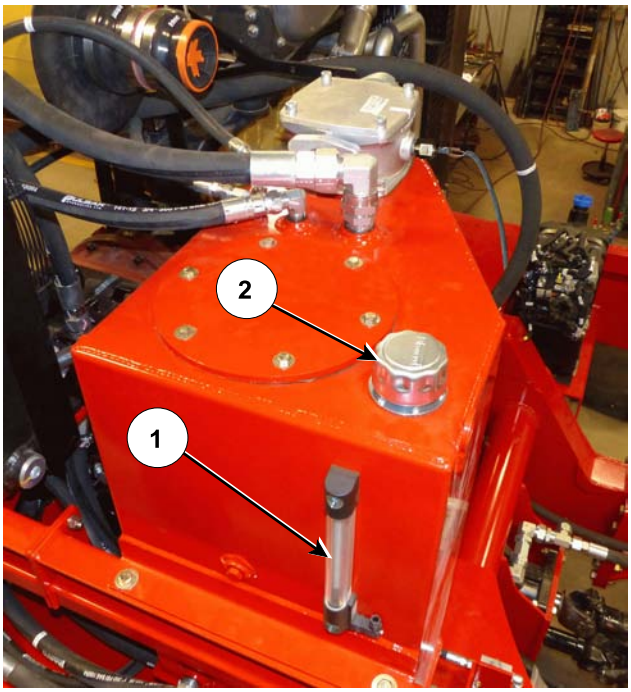
Filling the Oil Tank

Note: Keep the area around the filler cap clean to prevent oil contamination which will lead to hydraulic component failure.

- Fill the tank with about 160 liters of Hydrex MV-32 type oil or equivalent through the oil filler cap (2).

- Run the engine so that the pumps will fill the oil cooler with oil.

- Add more oil to the oil tank as needed to fill the tank to the middle of the sight glass (1).
  - This level allows some room for expansion of the oil as it heats up during use.



Oil Tank Level and Fill 219222C

Changing the Hydraulic Oil Tank Return Filter

By pressing the Info button on the display and turning the rotary dial the Hydraulic System Info will be displayed.

The status of the tank return oil filter is shown and if there is service needed.

- Change the filter when indicated.
- Change the filter each time the hydraulic oil in the oil tank is changed.

To Change the Filter

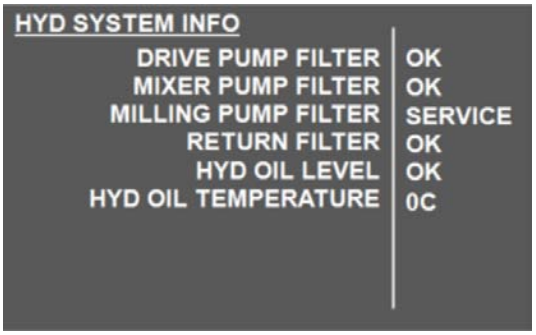
- Remove the 4 cap screws (1) from the filter cover.

- Remove the filter cover (2).

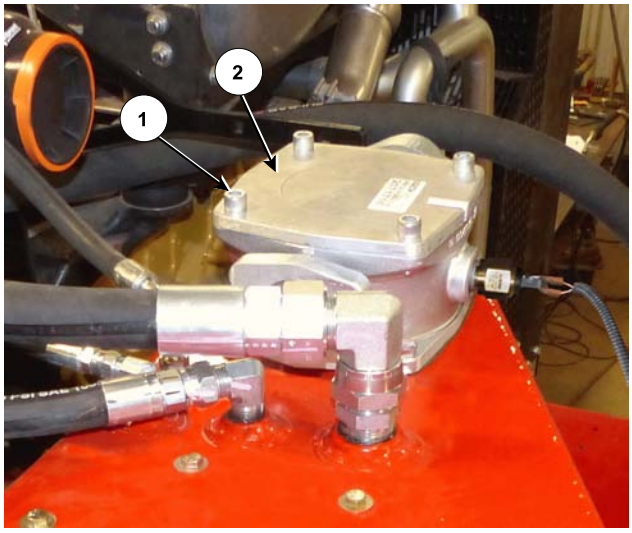
- Remove the upper O-ring seal under the cap.
  - The O-ring seal can be re-used.
    - If the upper O-ring seal has deteriorated, replace with a new part.

- Remove the filter.
  - Examine the filter surface for dirt residues and larger particles which may indicate damage to components.

- If the lower O-ring came out with the filter, remove the O-ring to be re-used.
  - If the lower O-ring seal has deteriorated, replace with a new part.



Hyd System Info on Display 219233



Replace the Oil Tank Filter 219224C


Oil Tank Filter 219229

- Install the new oil filter.

    - Use the filter type as specified in the "Capacities and Specifications" Section below.

    - Place oil on the lower O-ring.
    - Place the lower o-ring onto the filter.
    - Line up the filter to seat in the housing.
    - Place oil on the upper O-ring seal.
    - Place the upper O-ring onto the cap.
    - Install the cap and fasteners.
        - Torque to 26 ft-lb (35 NM).

Oil Tank Filter 219229

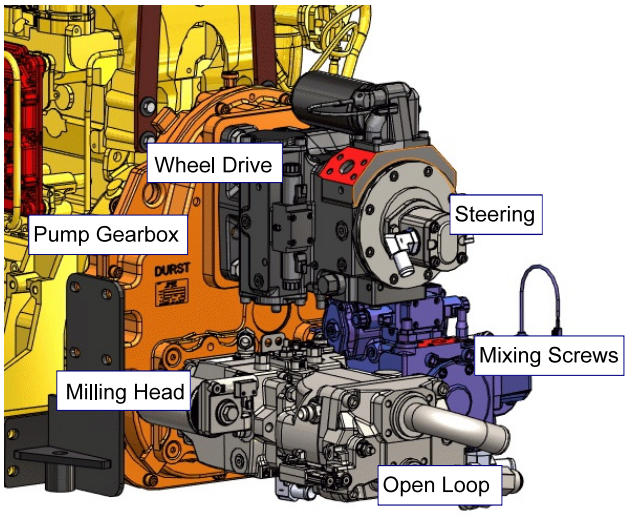
Hydraulic Pumps

- There are 5 hydraulic pumps driven through the pump gearbox located at the rear of the engine.

- The wheel drive pump, mixing screw pump and the milling head pumps are directly mounted to the gearbox.

- The steering pump is connected to the wheel drive pump.

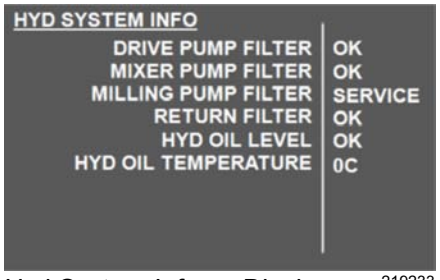
- The open loop pump for the braking and auxiliary functions is connected to the milling head pump.



Hydraulic Pumps 219220C2

Hydraulic Pumps Oil Filters

By pressing the Info button on the display and turning the rotary dial, a screen showing Hydraulic System Info will be displayed. The status of the hydraulic system pump oil filters is shown and if there is service needed.



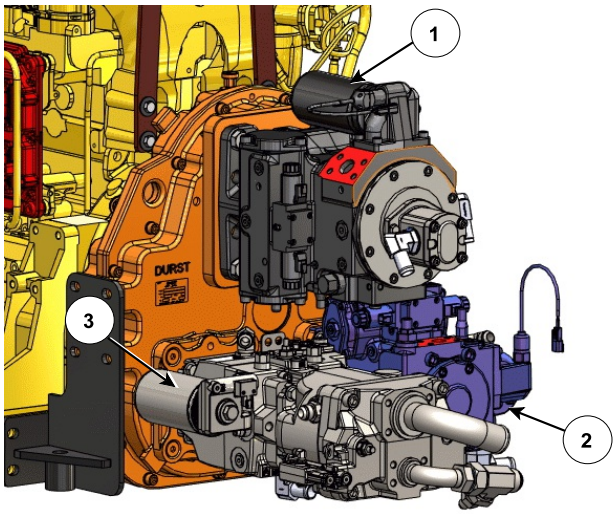
Hyd System Info on Display 219233

Replace the filters when the oil in the oil tank is replaced.

Changing the Pump Filters

- There are 3 pump oil filters located on the pumps.

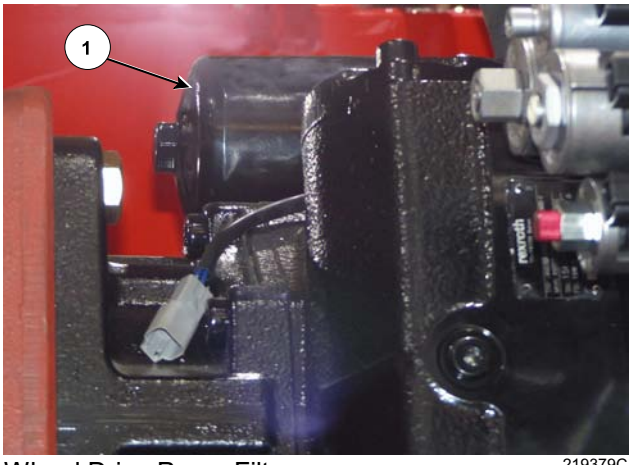
  1. Wheel drive pump filter
  2. Mixing screws pump filter
  3. Milling head pump filter



Pump Filters 219220C

- Wheel drive pump oil filter. (1)

  - This is a cartridge type filter.

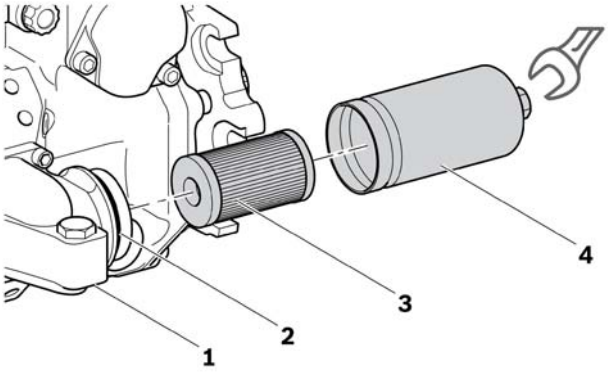


Wheel Drive Pump Filter 219379C

To Change the Wheel Drive Pump Filter:

Note: A small amount of oil may leak out while the filter is being changed. Catch the oil for disposal.

1. Remove the filter housing (4) from the filter head (1).
2. Remove the used filter element (3) from the filter housing (4).
3. Check the filter head (1) and filter housing (4) for damage, wear and contamination.
4. Check the O-ring (2) and O-ring groove for damage, wear and contamination.
   - If required, replace the O-ring (2).
5. Lightly lubricate the O-ring (2).
6. Place the new filter element (3) into the filter housing (4).
7. Screw the filter housing (4) onto the filter head (1).
8. Tighten the filter housing (4) to 45 Nm.

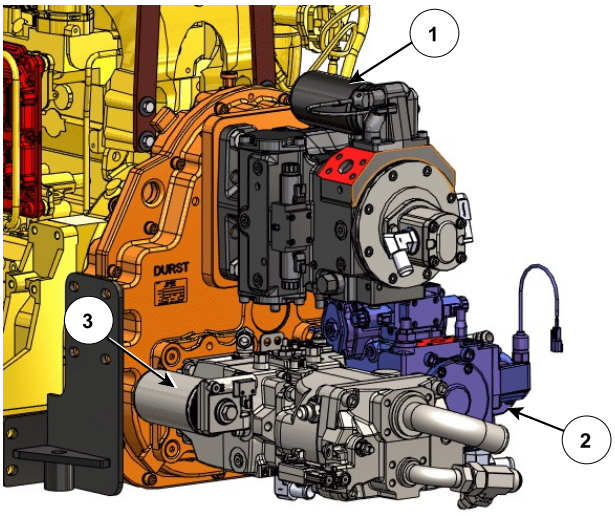


Change The Cartridge Filter 219384

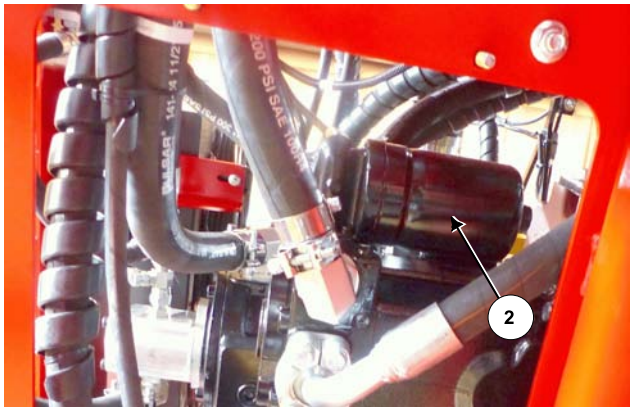
- Mixing screws pump oil filter. (2)

  - The mixing screw filter is accessed by reaching up through the opening in the machine frame near the rear right wheel.

  - This is a cartridge type filter.



Pump Filters 219220C

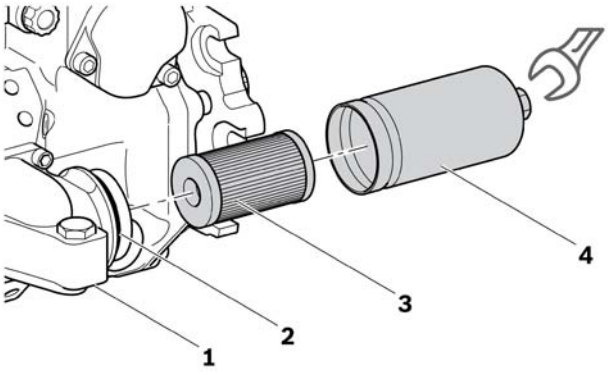


Mixing Screws Pump Filter - Access from Below the Frame 220121C

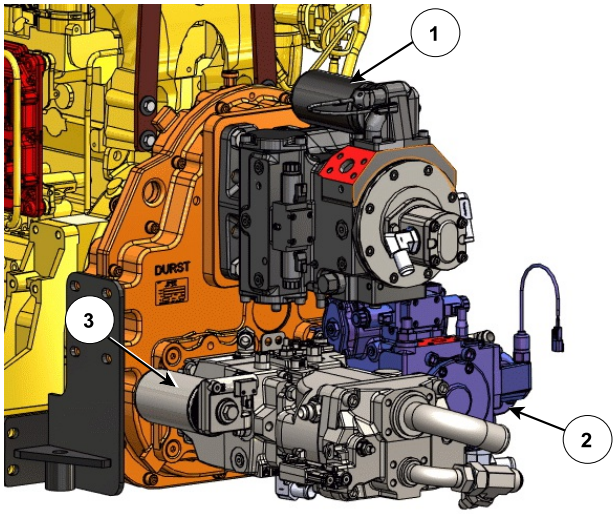
To Change the Mixing Screw Pump Filter:

Note: A small amount of oil may leak out while the filter is being changed. Catch the oil for disposal.

1. Remove the filter housing (4) from the filter head (1).
2. Remove the used filter element (3) from the filter housing (4).
3. Check the filter head (1) and filter housing (4) for damage, wear and contamination.
4. Check the O-ring (2) and O-ring groove for damage, wear and contamination.
   - If required, replace the O-ring (2).
5. Lightly lubricate the O-ring (2).
6. Place the new filter element (3) into the filter housing (4).
7. Screw the filter housing (4) onto the filter head (1).
8. Tighten the filter housing (4) to 45 Nm.



Change The Cartridge Filter 219384



Pump Filters 219220C

- Milling head pump filter. (3)

  - This is a spin on type filter.

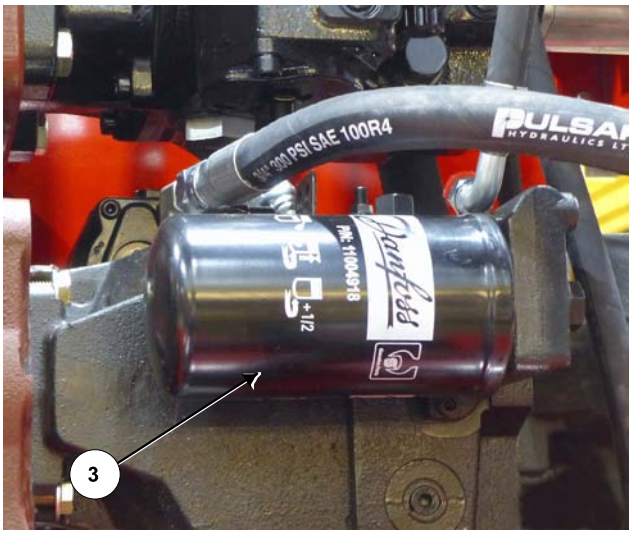
To Change the Milling Head Pump Filter:

Note: A small amount of oil may leak out as the filter is being changed. Catch the oil for disposal.

- Remove the old filter (3) and discard.

- Place some oil on the rubber seal ring of the new filter.

- Screw the new filter (3) onto the pump.
  - Tighten in place.



Milling Head Pump Filter 219380C

- Other pumps
  - The steering pump and the open loop pump for the braking and auxiliary functions utilize the return filter mounted on the main oil tank.

  - See above for information on changing the oil tank return oil filter.

Gearbox for the Hydraulic Pumps

- Check the oil level of the gearbox by using the dipstick (1).

Note: Do not over fill with oil as this will result in overheating and possible failure of the pump drive gearbox.

- Clean the breather (2) located at the top of the gearbox.

To Change the Pump Drive Gearbox Oil

Note: Refer to the Maintenance Interval Schedule for the timing of changing the hydraulic oil.

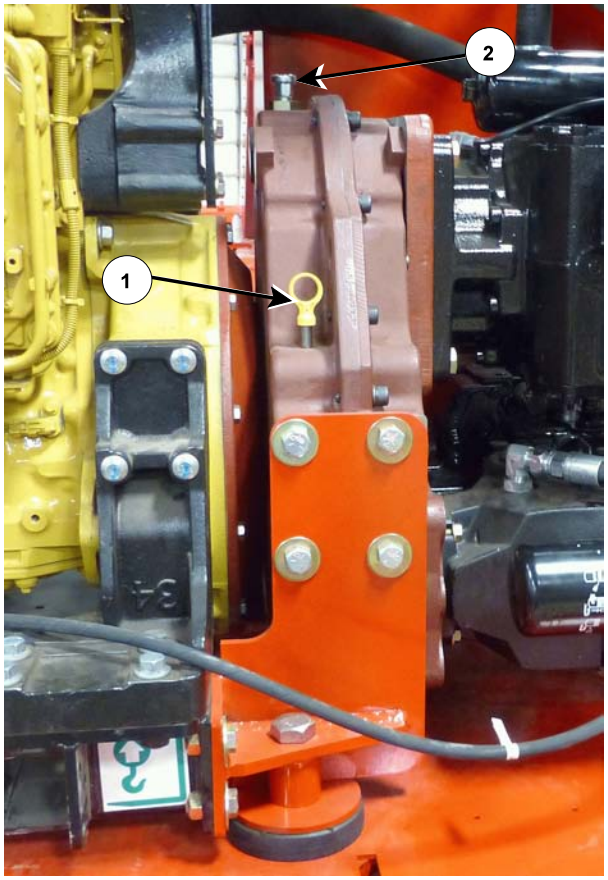
- Change the oil when gearbox is warm.

- Drain the oil by removing the drain plug located at the bottom of the gearbox by reaching up through the frame.
  - Catch the oil to be disposed in a safe manner.
  - Replace the drain plug.
    - Torque to 50 ftlbs.

- Remove the breather (2) to fill the gearbox with oil.

- Fill with approximately 5 litres of 75W90 synthetic oil.

- Check the oil level using the dipstick (1).



Gearbox for Hydraulic Pumps 219225C

Visually Inspect Hydraulic Hoses/Fittings

Shut down the machine and replace the hydraulic hose assembly if any of the following conditions exist:

- Fitting slippage on hose.
- Damaged, cracked, cut or abraded cover (any reinforcement exposed).
- Hard, stiff, heat cracked or charred hose.
- Cracked, damaged or badly corroded fittings.
- Leaks at fitting or in hose.
- Kinked, crushed, flattened or twisted hose.
- Blistered, soft, degraded or loose cover.

Note: Some hydraulic circuits are pressured to very high pressures by accumulators.

Accumulators in the hydraulic system contain high pressure oil.

Those circuits retain pressure even after the machine is turned off.
They need the pressure to be relieved with special methods before servicing.

Contact with high pressure oil may cause death or serious injury.

Visually Inspect Hydraulic Cylinders

Shut down the machine and visually inspect all hydraulic cylinders, looking for leaks and/or other damage.

- If hydraulic cylinder damage is found, make all necessary repairs or replace before operating the machine.

Visually Inspect the Hydraulic Pumps and Motors

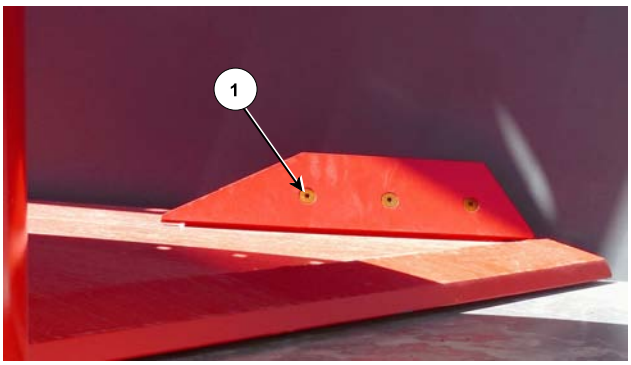
Shut down the machine and visually inspect all hydraulic pumps and motors, looking for leaks and/or other damage.

- If hydraulic pump or motor damage is found, make all necessary repairs or replace before operating the machine.

Adjust The Kicker Plate on the Screw Leading Edge

As the machine mixes material, the kicker plate edge will wear as it lifts material onto the screw.

- Adjust the kicker plate toward the outer edge of both screws.
  - Loosen the fasteners (1) and slide the kicker plate to the edge of the screw.
  - Tighten the fasteners (1) to hold the kicker plate.



Adjust Kicker Plate to the Edge of the Screw 220138C

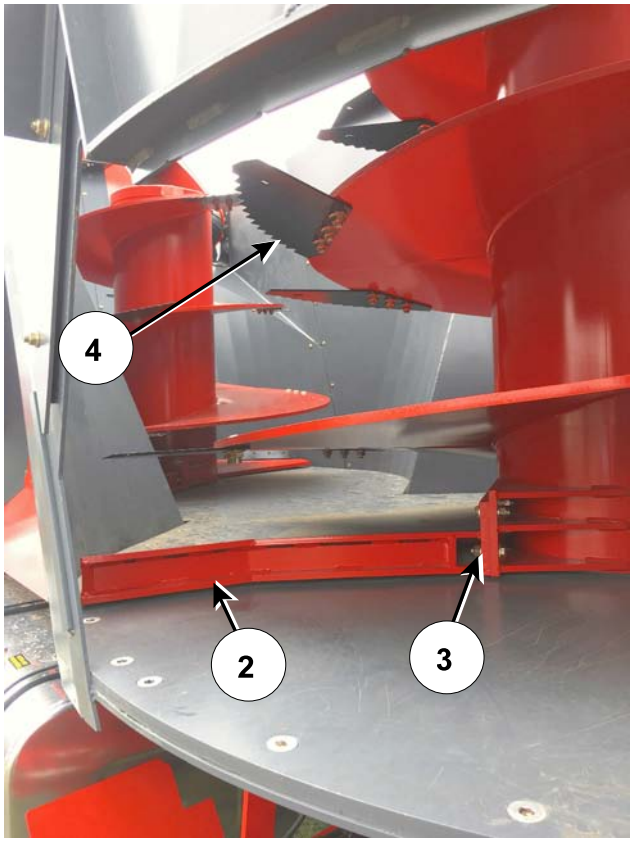
Adjust the Screw Sweeper

If the screw sweeper (2) is contacting the tub floor, add shims between the sweeper and screw mount (3) to move the sweeper up for a small clearance from the tub floor.

Knives on the Screws (Optional)

If the optional knives (4) are installed on the screws, the knives nearer to the base of the screw are subject to the most wear.

- To help with uniform wear, exchange the lower knives with the upper knives.
- Replace the knives when they are worn or are no longer cutting material.



Screw Sweeper Clearnace
Change or Replace the Knives 219259

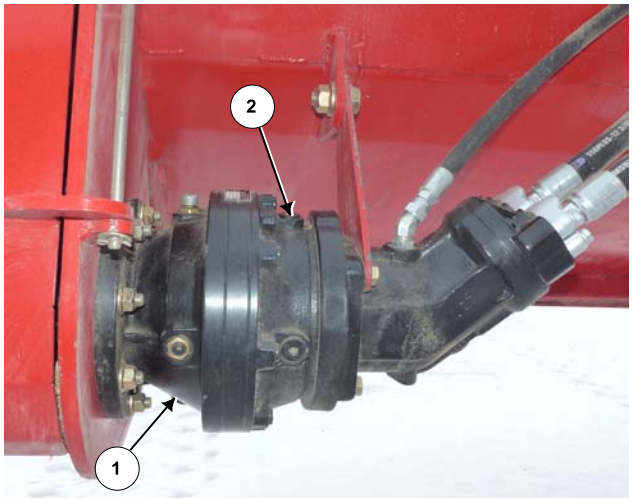
Do Not Enter the Tub While the Mixers Are Turning.

Entering the tub when the mixers are turning will result in death or serious injury.

Do not lean over the mixing tub while the screws are turning to avoid the danger of falling into the tub.

Do not contact the rotating screws. Never attempt to manually remove debris while the screws are rotating.

Milling Head Gearbox



Change the Milling Head Gearbox Oil 220024C2

To Change the Milling Head Gearbox Oil:

1. Remove the oil fill plug (2) from the top of the gearbox.

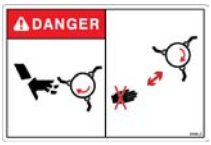
2. Remove the oil drain plug (1) at the bottom of the gearbox.
   - Catch the oil to be properly disposed of.

3. Replace the drain plug (1).

4. Fill the gearbox with approximately 900 ml of Synduro SHB 220 Synthetic oil
   - Check the oil level through the sight glass on the side of the gearbox.

5. Replace the oil fill plug (2) at the top.

Milling Head and Conveyor




Turn Off Battery Switch & Lock 219309

To change the milling head teeth:

Contact with moving milling teeth and auger will cause serious injury or death.
Keep hands out of the cutting area of the loading arm when the drum is rotating.

1. Raise the milling head to about 3 feet off the ground.

2. Set the park brake, shut off engine, remove key and wait for all parts to stop turning before servicing.

3. Turn off the battery switch and lock it to prevent accidental starting of the machine.

4. Replace the milling head teeth if they are worn or damaged.


Change the Milling Head Teeth 219227

To Adjust the Milling Head Drive Belt

Contact with the moving belt or sheaves may cause serious injury or death.
Keep away from moving parts.

- Unlock the guard door and swing it open.

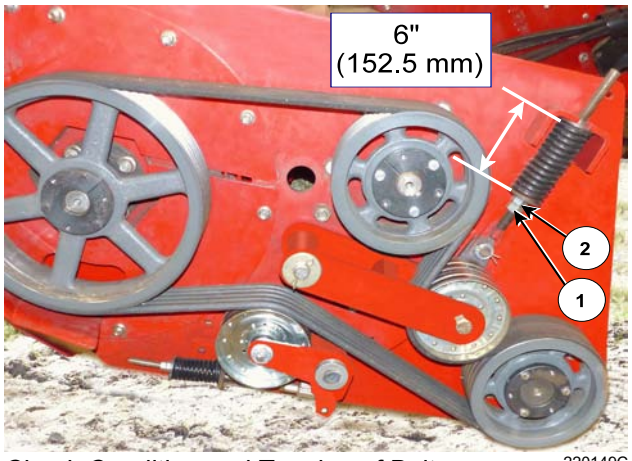
Upper Spring

Note: Before adjusting the upper spring check that the belt is not rubbing on the lower tensioner pivot tube.
  - There should be about 3/8" clearance from the bottom of the belt (3) and the lower idler pivot (4).
  - Instructions on adjusting the lower spring are given below.

- The length of the upper tension spring should be 6" (152.5mm) measured between the 2 spring washers.

- Loosen the locknut (1) on the threaded rod.

- Tighten the adjusting nut (2) until the spring measures 6" (152.5 mm) measured between the 2 spring washers. Tighten the locknut.

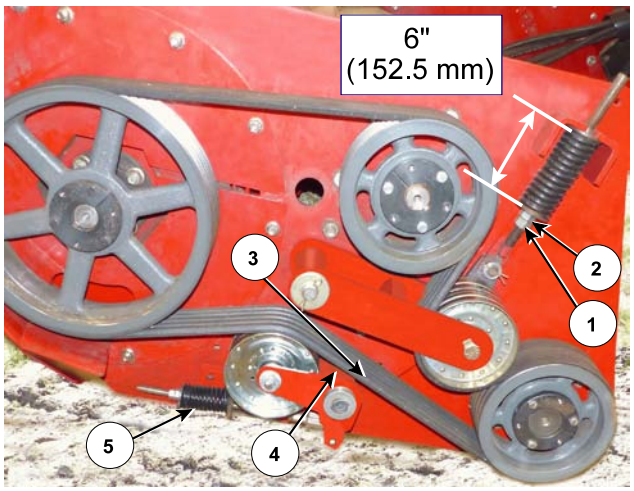


Check Condition and Tension of Belt 220149C

Lower Spring

- To adjust the lower spring:

  - Start tightening the upper spring.
    - Loosen the locknut (1).
    - Tighten the spring adjusting nut (2).
    - If the belt (3) is making contact with the lower tension pivot tube (4), then tighten the lower spring (5) until the belt (3) is a small amount above the pivot tube (4).



Adjusting the Lower Spring 220149C5

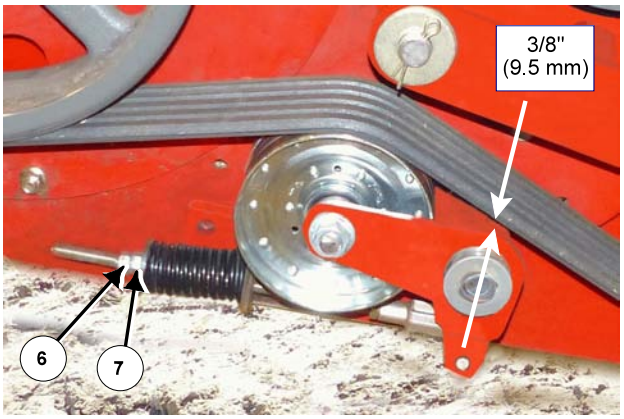
- Keep tightening the upper spring until both springs are nearly fully compressed.

- Once both springs are fully compressed then check the clearance of the belt (3) from the lower pivot tube (4).

  - If the clearance is less than 3/8" then loosen the lower spring jam nut (6) and tighten adjusting nut (7).

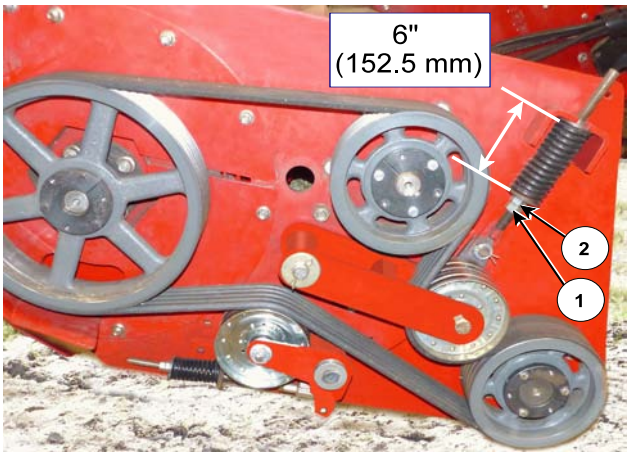
  - If clearance is more than 3/8" then loosen on the lower spring nut (7) and tighten the jam nut (6).

    Note: If needed, tighten or loosen the upper spring during this process in order to keep both springs nearly fully compressed.



Check Clearance of Belt from Lower Tension Pivot Tube 220150C

- Loosen the upper spring nut (2) until the spring measures 6" (152.5 mm) measured between the spring washers.
  - Tighten the locknut (1) on the upper spring threaded rod.



Check Condition and Tension of Belt 220149C

To Change the Milling Head Belt

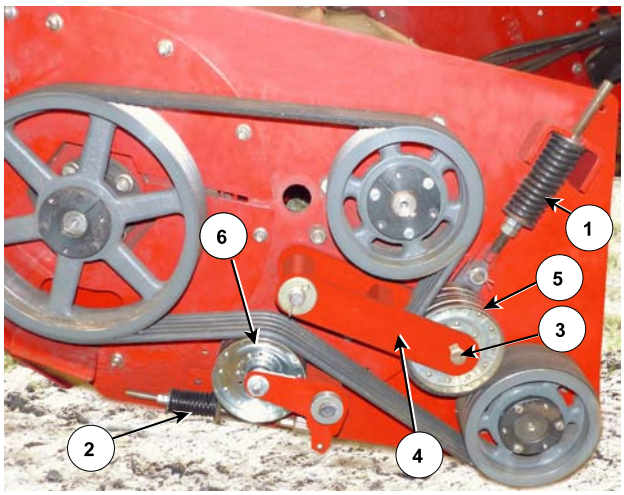
Note: Before beginning prepare a temporary bolt that will keep the upper idler tensioners and spacers in place.
- Use a 3/4" x 6" bolt.
- Measure the distance between the legs (4) of the tensioner bracket.
- Cut the head of the bolt and any length needed so that the bolt will fit into the idlers and spacers but can be removed from between the idler bracket legs (4).

1. Loosen off all tension from both the upper (1) and lower (2) springs.

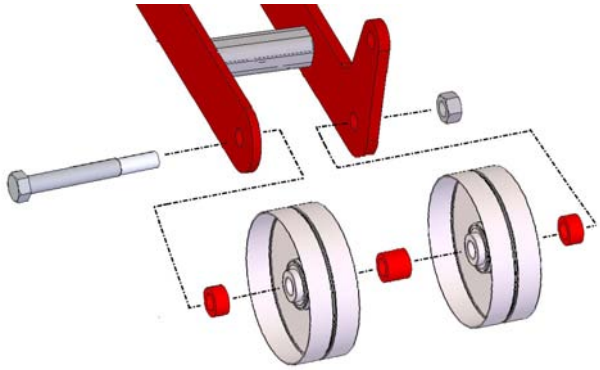
2. Remove the locknut from the upper idler bolt (3).
   - Access the lock nut on the backside of the milling head wall.
   - Keep the bolt for re-use.

3. Use the prepared temporary bolt to push out the upper idler bolt (3)
   - Push from the backside of the milling head wall through the idler spacers and idlers.
   - Center the temporary bolt to be between the tensioner legs (4).

4. Remove the upper idlers (5) (with the temporary bolt in place) from between the tensioner legs.
   - Use caution to keep the spacers and idlers in place.



Replacing the Milling Head Belt 220149C3



Exploded View of Upper Idler 220153

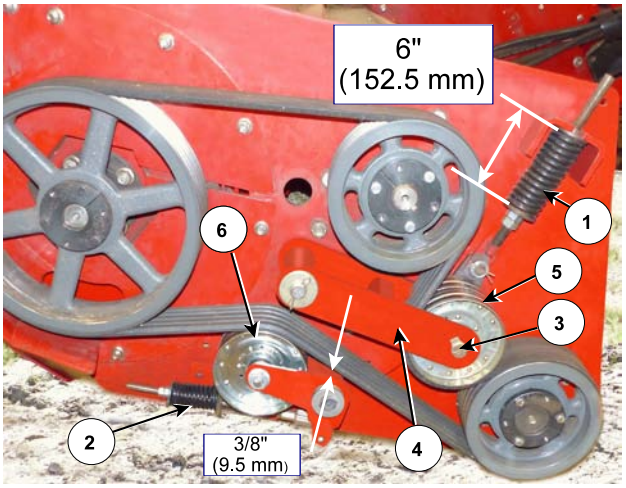
5. Place the new belt around the sheaves and over the lower tension idler (6).

6. Place the upper tension idlers and spacers (5) (with the temporary bolt) back in place between the tensioner bracket legs (4).

7. Push out the temporary bolt with the idler bolt (3) removed earlier.
   - Push from the sheaves side of the milling head wall.

8. Tighten the idler bolt (3) with the locknut.
   - Access the bolt threads on the backside of the milling head wall.

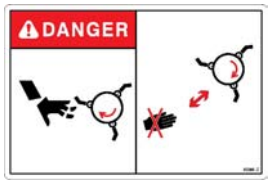
9. Tighten the drive belt by following the instructions "To Adjust the Milling Head Drive Belt" given above.



Replacing the Milling Head Belt 220149C4

Tightness and Tracking of the Loading Conveyor.

Contact with moving milling teeth and auger will cause serious injury or death.
Keep hands out of the cutting area of the loading arm when the drum is rotating.
Keep body and clothing away from moving parts to prevent serious injury or death.

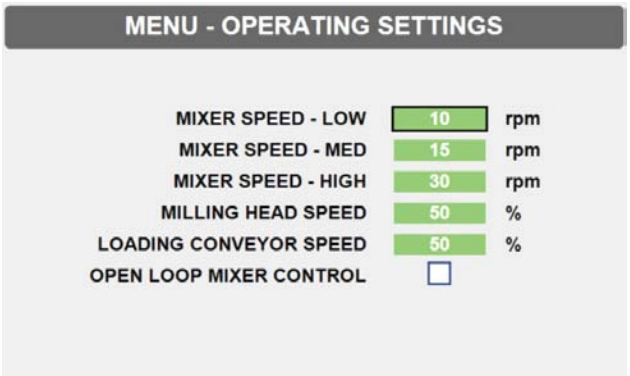


Note See Section 4 "Preparing to Use the AccuMix 1000" for checking the condition of the loading arm conveyor belt.

1. Before starting to adjust belt tightness or tracking:

- Change the speed of the milling head to 0 (zero) % so that it does not rotate.
  This is a safety step to prevent any movement of the milling head while working in the area.
  - Select Menu and Operating Settings.
  - Select Milling Head Speed.
  - Use the selector knob to set the speed to 0 rpm.

- Change the speed of the loading conveyor.
  - On the display in the cab adjust the loading conveyor speed to 10 %.
    - At a later step the conveyor will need to move to adjust the tracking on the rollers.

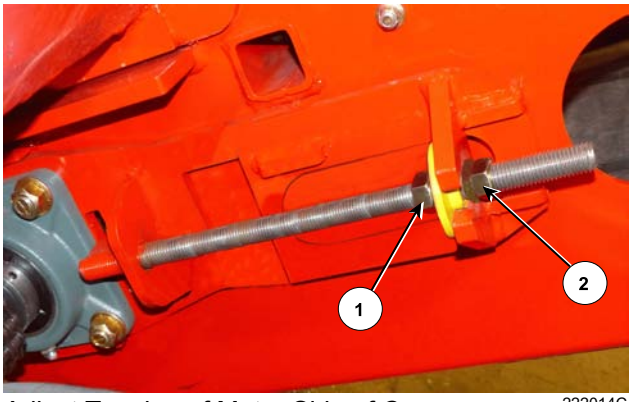


Operating Settings 220097

2. Check the tightness of the conveyor over the rollers.

   On the lower motor side of the conveyor:

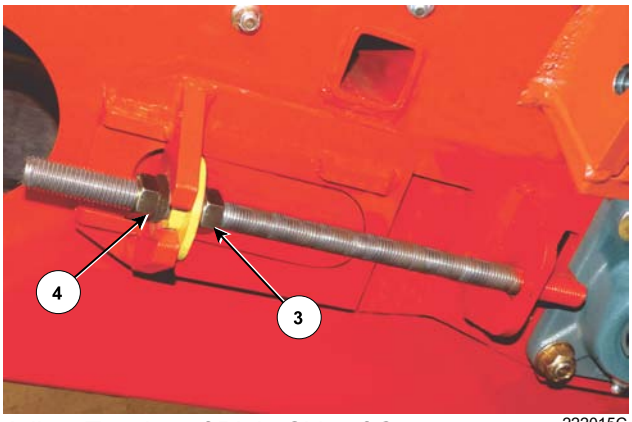
   - The tightness of the conveyor will need to be adjusted if there is slipping of the conveyor or the conveyor does not move when the motor is engaged.
   - On the motor side loosen the upper nut (2) of the tension adjustment.
   - Torque the nut (1) 12-14 ftlbs to adjust the tension.
   - Tighten the upper nut (1).



Adjust Tension of Motor Side of Conveyor 222014C

   On the lower right side of the conveyor:

   - The tightness of the conveyor will need to be adjusted if there is slipping of the conveyor or the conveyor does not move when the motor is engaged.
   - On the right side loosen the upper nut (4) of the tension adjustment.
   - Torque the lower nut (3) to 12-14 ftlbs to adjust the tension .
   - Tighten the upper nut (4).



Adjust Tension of Right Side of Conveyor 222015C

3. Check the tracking of the conveyor.

   - Start the engine of the machine.

   - Select Load on the Display.

   Ensure the milling head speed is set to 0 (zero) rpm so the head is not turning while working in this area.

   Follow the procedure given above for changing the milling head speed in the display.

   - Use the joystick control to raise the loading arm so the loading conveyor can be seen under the milling head.

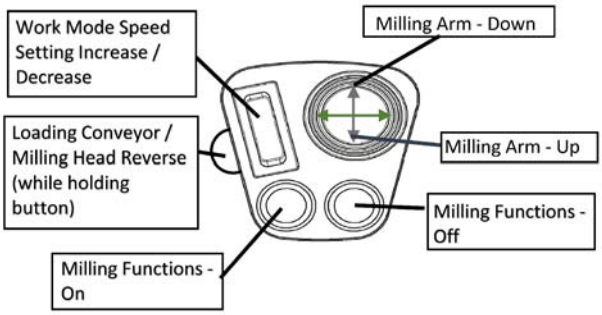
     Note: Ensure the loading conveyor speed is set to 10 %. This slow speed allows the conveyor to turn while adjusting for tracking.

   - Press the joystick button to begin the milling function/movement of the loading conveyor.
     - The milling head will not turn if the milling head speed has been adjusted to 0 (zero).

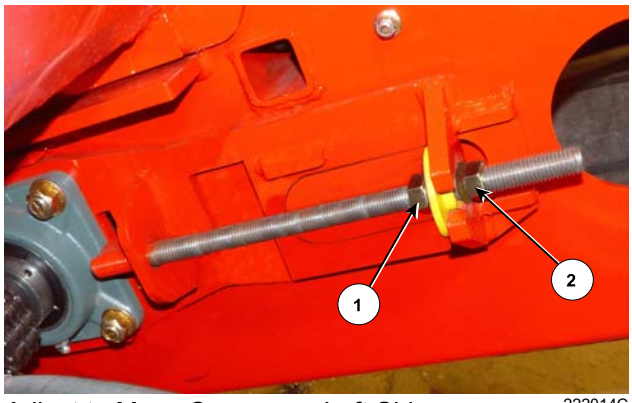
     - Check that the loading conveyor is running centered between the side walls of the loading arm.

   <u>To adjust the lower conveyor tracking:</u>
     - Loosen the upper nuts (2)(4) and move the lower nuts (1)(3) on the side the conveyor should move toward.
       - Do small adjustments and check the effect on the clearance to the sidewalls of the arm.
     - When done adjusting tighten the upper nuts (2)(4).

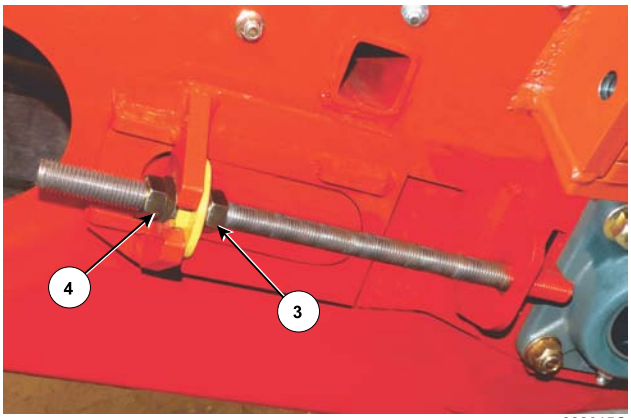
Check the Tracking of the Conveyor 219254



Start the Conveyor for Tracking Adjustment 219230



Adjust to Move Conveyor - Left Side 222014C



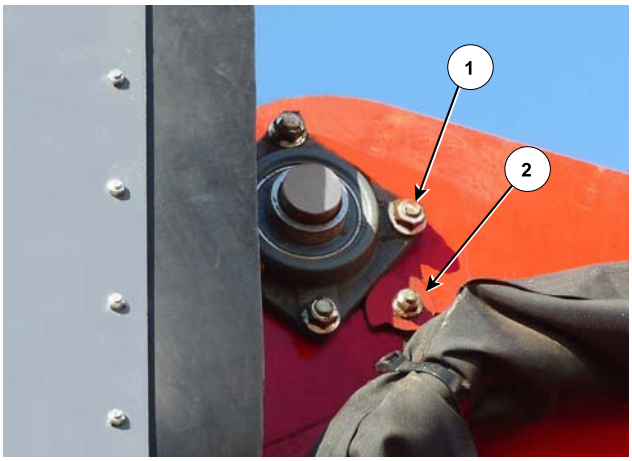
Adjust to Move Conveyor - Right Side 222015C

To adjust the upper conveyor tracking:

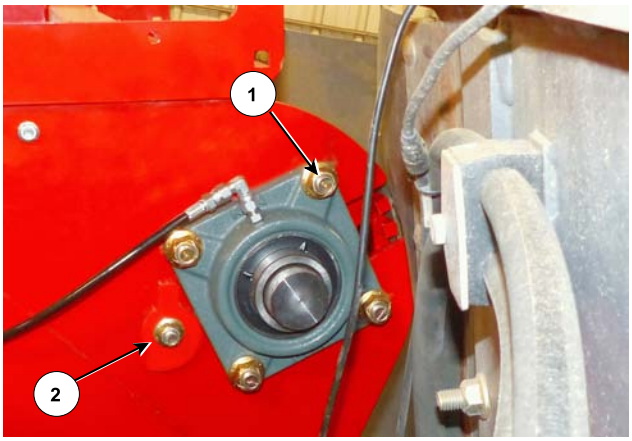
- If the conveyor needs to move, loosen the nuts of the bearing (1) on the side the conveyor should move toward.
  - The bearing bolts are positioned inside slots.

- Turn the adjusting cam (2) to move the belt.
  - Do small adjustments and check the effect.

- When done adjusting the upper tracking tighten the adjusting cam (2) and the bearing bolts (1).



Adjust Bearing for Conveyor Tracking - Right Side 219369C2

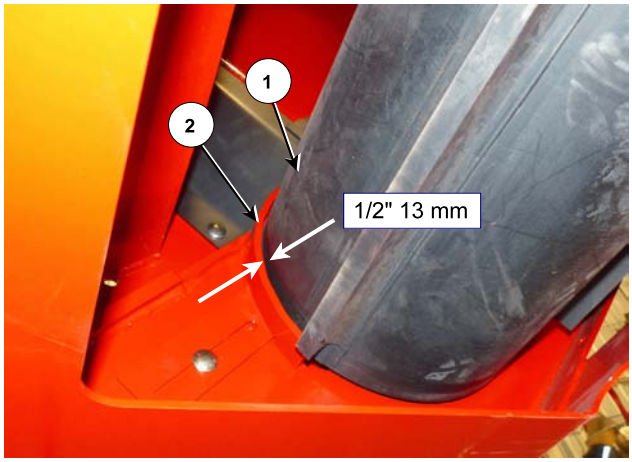


Adjust Bearing for Conveyor Tracking - Left Side 220007C

4. Adjust the right lower conveyor debris guard (2) located inside the arm housing.

   - Check that the debris guard has ½" (13 mm) between the guard (2) and the belt (1).

   - The debris guard (2) can be viewed from the bottom of the loading arm.

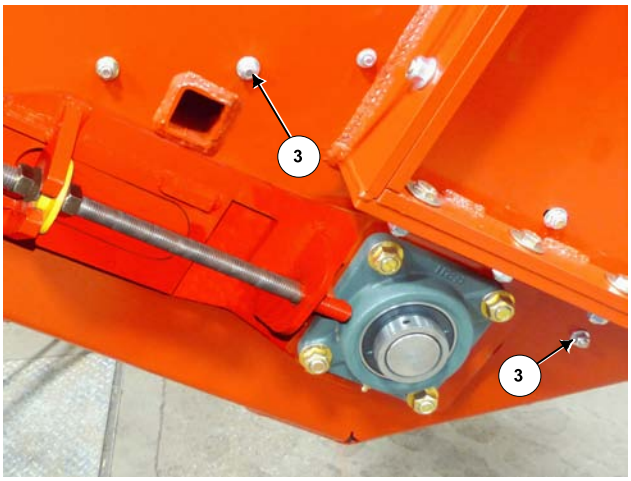


Check the Clearance of the Inside Conveyor Debris Guard 219005C

- To adjust the debris guard, loosen 2 nuts (3) located on the right outside of the loading arm.

- Move the debris guard so that there is ½" (13 mm) between the guard (2) and the belt (1).

- Tighten the nuts (3).



Adjust the Inside Conveyor Debris Guard 222022C

Unloading Doors and Conveyors

Chain Tension Adjustment on the Front Under the Cab Conveyor

On the motor side (left side) of the conveyor:

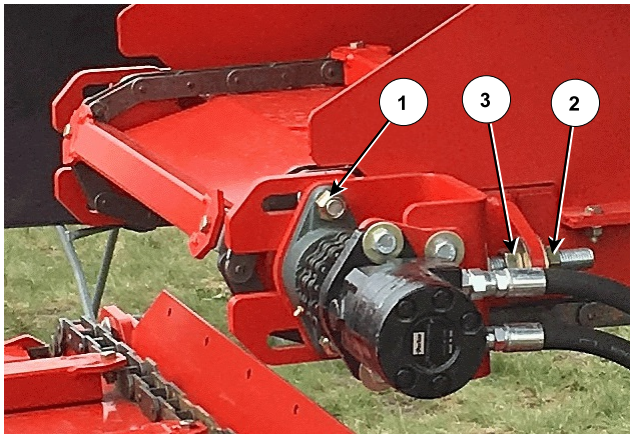
- Loosen the nuts on the chain roller bearings (1).

- Loosen the locknut (2) on the tension adjusting bolt.

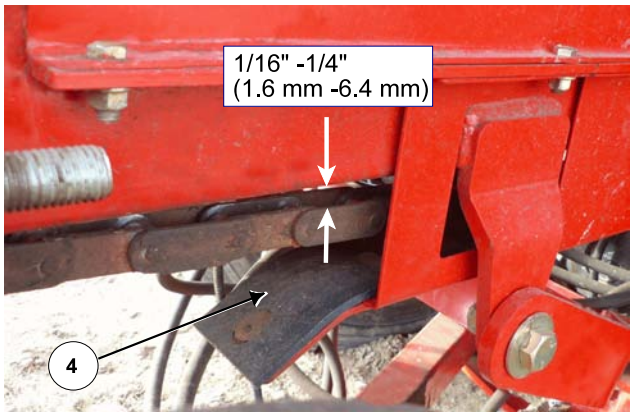
- Turn the adjusting nut (3) until the chain hangs 1-16" - 1/4" (1.6 mm - 6.4 mm) below the chain guide but does not ride on the UHMW wear strip (4) located under the conveyor table.

- Tighten the nuts (1) on the bearings.

- Tighten the locknut (2) on the adjusting bolt.



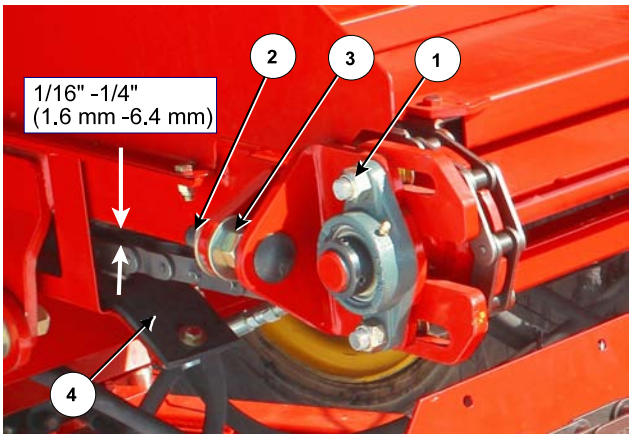
Under Cab Conveyor Chain Adjustment-Left Side 219234C



Chain Tension Adjustment Settings 219383C

On the right side of the conveyor:

- Loosen the nuts on the chain roller bearing (1).
- Loosen the locknut (2) on the tension adjusting bolt.
- Turn the adjusting nut (3) until the chain hangs 1-16" - 1/4" (1.6 mm - 6.4 mm) below the chain guide but does not ride on the UHMW wear strip (4) located under the conveyor table.
- Tighten the nuts (1) on the bearings.
- Tighten the locknut (2) on the adjusting bolt.

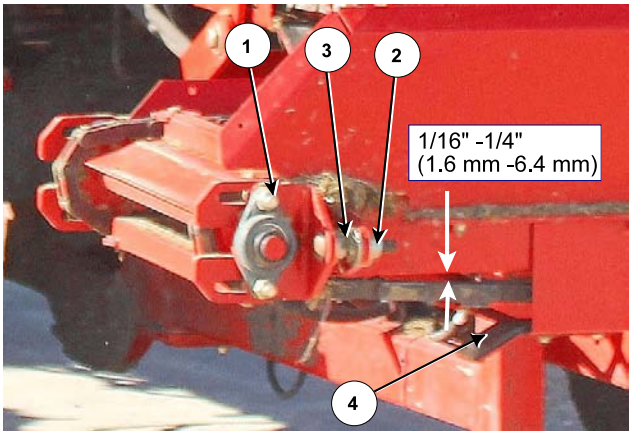


Under Cab Conveyor Chain Adjustment-Right Side 219235C

Front Side to Side Conveyor Chain Tension Adjustment

On the front right side of the conveyor:

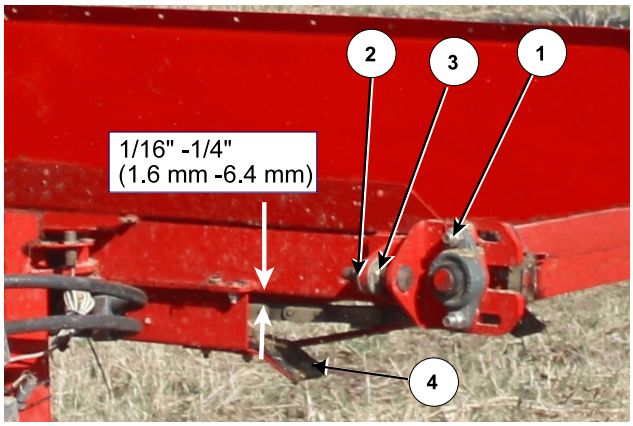
- Loosen the nuts on the front chain roller bearings (1).
- Loosen the locknut (2) on the tension adjusting bolt.
- Turn the adjusting nut (3) until the chain hangs 1-16" - 1/4" (1.6 mm - 6.4 mm) below the chain guide but does not ride on the UHMW wear strip (4) located under the conveyor table.
- Tighten the nuts (1) on the bearings.
- Tighten the locknut (2) on the adjusting bolt.



Front of Side to Side Conveyor Chain Tension Adjustment 219237C

On the rear side of the conveyor:

- Loosen the nuts on the front chain roller bearings (1).
- Loosen the locknut (2) on the tension adjusting bolt.
- Turn the adjusting nut (3) until the chain hangs 1-16" - 1/4" (1.6 mm - 6.4 mm) below the chain guide but does not ride on the UHMW wear strip (4) located under the conveyor table.
- Tighten the nuts (1) on the bearings.
- Tighten the locknut (2) on the adjusting bolt.

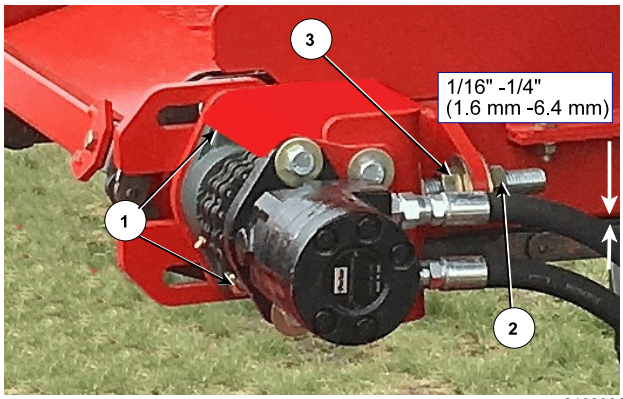


Rear of Side to Side Conveyor Chain Tension Adjustment 219238C

Rear Unloading Conveyor

On the motor side (back side) of the conveyor:

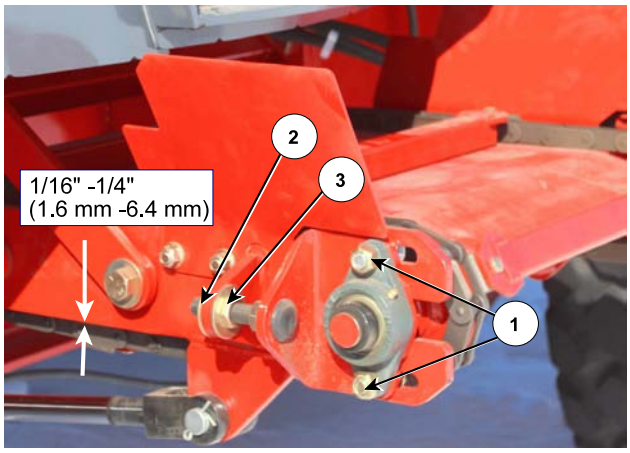
- Loosen the nuts on the chain roller bearings (1).
- Loosen the locknut (2) on the tension adjusting bolt.
- Turn the adjusting nut (3) until the chain hangs 1-16" - 1/4" (1.6 mm - 6.4 mm) below the chain guide.
- Tighten the nuts on the bearings (1).
- Tighten the locknut (2) on the adjusting bolt.



Adjust Motor Side of Conveyor Chain 219239C

On the front side of the rear conveyor:

- Loosen the nuts on the chain roller bearings (1).
- Loosen the locknut (2) on the tension adjusting bolt.
- Turn the adjusting nut (3) until the chain hangs 1-16" - 1/4" (1.6 mm - 6.4 mm) below the chain guide.
- Tighten the nuts on the bearings (1).
- Tighten the locknut (2) on the adjusting bolt.



Adjust Front Side Of Conveyor Chain 219240C

Diesel Exhaust Fluid (DEF) Tank

When handling DEF, follow these procedures:

- Do not breathe DEF vapor or mist.
- Do not eat, drink or smoke when using DEF.
- Avoid DEF contact with eyes, skin and clothing.
- Wash thoroughly after handling DEF.

- The DEF tank is located on the left side of the machine behind the rear door next to the tub.

Note: Fill the DEF tank each time the fuel tank is filled. The DEF tank has a 1:1 fill rate with the fuel tank. If fuel is added, DEF needs to be added.

- The DEF tank capacity is 37.8 liters.
- There are filters inside the DEF tank that will need to be replaced.
  - Refer to the recommended change interval Schedule.
  - Refer to CAT engine manual for filter replacement procedures.

DEF Tank Location 219390

Compressed Air Dryer & Governor

1. Every 900 hours check the condition of the compressed air dryer.
    - Check for moisture in the air system by opening the drain valve (1) on the bottom of the air tank checking for water.
        - If moisture is present, the desiccant of the air dryer may require replacement.
            - The presence of water may be caused by other circumstances including wide temperature variations in the operating environments. See the air dryer service document for more information.
            - If the desiccant needs replacing, follow the procedure outlined in the air dryer service document.

    - Check if there is any oil on the exhaust of the air dryer or the surrounding area.
        - If there is wet glistening oil or there is any sign of oil dripping from the exhaust of the dryer, then there is an oil carry over problem in the air compressor.
            - Get the compressor serviced. Also change the desiccant in the air dryer.

2. Every 1500 hours inspect the compressed air governor for proper operation.

    - See the air governor service document for the operational tests to be performed.
    - See the air governor service document for servicing the governor.

Check For Moisture by Opening Air Tank Drain Valve 222012C

Compressed Air Dryer Check for Oil from Exhaust 222011


Check the Air Governor 222013C

Air Conditioning System

Do not attempt to service the air-conditioning system. Contact your dealer for service. Failure to comply could result in death or serious injury.

Recommended Service Interval Chart

Note: The Engine Service Schedule part of this Service Chart was adapted from the CAT Engine Manual.

See the CAT Engine manual for additional information and procedures.

Note: Refer to the service manuals for the other components.

Daily
Check Engine Oil Level
Check Pump Drive Oil Level
Check Engine Air Cleaner Service Indicator
Drain Water from Fuel Water Separator
Check Hydraulic Oil tank Level
Check Hydraulic Components for leaking
Check Mixer Screw Oil Levels
Check the Suspension Height System is Working
Remove Trash and Debris
Clean the Radiator, Charge Air Cooler and Condenser as Required
Clean Backup Camera
Clean Tub Camera
Clean the Forward Looking Camera

Every 50 Service Hours
Grease Points as Indicated in this Section
Drain Fuel Tank Sump
Check Wheels
Check Tire Lug Nuts
Check Tire Inflation

Every 100 Hours
Grease Driveline Shafts
Grease Screw Drive Shafts
Change Axle Differential Oil - First Change
Change Axle Hub Reduction - First Change
Change Oil - Mixing Screw Gearbox - First 100 hours
Adjust Brakes - First 100 Hours

Every 250 Service Hours
Check Axle Differential Oil Level
Check Axle Hub Reduction Oil Level
Check Radiator Hoses
Check Suspension Height System components

Every 500 Service Hours or 1 Year
Replace Engine Air Filters
Inspect Engine Air Intake System
Change Engine Oil and Filter
Replace Fuel Filter (In—Line)
Replace Fuel System Primary Filter (Water Separator) Element
Replace Fuel System Secondary Filter
Check Battery Electrolyte Level
Service Battery Connections
Test/Add Cooling System Supplemental Coolant Additive (SCA)
Change Pump Drivebox Oil - First 500 hours
Check Mixing Screw Gearbox Seals and Screw tightness
Check Wheels and Bolt Torque
Change Oil Pump Filters or as indicated on Display
Change Hydraulic Oil Tank Filter or as indicated on Display

Adjust Brakes

Every 900 Hours
Drain the air tank. If moisture is present the air dryer desiccant may need to be replaced.

Every 1000 Service Hours
Replace Fuel Tank Vent Filter
Replace Cab and Recirculating Filter
Check Accumulator Charge Pressures
Inspect Engine Belt
Inspect Engine Belt Tensioner
Inspect Engine Water Pump
Change Transfer Case Oil - After First 1000 hours
Check Transfer Case Oil Level
Change Axle Differential Oil
Change Axle Hub Reduction Oil
Change Pump Drivebox Oil
Change Hydraulic Oil in Main Oil Tank & Change Tank Filter
Grease Swivel Links holding the Weigh Load Cells

Every 1500 Service Hours
Replace Engine Crankcase Breather Element
Inspect the Compressed Air Governor for Proper Operation. Service if necessary.

Every 2000 Service Hours
Inspect Aftercooler Core
Inspect Engine Mounts
Inspect Starting Motor
Change the Oil in the Mixing Screw Driveboxes
Check Tightness of screws on Mixing Screw Drivebox

Every 3000 Service Hours or 2 Years
Inspect the Alternator
Replace Alternator and Fan Belts
Change the Engine Coolant (DEAC)
Grease the Swivel Link Threads

Every 4000 Service Hours
Clean/Test Aftercooler Core

Every 4500 Service Hours
Inspect the Turbocharger

Every 5000 Service Hours
Replace the Diesel Exhaust Fluid Filter
Replace the DEF Injector
Check And/or Replace the Seals of the Screw Planetary Gearbox

Every 6000 Service Hours
Add Coolant Extender (ELC)

Every 10,000 Service Hours
Replace the DEF Manifold Filters
Change Oil in Transfer Case
Rebuild the air dryer including the desiccant cartridge

Table of Contents for Section 8 - Accumix 1000S Troubleshooting

Troubleshooting

Engine

Symptom	Problem	Solution
Engine Will Not Crank	Joystick not in Neutral	Put joystick in neutral.
	Parking Brake	Parking brake not turned on. Turn on the Parking Brake.
	Mixing Screw functions turned on, checkmark in Low / Med / High setting	Uncheck screw speed on the Display.
	Oil level in tank low	Check the hydraulic oil level in the oil tank reservoir. The engine will not start to protect the hydraulic pumps if the oil level goes below a preset level.
	Fuse blown in fuse panel	Check Fuses and replace if needed.
	Battery Switch turned Off	Turn on the Battery Switch.
	Batteries	Check the condition of the batteries. Clean the battery posts. Charge the batteries.
Engine Turns off	Out of fuel	Check the fuel level. Fill if needed.
	Hydraulic Oil Tank Oil Level	Check the hydraulic oil level in the oil tank reservoir. The engine will turn off to protect the hydraulic pumps if the oil level goes below a preset level.
Engine Overheats	Cooling Radiator	Turn engine up to a high RPM and push the Reverse Fans button to do a manual engine fan reversal to clean out debris from the radiator.
		The cooling radiator screens and radiator may be clogged with debris. Clean the screens and radiator.

Engine Hard to Start	Engine Preheaters	The Display shows a "Wait to Start" symbol to indicate the cylinder preheaters are working. Wait to crank the engine until the "Wait to Start:" symbol goes out.
	Fuel	Use a grade of fuel according the ambient temperature.
	Cold Weather	Refer to the recommendations given in Section 5 for Cold Weather Starting.
Engine Lacks Power	Engine Derated	Refer to the CAT Engine manual for conditions causing engine derating.
	Low DEF	The engine will derate if the DEF level gets low in the DEF tank.
	Water in the fuel	Drain the water from the water separator filter. Drain the water from the fuel tank. Refer to Section 7 for Information.
	Restricted Air Intake	Check the engine air intake filters. Replace as needed.
		Check the air intake screen located on the top of the engine cabinet. Remove any debris restricting air flow.

Hydraulic System

Hydraulic system overheating	Oil Cooling fan	Check the hydraulic connections to the cooling fan.
		Check the connection to the temperature sensor which is the lowest sensor on the back of the hydraulic tank.

	Fan reversing solenoid	Check the solenoid for a good wiring connection.
	Oil cooling radiator	Clean the screen and radiator from debris that may be preventing air flow through the cooler.
Low oil pressure	Oil Filters	Check the condition of the oil filters. Refer to the Hyd System Info screen on the Display for the condition of the filters. Replace.
	Oil leak	Check the hoses and connections for leaks. Replace or repair.

Travel

Symptom	**Problem**	**Solution**
Machine will not shift into Travel/Automotive mode	Machine in 4WD	Shift to AWD.
	Not in front wheel steer	Change to Front Steer mode.
	Loading arm too high	Lower loading arm into travel position. See Display Info screen for arm position.
	Transfer Case not shifting	Check Info screen and wait for air pressure to build.
	Air System Solenoid	Check the air system solenoid for a good wiring connection.
Machine will not shift into AWD	In Work Mode with 4WD	On the Display choose Work Mode.
	Transfer Case not shifting	Check Info screen and wait for air pressure to build.
	Air System Solenoid	Check the air system solenoid for a good wiring connection.
Machine will not shift into 4WD	Not in Work Mode	On the Display choose Work Mode.

	Transfer Case not shifting	Check Info screen and wait for air pressure to build.
	Air System Solenoid	Check the air system solenoid for a good wiring connection.
Foot accelerator pedal not working in Automotive mode	Joystick position	Move the joystick to at least 80% in the direction of travel desired.
Machine slows and/or stops in Travel/Automotive mode	Arm position too high	Move joystick to neutral, lower arm and resume driving. Check the arm position in the Operating Info screen.
	Rear wheels not centered.	Shift into Work mode. Center the front wheels. Change to All Wheel steer mode. Center the rear wheels. Change back to Front steer and Travel mode.
Machine will not drive or drives very slowly	Transfer Case not shifting	Check Info screen and wait for air pressure to build.
	Transfer Case Solenoid	Check the solenoid for a good wiring connection.
	Motor Speed Sensor	Check the solenoid for a good wiring connection.
Machine only drives slowly in Work Mode	Low range selected in Work Mode.	Check selection in Dive Control on the display. Use the rocker on the joystick to increase the range. The speed ranges can be set in the Menu-Work Mode Travel Speeds screen. See Section 3 for more information.
Park brake will not release	Foot not on the brake pedal.	Place foot on the brake and release the park brake.
	Joystick not in neutral	Place joystick to neutral position and try to release again.
	Brake accumulators not completely charged	Wait for a minute and try to release again.

Steering

Symptom	Problem	Solution
Steering Front and Rear checkmarks not on the screen at the same time. Front and rear tires not following the same track when straight (dog tracking)	Front and rear steering out of alignment	Shift to Work Mode. Switch to All Wheel steering. Center the rear wheels. Switch to Front steer and center front steering. Wheels should be re-aligned.
	Steering Not Centered Before Steering Mode Changed	Center the steering checkmarks on the Display before changing the steering mode to prevent "dog tracking".
Cannot Shift into All Wheel Steer or Crab Steer	Steering Not Centered	Only change steering mode once the steering centered checkmarks are both on.
	In Travel or Automotive mode	All Wheel and Crab Steer are only available in Work Mode. Shift into Work mode then change steering.
Steering hard to steer	Heavy Load on a Hard Surface While Not Driving	Heavy loads on hard surfaces (such as concrete) make it difficult to turn the wheels when not driving. Move the machine forward to make the steering easier.
	Hydraulic connection	Check the hydraulic connection at the steering valve located under the cab.
	Engine has stopped	Machine can be steered but with manual force on the steering wheel.

Mixing Screws

Symptom	Problem	Solution
Screws will not start or they stop during operation	Over pressure in the pump due to high loading	Turn off the screws and try to start at a lower speed.
	Load is heavy material	Load less material in the tub.
	Load has settled	Follow the procedures outlined in Section 6 for "Removing Settled Material That Is Causing the Mixing Screws To Not Turn".
	Solenoid	Check the solenoid for a good wiring connection.
	Speed Sensor	Check the solenoid for a good wiring connection.
Screw not cutting material	Aggression Bars	Move the aggression bars into the tub for more material cutting.
	Optional Knives	Install the optional knives onto the screws for more material cutting.
		Knives are dull. Exchange the lower knives that get more wear with the upper knives. Replace with new knives.
Rear Mixing Screw Not Turning	Screw Driveline	Check that the driveline from the front mixing screw drivebox is connected to the rear mixing screw drivebox.

Milling Head/Loading Conveyor

Symptom	Problem	Solution
Loading arm will not lower	Front unloading conveyor to the right	Move the front unload conveyor to the center.
	Unload Mode Selected	Switch to Load Mode on the Display.

Loading conveyor and milling head stop during operation	Off button or reverse button pressed during operation	Reverse away from material and restart milling head.
	Loading material too heavy resulting in plugging the conveyor and milling head	Move machine away from material. Start the milling head and hold the reversing button to clear material out of the loading belt and milling head.
Milling head stops during operation	Trying to load too much material	Leave the milling head turned on and reverse away from material. The milling head should start up again.
	Material plugged in the milling head or auger	With the milling function turned on press and hold the reverse button to push out material. A few reverse/forward cycles may have to completed to clear material.
		Stop the milling process. Follow the procedure outlined in Section 6 to manually remove the plugged material from the auger/milling head/conveyor.
	Drive belt incorrect tension or broken.	Check milling drive belt. See Section 7 for procedures to tension the drive belt. Replace drive belt.
Milling head and loading conveyor will not start	Not in LOAD Mode	Switch to LOAD mode on the display. Turn on the milling functions with the joystick.
	Milling speed or conveyor speed presets set to 0%	Refer to Section 3 for information to adjust milling head and conveyor speed.
	In Travel or Automotive Mode	Transfer to Work mode.
Milling head or loading belt start but are running slow	Milling speed or conveyor speed presets set low	Refer to Section 3 for information to adjust conveyor and milling head speed.

Material being loaded is going too far into the tub or not far enough.	Loading conveyor speed too fast or slow.	Refer to Section 3 for information to adjust conveyor speed.
Loading Conveyor not moving	Not in LOAD Mode	Switch to LOAD mode on the display. Turn on the milling functions with the joystick.
	Conveyor speed setting	Adjust the conveyor speed in the Display. Refer to Section 3 for information on adjusting the % speed of the conveyor.
	Hydraulic Motor	Check the hydraulic connections at the conveyor motor are in good condition.
	Solenoid	Check the solenoid for a good wiring connection.
Loading conveyor moving to slow/fast.	Conveyor speed setting	Adjust the conveyor speed in the Display. Refer to Section 3 for information on adjusting the % speed of the conveyor.
Loading Conveyor Rubbing on Sides of Loading Arm	Conveyor not centered on rollers	Refer to Section 7 for information on centering the conveyor.
Material is loading to far landing on the engine compartment	Loading Conveyor Speed	Loading conveyor speed is set to high. Slow down the conveyor speed.
	Top Deflector	The top deflector at the top of the loading arm may have come loose or is worn out. Tighten or replace.

Unload

Symptom	**Problem**	**Solution**
Front unload conveyor will not move to the right	Loading arm too low	Change to Load mode and lift the loading arm.
Front unload to the left but running to the right	Front conveyor not fully to the left	Use joystick to ensure front unload conveyor is completely left.

Rear unload conveyor not retracting	Not enough weight to retract fully	Push joystick right in Rear Unload to retract conveyor.
Unload conveyor does not turn	Hydraulic motor	Check the hydraulic connections at the motor.
	Material caught in the conveyor chains	Remove material from the chains.
	Front Unload Conveyor not all the way to right or left	Move front conveyor completely left or right.
Material spills over sides of conveyor	Too much material released from tub	Control the amount of material coming from tub by controlling the tub door.
Not enough material comes out of tub door	Mixing Screw Speed	Increase the speed of the mixing screws to move more material out.
Optional High Bunk conveyor does not lift	Hydraulic Cylinder	Check the connections to the hydraulic lift cylinder.

Suspension

Symptom	**Problem**	**Solution**
Machine is not level	Suspension System	Check the suspension page on the Display. Set the axle positions to make the machine level.
		Check the rotation sensors at the suspension cylinders. Check for good wire connections.
		Check for good hydraulic connections at the suspension cylinders
		Check the suspension page on the Display. Reset any error codes. If error continues contact your dealer.

Weigh System

Symptom	Problem	Solution
Weigh scales do not seem to show correct weight	Connection to the weigh bar	Check for good wire connections at all 4 weigh bars.
	Calibration of the weigh scales	Follow the scale calibration procedure as indicated in the Weigh Scale Operator manual.

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Table of Contents for Section 9 - AccuMix 1000S Specifications

Machine Specifications

Tub		
Capacity	1,000 ft^3	30m^3
Number of Screws	2	
Screw Speed	3 Adjustable Presets - Range 0 to 45RPM	
Aggression Plates	4	
Weigh System	4 Point Weighing System	

Engine		
Engine	Caterpillar C7.1 Six Cylinder Diesel - Tier 4 Final	
Engine Power	300hp	224 kW
Engine Cooler	Flexxaire Auto Reversing Fan	
Hydraulic Cooler	Hydraulic Auto Reversing Fan	
DEF Tank Capacity	8.5 US gal	32 liters
Fuel Tank Capacity	123 US Gal	465 liters

Loading Arm		
Milling Head Power	150 hp	112 kW
Milling Head Speed	Adjustable 0 to 600 rpm	
Milling Head Width	92 in.	2,335 mm
Max Loading Height	260 in.	6,600 mm

Unloading		
Conveyors	Chain with Steel Slats	
Front Unload Height	30 in.	760 mm
Front Unload Direction	Left and Right	
Optional Front Unload	High Bunk Unload to the Left	
Rear Unload Height	32 in.	813 mm
Rear Unload Direction	Left	

Drivetrain		
Drive Modes	Work, Travel and Automotive	
Ranges	4 Adjustable Ranges in Work Mode	
Max Speed Note: With the optional large lug tires the speed depends on load weight	25 mph	40 km/h
Transmission	Hydrostatic with Transfer Case (AWD and 4WD)	
Tires	20.5R25	
Suspension	Active Front and Rear Hydraulic	
Steering	Front, Circle and Crab	

Dimensions and Weights		
Unloaded Weight w/Arm	47,900 lb.	21,7100 kg
Unloaded Weight w/o Arm	42,900 lb	19,500 kg
Max Payload	24,000 lb	11,000 kg
Length - with Loading Arm	470 in.	11,940 mm
Length - without Loading Arm	400 in.	10,160 mm
Height - To top of Tub	138 in.	3,505 mm
Width	124 in.	3,150 mm
Wheel Base	275 in.	6,985 mm

Cab and Controls	
Display	Touchscreen
Cameras	Back-up, Tub, Right Hand
Mirrors	Heated
Seat	Adjustable air-ride, heated and ventilated
Climate	Auto Heat and A/C
Electrical System	12V and 24V Combined System

Capacities and Specifications

1. Engine Fuel Tank
   - Max 511 liters (135 US gallons) (112 Imp gallons)
   - Fuel Grade (depending on weather conditions)
     - No. 1 is ASTM D975 grade 1D S15
     - No. 2 is ASTM D975 grade 2D S15

2. DEF Tank
   - 37.84 Liters (10 US gallons)
   - Use approved Diesel Exhaust Fluid

3. Engine Oil
   - API ECF-3, CK-4, AECA E9
     - Minimum 13.5 l (3.56 US gal)
     - Maximum 16.5 l (4.36 US gal)

4. Engine Coolant
   - 50% or 60% Ethylene Glycol (depending on temperature range - See Section 7 or CAT Operator Manual)
   - 15 l (3.9 US gal) - Engine only
   - Radiator = 27 liters (7 US gallons)

5. Engine Air Filters
   - Refer to the CAT Operator Manual

6. Cabin Air Filter
   - JD95R or equivalent.

7. Tire Air Pressure
   - 76 psi (524 kPa)
     - Optional large lug tire - 54 psi (372 kPa)

8. Wheel Nut Torque
   - 480 lb-ft (650 Nm)

9. Air System Dryer Cartridge Type
   - AD-9 desiccant or equivalent

10. Driveline, Suspension and General Grease Specifications
    - E.P. grease meeting the N.L.G.I. #2 specifications and containing no more than 1% molybdenum disulfide

11. Hydraulic Oil Tank
    - Hydrex MV-32 type oil or equivalent
    - 160 liters (42.3 US gallons)

12. Hydraulic Oil Tank Return Filter
    - 5 Micron, RFM TYPE

13. Wheel Drive Pump Filter
    - Rexroth R902603004 cartridge type or equivalent

14. Mixer Pump Filter
    - Rexroth R902603243 cartridge type or equivalent

15. Milling Pump Filter
    - Danfoss 11004918 spin on type or equivalent

16. Mixing Screw Planetary Gearbox
    - EP150 Synthetic
    - 19 liters (5 US gallons)/each gearbox + tank on tub of 10-11 liters (2.6 - 2.9 US gallons)

17. Milling Head Gearbox
    - Approximately 900 ml of Synduro Shb 220 Synthetic oil or equilvalent.

18. Milling Head Drive Belt
    - V-belt, 5 Band, 127", B Section

19. Transfer Case
    - 75W90 synthetic oil
    - Approximately 5 liters (1.3 US gallons) - verify through oil level plug

20. Pump Gearbox (on engine flywheel)
    - 75W90 synthetic oil
    - Approx. 5 liters (1.3 US gallons) - verify with dipstick level

21. Axles
    - Center part of axle
        - 75W90 synthetic oil - LS additive oils. API GL5
        - Fill to level plug (Approx. 14.5 liters)
    - Hub part of axle
        - 75W90 synthetic oil API GL5
        - Fill to level plug
    - Grease specifications
        - E.P. grease meeting the N.L.G.I. #2 specifications and containing no more than 1% molybdenum disulfide Pinions

    - Brakes
        - Uses the hydraulic system oil.

22. Batteries
    - 12 volt Group D Commercial

Highline New Equipment Limited Warranty Policy

One (1) Year / 12 Months - Parts and Labour

Highline Mfg. (hereinafter "Highline") warrants this new product of Highline's manufacturer to be free from defects in material and workmanship, under normal use and service for one (1) full year after initial purchase/retail sale. Highline will warrant its product for one (1) year parts and labour, if performed by a qualified Dealer. This Limited Warranty shall apply only to complete machines of Highline's manufacture. Parts are covered by a separate Limited Warranty.

EQUIPMENT AND ACCESSORIES NOT OF HIGHLINE'S MANUFACTURE ARE WARRANTED ONLY TO THE EXTENT OF THE ORIGINAL MANUFACTURER'S WARRANTY AND SUBJECT TO THEIR ALLOWANCE TO HIGHLINE ONLY IF FOUND DEFECTIVE BY SUCH MANUFACTURER.

During the Limited Warranty period specified above, any defect in material or workmanship in any warranted item of Highline Equipment not excluded below shall be repaired or replaced at Highline's option without charge by any authorized independent Highline Dealer. An authorized Dealer must make the warranty repair or replacement. Labour in accordance with Highline's labour reimbursement policy. Highline reserves the right to supply remanufactured replacement parts as it deems appropriate.

RETAIL PURCHASER RESPONSIBILITY

This Limited Warranty requires proper maintenance and periodic inspections of the Equipment as indicated in the Operator's Manual furnished with each new Equipment. The cost of routine or required maintenance and services is the responsibility of the retail purchaser. The retail purchaser is required to keep documented evidence that these services were performed. This Highline New Equipment Limited Warranty may be subject to cancellation if the above requirements are not performed.

EXCLUSIONS AND LIMITATIONS

The warranties contained herein shall NOT APPLY TO:

1. Any defect which was caused (in Highline's sole judgement) by other than normal use and service of the Equipment, or by any of the following:
    a. accident
    b. misuse or negligence
    c. overloading
    d. of reasonable and proper maintenance
    e. improper repair or installation
    f. unsuitable storage
    g. non-Highline approved alteration or modification
    h. natural calamities
    i. vandalism
    j. parts or accessories installed on Equipment which were not manufactured or installed by Highline authorized Dealers
    k. the elements
    l. collision or other accident
2. Any Equipment whose identification numbers or marks have been altered or removed.
3. Any Equipment which any of the required or recommended periodic inspection or services have been performed using parts not manufactured or supplied by Highline or meeting Highline Specifications including, but without limitation, lubricants (oil, grease), belt lacings, and hydraulic fluids.
4. Any Equipment used in demonstrations not performed by a Highline Dealer. Warranty will be at the discretion of Highline for all other demonstration warranty.
5. New Equipment delivered to the retail purchaser in which the warranty registration has not been completed and returned to Highline within thirty (30) days from the date of purchase.
6. Any defect that was caused (in Highline's sole judgement) by operation of the Equipment not abiding by standard operating procedures outlined in the Operator's Manual.
7. Tire Limited Warranties and support are the responsibility of the respective product's manufacturer.
8. Transportation costs, if any, of transporting to the Highline Dealer.
9. In no event shall Highline's liability exceed the purchase price of the product.
10. Highline shall not be liable to any person under any circumstances for any incidental or consequential damages (including but not limited to, loss of profits, out of service time and damage to equipment which this equipment may be attached) occurring for any reason at any time.

11. Diagnostic and overtime labour premiums are not covered under this Limited Warranty Policy.
12. Depreciation damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow operating instructions, misuse, and/or lack of proper protection during storage.
13. Accessory systems and electronics not of Highline's manufacture are warranted only to the extent of such manufacturer's respective Limited Warranty if any.
14. Wear items which are listed by product group below:

COMMON WEAR ITEMS

Roller chain, sprockets, clutches, shear bolts, clutch components, chains, gearbox housings bolts/torqued parts, flails, feed roller belting, coupler chain, DRV couplers, bogie wheels, apron tines and hoses, blades and blade pans, blade bolts and nuts, skid shoes, chain guards, clutches and clutch components.

PARTS WARRANTY

Parts replaced in the warranty period will receive the balance of the one year New Equipment Limited Warranty. Replacement parts after the original machine warranty are warranted to be free from defects of material for ninety (90) days or the part will be repaired or replaced, without labour coverage for removal and reinstallation.

EXCLUSION OF WARRANTIES

UNLESS OTHERWISE REQUIRED BY LAW, AND EXCEPT FOR THE WARRANTIES EXPRESSLY AND SPECIFICALLY MADE HEREIN, HIGHLINE MAKES NO OTHER WARRANTIES, AND ANY POSSIBLE LIABILITY OF HIGHLINE HEREIN UNDER IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGHLINE RESERVES THE RIGHT TO MODIFY, ALTER AND IMPROVE ANY PRODUCT WITHOUT INCURRING ANY OBLIGATION TO REPLACE ANY PRODUCT PREVIOUSLY SOLD WITH SUCH MODIFICATION. NO PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY, OR TO ASSUME ANY ADDITIONAL OBLIGATION ON HIGHLINE'S BEHALF.

AM1000S Extended Service and Warranty Policy

Highline Manufacturing (referred to hereafter as Highline) warrants its new, unused, Agricultural Equipment to be free of defects in material and workmanship at time of the delivery according to the Highline New Equipment Limited Warranty Policy found at the end of each product manual. In exception to this Highline offers the supplemental information below:

1) **LOSS OF USE:** In the event the AM1000S is unable to function (Machine Down), a replacement unit will be supplied by the dealership within a 24 hour period. Highline Manufacturing will reimburse the dealership for the use of the rental machine at the area published rental rate until the AM1000S is in a state of serviceable repair.

2) **5-YEAR LIMITED EXTENDED WARRANTY REPAIR PERIOD**

- **1st Year:** Highline will repair or replace, at its option, without charge for parts or labor, any defective part of the equipment for a period of twelve (12) months from the warranty start date to the first retail purchaser (see base warranty policy).
- **2nd Year:** Highline will repair or replace, at its option, without charge for parts, any Highline Manufactured Part that is found to be defective for the period of thirteen (13) months to twenty-four (24) months from the warranty start date to the first retail purchaser.
- **3rd year:** Highline will repair or replace, at its option, for a charge of 50% of the parts, any Highline Manufactured Part that is found to be defective for the period of twenty-five (25) months to thirty-six (36) months from the warranty start date to the first retail purchaser.
- **5th year:** Highline will repair or authorize the repair, at its option, without charge for parts or labor, any defective part of the AM1000S mixer structural frame including but not limited to missed or failed welds and structural deficiencies for the period of sixty (60) months from the warranty start date to the first retail purchaser.

NOTE: A Highline Manufactured Part is any part which has been manufactured by Highline Manufacturing. Parts purchased from an outside supplier are not considered to be manufactured by Highline. Purchased parts would include roller chain, hydraulic motors, hydraulic cylinders, bearings etc.

Any parts that are covered by an Extended Warranty published by Highline are an exception to the Basic Policy and are to be warranted as per the details of the Extended Warranty document. The extended warranty policy may change from time to time without prior notice from Highline.

3) **SUPPLEMENTAL EXTENDED WARRANTY**

- **Hydraulic Drive Pumps and Motors:** Highline will repair or replace, at its option, without charge for parts or labor, any defective hydraulic pump and/or components or hydraulic motor and/or components for a period of 12 months from the warranty start date to the first retail purchaser. The hydraulic pump or hydraulic motor will be

warrantied against any defects in material and/or workmanship under normal use and while being maintained in accordance with the operators manual or supplemental instructions. This supplemental warranty will require the submission of oil samples.

- **Mechanical Mixer Gearbox Drive Units:** Highline will repair or replace, at its option, without charge for parts or labor, any defective mixer drive gearbox and/or components for a period of 24 months from the warranty start date to the first retail purchaser. The mixer drive gearbox will be warrantied against any defects in material and/or workmanship under normal use and while being maintained in accordance with the operators manual or supplemental instructions. This supplemental warranty will require the submission of oil samples.
- **Caterpillar Engine:** All warranty work must be completed by a certified Caterpillar Maintenance Technician for a period of 24 months or 3000 hours of service. Following this base period, all subsequent engine work can be completed by a qualified heavy duty Journeyperson mechanic. Customer Support is available in Albert and Saskatchewan by Finning. Support will be dispatched by calling 1-888-346-6464. Customer Support is available in Manitoba, Ontario, Quebec, Nunavut and the Maritime Provinces by Toromont Cat. Support will be dispatched by calling 1-204-453-4343. Extended warranty and maintenance packages for the Caterpillar engine are available. For information and direction related to these call 1-306-258-2233. **Upon the sale to the end user, the engine will need to be registered with Caterpillar here:** https://www.cat.com/en_AU/articles/support/enginewarranty.html. **Failure to register the warranty with Caterpillar may delay any service or warranty work that needs to be conducted.**
- **Engine Hydraulic Splitter Gear Box:** Highline will repair or replace, at its option, without charge for parts or labor, any defective hydraulic splitter gearbox and/or components for a period of 12 months from the warranty start date to the first retail purchaser. The splitter gearbox will be warrantied against any defects in material and/or workmanship under normal use and while being maintained in accordance with the operators manual or supplemental instructions. This supplemental warranty will require the submission of oil samples.
- **Cab;** Highline will repair or replace, at its option, without charge for parts or labor, any defective part of the cab assembly and/or components for a period of 12 months from the warranty start date to the first retail purchaser.
- **Transfer Case:** Highline will repair or replace, at its option, without charge for parts or labor, any defective transfer case and/or components for a period of 12 months from the warranty start date to the first retail purchaser. The transfer case will be warrantied against any defects in material and/or workmanship under normal use and while being maintained in accordance with the operators manual or supplemental instructions. This supplemental warranty will require the submission of oil samples.
- **Differentials:** Highline will repair or replace, at its option, without charge for parts or labor, any defective differential and/or components for a period of 12 months or 2000 hours from the warranty start date to the first retail purchaser. The differential will be warrantied against any defects in material and/or workmanship under normal use and while being maintained in accordance with the operators manual or supplemental instructions. This supplemental warranty will require the submission of oil samples.

- **Hydraulic Cylinders:** Hydraulic Cylinders are warranted for a period of 12 months from the date of delivery. If a cylinder is leaking, seal kits must be installed by the dealer before cylinders are replaced. If the defect is found to be more extensive than a damaged seal, then a new cylinder will be provided by Highline. Please contact the Service Department regarding any questionable cylinders.

3) EXCEPTIONS TO THIS WARRANTY

In no event shall the owner be entitled to recover costs for incidental, special or consequential damages such as, but not limited to: loss of profit or revenue, other commercial losses or inconvenience.

Repair, Maintenance, and Service items not related to defects:

1) Loss or damage during shipment.
2) Failure resulting from lack of or improper maintenance.
3) Damage caused by operator abuse, negligence, or improper operation.
4) Non-defective items replaced due to customer demand unless authorized by the Highline Service Department.
5) Non-reimbursable maintenance items including but not limited to oil, grease, chains, etc.
6) Any and all costs for repairs or replacement of parts not shown to be defective.
7) Damage due to accidents.

EXCLUSION OF WARRANTIES

UNLESS OTHERWISE REQUIRED BY LAW, AND EXCEPT FOR THE WARRANTIES EXPRESSLY AND SPECIFICALLY MADE HEREIN, HIGHLINE MAKES NO OTHER WARRANTIES, AND ANY POSSIBLE LIABILITY OF HIGHLINE HEREIN UNDER IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGHLINE RESERVES THE RIGHT TO MODIFY, ALTER AND IMPROVE ANY PRODUCT WITHOUT INCURRING ANY OBLIGATION TO REPLACE ANY PRODUCT PREVIOUSLY SOLD WITH SUCH MODIFICATION. NO PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY, OR TO ASSUME ANY ADDITIONAL OBLIGATION ON HIGHLINE'S BEHALF.

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