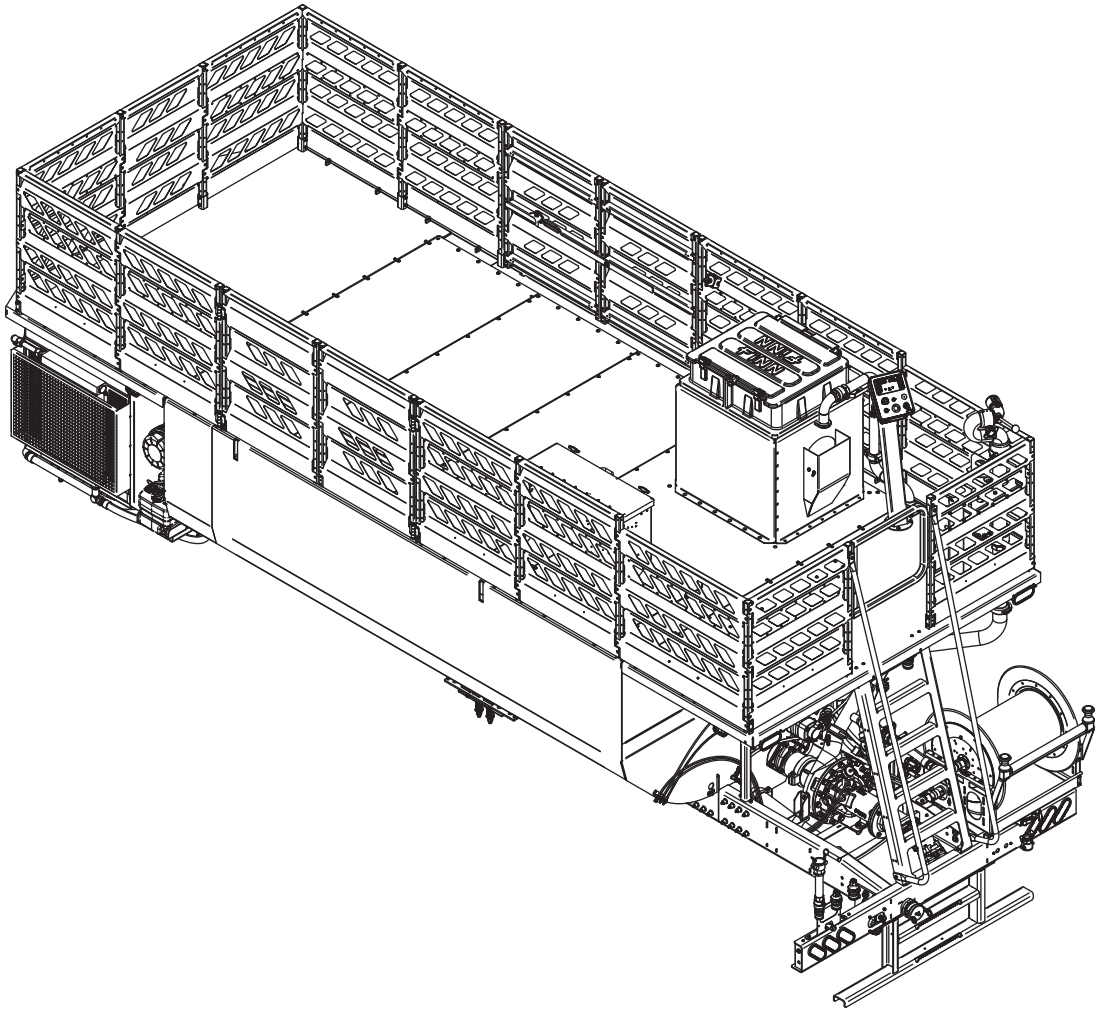
FINN CORPORATION®

Activate Your Warranty By Registering TODAY!!!

9281 LeSaint Drive • Fairfield, Ohio 45014
Phone (513) 874-2818 • Fax (513) 874-2914
Sales: 1-800-543-7166



TITAN HT330/TITAN HT400 HydroSeeder®

Operator Instructions Manual

Item **A3153-002** Serial No. _____

FOR OFFICE USE ONLY		
DATE	**UPDATE DESCRIPTION**	**CODE**
02/25/21	Initial release: new engine	OM0225

FINN CORPORATION

ACTIVATE YOUR FINN EQUIPMENT WARRANTY

☞ It is the responsibility of the Finn Dealer to register your Finn Equipment shortly after the equipment start-up and operation overview at which time you will be asked to sign off on the **WARRANTY VALIDATION FORM**.

Be sure to confirm with your sales representative that this has been done.

This registration process activates the Finn Limited Warranty.

What should you do if you need repairs or parts under Warranty?

How to get parts and or repairs done under warranty:

Notify **YOUR DEALER** immediately when you discover a faulty material, workmanship, or faulty component. **Do not** wait weeks or months to get it reported. Be sure to tell the dealer that this is a failure that occurred under warranty.

NOTE: Warranty work must be done by a Finn Authorized Dealer in order to be covered by the Finn Warranty Program, unless otherwise approved by the Finn Warranty Administrator.

Instructions to Dealer on processing warranty work:

Initiating a claim

1. Be sure to have the model, serial number and number of hours on unit.
2. A description of the problem as understood at the time.
3. Call Finn's Warranty Administrator to secure warranty claim authorization number.
4. Confirm with Warranty Administrator that the unit is eligible for warranty coverage.
5. Any parts needed for the repair work should be placed with the Warranty Administrator instead of the parts department. These will be shipped to you at no charge pending the outcome of the investigation.
6. Labor hours must coincide with the published "Labor Schedule" or estimate approved by the Finn Warranty Administrator.
7. Once work is done, a Finn Warranty Claim Form must be filled out and emailed along with any related receipts or invoices to the Warranty Administrator. We ask that this is done ASAP after work is completed.

Faulty or failed parts:

IF Finn wants you to return failed parts, you will receive a return shipping label in the package with new parts. On that Label will be marked a return authorization number. (Which is the same number as you claim number.)

Please also mark the outside of the package that you are shipping back (using a marker) with the claim/return number. **THESE PARTS MUST BE RETURNED WITHIN 10 DAYS!** Failure to do so can void warranty coverage.

NOTE: Further information and related forms can be found on the Finn Web site in the Dealer Portal warranty section.

FINN CORPORATION®

WARRANTY PERIOD

HydroSeeder® and Straw Blower: 2 years or 2000 hours, whichever comes first.

Bark Blower: 1 year or 1200 hours, whichever comes first.

COMMERCIAL LIMITED WARRANTY

EFFECTIVE 01/01/2018

OUR WARRANTY TO YOU

Finn Corporation warrants to you, the original purchaser, for use (or rental to others for use) and to a second owner who purchases a used machine from an Authorized Dealer Rental Program (the remaining warranty), all new construction machinery, parts and attachments (except those referred to herein) that are manufactured by Finn to be free from defects in material and workmanship for a period noted above. Replacement parts provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product to which parts are installed, as if parts were original components of the product.

TO QUALIFY FOR WARRANTY CONSIDERATION

A. Your Finn Dealer will register your equipment with Finn. **FAILURE TO REGISTER WILL VOID THE WARRANTY.**
B. Notify your dealer same day or next day of any need for work under warranty.
C. Warranty work must be done by an authorized Finn dealer or service provider of Finn's choice and any parts must be ordered through the Finn warranty administrator.

WHAT FINN WILL DO

Upon notification to Finn concerning a failure of material or workmanship in accordance with the above stated Warranty, Finn Corporation will:

A. Verify claim falls within the valid warranty time frame.
B. Verify the product and equipment has been registered with Finn.
C. Upon affirmation of warranty period and registration, Finn will provide new or repaired replacement part(s), whichever Finn elects and a return shipping label for returning failed parts if applicable.
D. Evaluate the part when defective part is returned. If damage to a part is determined not to be covered under the warranty, the customer will be billed.
E. Reconcile costs with customer for parts and shipping, as determined by our inspection of failed parts, and confirmation of warranty coverage, per the terms of this warranty.
F. Correction of nonconformities, in the manner provided above, shall constitute fulfillment of all liabilities of Finn Corporation.

WHAT THE WARRANTY DOES NOT COVER

1. Normal wear parts, Allied Equipment, trade accessories not manufactured by Finn, such as but not limited to items such as various filters, fluids, brakes, clutch linings, coupler insert, belts, hoses, light bulbs, mechanical seal, over center clutches, tires, ignitions, starters, batteries, carburetors, engines or like or unlike equipment or accessories. (Such being subject to the warranty, if any, by their respective manufacture).
2. Secondhand, used, altered, or rebuilt machines or parts.
3. Defects, malfunctions or failures resulting from accidents, abuse, misuse, improper servicing, or neglect of required operational guidelines and maintenance service, as outlined in the Finn Corporation's Operators Manual(s).
4. Any defect or failure of products warranted arises out of or is caused by accessories or parts not manufactured or supplied by Finn Corporation, whether same are supplied by purchaser, dealers, or any other party.

STORAGE

Dealers and customers are responsible to follow all guidelines related to Seasonal and Long Term Storage of Equipment, as advised in operation and equipment manuals. i.e. Finn, Engine, Clutch, Pump, Motor, etc. Equipment failures caused by neglect of these guidelines are not warrantable.

THIS IS THE ONLY EXPRESS WARRANTY ON OUR PRODUCTS

We neither assume nor authorize anyone to assume for us any other express warranty. The Distributor/Dealer has no authority to make any representation or promise on behalf of Finn Corporation or to modify the terms or limitations of this warranty in any way.

THIS WARRANTY THEREFORE SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATIONS ON OUR RESPONSIBILITY WITH RESPECT TO PRODUCTS PURCHASED

THE REMEDIES OF THE USER SET FORTH HEREIN ARE EXCLUSIVE, WITHOUT REGARD TO WHETHER ANY DEFECT WAS DISCOVERABLE OR LATENT AT THE TIME OF DELIVERY OF THE PRODUCT TO THE PURCHASER.

ALL WARRANTY REPAIR MUST BE DONE BY A FINN AUTHORIZED SERVICE PROVIDER OR AUTHORIZED REPAIR SHOP OF FINN'S CHOICE.

TRANSPORTATION, HAULING, STORAGE, OR OTHER SIMILAR COSTS ARE NOT PART OF FINN'S OBLIGATION UNDER THE LIMITED WARRANTIES AND IS THE RESPONSIBILITY OF THE EQUIPMENT OWNER.

THE ESSENTIAL PURPOSE of this exclusive remedy shall be to provide the original purchaser with repair or replacement of parts that prove to be defective within the period and under the conditions previously set forth. This exclusive remedy shall not have failed of its essential purpose (as that term is used in the Uniform Commercial Code) provided Finn remains willing to repair or replace defective parts within a commercially reasonable time after it obtains actual knowledge of the existence of a particular defect.

IN NO EVENT shall Finn be liable for any special, consequential, incidental or indirect damages, including lost profits or lost commercial opportunities, with respect to the sale of the above warranted product or anything done in connection therewith, or for property damage sustained by a person claiming to be a third party beneficiary of a surviving warranty under the law of any jurisdiction.

NOTICE

FINN CORPORATION URGES the use of only Finn corporation supplied parts and attachments to assure proper performance and safe operation of Finn corporation equipment. Insist on parts and attachments manufactured or supplied by Finn corporation when you purchase, repair or replace your Finn equipment and attachments. Finn corporation cannot assure that parts and attachments not manufactured or supplied by Finn meet Finn corporation's quality standards, specifications, or operating requirements. Our warranty is not effective to the extent any failure of or defect in a Finn corporation product arises from or is caused by parts, attachments or components not originating with Finn corporation. Use of Finn corporation equipment with parts and attachments not manufactured or supplied by Finn could result in personal injury and void warranty coverage.

INDEX

Continued . . .

INDEX (Continued)

SAFETY FIRST

With any piece of equipment, new or used, the most important part of its operation is **SAFETY!**

FINN Corporation encourages you and your employees to familiarize yourselves with your new equipment and stresses safe operation.

The first pages of this manual are a summary of the main safety aspects associated with this unit. Be sure to read and understand completely before operating the machine.

The symbols below are used throughout the operation and maintenance sections of this manual to call attention to safety procedures.

⚠ DANGER ***Danger indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.***

⚠ WARNING ***Warning indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.***

⚠ CAUTION ***Caution indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.***

NOTICE ***Notice indicates important information, that if not followed, MAY cause damage to equipment.***

NOTE: This is helpful information.

The **DANGER**, **WARNING**, **CAUTION** and **NOTICE** notifications and instructions in this manual *cannot* cover all possible conditions and situations that may occur.

It must be understood by the operator that caution is a factor which *cannot* be built into this product; caution must be supplied by the operator.

CALIFORNIA PROPOSITION 65

⚠ WARNING ***The engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm. Wear protective equipment.***

⚠ WARNING ***Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.***

HYDROSEEDER® SAFETY SUMMARY SECTION

It is important that all operators of this machine are familiar with all safety aspects covered in this section and have read the entire Operator's Manual before operating the machine. Always keep a copy of this manual with the machine. It is the responsibility of the operator of the machine to fully understand this safety summary section. Remember that YOU are the key to safety. Good safety practices protect not only you but also the people working with and around you. Keep in mind that this safety section is written for this type of machine only. Practice all other usual and customary safe working precautions. Above all, remember that safety is up to you.

The FINN HydroSeeder® is designed to mix and apply water, seed, fertilizer, agricultural lime, and hydraulic mulch to the prepared seedbed. The resultant slurry from mixing one or more of the above materials may react, causing harmful or deadly gasses within the tank. Heat, evaporation, or extended emptying period can/will accelerate the formation of these gasses. Please contact your supplier(s) of these slurry components regarding their potential reactivity.

I. PRE-START EQUIPMENT CHECK (equipment check is to be made with the engine off)

1. If you have a chassis-mounted unit, check devices securing HydroSeeder® to the truck, break lights and all safety components.

2. Make sure loading hatch bag cutter is in place and secure.
3. Check that all guard railing is in place and secure.
4. Verify that all guards are in place.
5. With the ignition switch ON, verify that the signal horn and safety lights are operating correctly.
6. By carefully looking down through the loading hatch, inspect the slurry tank for foreign objects. Never enter the tank without following the procedures described in Step 5 of section IV. MAINTENANCE.
7. Remove unnecessary objects (or material) from the tank top.
8. Make sure no one is working on or inside the machine. Give a visual and audible signal that all is clear, before starting the engine.
9. Inspect all hydraulic hoses for cracks, bulges, or damage. If hoses are bad, replace immediately.
10. Inspect all discharge hoses for cracks, bulges, or damage. If hoses are bad, replace immediately.

II. MACHINE OPERATION

1. Always wear safety goggles when operating the machine. Other safety attire such as safety shoes, ear protection, gloves, hard hats, dust masks, etc. should be worn as required by warning decals on machine, operator's manuals, or job site requirements. Remove rings, watches, etc. Avoid wearing loose-fitting clothing that may get caught in rotating machinery.

2. Do not operate the machine without all guards in place.

3. Do not load unit while in transit. Load only when parked and unit is as level as possible. Take care not to drop pens, lighters, etc. or pieces of paper or plastic bags into the tank, as these objects might plug the slurry system. Should any object be dropped into the tank, do NOT reach into the tank to retrieve the foreign object. See Step 5 under section IV. MAINTENANCE before allowing any personnel to enter the tank.
4. Make sure area to be sprayed is clear of all persons, animals, etc.
5. The driver of the carrying or towing vehicle is responsible for the safety of the operator(s) of the machine. Make sure the driver is aware of and avoids all possible hazards to the operator(s) of the machine, such as low tree limbs, low power lines, etc. Vehicles on which equipment is mounted or towed must be stopped and started gradually. Avoid abrupt starts or stops. Never operate on a slope or a hill that may endanger the driver and/or the operator(s). All personnel should review and be familiar with stop/start signals between the driver and operator(s) before going into operation. Only the operator should be located on the platform during operation.

II. MACHINE OPERATION (Continued)

6. Operator(s) of equipment should never ride on the machine at speeds of greater than 5 mph (8 km/h).

7. Never operate machine in an enclosed area without venting the engine exhaust of both the equipment and vehicle on which the equipment is mounted. Deadly carbon monoxide fumes can accumulate.

8. Never operate this or any other machinery when fatigued, tired, under the influence of alcohol, illegal drugs, or medication. You must be in good physical condition and mentally alert to operate this machine.

9. Never modify the machine. Never remove any part of the machine (except for service and then reinstall before operating).

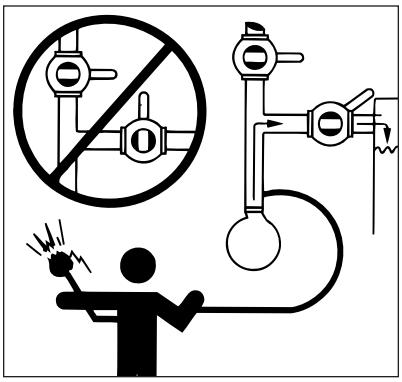
10. Use proper means (steps, ladder) for mounting and dismounting of the machine. Never mount or dismount a moving machine.

11. The battery charger for the machine remote may be in an enclosure (toolbox or remote case). Keep the surrounding area of the enclosure well ventelated. Do not cover the enclosure in any way. Open the enclosure carefully: if damage to the battery has occured, battery acid can be harmful.

III. SLURRY APPLICATION

1. Do not aim discharge spray toward power-lines, transformers, or other high voltage electrical conductors. Also do not aim discharge spray towards people, animals or anything other than the intended application area.

2. Never engage (turn on) the slurry pump when both the recirculation and discharge valves are closed (as illustrated to the right). Operation with both valves closed will result in extreme heat generation that could cause severe bodily injury and damage to the equipment.



III. SLURRY APPLICATION (Continued)

3. Plan application so that the farthest area is covered first, then work back toward the HydroSeeder®, so individuals are not walking back over slippery ground.

4. The recirculation valve is to remain open at all times during normal operation. This valve is only intended to isolate the slurry tank should it be full during pump or boom maintenance. A closed or plugged recirculation line can cause extreme heat in the pump or discharge lines that may result in severe bodily injury and damage to the equipment.

5. During application through a hose, high pressure can be exerted at the end of the hose. Hose-holding personnel must establish good footing. The operator should apply gradual pressure to the hose only after hose-holding personnel are firmly positioned and have firm control of the hose. Additional personnel to direct hose may be necessary if working on slopes. The proper technique for grasping the hose used by hose-holding personnel is to route and firmly grasp the hose over the shoulder or under both arms. Never route/hold the hose so it goes between the legs. If the hose-holding personnel finds that it is uncomfortable for him to handle the hose by himself, additional hose-holding personnel should be positioned at the end of the hose.

6. Before opening any valves or pipe clamps, shut machine down and verify that there is no remaining pressure in the lines and that the contents (slurry, hydraulic fluid, etc.) are not hot. If hot or still under pressure, do **NOT** open valves or pipe clamps as the hot/pressurized/caustic material may cause severe personal injury. Allow to cool and relieve pressure prior to opening with caution. Do not allow contents to come into contact with personnel as severe bodily injury could result.

7. Except when loading materials, keep loading hatch lid closed to protect operator and prevent splashing of wet material onto the tank top.

8. Wash off spillage of slippery mulch or slurry additive from the tank top and platform before operating equipment.

HYDROSEEDER® SAFETY SUMMARY SECTION (CONTINUED)

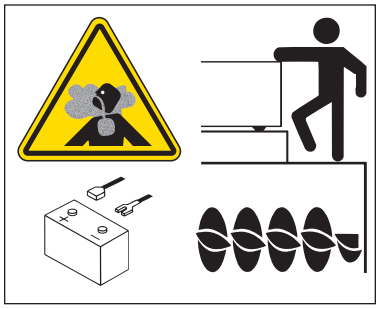
IV. MAINTENANCE

1. Before servicing the machine, turn off engine and allow all moving parts to stop. To prevent accidental starting, disconnect battery. Tag the engine operating area to show that the machine is being serviced. Use lockout/tagout procedure (Occupational Health and Safety Administration (OSHA) 29 CFR 1910.147).

2. It is recommended that only authorized, genuine FINN replacement parts be used on the machine.

3. Do not use ether or cold start fluid; glow plug type heaters and other intake manifold preheaters could cause an explosion or fire and damage to engine or severe injury or death could result.

4. When combined with water, heat or time, some hydroseeding amendments may react causing harmful or deadly gasses. Consult your material suppliers for reactivity and SDS information. The slurry tank and associated plumbing must be flushed and drained after each day of operation.



5. Never enter the tank through the loading hatch or riser atop the tank. Remove the fasteners securing the access panel adjacent to the loading hatch and utilize a ladder or steps to enter here.

   Your slurry tank may be considered a confined space by OSHA under 29 CFR 1910.146. Before entering any confined space, your company must develop a procedure for safe entry. Make sure your company's plan meets all the requirements of 29 CFR 1910.146, and/or all applicable laws and regulations.

6. Before loosening any clamps or opening any valves, determine if material in the line is hot by feeling the pipe. Do NOT allow material to come in contact with personnel. Severe bodily injury could result.

7. Radiator maintenance: Liquid cooling systems build up pressure as the engine gets hot. Before removing radiator cap, stop the engine and let the system cool. Remove radiator cap only after the coolant is cool.

8. Battery maintenance: Lead-acid batteries contain sulfuric acid, which will damage eyes or skin on contact. Always wear a face shield to avoid getting acid in the eyes. If acid contacts the eyes, flush immediately with clean water and get medical attention. Wear rubber gloves and protective clothing to keep acid off skin. Lead-acid batteries produce flammable and explosive gasses. Keep arcs, sparks, flames, and lighted tobacco away.

9. Filling of fuel: Never fill the tank with the engine running, while smoking, or when near an open flame. Never smoke while handling fuel or working on the fuel system. The fumes in an empty fuel container are explosive. Never cut or weld on fuel lines, tanks, or containers. Move at least 10 ft. (3 m) away from fueling point before starting engine. Wipe off any spilled fuel and let dry before starting engine.

   IMPORTANT: Be careful not to allow fuel, lubricant, hydraulic fluid, or cooling fluids to penetrate into the ground or be discharged into the water system. Collect all fluids and dispose of them in accordance with all applicable laws and regulations.

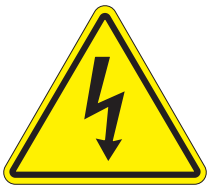
10. Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause injury, blindness, or death. Pressure may build up in the hydraulic system; use caution when removing the cap.

11. Make certain that all decals on the machine are maintained in good legible condition. Replacement decals are available through FINN Corporation by specifying part number shown in the lower right-hand corner of the decal. See the Parts Section of this manual for the location and quantity of all decals on this unit.

12. Do not pressure wash this unit. Do not pressure wash around any control boxes, radio remotes or control panels. Pressure washing this unit can cause damage to the electrical systems and components and also cause the unit to not function. Pressure washing injects water into sensitive electrical components. To clean the unit, use a method that controls the amount of water that is applied to surface of the unit.

COMMON SAFETY SYMBOLS

Hazard/
Attention



Electrical Shock
Hazard

Hearing Hazard

Arc Flash
Hazard or
Explosion
Hazard

Electrocution
Hazard

Fire Hazard

Body
Entanglement
Hazard

Electrostatic
Discharge
Hazard

Fumes/Dust
Hazard

Burn Hazard

Electrostatic
Sensitive Area
Hazard

Pinch Point/
Entanglement
Hazard

Carbon Dioxide
Hazard

Explosive or
High Pressure
Hazard

Grounding
Required
Hazard

Corrosive
Hazard

Explosive
Material Hazard

Crush Hazard

Cut/Crush
Hazard

Vision Damage
Hazard

Crush/Pinch-
point Hazard

Cut/Sever
Hazard

Vision and
Hearing
Damage
Hazard

Crush/
Entrapment
Hazard

Sever/Reach
Hazard

Vision, Hearing
and Respiratory
Damage
Hazard

High Voltage
Hazard

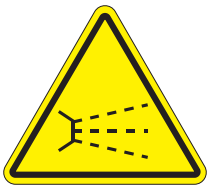
COMMON SAFETY SYMBOLS

Heavy Object Hazard

Skin Puncture Hazard

Breathing Protection Required

Hot Surface Hazard



Splash/Spray Hazard

Vision Protection Required

Loose Clothing Entanglement Hazard

Stumble Hazard

Hearing Protection Required

Pinch Point/ Moving Belt Hazard

Trip Hazard

Vision, Hearing and Head Protection Required

Poison Hazard

Watch Head/ Overhead Hazard

Breathing, Vision, Hearing and Head Protection Required

Radio Frequency Hazard

Fall/Loss of Balance Hazard

Foot Protection Required

Remote Start Hazard

Battery Charging in Enclosed Area Hazard

Lockout/Tagout Procedure Required

Sever by Rotating Parts Hazard

Mandatory Operator Action Required

Gloves Required

Rotating Shaft Hazard

Read Manual

Trailer Safety

COMMON SAFETY SYMBOLS


Lift Point

Do Not Ride on Moving Vehicle


Do Not Remove Guards


Do Not Obstruct or Block


Do Not Spray Power Lines


Do Not Touch


Do Not Pressure Wash

SAFETY DECAL EXAMPLES

⚠ DANGER

CONFINED SPACE HAZARD! (Reference: OSHA 29 CFR 1910.146)

Before entering tank:

1. Drain, flush and ventilate tank interior.
2. Turn off engine and disconnect battery cables.
3. Continuously ventilate area or wear appropriate breathing apparatus.
4. Provide standby individual outside tank able to communicate with person inside and able to remove him with a lifeline if necessary.

FLYING MATERIAL HAZARD!

Wear eye protection around operating equipment. Failure to comply will result in death or serious injury.

P/N 41392-04

⚠ WARNING

BURN HAZARD!

Cooling system is under pressure.
Allow system to cool before handling.
Remove radiator cap slowly.
Wear appropriate safety gear (safety glasses, safety gloves, etc.).
Failure to comply could result in death or serious injury.

RADIATOR HANDLING INSTRUCTIONS

1. Use a 50/50 solution of water and antifreeze. Using 100% antifreeze will result in engine damage.
2. Check and replenish water prior to use. More water will be consumed when operating in hot conditions.
3. If overflow pipe begins emitting vapor, check and replenish water.
4. Remove and clean screen when dirty.
5. Check and clean fins periodically. Clogged fins will increase water consumption.
6. Protect radiator from fertilizer corrosion by washing radiator core with water.

A4152-001

⚠ WARNING

BURN HAZARD!

Contents could be under pressure.

DO NOT come in contact with material.

Ensure material in line is not hot before loosening clamps or opening valves.

DO NOT operate pump with both recirculation and discharge valves closed.

DO NOT use remote valve unless recirculation valve is open.

Excessive heat or bodily injury could occur.

Failure to comply could result in death or serious injury.

P/N 41385

⚠ DANGER

FIRE HAZARD!

Handle fuel with care: it is highly flammable. Do not refuel the engine while smoking or when near open flame or sparks.

Always stop engine before refueling machine. Fill fuel tank outdoors.

Prevent fires by keeping engine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.

P/N A1688-001

⚠ WARNING

Wear proper eye protection when operating machine.

Failure to comply could result in death or serious injury.

A4151-001

OPERATION AND MAINTENANCE MANUAL FOR THE FINN TITAN HT330/TITAN HT400 HYDROSEEDER®

This manual gives you step-by-step instructions for the operation and maintenance of the FINN HydroSeeder®. For best results and to ensure longer life of the equipment, please follow these instructions carefully. For your safety, read the entire manual before operating this unit.

DEFINITION OF HYDROSEEDING

Hydroseeding is the process whereby seed, fertilizer and/or lime, and wood fiber mulch (using water as a carrying medium) are applied on the soil to establish vegetation.

THE FINN HYDROSEEDER® AND HOW IT WORKS

The FINN HydroSeeder® will apply seed, fertilizer and/or lime, wood fiber mulch, or stabilizing materials in any prescribed or desired combination. The materials placed in the HydroSeeder® slurry tank are mixed with water and kept in suspension by a dual-agitation mechanical process and recirculation of slurry, thus forming a slurry that is pumped to the discharge assembly and directed onto the seed bed by the operator. This equipment is designed to accomplish hydroseeding in one easy operation with maximum efficiency.

MOUNTING THE TITAN HT HYDROSEEDER®

⚠ DANGER ***Pick-up hooks on HydroSeeders® are for lifting EMPTY machines ONLY. Use appropriate spreader bar for the tank width. Ensure all capacities of lifting devices are rated for 15,000 lb (6,800 kg) or greater. Failure to comply will result in death or serious injury.***

A complete mounting kit is provided with the unit, but the mounting kit is shipped loose.

The mounting instructions are intended to serve as a resource during the truck selection process. The guidelines contains all the information that should be required for a safe and reliable installation of the Finn HT HydroSeeder® onto a suitable chassis.

The following pages contain center of gravity (**CG**) information for some of the most common loading scenarios for the Finn HT HydroSeeder®, as well as the respective **CG** locations in three planes:

1. From the front of the unit backwards = **X** (in INCHES)
2. From the center of the machine to the side = **Y** (in INCHES)
3. From the truck frame rails up = **Z** (in INCHES)

The **CG** of the Finn HT HydroSeeder® is always on the right/curb-side of the vehicle center (**Y**).

In addition to the **CG** information, clearance zones have been outlined for easier mounting considerations. Clearance zones are areas on the truck frame or around the HydroSeeder® that should remain otherwise unoccupied to provide room for the truck mounting brackets or air flow around the diesel engine of the HydroSeeder®.

Hole layout and more detailed mount considerations are provided in the pages following the **CG** information.

These pages contain an illustrated parts list of the truck mounting kit for component identification. The mounting kit also appears in the parts section of this manual.

MOUNTING THE TITAN HT HYDROSEEDER® (CONTINUED)

Before selecting a chassis for the HydroSeeder®, carefully review this manual and consider the following:

A. In ALL circumstances, installer should ALWAYS follow the truck chassis' body-builder guidelines available from the manufacturer. Never exceed either the Gross Axle Weight Rating (GAWR) or the Gross Vehicle Weight Rating (GVWR) for the chassis.

B. Only install the HydroSeeder® onto a vehicle with an end of frame dimension sufficient to fully support the HydroSeeder® frame length.

C. Position the HydroSeeder® onto the vehicle chassis so that the clearance zones mentioned in the guide are maintained.

Once the proper carrier has been selected, the HydroSeeder® must be securely mounted onto it.

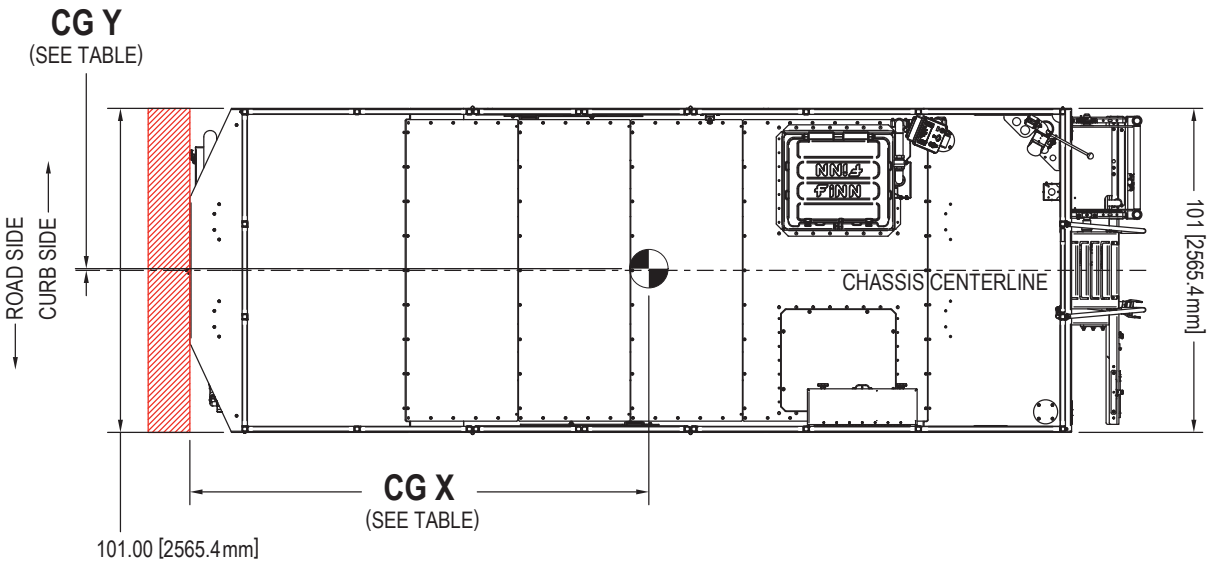
⚠ WARNING ***The FINN HydroSeeder® should be mounted by a qualified truck body installer. Failure to comply could result in personal injury. Failure to comply could also result in product or property damage.***

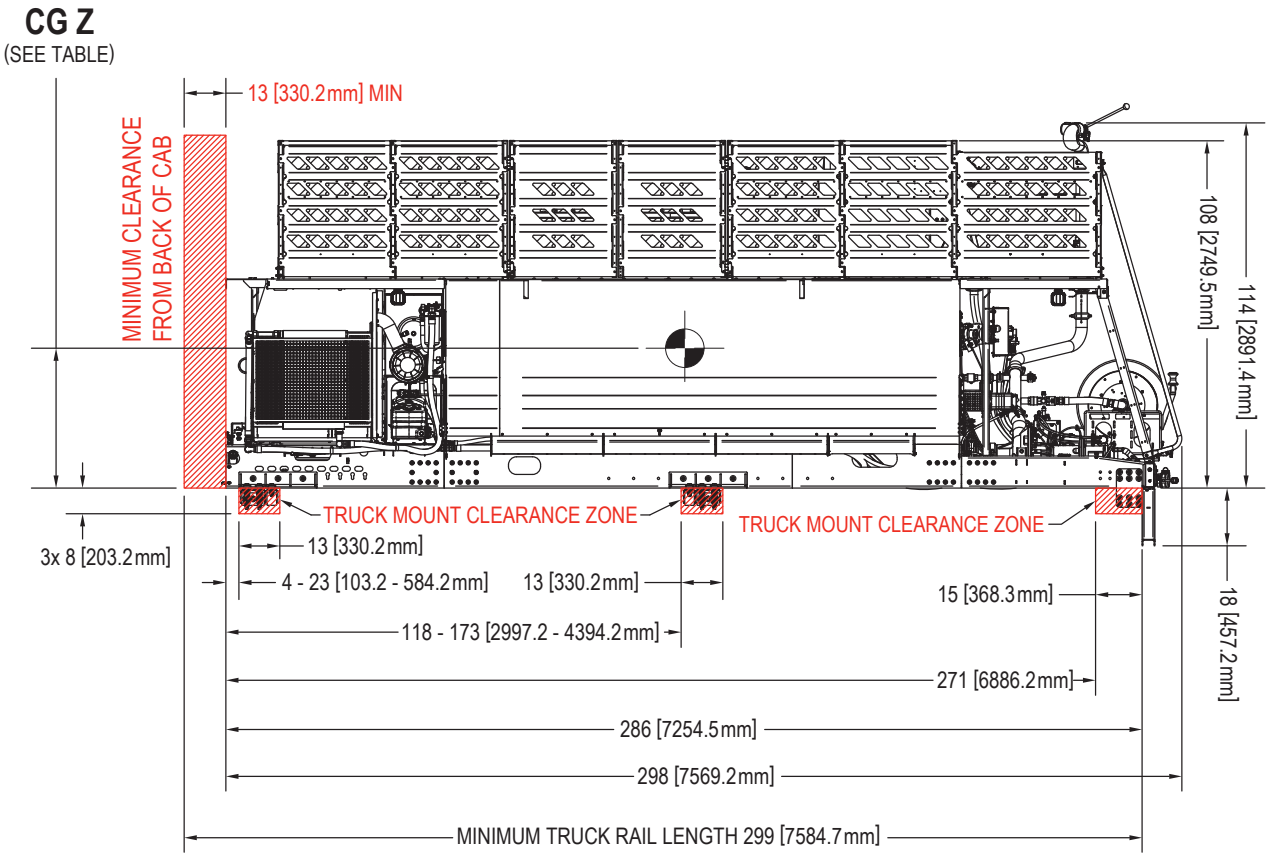
⚠ WARNING ***Install/Mount the FINN HydroSeeder® in compliance with the vehicle ratings, machine mounting requirements and applicable laws. Failure to do so could result in personal or property damage.***

NOTICE ***The mounting of the HydroSeeder® to the truck must allow for tire clearance as well as frame twist.***

Follow mounting instructions given in the Truck Mounting/Loading Information section. Consult truck manufacturer for proper truck sizing and mounting recommendations. If the included truck mounting guidelines are unable to be met and/or the provided mount kit doesn't work for your needs, consult the factory.

HT330 CG/LOADING INFORMATION





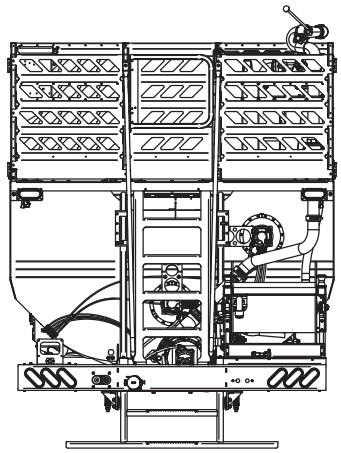
ALL DIMENSIONS IN INCHES
DRAWING NOT TO SCALE

HT330 CG/LOADING INFORMATION (CONTINUED)

DESCRIPTION	CG X	CG Y	CG Z	WEIGHT
HT330 MACHINE ONLY *	129.8 in.	4.1 in.	39.3 in.	14,127 lbs.
HT330 + WATER ONLY (MAX FILL)	142.2 in.	1.4 in.	41.0 in.	41,681 lbs.
HT330 + WATER/GRAN SOLIDS	143.0 in.	1.2 in.	41.1 in.	47,507 lbs.
HT330 + WATER/WOOD MULCH	142.1 in.	1.4 in.	41.0 in.	40,677 lbs.
HT330 + DECK LOAD **	119.5 in.	3.0 in.	51.4 in.	19,166 lbs.
HT330 + WATER + DECK LOAD	136.7 in.	1.2 in.	45.8 in.	46,722 lbs.
HT330 + WATER/WOOD MULCH + DECK LOAD	136.4 in.	1.3 in.	45.9 in.	45,717 lbs.

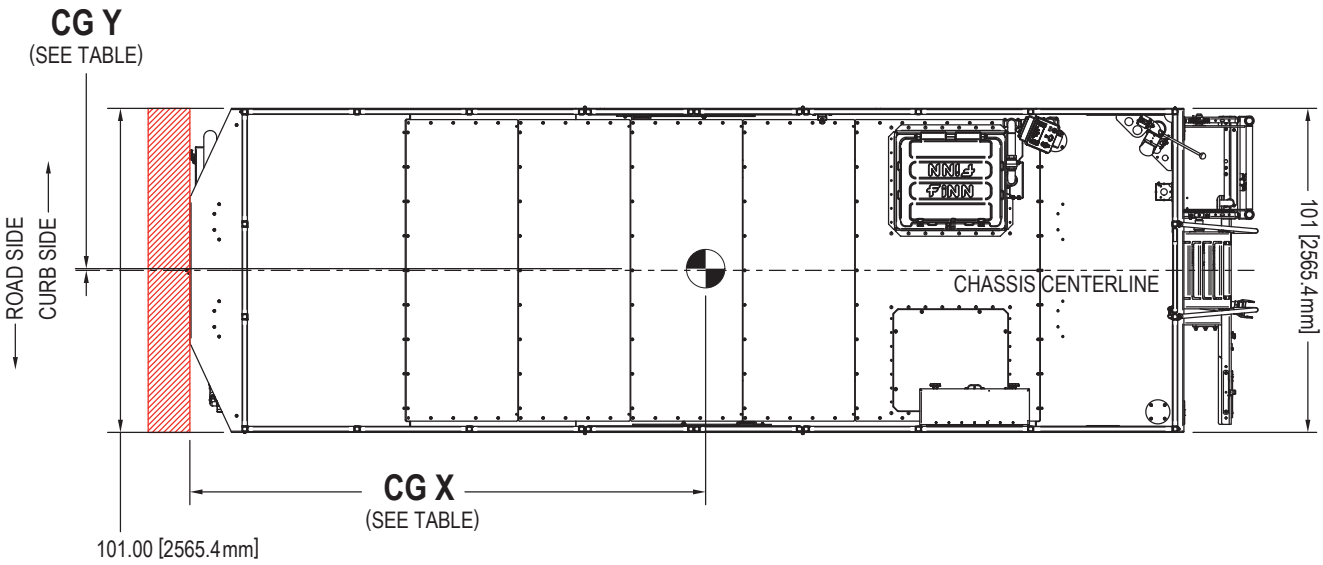
* MACHINE FLUIDS AT CAPACITY (HYDRAULIC OIL, FUEL, COOLANT, ETC.)

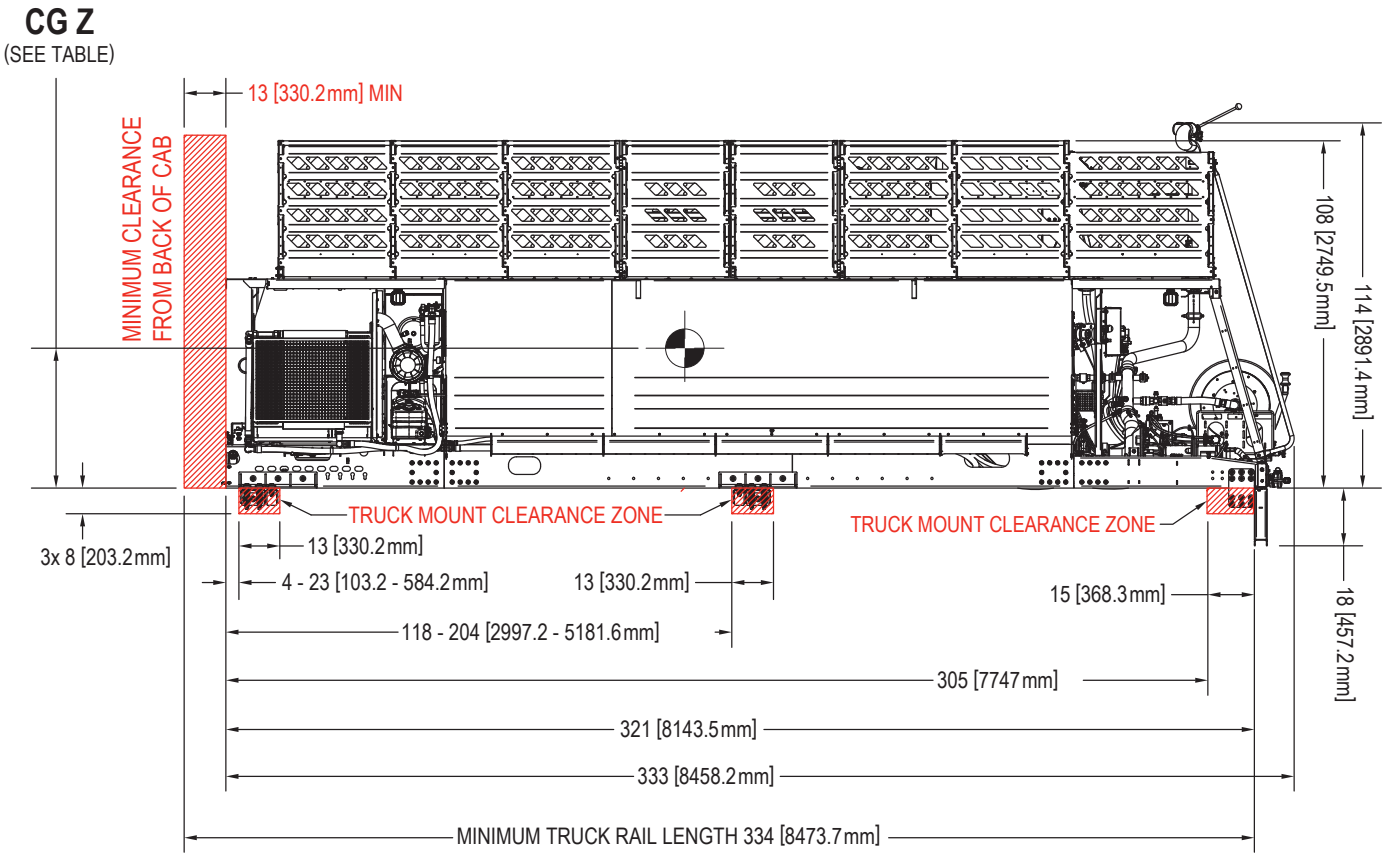
** NO MULCH/WATER IN TANK, (6X) 840LB SKIDS



Provided data assumes the following option configuration: single curb-side boom, single curb-side fill port, Ø1.25 hose reel/hose, centrifugal pump, no air flush.

HT400 CG/LOADING INFORMATION





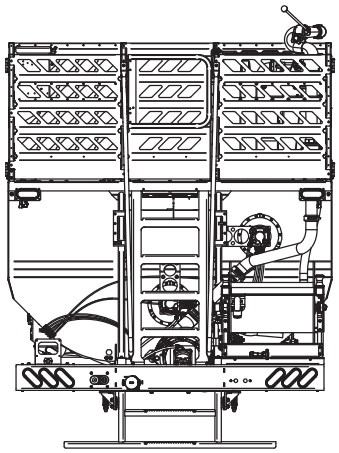
ALL DIMENSIONS IN INCHES
DRAWING NOT TO SCALE

HT400 CG/LOADING INFORMATION (CONTINUED)

DESCRIPTION	CG X	CG Y	CG Z	WEIGHT
HT400 MACHINE ONLY *	146.5 in.	4.0 in.	39.4 in.	15,075 lbs.
HT400 + WATER ONLY (MAX FILL)	160.0 in.	1.2 in.	41.1 in.	48,475 lbs.
HT400 + WATER/GRAN SOLIDS	160.8 in.	1.1 in.	41.2 in.	55,698 lbs.
HT400 + WATER/WOOD MULCH	159.8 in.	1.3 in.	41.1 in.	46,935 lbs.
HT400 + DECK LOAD **	154.2 in.	1.1 in.	46.6 in.	21,795 lbs.
HT400 + WATER + DECK LOAD	154.5 in.	1.1 in.	46.5 in.	55,195 lbs.
HT400 + WATER/WOOD MULCH + DECK LOAD	154.2 in.	1.1 in.	46.6 in.	53,655 lbs.

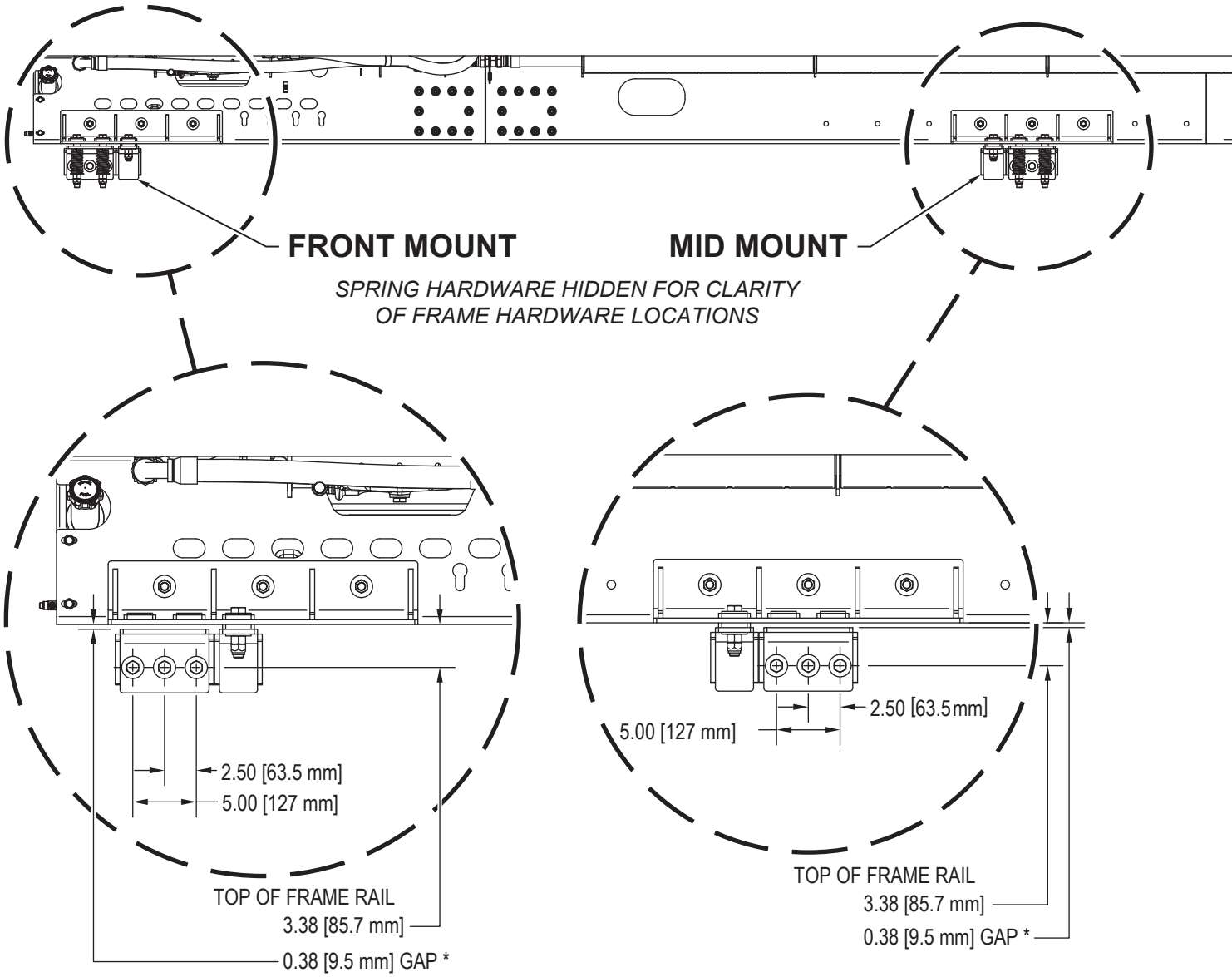
* MACHINE FLUIDS AT CAPACITY (HYDRAULIC OIL, FUEL, COOLANT, ETC.)

** NO MULCH/WATER IN TANK, (8X) 840LB SKIDS

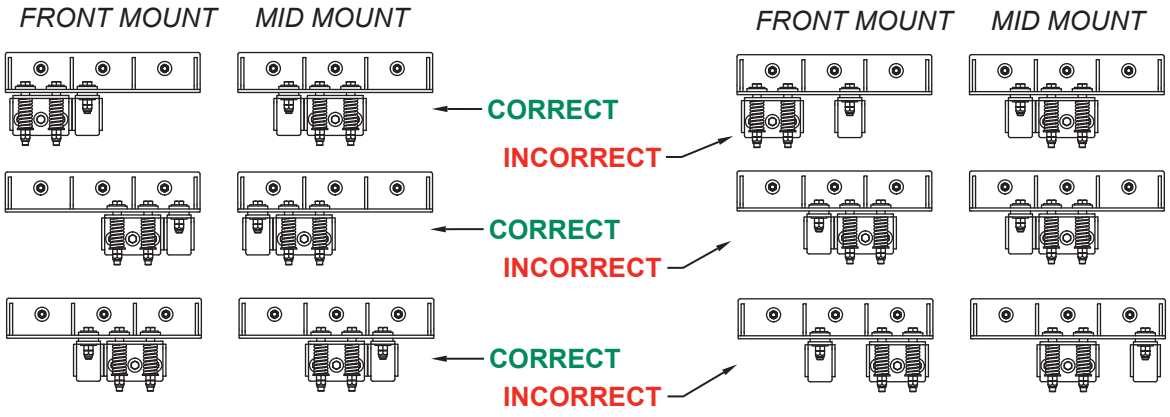


Provided data assumes the following option configuration: single curb-side boom, single curb-side fill port, Ø1.25 hose reel/hose, centrifugal pump, no air flush.

TRUCK MOUNTING/LOADING INFORMATION

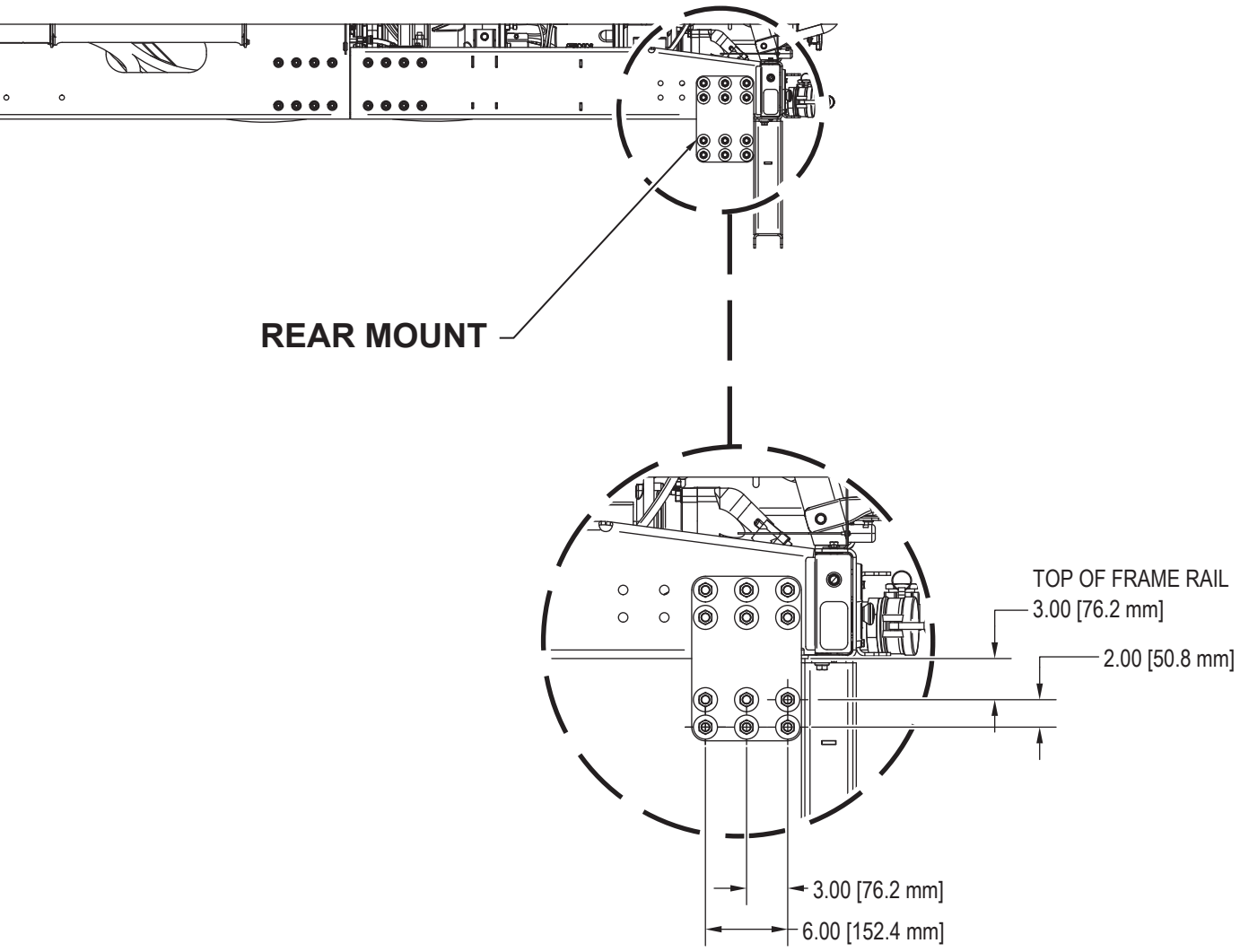


ALLOWABLE TRUCK MOUNTING EXAMPLES

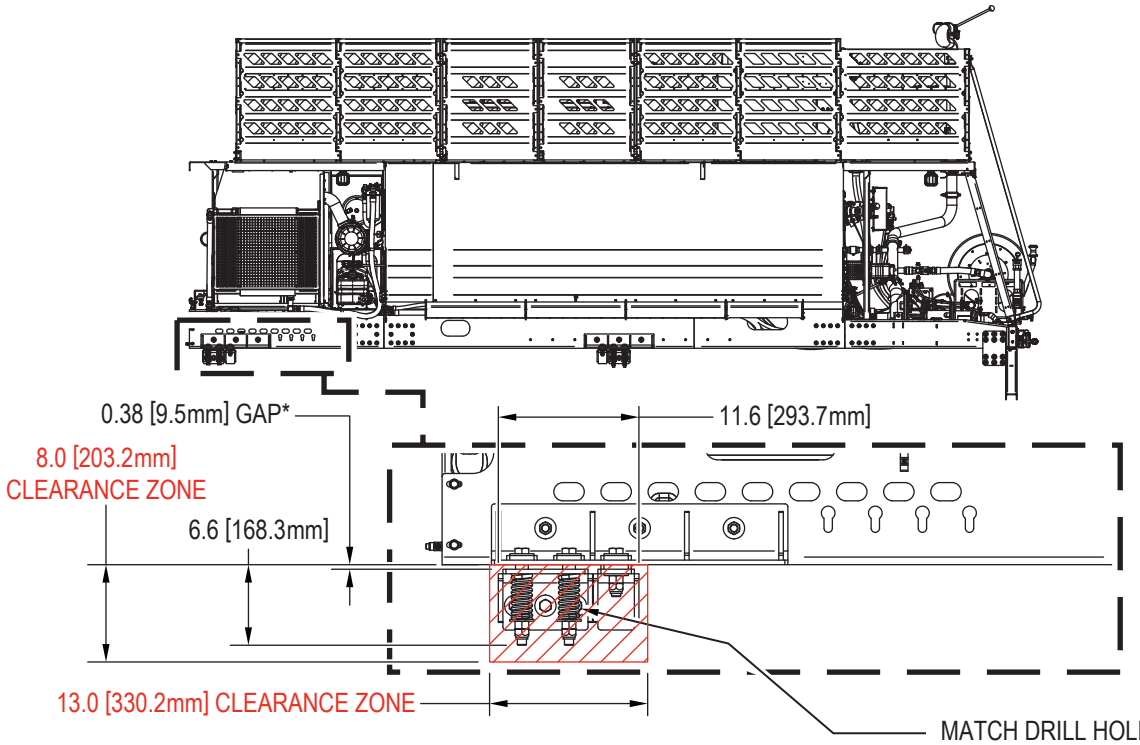


NOTE: Side-shift mounts must be installed directly adjacent to **AND** both be inside or outside of the spring mounts.

TRUCK MOUNTING/LOADING INFORMATION (CONTINUED)



FRONT MOUNTING INSTALLATION INSTRUCTIONS



MATCH DRILL HOLES:
DRILL 11/16 in. [17.5mm]
THROUGH 6X, BOTH SIDES.
USE CARE!

RECOMMENDED ZINC PLATED
HARDWARE (INCLUDED)
5/8-18 (UNF) GRADE 8 X 2.5
TORQUE TO 204 FT-LB [277 N-m]

ALTERNATE BOBTAIL
FASTENERS
USE EITHER: 16mm -OR- 5/8 in.

DO NOT WELD TO CHASSIS

SPRING/STOP MOUNT
HARDWARE:
3/4-16 (UNF) NUTS
TORQUE TO 357 FT-LB [484 N-m]

GENERAL INSTALLATION NOTES:

1. Do not weld on truck chassis or Finn HT HydroSeeder®.
2. Use great care when drilling through truck chassis/frame so as not to puncture or otherwise damage electrical, air, hydraulic, etc. lines that may exist behind frame rails.

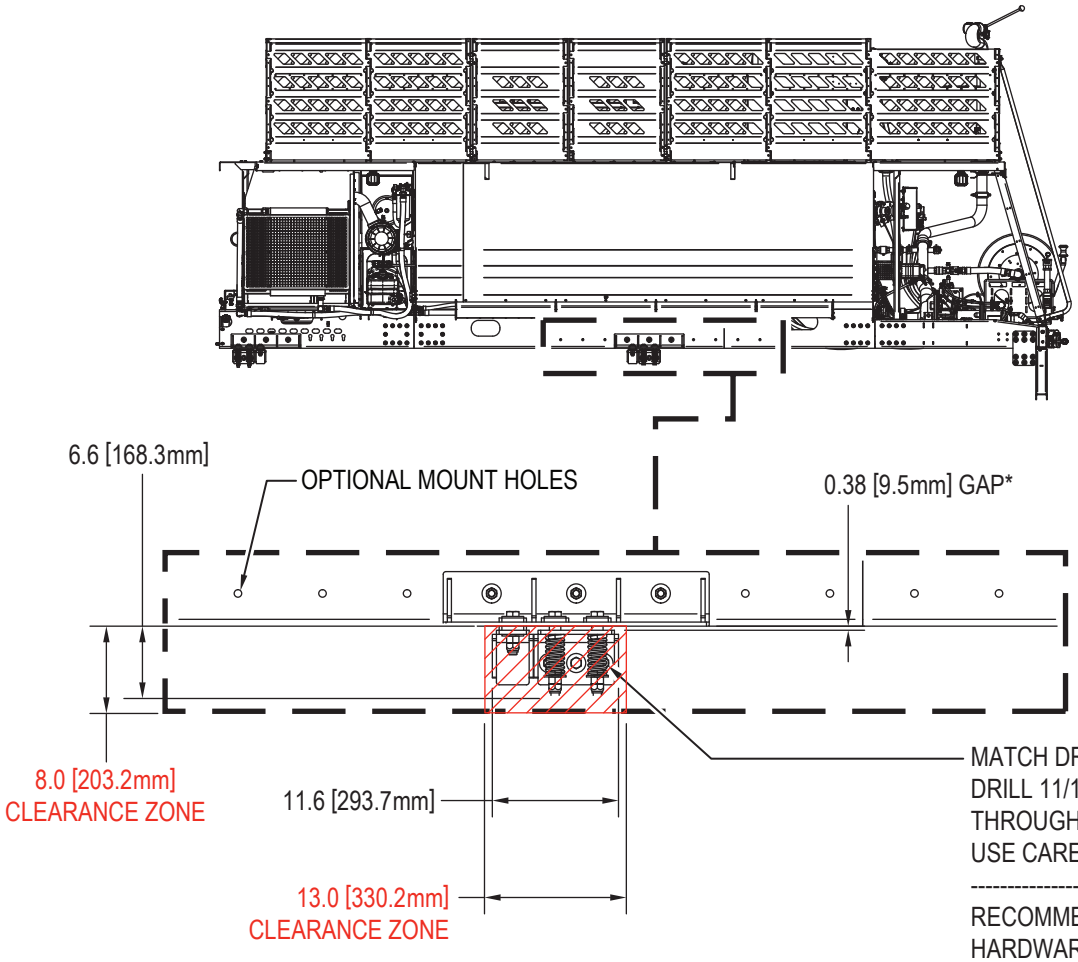
   Damage to components behind frame rails may result in inoperable/damaged equipment or unsafe conditions.
3. Front mounts may be installed at any of the positions offered by the pre-existing key holes in the front of the HT HydroSeeder® rails so long as the following conditions are met:

   A. All 6 fasteners must be used on both sides (12 total)

   B. Left and right mounts are installed in the same position front to back (symmetrical between left and right sides)
4. Keyhole slots in HT HydroSeeder® frame (and access holes above the slots) are to be used for installation of hardware. Insert bolt and washer through elongated horizontal slot(s) and drop into keyhole, holding with fingers while loosely installing mounting bracket, washer, and nut. Insert wrench through elongated slots to hold head of fastener while torquing nut on exterior of truck mounting brackets.
5. 5/8-18 UNF x 2.5 Bolts must show a ***MINIMUM*** of 1/8 in. (0.125) [3mm] of thread beyond nut at final installation (after torquing). If condition is not met, longer equivalent fasteners must be used (not provided in kit).
6. Refer to guidelines on overall truck mounting page for allowable configurations for spring/side shift mounts.

* DURING MATCH-DRILLING, USE INCLUDED SQUARE WASHERS AS 3/8 in. SPACER BLOCKS FOR SPRING MOUNTS. REMOVE SPACER AFTER DRILLING AND PRIOR TO FINAL INSTALLATION, LEAVING 3/8 in. GAP.

MID MOUNTING INSTALLATION INSTRUCTIONS



RECOMMENDED ZINC PLATED HARDWARE (INCLUDED)
5/8-18 (UNF) GRADE 8 X 2.5
TORQUE TO 204 FT-LB [277 N-m]

ALTERNATE BOBTAIL FASTENERS
USE EITHER: 16mm -OR- 5/8 in.

DO NOT WELD TO CHASSIS

SPRING/STOP MOUNT HARDWARE:
3/4-16 (UNF) NUTS
TORQUE TO 357 FT-LB [484 N-m]

GENERAL INSTALLATION NOTES:

1. Do not weld on truck chassis or Finn HT HydroSeeder®.
2. Use great care when drilling through truck chassis/frame so as not to puncture or otherwise damage electrical, air, hydraulic, etc. lines that may exist behind frame rails.

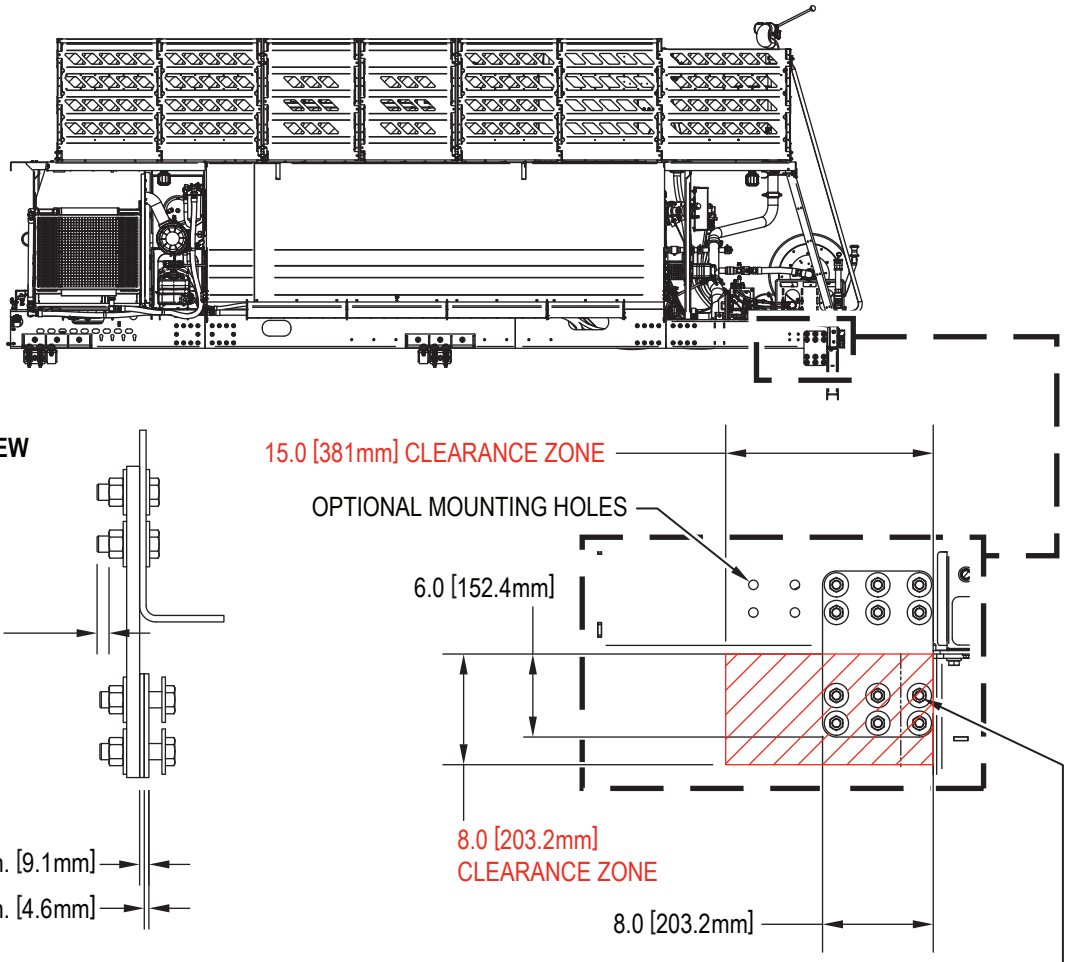
   Damage to components behind frame rails may result in inoperable/damaged equipment or unsafe conditions.
3. Mid mounts may be installed at any of the positions offered by the pre-existing holes in the middle of the HT HydroSeeder® rails so long as the following conditions are met:

   A. All 6 fasteners must be used on both sides (12 total)

   B. Left and right mounts are installed in the same position front to back (symmetrical between left and right sides)
4. 5/8-18 UNF x 2.5 Bolts must show a ***MINIMUM*** of 1/8 in. (0.125) [3mm] of thread beyond nut at final installation (after torquing). If condition is not met, longer equivalent fasteners must be used (not provided in kit).
6. Refer to guidelines on overall truck mounting page for allowable configurations for spring/side shift mounts.

* DURING MATCH-DRILLING, USE INCLUDED SQUARE WASHERS AS 3/8 in. SPACER BLOCKS FOR SPRING MOUNTS. REMOVE SPACER AFTER DRILLING AND PRIOR TO FINAL INSTALLATION, LEAVING 3/8 in. GAP.

REAR MOUNTING INSTALLATION INSTRUCTIONS



GENERAL INSTALLATION NOTES:

1. Do not weld on truck chassis or Finn HT HydroSeeder®.
2. Use great care when drilling through truck chassis/frame so as not to puncture or otherwise damage electrical, air, hydraulic, etc. lines that may exist behind frame rails.

   Damage to components behind frame rails may result in inoperable/damaged equipment or unsafe conditions.
3. Rear mounts may be installed at any of the positions offered by the pre-existing key holes in the front of the HT HydroSeeder® rails so long as the following conditions are met:

   A. All 12 fasteners must be used on both sides (24 total)

   B. Left and right mounts are installed in the same position front to back (symmetrical between left and right sides)
4. Optional spacer plates (up to two per side) may be installed in-between the fixed mount and HT HydroSeeder® chassis or truck frame to minimize frame width differences.
5. 5/8-18 UNF x 2.5 Bolts must show a ***MINIMUM*** of 1/8 in. (0.125) [3mm] of thread beyond nut at final installation (after torquing). If condition is not met, longer equivalent fasteners must be used (not provided in kit).

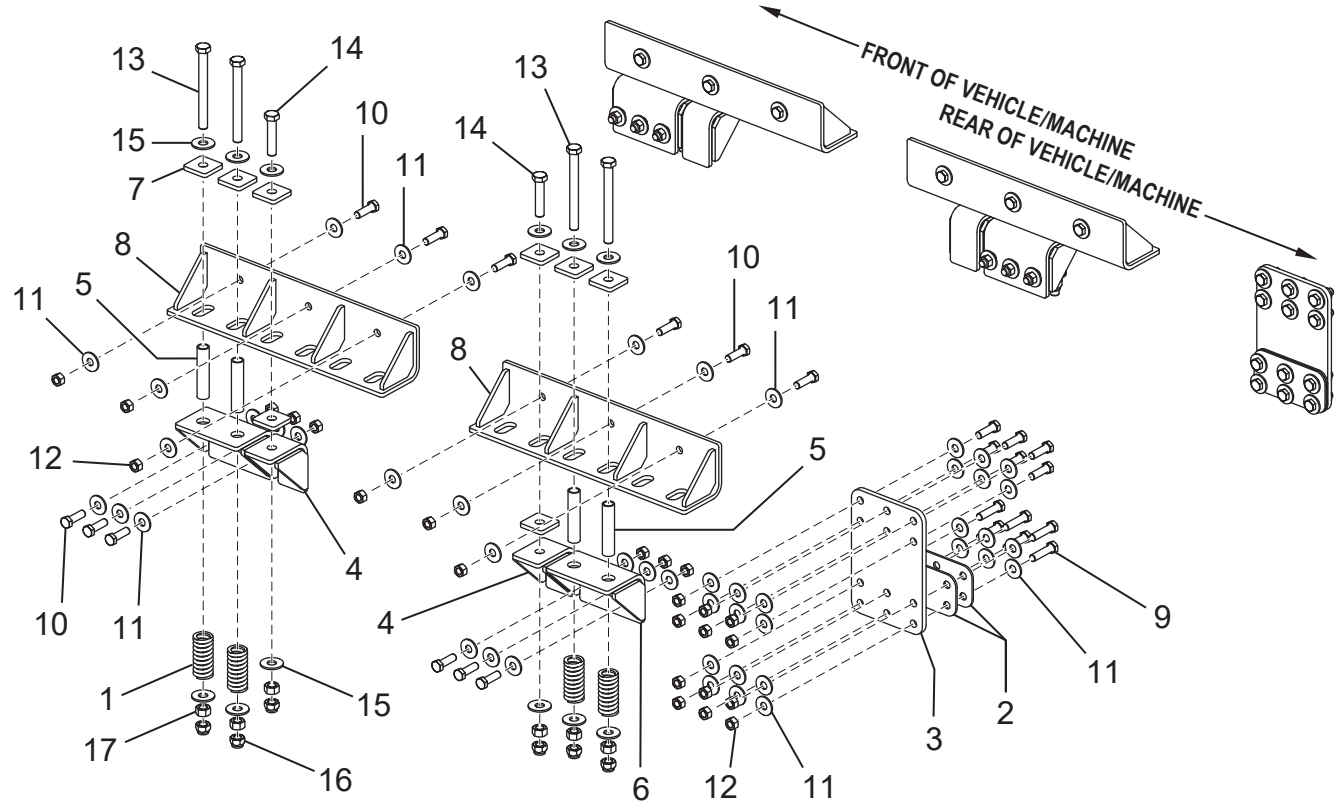
MATCH DRILL HOLES:
DRILL 11/16 in. [17.5mm]
THROUGH 6X, BOTH SIDES.
USE CARE!

RECOMMENDED ZINC PLATED
HARDWARE (INCLUDED)
5/8-18 (UNF) GRADE 8 X 2.5
TORQUE TO 204 FT-LB [277 N-m]

ALTERNATE BOBTAIL
FASTENERS
USE EITHER: 16mm -OR- 5/8 in.

DO NOT WELD TO CHASSIS

TRUCK MOUNTING KIT



Ref. No.	Kit Ref.	Part Number	Description	No. Req'd
1	▲	011563	Truck Mount Compression Spring	8
2	▲	A3539-001	Rear Truck Mount Spacer Plate	4
3	▲	A3466-001	Rear Truck Mount Plate	2
4	▲	A3462-001	Truck Mount Stop Bracket Assembly	4
5	▲	A3453-001	Spring Spacer Tube	8
6	▲	A3450-001	Lower Truck Mount Bracket Assembly	4
7	▲	A3448-001	Truck Mount Square Washer	16
8	▲	A3447-001	Upper Truck Mount Bracket Assembly	4
9	▲	●	5/8-18 UNF - 2.5 Grade 8 Hex Cap Screw	12
10	▲	●	5/8-18 UNF - 2 Grade 8 Hex Cap Screw	36
11	▲	●	5/8-Wide - Type A Plain Washer (Inch)	96
12	▲	●	5/8-18 Hex Nut (Inch Series)	48
13	▲	●	3/4-16 UNF - 7.5 Grade 8 Hex Cap Screw	8
14	▲	●	3/4-16 UNF - 3.5 Grade 8 Hex Cap Screw	4
15	▲	●	3/4-Wide - Type A Plain Washer (Inch)	24
16	▲	●	3/4-16 Metal Prevailing Torque Type Lock Nut	12
17	▲	●	3/4-16 Hex Nut (Inch Series)	12

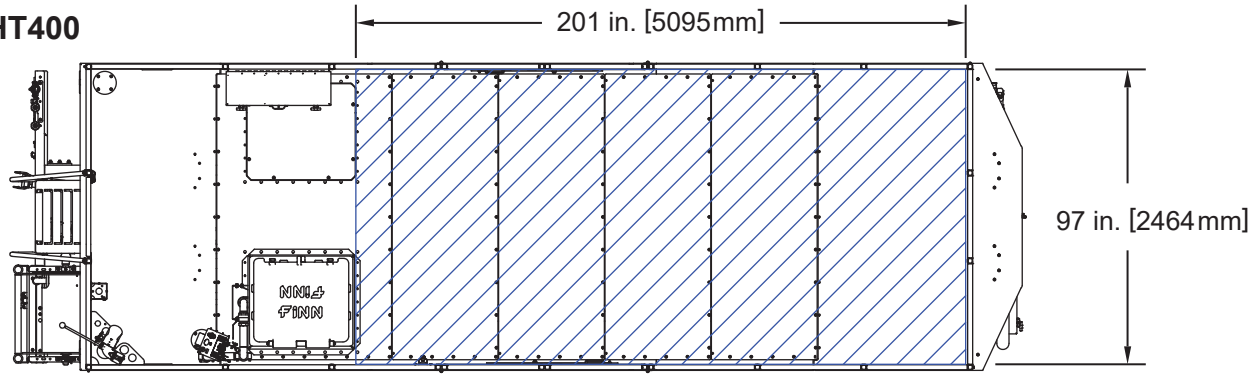
KITS AND MARKERS

▲	A4887-001	HT Truck Mount Kit
●	Standard Hardware Item	

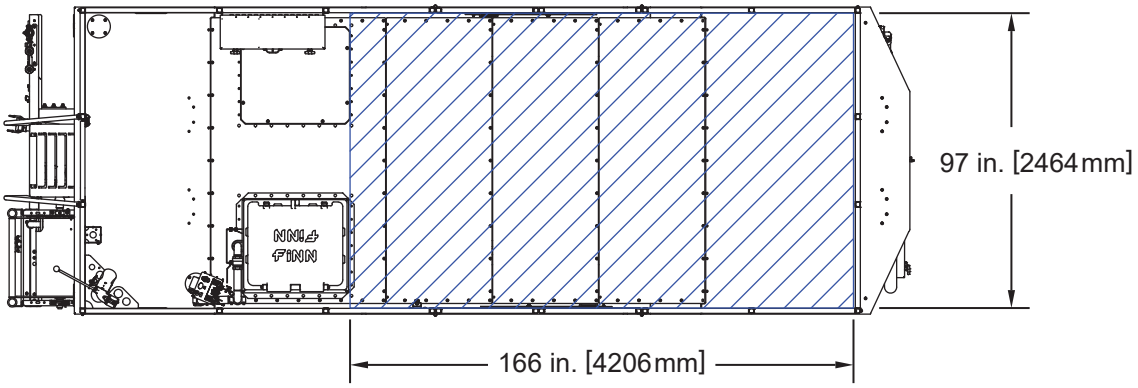
GENERAL MACHINE INFORMATION

The HT330 and HT400 feature load-rated decking with convenient tie-downs for securing mulch bales, pallets of materials, or anything else that may be required. Both the HT330 and the HT400 material storage areas include tie-down points spaced every 17 inches along the length of the machine and are rated for use with up to a 1,500 lb.-rated ratchet strap (typical of a 1.5 in. wide common ratchet strap). The HT330 and HT400 material storage areas are rated for a MAXIMUM LOAD of 75 PSF (pounds per square foot).

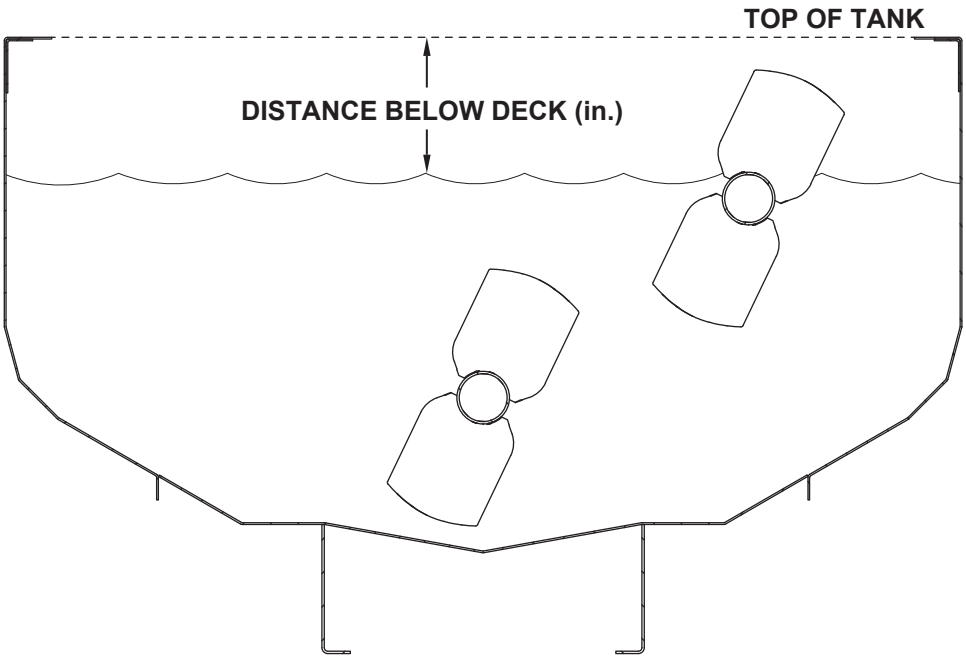
HT400



HT330



SECTION CUT OF TANK



GENERAL MACHINE INFORMATION (CONTINUED)

HT330 HYDROSEEDER TANK VOLUME			
GALLONS (gal.)	LITERS (L)	INCHES (in.) BELOW DECK	CENTIMETERS (cm) BELOW DECK
3,300	12,492	0.4	1.0
3,200	12,113	1.9	4.8
3,100	11,735	3.3	8.3
3,000	11,356	4.7	11.9
2,900	10,978	6.1	15.6
2,800	10,599	7.6	19.2
2,700	10,221	9.0	22.9
2,600	9,842	10.4	26.5
2,500	9,464	11.9	30.2
2,400	9,085	13.3	33.8
2,300	8,706	14.8	37.5
2,200	8,328	16.2	41.1
2,100	7,949	17.6	44.8
2,000	7,571	19.1	48.4
1,900	7,192	20.5	52.1
1,800	6,814	21.9	55.7
1,700	6,435	23.4	59.4
1,600	6,057	24.9	63.2
1,500	5,678	26.3	66.7
1,400	5,300	27.7	70.3
1,300	4,921	29.1	74.0
1,200	4,542	30.6	77.6
1,100	4,164	32.0	81.3
1,000	3,785	33.5	85.1
900	3,407	34.9	88.7
800	3,028	36.4	92.4
700	2,650	37.9	96.4
600	2,271	39.5	100.3
500	1,893	41.1	104.5
400	1,514	42.9	108.9
300	1,136	44.8	113.7
200	757	46.9	119.1
100	379	49.3	125.1

GENERAL MACHINE INFORMATION (CONTINUED)

HT400 HYDROSEEDER TANK VOLUME			
GALLONS (gal.)	LITERS (L)	INCHES (in.) BELOW DECK	CENTIMETERS (cm) BELOW DECK
4,000	15,142	0.6	1.6
3,900	14,763	1.9	4.8
3,800	14,385	3.0	7.6
3,700	14,006	4.2	10.6
3,600	13,627	6.4	16.2
3,500	13,249	6.5	16.5
3,400	12,870	7.8	19.7
3,300	12,492	8.9	22.6
3,200	12,113	10.0	25.4
3,100	11,735	11.3	28.6
3,000	11,356	12.4	31.6
2,900	10,978	13.6	34.6
2,800	10,599	14.8	37.5
2,700	10,221	16.0	40.6
2,600	9,842	17.1	43.5
2,500	9,464	18.4	46.7
2,400	9,085	19.5	49.5
2,300	8,706	20.6	52.4
2,200	8,328	21.9	55.6
2,100	7,949	23.0	58.4
2,000	7,571	24.3	61.6
1,900	7,192	25.4	64.6
1,800	6,814	26.6	67.5
1,700	6,435	27.8	70.5
1,600	6,057	28.9	73.5
1,500	5,678	30.1	76.5
1,400	5,300	31.3	79.5
1,300	4,921	32.5	82.6
1,200	4,542	33.7	85.6
1,100	4,164	34.9	88.7
1,000	3,785	36.1	91.8
900	3,407	37.4	94.9
800	3,028	38.7	98.3
700	2,650	40.0	101.6
600	2,271	41.3	104.9
500	1,893	42.7	108.4
400	1,514	44.3	112.4
300	1,136	45.9	116.5
200	757	47.7	121.1
100	379	49.8	126.4

AREA COVERAGE - MATERIAL CAPACITY

To determine the coverage per load for any HydroSeeder®, three questions must be answered prior to the application. First, is the application a one-step process (which is when the seed, fertilizer, and mulch are applied proportionally per load) or a two-step process (which is when the seed and fertilizer are applied alone and then covered by mulch as a second operation)? Second, at what rates (usually in lbs per 1,000 sq. ft or lbs per acre) are the seeding materials to be applied? Finally, what are the loading capacities of the HydroSeeder®?

Application rates vary for different geographic locations, but in general, seed is applied at 6 to 10 lbs (3 to 4 kg) per 1,000 sq. ft; fertilizer is applied at a rate of approximately 400 lbs per acre; and fiber mulch is applied at 1,500 to 2,000 lb (680 to 907 kg) per acre. (Note: There are 43,560 sq. ft in an acre.) Local agronomists, agricultural extension agents, or soil and water conservation officials should be contacted for more specific information on application rates for a given area.

The following tables show loading versus coverage rates for the HydroSeeder®.
Table A shows rates for one-step applications. The coverage area is determined by the fiber mulch capacity of the HydroSeeder® and the rate at which it is applied.
Table B shows the area coverage when seeding only, where little or no mulch is applied. The coverage area is determined by the granular solids capacity of the HydroSeeder® and the rate at which the solids are applied.

TABLE A

USING SEED, FERTILIZER, AND MULCH

Table is based on 1,500 lb (680 kg) of mulch, 400 lb (181 kg) of fertilizer, and 345 lb (156 kg) of seed at 8 lb (3.6 kg) / 1000 sq. ft. per acre.

Unit	Amount of Material in Tank in Pounds (kilograms)			Coverage Area
	Seed	Fertilizer	Mulch	sq. ft. (sq m)
HT330	345 (156)	400 (181)	1,500 (680)	43,560 (4,046)
HT400	414 (187)	480 (218)	1,800 (816)	52,272 (4,856)

TABLE A EXAMPLE (USING HT330 DATA)

$$\frac{\text{1,500 lb (680 kg) Mulch per Tank}}{\text{1,500 lb (680 kg) Mulch per Acre}} = \text{1 Acre per Load}$$

400 lb (181 kg) Fertilizer per Acre x 1 Acre = 400 lb (181 kg) Fertilizer per Load
345 lb (156.5 kg) Seed per Acre x 1 Acre = 345 lb (156 kg) Seed per Load

TABLE B

SEED AND FERTILIZER ONLY

Table is based on rates of 8 lb (3.6 kg) seed and 9.2 lb (4.2 kg) fertilizer per 1,000 sq. ft.

Unit	Amount of Material in Tank in Pounds (kilograms)			Coverage Area	
	Seed	Fertilizer	Mulch	sq. ft. (sq m)	Acreage (Hectare)
HT330	3,485 (1,580)	4,000 (1,814)	7,485 (3,395)	435,600 (40,467)	10 (4.04)
HT400	4,140 (1,878)	4,800 (2,177)	8,940 (4,055)	522,720 (48,562)	12 (4.86)

TABLE B EXAMPLE (USING HT330 DATA)

$$\frac{\text{7,485 lb (3,395 kg) Tank Capacity (Solids)}}{\text{8 lb (3.6 kg) of Seed + 9.2 lb (4.2 kg) of Fertilizer per 1,000 sq. ft.}} = \text{435,600 sq. ft. per Load}$$

$$\frac{\text{8 lb (3.6 kg) of Seed}}{\text{1,000 sq. ft.}} \text{ X 435,600 sq ft} = \text{3,485 lb (1,580 kg) of Seed per Tank}$$

HT HYDROSEEDER® OPTIONS AND ATTACHMENTS

Hose Reel The optional hose reel mounts to the HT HydroSeeder® at the rear of the machine. The 200 ft. (62M) capacity hydraulic reel is powered in both *IN* and *OUT* directions and features a fairlead for guiding hose onto the reel. The hose reel is also able to be proportionally controlled from the radio remote system for easier independent operator use. The HT HydroSeeder® hose reel is compatible with either 1-1/4 in. or 1-1/2 in. hose.

Hardened Pump The pump casing, impeller, and suction cover are treated with a special process designed to increase the materials' resistance to wear. The hardened pump option is available on both centrifugal or vortex pump options.

Second Boom The second boom option adds a second spray boom to the driver's side/road side of the machine, and enables spraying from both sides of the machine for increased efficiency without having to reposition the machine. The second boom can be operated individually or at the same time as the primary boom.

Air Flush System The air flush option uses compressed air (typically provided by the truck that the HT HydroSeeder® is mounted to) to purge any remaining material slurry from the HydroSeeder® hose, discharge boom(s) and recirculation piping. To maximize performance, all discharge plumbing should be purged after every load. The air flush system provides a quick and easy means of purging without the need to acquire a flush tank or an additional water supply.

Work Light Option The work light option adds lighting on top of the machine to illuminate the working surface between the loading hatch and the access gate, as well as four (4) bright scene lights at the corners of the machine pointed outward. The lights are controlled from the control panel atop the machine.

Fill Port Options There are three (3) fill port options available with the HT HydroSeeder®: curb side, road side or dual fill port (2 unique connection points into the HT tank). All fill port options offer a dedicated point to attach the water supply to the machine and includes both a hose-bib for attaching a standard garden hose in the event that a user wants to wash down the unit but only has access to a water source sized for the standard 2 in. cam-lock quick connects. Each fill port option also features a break-away section in the event that the HT HydroSeeder® is moved or the hose is pulled while still connected to the machine; this break-away section will protect the remaining fill piping and valves that are permanently installed on the machine.

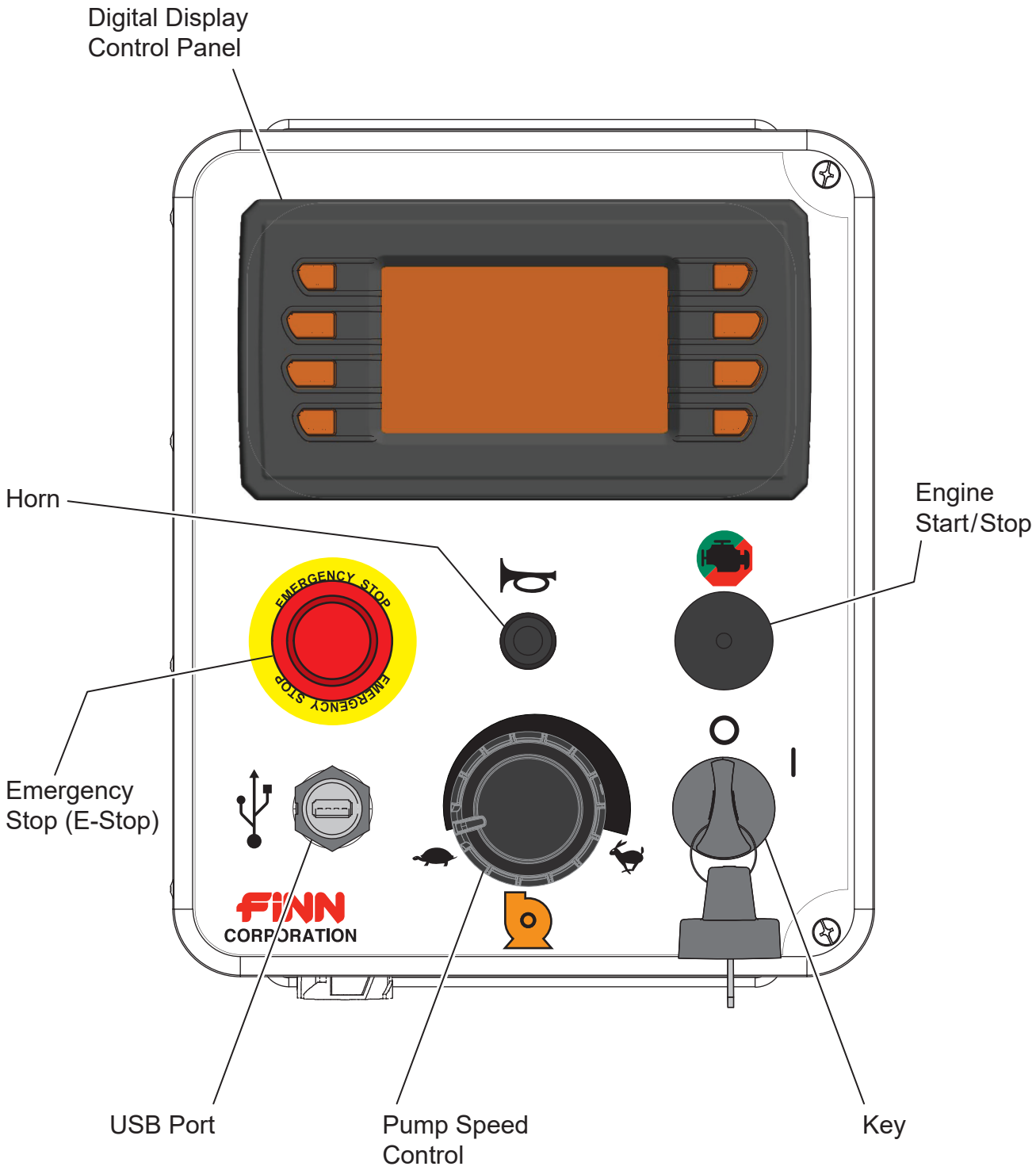
NOTES

CONTROL PANEL INFORMATION

⚠ WARNING ***See HYDROSEEDER® SAFETY SUMMARY SECTION before operating the machine. Failure to comply could result in death or serious injury. Failure to comply could also result in product or property damage.***

The main control panel of the HT HydroSeeder® is shown below.

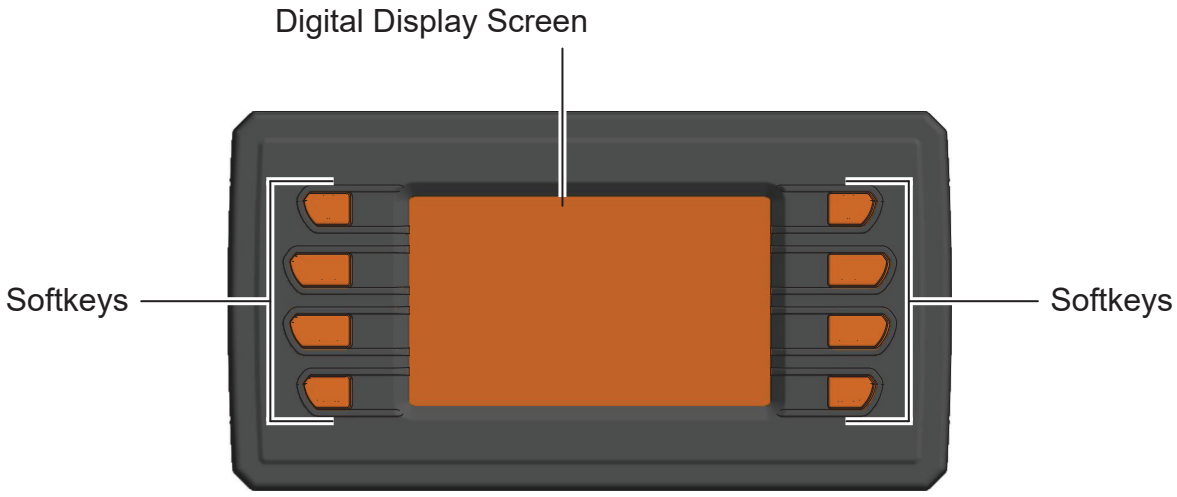
The operator of the HT HydroSeeder® should be familiar with the controls before operation.



Main Control Panel

CONTROL PANEL INFORMATION (CONTINUED)

Emergency Stop (E-Stop)	The Emergency Stop (E-Stop) is a critical safety component. The button is colored red to be visible and to indicate a "stop" function. The button is made increasingly visible by the bright yellow that surrounds it. The E-Stop will cut all power to the machine when pushed (engaged). E-Stop devices should NEVER be disabled under any circumstances.
Digital Display Control Panel	Control interface for the unit which displays various functions of the unit. The digital display shows information about the machine. Commands and settings are selected through the use of the softkeys.
USB Port	An access point for system and software updates. This USB Port is NOT intended for use as a charging port for phones, tablets, etc.
Pump Speed Control	This rotary dial is used to adjust the slurry pump speed (“Fast-Rabbit/ Slow-Turtle”) to the desired speed.
Horn	The horn button on this unit is used as a signal for start, stop, turn, etc. while the unit is in use. The horn can be used as a form of communication between operator and driver of the carrying vehicle. The horn is also useful in alerting bystanders in the area that HydroSeeding will soon begin.
Engine Start/Stop	Press and hold this button to start and stop the engine. The key switch must be in the ON/RUN position to start the engine.
Key	Ignition switch which turns on the unit for operation. It has two settings: an OFF position and an ON/RUN position (which will activate the electronics of the unit without starting the unit).
◯ **OFF Symbol**	Key switch is in the OFF position, turning machine off.
| **ON/RUN Symbol**	Key switch is in the ON/RUN position while in operation.

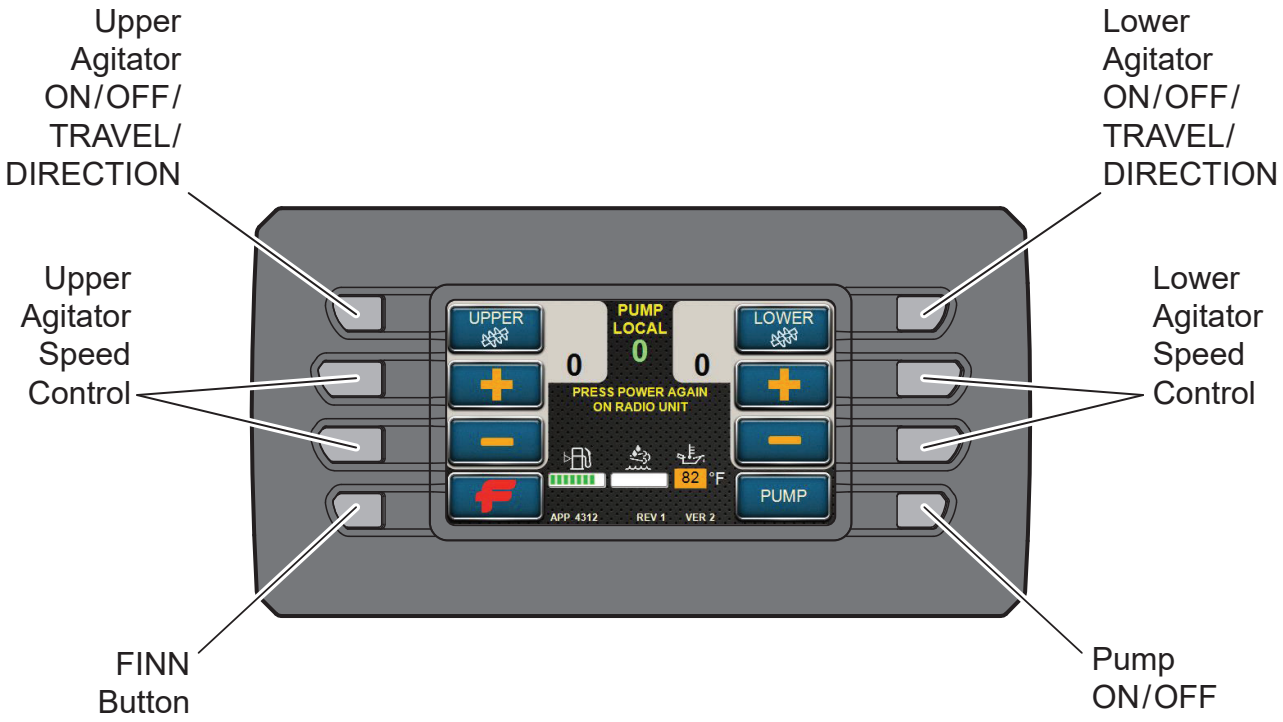


Digital Display Control Panel

CONTROL PANEL INFORMATION (CONTINUED)

The digital display control panel of the HT HydroSeeder® with a sample control screen is shown below.

The operator of the HT HydroSeeder® should be familiar with the controls and symbols used in the operation of the unit before operation.



COMMONLY USED SOFTKEY ICONS

ADD Button
Used to increase a setting.

MINUS Button
Used to decrease a setting.

LEFT ARROW Button
Used to go to the previous screen option.

RIGHT ARROW Button
Used to go to the next screen option.

RETURN Button
Returns to the previous screen (without saving).

BACK and SAVE Button
Saves the changes made and returns to the previous screen.

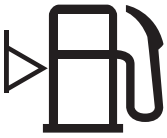
FINN Button
Switches the screen to the other options and settings screens.

HOME Button
Returns to the home screen.

CONTROL PANEL INFORMATION (CONTINUED)

The digital display control panel of the HT HydroSeeder® uses icons to show information and alerts to the operator. The icons are listed below. The operator of the HT HydroSeeder® should be familiar with these icons and be aware of the warning or information that they represent.

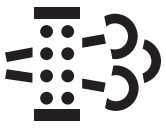
DISPLAY ICONS



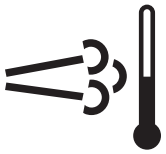
FUEL LEVEL Icon
This meter indicates the fuel level in the unit; it does not indicate the fuel level of the truck the unit is attached.

OIL TEMPERATURE Icon
This shows the oil temperature of the units engine.

WAIT TO START Icon
When this icon appears, do not start the engine. Wait until this icon disappears to start the engine.



REGENERATION ACTIVE Icon
This shows the Regeneration System is active and working.



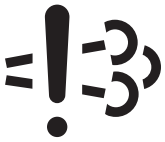
ENGINE HIGH TEMPERATURE Icon
When this icon appears, the engine temperature is high.

DEF FLUID LEVEL Icon
This meter indicates the Diesel Exhaust Fluid (DEF) level in the unit.

WARNING Icon
This icon appears when a problem is detected. It is often used with other symbols to indicate an operation error to the operator.

STOP ENGINE Icon
This icon appears when a problem is detected. If the engine is on, shut it off immediately.

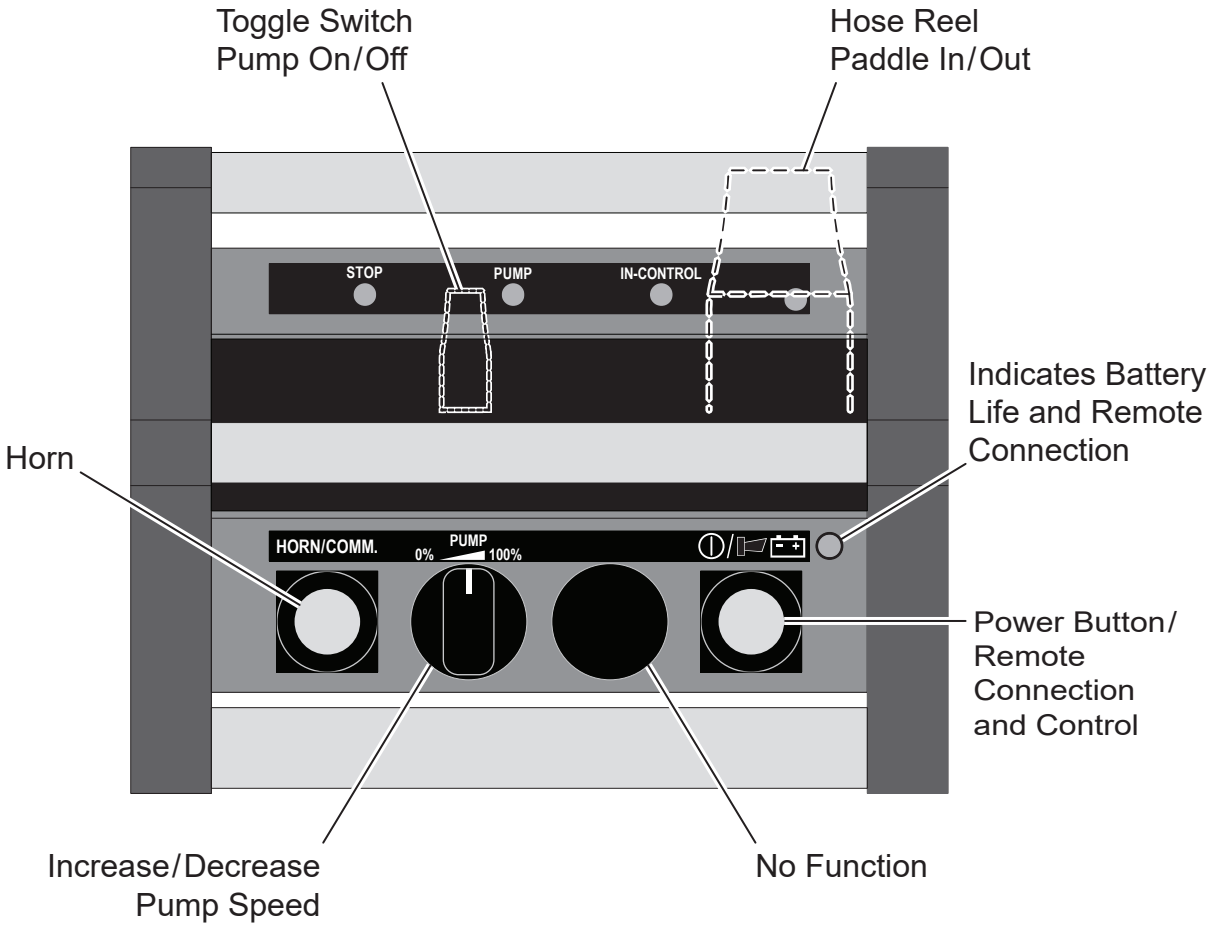
REGENERATION INHIBIT Icon
This shows the Regeneration System is NOT active and/or has been manually stopped or inhibited.

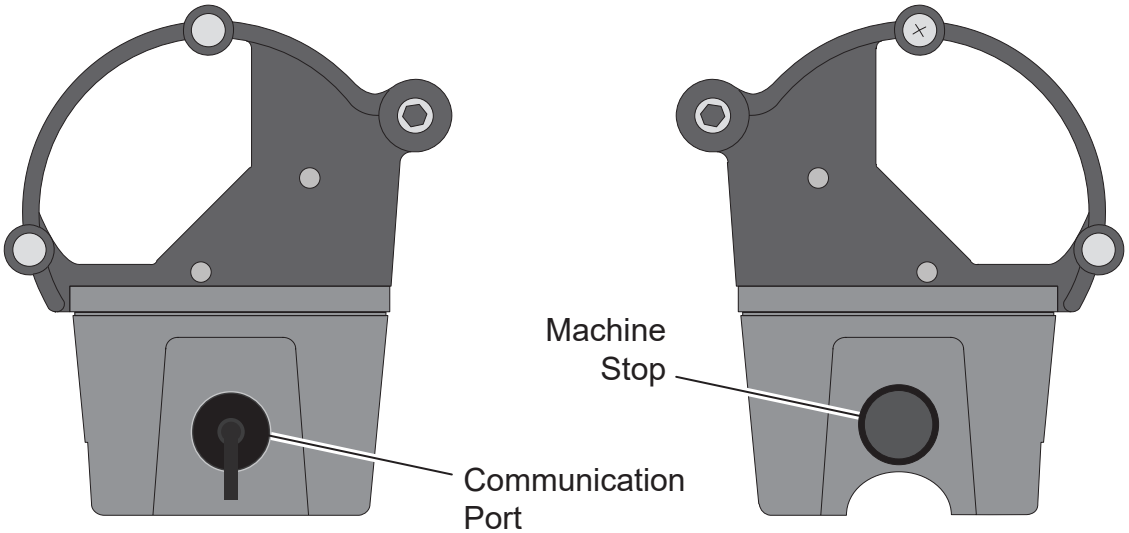


SCR INDUCEMENT SEVERITY Icon
This icon appears when there's an anomaly with the SCR system, such as tampering or low DEF tank level.

RADIO REMOTE TRANSMITTER

Top View





Left Side View

Right Side View

PRIOR TO OPERATION

Safety check to ensure operator safety:

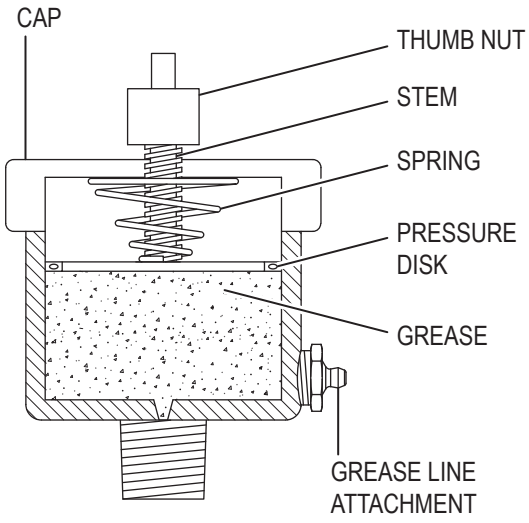
1. Check condition of all mounting hardware that secures HydroSeeder® to truck frame.
2. Make sure bag cutter is in place and secure.
3. Inspect all railings, ensuring they are all in place and secure.
4. Make sure that all guards are in place.
5. With the ignition switch ON, verify that the amber safety lights, under the operator's platform, are flashing.

EQUIPMENT CHECK

⚠ WARNING ***Equipment check should be made with the engine OFF and all rotating parts stopped. Failure to comply could result in death or serious injury.***

1. See that tool kit contains all the prescribed items. See TOOL KIT.
2. Inspect slurry tank for foreign objects. See MAINTENANCE of the HYDROSEEDER® SAFETY SUMMARY SECTION.
3. Check fuel level.
4. Check the hydraulic oil level. See HYDRAULIC SYSTEM for oil specifications.
5. Check engine oil level. For oil type refer to engine manual.
6. Check engine coolant level.
7. Inspect air cleaner for dust and dirt, replace if necessary.
8. Secure drain plug on the slurry tank drain pipe.
9. Check to be certain pump drain plug is in place.
10. Lubricate equipment. See LUBRICATION AND FLUIDS CHART.
    A. Each lubrication point on the machine is marked with a decal.
    B. Check automatic pressure lubricator at pump. If the red indicator is fully raised, the automatic pressure lubricator contains lubricant. If not, lubricant must be replaced by the following procedure (See illustration):
        1. Insert the 14 oz tube (A2401-001) into a manual or pneumatic grease gun.
        2. Attach the grease gun to the grease button on the centralized grease mount. It is NOT necessary to remove or unthread anything from the lubricator.
        3. Dispense the grease until the red indicator rises approximately 1 inch above the cap.

           Monitor the red indicator for level of grease.



Automatic Pressure Lubricator Components

11. Check nozzle(s) for any obstructions and clean if required.
12. Check pump discharge and recirculation valve handles for free movement.

BOOM AND RECIRCULATION VALVE OPERATION

The HT HydroSeeder® is equipped with one valve for each boom that is installed, as well as a valve on the recirculation leg. The recirculation valve should remain open at all times during normal operation. The recirculation valve is included with your machine so that in the event pump or boom plumbing maintenance needs to be performed with a full slurry tank, the pump system may be isolated and disassembled without losing material from the tank (when also used with the gate valve on the pump suction pipe).

NEVER articulate any of the valves while the slurry pump is running. If valves need to be opened/closed to change the operating configuration of the machine (e.g.: spray from the opposite side of the machine from the second boom), turn the slurry pump off and wait for material to stop flowing. Valves may be safely opened/closed when the slurry pump is not running.

Valves should only ever be used in the fully open or fully closed positions; **NEVER** use boom valves to control flow to the booms. Flow control should be done with the knob on the control panel or the knob on the radio remote system. Flow through the boom(s) is to be controlled by turning the slurry pump on or off and/or with use of the speed control dials (main control panel or radio remote). **NEVER** use the discharge valves to control distance.

⚠ DANGER ***NEVER engage (turn on) the slurry pump when all valves are closed. If boom and recirculation valves are closed, extreme heat and pressure will likely result. Failure to comply could result in death or serious injury. Failure to comply could also result in product or property damage.***

1. SLURRY FLOW PATH VALVES

The illustration shows the valves used to control slurry flow path in your HT machine. None of the valves should be actuated while the slurry pump is engaged. None of the included valves are flow control valves, and should **ONLY** be used in the **FULLY OPEN** or **FULLY CLOSED** positions. Failure to comply with instruction may result in damage to machine, death, or serious injury.

The curb side boom valve (**A**) is used to isolate the curb side boom if the HT is to be used in an alternate spraying configuration.

If equipped, the road side boom valve (**B**) is used to isolate the road side boom if the HT is to be used in an alternate spraying configuration.

If equipped, the road side boom cross over valve (**C**) should be used in combo with the road side boom valve (**B**) – this valve is to be closed during any time when slurry application is not utilizing the road side boom; leaving this valve open when not intending to use the road side boom will allow slurry to pack into the additional piping and increase the chances of de-watering the slurry mix and/or clogging.

The slurry recirculation valve (**D**) is installed after the orifice nozzle in the flow path back to the slurry tank. This valve should remain open under all slurry application configurations. The recirculation valve is only to be used if/when maintenance is required on the slurry pump and associated piping. Closing this valve will allow the operator to isolate the slurry tank from the piping and pump to prevent excessive loss of product during maintenance or service. Use this valve in combination with the suction valve (**F**).

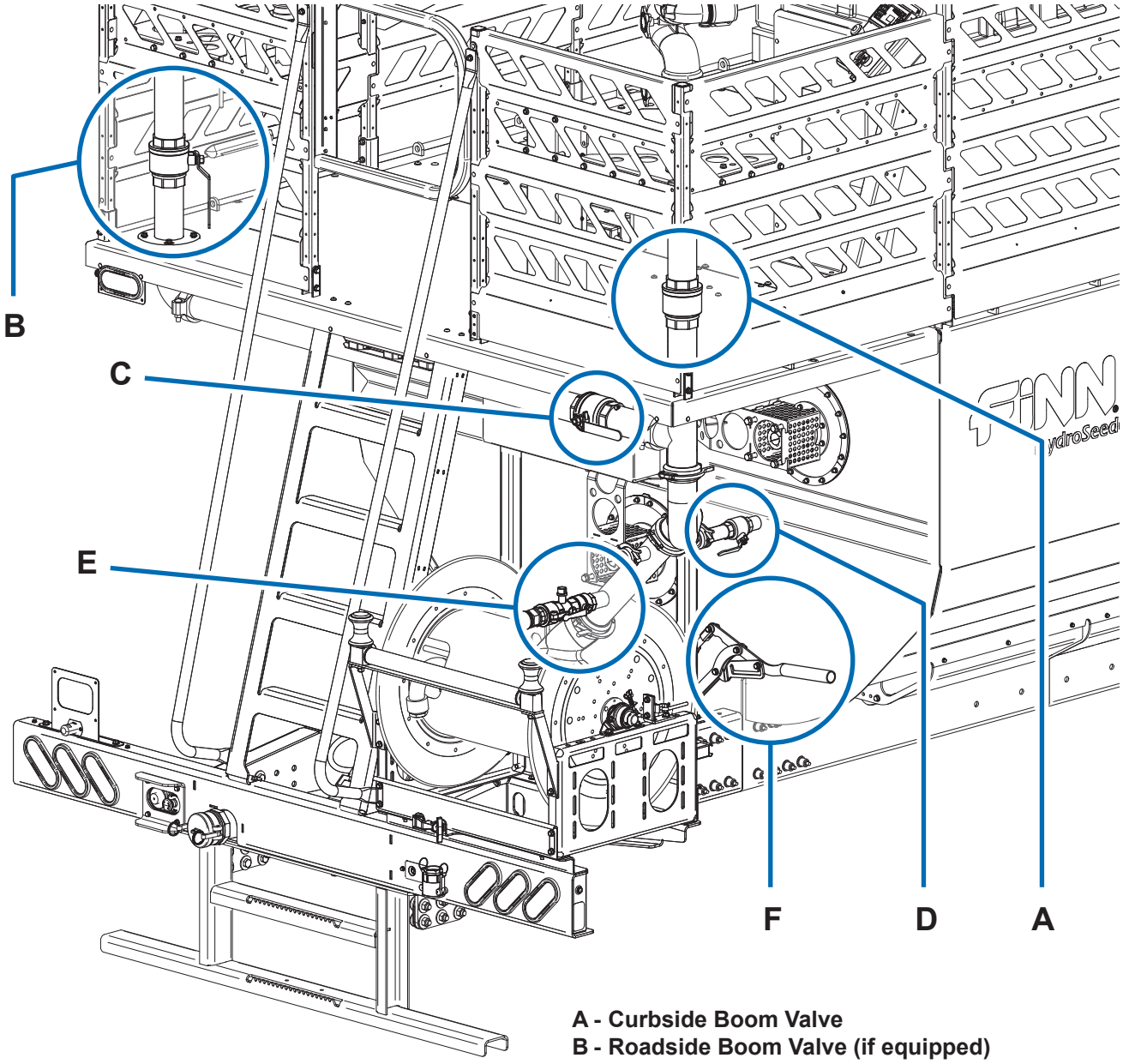
The auxiliary hose (hose reel if equipped) valve (**E**) is used to isolate any auxiliary equipment and/or hose reel when the HT is to be used in an alternate spraying configuration. This valve is to remain closed during any time when the slurry application is not utilizing the aux/hose reel; leaving this valve open when not intending to use the aux/hose reel connection will allow slurry to pack into the additional hose and increase the chances of de-watering the slurry mix and/or clogging.

BOOM AND RECIRCULATION VALVE OPERATION (CONTINUED)

1. SLURRY FLOW PATH VALVES (CONTINUED)

The suction valve (**F**) should remain open under all slurry application configurations. The suction valve is to be used if/when maintenance is required on the slurry pump and associated piping. Closing this valve will allow the operator to isolate the slurry tank from the piping and pump to prevent excessive loss of product during maintenance or service. Use this valve in combination with the recirculation valve (**D**).

NOTE: Do not use any slurry flow path valves to control slurry spray distance. All valves should be either fully open or fully closed, depending on the operation. Control of the slurry spray distance should be accomplished by adjusting the pump speed or selecting a different nozzle.



A - Curbside Boom Valve
B - Roadside Boom Valve (if equipped)
C - Roadside Boom Crossover Valve (if equipped)
D - Recirculation Valve
E - Auxiliary Hose (Hose Reel) Valve (if equipped)
F - Suction Valve

Slurry Flow Path Valve Operation View

BOOM AND RECIRCULATION VALVE OPERATION (CONTINUED)

2. SLURRY APPLICATION CONFIGURATIONS

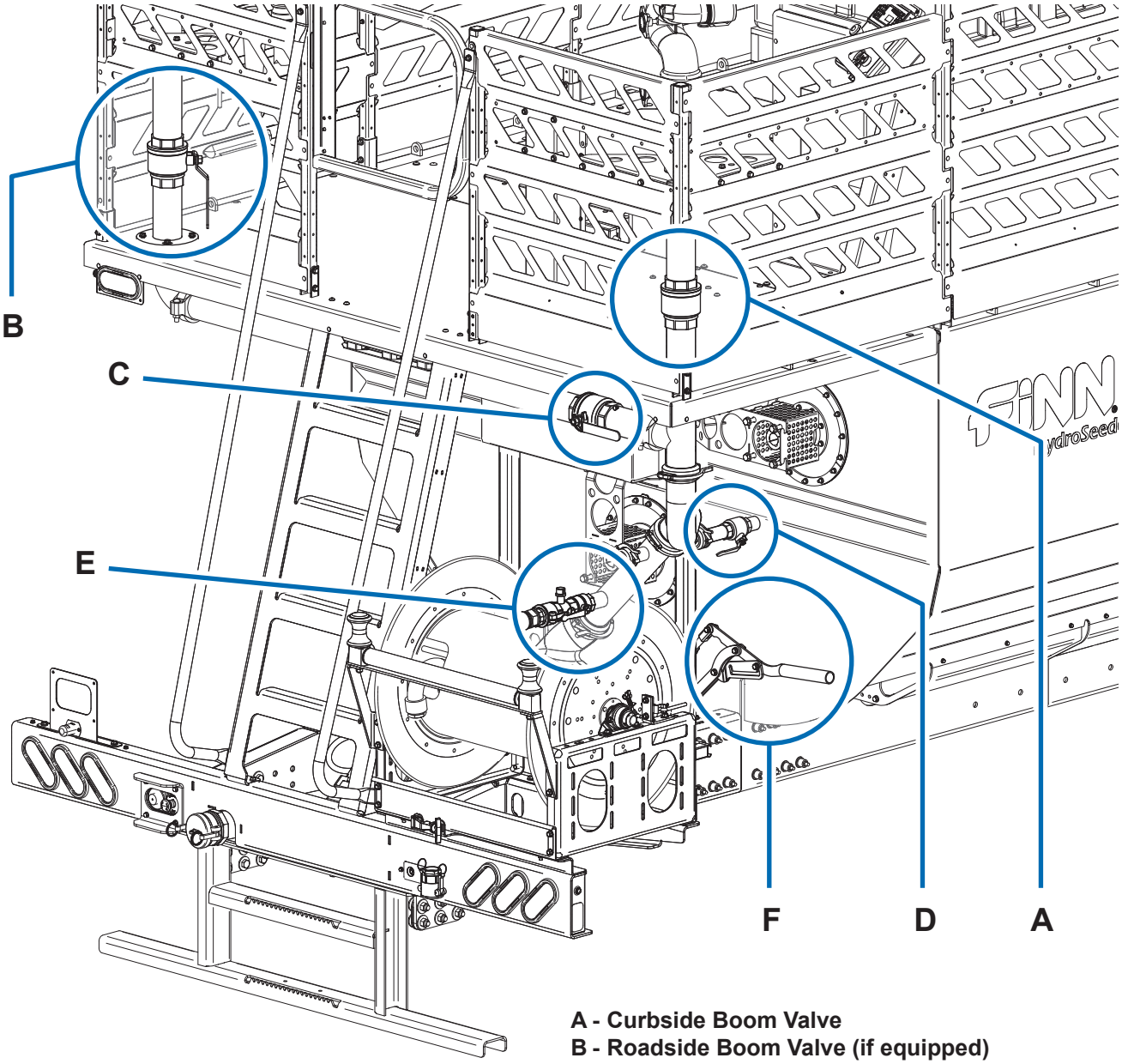
Curbside Boom Usage	**OPEN**	Curbside boom valve (**A**)
		Recirculation valve (**D**)
		Suction valve (**F**)
	CLOSED	Roadside boom valve (**B**) *if equipped*
		Roadside boom crossover valve (**C**) *if equipped*
		Aux/hose reel valve (**E**) *if equipped*

Roadside Boom Usage	**OPEN**	Roadside boom valve (**B**) *if equipped*
		Roadside boom crossover valve (**C**) *if equipped*
		Recirculation valve (**D**)
		Suction valve (**F**)
	CLOSED	Curbside boom valve (**A**)
		Aux/hose reel valve (**E**) *if equipped*

Curbside Boom and Roadside Boom Usage	**OPEN**	Curbside boom valve (**A**)
		Roadside boom valve (**B**) *if equipped*
		Roadside boom crossover valve (**C**) *if equipped*
		Recirculation valve (**D**)
		Suction valve (**F**)
	CLOSED	Aux/hose reel valve (**E**) *if equipped*

Aux/Hose Reel Usage	**OPEN**	Recirculation valve (**D**)
		Aux/hose reel valve (**E**) *if equipped*
		Suction valve (**F**)
	CLOSED	Curbside boom valve (**A**)
		Roadside boom valve (**B**) *if equipped*
		Roadside boom crossover valve (**C**) *if equipped*

BOOM AND RECIRCULATION VALVE OPERATION (CONTINUED)



A - Curbside Boom Valve
B - Roadside Boom Valve (if equipped)
C - Roadside Boom Crossover Valve (if equipped)
D - Recirculation Valve
E - Auxiliary Hose (Hose Reel) Valve (if equipped)
F - Suction Valve

Slurry Flow Path Valve Operation View

CONTROL PANEL GUIDE AND SYSTEM OPERATION

The digital display control panel has eight navigation buttons which are configured for use to properly operate and maintain the unit. Please read this entire section before operating the unit. This section will cover proper use of the digital display control panel while the unit is running, and the information should be familiar before operating the unit.

NOTICE ***Please read this entire section BEFORE turning the engine on. Knowing the information presented in this section and the controls covered is very important to the proper operation and use of this unit. There is a section further in the manual for STARTING PROCEDURE that will cover starting the unit.***

Getting Started

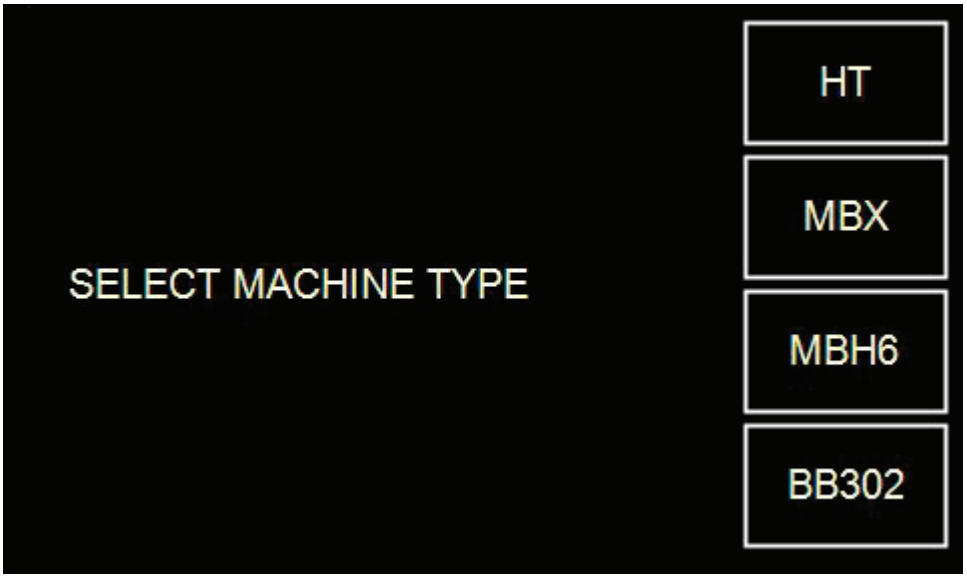
⚠ CAUTION ***See safety section of the manual before operating the unit. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.***

Turn key clockwise to the **ON/RUN** position and wait for control pad to illuminate and go through its start-up procedure.

Menu Navigation

The eight system softkeys are used to navigate between displays, select menu items and change data. Pressing any of the navigation softkeys will display the softkey menu that is associated with each softkey.

Your unit should display the normal Home/ Engine Off screen at the beginning, but should the screen shown here appear, press the softkey labelled HT to return the unit to valid operation.



Start Up Display

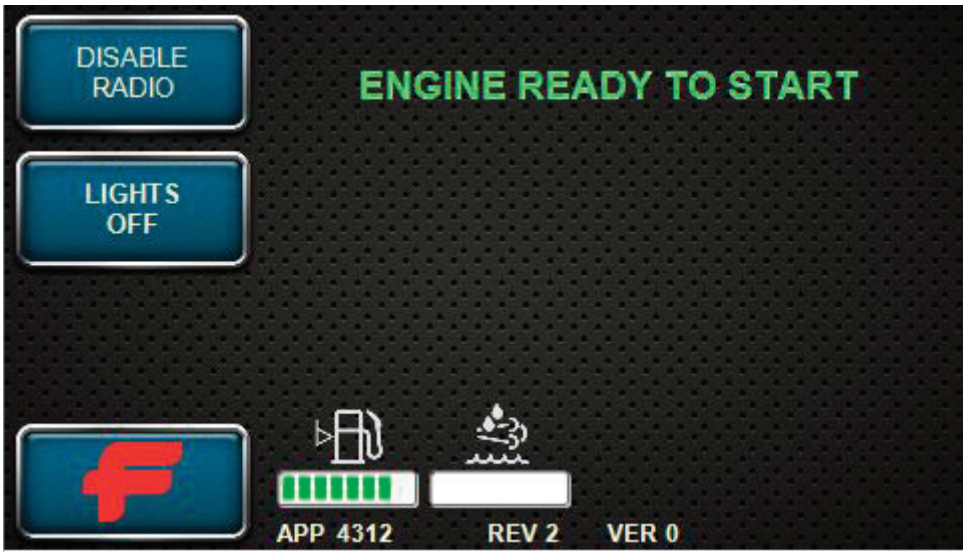
The normal Home/Engine Off screen display should appear at the touch of the softkey. This screen allows you to see the status of the machine BEFORE the unit is turned on. At this point in startup, the radio remote will be OFF and the controller will be OFFLINE.

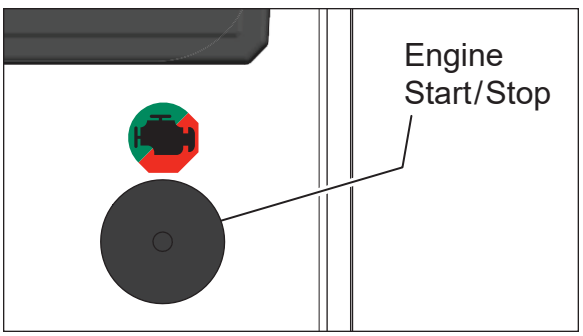
This screen shows the fuel level of the unit and the DEF level of the unit.

The **LIGHTS OFF** softkey option is hidden if Work Light Option is disabled.

The operator can cycle through the lighting options (LIGHTS ON, SCENE LIGHTS and DECK LIGHTS) from this screen to control unit lights (if equipped). Pressing the **LIGHTS OFF** softkey will cycle through the lighting options and turn the lights on or off by using the same softkey.

Once the system is ready, the screen will inform you that the engine is ready to start. It would be at this time that the operator would press the **Engine Start/Stop** button on the control panel.





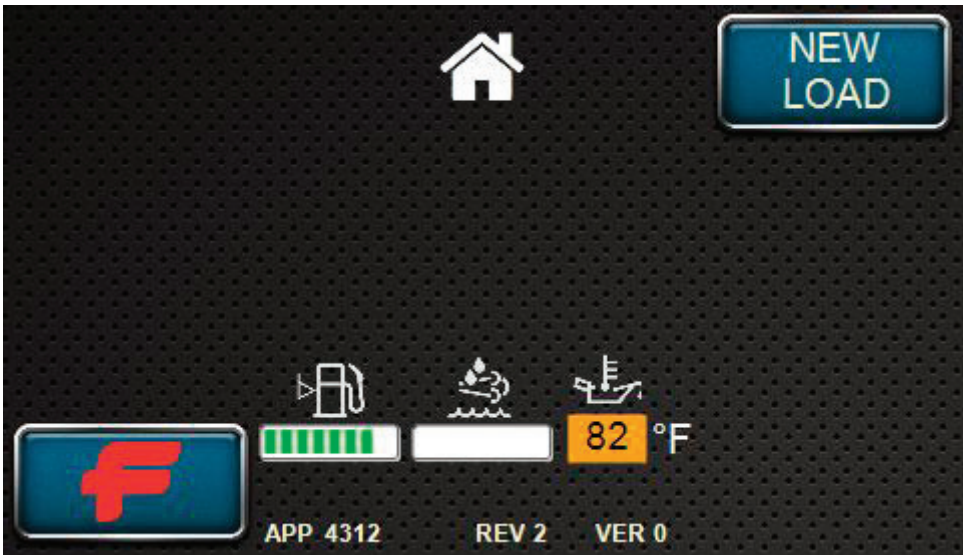
CONTROL PANEL GUIDE AND SYSTEM OPERATION (CONTINUED)

Beginner Mode

When the HT HydroSeeder® is in ***Beginner Mode***, the control system manages agitator speeds and direction for the operator(s) and will guide users through when/how to successfully load the machine. It should be noted that this is not a one size fits all program, but is the best approximation of a universal cycle as Finn could develop based on knowledge of the equipment and applied materials' application and mixing recommendations. Some level of machine competency is required to be able to successfully and efficiently operate the machine.

Loading and Mixing in Beginner Mode

To begin the process of loading the machine, press the softkey labelled **NEW LOAD**.



After confirmation from the user, the machine will engage both agitators into **LOAD MODE** and instruct the user to begin filling the machine with water and mulch.

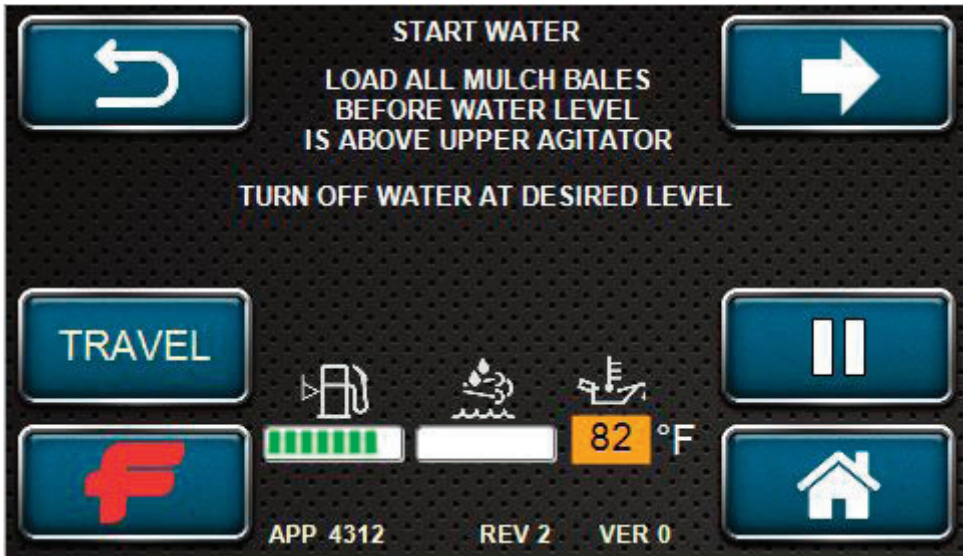
CONTROL PANEL GUIDE AND SYSTEM OPERATION (CONTINUED)

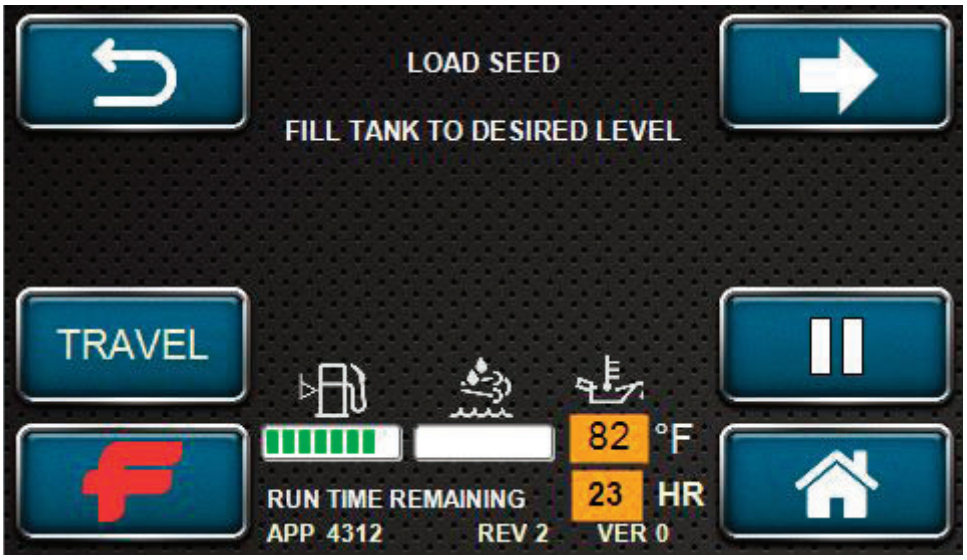
Loading and Mixing in Beginner Mode (Continued)

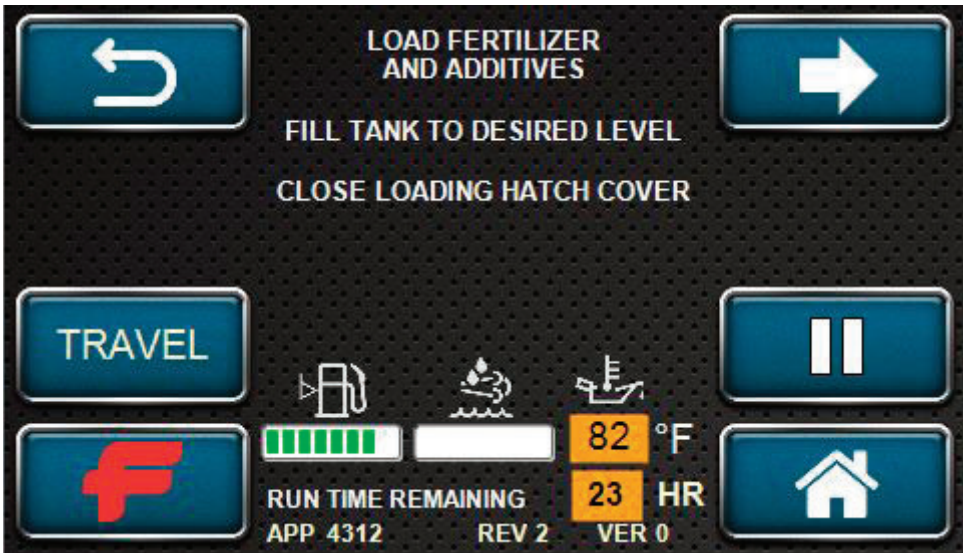
The first screen displayed instructs the user to begin adding water and any/all mulch bales or applied materials. Any mulch or applied material should be loaded prior to the slurry level reaching the center of the Finn Integrinder™ agitator shaft.

After all mulch/applied materials are loaded, the user should progress to the next step of **LOAD MODE** by pressing the softkey next to the next arrow in the upper right of the control screen. The **BEGINNER MODE** will then prompt the user(s) to load in all seed and fertilizer before the slurry level in the tank reaches the top of the tank (this assumes a full tank sized load).

On these three loading screens, the **TRAVEL** button in the lower left will put the HT HydroSeeder® into a low idle state and continue to lightly agitate the mixture to prevent settling or separation until either the **TRAVEL** button is pressed again or another mode is requested (**SPRAY MODE** for example).

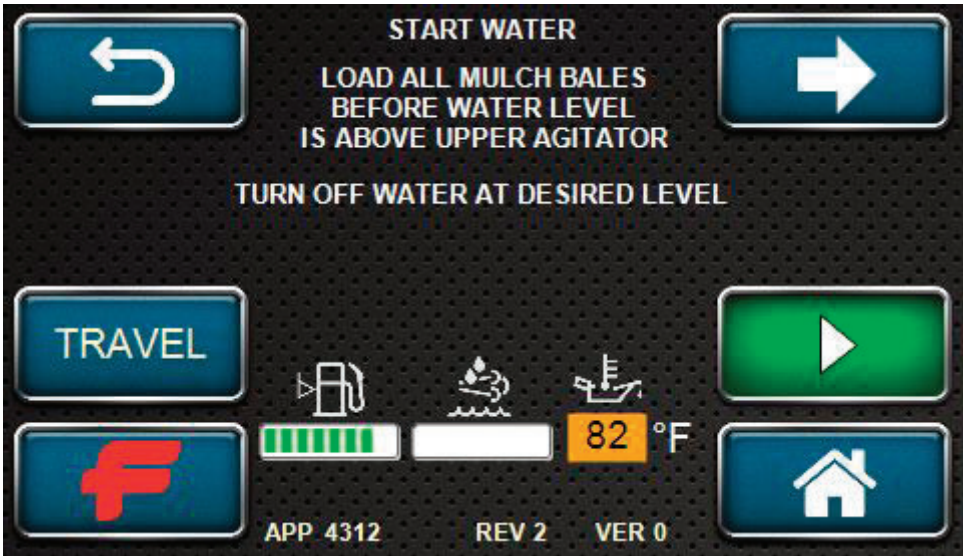


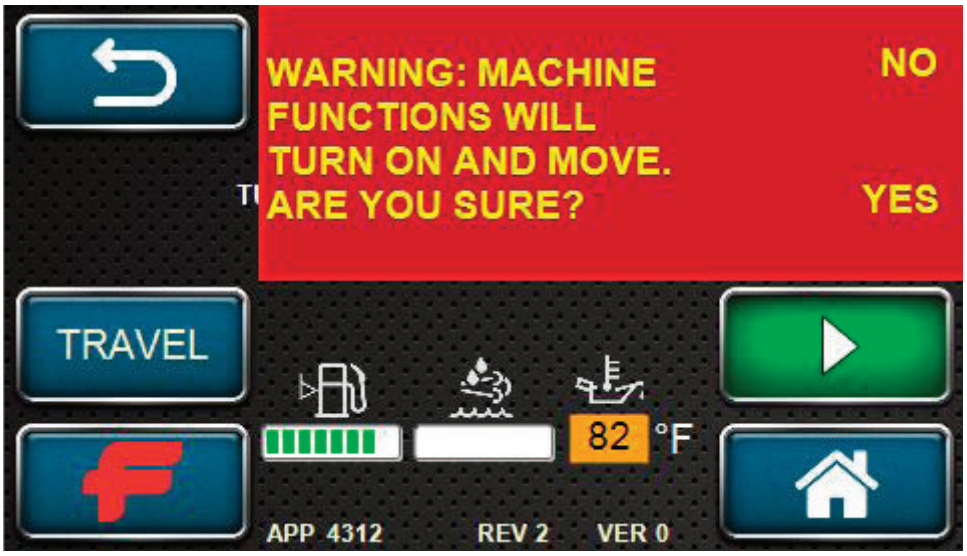




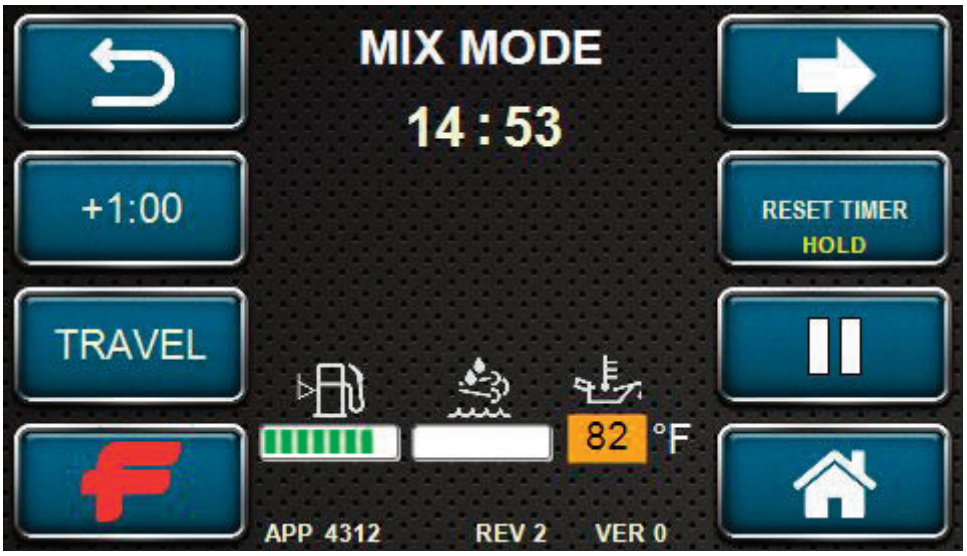
Loading and Mixing in Beginner Mode (Continued)

The **PAUSE/PLAY** button in the lower right will stop the machine's operation and bring the engine to low idle until the user pushes **PAUSE/PLAY** again and confirms the choice. This is useful should the operator need to stop the machine for whatever reason and doesn't want to fully exit the **BEGINNER MODE** operation.





After the load screens (all mulch/applied materials, seed, and fertilizer/amendments have been added) the user may progress to **MIX MODE** by pressing the softkey next to the right arrow at the top right corner of the main control screen.



CONTROL PANEL GUIDE AND SYSTEM OPERATION (CONTINUED)

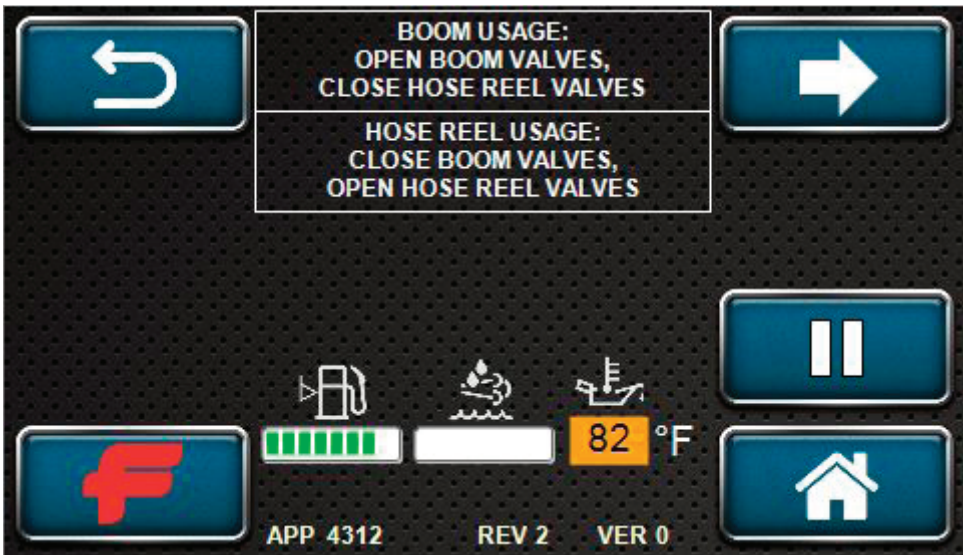
Loading and Mixing in Beginner Mode (Continued)

During **MIX MODE** in the **BEGINNER MODE**, the HT HydroSeeder® will automatically manage speed and direction of the agitators for a pre-set 15:00 (15 minute) timer. As was true with the **LOADING** screens, the user may opt to put the machine into **TRAVEL MODE** or stop things with the **PAUSE/PLAY** softkeys.

At any point during **MIX MODE**, the user may opt to add +1:00 (1 minute) with a single softkey press or skip ahead to the **SPRAY** screens by pressing the **NEXT** (arrow) softkey in the upper righthand corner.

Upon completion of the mix cycle, the machine will alert the user that the mixing has completed and revert to the **TRAVEL** state, keeping the mixture homogenous.

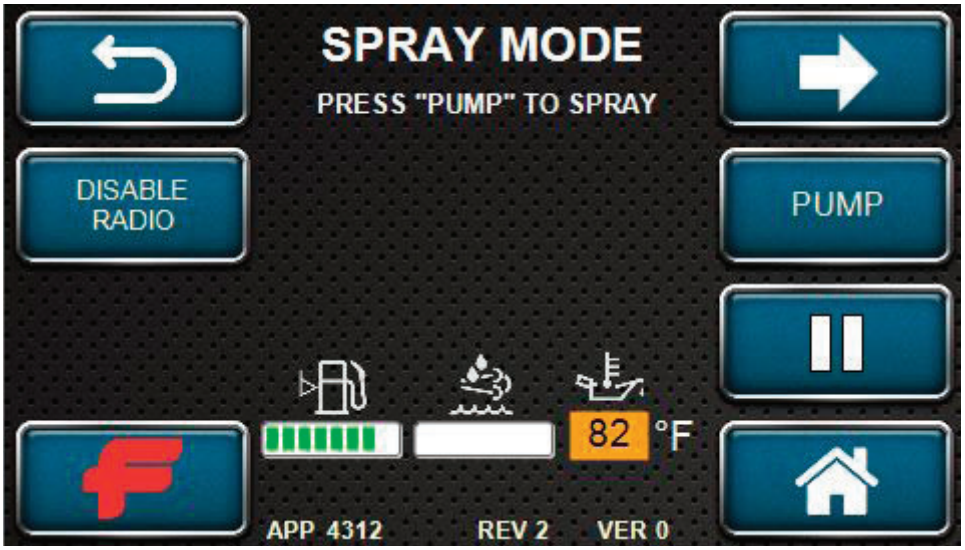
After **MIX MODE** is complete and the user moves forward to the SPRAY interface, the **BEGINNER MODE** of the HT HydroSeeder® will again automatically manage the agitator speed and direction for the operator, allowing you to concentrate on that perfect application of hydro mulch. Prior to entering the **SPRAY MODE** interface, the operator is given a quick reminder for required valve positions based on desired mode of operation.



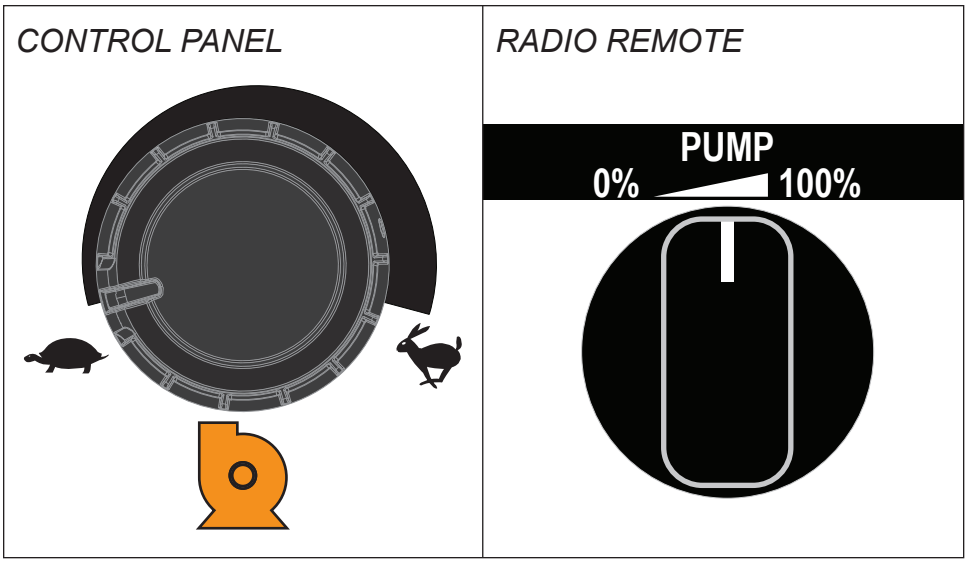
CONTROL PANEL GUIDE AND SYSTEM OPERATION (CONTINUED)

Loading and Mixing in Beginner Mode (Continued)

At the **SPRAY MODE** screen, the operator is able to enable/disable the radio (**DISABLE RADIO** softkey), **PAUSE/PLAY** softkey to stop machine motion (including agitators) and turn the slurry pump on and off (**PUMP** softkey).

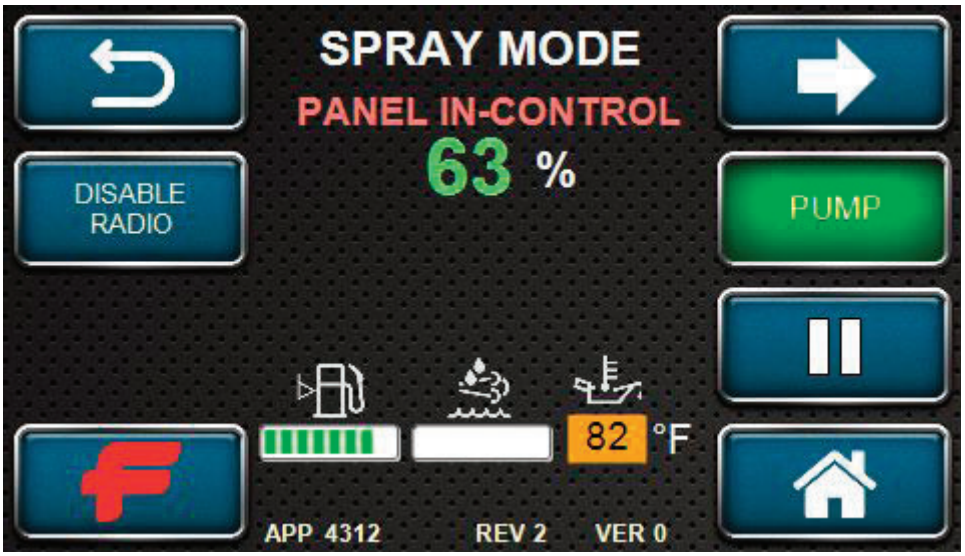


Speed of the pump is controlled with the main pump speed dial on the control box or on the radio remote (depending on which item is in control of the machine).



The **SPRAY MODE** screen will show whether the control panel or radio remote is in control (the image here shows that the control panel is in control), and at what percentage the slurry pump is operating.

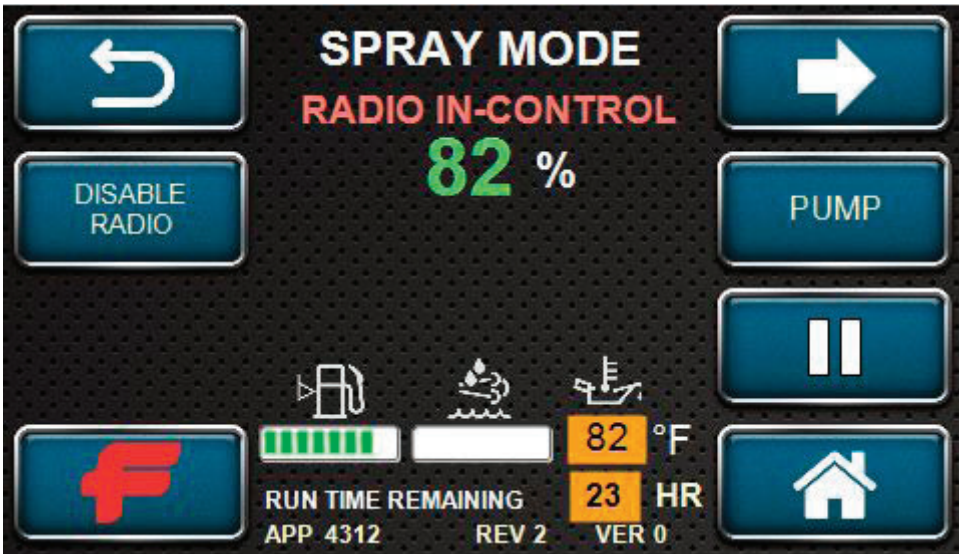
Because the pump button is engaged and the readout says 63%, the slurry pump is on and is operating at 63% from the main control panel.



CONTROL PANEL GUIDE AND SYSTEM OPERATION (CONTINUED)

Loading and Mixing in Beginner Mode (Continued)

As an additional example, the screen at right is showing that the main control panel is ***NOT*** in control of the HT HydroSeeder® slurry pump, but the radio remote ***IS***. After slurry application is complete, proceed to the next instruction using the upper right hand **NEXT** (arrow) softkey.

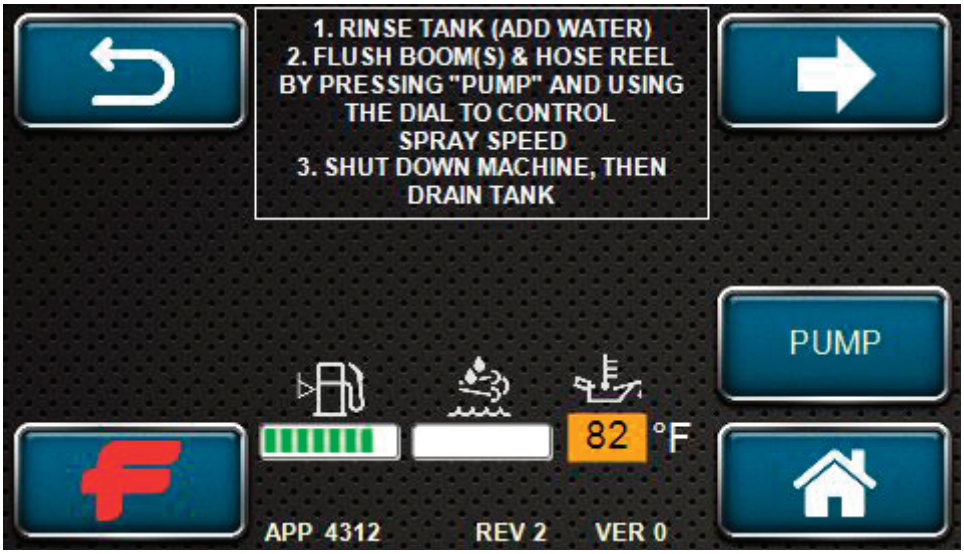


With the new hydrostatic slurry pump system, the user does not need to reduce the requested pump speed prior to starting or stopping the slurry pump with the **PUMP** softkey.

The final step in the HydroSeeding process is to clean the tank.

Typically, the tank is refilled with a couple hundred gallons of water, and flushed through either the boom(s) and/or hose reel depending on what was used to apply the slurry mixture.

Use the **PUMP** softkey to start the flush process and use the dial to control the spray speed.



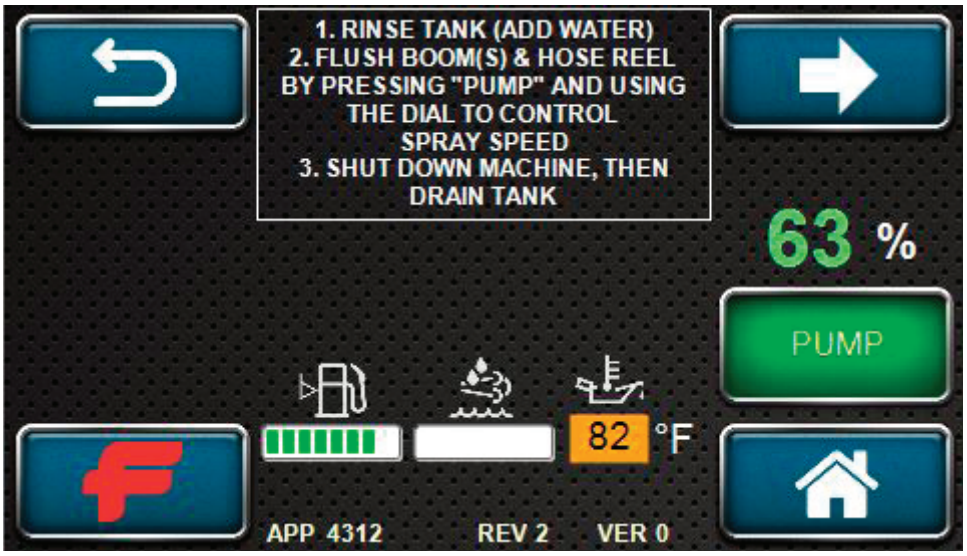
CONTROL PANEL GUIDE AND SYSTEM OPERATION (CONTINUED)

Loading and Mixing in Beginner Mode (Continued)

Pressing the **PUMP** softkey will cause a warning screen to appear. This is a safety safeguard built into the system.

Pressing the **YES** softkey will start the flushing process.

The digital display will highlight the **PUMP** icon next to the softkey and display the slurry pump is on and is operating at 63%.

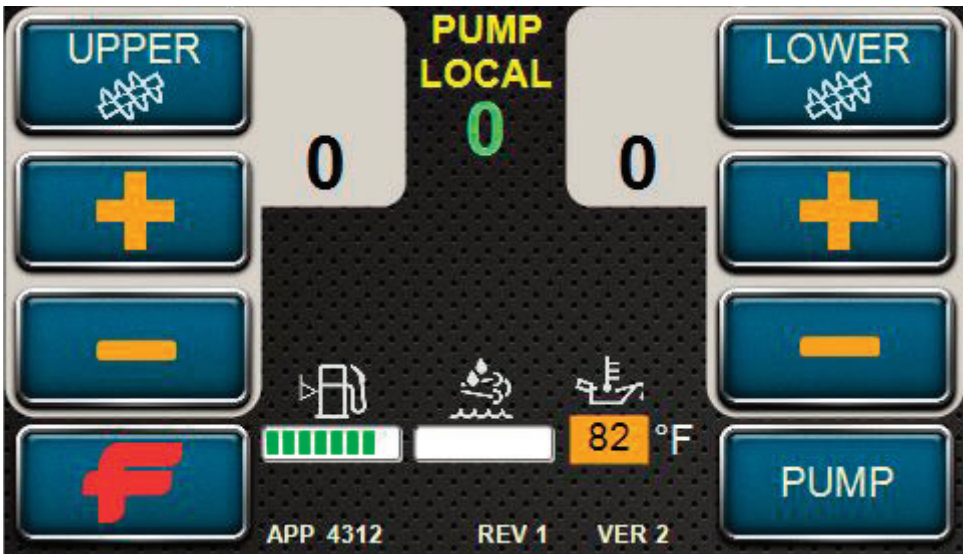


Following an adequate rinse out and line flush, remove the 3 in. drain plug cap (near the rear bumper of the machine) and drain any remaining water/slurry from the tank.

Finn suggests finding a location such that the front (engine end) of the HT HydroSeeder® is elevated more than the rear, allowing any remaining water and/or materials to drain out through the sump drain.

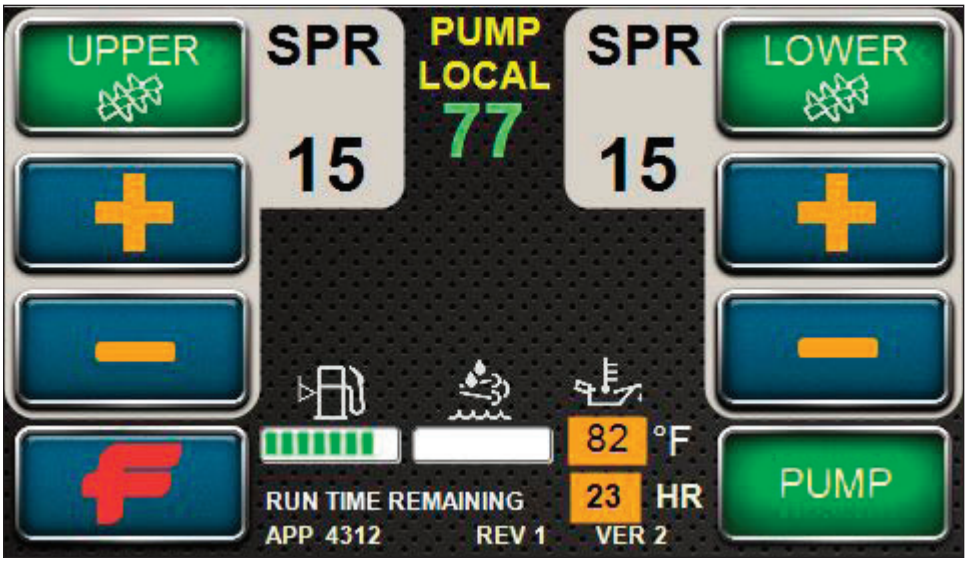
Loading and Mixing in Pro Mode

When the HT HydroSeeder® is in **PRO MODE**, the operator has full control of both the upper and lower agitator as well as the slurry pump from the main screen.



The agitators can be cycled through *OFF*, *MIX*, *SPRAY* and *TRAVEL* by pressing the **UPPER** and **LOWER** softkeys. The speed of the upper and lower agitators can be controlled with the softkeys next to the plus (**+**) and minus (**–**) icons on screen.
The agitator's direction and speed is displayed in black text next to the agitator buttons (MIX = Mix, SPR = Spray, TRV = Travel). Unlike beginner mode, both agitators need to be set to TRV (Travel mode) in order to enter travel mode.

The slurry pump can be engaged and disengaged using the softkey next to the **PUMP** icon in the lower right. The slurry pump speed percentage is displayed at the top center of the display in green/yellow text, and is controlled either with the large pump speed dial on the main control panel *OR* the radio remote if the radio is enabled (see Settings and Diagnostics section).



As an example, this screenshot shows that both upper and lower agitators are operating in spray mode at 15% max speed, and the slurry pump is operating at 77% speed.

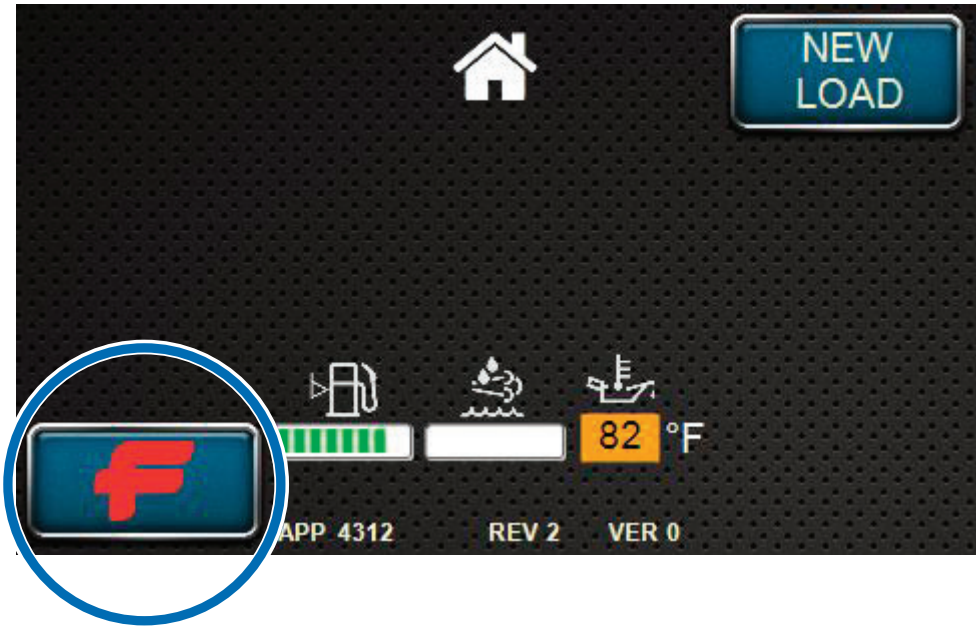
The slurry pump is powered with a hydraulic motor and can be turned *ON*/*OFF* much more quickly. As a result the slurry pump can be turned *ON*/*OFF* (using the softkey or radio remote controls) without adjusting speed.

SETTINGS AND DIAGNOSTICS

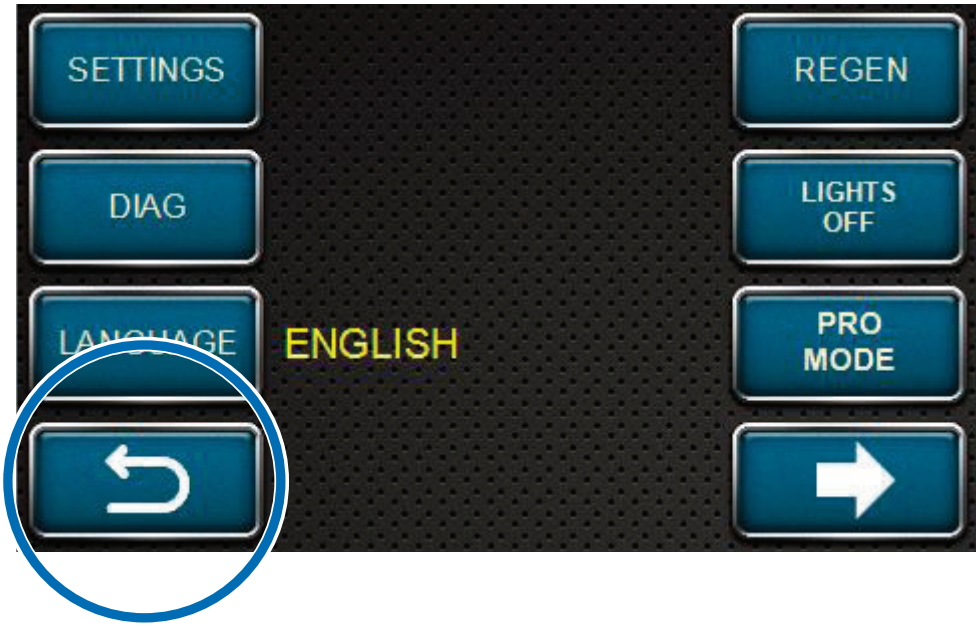
Main Menus

Users can access the settings and diagnostics of the HT HydroSeeder® by pressing the **FINN (F)** softkey at the lower left side of the home screen and most *operating* screens.

NOTE: BEGINNER MODE home screen shown.



At any point during *menu* navigation, the user may press the softkey at the lower left side (**RETURN**) to go back one screen, or *HOLD* the **RETURN** softkey to return all the way to the **HOME** screen.



SETTINGS AND DIAGNOSTICS (CONTINUED)

Main Menus (Continued)

The **SETTINGS** softkey will allow the operator to adjust units, light/horn comm mode, the machine-minder alarm, and more detailed machine settings.

The **REGEN** softkey will take the user to the regeneration controls for the John Deere engine.

The **DIAG** softkey will take the user to the Diagnostics Settings for the engine, HT unit and radio remote.

If the option is equipped, **MACHINE LIGHTS** will toggle between **SCENE LIGHTS**, **DECK LIGHTS**, **SCENE AND DECK LIGHTS**, and **OFF** (**OFF** is the default).

LANGUAGE can be toggled between English and Spanish (English is the default).

PRO MODE, once enabled, will allow the user to exit **BEGINNER MODE** and have full manual control of the machine. **BEGINNER MODE** is enabled by default.

NOTE: When **BEGINNER MODE** is enabled, **PRO MODE** is disabled by default.

The **NEXT** softkey at the bottom right of the screen provides access to the **ABOUT** function and any future additions to the software that may be added.

The **ABOUT** page provides information about the control system and versions.

SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen

At the primary settings screen, there are several options.

UNITS can be toggled between metric or imperial (imperial is the default).

COMM MODE can be cycled through **LIGHT AND HORN**, **LIGHT ONLY**, **HORN ONLY**, and **DISABLED** (**LIGHT AND HORN** is the default).

ALARM DISABLE will activate/deactivate the machine-minder horn alert for when the key is left on with the engine turned off for more than 10 minutes (**ALARM ENABLED** is the default).

After changes to the above three settings are made, press the softkey at the lower left side (**RETURN**) to go back one screen, or *HOLD* the **RETURN** softkey to return all the way to the **HOME** screen.

The **MACHINE** softkey will take the user to the settings screen shown here for unit settings and options.

Pressing the **HOSE REEL** softkey will take the user to the settings screen for customizable hose reel settings/behavior.

Pressing the **LOAD MODE** softkey will take the user to the settings screen for customizable load settings which can assist in the performance of the unit in **BEGINNER MODE**.

Pressing the **MIX MODE** softkey will take the user to the settings screen for customizable mix settings which can assist in the performance of the unit in **BEGINNER MODE**.

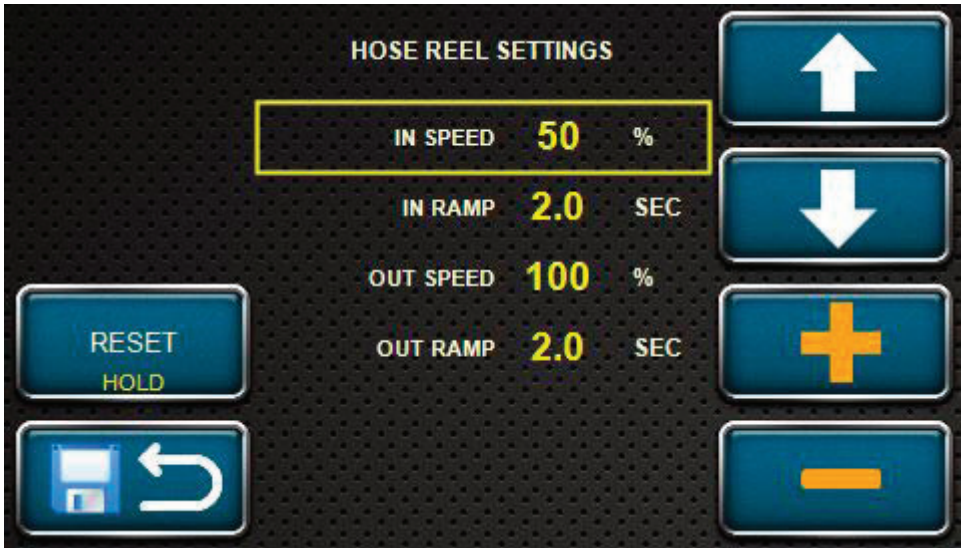
Pressing the **SPRAY MODE** softkey will take the user to the settings screen for customizable spray settings which can assist in the performance of the unit in **BEGINNER MODE**.

SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen - Hose Reel

By *HOLDING* the **RESET** softkey for three (3) seconds, the values will be reset to factory defaults.

The **UP/DOWN** softkeys (upper buttons on right side) move between setting fields, while the plus (**+**) and minus (**–**) softkeys will increase or decrease the values of the settings.



Hose Reel Settings

NOTE: All Hose Reel Settings apply to ***BOTH*** the button station and the radio remote operations.

***IN SPEED*:** This setting allows the user to limit the top speed of the hose reel in the “IN” direction to something less than 100%.

***IN RAMP*:** The IN RAMP speed the time required to go from stopped to full speed in the “IN” direction when using the bumper-mounted hose reel control buttons.

***OUT SPEED*:** This setting allows the user to limit the top speed of the hose reel in the “OUT” direction to something less than 100%.

***OUT RAMP*:** The OUT RAMP speed the time required to go from stopped to full speed in the “OUT” direction when using the bumper-mounted hose reel control buttons.

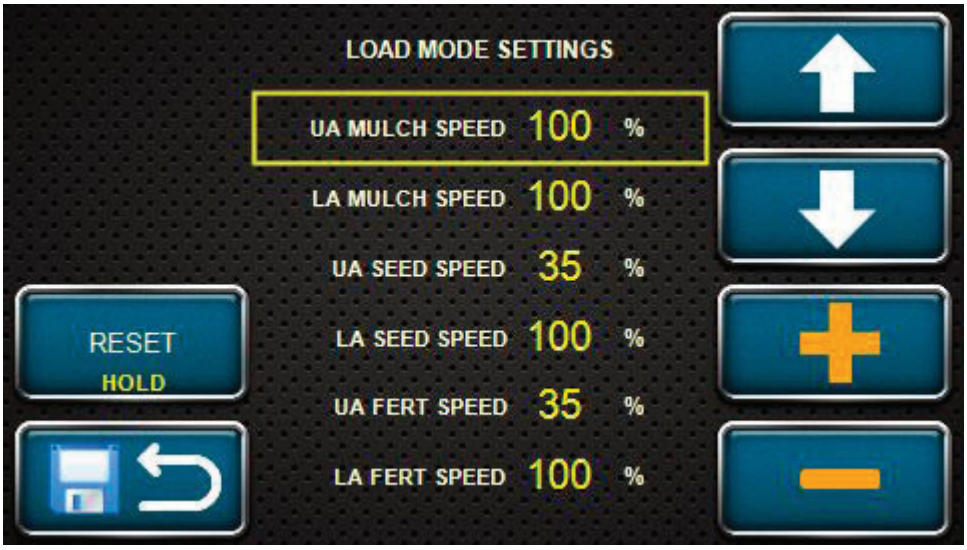
By pressing the **RETURN/SAVE** softkey, any changes the user has made while in this screen will be stored.

SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen - Load Mode

By *HOLDING* the **RESET** softkey for three (3) seconds, the values will be reset to factory defaults.

The **UP/DOWN** softkeys (upper buttons on right side) move between setting fields, while the plus (**+**) and minus (**–**) softkeys will increase or decrease the values of the settings.



Load Mode Settings

NOTE: These settings apply to **Load Mode** while in **BEGINNER MODE** operation.

***UA MULCH SPEED*:** This is the upper agitator speed during the Mulch phase of the **BEGINNER MODE**.

***LA MULCH SPEED*:** This is the lower agitator speed during the Mulch phase of the **BEGINNER MODE**.

***UA SEED SPEED*:** This is the upper agitator speed during the Seed phase of the **BEGINNER MODE**.

***LA SEED SPEED*:** This is the lower agitator speed during the Seed phase of the **BEGINNER MODE**.

***UA FERT SPEED*:** This is the upper agitator speed during the Fertilizer/Additives phase of the **BEGINNER MODE**.

***LA FERT SPEED*:** This is the lower agitator speed during the Fertilizer/Additives phase of the **BEGINNER MODE**.

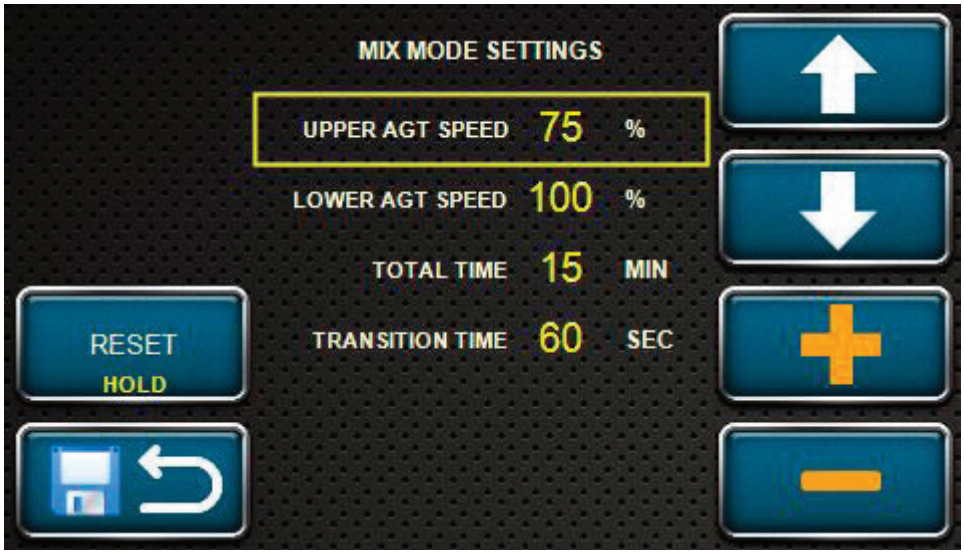
By pressing the **RETURN/SAVE** softkey, any changes the user has made while in this screen will be stored.

SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen - Mix Mode

By *HOLDING* the **RESET** softkey for three (3) seconds, the values will be reset to factory defaults.

The **UP/DOWN** softkeys (upper buttons on right side) move between setting fields, while the plus (**+**) and minus (**–**) softkeys will increase or decrease the values of the settings.



Load Mode Settings

NOTE: These settings apply to **Mix Mode** while in **BEGINNER MODE** operation.

***UPPER AGT SPEED*:** This is the upper agitator speed while in the Mix Mode phase of **BEGINNER MODE**.

***LOWER AGT SPEED*:** This is the lower agitator speed while in Mix Mode.

***TOTAL TIME*:** This is the default total mix time for **BEGINNER MODE**.

***TRANSITION TIME*:** In the Mix phase of Beginner Mode, the agitators will automatically change directions through 4 configurations of tank mixing. The Transition time sets the delay between the agitator direction changes.

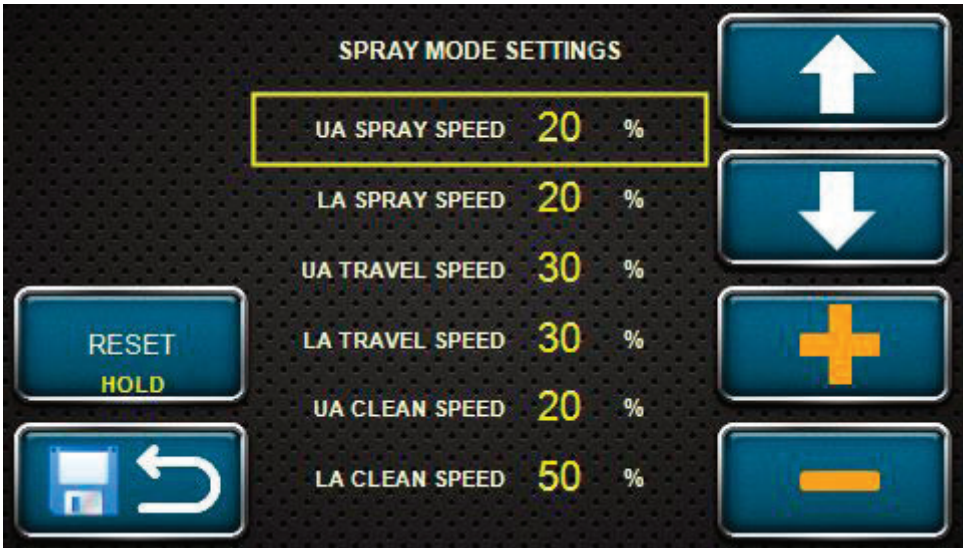
By pressing the **RETURN/SAVE** softkey, any changes the user has made while in this screen will be stored.

SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen - Spray Mode

By *HOLDING* the **RESET** softkey for three (3) seconds, the values will be reset to factory defaults.

The **UP/DOWN** softkeys (upper buttons on right side) move between setting fields, while the plus (**+**) and minus (**–**) softkeys will increase or decrease the values of the settings.



Load Mode Settings

***UA SPRAY SPEED*:** This is the upper agitator speed while in the Spray Mode phase of **BEGINNER MODE**.

***LA SPRAY SPEED*:** This is the lower agitator speed while in the Spray Mode phase of **BEGINNER MODE**.

***UA TRAVEL SPEED*:** This is the upper agitator speed while in Travel Mode. This speed applies to Travel mode in both **BEGINNER MODE** *and* **PRO MODE**.

***LA TRAVEL SPEED*:** This is the lower agitator speed while in Travel Mode. This speed applies to Travel mode in both **BEGINNER MODE** *and* **PRO MODE**.

***UA CLEAN SPEED*:** This is the upper agitator speed while in the Clean Mode phase of **BEGINNER MODE**.

***LA CLEAN SPEED*:** This is the lower agitator speed while in the Clean Mode phase of **BEGINNER MODE**.

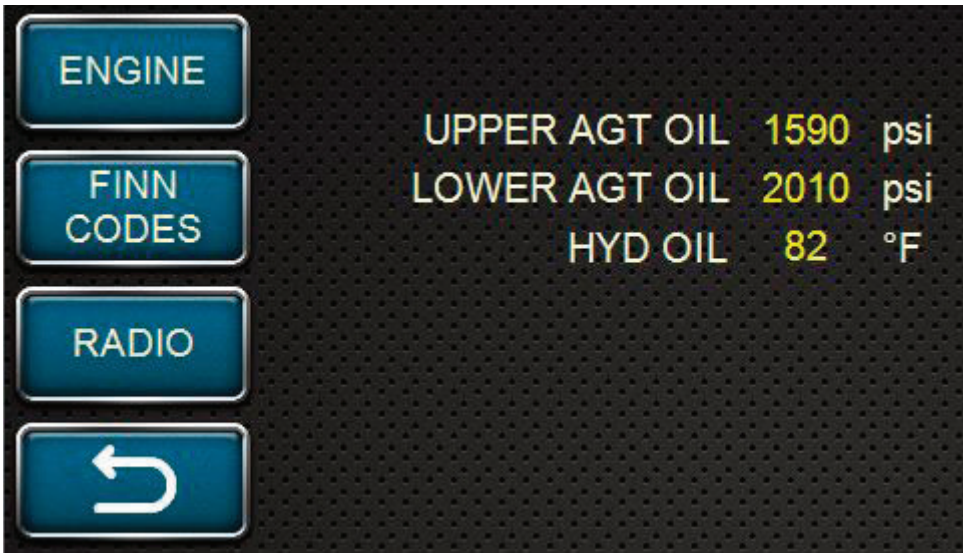
By pressing the **RETURN/SAVE** softkey, any changes the user has made while in this screen will be stored.

SETTINGS AND DIAGNOSTICS (CONTINUED)

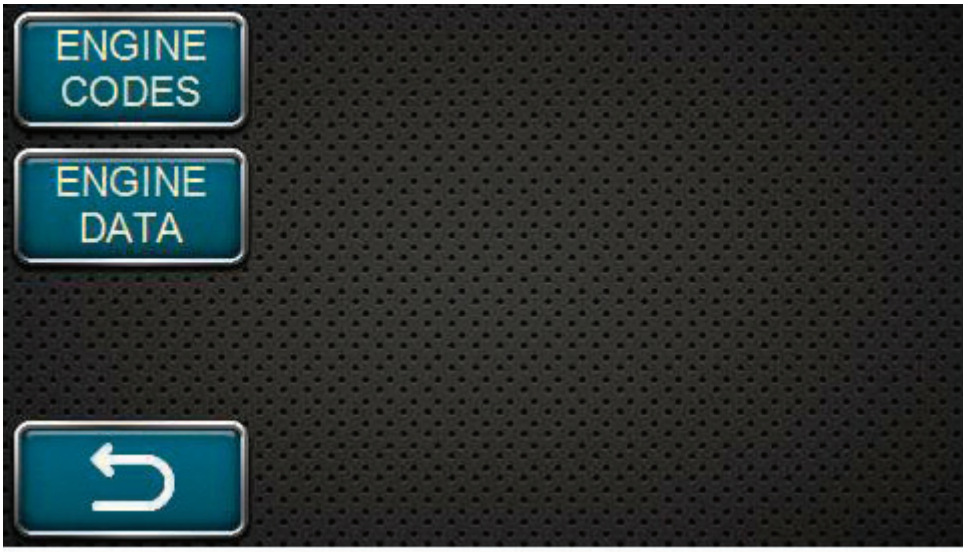
Settings Screen - Diagnostics (Engine)

The **DIAG** softkey will take the user to the Diagnostics Settings for the engine, HT unit and radio remote.

The diagnostic menu shows the current agitator hydraulic pressures and system temperature, as well as provided options to further troubleshoot the John Deere **ENGINE** issues, present **FINN CODES**, or perform two (2) different **RADIO** tests on the radio remote controller.



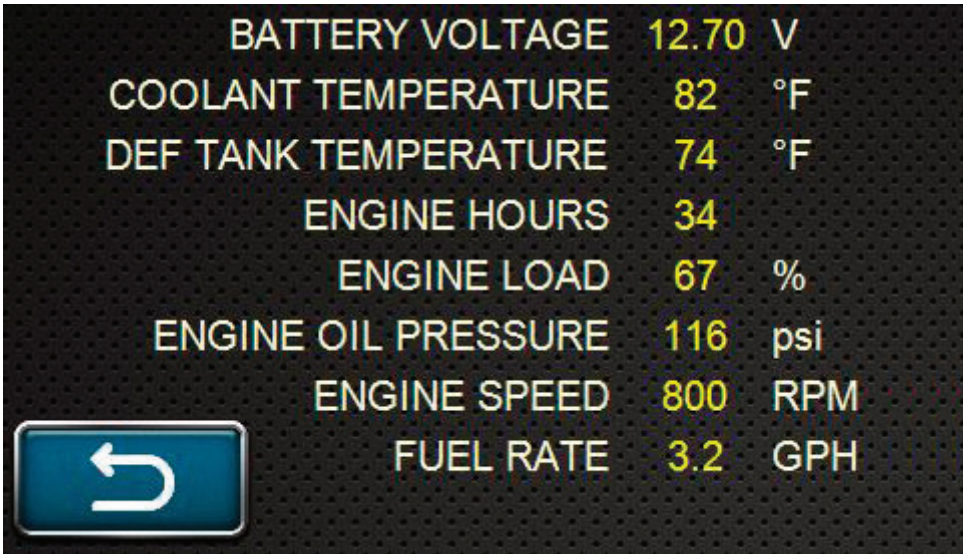
Pressing the **ENGINE** softkey will offer the user a choice between **ENGINE CODES** (data coming from the John Deere engine that would otherwise be known as “Diagnostic Trouble Codes" or DTCs) or **ENGINE DATA**.



SETTINGS AND DIAGNOSTICS (CONTINUED)

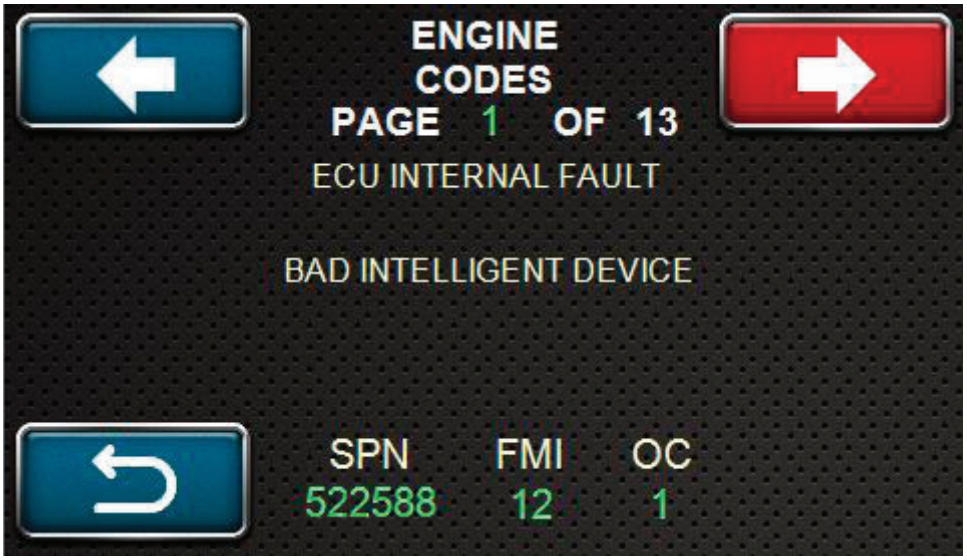
Settings Screen - Diagnostics (Engine, Continued)

ENGINE DATA provides real-time information for Battery Voltage, Coolant Temperature, DEF Tank Temperature, Engine Hours, Engine Load Percentage, Engine Oil Pressure, Engine Speed and Fuel Consumption rate.



ENGINE CODES provides access to the list of any engine codes (and their diagnostic codes) for use in troubleshooting and repairing John Deere engine specific issues. Flashing arrows at the top corners of the page indicate that there are additional codes available on follow-on screens.

An engine code example is shown here.

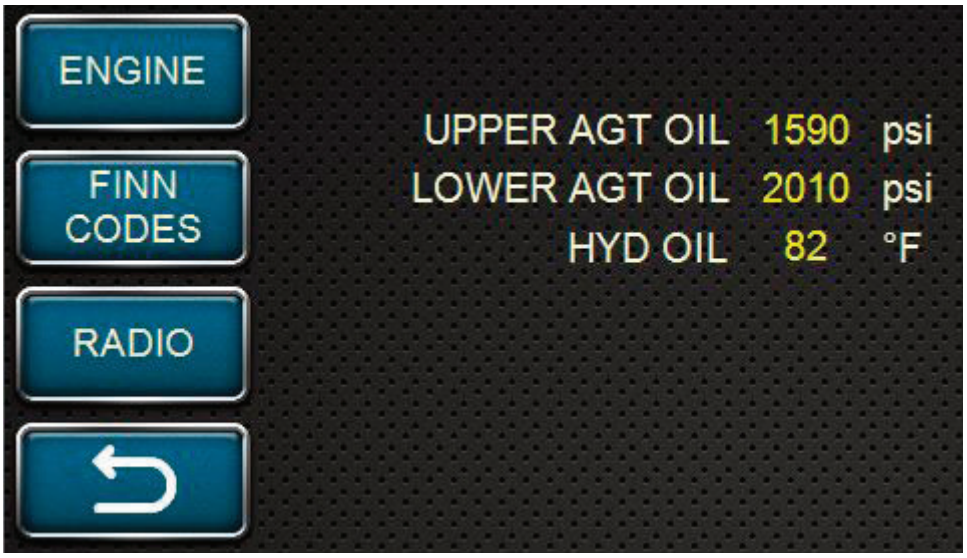


SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen - Diagnostics (Radio)

The **DIAG** softkey will take the user to the Diagnostics Settings for the engine, HT unit and radio remote.

The diagnostic menu shows the current agitator hydraulic pressures and system temperature, as well as provided options to further troubleshoot the John Deere **ENGINE** issues, active **FINN CODES**, or perform **RADIO** tests on the radio remote controller.



Pressing the **RADIO** softkey will bring the user to two new and valuable tools to help troubleshoot radio problems in addition to radio control. The user options are **RADIO TEST**, **RF SIGNAL TEST**, and **DISABLE RADIO**.

The **DISABLE RADIO** softkey will disable the radio so the machine can be operated from the panel without requiring the radio to be powered on.

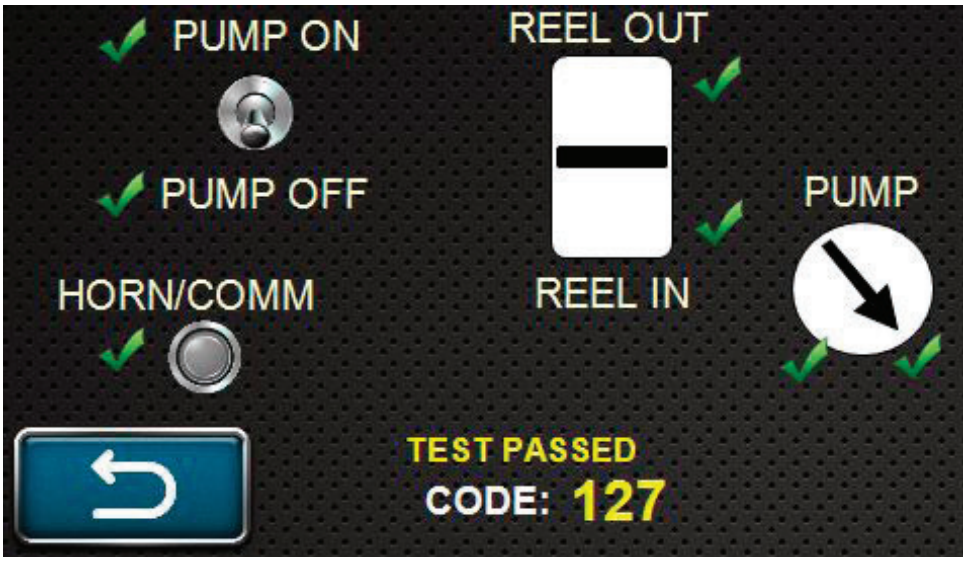
SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen - Diagnostics (Radio, Continued)

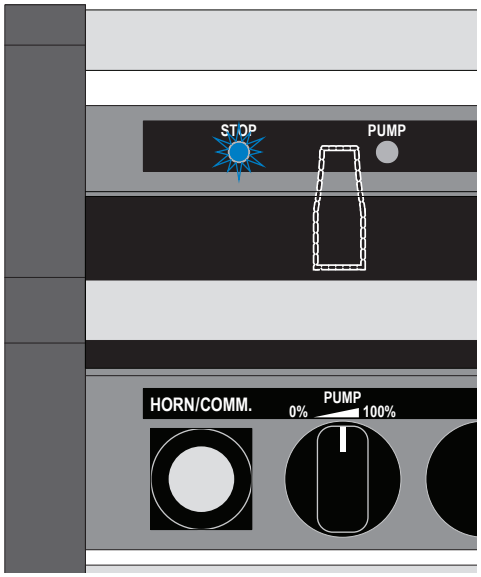
The **RADIO TEST** softkey will prompt the user to exercise all the inputs (to the full ranges) on the radio and press the Emergency Stop (E-Stop) button on the radio when complete.

If the engine is running upon completion of the radio test, the engine will stop (the radio remote's E-Stop has been pressed). Either reset the E-Stop button on the radio or disable radio mode at the main control panel to engine re-start.

The test will display a **RADIO TEST CODE** value based on the results of the test which can be useful in troubleshooting radio remote issues. A list of the **RADIO TEST CODES** is available at the end of this manual.



Pressing the **RF SIGNAL TEST** softkey will flash the **STOP** indicator light *BLUE* on the radio handheld at a constant rate. If the rate becomes less consistent or slower, the RF signal quality is dropping. This function can be used to help prevent engine shutdown conditions due to loss of RF signal.



SETTINGS AND DIAGNOSTICS (CONTINUED)

Settings Screen - Diagnostics (Regeneration)

The **REGEN** softkey takes the user to the HT HydroSeeder® Regeneration (REGEN) status screen.

On the **REGEN** screen, the regen status info is displayed, as well as the controls to *INHIBIT* or *MANUALLY* begin a regeneration. In order to manually regenerate the diesel exhaust system, the **HYD. INTERLOCK** (Hydraulic Interlock) must be active. With the hydraulic interlock active, the slurry pump and agitators (all hydraulic functions) will not activate.

The **MANUAL REGEN** can be activated by pressing the **HYD. INTERLOCK** softkey first, and then holding the **MANUAL REGEN** softkey for 3 seconds.

It is possible to prevent automatic regeneration by pushing the softkey next to **REGEN INHIBIT**. It should be noted that if a regen cycle is required and soot/ash loads increase to an unacceptable level, the John Deere engine will eventually operate in a de-rated condition and potentially shut down until a regen cycle is completed to correct soot and ash load levels.

STARTING PROCEDURE

⚠ WARNING ***See HYDROSEEDER® SAFETY SUMMARY SECTION before operating the machine. Failure to comply could result in death or serious injury. Failure to comply could also result in product or property damage.***

Before starting, ensure that all hydraulic shutoff valves are open and there is adequate hydraulic fluid in the reservoir (must be visible on the sight gauge on the side of the tank). Inspect the battery disconnect switch, and ensure that the battery disconnect switch is in the **ON** position. Check the diesel fuel and DEF (Diesel Exhaust Fluid) levels, and ensure that they are adequate for the anticipated run-time.

1. At the main control panel of the HT machine (near the primary boom/loading hatch area), turn the key clockwise to the **ON/RUN** position. Wait for display and engine computer to boot (usually about 15 seconds at first startup). If radio remote operation isn't desired, ***DISABLE RADIO*** softkey option must be pressed prior to starting. If radio operation is desired, radio mode must be enabled (***DISABLE RADIO*** softkey option not pressed) and the radio must be on and within range. On-screen alerts will help guide the user in the event that all start conditions aren't met.

   NOTE: If at any point in radio enabled mode the radio signal is lost or turned off (eg: E-Stop button on radio remote is pressed) the HT HydroSeeder® will shut down and display an appropriate message on the main operating screen.

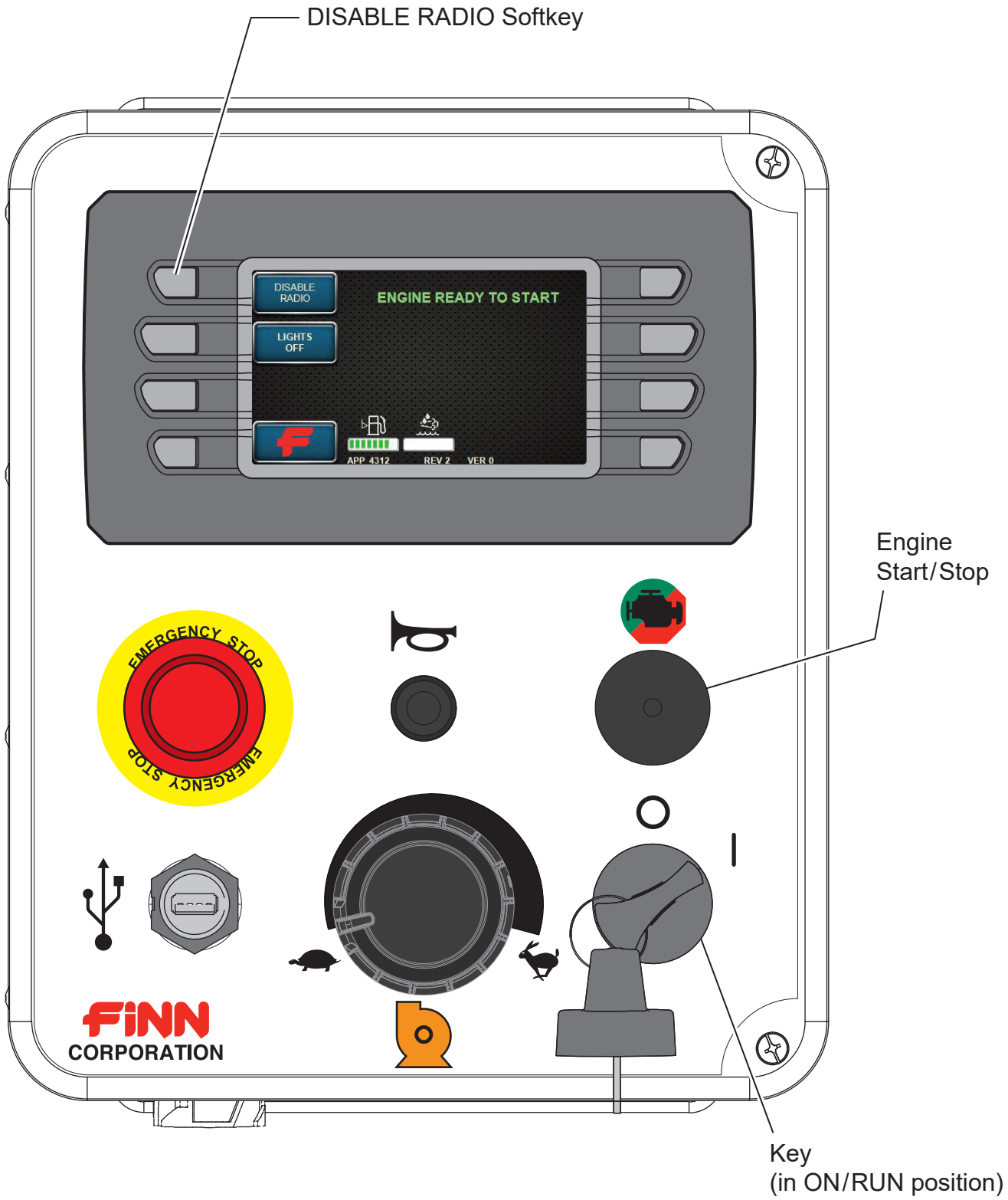
   NOTE: From the initial screen prior to start, radio disable and lighting options (should this option be equipped on the HT HydroSeeder®) are able to be controlled without starting the engine.

2. Press and hold the **ENGINE START/STOP** button until engine starts and screen continues to main HT operating screen. If at any point during engine operation a fault condition is detected, alert icons will be shown on the main operating screen; additional information about alerts are available in the diagnostics menus.

   NOTE: This engine has several safety measures in place that will shut the engine down immediately to prevent damage. Refer to the included John Deere engine manual for additional info on shutdown conditions and how to address these. If a shutdown condition exists, the main control screen will show alerts and an appropriate engine code to assist in addressing these conditions.

3. At first start, the HT HydroSeeder® will boot into Beginner Mode. Beginner Mode is designed to guide even the most inexperienced users successfully through a typical hydroseeding application. Pressing the **FINN (F)** softkey in the lower left-hand corner of the digital display control panel will allow the user to change the mode of operation to **PRO MODE**, should this be desired.

STARTING PROCEDURE (CONTINUED)



TROUBLESHOOTING YOUR HYDROSEEDER®

Because of the tremendous work load usually placed upon the HydroSeeder®, minor malfunctions will occur from time to time. If these are not remedied immediately, they could lead to poor performance and damage to the equipment. This section describes symptoms, possible causes, and potential corrective action(s) to take.

1. Foam in the tank and air entrainment:

   The mixture of dry materials with water will sometimes cause excessive foaming, while other dry materials with water mixtures will cause air entrainment. These situations could reveal themselves with the occurences of an erratic slurry discharge, a drop in the pressure of the discharge, or a drop-off in distance of slurry discharge.

   Some solutions are:

   A. As slurry level drops in the tank, slow the agitators.
   B. Add antifoaming agent to tank per manufacturer's recommended rates.
   C. If you can determine which additive is causing the air problem (assuming it's not specifically water), either add it last or not at all.

2. Plugging or clogging:

⚠ DANGER ***Turn off engine and follow appropriate lock out, tag out procedures before working on equipment. Failure to comply could result in death or serious injury.***

Sometimes, when a stoppage occurs, you will not be able to find anything in the line. When this happens, it means that the system may have become airbound instead of plugged. To remedy this, see the TROUBLESHOOTING CHART later in this section. Plugging can occur in any of the following places: recirculation valve or bypass orifice, the discharge nozzle, the pump area, the sump area. The plugging is most typically caused by either foreign objects or dewatered mulch.

Obstruction in the discharge nozzle is characterized by a change in or stoppage of the spray pattern.

1. Disengage (turn off) any operating modes and shut down engine.
2. Make certain that pump has stopped rotating.
3. Slowly and carefully remove nozzle.
4. Using the nozzle cleaning rod attached to the underside of the nozzle tray, clear the nozzle.

⚠ DANGER ***Severe injury can result from opening clamps when piping is hot. Before loosening any clamps, determine if the pipe is hot. If so, let it cool before attempting repair. Failure to comply will result in death or serious injury.***

If the recirculation system is not working:

1. Disengage (turn off) any operating modes and shut down engine.
2. Ensure the machine is made safe by appropriate lock out, tag out procedures.
3. Close recirculation valve and suction valve.
4. Remove two clamps on each side of bypass orifice, and slide rubber seals back and remove orifice assembly.
5. Check bypass orifice and visible piping. Clear any obstructions.
6. Replace bypass orifice, reinstall seals and clamps; and re-open both recirculation valve and suction valve.

3. Obstruction in the pump, (determined by a drop in pressure or pump cavitation).

⚠ DANGER ***Turn off engine and follow appropriate lock out, tag out procedures before working on equipment. Failure to comply could result in death or serious injury.***

If the drop in pressure is accompanied by a frothy or whitish discharge stream, the blockage is in the suction line or sump area. To clear the pump:

A. Disengage (turn off) pump and stop the engine.

B. Loosen the suction pipe clamps. If there is material in the tank, shut off the suction line valve.

C. Remove the clamp closest to the pump.

NOTE: If no water comes out, obstruction is in sump area.

D. Reach into the pump and remove the obstruction. If jammed, the pump suction cover may need to be removed.

E. Reassemble, removing pipe plug in the process.

F. Open suction line valve.

4. Obstruction in sump area (located at the bottom of the tank on the inside where the suction pipe is attached).

A. Easiest: To clear the sump area: Backflush through the discharge plumbing with the water supply hose.

⚠ DANGER ***Turn off engine and follow appropriate lock out, tag out procedures before working on equipment. Failure to comply could result in death or serious injury.***

B. Another method: Remove the drain plug and run a long pole through the opening and into the sump area. Remove the obstruction and replace the drain cap.

NOTE: Tank draining may occur.

NOTICE ***Do not turn the pump shaft backward with a wrench. This will unscrew pump impeller from pump shaft. Consequently, when pump is engaged (turned on), the pump impeller will screw onto pump shaft with a force great enough to break pump impeller.***

TROUBLESHOOTING YOUR HYDROSEEDER® (CONTINUED)

Problem	Potential Causes	Suggested Solutions
LEAKS		
Tank Bearing	Seal worn	Replace seal and follow lube schedule.
	Flex plate seal has compressed	Check torque on all flex-plate nuts by tightening in a star-pattern to 20 lb-ft (27.1 N-m)
Pressure Pipe Clamps	Rubber seal cracked, pinched, or torn.	Replace, always grease seal before clamping shut.
Suction Pipe Clamps	Rubber seal cracked, pinched, or torn	Replace, always grease seal before clamping shut.
Discharge Swivels	Not greased often enough and/or seals are worn	Rebuild monitor with repair kit (part number A4666-001.
Pump Shaft	Pressure lubricator not serviced	Replace pump seal. Service automatic pressure lubricator daily.
Pump Suction Cover	O-ring bad	Replace O-ring; use grease when replacing.
Discharge Boom or Nozzle Camlock Fittings	Worn or no gasket	Replace gasket.
FOAMING OF SOLUTION AND LACK OF DISTANCE		
Pump loses prime – lacks distance	Sucking air in suction lines	Check all suction connections to see that rubber seals are in good shape. Grease seals before replacing clamps.
	Air entrainment	See earlier in TROUBLESHOOTING YOUR HYDROSEEDER SECTION.
	Soft water	Slow the agitator.
	Too much agitation	Slow the agitator.
	Pump worn	Reset pump tolerance. See PUMP MAINTENANCE SECTION.
	Suction partially plugged	Clean out machine. See CLEANING AND MAINTENANCE SECTION.
	Nozzle worn or plugged	Clean nozzles; replace if necessary
	Fertilizer	Change type.

TROUBLESHOOTING YOUR HYDROSEEDER® (CONTINUED)

Problem	Potential Causes	Suggested Solutions
VALVES		
Valve stuck	Frozen	Thaw out ice and lubricate; leave in discharge (open) position during storage.
Constant plugging during operation	Foreign material in slurry	Drain and clean out tank.
Constant plugging during loading and discharging	Loading HydroSeeder® with mulch faster than water fill rate allows.	Load applied materials into machine slower.
	Not moving valve handle far enough	Valve should be fully open.
	Machine not being flushed out prior to reloading	See LOADING SECTION.
Extension hose plugs after use	Letting water run out, leaving wood fiber mulch to dry out	If hose has to be uncoupled, seal ends, to keep water in hose and prevent wood fiber mulch from drying out.
PUMP		
Excessive wear	Fertilizer with highly abrasive fillers	Change fertilizer – avoid abrasive fillers.
	Overloading machine with dry material	Load machine to recommended capacities.
Will not turn	Frozen	Warm housing to melt ice.
	Jammed with fertilizer or lime	Remove cover and clean interior.
	Impeller rusted to suction cover plate	Pull cover and remove rust.

CLEANING AND MAINTENANCE

DAILY

1. Cleaning the HydroSeeder®
   - A. Fill slurry tank to center of upper agitator shaft with clean water.
   - B. Turn on both agitators in the MIX direction at 100% to loosen remaining material stuck in tank.
   - C. Remove discharge nozzle and gasket from discharge boom.
   - D. While pointing discharge toward an open area, move agitators to SPRAY direction at a lower percent (approximately 25%) and turn on slurry pump. Allow to discharge until clear water is visible.
   - E. Turn off slurry pump and agitators. Turn off machine.
   - G. Always remove drain plug and allow the tank to drain.
   - H. In freezing weather, leave slurry tank drain cap off and remove pump drain plug. Move all slurry valves to OPEN position.
   - I. Wash the outside of the HydroSeeder® , including the radiator, to remove any corrosive materials.
   - J. If using lime, daily maintenance should be performed.
   - K. Clean out and drain extension hoses.
2. Lubricating the HydroSeeder® – See LUBRICATION AND FLUIDS CHART.

NOTICE ***Change engine oil and filter at least once annually.***

- A. Service the automatic pressure lubricator on pump as needed.
- B. Check the engine oil daily. Refer to engine operator's manual for suggested maintenance schedule and specifications.
- C. Lubricate the swivel on the discharge assembly and the swivel on the hose reel.
- D. If equipped with the Air Flush Option, refer to the Air Flush System Manual.

WEEKLY OR EVERY 40 HOURS OF OPERATING TIME

1. Clean the air cleaner following the instructions in the Engine Operator’s Manual.
2. Lubricate all the points on the HydroSeeder® as outlined in DAILY.
3. Check the level in the hydraulic oil reservoir; maintain level at sight gauge (the oil level should be within 1 inch of the top of the sight gauge).
4. Check coolant level. Coolant should be visible in the sight glass on the side of the aluminum overflow tank above the radiator.
5. Inspect the slurry tank for buildup of residue in the suction area and clear if necessary.
6. Check and clean engine radiator. Flush with clear, low-pressure waterspray and blow dry with compressed air. Do NOT use high-pressure water spray.

MONTHLY OR EVERY 160 HOURS OF OPERATING TIME

1. Lubricate the agitator shaft bearings located on the outside front and rear of slurry tank.
2. Lubricate the two pump bearings (use the lube points on the rear lube manifold).

CLEANING AND MAINTENANCE (CONTINUED)

SEASONAL AND WINTER STORAGE MAINTENANCE

1. Drain the slurry tank of all water, prior to storage, and leave the drain cap uninstalled.
2. If possible, cover machine with tarp or park inside of an enclosure.
3. Store the HydroSeeder® with all slurry valve handles in the open position. To prevent damage from freezing, it is advisable to open all slurry valves, remove all slurry drain plugs and store in a climate controlled area.
4. Pour 1 qt (0.95 L) of mineral oil or environmentally safe lubricant into the pump housing and spin pump by hand to prevent rust in the pump. Remove drain plug.
5. Chip and steel-brush any interior rust spots in the slurry-tank and touch up with paint. See IV. MAINTENANCE of the HYDROSEEDER® SAFETY SUMMARY SECTION.
6. Lubricate all fittings.
7. Check antifreeze in radiator. Add antifreeze as required.
8. Lubricate equipment again just prior to putting into operation after having been in storage.
9. Change hydraulic oil and filter. (500 hours)
10. Disconnect battery. In cold weather, remove battery and store it in a safe, warm place.
11. Add fuel stabilizer to fuel tank.

CLEANING AND MAINTENANCE SCHEDULE

CLEANING AND/OR MAINTENANCE TASK	FREQUENCY	After Every Load	Daily (Every 8 Hours)	Weekly (Every 40 Hours)	Monthly (Every 160 Hours)	Seasonal/Winter Storage
Grease agitator shaft bearings (4x, NLGI #2 grease)	◆			◆		
Grease pump housing bearings (2x, NLGI #2 grease)	◆			◆		
Grease pump pressure lubricator (1x, sodium grease)	◆		◆			
Grease swivels on discharge booms (2x per, NLGI #2 grease)	◆					
Grease swivel on hose reel if equipped (1x, NLGI #2 grease)	◆					
Check hydraulic oil level		◆			◆	
Check slurry tank for buildup or other obstructions	◆	◆			◆	
Check engine air filter				◆	◆	
Check engine oil level/condition			◆		◆	
Check engine coolant level/condition			◆		◆	
Drain tank of all water	◆	◆			◆	
Change hydraulic oil and filters [075747-C and A3055-001 (the two filter elements in the engine module)]					◆	
Check and clean engine and hydraulic radiator; charge air cooler.*				◆	◆	
Flush pump, extension hose, booms and then remove pump case drain plug	◆	◆			◆	
Remove all drain plugs/caps, open boom, slurry and extension hose valves					◆	
Disconnect battery (main battery isolation switch), add fuel stabilizer and store battery inside if in cold climate.					◆	
Pour 1 qt. (0.95 L) of mineral oil or environmentally safe lubricant into pump housing and spin pump slowly to prevent rust in the pump. Remove drain plug after.					◆	

◆	Perform indicated Cleaning or Maintenance listed.
*	Flush with clear, low-pressure waterspray and blow dry with compressed air. **DO NOT** use high-pressure water spray.
	If ***not*** using lime or other corrosive additives, the standard time increment listed with this marking is recommended.
	If using lime or other corrosive additives, it's suggested to flush the tank after every load and perform the cleaning or maintenance tasks listed with this marking.

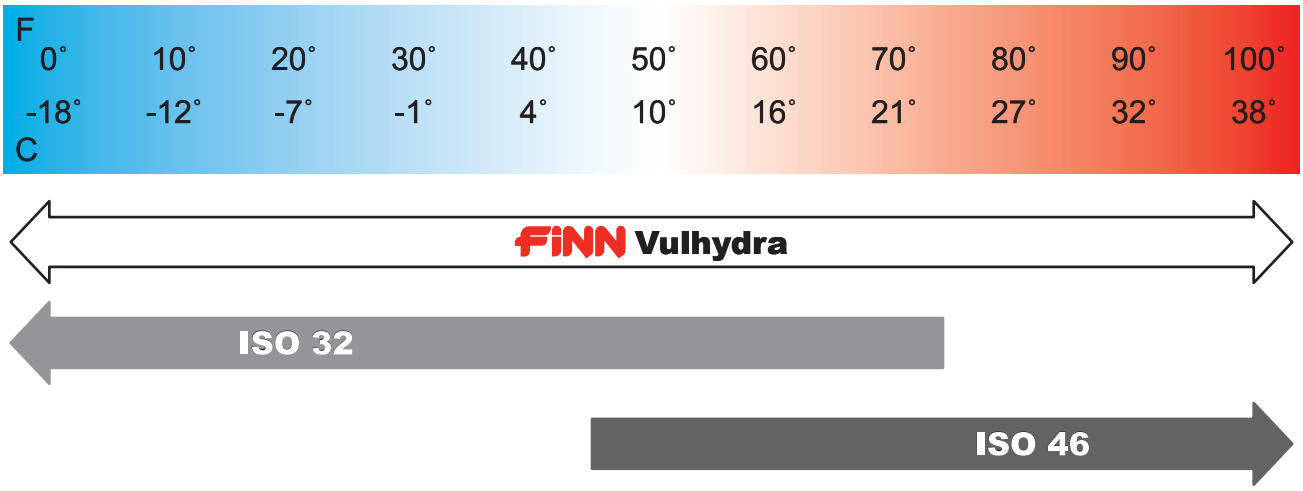
HYDRAULIC SYSTEM

The hydraulic system on your FINN HydroSeeder® is designed to give trouble-free service, if maintained. The most important areas of maintenance are the hydraulic oil and filtration. The reservoir holds 82 gallons (310 L) of hydraulic oil.

The hydraulic oil should be replaced per the LUBRICATION AND FLUIDS CHART, or if the oil becomes milky or gives off a burnt odor. The hydraulic oil filter must be replaced on schedule with a FINN hydraulic filter (part number A3055-001 and 075747-C).

At time of manufacture, this unit contains Finn Vulhydra hydraulic oil. The chart below illustrates the operating temperature range of the Finn Vulhydra hydraulic oil as well as the closest ISO equivalents.

NOTE: The Finn Vulhydra hydraulic oil may be substituted for either of the two ISO oils listed below. Please use the temperature chart to determine what oil works best in your situation.



PUMP ASSEMBLY MAINTENANCE

⚠ CAUTION ***Pump assembly maintenance should be performed only when the machine is turned off and the batteries have been disconnected. Follow appropriate lock out, tag out procedures before beginning pump maintenance. Failure to comply could also result in personal, product or property damage.***

NOTE: Refer to cross-section illustration and parts list for materials and location. The cross-section illustration is located at the end of this section. The illustration is titled Total Pump Assembly.

DISASSEMBLY

A. PUMP REMOVAL

1. Remove the pipe clamp and suction pipe located between the suction gate valve the pump inlet.
2. Remove the pipe clamps and pump discharge tree located between the pump outlet and the boom piping.
3. Remove the three pump shaft guards.
4. Disconnect the grease hoses attached to the pump assembly.
5. Close all hydraulic valves on the hydraulic oil reservoir located between the engine and the tank at the front of the machine. There are a total of four valves, two ball valves, and two butterfly valves.
6. Disconnect the four hydraulic hoses attached the pump hydraulic motor. Cap and/or plug both the hoses and fittings to avoid excess oil leakage.
7. Remove the pump hydraulic motor, the pump/motor adapter, and one of the coupling hubs as one unit by removing the four fasteners that attach the pump/motor adapter to the pump assembly.
8. Remove the four fasteners that secure the pump assembly in the pump module base. Do not remove the pump mount brackets located on the sides of the pump casing.
9. Remove the pump assembly from the pump module base using the two lifting points provided, one on the pump casing and one on the pump frame.

B. PUMP DISASSEMBLY

1. Remove the automatic lubricator (1), pipe elbow (2), and pipe nipple (3).
2. Remove the coupling hub (4) and key (5) from the drive end of the pump shaft (6)
3. Remove the pump casing (7V or 7C).
4. Restrain the pump shaft (6) using the flats on exposed portion of the shaft to prevent rotation while removing the impeller (8V or 8C). A 2-1/4 in. wrench may be used.
5. If a vortex impeller is installed (straight vanes) remove the impeller retaining bolt (9) and lockwasher (10) by turning clockwise; this bolt has left-hand threads. Otherwise, proceed to the next step.
6. Put a block of wood against one of the impeller vanes. Strike the wooden block with a dead-blow hammer to turn the impeller (8V or 8C) counterclockwise as viewed from the suction end.

NOTICE ***Check for runout to see that the shaft has not been bent. If runout exceeds 0.005 in., replace the shaft. Bearing journals and oil seal journals must be smooth and free of scratches or grooves. Shaft threads must be in good condition. Replace shaft if necessary.***

PUMP ASSEMBLY MAINTENANCE (CONTINUED)

DISASSEMBLY (CONTINUED)

C. MECHANICAL SEAL

Seal faces, gaskets and shaft sealing members must be in perfect condition or leakage may result. Replace worn or damaged parts.

D. BEARINGS

Replace if worn, loose, or rough and noisy when rotated.

E. SEALS AND O-RINGS

It is recommended that all seals and o-rings be removed during disassembly and replaced.

F. GENERAL

All parts should be clean before re-assembly. This is especially important at retaining ring and o-ring grooves, threads, gasket sealing surfaces, and bearing and seal journals. Any burrs should be removed with emery cloth (120 grit or finer). Any loose abrasive left from the emery cloth should be carefully cleaned from the parts.

ASSEMBLY

A. PUMP ASSEMBLY

1. Remove one of the bearing shields on the inboard bearing (21) and discard.
2. Apply anti-seize compound to the inner race of the inboard bearing (21) and the pump shaft (6) journal for the inboard bearing (21). With the side of the inboard bearing (21) with the shield removed facing the shaft shoulder, press the inboard bearing (21) onto the pump shaft (6) ensuring that the inner race is fully seated on the shaft shoulder. Apply load to the inner race only when pressing bearings onto the pump shaft.
3. Place the retaining ring (23) loosely over the pump shaft (6).
4. Apply anti-seize compound to the inner race of the outboard bearing (22) and the pump shaft (6) journal for the outboard bearing (22). Press the outboard bearing (22) onto the pump shaft (6) ensuring that the inner race is fully seated on the shaft shoulder. Apply load to the inner race only when pressing bearings onto the pump shaft.
5. Apply anti-seize compound to the threads on the pumps shaft (6) adjacent to the outboard bearing (22). Install the lockwasher (25) and locknut (26) onto the pump shaft (6) to retain the outboard bearing (22). The chamfer on the locknut (26) should be against the inner race of the outboard bearing (22). Tighten the locknut to 64-90 lb-ft, then bend the lockwasher (25) tab into the locknut (26) to secure.
6. Pack both bearings (21) and (22) with NLGI #2 multi-purpose grease.
7. Remove the garter spring from the grease seal (24) and discard the spring. Apply a thin bead of Loctite 640 or similar retaining compound to the outer diameter of the grease seal (24) and install the grease seal (24) into the outboard bearing housing (19) with the seal lip directed towards the housing. Generously lubricate the rubber seal lip with grease.
8. Install the o-ring (27) onto the outer bearing housing (19).
9. Lightly grease the outer diameter of the outboard bearing (22) and the inner diameter of the outboard bearing housing (19).
10. Insert the bearing and shaft assembly, outboard bearing (22) end first, into the outboard bearing housing (19). Be careful not to damage the grease seal.

PUMP ASSEMBLY MAINTENANCE (CONTINUED)

ASSEMBLY (CONTINUED)

A. PUMP ASSEMBLY (CONTINUED)

11. Install the retaining ring (23), ensuring that it is fully seated in the groove.
12. Lightly grease the outer diameters of the outboard bearing housing (19) and the inboard bearing (21).
13. Lightly grease the machined inner diameters of the pump frame (14).
14. Install the outboard bearing housing and shaft assembly into the pump frame (14). The grease port on the outer bearing housing (19) should be aligned with the lifting lug on the pump frame (14).
15. Secure the outboard bearing housing (19) with three 1/2-13 x 1-1/2 hex flange screws (28). First apply a small amount of anti-seize compound the fastener threads, then install and torque the fasteners to 57 ft-lbs.
16. Remove the garter spring from the grease seal (18) and discard the spring. Apply a thin bead of Loctite 640 or similar retaining compound to the outer diameter of the grease seal (18) and install the grease seal (18) into the bearing retainer plate (17) with the seal lip directed towards the housing. Generously lubricate the rubber seal lip with grease.
17. Install the bearing retainer plate (17) onto the pump frame (14). The chamfer on the bearing retainer housing should be aligned with the lifting lug on the pump frame (14). The bearing retainer plate is marked “TOP” for this purpose, and this text should be at the 12 o’clock position. Be careful not to damage the grease seal (18). Secure the bearing retainer plate (17) with six 5/16-18 x 1 hex flange screws (29). First apply a small amount of anti-seize compound the fastener threads, then install and torque the fasteners to 13 ft-lbs.
18. Install the roll pin (30) into the seal cover (15) ensuring that it is fully seated in the hole.
19. Remove the garter spring from the grease seal (16) and discard the spring. Apply a thin bead of Loctite 640 or similar retaining compound to the outer diameter of the grease seal (16) and install the grease seal (16) into the seal cover (15) with the seal lip directed towards the housing. Generously lubricate the rubber seal lip with grease.
20. Install the seal cover (15) on the pump frame (14). The grease port on the seal cover (15) should be aligned with the lifting lug on the pump frame (14) in the 12 o’clock position.
21. Secure the seal cover (15) with three 1/2-13 x 1-1/2 hex flange screws (13). First apply a small amount of anti-seize compound the fastener threads, then install and torque the fasteners to 57 ft-lbs.
22. Lightly grease the pump shaft (6) as well as the seal cover (15) bore and lead-in chamfers for the installation of the mechanical seal (11). Lightly grease the o-ring and shaft seals on the rotating seal ring and stationary seat of the mechanical seal (11).
23. Carefully install the stationary seat of the mechanical seal (11) into the seal cover (15) being sure to align the groove on the stationary seat of the mechanical seal (11) with the roll pin (30) in the seal cover (15). Push gently on a side alternating from side to side until the stationary seat is all the way down. Wipe any excess grease off of the stationary seat with a clean cloth.
24. Install the rotating seal ring of the mechanical seal (11) onto the pump shaft (6) making sure no dirt or debris is on either of the mechanical seal faces.
25. Install the spring seat of the mechanical seal (11) and o-ring (12) onto the impeller (8V or 8C). Use a thin layer of grease to hold the o-ring (12) in the groove on the impeller (8V or 8C).
26. Apply anti-seize compound to the threads on the end of the pump shaft (6).

PUMP ASSEMBLY MAINTENANCE (CONTINUED)

ASSEMBLY (CONTINUED)

A. PUMP ASSEMBLY (CONTINUED)

27. Restrain the pump shaft (6) using the flats on exposed portion of the shaft to prevent rotation while installing the impeller (8V or 8C). A 2-1/4 in. wrench may be used.
28. Place the mechanical seal spring onto the spring seat and install the impeller (8V or 8C), o-ring (12), spring seat, and spring onto the pump shaft (6). Thread the impeller onto the shaft by turning clockwise being sure that the spring engages in the spring seat on the impeller (8V or 8C). Put a block of wood against one of the impeller vanes. Tighten the impeller (8V or 8C) by striking the wooden block with a dead-blow hammer with three or four solid blows.
29. If a vortex impeller (8V) is installed (straight vanes) install the impeller retaining bolt (9) and lockwasher (10) by turning counterclockwise; this bolt has left-hand threads. Prior to installation, the lockwasher (10) will need to be converted to a left-hand orientation by means of a vice and pliers. First apply a small amount of anti-seize compound the impeller retaining bolt (9) threads, then install and torque the impeller retaining bolt (9) to 160 ft-lbs. Otherwise, proceed to the next step.
30. Using feeler gauges, measure the clearance between the vanes on the back of the impeller (8V or 8C) and the seal cover (15). The clearance should be between 0.015 in. and 0.020 in. If the clearance is within this range, proceed to the next step. If the clearance is greater than 0.020 in., subtract 0.015 in. from the measured clearance. The result is the thickness of shims (20) to be added between the outboard bearing housing (19) and pump frame (14). Loosen the three 1/2-13 x 1-1/2 hex flange screws (28) that secure the outboard bearing housing (19). Withdraw the outboard bearing housing (19) from the pump frame (14). Two threaded holes are provided in the outboard bearing housing (19) to use jack bolts for this purpose. Install the required shims (20) evenly in the three bolt positions. Remove the jack bolts and re-tighten the 1/2-13 x 1-1/2 hex flange screws (28) to 57 ft-lbs. Recheck the impeller (8V or 8C) to seal cover (15) clearance and adjust as necessary.
31. Install the o-ring (31) onto the outer diameter of the seal cover (15).
32. Lightly grease the outer diameter of the seal cover (15), the o-ring (31), and the inner diameter of the casing (7V or 7C).

PUMP ASSEMBLY MAINTENANCE (CONTINUED)

ASSEMBLY (CONTINUED)

A. PUMP ASSEMBLY (CONTINUED)

31. Install the casing (7V or 7C).

    VORTEX

    Push the casing (7V) firmly onto the seal cover (15). The arrow on the casing that indicates direction of pump rotation should be at the 12 o'clock position. There should be no gap between the casing (7V) and the seal cover (15). Secure the casing (7V) with eight 3/4-10 x 2 hex cap screws, flat washers, and lock washers (32). First apply a small amount of anti-seize compound the fastener threads, then install and torque the fasteners to 200 ft-lbs.

    CENTRIFUGAL

    Push the casing (7C) firmly onto the seal cover (15) until the casing (7C) is in full and even contact with the impeller (8C). Secure the casing (7C) with eight 3/4-10 x 2 hex cap screws, flat washers, and lock washers (32). First apply a small amount of anti-seize compound the fastener threads, then install the fasteners finger-tight.

    Install eight 3/4-10 x 2 hex cap screws, with 3/4 nuts screwed all the way onto them (33) into the threaded holes of the seal cover (15). First apply a small amount of anti-seize compound to the fastener threads, then install the fasteners finger-tight such that the ends of the screws are in contact with the casing (7C).

    Loosen the first set of eight fasteners (32) by 2 turns each. Tighten the second set of eight fasteners (33) one-and-one-quarter turn each and then torque the jam nuts to 140 ft-lbs. in a crisscross pattern while holding the screws in position. Torque the first set of 8 fasteners (32) to 140 ft-lbs. in a crisscross pattern.

    Using feeler gauges, measure the clearance between the vanes on the front of the impeller (8C) and the casing (7C). The clearance should be between 0.030 in. and 0.040 in. If the clearance is within this range, proceed to the next step. If the clearance is not within this range, adjust the casing fasteners as required to achieve the correct clearance. Rotate the impeller (8C) by hand to ensure that it turns freely through a full revolution with no rubbing.

32. Install the coupling hub (4) and 5/16 in. x 5/16 in. x 2 in. key (5) onto the drive end of the pump shaft (6). The end of the pump shaft (6) should be flush with the bottom of the counterbore in the hub (4). Torque cross clamp screw on the coupling hub (4) to 45 ft-lbs.
33. Install the automatic lubricator (1), pipe elbow (2), and pipe nipple (3).

PUMP ASSEMBLY MAINTENANCE (CONTINUED)

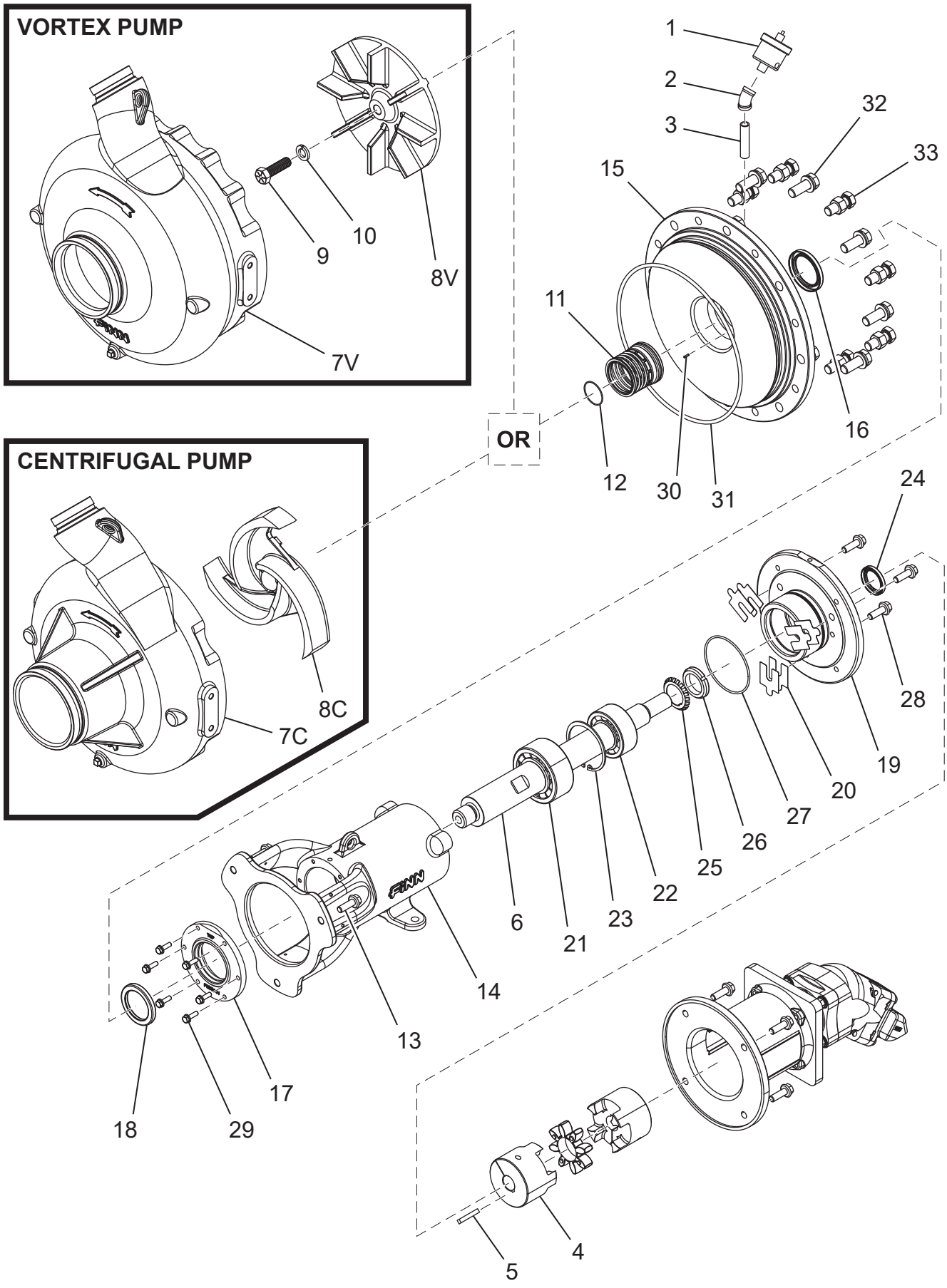
ASSEMBLY (CONTINUED)

B. PUMP INSTALLATION

1. Place the pump assembly into the pump module base using the two lifting points provided, one on the pump casing and one on the pump frame.
2. Secure the pump assembly into the pump module base using four 1/2-13 x 1-3/4 hex flange screws, flat washer, and locknuts. Do not fully tighten the fasteners until all of the piping connections are made to the pump.
3. Install the pump hydraulic motor and the the pump/motor adapter. Be sure to align the two coupling hubs and install the coupling insert between them. Secure the pump/motor adapter with four 1/2-13 x 1-1/2 hex flange screws. First apply a small amount of anti-seize compound the fastener threads, then install and torque the fasteners to 57 ft-lbs.
4. Connect the four hydraulic hoses attached the pump hydraulic motor.
5. Connect the grease hoses to the pump assembly.
6. Install the three pump shaft guards. Secure them using two 1/4-20 x 3/4 hex flange screws each. First apply a small amount of anti-seize compound the fastener threads, then install and torque the fasteners to 6 ft-lbs.
7. Install and connect the pump discharge tree and secure with pipe clamps.
8. Install the suction pipe between the suction gate valve and the pump inlet and secure with pipe clamp and fasteners.
9. Tighten the fasteners that secure the pump assembly into the pump module base from *Step 2* above. Torque the fasteners to 64 ft-lbs.
10. Open all hydraulic valves on the hydraulic oil reservoir located between the engine and the tank at the front of the machine. There are a total of four valves, two ball valves, and two butterfly valves.

PUMP ASSEMBLY MAINTENANCE (CONTINUED)

TOTAL PUMP ASSEMBLY

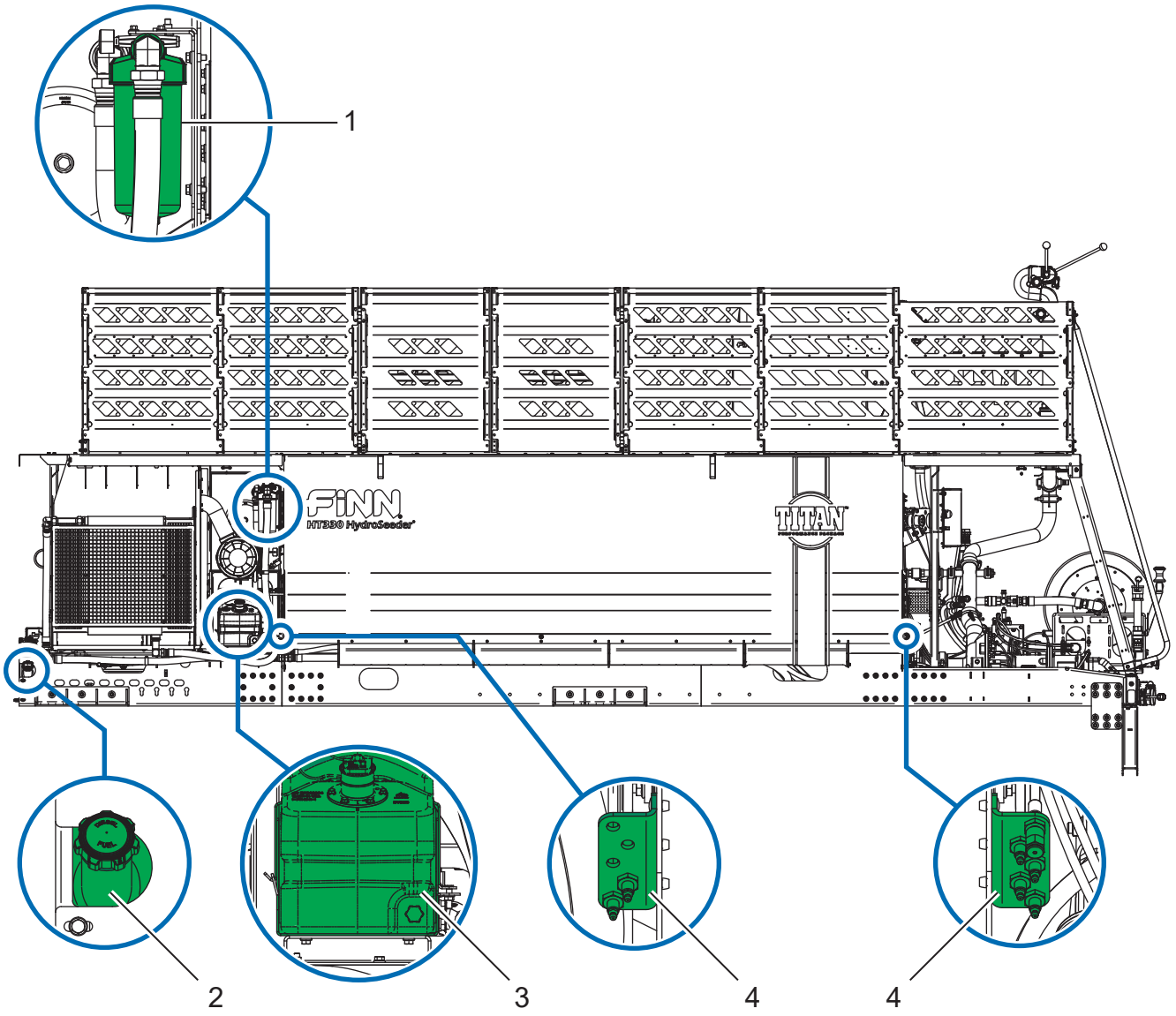


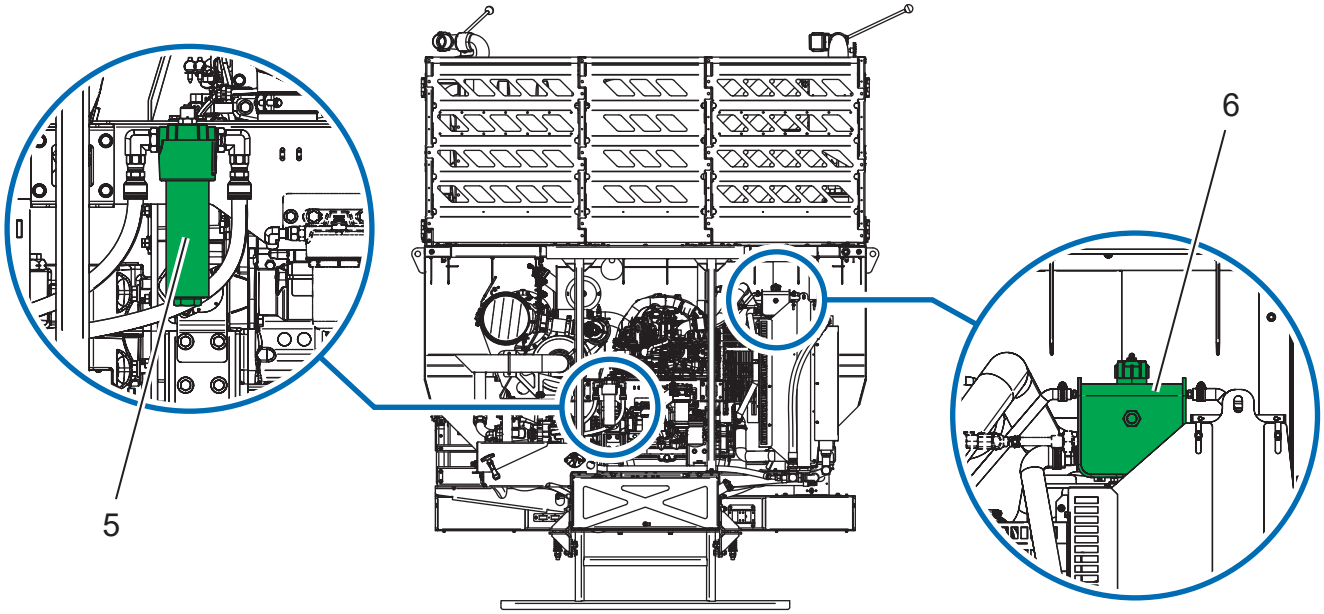
PUMP ASSEMBLY MAINTENANCE (CONTINUED)

TOTAL PUMP ASSEMBLY

Ref. No.	Description
1	Automatic Lubricator
2	Pipe Elbow
3	Pipe Nipple
4	Coupling Hub
5	Key
6	Pump Shaft
7V	Vortex Pump Casing
7C	Centrifugal Pump Casing
8V	Vortex Pump Impeller
8C	Centrifugal Pump Impeller
9	Impeller Retaining Bolt
10	Lockwasher
11	Mechanical Seal
12	O-ring
13	1/2-13 x 1-1/2 Hex Flange Screw
14	Pump Frame
15	Seal Cover
16	Grease Seal
17	Bearing Retainer Plate
18	Grease Seal
19	Outboard Bearing Housing
20	Shims
21	Inboard Bearing
22	Outboard Bearing
23	Retaining Ring
24	Grease Seal
25	Lockwasher
26	Locknut
27	O-ring
28	1/2-13 x 1-1/2 Hex Flange Screw
29	5/16-18 x 1 Hex Flange Screw
30	Roll Pin
31	O-ring
32	3/4-10 x 2 Hex Cap Screw, 3/4 Flat Washer, 3/4 Lock Washer
33	3/4-10 x 2 Hex Cap Screw, 3/4 Nuts

THESE PAGES ARE FOR REFERENCE TO THE PUMP MAINTENANCE SECTION. SEE PARTS MANUAL FOR PART NUMBERS TO ORDER REPLACEMENT PARTS.


1
FINN
HTB80 HydroSeeder
TITAN
2
3
4
4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6

LUBRICATION, FILTERS AND FLUIDS CHART

Ref. No.	Description	Fluid
1	10 micron Filter (Filter Element part number A3055-001)	-----
2	Fuel Tank	Ultra Low Sulfur Diesel Fuel
3	Diesel Exhaust Fluid (DEF) System	DEF Fluid
4	Grease Service Points	See Service Point Decal for Information
5	High Pressure Filter (Filter Element part number 075747-C)	-----
6	Engine Coolant Resrvoir	50/50 Antifreeze and Water Mixture

NOT SHOWN

Engine Air Filter (part number A3002-001)

Primary Fuel Filter with Water Separator (part number A2021-001)

Secondary Fuel Filter (part number A2022-001)

Engine Oil Filter (part number A1927-001)

FLUID CAPACITIES

Fuel	50 gallons (189 L)
Hydraulic Oil	82 gallons (310 L)
Engine Coolant	See Engine Manual
Engine Oil	See Engine Manual

CLEANING AND MAINTENANCE LOG

Load **includes** using lime or other corrosive additives. Flush the tank after every load.

CLEANING AND/OR MAINTENANCE TASK	LOAD 1	LOAD 2	LOAD 3	LOAD 4	LOAD 5	LOAD 6	LOAD 7	LOAD 8
Grease agitator shaft bearings (4x, NLGI #2 grease)								
Grease pump housing bearings (2x, NLGI #2 grease)								
Grease pump pressure lubricator (1x, sodium grease)								
Grease swivels on discharge booms (2x per, NLGI #2 grease)								
Grease swivel on hose reel if equipped (1x, NLGI #2 grease)								
Check slurry tank for buildup or other obstructions								
Drain tank of all water								
Flush pump, extension hose, booms and then remove pump case drain plug								
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

CLEANING AND/OR MAINTENANCE TASK	LOAD 9	LOAD 10	LOAD 11	LOAD 12	LOAD 13	LOAD 14	LOAD 15	LOAD 16
Grease agitator shaft bearings (4x, NLGI #2 grease)								
Grease pump housing bearings (2x, NLGI #2 grease)								
Grease pump pressure lubricator (1x, sodium grease)								
Grease swivels on discharge booms (2x per, NLGI #2 grease)								
Grease swivel on hose reel if equipped (1x, NLGI #2 grease)								
Check slurry tank for buildup or other obstructions								
Drain tank of all water								
Flush pump, extension hose, booms and then remove pump case drain plug								
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

CLEANING AND MAINTENANCE LOG (CONTINUED)

Load **DOES NOT** include using lime or other corrosive additives. ***Daily*** cleaning and maintenance.

CLEANING AND/OR MAINTENANCE TASK										
Check hydraulic oil level										
Check slurry tank for buildup or other obstructions										
Drain tank of all water										
Flush pump, extension hose, booms and then remove pump case drain plug										
	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____

CLEANING AND/OR MAINTENANCE TASK										
Check hydraulic oil level										
Check slurry tank for buildup or other obstructions										
Drain tank of all water										
Flush pump, extension hose, booms and then remove pump case drain plug										
	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____

CLEANING AND/OR MAINTENANCE TASK										
Check hydraulic oil level										
Check slurry tank for buildup or other obstructions										
Drain tank of all water										
Flush pump, extension hose, booms and then remove pump case drain plug										
	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____

CLEANING AND MAINTENANCE LOG (CONTINUED)

Load **DOES NOT** include using lime or other corrosive additives. ***Weekly*** cleaning and maintenance.

CLEANING AND/OR MAINTENANCE TASK										
Grease pump pressure lubricator (1x, sodium grease)										
Check engine oil level/condition										
Check engine coolant level/condition										
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

CLEANING AND/OR MAINTENANCE TASK										
Grease pump pressure lubricator (1x, sodium grease)										
Check engine oil level/condition										
Check engine coolant level/condition										
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

CLEANING AND/OR MAINTENANCE TASK										
Grease pump pressure lubricator (1x, sodium grease)										
Check engine oil level/condition										
Check engine coolant level/condition										
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

CLEANING AND MAINTENANCE LOG (CONTINUED)

Load **DOES NOT** include using lime or other corrosive additives. ***Monthly*** cleaning and maintenance.

CLEANING AND/OR MAINTENANCE TASK										
Grease agitator shaft bearings (4x, NLGI #2 grease)										
Grease pump housing bearings (2x, NLGI #2 grease)										
Check engine air filter										
Check and clean engine and hydraulic radiator; charge air cooler.*										
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

CLEANING AND/OR MAINTENANCE TASK										
Grease agitator shaft bearings (4x, NLGI #2 grease)										
Grease pump housing bearings (2x, NLGI #2 grease)										
Check engine air filter										
Check and clean engine and hydraulic radiator; charge air cooler.*										
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

CLEANING AND/OR MAINTENANCE TASK										
Grease agitator shaft bearings (4x, NLGI #2 grease)										
Grease pump housing bearings (2x, NLGI #2 grease)										
Check engine air filter										
Check and clean engine and hydraulic radiator; charge air cooler.*										
	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:

*	Flush with clear, low-pressure waterspray and blow dry with compressed air. **DO NOT** use high-pressure water spray.

CLEANING AND MAINTENANCE LOG (CONTINUED)

Seasonal/Winter Storage cleaning and maintenance.

CLEANING AND/OR MAINTENANCE TASK	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____	Date: ____
Check hydraulic oil level										
Change hydraulic oil and filter (axxx-001)										
Check slurry tank for buildup or other obstructions										
Check engine air filter										
Check engine oil level/condition										
Check engine coolant level/condition										
Drain tank of all water										
Check and clean engine and hydraulic radiator; charge air cooler.*										
Flush pump, extension hose, booms and then remove pump case drain plug										
Remove all drain plugs/caps, open boom, slurry and extension hose valves										
Disconnect battery (main battery isolation switch), add fuel stabilizer and store battery inside if in cold climate.										
Pour 1 qt. (0.95L) of mineral oil or environmentally safe lubricant into pump housing and spin pump slowly to prevent rust in the pump. Remove drain plug after.										

*	Flush with clear, low-pressure waterspray and blow dry with compressed air. **DO NOT** use high-pressure water spray.

RADIO TEST CODES

Radio Code Number	**Pump On** Toggle Switch Pressed Upwards	**Pump Off** Toggle Switch Pressed Downwards	**Reel In** Paddle Switch Pressed Downwards	**Reel Out** Paddle Switch Pressed Upwards	**Communication** Push Button Pressed	**Pump** Dial To Left-Most Position (0%)	**Pump** Dial To Right-Most Position (100%)
0	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL
1	PASS	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL
2	FAIL	PASS	FAIL	FAIL	FAIL	FAIL	FAIL
3	PASS	PASS	FAIL	FAIL	FAIL	FAIL	FAIL
4	FAIL	FAIL	PASS	FAIL	FAIL	FAIL	FAIL
5	PASS	FAIL	PASS	FAIL	FAIL	FAIL	FAIL
6	FAIL	PASS	PASS	FAIL	FAIL	FAIL	FAIL
7	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL
8	FAIL	FAIL	FAIL	PASS	FAIL	FAIL	FAIL
9	PASS	FAIL	FAIL	PASS	FAIL	FAIL	FAIL
10	FAIL	PASS	FAIL	PASS	FAIL	FAIL	FAIL
11	PASS	PASS	FAIL	PASS	FAIL	FAIL	FAIL
12	FAIL	FAIL	PASS	PASS	FAIL	FAIL	FAIL
13	PASS	FAIL	PASS	PASS	FAIL	FAIL	FAIL
14	FAIL	PASS	PASS	PASS	FAIL	FAIL	FAIL
15	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL
16	FAIL	FAIL	FAIL	FAIL	PASS	FAIL	FAIL
17	PASS	FAIL	FAIL	FAIL	PASS	FAIL	FAIL
18	FAIL	PASS	FAIL	FAIL	PASS	FAIL	FAIL
19	PASS	PASS	FAIL	FAIL	PASS	FAIL	FAIL
20	FAIL	FAIL	PASS	FAIL	PASS	FAIL	FAIL
21	PASS	FAIL	PASS	FAIL	PASS	FAIL	FAIL
22	FAIL	PASS	PASS	FAIL	PASS	FAIL	FAIL
23	PASS	PASS	PASS	FAIL	PASS	FAIL	FAIL
24	FAIL	FAIL	FAIL	PASS	PASS	FAIL	FAIL
25	PASS	FAIL	FAIL	PASS	PASS	FAIL	FAIL
26	FAIL	PASS	FAIL	PASS	PASS	FAIL	FAIL
27	PASS	PASS	FAIL	PASS	PASS	FAIL	FAIL
28	FAIL	FAIL	PASS	PASS	PASS	FAIL	FAIL
29	PASS	FAIL	PASS	PASS	PASS	FAIL	FAIL
30	FAIL	PASS	PASS	PASS	PASS	FAIL	FAIL
31	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
32	FAIL	FAIL	FAIL	FAIL	FAIL	PASS	FAIL
33	PASS	FAIL	FAIL	FAIL	FAIL	PASS	FAIL

RADIO TEST CODES (CONTINUED)

Radio Code Number	**Pump On** Toggle Switch Pressed Upwards	**Pump Off** Toggle Switch Pressed Downwards	**Reel In** Paddle Switch Pressed Downwards	**Reel Out** Paddle Switch Pressed Upwards	**Communication** Push Button Pressed	**Pump** Dial To Left-Most Position (0%)	**Pump** Dial To Right-Most Position (100%)
34	FAIL	PASS	FAIL	FAIL	FAIL	PASS	FAIL
35	PASS	PASS	FAIL	FAIL	FAIL	PASS	FAIL
36	FAIL	FAIL	PASS	FAIL	FAIL	PASS	FAIL
37	PASS	FAIL	PASS	FAIL	FAIL	PASS	FAIL
38	FAIL	PASS	PASS	FAIL	FAIL	PASS	FAIL
39	PASS	PASS	PASS	FAIL	FAIL	PASS	FAIL
40	FAIL	FAIL	FAIL	PASS	FAIL	PASS	FAIL
41	PASS	FAIL	FAIL	PASS	FAIL	PASS	FAIL
42	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL
43	PASS	PASS	FAIL	PASS	FAIL	PASS	FAIL
44	FAIL	FAIL	PASS	PASS	FAIL	PASS	FAIL
45	PASS	FAIL	PASS	PASS	FAIL	PASS	FAIL
46	FAIL	PASS	PASS	PASS	FAIL	PASS	FAIL
47	PASS	PASS	PASS	PASS	FAIL	PASS	FAIL
48	FAIL	FAIL	FAIL	FAIL	PASS	PASS	FAIL
49	PASS	FAIL	FAIL	FAIL	PASS	PASS	FAIL
50	FAIL	PASS	FAIL	FAIL	PASS	PASS	FAIL
51	PASS	PASS	FAIL	FAIL	PASS	PASS	FAIL
52	FAIL	FAIL	PASS	FAIL	PASS	PASS	FAIL
53	PASS	FAIL	PASS	FAIL	PASS	PASS	FAIL
54	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
55	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
56	FAIL	FAIL	FAIL	PASS	PASS	PASS	FAIL
57	PASS	FAIL	FAIL	PASS	PASS	PASS	FAIL
58	FAIL	PASS	FAIL	PASS	PASS	PASS	FAIL
59	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
60	FAIL	FAIL	PASS	PASS	PASS	PASS	FAIL
61	PASS	FAIL	PASS	PASS	PASS	PASS	FAIL
62	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
63	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
64	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	PASS
65	PASS	FAIL	FAIL	FAIL	FAIL	FAIL	PASS
66	FAIL	PASS	FAIL	FAIL	FAIL	FAIL	PASS
67	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS

RADIO TEST CODES (CONTINUED)

Radio Code Number	**Pump On** Toggle Switch Pressed Upwards	**Pump Off** Toggle Switch Pressed Downwards	**Reel In** Paddle Switch Pressed Downwards	**Reel Out** Paddle Switch Pressed Upwards	**Communication** Push Button Pressed	**Pump** Dial To Left-Most Position (0%)	**Pump** Dial To Right-Most Position (100%)
68	FAIL	FAIL	PASS	FAIL	FAIL	FAIL	PASS
69	PASS	FAIL	PASS	FAIL	FAIL	FAIL	PASS
70	FAIL	PASS	PASS	FAIL	FAIL	FAIL	PASS
71	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS
72	FAIL	FAIL	FAIL	PASS	FAIL	FAIL	PASS
73	PASS	FAIL	FAIL	PASS	FAIL	FAIL	PASS
74	FAIL	PASS	FAIL	PASS	FAIL	FAIL	PASS
75	PASS	PASS	FAIL	PASS	FAIL	FAIL	PASS
76	FAIL	FAIL	PASS	PASS	FAIL	FAIL	PASS
77	PASS	FAIL	PASS	PASS	FAIL	FAIL	PASS
78	FAIL	PASS	PASS	PASS	FAIL	FAIL	PASS
79	PASS	PASS	PASS	PASS	FAIL	FAIL	PASS
80	FAIL	FAIL	FAIL	FAIL	PASS	FAIL	PASS
81	PASS	FAIL	FAIL	FAIL	PASS	FAIL	PASS
82	FAIL	PASS	FAIL	FAIL	PASS	FAIL	PASS
83	PASS	PASS	FAIL	FAIL	PASS	FAIL	PASS
84	FAIL	FAIL	PASS	FAIL	PASS	FAIL	PASS
85	PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS
86	FAIL	PASS	PASS	FAIL	PASS	FAIL	PASS
87	PASS	PASS	PASS	FAIL	PASS	FAIL	PASS
88	FAIL	FAIL	FAIL	PASS	PASS	FAIL	PASS
89	PASS	FAIL	FAIL	PASS	PASS	FAIL	PASS
90	FAIL	PASS	FAIL	PASS	PASS	FAIL	PASS
91	PASS	PASS	FAIL	PASS	PASS	FAIL	PASS
92	FAIL	FAIL	PASS	PASS	PASS	FAIL	PASS
93	PASS	FAIL	PASS	PASS	PASS	FAIL	PASS
94	FAIL	PASS	PASS	PASS	PASS	FAIL	PASS
95	PASS	PASS	PASS	PASS	PASS	FAIL	PASS
96	FAIL	FAIL	FAIL	FAIL	FAIL	PASS	PASS
97	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS
98	FAIL	PASS	FAIL	FAIL	FAIL	PASS	PASS
99	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS
100	FAIL	FAIL	PASS	FAIL	FAIL	PASS	PASS
101	PASS	FAIL	PASS	FAIL	FAIL	PASS	PASS

RADIO TEST CODES (CONTINUED)

Radio Code Number	**Pump On** Toggle Switch Pressed Upwards	**Pump Off** Toggle Switch Pressed Downwards	**Reel In** Paddle Switch Pressed Downwards	**Reel Out** Paddle Switch Pressed Upwards	**Communication** Push Button Pressed	**Pump** Dial To Left-Most Position (0%)	**Pump** Dial To Right-Most Position (100%)
102	FAIL	PASS	PASS	FAIL	FAIL	PASS	PASS
103	PASS	PASS	PASS	FAIL	FAIL	PASS	PASS
104	FAIL	FAIL	FAIL	PASS	FAIL	PASS	PASS
105	PASS	FAIL	FAIL	PASS	FAIL	PASS	PASS
106	FAIL	PASS	FAIL	PASS	FAIL	PASS	PASS
107	PASS	PASS	FAIL	PASS	FAIL	PASS	PASS
108	FAIL	FAIL	PASS	PASS	FAIL	PASS	PASS
109	PASS	FAIL	PASS	PASS	FAIL	PASS	PASS
110	FAIL	PASS	PASS	PASS	FAIL	PASS	PASS
111	PASS	PASS	PASS	PASS	FAIL	PASS	PASS
112	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS
113	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS
114	FAIL	PASS	FAIL	FAIL	PASS	PASS	PASS
115	PASS	PASS	FAIL	FAIL	PASS	PASS	PASS
116	FAIL	FAIL	PASS	FAIL	PASS	PASS	PASS
117	PASS	FAIL	PASS	FAIL	PASS	PASS	PASS
118	FAIL	PASS	PASS	FAIL	PASS	PASS	PASS
119	PASS	PASS	PASS	FAIL	PASS	PASS	PASS
120	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
121	PASS	FAIL	FAIL	PASS	PASS	PASS	PASS
122	FAIL	PASS	FAIL	PASS	PASS	PASS	PASS
123	PASS	PASS	FAIL	PASS	PASS	PASS	PASS
124	FAIL	FAIL	PASS	PASS	PASS	PASS	PASS
125	PASS	FAIL	PASS	PASS	PASS	PASS	PASS
126	FAIL	PASS	PASS	PASS	PASS	PASS	PASS
127	PASS	PASS	PASS	PASS	PASS	PASS	PASS

FINN CODES

FINN Code Number	Text Shown on Display	Problem	Solution
1	E-STOP N.C. WIRE BREAK	E-stop normally closed circuit wire break	Check the normally closed contact block wiring to the e-stops, door switch, and safety relay
2	E-STOP GROUND LEVEL N.O. SHORTED	Ground level e-stop normally open circuit shorted to another circuit or normally closed circuit failed to open when button pressed	Check wiring to the contact blocks on the ground level e-stop
3	E-STOP IN-CAB N.O. SHORTED	In-cab e-stop normally open circuit shorted to another circuit or normally closed circuit failed to open when button pressed	Check wiring to the contact blocks on the in-cab e-stop
4	E-STOP PANEL N.O. SHORTED	Panel e-stop normally open circuit shorted to another circuit or normally closed circuit failed to open when button pressed	Check wiring to the contact blocks on the panel e-stop
5	E-STOP TANK LID N.O. SHORTED	Tank lid e-stop normally open circuit shorted to another circuit or normally closed circuit failed to open when button pressed	Check wiring to the contact blocks on the tank lid e-stop
8	CONTROLLER CAN-BUS OFFLINE	Controller can't be found by display on CAN bus	Check the power/ground/CAN-High/CAN-Low wiring to the controller
9	ENGINE ECU CAN-BUS OFFLINE	Engine ECU can't be found by display on CAN bus	Check the power/ground/CAN-High/CAN-Low wiring to the engine ECU
10	LOAD CENTER CAN-BUS OFFLINE	Load center (fuse/relay holder) can't be found by display on CAN bus	Check the power/ground/CAN-High/CAN-Low wiring to the load center
11	HYDRAULIC OIL LEVEL LOW	Hydraulic oil level switch input is reporting a low level condition	Check hydraulic oil level in tank and check wiring to the oil level switch
12	HYDRAULIC OIL TEMP. HOT	Hydraulic oil temperature input is reporting a hot oil condition (> 76°C, 170°F)	Wait for oil to cool down (< 71°C, 160°F) and start run mode again
13	HYDRAULIC OIL TEMP. BELOW RANGE	Hydraulic oil temperature is below range (< -40°C, -40°F)	Check wiring to the oil temperature sensor (open circuit is likely)
14	HYDRAULIC OIL TEMP. ABOVE RANGE	Hydraulic oil temperature is above range (> 150°C, 302°F)	Check wiring to the oil temperature sensor (short circuit to ground wiring is likely)
22	HOSE REEL IN SOL OPEN CIRCUIT	Hose Reel In Solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller
23	HOSE REEL OUT SOL OPEN CIRCUIT	Hose Reel Out Solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
24	HOSE REEL SPEED SOL OPEN CIRCUIT	Hose Reel Speed Solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
31	LOWER AGITATOR FWD OPEN CIRCUIT	Lower Agitator FWD solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
32	LOWER AGITATOR REV OPEN CIRCUIT	Lower Agitator REV solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
33	LOWER AGITATOR SPEED OPEN CIRCUIT	Lower Agitator Speed solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil

FINN CODES (CONTINUED)

FINN Code Number	Text Shown on Display	Problem	Solution
34	UPPER AGITATOR FWD OPEN CIRCUIT	Upper Agitator FWD solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
35	UPPER AGITATOR REV OPEN CIRCUIT	Upper Agitator REV solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
36	UPPER AGITATOR SPEED OPEN CIRCUIT	Upper Agitator Speed solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
37	PUMP SPEED SOL OPEN CIRCUIT	Pump Speed Solenoid output detected an open circuit condition	Check wiring to the solenoid and the controller, or replace the solenoid coil
38	ENGINE START RELAY OPEN CIRCUIT	Engine Start relay output detected an open circuit condition	Check wiring to the relay and the controller, or replace the relay
39	ENGINE IGNITION RELAY OPEN CIRCUIT	Engine Ignition relay output detected an open circuit condition	Check wiring to the relay and the controller, or replace the relay
40	ENGINE THROTTLE RELAY OPEN CIRCUIT	Engine Throttle relay output detected an open circuit condition	Check wiring to the relay and the controller, or replace the relay
44	FUEL SENDER VOLTAGE BELOW RANGE	Fuel level sender voltage is below range (< 0.8V)	Check wiring to the fuel sender and the controller (open circuit is likely)
45	FUEL SENDER VOLTAGE ABOVE RANGE	Fuel level sender voltage is above range (> 4V)	Check wiring to the fuel sender and the controller (short circuit to power wiring is likely)
46	CONTROLLER APP. NUMBER INVALID	The HFX controller application number received from the CAN bus is not the number expected by the VFX display (incorrect HFX model or application is not "Finn Common" project related)	Load the correct application software on the HFX controller or connect the appropriate hardware (HFX48m for HT)
47	PUMP DIAL SIGNAL 1 ABOVE RANGE	Operator Station Pump Speed Dial signal 1 voltage is above the valid range max value (4.7V) due to a wiring open/short circuit or dial failure; pump speed control will switch to signal 2	Check wiring to the dial and the controller, or replace the dial
48	PUMP DIAL SIGNAL 1 BELOW RANGE	Operator Station Pump Speed Dial signal 1 voltage is below the valid range min value (0.3V) due to a wiring short circuit or dial failure; pump speed control will switch to signal 2	Check wiring to the dial and the controller, or replace the dial
49	PUMP DIAL SIGNAL 2 ABOVE RANGE	Operator Station Pump Speed Dial signal 2 voltage is above the valid range max value (4.7V) due to a wiring open/short circuit or dial failure	Check wiring to the dial and the controller, or replace the dial
50	PUMP DIAL SIGNAL 2 BELOW RANGE	Operator Station Pump Speed Dial signal 2 voltage is below the valid range min value (0.3V) due to a wiring short circuit or dial failure	Check wiring to the dial and the controller, or replace the dial

FINN CODES (CONTINUED)

FINN Code Number	Text Shown on Display	Problem	Solution
51	CAB PUMP DIAL SIGNAL 1 ABOVE RANGE	While the pump is activated from the in-cab control box, the In-Cab Pump Speed Dial signal 1 voltage is above the valid range max value (4.7V) due to a wiring open/short circuit or dial failure; pump speed control will switch to signal 2	Check wiring to the dial and the controller, or replace the dial
52	CAB PUMP DIAL SIGNAL 1 BELOW RANGE	While the pump is activated from the in-cab control box, the In-Cab Pump Speed Dial signal 1 voltage is below the valid range min value (0.3V) due to a wiring short circuit or dial failure; pump speed control will switch to signal 2	Check wiring to the dial and the controller, or replace the dial
53	CAB PUMP DIAL SIGNAL 2 ABOVE RANGE	While the pump is activated from the in-cab control box, the In-Cab Pump Speed Dial signal 2 voltage is above the valid range max value (4.7V) due to a wiring open/short circuit or dial failure	Check wiring to the dial and the controller, or replace the dial
54	CAB PUMP DIAL SIGNAL 2 BELOW RANGE	While the pump is activated from the in-cab control box, the In-Cab Pump Speed Dial signal 2 voltage is below the valid range min value (0.3V) due to a wiring short circuit or dial failure	Check wiring to the dial and the controller, or replace the dial
55	LOAD CENTER RELAY 1 FAULT	Fault is detected with "Relay 1" in the mVEC load center, used for controlling the HT engine low/high throttle signal	Replace relay 1 with a good working relay or replace mVEC load center
56	LOAD CENTER RELAY 2 FAULT	Fault is detected with "Relay 2" in the mVEC load center, used for controlling the HT scene work light power	Replace relay 2 with a good working relay or replace mVEC load center
57	LOAD CENTER F2 FUSE BLOWN	"F2" fuse in the mVEC load center is blown, used for powering the HT controller system battery input	Correct the over-current issue and replace F2 fuse with a good working fuse
58	LOAD CENTER F2 FUSE NOT POWERED	"F2" fuse in the mVEC load center is not receiving sufficient voltage, used for powering the HT controller system battery input	Check the mVEC load center's gray 2-pin power connector for sufficient connection or replace mVEC load center
59	LOAD CENTER F7 FUSE BLOWN	"F7" fuse in the mVEC load center is blown, used for powering the HT controller output pins on plug A	Correct the over-current issue and replace F7 fuse with a good working fuse
60	LOAD CENTER F7 FUSE NOT POWERED	"F7" fuse in the mVEC load center is not receiving sufficient voltage, used for powering the HT controller output pins on plug A	Check the mVEC load center's gray 2-pin power connector for sufficient connection or replace mVEC load center

FINN CODES (CONTINUED)

FINN Code Number	Text Shown on Display	Problem	Solution
61	LOAD CENTER F8 FUSE BLOWN	"F8" fuse in the mVEC load center is blown, used for powering the HT controller output pins on plug B	Correct the over-current issue and replace F8 fuse with a good working fuse
62	LOAD CENTER F8 FUSE NOT POWERED	"F8" fuse in the mVEC load center is not receiving sufficient voltage, used for powering the HT controller output pins on plug B	Check the mVEC load center's gray 2-pin power connector for sufficient connection or replace mVEC load center
63	LOAD CENTER F9 FUSE BLOWN	"F9" fuse in the mVEC load center is blown, used for powering the 12V/ USB charger in the tool box	Correct the over-current issue and replace F9 fuse with a good working fuse
64	LOAD CENTER F9 FUSE NOT POWERED	"F9" fuse in the mVEC load center is not receiving sufficient voltage, used for powering the 12V/USB charger in the tool box	Check the mVEC load center's gray 2-pin power connector for sufficient connection or replace mVEC load center
65	LOAD CENTER F10 FUSE BLOWN	"F10" fuse in the mVEC load center is blown, used for powering the scene work lights	Correct the over-current issue and replace F10 fuse with a good working fuse
66	LOAD CENTER F10 FUSE NOT POWERED	"F10" fuse in the mVEC load center is not receiving sufficient voltage, used for powering the scene work lights	Check the mVEC load center's gray 2-pin power connector for sufficient connection or replace mVEC load center
67	LOAD CENTER F14 FUSE BLOWN	"F14" fuse in the mVEC load center is blown, used for powering the "Relay 6" relay coil for supplying switched power to the water truck option's spray valves	Correct the over-current issue and replace F14 fuse with a good working fuse
68	LOWER AGITATOR PRESSURE LOW	Measured lower agitator pressure of less than 50 psi (0.167V at controller input pin) is detected for 2 seconds when the agitator is enabled	Check wiring to the agitator pressure sensor and the controller for potential open circuit, or the issue could be hydraulic related
69	LOWER AGT PRESSURE ABOVE RANGE	Measured lower agitator pressure is greater than 3300 psi (11V at controller input pin)	Check wiring to the agitator pressure sensor and the controller for potential short between signal and power
70	UPPER AGITATOR PRESSURE LOW	Measured lower agitator pressure of less than 50 psi (0.167V at controller input pin) is detected for 2 seconds when the agitator is enabled	Check wiring to the agitator pressure sensor and the controller for potential open circuit, or the issue could be hydraulic related
71	UPPER AGT PRESSURE ABOVE RANGE	Measured lower agitator pressure is greater than 3300 psi (11V at controller input pin)	Check wiring to the agitator pressure sensor and the controller for potential short between signal and power
78	TOO MANY LOWER AGITATOR AUTO-REVS	The lower agitator had 2 auto-reverse cycles in a row due to high hydraulic oil pressure, causing the machine to automatically turn off the agitators and pump	Operate the machine at lower hydraulic oil pressures, or adjust the lower agitator's pressure settings from the passcode-protected menu
79	TOO MANY UPPER AGITATOR AUTO-REVS	The upper agitator had 2 auto-reverse cycles in a row due to high hydraulic oil pressure, causing the machine to automatically turn off the agitators and pump	Operate the machine at lower hydraulic oil pressures, or adjust the upper agitator's pressure settings from the passcode-protected menu

NOTES

NOTES