WOLVERINE

AGITATION BOAT (401-0000)

OPERATIONS AND MAINTENANCE MANUAL

ONLINE RESOURCES

BAZOOKA FARMSTAR

1-6-2025

OVERVIEW

Wolverine is a simple and low maintenance remote control agitation system, creating the most mixing and flow on the market. Ground drive, submersible pump/gun, and propellers are powered using two separate hydrostat hydraulic systems for maximum efficiency, power, and control. It uses only 8 hydraulic cylinders for all movement functions and zero gate valves. Dual articulating propellers create a new level of agitation power, control when using gun, and unmatched speed and maneuverability. Props are controlled with smart cylinders, so they stay synchronized and react precisely to your remote inputs, which means the control is intuitive and simple. The remote display shows vitals of the engine and hydraulics as well as prop cylinder positions. Multiple GPS modes allows for autonomous flexibility depending on lagoon shape and agitation requirements.

For videos and additional resources, point phone camera at QR code and click the link.
http://bazookafarmstar-5546834.hs-sites.com/en-us/wolverine-series-resource-hub

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SAFETY AND WARNINGS

- Read and understand this manual and all safety signs before operating and maintaining. Review the safety instructions and precautions annually.
- Replace any CAUTION, WARNING, DANGER or instruction safety decal that is not readable or is missing.
- Stay clear of any moving parts such as props, wheel drives, hydraulic cylinders and linkages
- Do not attempt to operate this equipment under the influence of drugs or alcohol.
- Give the unit a visual inspection for any loose hardware, worn parts or cracked welds, and make necessary repairs prior to using the product.
- If equipment has been altered in any way from original design, the manufacturer does not accept any liability for injury or warranty.
- Check all hose clamps and fittings for a tight fit before operating.
- **Warning: Operating this equipment without experience and a thorough understanding of how it functions could result in damage to the equipment, injury, or death.**

SAFETY AND WARNINGS

- The Wolverine should only be operated by responsible persons who have thoroughly read the operators manual and have been properly instructed to do so. Do not allow unnecessary persons to operate the machine.
- Follow the maintenance schedule outlined in this manual.
- Be certain all shields and guards are kept in place before operating.
- Hydraulic system parts and connections can contain high pressures which, if suddenly and unexpectedly released, can cause serious injury or death. Do not check for leaks with your bare hands.
- Hydraulics may be pressurized even with machine off. Use caution when removing hydraulic hoses or components.
- Repair any loose or damaged hydraulic hoses. Inspect all hoses carefully before use. Tighten all connections securely.
- Ensure operator and bystanders are entirely clear of machine before starting and operating.
- Do not perform maintenance with engine running.
- Park machine on flat level ground and chock tires before performing maintenance.
- Support equipment properly when working beneath it.

QUICK STARTUP GUIDE

STARTUP

1. Turn ON Master Battery Disconnect Switch.
2. Turn KEY SWITCH to position 1 on Tec-10 Engine Controller.
3. On the remote, press and hold POWER button until "Bazooka Farmstar" logo appears. When instructed on screen, press E-STOP in and turn to release it.
4. Wait for LED light on the Tec-10 engine controller to turn green and remote display showing home screen.
5. Press UP on ENGINE toggle to START/RUN the engine. (DO NOT use the Tec-10 start button.)
6. Once engine starts, press UP on MACHINE CONTROL toggle to ENABLE remote control of machine. Alarm will sound 6 times, when complete, remote control can now be used top operate the machine (Safety Feature).

SHUTDOWN

1. Press DOWN on ENGINE toggle to turn OFF engine
2. Turn IGNITION KEY fully to the LEFT on Tec-10 Engine Controller
3. CRITICAL STEP: Wait 2 MINUTES before turning OFF Master Battery Disconnect to allow DEF lines to purge. *Failure to wait 2 minutes will result in error codes and a disabled machine.*

Battery **Connected**

Battery **Disconnected**
(Wait 2 Min. after Engine Shutdown)

CONTROLLER REFERENCE

SCREEN
- Toggle between 4 display screens.
- When using certain functions, screen will automatically toggle to appropriate screen, and after 5 seconds, it will return to the last selected screen.

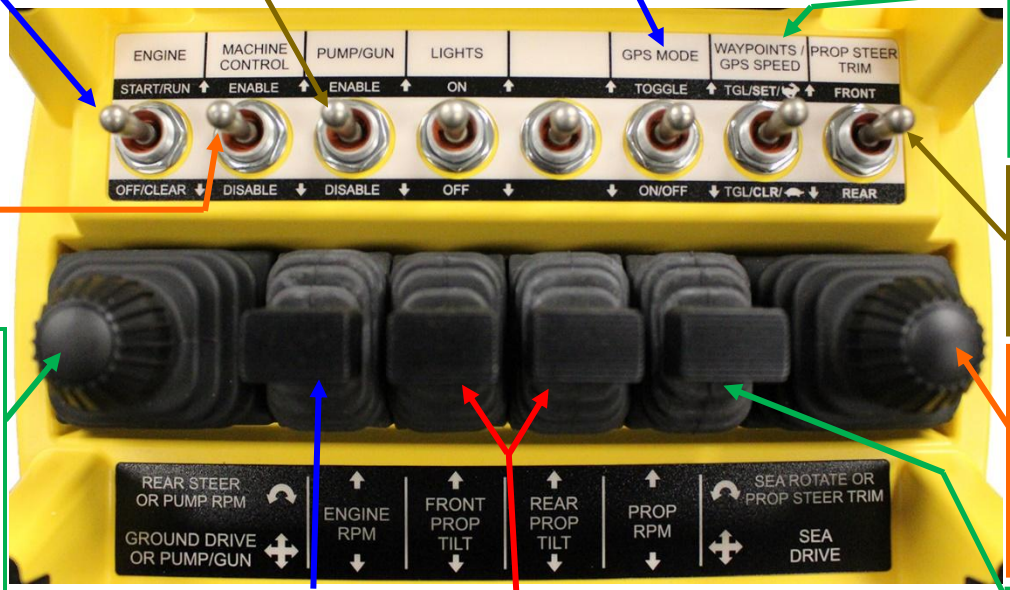
TRIM PRESET - Overrides current trim settings for propeller trim angles (angle of prop gimbals when no joystick input is given). Set props manually with other TRIM switches/paddles on controller.
- **PS1:** Trim both props to 0° Vertical angle and 3° Left/Right angle (Point Props straight down – boat should be in a neutral position)
- **PS2:** Trim props to a 40° Outward angle and 3° Left/Right angle (Optimal angle for crust busting and floating surface solids toward the props).
- **SAVE CURRENT Trim Settings**—hold PS1 or PS2 for 3 seconds to lock in current prop trim (which are set manually)
- **FACTORY PRESET Trim Settings**—Hold PS1 or PS2 for 6 seconds to restore factory preset

ENGINE
- UP to START Engine when remote is connected, and engine controller LED light shows Green.
- DOWN to SHUTDOWN engine.
- HOLD DOWN 3 seconds to clear codes on engine controller and remote.

PUMP/GUN
- Enables and Disables Pump/Gun operation. Will disable the use of ground drive (tires) on left joystick when pump/gun is enabled. See control description for left joystick below.

GPS MODE
- Toggle UP to switch between GPS Modes (COVER, POINT-TO-POINT, ANCHOR, NONE)
- Hold down to turn the selected GPS mode ON/OFF. (See manual)

WAYPOINTS/GPS SPEED
Toggle through waypoints, enter waypoint to current boat position, clear waypoints, and change boat speed when GPS mode is ON.
- Tap UP to move waypoint selection right
- Tap DOWN to move waypoint selection left
- Hold UP 3 seconds to SET selected waypoint to current boat position (Alarm sounds once)
- Hold DOWN 3 seconds to clear selected waypoint (Alarm sounds once). Hold DOWN 6 seconds to clear *all* waypoints at once (Alarm sounds a second time)
- Rabbit/Turtle: Adjust boat speed during GPS sequence between 0.5 and 2 mph. When GPS Mode is ON, tap UP to increase boat speed, tap DOWN to decrease boat speed



MACHINE CONTROL
Safety lockout which keeps the machine from accidentally being operated upon engine startup. When enabling, alarm sounds 6 times before machine can be operated by remote.
- UP to ENABLE machine operation
- DOWN to DISABLE machine operation

PROP STEER TRIM (FRONT or REAR Prop Angle)
- Hold UP and TWIST SEA DRIVE knob to adjust left/right "Home" angle on FRONT Prop
- Hold DOWN and TWIST SEA DRIVE knob to adjust left/right "Home" angle on Rear Prop

GROUND DRIVE (Default)
- DRIVE machine forward or Backward
- STEER FRONT tires left or right
- STEER REAR tires left or right (Twist knob)

PUMP/GUN CONTROL (When Pump/Gun ENABLED)
- GUN AIM UP/DOWN
- GUN AIM LEFT/RIGHT
- PUMP RPM– Twist to increase/decrease submersible pump speed (Gallons/minute)

When Pump RPM is ZERO, pump can run in slowly in reverse by twisting counterclockwise on PUMP RPM knob.

SEA DRIVE
Propeller directional control which drives boat when floating. PROP RPM must be high enough to provide thrust.
- Moves machine forward or Backward
- SIDE SHIFT machine left or right
- SPIN machine clockwise/counterclockwise (Twist knob)

ENGINE RPM
- Briefly BUMP fully UP or fully DOWN to *INCREMENT* Engine RPM up or down.
- RPM Ramping speed is proportional to how far lever is HELD UP or DOWN.
- 2 sec. up or down will go to MAX/MIN RPM.

FRONT/REAR PROP TILT ANGLE (TRIM)
- Set "home" prop tilt angle in the front/back direction, when no sea drive controls are being used
- SEA DRIVE overrides this setting to move boat in intended direction. Use PS1 to return to 0° easily

PROP RPM
- Hold UP to INCREASE Prop Speed
- Hold DOWN to DECREASE Prop Speed
- When prop speed is ZERO, hold down to run props slowly in reverse
- 2 sec. up or down will go to MAX/MIN RPM

STARTUP PROCEDURE

Pre-Start Checklist

- ❑ Machine Master Disconnect Switch ON, Tec-10 Key Switch ON, Radio Remote ON (Do Not Start Engine)
- ❑ Check Fuel Level (Remote Display) on the 150 gallon (567 L) tank
- ❑ Check DEF Level (Remote Display) tank is approx. 8.5 gal (32L) – Ignoring low level warnings can cause the engine to go into a derate mode until tank is refilled.
- ❑ Check Engine Oil (engine dipstick)
- ❑ Check Engine Coolant (engine radiator – with engine cold/cool, remove radiator cap, coolant should be seen inside the radiator.)
- ❑ Check Hydraulic Oil Level (On cylindrical reservoir - confirm it is filled to the full/top mark – sight glass should be full.)
  - ❑ Use Tractor Hydraulic Fluid or equivalent to fill (see page 19)
- ❑ Check prop gimbal mechanisms – try to shake by hand to check play. Excess movement could mean worn bushings.
- ❑ Spin props by hand (engine off) to make sure they spin somewhat freely and no visible damage to props.
- ❑ Grease Locations – (12) Steering Pins, (8) smart cylinders, (3) bearing housings, (4) gun pivot, (2) prop tilt
  - ❑ Grease daily - marine grease highly recommended (See "Maintenance – Grease Locations" section)

Engine Start

1. Turn ON Master Battery Disconnect Switch
2. Turn KEY SWITCH to position **1** on Tec-10 Engine Controller.
3. On the remote, press and hold POWER button until "Bazooka Farmstar" logo appears. When instructed on screen, press E-STOP in and quickly turn to release it.
4. Wait for LED light on the Tec-10 engine controller to turn green and remote display showing home screen.
   Yellow or red LED lights may indicate an engine fault – codes should be displayed on the screen and consult the engine manual for corrective action.
5. Press UP on ENGINE toggle to START/RUN the engine. DO NOT START THE MACHINE FROM THE TEC10 PANEL, DOING SO WILL IGNORE IMPORTANT SAFETY SHUTDOWNS AND COULD CAUSE DAMAGE TO MACHINE.
6. Once engine starts, press UP on MACHINE CONTROL toggle to ENABLE remote control of machine. Alarm will sound 6 times, when complete, remote control can be used to operate the machine (Safety Feature).
   - ALLOW HYDRAULIC OIL TEMPERATURE TO WARM BEFORE INCREASING ENGINE RPM. SEE PAGE 18 FOR CRITICAL INFORMATION ON THE RELATIONSHIP BETWEEN HYDRAULIC OIL TEMPERATURE AND ALLOWABLE ENGINE SPEED
7. Increase Engine RPM (throttle) using left-most paddle on the radio/remote before operating vehicle.
   - Proportional/bump paddle or hold up for 2 seconds to full throttle (2200-2400 RPM depending on the engine) or down for 2 seconds to idle (800 - 900 RPM depending on the engine)
   - Note – operating the ground drive or props at idle may give a low charge pressure warning, increase throttle to eliminate the warning – if the warning stays active for 60 seconds, the machine will shut down, but can be restarted.

SHUT DOWN PROCEDURE

Engine Shutdown

1. Park machine on level ground.
2. If machine has been recently running under heavy load, bring machine down to idle until fluid temperatures stabilize.
3. Push down, left-most toggle switch on radio to shut off engine (Tec-10 key can be switched to the off position to shut down engine as well).
4. Only in an emergency should the E-Stop buttons be used (Tec-10 panel or radio remote)
5. Turn Tec-10 engine controller Key switch to **0** to kill power to the panel.
6. CRITICAL STEP: WAIT AT LEAST 90 SECONDS AFTER ENGINE SHUTDOWN BEFORE TURNING OFF THE MASTER BATTERY DISCONNECT SWITCH. Tier 4 engines need this time to purge the DEF from the lines back to the tank. Failure to do so will result in a fault code being displayed and if left for long, DEF can crystalize in the lines and will need serviced.
    - If this is not done, the engine will most likely shut off within 15 to 30 seconds of the next startup and will throw an engine fault code (red LED on the Tec10 panel). To clear this code, wait at least 90 seconds after the engine is off, and do a power cycle with the master disconnect switch.

GENERAL OPERATION – Display/System Parameters

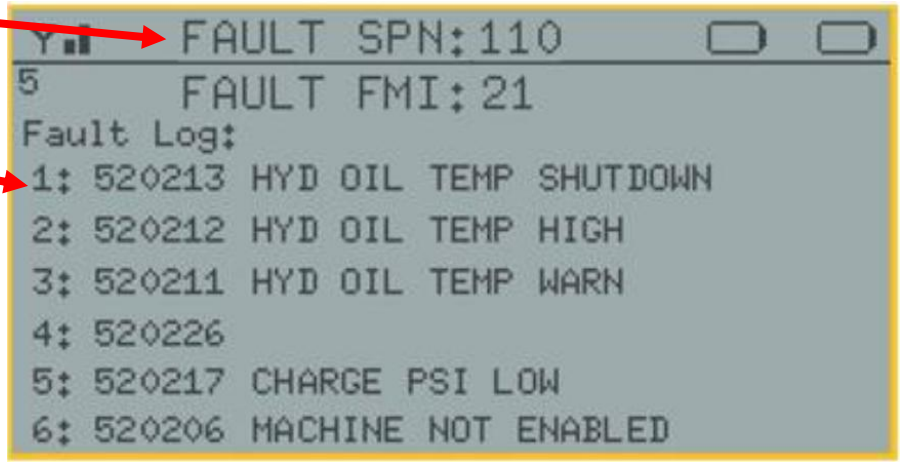
The table below describes all engine and system parameters shown on your remote control display and explains the Typical or "Safe" operating ranges they should stay within. The "WARNING" column explains at what level a warning will show on the top of the remote display. The "CRITICAL" column explains at what level a critical shut-down or failure may occur. Operating outside of typical ranges may result in a system or component failure. If machine is unable to maintain operation in nominal ranges, stop using the machine and contact your Bazooka Farmstar or Engine Service Representative immediately before resuming operation.

Displayed Parameter	Description	Typical "Safe" Operating Range	Warning	Critical	Notes
ENG RPM	Engine RPM	800 – 2200/2400 rpm	-	-	Governed (engine dependent)
COOLANT	Engine Temp	195° - 215° F	215° F	225° F	Engine RPM derate starting at 205°F Engine shut down @ 225 - 235° F (engine dependent)
VOLTAGE	Battery Voltage	12V - 14V	-	Below 12V	Engine may not start
ENG OIL PSI	Engine Oil Pressure	70 - 100 psi	15 psi	10 psi	Engine shut down @ 10 psi
ENG LOAD	Engine Load	0%-95%	-	-	Governed @ 95%
FUEL LVL	Fuel Level (150 Gal Tank)	0%-100%	20%	10%	Alarms & Lights Flash @ 15%. Warning repeats every minute
FUEL GPH	Fuel consumption rate (Gal/Hr)	13 - 15 GPH	-	-	When running over 90% Engine Load
DEF LVL	Diesel Exhaust Fluid Level	0%-100%	20%	13%	Alarms & Lights Flash @ 20%. Engine shut down at 13%
HYD TEMP	Hydraulic Oil Temp	120° - 155° F	170° F	200° F	Fan turns on @ 140°, Warnings start @ 170°, Engine shut down @ 200° F Engine RPM derate below 100°F
HYD LVL	Hydraulic Oil Level (18 Gal Tank)	Visual on Tank	-	Below LOW	Warnings at 70% & 40% full, Engine shut down @ 10%
HYD FLTR	Hydraulic Filter Status	See Sight Glass	Red Zone	Bypassing	Visual only, Electronic indicator on dual filter only
PROP PSI	Propeller Hydraulic Pressure	300 - 5100 psi	-	-	Integrated pressure reliefs
PROP RPM	Propeller RPM (Front and Rear)	0 - 850 rpm	-	-	50 RPM difference Front to Back is Typical
PUMP 2 PSI	Hydrostat Charge Pressure	300 - 600 psi	275 psi	250 psi	LOW CHARGE PSI warning at 275 psi & Engine shutdown at 250 psi for 60 seconds. False warnings may occur at low engine RPM. Verify Charge pressure is above 275 psi and increase engine rpm to avoid warnings
AUX PSI	Auxiliary Hydraulic Pressure (Cylinders)	0 - 3000 psi	-	-	Integrated pressure reliefs. Varies with each cylinder function.

GENERAL OPERATION – Fault Codes

Any active faults will be displayed across the top of the screens

Log of the last 6 fault codes that were displayed at the top of the display. This is a rolling log, fault 1 is the newest.



CLEAR ENGINE & FAULT CODES

1. With engine off - Hold DOWN on ENGINE toggle for 3 seconds to clear engine or fault codes and resume engine start procedure. (Some codes cannot be cleared by remote.)
2. NOTE: Some error codes cause a 15 second delay in your ability to restart, keep trying if engine does not immediately start. Try turning the radio remote OFF and ON again by holding the POWER button on the remote to reset the connection.

- Fault codes starting with "520XXX" are Machine Codes, which you can find listed on the Resource Page.
- All other SPN Codes will be engine related
- CAT/Perkins Engine Fault Codes can be found on the Resource Page:
  Perkins 7.1 L SPN Troubleshooting Guide
- Cummins Engine Fault Codes can be found on the Resource Page:
  Cummins 6.7 SPN Codes

Note: All of the above links can be found on the Wolverine Resource Page.

Go to the Resource Page for Troubleshooting Guides.

QR Link to the
Wolverine Resource Page

GENERAL OPERATION – Ground Drive

CRITICAL: Fuel pickups are located at the *rear* of the fuel tank, always BACK DOWN RAMPS and drive FORWARD UP RAMPS to ensure lower fuel levels always saturate fuel pickups. Failure to do so may result in a stalled vehicle in a precarious position.

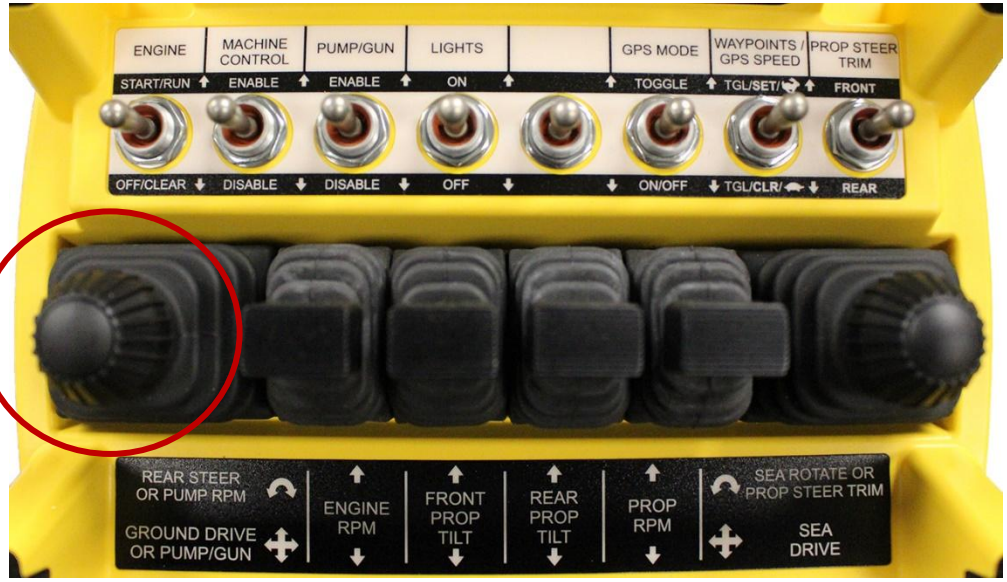
- With the engine running and machine enabled, the left joystick will move the machine's ground drive system.
- Ensure minimum 1200 rpm is achieved before operating ground drive or "Low Charge Pressure" warning may activate.
- The ground drive Forward/Reverse are powered by the second 105cc tandem hydrostat pump on the engine. When activated via the radio/remote, you can see the harness connectors light up for forward/reverse on top of the pump.
- Steering uses dual-ended steering cylinders w/ tie rods so the wheels will always stay aligned.
- The two outermost sections on the Aux Valve Bank control the front and rear steering respectively. You will see the valve handles move and the harness connectors light up when activated from the radio/remote.
- Steering speed and sensitivity are adjustable – please contact a Bazooka representative if you feel this needs changed or adjusted.
- Ground drive joystick is shared with the Pump/Gun. Left joystick only controls drive and steer when Pump/Gun is not enabled.

GROUND DRIVE

↕ DRIVE machine forward or Backward

↔ STEER FRONT tires left or right

↷ STEER REAR tires left or right (Twist knob)

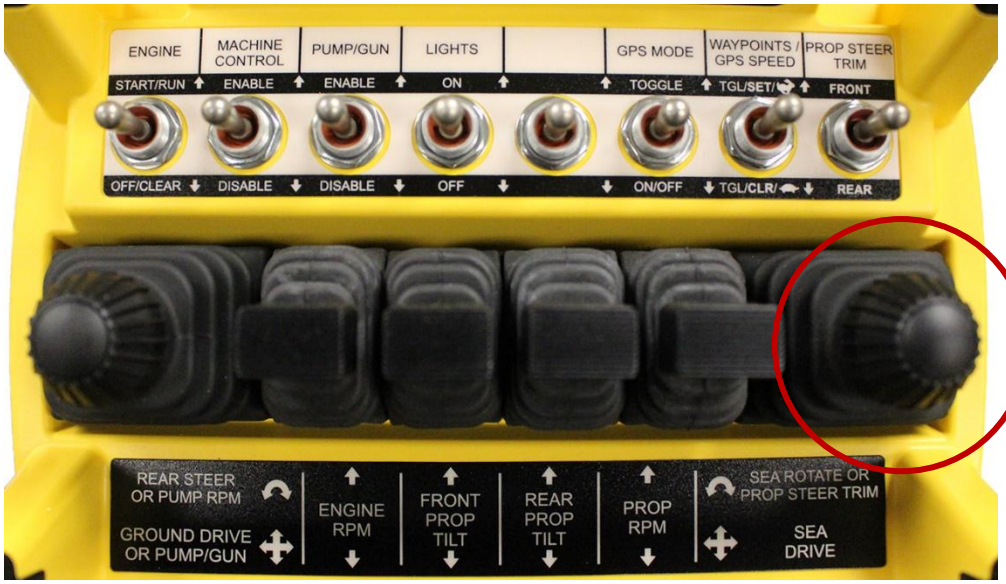


GENERAL OPERATION – Sea Drive

- With the engine running, machine enabled, and machine in the water, ramp up the engine RPM .
- Increase PROP RPM (right-most Paddle) to start spinning the props. Hold it up for 2 seconds for quick ramp to 100% and confirm on remote display PROP SPEED 100%. Prop RPM ramps proportionally with distance paddle is pushed.
- While agitating, make sure engine is at full RPM (approx. 2150 RPM) – This keeps engine fan speed up for better cooling, as well as the pump speed up for higher efficiency. If you wish to slow the props down, simply push the PROP RPM paddle down until you reach your desired prop speed, engine load, or fuel consumption rate.
- Use right joystick to move the propellers to propel the boat Forward/Reverse, Spin Right/Left, or side-shift Right/Left.

Prop Reversing: If prop gimbal mechanism begins to shake, it's likely something is caught on the propellers. Running the props momentarily in reverse may help spin off any debris:

1. Press DOWN (2 sec.) on PROP RPM paddle until prop speed is 0% (confirm on display), then release.
2. Press and hold PROP RPM paddle DOWN and the props will spin in reverse for as long as the paddle is held down. Boat will pull down further into manure. Release to return prop rpm to 0%.
3. Ramp up PROP RPM again. If shaking continues, drive machine out and check for stuck debris or prop damage causing an imbalance.



SEA DRIVE

↕ MOVES machine forward or Backward
↔ SIDE SHIFT machine left or right
↻ SPIN machine clockwise/counterclockwise (Twist knob)

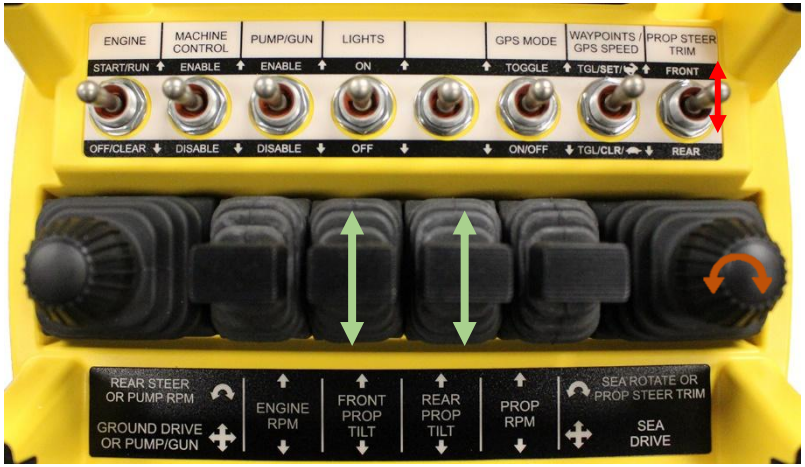
GENERAL OPERATION – Prop Trim

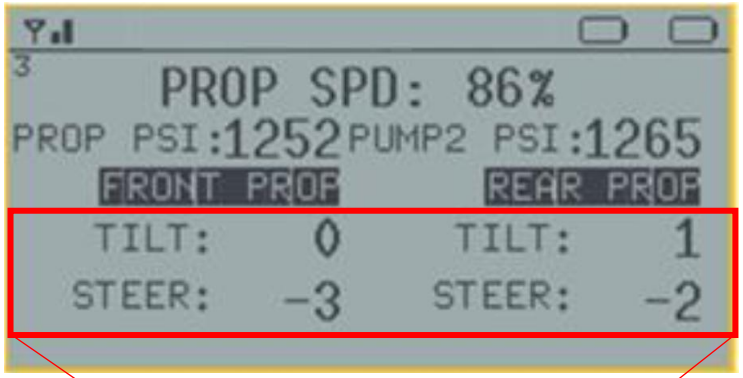
"Trim" is the position the prop gimbal mechanisms will return to when no movement command comes from the joystick (aka neutral position of the props). Prop angles are displayed on the remote. See next page for pre-sets/overrides for trim setting.

- If the boat moves or turns in any direction when no joystick command has been given, the trim direction of each prop can be adjusted in 4 directions to compensate or counteract this unwanted movement.
- It can also be used to keep the props set in a direction that allows a user to move the boat around the lagoon without continually moving the joystick in that direction.

- PROP **TILT** TRIM adjusts the forward or backward neutral position of the props.
  - Using the two center paddles: Left paddle = Front prop tilt, Right paddle = Rear prop tilt.
  - Pushing the levers forward/up will adjust the prop trim so that the machine is biased forward.
  - Pushing the levers down/toward the operator will adjust the prop trim so the machine is biased backward.
  - The radio display will show the angle of each prop – Zero degrees is straight down, with +/- 43 degrees of adjustment in forward or reverse direction.

- PROP **STEER** TRIM adjusts the left or right neutral position of the props.
  - Hold the right most toggle switch up for the front prop, or down for the rear prop AND twisting the sea drive joystick knob clockwise or counterclockwise will adjust the steering angle of the corresponding prop.
  - Release the toggle switch when the desired steering angles are set.
  - This adjustment is sensitive and doesn't take much twist to adjust.
  - While holding the toggle switch, twisting the joystick to the right will bias the boat right, twisting left will bias the boat left.





Prop Angle Displayed

GENERAL OPERATION – Prop Trim Cont'd

PS1 and PS2 are Trim Pre-Set buttons, located to the right of the radio display. These give the operator 2 Prop Setpoints that can be changed to any prop position you like or stay with the factory defaults described below.

From the Factory:

- PS1:
  - Trims both props straight down in a neutral position
  - 0° Vertical angle and 3° Left/Right angle (to counter prop rotation movement)
  - Used for deeper agitation downward and will also keep the boat in place better than any other trim setting.

- PS2:
  - Trims both props to an outwards position
  - 40° Outward angle and 3° Left/Right angle (to counter prop rotation movement)
  - Optimal angle for crust busting and circulating surface solids toward the props.

Changing PS1 and PS2:

- Trim the props to a desired angle, then hold PS1 or PS2 down for 3 seconds. The radio will beep once. Release the button and the new Pre-Set position has now taken affect for that button.

Restore PS1 and PS2 to Factory Settings:

- Hold either PS1 or PS2 down for 6 seconds. The radio will beep twice. Release the button and it will have restored the default factory settings described above for the corresponding button.

GENERAL OPERATION – GPS Modes

Wolverine uses 2 GPS receiver units to calculate boat position and heading (direction it's pointing). One receiver is mounted above the radiator, the other above of the front cover panel. The boat will operate autonomously when it is operating within the specified boundary and all other criteria are met.

Safety

- Wolverine's GPS system does not have impact or visual scanning sensors to know if it's impacted foreign objects in or around the lagoon. Ensure all waypoints are set with ample clearance around such objects or damage may occur to the boat or whatever was impacted.
- Never operate GPS mode without a skilled operator always maintaining a visual on the boat.
- Ground Drive will not automatically engage when GPS mode is enabled, to ensure the boat cannot autonomously drive from the lagoon.
- The Pump and Gun can only be used with GPS while in Anchor mode (not in Cover Mode or Point to Point modes).

GPS Modes:

- **COVER** – Boat will agitate within the area created by the waypoints entered (at least 3 points must be set to form an enclosed area – max of 8 points). It moves in straight lines randomly across the area until encountering the outer boundary of the polygon created by the waypoints. Turn ON when the boat is *inside* the waypoint area. The boat is programmed to count the number of times it's encountered each edge of the waypoint area to ensure it will never encounter one edge too many times before returning to other less frequented edges.
- **POINT TO POINT** – Boat will move to waypoint one and will then continue to move from waypoint to waypoint and will return to the first waypoint after reaching the last waypoint (at least 3 points must be set – max of 8). Agitating the perimeter of the lagoon before it gets pumped down too far will reduce the need for bank washing. Ideally used in intervals with COVER mode to agitate the perimeter, then back to the middle to keep solids suspended.
- **ANCHOR** – Boat will stay in one position and pointed in one direction (within certain tolerance limits and a 15' max radius). Does not use waypoints, rather it keeps the boat in the *current* position and heading at the time GPS ANCHOR mode is turned on. If you move the boat to a new position while Anchor mode is ON, it will anchor in that new position without resetting anchor mode. This is handy when using anchor mode along with the pump/gun, use the boat to aim the gun side to side rather than the gun side movement.

GPS Out of Bounds (Error Message):

- This error code means the boat not currently inside the waypoint boundary or it has been overcome by outside forces and is unable to maintain GPS functions. It can be overridden by using any function on the remote to regain manual control of the machine.
    - Boat will turn off props and go to Engine Idle.
    - Lights will flash and alarm will sound on boat and remote. Look at top line of display for fault.
    - Take corrective action regarding the fault which caused the out of bounds or GPS Error.
    - Boat can be maneuvered back inside the waypoint area and GPS turned on again to resume.

GPS STUCK (Warning Message):

- This warning means the machine is "in-bounds", but has been moving slower than 0.2MPH for more than 60 seconds. Most likely the wheels are hung up on the bottom of the lagoon. Note – Props will remain active and machine is still trying to advance to the next waypoint.

GENERAL OPERATION – Using GPS

GPS General Operation:

1. Starting with Waypoint 1, enter waypoints in a clockwise or counterclockwise direction in ascending order (At least 3 points are needed)
   - Waypoints cannot be entered in a drastic zig-zag pattern and lines/boundaries can't overlap/intersect
   - Waypoints need to form a single "enclosed" shape, if one were to draw a line between points in ascending order and repeating at 1.
2. Select the GPS MODE to run
3. Move boat inside the shape created by the waypoint boundary (GPS will not turn on otherwise, or fault with GPS OUT OF BOUNDS error.)
4. Turn GPS ON (In Point-to-Point mode, boat will then go straight to Waypoint 1)
5. Adjust speed between 0.5 MPH and 2.0 MPH. Point-to-Point works best below 1.5 mph.

GPS Waypoint Selection and Entry

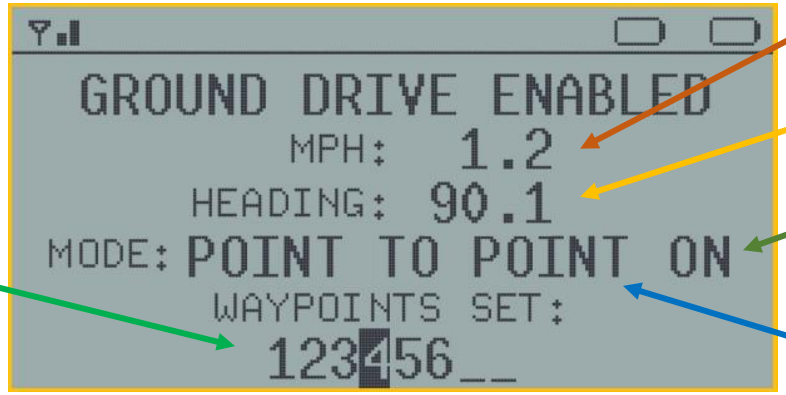
Use the "Waypoints/GPS Speed" Toggle switch:

- Tap UP to move waypoint selection right (Blinking Dark Box hi-lights current selection)
- Tap DOWN to move waypoint selection left

Entering Waypoints

Use the "Waypoints/GPS Speed" Toggle switch:

- Hold UP 3 seconds to SET selected waypoint to current boat position. Alarm sounds once. Selection box will move 1 place to the right for entering next waypoint. Maneuver boat to next waypoint position, repeat waypoint SET procedure.
- Hold DOWN 3 seconds to clear selected waypoint. Alarm Sounds Once. Waypoints can be overwritten without clearing if you want to enter a new position for that point.
- Hold DOWN 6 seconds to clear *all* waypoints at once. Alarm sounds twice.



GPS SPEED (How fast boat moves during GPS operation)
- When GPS is on, toggle WAYSPOINTS/GPS SPEED UP or DOWN (Rabbit or Turtle) to select speeds between 0.5 mph up to 2.0 mph

GPS HEADING (Reference Only)

GPS STATUS, ON/OFF
- GPS MODE, Toggle DOWN to turn GPS Mode ON or OFF

CURRENT GPS MODE
- GPS MODE, Toggle UP to switch/toggle between modes: COVER, POINT-TO-POINT, ANCHOR and NONE

GENERAL OPERATION – GPS Best Practices

GPS Tips and Best Practices

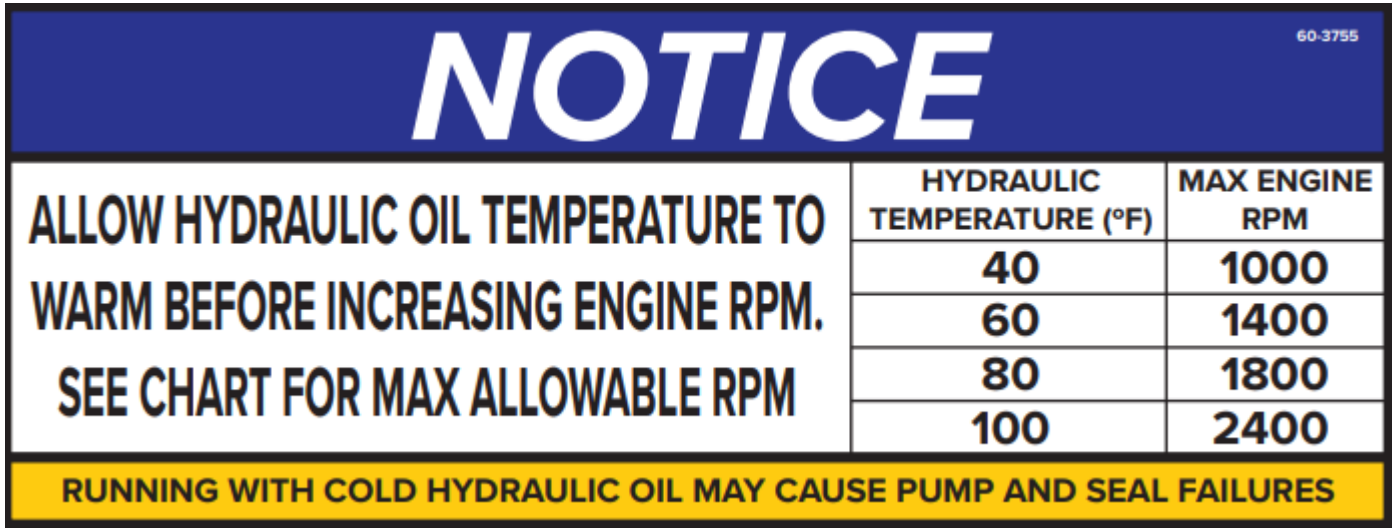
- Operate in any GPS mode with PROP SPEED set to 100%.
- You must start on Waypoint 1.
- You cannot skip a waypoint in the sequence.
- For Cover Mode or Point-2-Point Mode, you must put the machine inside the waypoints/boundary before you can turn GPS on.
- Whenever you see the machine lights and alarms flashing, check the very top of the radio display before touching any controls so you know what fault caused the GPS to shut down.
- You can reset individual waypoints by selecting that waypoint, move the boat to the new position and hold up on the "WAYPOINT/GPS SPEED" toggle switch for 3 seconds to overwrite the SET point.
- When starting at a new lagoon, it is best to clear all waypoints. Hold down "WAYPOINT/GPS SPEED" for 6 seconds.
- The last set of waypoints will be stored even after the radio and machine are powered down.
- If the machine isn't staying "in bounds" while GPS mode is on, check the following:
  - Verify Waypoint shape creates one enclosed area and there is ample room to maneuver inside the shape
  - Decrease speed in GPS mode below 1.5 mph.
  - Last Resort: Re-trim prop gimbals at full engine rpm and 100% prop RPM so boat is very still/stable when no commands are given (neutral position on right joystick). Change GPS TRIM setting by holding PS1 and PS2 buttons simultaneously for 10 seconds.
- Pump/Gun CANNOT be used in Point-to-Point or COVER modes.
- Pump/Gun CAN be used in Anchor mode.

Faults that may stop GPS from working:

- LOW DEF or LOW FUEL levels – currently set to trigger at 20% (the machine will not let you use GPS mode again until the levels are above 20%)
- HIGH HYD OIL Temp – Hydraulic oil temperature has 170° F warning, 200° F machine shutdown
- LOW HYD OIL LVL – Low hydraulic oil level will shut down the machine to protect critical components
- HIGH ENGINE TEMP – 215° F warning, 225° F machine shutdown
- FRONT/REAR GPS FAULT (usually a wiring/connectivity issue if this ever occurs)
  - The LED light on the GPS head units will flash green for each satellite it is connected to (5 green flashes means it is connected to 5 satellites)
- CHARGE PRESSURE LOW (operating the ground drive at idle can cause this, but if this fault occurs at full throttle, your machine should be inspected immediately. Warning at 275 psi, machine shutdown at 250psi (can be restarted to allow the operator to get out of the lagoon or on a trailer).
- LOST RF LINK - Lost the signal between the radio and the receiver.
- GPS – Machine Stuck – if the boat shows 0mph for more than 30 seconds while operating in bounds, the lights and alarms will sound, but the props will stay active and continue to agitate. This could happen as the lagoon lowers and the wheels start to hit the lagoon bottom.
- Faults from some components like smart cylinders that help control the prop location/articulation
- GPS Out Of Bounds - Outside forces like other pumps or agitators, strong winds/currents

GENERAL OPERATION – Cold Start Warm-up Sequence

- Wolverine boats have been equipped with a cold start warm-up sequence that limits engine rpms while the hydraulic temperature warms to prevent potential damage in hydraulic components.
- Hold the engine rpm paddle (left most paddle) up for 2 seconds to request the max allowable engine rpm during the warmup sequence. The actual engine rpm will automatically increase to the max allowable rpm as hydraulic oil warms.
- In the event of a failed hydraulic temperature sensor the allowable engine speed will ramp up over 15 minutes.
- On machines that have not been equipped with the cold start warm-up sequence – follow chart below. Do not increase engine speed to stated max engine rpm until hydraulic oil temperature is above related temp. Failure to do so may cause pump and seal failures.
    - Below sticker should be located on hydraulic oil tank. If sticker is missing from hydraulic tank, please call a Bazooka Farmstar representative for replacement.



HYDRAULIC OIL

Use ISO 46 Anti-Wear (AW) Hydraulic Oil Only
Minimum Oxidation Life – 5000+ hrs (8000 hrs recommended)

- Factory filled with **Tec-Guard Defend AW46** Hydraulic oil. Tec-Guard Defend PDF Link
  Available through Rilco Lubricants & Services and its distributors.
- Equivalent alternatives to the Tec-Guard Defend AW46 specs are acceptable. Contact Bazooka Farmstar with questions.

  - Check Hydraulic oil level prior to each startup using remote control indicator. Add oil until it reads full.
    - The tank decal is for visual reference, refill oil if it the level is visible between Low and Full
  - The hydraulic tank is designed to purge air from the system. After performing oil changes, oil level may fall as air is worked out of the system. Continue to add oil until oil level is stable at low and high engine rpm.
  - Never add dissimilar oils, always drain before adding different/new oil.

Install updated warm up sequence and oil type decals if not currently placed on tank:

60-3755

60-3744

MAINTENANCE – GREASE LOCATIONS

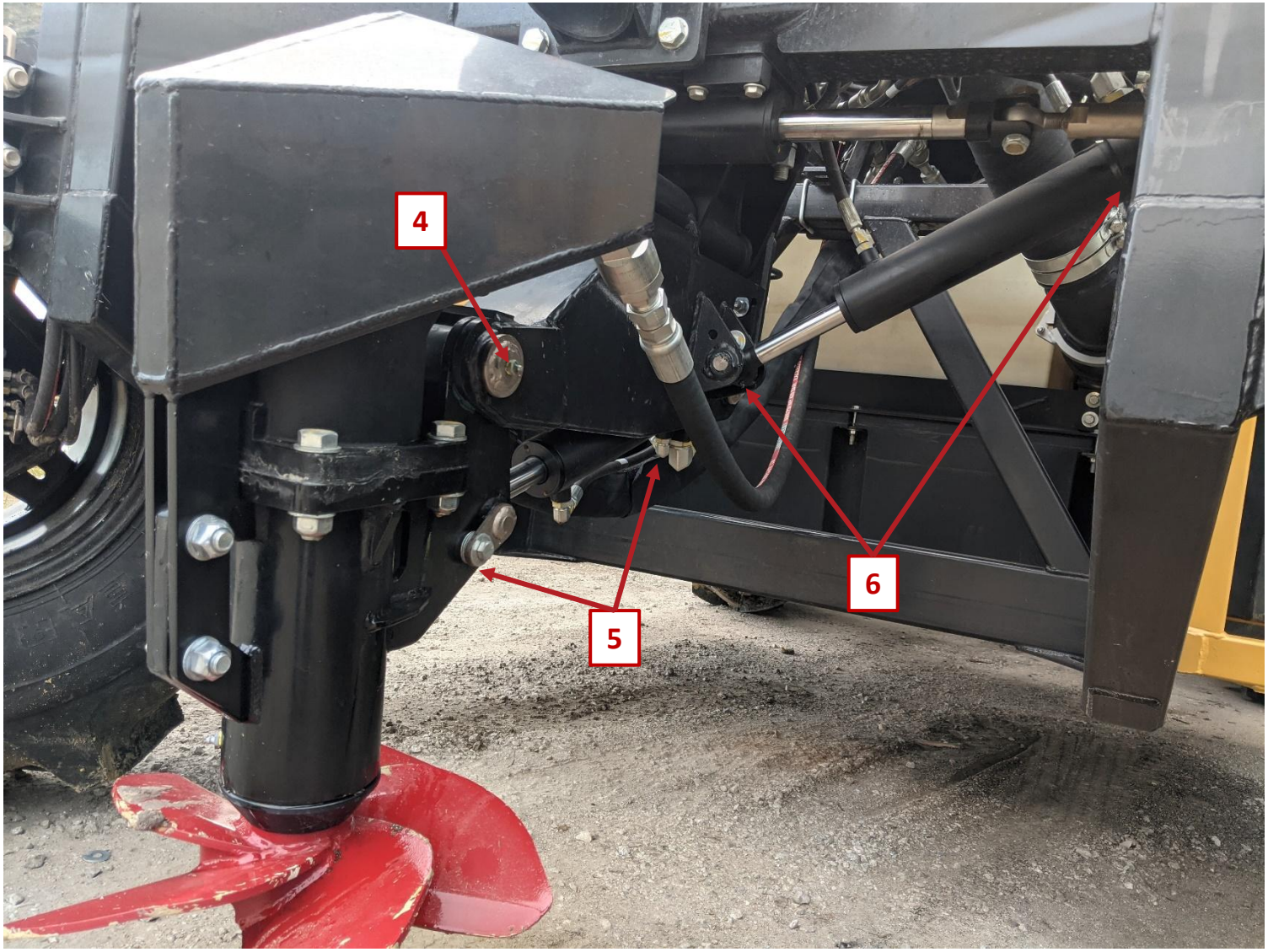
<u>Grease Daily</u> after each use and before storage
Lubricate all fittings with a good quality **MARINE GRADE NLGI #2 grease** containing no more than 1% molybdenum disulfide.

1. Steering Pivot Pin (4 Pins) – Top or Bottom Zerk
2. Gun Swivel (4 Zerks around swivel)
   - May decrease interval depending on use
3. Prop Bearing Housings (x2, Front and Back of Machine)

Grease used from factory

MAINTENANCE – GREASE LOCATIONS

4. Prop Tilt Pin (Front and back of Machine) - Check for excessive wobble, replace bushings or pins
5. Prop Tilt Cylinder Ends (Front and Back of Machine) - Check for excessive wobble, replace bushings or pins
6. Prop Steer Cylinder Ends (Front and Back of Machine) - Check for excessive wobble, replace bushings or pins



MAINTENANCE – GREASE LOCATIONS

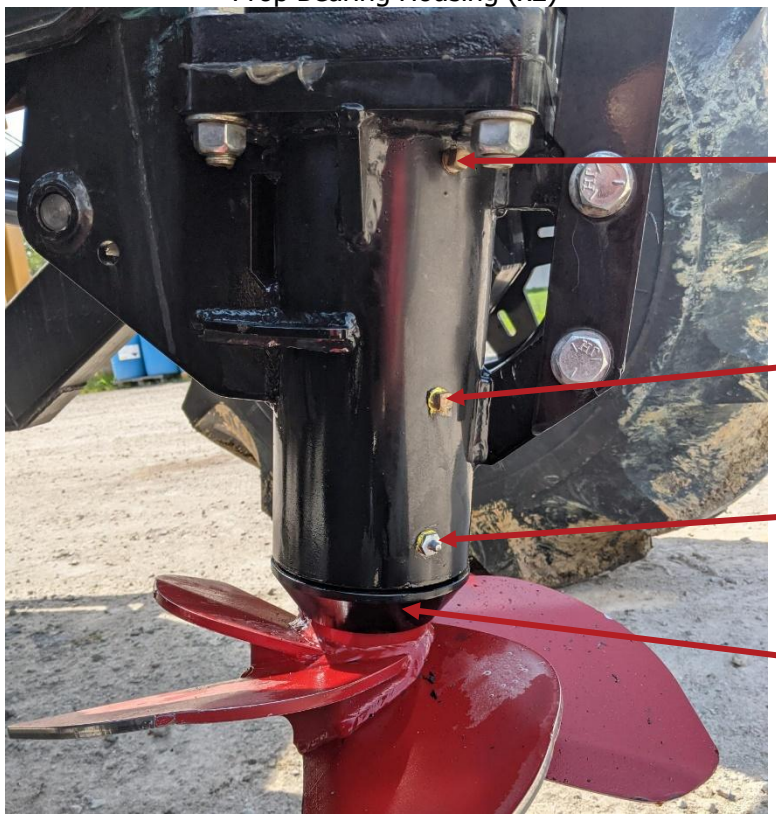
7. Submersible Pump Bearing Housing (1 Zerk, Rear of Machine)

MAINTENANCE – Bearing Housing Service (x3)

Check Fluid level weekly. Drain oil and replace every season or 1000 hours, whichever comes first. Bearing Housings are filled with 75W/90 gear oil.

- Port plugs are magnetic – large amounts of metal on the plugs could indicate bearings need serviced or replaced. See "Bearing Housing Rebuild Instructions" for further information.
- There is a top seal and four lower seals with a grease space between the lower seals. This grease space is filled by the grease zerk towards the bottom of the housing. With the prop and plastic shaft protector off, you can fill that space until you see grease coming out around the shaft. Add 1-2 pumps of grease daily.
- If the hydraulic motor is ever removed from the bearing housing, put some grease on the splined motor shaft before reassembling. A small bead of silicone should also be placed around the outside lip of the motor flange and face where it mates with the bearing housing.
- When draining and filling oil, it is best to reorient/trim props to an angle such that all oil can drain out bottom port, or all air can be bled out the top port. No air in housing eliminates expansion/contraction, as well as condensation risk.

Prop Bearing Housing (x2)

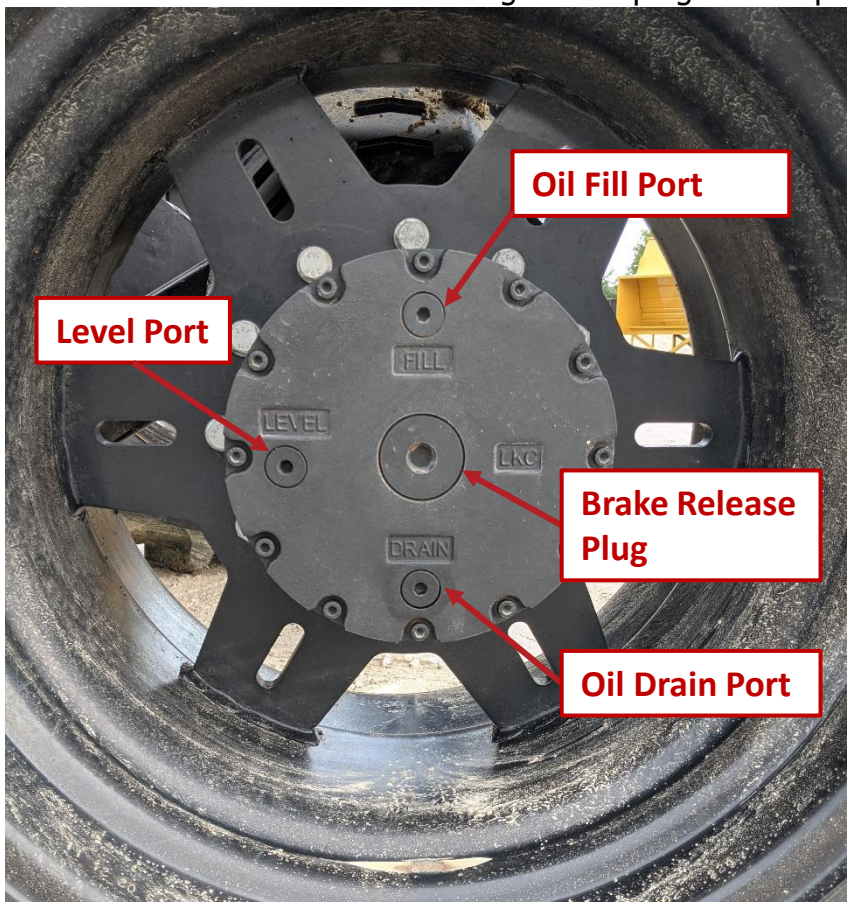


Pump Bearing Housing (x1)
Rear of Machine

MAINTENANCE – Ground Drive Service (x4)

Drain oil and replace after first 300 hours, then every 6 months or 1000 hours, whichever comes first. Drives contain GL-5 85W/90 or 80W/90 gear oil (Approx 60oz / 1.7L per drive).

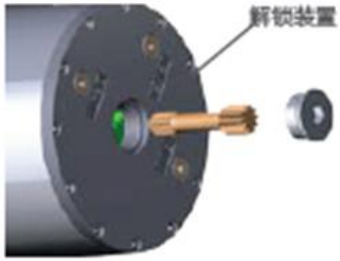
- Never add dissimilar oils, always drain before adding different/new oil.
- Fill, Drain, and Level ports are accessible on the outside of each tire/wheel.
- To properly drain and fill, orient drives as shown below (Fill port top dead center, drain port bottom dead center).
  1. Remove all plugs from wheel drive and fully drain the housing. Replace "Drain Port" when complete.
  2. Fill housing through "Fill" port, and with "Level" port unplugged
  3. Stop filling when oil begins to come out of "Level" port.
  4. Re-install and tighten all plugs to complete oil change.



Brake Release (For Slow-Speed Towing)

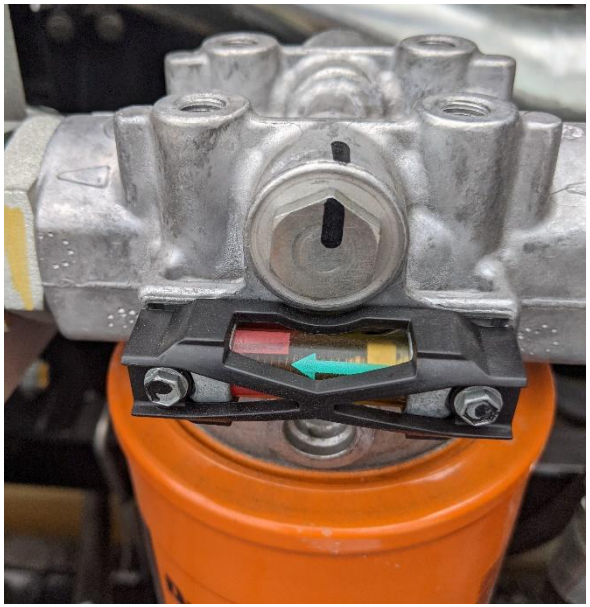
Wheel drive brakes are hydraulically actuated and released, which happens automatically when the hydraulic system is working properly, and a "drive" command is given from the remote. In case of system failure, release the brakes manually to tow the vehicle.

1. Ensure vehicle is held properly and will not roll in an uncontrolled way before releasing wheel brakes (Chocks, straps, winch, etc.).
2. Using an 18mm Allen wrench, remove the center brake release plug from wheel drives.
3. Remove the input pinion shaft from the gear drive. Note orientation of shaft to re-install properly when freewheel/towing is no longer needed (See image below).
4. Re-install and tighten the Brake Release Plug onto the wheel drive.
5. Vehicle will now roll freely for slow towing. Re-install pinion gears before using machine's hydraulic drive system again.



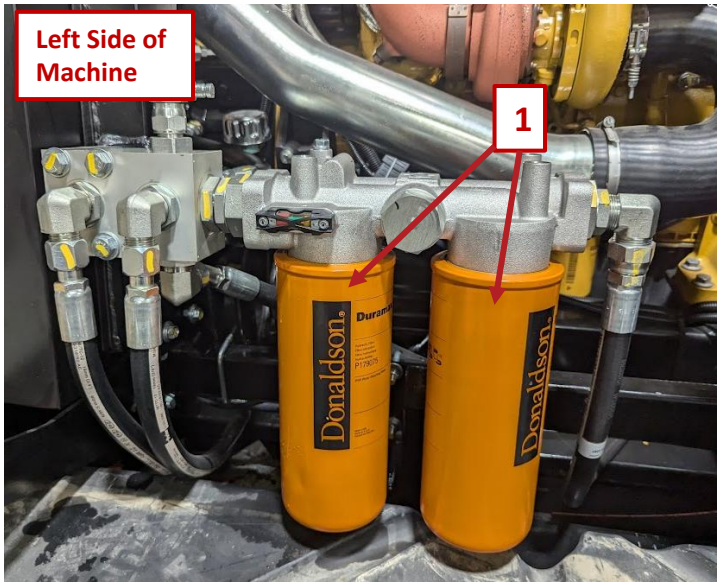
MAINTENANCE – Hydraulic Filters

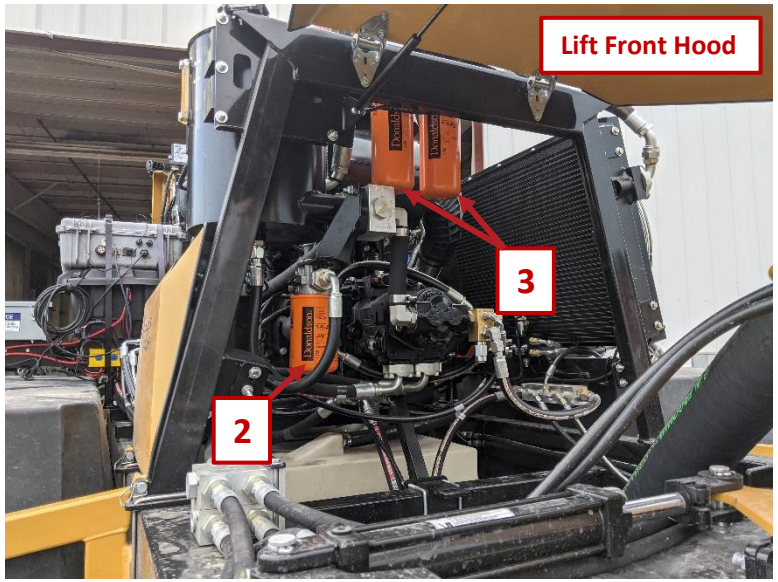
Failure to change hydraulic filters per below, will result in decreased service life of costly hydraulic components - Consult Engine Operators Manual for engine-mounted filter maintenance



- Replace hydraulic oil and filters every 500 hours (or sooner if any filter is in bypass mode)
- Filter Bypass Indicator (Left Image) – If the engine is at full throttle and the yellow cylindrical indicator is just touching the "red zone", the filters need to be replaced. Make sure hydraulic oil temp is in operating temperature range (120-140 F) before checking filters.
    - Check Aux Pump Return Filters daily before use, when engine is over 2000 RPM.
    - Check all other filters every 20-40 hours
    - A failed hydraulic component or manure contamination event could clog filters without warning and cause them to go straight to bypass mode and no longer function.

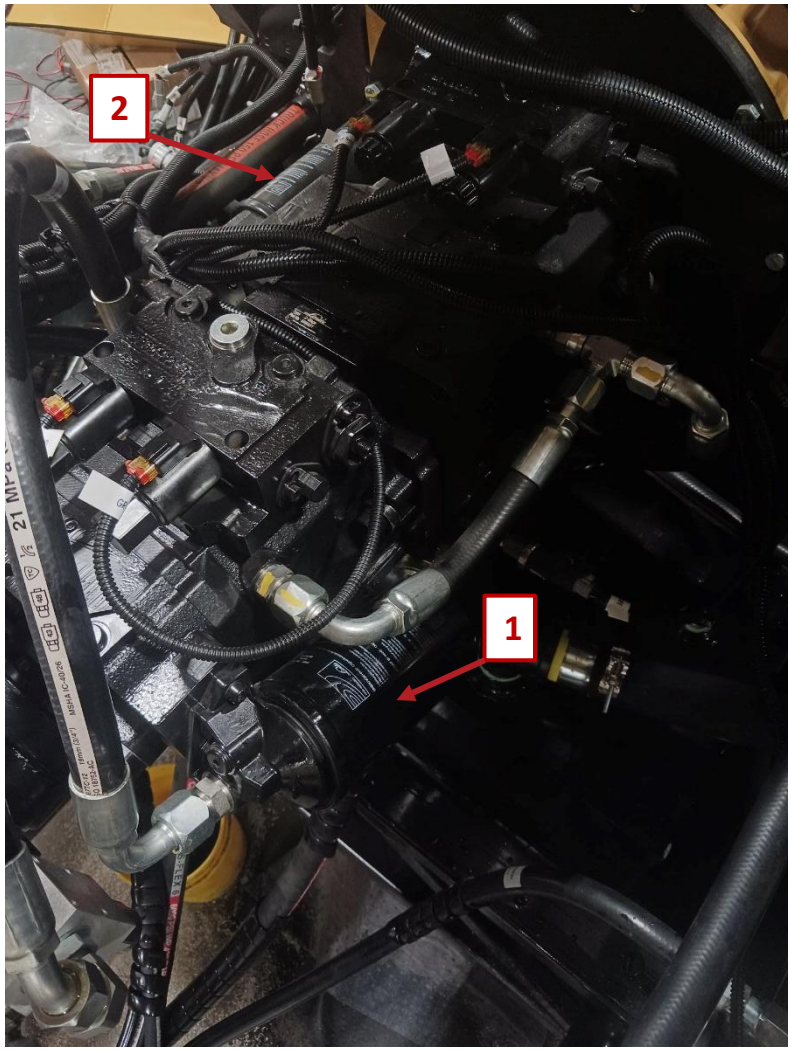
1. Auxiliary Pump Return Filter – Duramax P179075 (Or Equivalent) – Water and Oil Filter
    - Check when engine is running over 2000 RPM
2. Hydrostat Pump Case Drain Filter – Duramax P176208 (Or Equiv.) – Oil Filter
    - Check when engine is running over 2000 RPM
3. Main Circuit Return Filters – Duramax P165675 (qty 2) (Or Equiv.) – Oil Filter
    - There is an electronic indicator on the dual filter head that displays FILTER STATUS "OK" or "CHECK"
    - Filter may show "CHECK" during cold startups. Allow oil to come into operating temperature range for sensor to accurately show status.





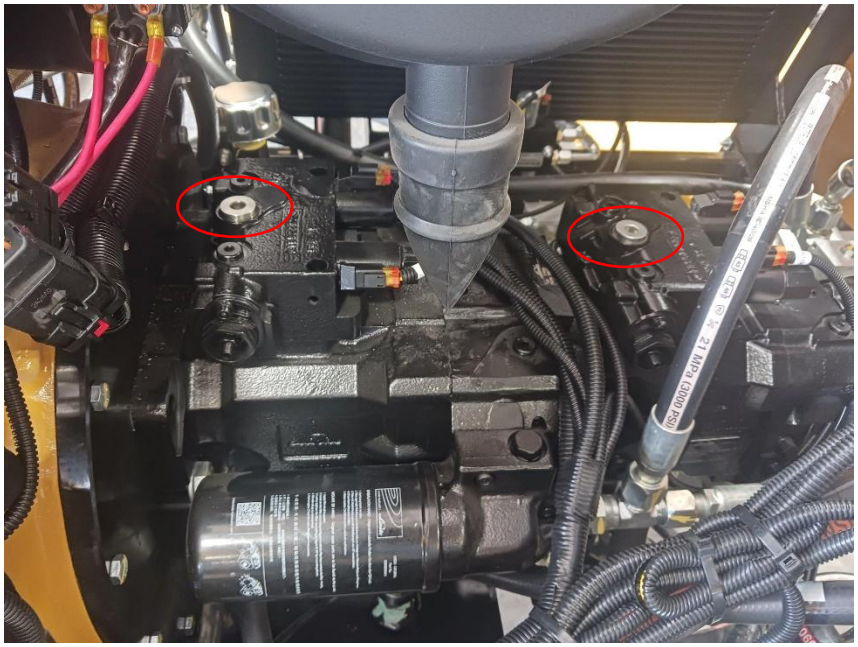
MAINTENANCE – Hydraulic Filters (continued)

Failure to change hydraulic filters per below, will result in decreased service life of costly hydraulic components
- Consult Engine Operators Manual for engine-mounted filter maintenance

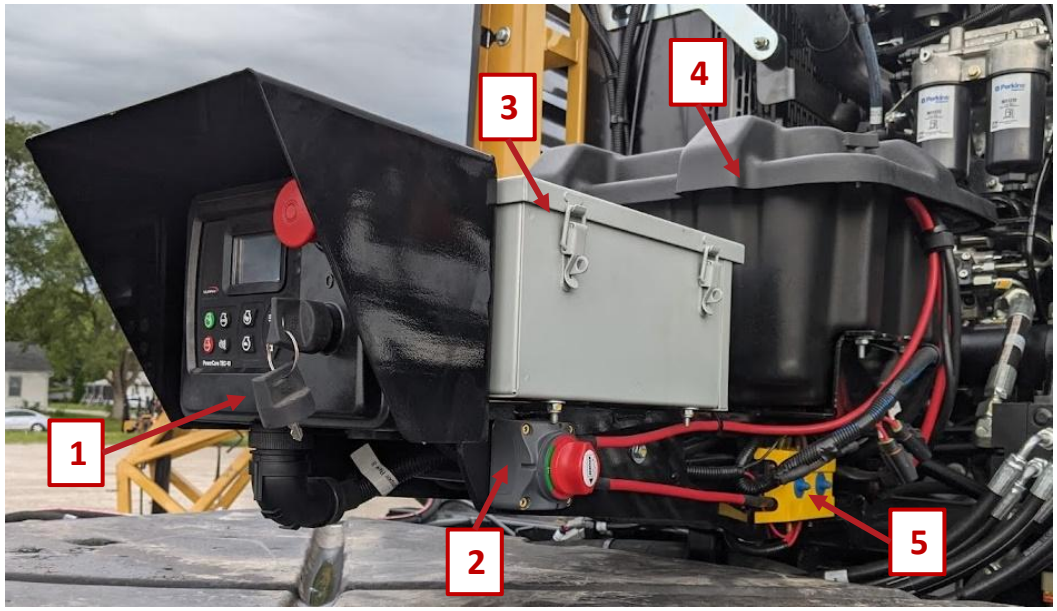


- There are (2) charge pressure filters located on either side of the Linde hydrostat pump that is mounted to the flywheel housing on the engine.
  - These should also be replaced every 500 hours (along with the hydraulic oil filters and oil) or sooner if other filters on the machine are showing "CHECK" on the remote, indicating the filters are plugged and in bypass mode.
  - Linde filter # 0009830633V (qty 2)

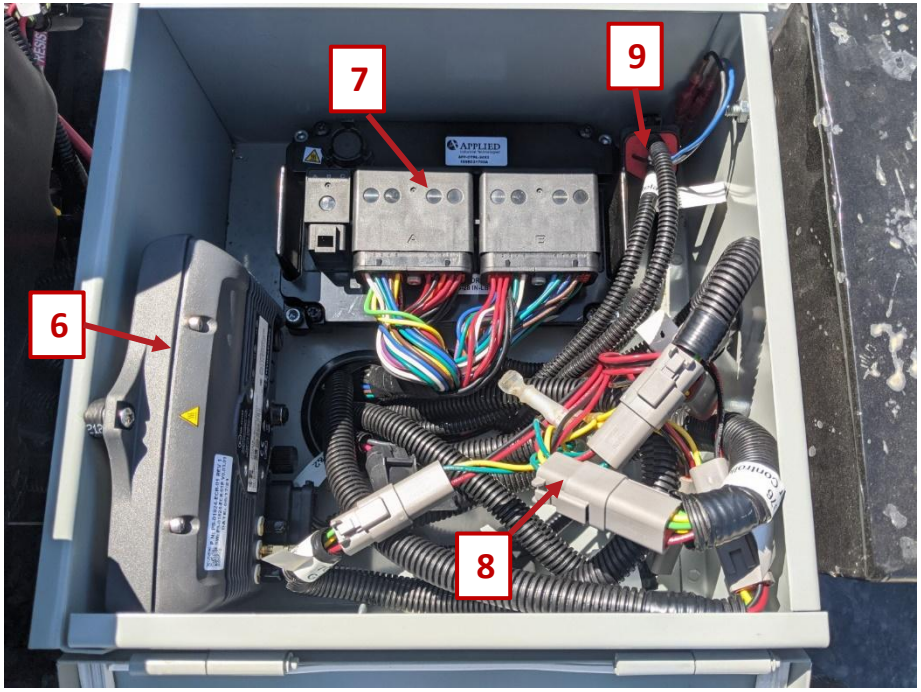
- When the new filters have been installed and oil has been replaced, loosen the top 2 plugs (circled below) on the top of the Linde pumps until oil runs out. This allows the air in the pump case and filters to escape while they fill with oil.



Electrical System – Introduction



1. Tec-10 Engine Controller with key switch and E-Stop
2. Master Battery Disconnect Switch – NOTE: STARTER IS WIRED DIRECTLY TO THE BATTERIES AND BATTERY CABLES SHOULD BE DISCONNECTED FROM THE BATTERIES BEFORE WELDING/SERVICING THE MACHINE
3. Electronic Control Box
4. Battery Box
5. Bus Bar (Battery Power Distribution Bus)



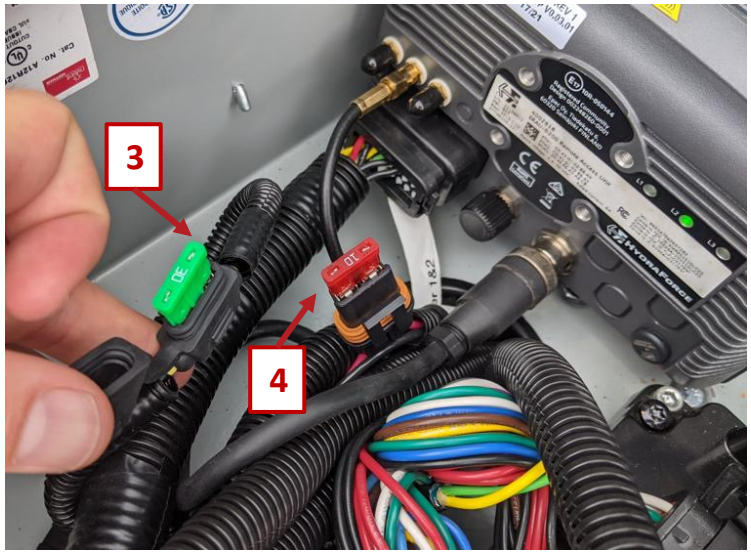
Inside Electronic Control Box

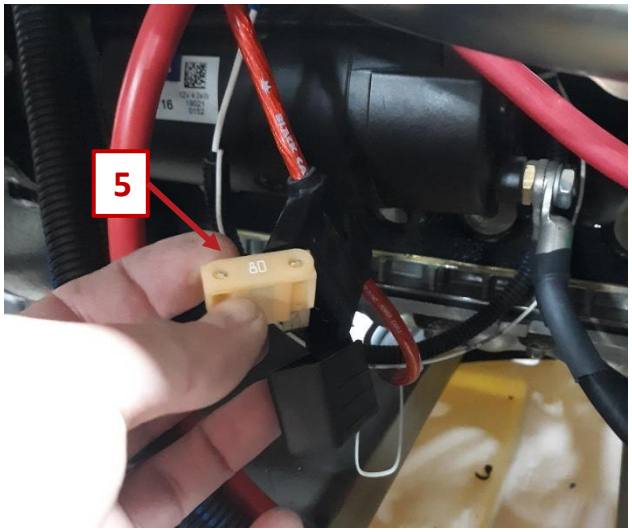
6. Master Controller
7. I/O Controller
8. CAN Splitter Harness
9. Relay – Flood lights
10. Remote Receiver (not pictured)
11. 24V to 12V Converter (if needed) (not pictured)

Electrical System – Fuse Locations (6 total)

If a fuse blows quickly after being replaced, it is a sign of more serious electrical issues. Trace electrical harnesses for wire damage and check connectors for damage or corrosion. Work-arounds may cause expensive electrical damage to the machine; always consult Bazoooka Farmstar service personnel prior to doing electrical work beyond changing fuses or plug-and-play wire harness replacement.

1. Tec-10 Engine Controller - 25 Amp (Latched cover)
2. Engine Harness (CAT/Perkins) - 25 Amp (x2)
3. Light Harness - 30 Amp (Inside Electrical Box)
4. CAN Splitter Harness - 20 Amp (Inside Electrical Box) (Newer models have individual fuses for each circuit)
5. Glow Plug Relay (CAT & Perkins) – 80 Amp (Engine Starter Motor, Left side of machine behind hydraulic cooling fan).





TROUBLESHOOTING

All our troubleshooting documentation is maintained on our online Resource Page so that it can be continually updated and expanded. Visit the Wolverine Resource Page for:

- Troubleshooting:
  - Complete fault code lists
  - Detailed troubleshooting guide
- Operation:
  - Updated versions of this manual
  - Remote control quick reference
  - Cloud monitoring overview
- Maintenance:
  - Replacement filter part numbers
  - Propeller replacement video
  - Swivel rebuild guide
  - Bearing housing guide
  - Fuel level sensor calibration
  - Remote control pairing
- Engine info:
  - SPN codes
  - Part numbers
  - Warranty registration
  - Service locations
- Videos covering:
  - Troubleshooting
  - Prechecks
  - Startup and shutdown
  - Operation
  - Detailed GPS operation examples

Point your phone's camera at the QR Code above to go to the Wolverine Resource Page

https://bazookafarmstar-5546834.hs-sites.com/en-us/wolverine-series-resource-hub

Bazooka Farmstar Warranty Policy

This warranty document contains the sole explanation of any and all warranty coverage and is subject to the provisions expressed below.

Customer Responsibility

It is the customer's responsibility to maintain the equipment in accordance with the instructions provided in the operations manual.

If a failure in the product occurs, it is the customer's responsibility to cease operation until the proper repairs have taken place. *Damage which occurs from continued operation after a failure may not be covered by warranty.*

Limited Warranty Coverage

New manufactured equipment comes standard with a 1-year limited warranty, beginning at the date the equipment was invoiced to the original purchaser of use, or from the date the equipment was first put into use. We guarantee the manufactured product to be free of material defects or workmanship issues. Limited Warranty Coverage is only valid on registered equipment.

In the event a failure occurs during normal operational use, Bazooka Farmstar will replace, repair, or credit the product or part at our discretion. Labor costs for the dealer and/or customer to install or assemble the replacement will be determined by Bazooka Farmstar at the time the claim in submitted.

Bazooka Farmstar has the right to inspect the customer's equipment to determine if a defect in materials or workmanship exists, as well as the labor hours required, prior to repairs made by the dealer and/or customer.

Certain products sold by Bazooka Farmstar are covered under their original manufacturer's warranty. These include but are not limited to engines and pumps.

Our dealers do not have authority to access, evaluate, or administer warranty on behalf of Bazooka Farmstar.

We do not guarantee our products to meet local municipal, state, or national laws or regulations.

Bazooka Farmstar Warranty Policy

This warranty does not cover used equipment or failures caused by:

- Accidents
- Alterations or modifications
- Abusive operation
- Improper repairs
- Misuse or neglected maintenance
- Use beyond original design intention (as specified in the Operation's Manual)
- Unapproved attachments or accessories
- Natural wear and tear

Submitting a Claim

Contact your Account Manager to begin the warranty process. **To be considered for approval, claims on registered equipment must be submitted within 30 days of the date the issue occurred.**

If you need replacement parts to repair the failure, your Account Manager will ship them out as soon as possible. After your replacement parts have shipped, you will receive an invoice with 60-day terms*.

If your Account Manager informs you that parts need to be returned as part of your warranty evaluation, a Return Material Authorization (RMA)** will be sent to you and you will have 30 days to return the items.

Upon receipt of the failed replacement parts, a warranty evaluation will be performed to determine a disposition. If approved, a credit will be issued in full.

Bazooka Farmstar will send your approval or denial via email for your records.

** We understand that evaluation, especially when involving a third party, may extend past 60 days. However, if the claim is in process and the items were returned by the expected return date on the RMA, no finance charges will be assessed.*

**This change is only applicable to warranty orders that require parts to be shipped when warranty coverage is not clearly approved, or the problem is not easily identified. Manufactured products containing material defects or workmanship issues, or instances where Bazooka Farmstar is undeniably at fault for the problem, will continue to be processed with no additional charges.*

***Issuance of an RMA does not guarantee credit or approval of warranty coverage.*