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

Activate Your Warranty By Registering TODAY!!!

T90-II HydroSeeder®

Parts and Operator's Manual

Model **MOA** Serial No. _____

NOTES

ACTIVATE YOUR FINN EQUIPMENT WARRANTY

IMPORTANT INFORMATION ON ACTIVATING YOUR FINN EQUIPMENT WARRANTY!!!

IT IS IMPERATIVE THAT YOU, THE PURCHASER, COMPLETE THE FOLLOWING STEP IN ORDER TO ACTIVATE THE FINN CORPORATION LIMITED WARRANTY.

☞ COMPLETE THE EQUIPMENT REGISTRATION FORM AND MAIL TO THE FINN CORPORATION.

IF FINN CORPORATION DOES NOT HAVE YOUR COMPLETED REGISTRATION FORM ON FILE, YOUR WARRANTY CLAIM WILL BE DENIED.

Once your FINN equipment has been registered, your FINN Limited Warranty will be activated per the warranty statement on the next page.

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

☞ 1. NOTIFY FINN CORPORATION OF THE FAILURE OF MATERIAL OR WORKMANSHIP

1-800-543-7166 Extension (246)

WARRANTY@FINNCORP.COM

☞ 2. AFTER YOU OR YOUR SERVICE DEALER NOTIFY FINN, FINN WILL:

- VERIFY THAT WE HAVE YOUR REGISTRATION ON FILE
- VERIFY THAT THE WARRANTY PERIOD IS IN EFFECT
- VERIFY THAT THE RELATED PART(S) ARE INCLUDED IN THE SCOPE OF WARRANTY (PENDING FINN'S INSPECTION OF DEFECTIVE PARTS)
- SEND YOU REPLACEMENT PART(S) AND A WARRANTY INFORMATION PACKET
- REQUEST YOU FOLLOW ALL INSTRUCTIONS AS NOTED IN THE PACKET

  - **Completely fill out the Parts Tag.**
  - **Attach the Parts Tag to the defective part(s).**
  - **Return the part(s) and the completed Warranty Claim Form to FINN Corporation using the return shipping label. (Within 2 weeks)**
  - **Tape the Orange identifier sheet, marked with the W/RMA number, on the outside of the box in which you are shipping the defective part(s).**

Warranty period:
Hydroseeders & Straw Blowers 2 years or 2000 hrs which ever comes 1st
All other equipment 1 year or 1200 hrs which ever comes 1st

Commercial Limited Warranty
Effective 4/1/2011

OUR WARRANTY TO YOU:

Finn Corporation warrants to you, the original purchaser, for use (or rental to others for use) 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.

WHAT FINN WILL DO:

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

- Verify claim falls within the valid warranty time frame.
- Verify the product and equipment has been **registered** with Finn in order to be eligible for warranty coverage.
- Upon affirmation of warranty period and registration, Finn will send to you a new or repaired replacement part(s), whichever Finn elects and a "Warranty Claim Information packet" containing instructions for processing the warranty claim.
- Evaluate the part when defective part is returned. Note: Failure to return defective part within **two weeks** will result in an invoice being sent to the customer. In addition, if damage to a part is determined not to be covered under the warranty, the customer will be billed.
- 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.
- Correction of nonconformities, in the manner provided above, shall constitute fulfillment of all liabilities of Finn Corporation.

WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE:

- As the purchaser covered under the above limited warranty you must **REGISTER** the equipment with Finn FAILURE TO REGISTER WILL VOID THE WARRANTY.
- Claim Number: Notify the warranty Dept. same day or next day of any intent to do warranty work and obtain a "Warranty Claim Number,"
- All warranty labor must be pre-approved by providing Finn with an estimate of labor costs. Once approved, Finn will issue you a Work Authorization Number, prior to work being performed.(EXCEPTION: Unless the labor is per the Labor Allowance Schedule or less)
- The labor costs reimbursement will be based on the Labor Allowance Schedule established by Finn and where not applicable, on a reasonable number of hours as determined by Finn.
- Notify Finn Corporation of any failure of material or workmanship as described under this warranty.
  - Web notification: Warranty@Finncorp.com
  - Phone 1-800-543-7166 extension 246
- Complete the required steps in the "Warranty Claim Information packet" (which Finn will send you) and return the defective part(s) as directed in the packet to Finn Corporation.
- Should the failed part, be a hydraulic component, Finn may send you an **"Oil Analysis Kit,"** requesting that a sample of oil from the hydraulic system be taken, and mail it to a lab. Follow the instruction sheet, on how to use your Finn Oil Analysis Kit that comes with the Kit. Failure to comply when requested will void the warranty.

WHAT THE WARRANTY DOES NOT COVER:

1. Normal wear parts and Allied Equipment or trade accessories not manufactured by it, such as but not limited to items such as various filters, fluids, brakes, clutch linings, belts, hoses, light bulbs, mechanical seal, over center clutches, tires, ignitions, starters, batteries, magnetos, carburetors, engines and labor, or like or unlike equipment or accessories. (Such being subject to the warranty, if any, provided 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. The warranty shall be null and void to the extent any defect or failure of the products warranted arises out of or is caused by accessories or component parts not manufactured or supplied by Finn Corporation, whether same are supplied by purchaser, dealers, or any other party.
5. This Warranty does **NOT** cover any costs associated with transporting the equipment for warranty service, such as mileage, fuel, or man hours; such is the responsibility of the equipment owner.
6. Dealers & Customers are responsible to follow all guidelines related to Seasonal & Long Term Storage of Equipment, as advised in operation & 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. Because 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.

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Continued . ..

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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 five 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

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates practices that are not related to personal injury.

NOTE:

Gives helpful information.

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.

CALIFORNIA

Proposition 65 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.

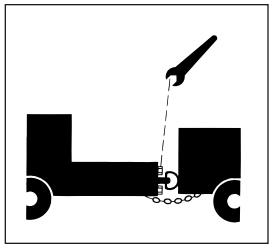
HYDROSEEDER® SAFETY SUMMARY SECTION

It is important that 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.

TheFINN 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)

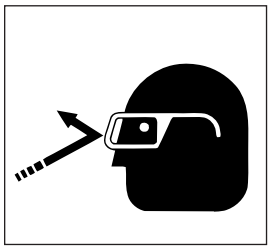
1. If you have a chassis-mounted unit, check devices securing HydroSeeder® to the truck or trailer frame.



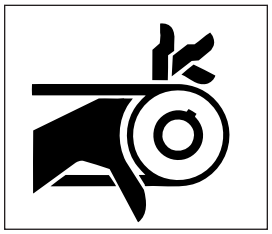
2. If HydroSeeder® is a trailer unit, check hitch and hitch bolts, lights, brakes, and all safety components.
3. Make sure loading hatch bag cutter is in place and secure.
4. Check that all guard railing is in place and secure.
5. Verify that all guards are in place.
6. With the ignition switch ON, verify that the signal horn is operating correctly.
7. 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 3 of section IV. MAINTENANCE on page 4.
8. Remove unnecessary objects (or material) from the tank top.
9. 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.
10. Inspect all hydraulic hoses for cracks, bulges, or damage. If hoses are bad, replace immediately.
11. 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 3 under section IV. MAINTENANCE on page 4 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.

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.

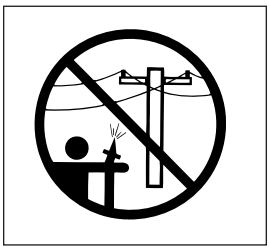
8. Never operate this or any other machinery when fatigued, tired, under the influence of alcohol, illegal drugs, or medication. You must be in good physical condition and mentally alert to operate this machine.

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

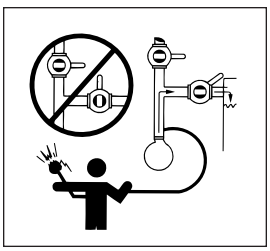
10. Use proper means (steps, ladder) for mounting and dismounting of the machine. Never mount or dismount a moving machine.

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) clutch when both the recirculation and discharge valves are closed. Operation with both valves closed will result in extreme heat generation that could cause severe bodily injury and damage to the equipment.

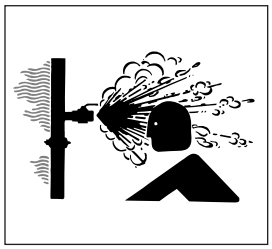


3. Recirculation valve must be open and material flowing back into the tank when using the remote valve. A closed or plugged recirculation line will cause extreme heat in the pump or discharge lines that will result in severe bodily injury and damage to the equipment.

4. 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.

5. 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.

6. Before opening any valves or pipe clamps, shut machine down and check if material in the pipe is hot. If hot, do NOT open valve or pipe clamps as the hot material may cause severe personal injury. Allow to cool and open with caution.

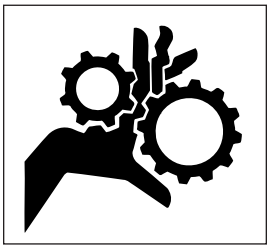


7. Except when loading materials, keep loading hatch lid closed to protect operator and prevent splashing of wet material onto the tank top.

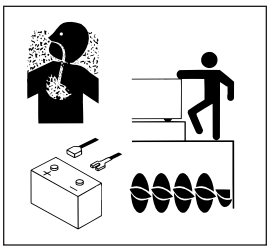
8. Wash off spillage of slippery mulch or slurry additive from the tank top and platform before operating equipment.

IV. MAINTENANCE

1. Before servicing the machine, turn off engine and allow all moving parts to stop. To prevent accidental starting, disconnect battery cables. 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. Certain hydroseeding amendments, when combined with or without the addition of water or heat or the element of time, may react causing harmful or deadly gasses. Consult your material suppliers regarding reactivity information. The slurry tank must be flushed and drained after each day of operation.



3. 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, or local legal requirement, including the following:

   a) Drain, flush, and ventilate tank interior.

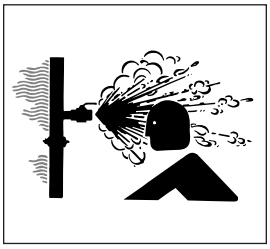
   b) Turn off engine, disconnect battery cables, and perform lockout/tagout procedures (29 CFR 1910.147).

   c) Provide continuous ventilation or proper breathing apparatus.

   d) If tank must be entered, personnel entering the tank must be tethered to a lifeline.

   e) Provide a stand-by individual outside of tank who is able to communicate with person inside and haul him out with the lifeline if necessary.

4. 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.



5. On trailer units, perform general maintenance such as checking the safety chains, hitch and hitch bolts, tires, and brakes. Repair or replace if worn or broken. Never operate machine on improperly inflated or damaged tires. Always use a safety cage or cable restraints when inflating a repaired tire.

6. 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.

7. 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.

8. 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 local municipal regulations.

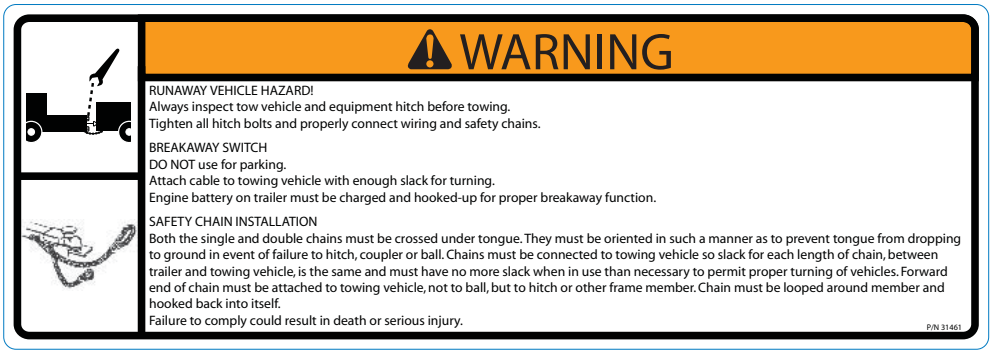
9. It is recommended that only authorized, genuine FINN replacement parts be used on the machine.

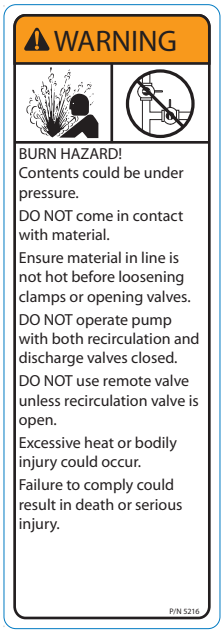
10. Do not use either cold start fluid, if engine is equipped with glow plug-type preheater, or other intake manifold type preheater. It could cause an explosion or fire and severe injury or death.

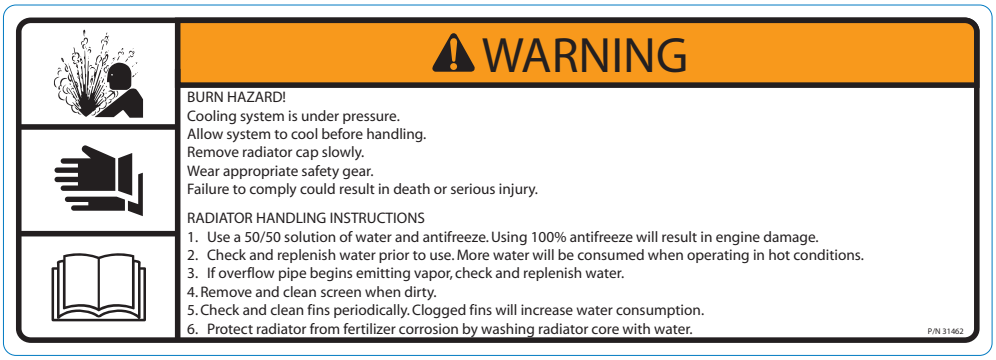
11. Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause injury, blindness, or death. Pressure may build up in the hydraulic system; use caution when removing the cap.

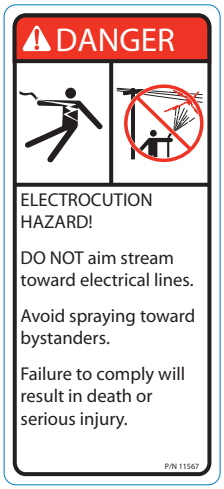
12. Make certain that all decals on the machine are maintained in good legible condition. Replacement decals are available through FINN Corporation by specifying part number shown in the lower right-hand corner of the decal. See page 5 for the current safety decals mounted on the unit. See pages 76 and 77 in the Parts Manual for the location and quantity of all decals on this unit.

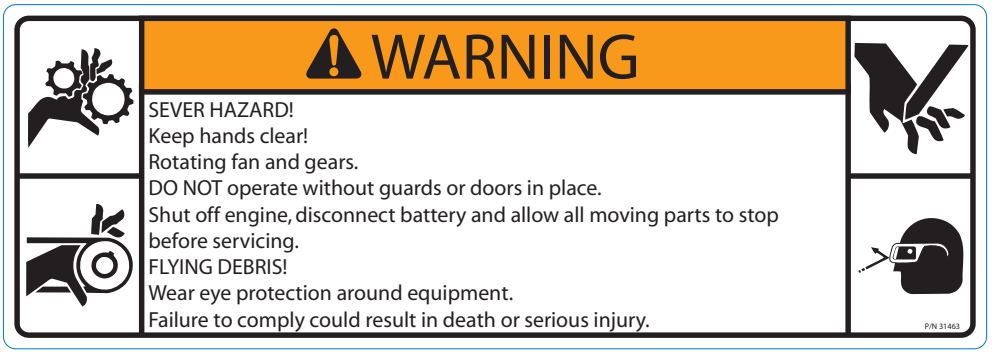
CURRENT SET OF SAFETY DECALS

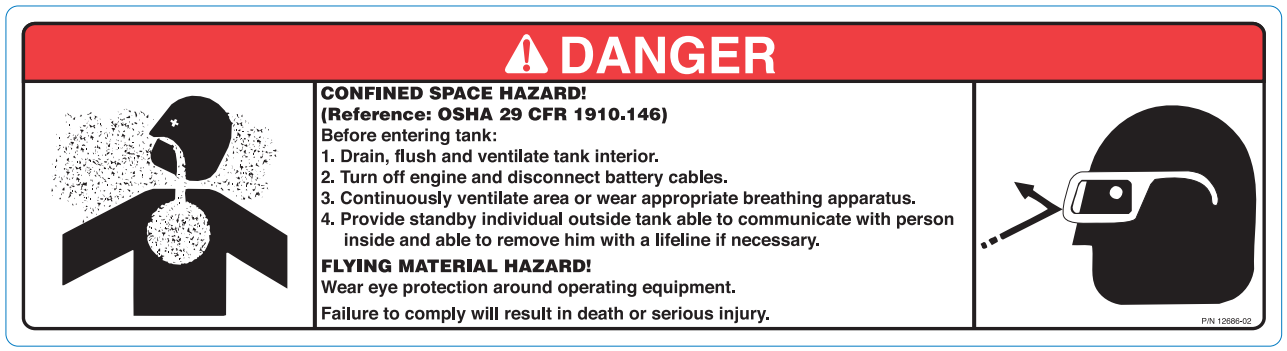


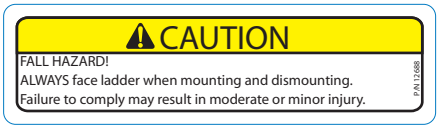


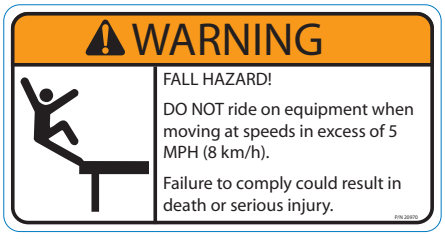












OPERATION AND MAINTENANCE. MANUAL FOR THEFINN T90 SERIES II HYDROSEEDER®

This manual gives you step-by-step instructions for the operation and maintenance of the FINN T90 HydroSeeder®. For best results and to ensure longer life of the equipment, please follow the 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 T90 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 process, recirculation of slurry and mechanical agitation, 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 HYDROSEEDER®

For speed and mobility of operation, the HydroSeeder® should be mounted on a truck or trailer, however, it is important to select a carrier with sufficient capacity to handle the added weight.

CARRIER VEHICLE REQUIREMENTS

HYDROSEEDER®		TRUCK REQUIREMENTS	
Type	**Maximum Weight** (Loaded)	**Approx. GVWR***	**Measurements** (cab to axle)
T90S	13,250 lb (6,010 kg)	18,000 lb (8,165 kg)	84 in –100 in (213–254 cm)
T90T	14,670 lb (6,654 kg)	Tow vehicle must be able to support 1,800 lb (816 kg) down on its hitch.	

* *Since truck weight will vary, ensure that vehicle's GVWR is sufficient for the particular application. This information can be obtained from the truck manufacturer or dealer.*

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

⚠CAUTION

Your FINN HydroSeeder® should be mounted by a qualified truck body installer. Failure to comply could result in minor or moderate personal injury. Product damage could also occur.

When mounting the HydroSeeder® to the truck, one of the following methods of mounting is acceptable:

1. Bolt the HydroSeeder® directly to the truck bed. Installer must ensure that the bed, as well as the bed-to-truck and HydroSeeder®-to-bed connections are adequate for the maximum weights loaded that are shown on page 6.
2. Mount the HydroSeeder® to the truck frame.

NOTE: The T90 HydroSeeder® has mounting legs that are 44 in. (111.76 cm) across and therefore require an adapter frame or a chassis bed of adequate strength to mount to the truck's 34 in. (86.4 cm) wide rails.

NOTICE

Mounting the HydroSeeder® to the truck must allow for tire clearance and frame twist. Place hard wood spacers along the length of truck rails or use FINN spring mounting kit (part number 011562) or equivalent.

3. Place chains over the HydroSeeder® and around truck bed and secure with binders. Secure the HydroSeeder® with blocks tied to the truck bed.

⚠CAUTION

When using a truck with a tilt bed, make sure to chain the truck bed down to prevent the bed from being accidentally hoisted. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

ATTACHMENTS

1. Extension hoses for reaching remote areas are available in 50 ft (15 m) lengths. All connections are camlock, quick-operating fittings. The hose is connected to the end of the discharge boom in place of a nozzle. The nozzle is connected to the end of the hose and controlled by the person on the ground. The flow is controlled by a second person on the HydroSeeder®. This allows for a full pressure and volume operation.

⚠DANGER

The recirculation valve must be open when using a remote valve. Failure to comply will result in death or serious injury.

2. For lower pressure applications, or for close-up work, i.e. around buildings, the remote valve attachment can be used. The attachment includes semi-rigid hose with quick-disconnect fittings along with a hand-held valve that fits the end of the hose and accepts the standard nozzle assemblies. The hose is connected to the outlet on the discharge pipe above the pump. The machine is run at 1/2 to 3/4 throttle and material is applied where desired.

3. Hose Reel: The live hose reel will mount either on the HydroSeeder® or on the truck frame. The 200 ft (61 m) capacity hydraulic rewind reel will wind up and store empty hose.
4. Fill pumps can either be carried on the truck or mounted on the HydroSeeder®.
5. Hardened pump parts: Pump casing, impeller, and suction cover are treated with special material designed to resist wear.
6. Rear spray bar: The spray bar option is not designed for slurry application but for the dispersion of liquids for dust control, watering, feeding, and washing applications. Rear spray bar can be arranged so that operation is remotely controlled from the truck cab.

PRE-START CHECK

The following safety check should be made to ensure operator safety:

1. A. Skid Unit – Check condition of all mounting hardware that secures HydroSeeder® to truck frame rails.
   B. Trailer Unit – Inspect hitch, safety chains, lights, brakes, and breakaway switch.
2. Make sure bag cutter is in place and secure.
3. Inspect that all railings are in place and secure.
4. Ensure that all guards are in place.

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. Verify that tool kit contains all the prescribed items. See PARTS MANUAL on page 40.
2. Inspect slurry tank for foreign objects. See steps 2 and 3 in Section IV, MAINTENANCE of the HYDROSEEDER® SAFETY SUMMARY SECTION on page 4.
3. Check fuel level. Fill if necessary.
4. Check hydraulic oil level and fill if necessary. See HYDRAULIC SYSTEM on page 24 for oil specifications.
5. Check engine oil level and fill if necessary. For oil type, refer to the engine manual.
6. Check fluid level in radiator and overflow tank.
7. Inspect air cleaner for dust and dirt, clean if necessary.
8. Secure drain plug on the outside-bottom of slurry tank.
9. Check to make sure the pump drain plug is in place.
10. Verify that the suction line shut-off valve is completely open.
11. Engage (turn on) and disengage (turn off) clutch to determine if it snaps in and out.

12. Install discharge assembly (if stored in location other than standard operating position).
    A. Check and clear nozzle of any obstructions.
    B. Tighten wing bolt at the opening around the top of discharge assembly and ensure that discharge assembly is secure.
13. Check pump discharge and recirculation valve handles for free movement.
14. Lubricate equipment – See LUBRICATION AND FLUIDS CHART on pages 34 and 35.
    A. Each lubrication point on the machine is marked with a decal.
    B. Check automatic pressure lubricator at pump. If the stem is fully extended, with thumb nut all the way up, the automatic pressure lubricator contains lubricant. If not, lubricant must be replaced by the following procedure (See Figure 2):
        1. Turn thumb nut clockwise until stem rises to maximum height.
        2. Remove cap and fill cap with sodium- (water soluble) base grease (FINN part number 000698). DO NOT use lithium- base (chassis lube) grease.
        3. Replace cap.
        4. Turn thumb nut counterclockwise until thumb nut is at the top of the stem. The spring and pressure disk in the lubricator forces grease, under pressure, to the pump seal.

NOTICE

When thumb nut has moved down to within 1/2 in. (1.25 cm) of touching the cap, re-service the automatic pressure lubricator.

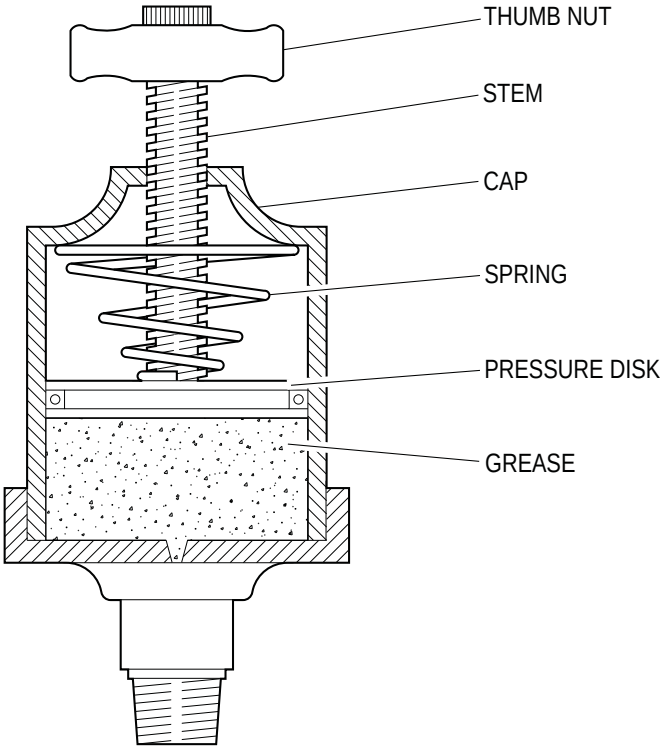


Figure 1 – Automatic Pressure Lubricator Components

TWO VALVE OPERATION

The T90 II HydroSeeder® is equipped with two independently operated ball valves to control slurry flow. One is located in the recirculation line below the platform, and the other is located in the discharge line above the platform. The recirculation valve is open when the handle is in line with the valve ports and is closed when the handle is at a right angle to the valve ports. The discharge valve is open when the V-notch in the foot pedal is in line with the valve ports and is closed when the V-notch is at a right angle to valve ports.

⚠ DANGER

Never engage (turn on) slurry pump clutch when both valve handles are positioned as shown in Figure 2. If both valves are closed, a situation of extreme heat generation will result. Failure to comply could result in death or serious injury. Failure to comply could also result in product or property damage.

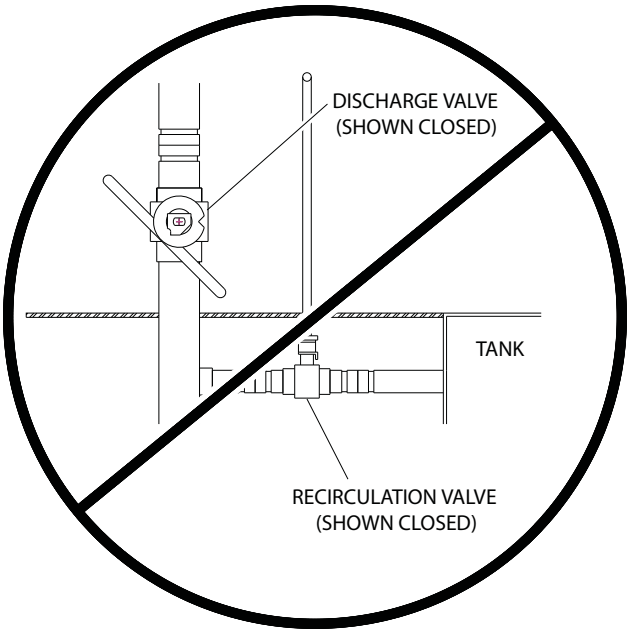


Figure 2 – NEVER Engage Slurry Pump Clutch w/ Both Valves Closed

1. DISCHARGE THROUGH BOOM

Flow is through boom with no flow through closed recirculation valve (Figure 4, Page 11). Flow through boom is controlled by engaging and disengaging slurry pump clutch. Do not use the discharge valve to control distance. Valve should be either completely open or completely closed. Control the spray volume and spray distance by adjusting the engine rpm.

2. EXTENSION HOSE THROUGH BOOM

DANGER

Do not use remote valve in this application. Failure to comply will result in death or serious injury.

Flow is through boom with no flow through a closed recirculation valve (Figure 4). Extension hose is connected to boom and flow is controlled by engaging (turning on) and disengaging (turning off) slurry pump clutch, or by controlling the speed of the engine.

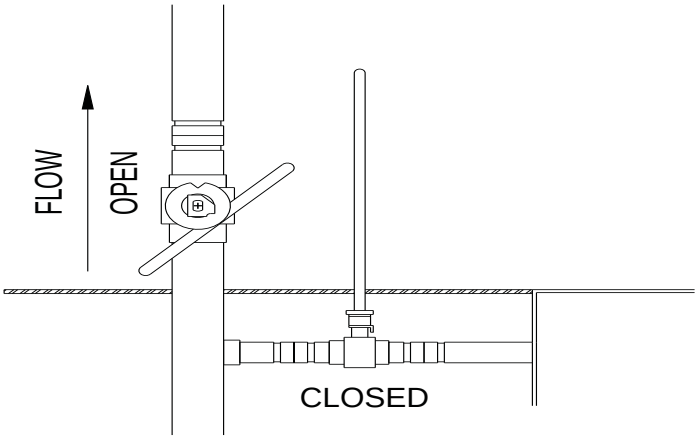


Figure 4 – Discharge Through Boom or Extension Hose Through Boom

3. EXTENSION HOSE OR HOSE REEL THROUGH REMOTE PORT

Flow is through recirculation valve with no flow through closed discharge valve (Figure 5). Flow through extension hose is controlled by engaging (turning on) and disengaging (turning off) the slurry pump clutch, or by the remote valve at end of hose. An open recirculation valve allows flow back into tank.

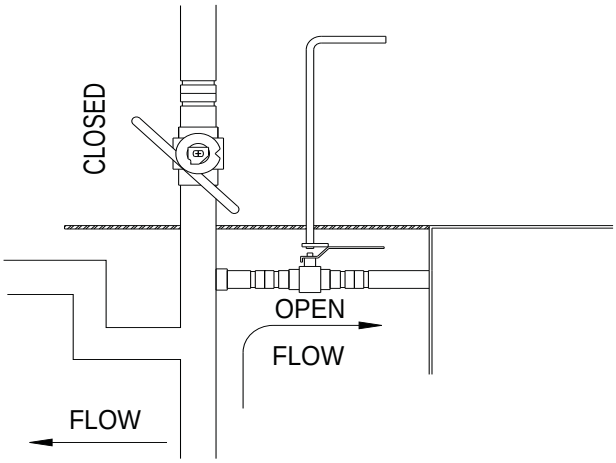


Figure 5 – Discharge Through Extension Hose or Hose Reel Through Remote Port

DANGER

The recirculation valve must be open when using a remote valve. Failure to comply will result in death or serious injury.

STARTING PROCEDURE

⚠WARNING

See HYDROSEEDER® SAFETY SUMMARY SECTION on pages 2 through 4 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, open recirculation valve, close discharge valve, disengage (turn off) clutch, and place agitator control in the NEUTRAL position.

1 Set throttle about 1/4 open.

2 Turn key counterclockwise and hold it until the glow plug indicator light goes out.

3 While holding in the safety switch button, turn the key clockwise until the starter engages and the engine starts.

4 Continue to hold the safety switch in for approximately 10 seconds. Allow engine to warm up for 3 to 5 minutes.

NOTE: This engine has a safety system that will shut the engine off if the engine oil pressure drops below 7 psi (48 kPa) or if the water temperature reaches 230˚F (110˚C).

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 job to be done 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 pounds per 1,000 square feet, or pounds 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 (2.7 to 4.5 kgs) per 1,000 sq ft. Fertilizer is applied at a rate of approximately 400 lbs (181 kgs) per acre, and fiber mulch is applied at 1,500 to 2,000 lbs (680 to 907 kg) per acre. (Note: There are 43,560 square feet 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 tables on page 13 show loading versus coverage rates for the FINN T90 II. 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

Unit	Amount of Material in Tank in pounds (kilograms)			Coverage Area
	Seed	Fertilizer	Mulch	sq ft (sq m)
T90 II	92 (42)	107 (48)	400 (181)	11,600 (1,075)

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.

TABLE A EXAMPLE:

$$\frac{\text{400 lb (181 kg) Mulch per Tank}}{\text{1,500 lb (680 kg) Mulch per Acre}} = \text{0.267 Acre per Load}$$

400 lb (181 kg) Fertilizer per Acre x 0.267 Acre = 107 lb (48 kg) Fertilizer per Load
345 lb (156.5 kg) Seed per Acre x 0.267 Acre = 92 lb (42 kg) Seed per Load

TABLE B

SEED AND FERTILIZER ONLY

Unit	Amount of Material in Tank in pounds (kilograms)			Coverage Area	
	Seed	Fertilizer	Total	sq ft (sq m)	Acreage (Hectare)
T90 II	784 (356)	900 (408)	1,684 (764)	97,906 (9,095)	2.25 (0.91)

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

TABLE B EXAMPLE:

$$\frac{\text{1,684 lb (764 kg) Tank Capacity (Solids)}}{\text{8 lb (3.6 kg) of Seed + 9.2 lb (4.2 kg) of Fertilizer per 1,000 sq ft}} = \text{97,906 sq ft per Load}$$

$$\frac{\text{8 lb (3.6 kg) of Seed}}{\text{1,000 sq ft}} \text{ X 97,906 sq ft} = \text{784 lb (356 kg) of Seed per Tank}$$

TANK CAPACITY CHART

T90 II		
Gallons (Liters)	in. (cm) from top	in. (cm) from bottom
800 (3,028)	10 (25.4)	42 (106.7)
750 (2,839)	12.25 (31.1)	39.75 (101.0)
700 (2,650)	14.25 (36.2)	37.75 (95.9)
650 (2,460)	16.25 (41.3)	35.75 (90.8)
600 (2,271)	18.25 (46.4)	33.75 (85.7)
550 (2,082)	20.25 (51.4)	31.75 (80.6)
500 (1,893)	22.5 (57.2)	29.5 (74.9)
450 (1,703)	24.75 (62.9)	27.75 (69.2)
400 (1,514)	26.75 (67.9)	25.75 (65.4)
350 (1,325)	29 (73.7)	23 (58.4)
300 (1,136)	31.25 (79.4)	20.75 (52.7)
250 (946)	33.5 (85.1)	18.5 (47.0)
200 (757)	36 (91.4)	16 (40.6)
150 (568)	39 (99.1)	13 (33.0)
100 (378)	42.25 (107.3)	9.75 (24.8)
50 (189)	46 (116.8)	6 (15.2)

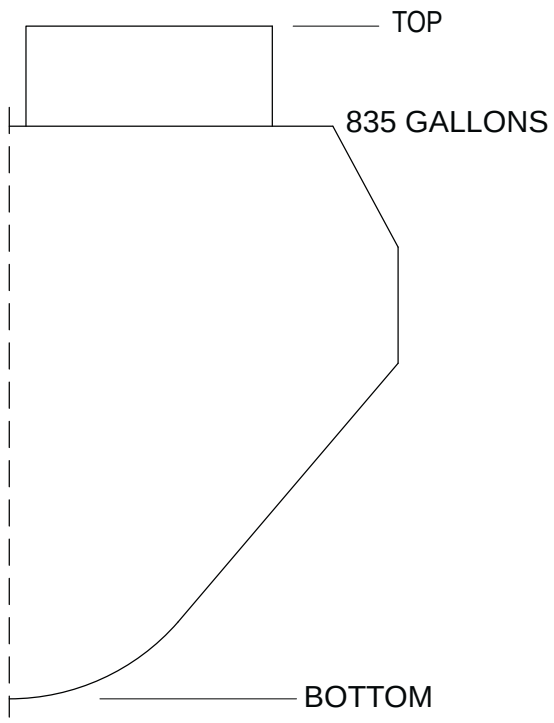


Figure 6 – Tank Capacity

LOADING

⚠WARNING

Take care not to lose pens, lighters, etc. from shirt pockets, or drop pieces of paper or plastic bags into the tank, as these might plug the slurry system. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

1. With clutch disengaged (turned off) and agitator control in the NEUTRAL position, start engine and allow it to warm up. See STARTING PROCEDURE on page 12.
2. Start filling unit with water from one of the water sources as listed below. When water reaches the top of agitator shaft, move agitator control to full REVERSE position.

   Tank can be filled by using one of the sources of water as follows:

   A. Water from any stream or pond using a fill pump. When filling from a pond or stream, be sure to use a suction strainer to filter out contaminants that could damage the pump and unit.
   B. Any pressure source, eg. fire hydrant. An optional air gap fill port is available for this unit but it is necessary to consult with local authorities before using a water main, in order to abide by all local ordinances.
   C. Water tanker.

3. Piping System Cleanout Procedure (Purging Line):
    A. Remove discharge nozzle and gasket from discharge boom.
    B. Aim discharge boom assembly into an open area away from any persons, obstructions, or high voltage power lines.
    C. Open discharge valve and close recirculation valve.
    D. Increase engine speed to approximately 1/2 to 3/4.
    E. Engage (turn on) clutch with a firm snap. Do NOT allow clutch to slip.
    F. When discharge stream is clear, open recirculation valve and close discharge valve. After recirculation stream is clear disengage (turn off) clutch.
    G. Replace gasket in discharge boom.
4. Continue filling tank with water.
5. Increase engine speed to full rpm.
6. Start loading dry material, loading the lightest material first. Agitator control should be in full REVERSE for mixing.
    A. Seed – Cut open the seed bag and dump contents into slurry tank. When using inoculant, add it in the tank along with the seed. When using quick-swelling seeds. load them just prior to application.
    B. Wood Fiber Mulch – Empty the entire bag in or cut bag open and drop in the sections of fiber. The amount of mulch to be used should be loaded by the time the water level is at 3/4 full. If agitator stalls or a high pitch squeal comes from the hydraulic system, reverse agitation to FORWARD for a moment to clear the obstruction, then return agitation to REVERSE.

⚠CAUTION

Hydraulic system will overheat if agitator shaft is jammed for extended period. This will damage hydraulic oil and system components.

⚠DANGER

Keep hands and arms away from tank interior and agitator. Failure to comply will result in death or serious injury.

    C. Fertilizer – Stand over hatch opening and drop the bag onto the bagcutter. Grasp both ends of the bag and dump material into slurry tank.
    D. All other additives – Consult with manufacturer for proper loading technique.
7. When all materials are loaded and in suspension, and the tank is full, move the agitator to NEUTRAL then full speed FORWARD to ensure all material is mixed. It may be necessary to change the agitator direction more than once to ensure a thorough mixture.
8. After material is thoroughly mixed, slow agitator in forward direction to 1/2 to 3/4 speed, or enough to create movement in all of the corners of the tank. Do not over-agitate the slurry. Always discharge the material with the agitator control in the FORWARD position.
9. Close hatch lid on slurry tank.

NOTE: The slurry should not be recirculated for more than 15 minutes prior to discharge to reduce wear and keep seed from swelling.

NOTE: If foaming occurs, reduce agitator speed.

LOADING AND MIXING BFM, FGM, SMM AND OTHER HIGHLY VISCOUS SLURRIES

1. With clutch disengaged (turned off) and agitator control in the NEUTRAL position, start engine and allow it to warm up. See STARTING PROCEDURE page 12.
2. Start filling unit with water from one of the water sources as listed below. When water reaches the top of agitator shaft, move agitator control to full REVERSE position.

   Tank can be filled by using one of the sources of water as follows:

   A. Water from any stream or pond using a fill pump. When filling from a pond or stream, be sure to use a suction strainer to filter out contaminants that could damage the pump and unit.

   B. Any pressure source, eg. fire hydrant. An optional air gap fill port is available for this unit but it is necessary to consult with local authorities before using a water main, in order to abide by all local ordinances.

   C. Water tanker.

3. Piping System Cleanout Procedure:

   A. Remove discharge nozzle and coupler gasket from the remote valve coupler at the end of the discharge hose (or from boom on the platform option).

   B. Aim discharge hose (or boom on the platform option) into an open area away from any persons, obstructions, or high voltage power lines.

   C. Open discharge and remote valves and close recirculation valve.

   D. Open throttle to approximately 1/2 to 3/4 full.

   E. Engage (turn on) clutch with a firm snap. Do NOT allow clutch to slip.

   F. When discharge stream is clear, open recirculation valve and close discharge valve. After recirculation stream is clear, disengage (turn off) clutch.

   G. Replace coupler gasket in the remote valve coupler (or in boom on the platform option).

4. Continue filling tank with water.
5. Increase throttle to 3/4 of full throttle.
6. Start loading dry material, loading the lightest materials first. Agitator control should be in full REVERSE for mixing.

   Seed - Cut open the seed bag and dump contents into slurry tank. (When using inoculant, add it in the tank along with the seed.) When using quick-swelling seeds, load them just prior to application.

   BFM, FGM, SMM, and other highly viscous slurries - When the water level is above the top of the agitator blades, begin adding the entire bag of material into the tank. It may become necessary to slow the rate of water being added to the tank. Add all bales before the tank is 3/4 full. If agitator stalls or a high-pitch squeal comes from the hydraulic system, reverse agitation to FORWARD for a moment to clear obstruction, then return agitator to REVERSE.

NOTE: BFM, FGM, and other viscous slurries will entrain air if proper mixing procedures are not followed. Ensure that the agitator blades are completely submerged prior to the addition of this material. This will prevent air from entering the slurry. Follow manufacturers suggested rates of materials as indicated on the packaging. Generally, this recommendation is 50 pounds of material to 125 gallons of water.

Fertilizer – Cut open the fertilizer bag and dump contents into slurry tank.

All other additives - Consult with manufacturer for proper loading technique.

7. When all materials are loaded and in suspension, and the tank is full, move the agitator to NEUTRAL then full speed FORWARD to ensure all material is mixed. It may be necessary to change the agitator direction more than once to ensure a thorough mixture.
8. Agitate per the manufacturer's recommendations. Generally, the agitation time is 10 minutes to allow the proper viscosity to be generated. Follow manufacturer's recommendations.
9. Once material is thoroughly mixed, place the agitator in FORWARD direction to 1/4 speed, or just enough to create movement in all corners of the tank. DO NOT OVER-AGITATE the slurry. Always discharge the material with the agitator control in FORWARD and at a slow speed.

NOTE: As the application process commences and the slurry level is decreased, which will expose the agitator blades, it is extremely important to ensure that the speed of the agitators is slow.

NOTE: Use of recirculation should be kept to a minimum.

NOTE: If foaming occurs, reduce agitator speed.

NOTE: When mixing multiple loads of BFM, FGM, SMM, and other viscous slurries, make sure to purge the lines with clear water before mixing the next load.

PRIOR TO APPLICATION

1. Operator should familiarize themselves the with area to be seeded and develop a plan to ensure uniform application.
2. Develop a plan for communication between operator and driver of the carrying or towing vehicle to signal for start, stop, turn, etc. through the use of the signal horn.
3. Operator takes up position on the platform. From this point, application will be controlled by the use of the clutch, valve, discharge assembly, and throttle.

DISCHARGE NOZZLE SELECTION

Nozzles are stored in the tool box. This HydroSeeder® is equipped with four nozzles – two long distance and two fan nozzles. The smaller. long distance nozzle is generally better suited for seed, fertilizer, and/or lime application, while the large long distance nozzle is better for wood fiber mulch application. Both of the fan nozzles are generally suited for both types of application.

Nozzle	Nozzle ID	Distance	Width	Discharge Time
Lg. Long Distance		Up to 180 ft (55 m)	-	5.5 min.
Sm. Long Distance	Brass	Up to 140 ft (42 m)	-	12 min.
Narrow Fan	151000	Up to 105 ft (32 m)	15.8 ft (4.8 m)	5.5 min.
Wide Fan	501000	Up to 75 ft (23 m)	20.5 ft (6.3 m)	5.5 min.

APPLICATION OF SLURRY

I. GENERAL APPLICATION TECHNIQUES

⚠DANGER

Do not spray toward power lines, transformers or other high voltage conductors. Failure to comply will result in death or serious injury.

⚠CAUTION

The driver of the carrying vehicle should remain alert for hazards to the operator, such as low power lines, hanging branches, etc. Driver should never start or stop abruptly. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

1. Determine which nozzle would best suit the application needs according to the DISCHARGE NOZZLE SELECTION chart above.
2. When applying seed and fertilizer, elevate discharge nozzle no less than 10 degrees (25 cm) above the area to be sprayed, allowing the slurry to gently rain onto the seed bed.
3. When applying wood and paper fiber, whenever possible, aim the stream toward the ground to create a surface with small pockmarks, which helps get seed in contact with ground. Do not allow the stream to blast away the surface of the seed bed.
4. Generally, the most remote area of the seed bed should be covered first. Distance is controlled by engine speed and nozzle selection.

⚠CAUTION

Do NOT partially close the valve to control the distance. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

5. While moving along area to be seeded, the operator should move the nozzle back and forth in a slow, even arc.
6. If application is to be interrupted for a short period of time, leave the valves open and disengage (turn off) clutch. Engage (turn on) clutch to continue application.
7. It may be necessary to slow the agitator as the tank empties to reduce foaming.

II. DISCHARGE THROUGH THE BOOM:

1. Move the discharge valve handle to the open position, the recirculation valve handle to the closed position, and engage (turn on) clutch. At this time, should the operator want to stop spraying for a short period, disengage (turn off) clutch; then engage (turn on) clutch to continue spraying.
2. When the tank is empty, or when discontinuing discharge for an extended period of time, disengage (turn off) clutch, then immediately move the discharge valve to the closed position, and idle the engine. This will maintain moisture in the discharge piping and help prevent plugging. Move the agitator control to the NEUTRAL position.

III. PROCEDURES WHEN USING HOSES:

Always pump clear water through the hose before pumping mulch. If the inside hose liner is dry, it will dewater the mulch, causing hose to plug.

A. PUMP TAKE OFF SYSTEM OR HOSE REEL WITH REMOTE VALVE

1. Open recirculation valve, close discharge valve, and close remote valve at the end of the hose.
2. Engage (turn on) clutch. When stream is flowing freely through recirculation line, open pump take off valve.

⚠CAUTION

The high pressure on the hose can exert strong forces, causing the potential for the hose operator to lose control of hose or footing. The hose will require additional hose holders when this operation occurs on slopes. Open the pump take-off valve and the remote valve slowly and only after the hose operator is firmly positioned and has firm control of hose. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

3. With the engine at 3/4 speed, open remote valve at the end of the hose to discharge load.
4. When finished spraying, close remote valve, disengage (turn off) clutch, and stop engine. If using fiber mulch, retain as much water as possible in the hose by elevating the hose ends or by coupling the hose ends together.
5. If another load is to be done, see RELOADING PROCEDURE below. If finished for the day, follow the clean up procedure described in DAILY CLEANING AND MAINTENANCE on page 22, and flush out the hose.

DANGER

The recirculation valve must be open when using a remote valve. Failure to comply will result in death or serious injury.

B. EXTENSION HOSE SYSTEM – WITHOUT REMOTE VALVE

1. Connect extension hose into end of discharge boom.
2. An operator controlling the end of the hose, directs a second operator at the machine to control the clutch and adjust the engine speed.

Since the extension hose will be seeing the full output of the pump with the recirculation valve closed, the equipment operator and individual at the end of the hose should exercise extreme care when operating unit on high pressure. The high pressure on the hose can exert strong forces causing hose operator to lose control of hose or footing. The hose will require additional holders on slopes. Engage the clutch only after the hose operator is firmly positioned and has firm control of hose. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

3. When hose operator is ready, signal the second operator to engage (turn on) clutch and slowly increase the engine rpm until the desired discharge pressure is reached.
4. When finished spraying, disengage (turn off) clutch, stop the engine, and close the discharge valve. If using fiber mulch, retain as much water as possible in the hose by elevating the ends or by coupling the ends together.
5. If another load is to be done, see RELOADING PROCEDURE below. If finished for the day, follow CLEANING PROCEDURE on page 22 and flush out the hose.

RELOADING PROCEDURE

1. Start at step 2 in LOADING on page 14.
2. After last load of the day, refer to CLEANING AND MAINTENANCE on pages 22 and 23.

LIMING WITH THE HYDROSEEDER®

In using large concentrations of granular solids through the HydroSeeder®, it is advisable to keep the slurry moving through the pump at all times. This keeps the solids from settling in the lines and creating a stoppage. This unit was designed for the application of agricultural-grade lime or FINN-HLL Liquid Lime.

PROCEDURE

1. With clutch disengaged (turned off) and agitator control in the NEUTRAL position, start engine and allow it to warm up. See STARTING PROCEDURE on page 12.
2. Start filling unit with water. When water reaches to top of the agitator shaft, move agitator control to approximately 1/2 speed REVERSE.
3. Open both the recirculation and discharge valves.
4. Remove discharge nozzle and gasket from discharge boom.
5. Aim discharge boom assembly into an open area away from any persons, obstructions, or high voltage power lines.
6. Move throttle to approximately 1/2 engine speed.
7. Engage (turn on) the clutch, and move the throttle to full engine speed. A stream of water should be coming from the end of the recirculation pipe beside the hatch opening, as well as from the boom.
8. As soon as both streams are clear, close the discharge valve and make sure water is being recirculated back to the tank.
9. Decrease throttle to 3/4 speed. Increase agitator speed to full REVERSE.

NOTICE

Do not disengage (turn off) clutch.

10. Twenty lb (9 kg) of granular solids displaces approximately 1 gal (3.8 L) of water. When filling the tank with water, the volume of granular solids must be accounted for. For example; If using the maximum recommended capacity of 2,500 lb (1,134 kg), 125 gal (473 L) (2,500 / 20) would have to be subtracted from the total tank capacity of 940 gal (3,558 L) minus 125 gal (473 L) equals 815 gal (3,085 L). If 1,000 lb (454 kg) of solids were used, 50 gal (189 L) (1,000 / 20) would have to be subtracted from the total tank capacity of 940 gal (3,558 L) minus 50 gal (189 L) equals 890 gal (3,369 L).
11. Fill the tank to the required capacity for the rate of granular solids to be applied.
12. Load the material. See LOADING on page 15, Steps 5 through 8.
13. When ready to apply slurry, install gasket and nozzle into boom.
14. Move agitator control to 3/4 speed FORWARD.
15. With clutch still engaged (turned on), open the discharge valve.

⚠CAUTION

To decrease pump wear and increase discharge distance, it may, at this point be desirable to close the recirculation valve. However, the recirculation valve must be open BEFORE closing the discharge valve if the application of slurry is to be interrupted. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

16. Apply the slurry. See APPLICATION OF SLURRY on pages 18 through 20.
17. If another load is to be applied, start again at step 1. If finished, follow CLEANING AND MAINTENANCE on pages 22 and 23.

CLEANING AND MAINTENANCE

AFTER FIRST 4 TO 8 HOURS OF OPERATION

1. Check and adjust clutch. See CLUTCH MAINTENANCE SECTION on page 28.
2. Torque wheel lugs. Torque again after 7 days (Trailer Option only).

DAILY

1. Cleaning the HydroSeeder®:
    A. Fill slurry tank to center of agitator shaft with clean water.
    B. Move agitator lever to full speed to flush off inside of tank top and walls.
    C. Remove discharge nozzle and gasket from discharge boom.
    D. While aiming discharge hose or boom toward an open area, move discharge valve handle to discharge position and engage (turn on) clutch. Allow to discharge until clear water is coming out.
    E. Move recirculation valve handle to recirculation and allow to run momentarily.
    F. Disengage (turn off) clutch, idle the engine, move valve handle to DISCHARGE position, move agitator handle to NEUTRAL, and turn off the engine.
    G. Always remove drain plug and allow tank to drain.
    H. In freezing weather, leave main tank drain plug out and remove pump drain plug. Move all slurry valves to open position.
    I. Wash the outside of HydroSeeder®, including radiator, to remove any corrosive materials.
    J. If using lime – DAILY maintenance should be performed after every load.
    K. Clean out extension hoses.
    L. Replace coupler gasket before reinstalling discharge nozzle onto remote valve coupler.
2. Lubricating the HydroSeeder· (see LUBRICATION AND FLUIDS CHART on pages 34 and 35):

⚠CAUTION

Lubrication should be performed IMMEDIATELY AFTER cleaning of the equipment, making sure the engine is not running. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

    A. Lubricate agitator shaft bearings located on the outside front and rear of slurry tank.
    B. Service automatic pressure lubricator on pump as needed. See page 9.
    C. Check the engine oil and replenish when necessary. Change oil and filter after first 50 hours then every 200 hours thereafter. Consult the engine operator's manual for the correct grade of oil and the engine break-in procedure.

NOTICE

Change engine oil and filter at least once annually even if the 200 hours have not been met.

    D. Lubricate swivel on discharge assembly.

WEEKLY OR EVERY 40 HOURS OF OPERATING TIME

1. Clean air cleaner by following the instructions in the engine operator's manual.
2. Lubricate all points on HydroSeeder® as outlined in DAILY CLEANING AND MAINTENANCE on page 22. Additionally, lubricate the four grease fittings on clutch/pump.
3. Check the oil level in the hydraulic oil reservoir; maintain level at sight gauge.
4. Check the clutch adjustment to ensure that it snaps in and out of engagement. Adjust the clutch with the engine off.
5. Check the antifreeze in radiator.
6. Inspect slurry tank for build-up of residue in suction area and clear if necessary.
7. Check and clean engine radiator. Flush with clear, low-pressure water and blow dry with compressed air. Do NOT use high-pressure water spray.

SEASONAL AND WINTER STORAGE MAINTENANCE

1. Drain slurry tank of all water, prior to storage, and leave drain plug off while in storage.
2. Park unit in suitable location and chock wheels to prevent inadvertent movement.
3. If possible, cover machine with tarp or park inside of an enclosure.
4. Store the HydroSeeder® with all slurry valve handles in the open position. To prevent damage from freezing, it is advisable to remove all slurry valves and store in a heated area.
5. 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.
6. Chip and steel-brush any interior rust spots in the slurry tank and touch-up with paint. See steps 2 and 3 in IV. MAINTENANCE of the HYDROSEEDER® SAFETY SUMMARY SECTION on page 4.
7. Lubricate all fittings.
8. Check anti freeze in radiator.
9. Lubricate equipment again just prior to putting into operation after having been in storage.
10. Change hydraulic oil and filter. (400 hours)
11. Disconnect battery cables. In cold weather, remove battery and store it in a safe, warm place.
12. Add fuel stabilizer to fuel tank.

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 19 gal (72 L) of ISO Grade 46 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 25 micron absolute filter (FINN part number 021618). The hydraulic system relief is factory-set at 2,100 psi (12,479 kPa).

CLUTCH/PUMP COMBINATION (CLUMP) MAINTENANCE

NOTE: Refer to Figures 8 and 9 on page 24 and 26 for all in-text callouts on pages 24 through 29.

⚠CAUTION

Clump maintenance should be done only while engine is not running and battery cables are disconnected. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

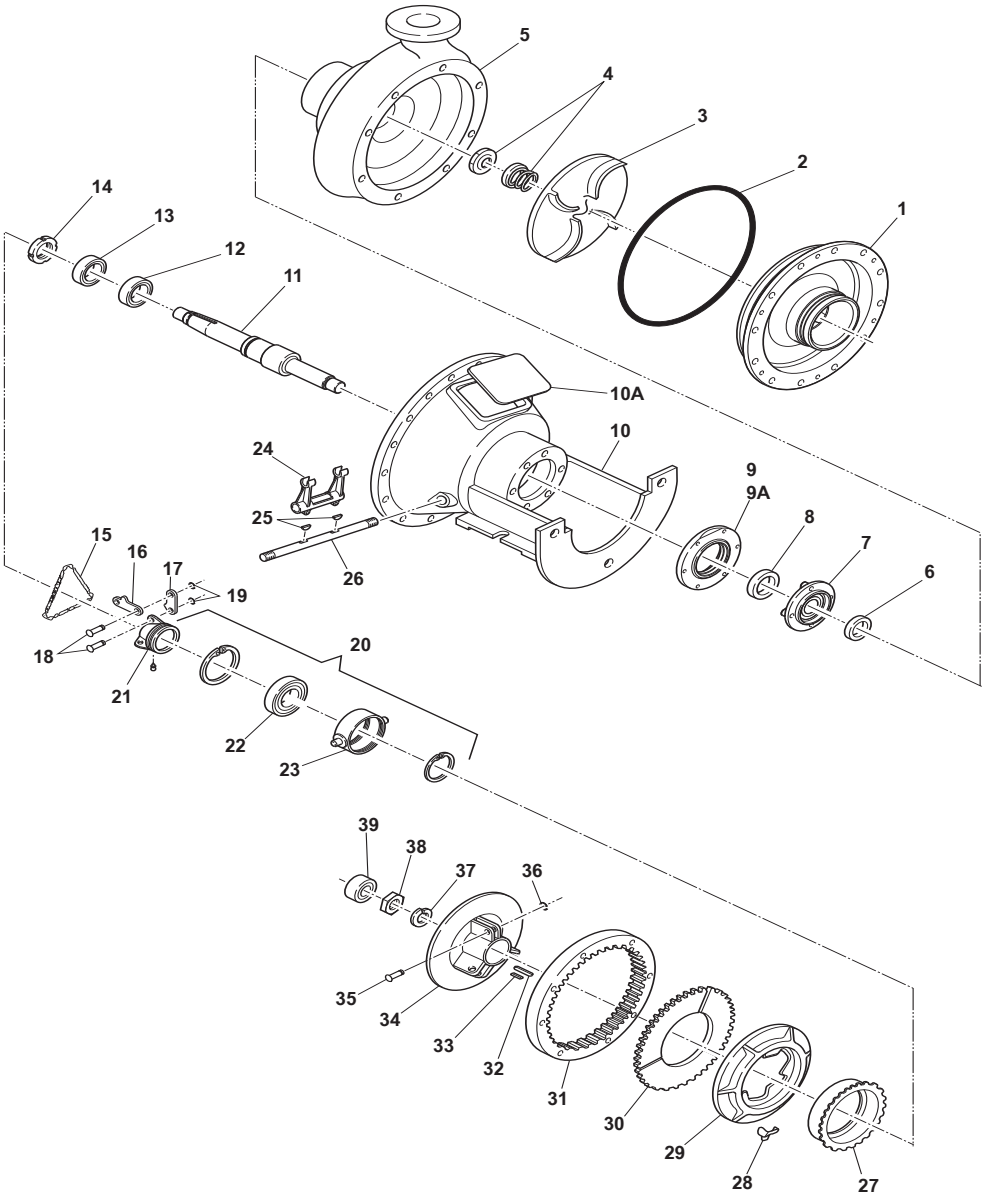


Figure 8 – Clump Assembly Components

CLUMP ASSEMBLY

(Reference Figures 8 and 9)

Ref. No.	Part Number	Description	No. Required
1	005146	Pump Suction Cover	1
1B	X0824SS	Suction Cover Bolt	4
1N	Y08SS	Suction Cover Nut	4
2	006437	O-ring	1
3	005543	Pump Impeller	1
4	006443	Mechanical Seal	1
5	005144	Pump Casing	1
5B	X0824SS	Pump Suction Cover Bolt	8
5W	W08FSS	Pump Suction Cover Washer	8
6	006444	Grease Retainer Seal	1
7	005446	Flange Bearing	1
7B	X0724SS	Flange Bearing Bolt	4
7LW	W07LSS	Flange Bearing Lockwasher	4
8	005447	Shaft Seal	1
9	005475	Thrust Bearing Retainer	1
9A	005544-02	Thrust Bearing Retainer Gasket	1
9B	X0512SS	Thrust Bearing Retainer Bolt	6
10	005670	Clutch/Pump Drive Housing	1
10A	005570	Clump Nameplate	1
10B	XST0408SS	Clump Nameplate Screw	2
11	005541	Clump Shaft	1
12	005450	Radial Ball Bearing	1
13	005449	Radial Ball Bearing w/ Seal	1
14	005448	Bearing Locknut	1
15	100211	Spring Lever	1
16	100212	Lever	3
17	100215	Connecting Link	6
18	100216	Link Pin	6
19	100217	Retaining ring	6
20	100327	Release Sleeve and Bearing Assembly	1
21	100328	Release Sleeve	1
22	100330	Release Bearing	1
23	100329	Bearing Carrier	1
24	100073	Clutch Yoke Assembly	1
25	100042	Woodruff Key	2
26	100041	Cross Shaft	1
27	100210	Adjusting ring	1
28	100214	Adjusting Lock	1
29	100208	Pressure Plate	1
30	100209	Clutch Facing	1
31	100218	Drive ring	1
32	100056	Clutch Key	1
33	100219	Separator Spring	1
34	100207	Clutch Body	1
35	100213	Pivot Lever Pin	3
36	100008	Retaining ring	3
37	100047	Lock Washer	1
38	100045	Drive Shaft Nut	1
39	005151	Pilot Bearing	1
40	160234	Pipe Plug	2
41	007705	Grease Fitting	2

PUMP MAINTENANCE SECTION

⚠CAUTION

Pump maintenance should be done only while engine is not running and battery cables are disconnected. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

A. FACTORY TOLERANCES

1. To check pump tolerances, loosen the two clamps on pump suction piping and remove the inlet elbow. Through the pump suction hole, insert a feeler gauge between the pump impeller (3) and the pump suction cover (1). This measurement on a new pump is between 0.040 to 0.045 in. (1.00 mm to 1.15 mm).

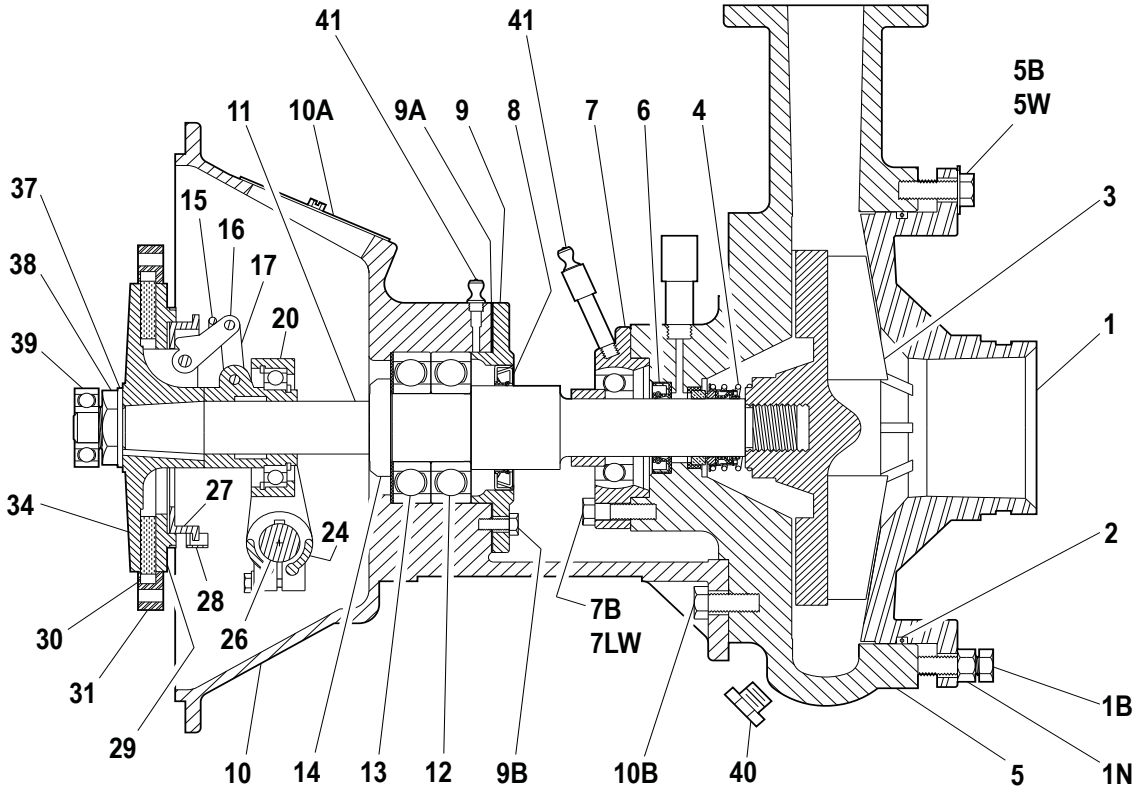


Figure 9 – Cross-Section Through Clutch/Pump Assembly (Clump)

NOTICE

Tightening of the bolts should be performed in a criss-cross pattern. DO NOT TIGHTEN OVER 15 lb-ft (20 N•m). Overtightening will crack the flange of the pump suction cover.

B. IMPELLER CLEARANCE – To bring the pump back to proper tolerance, proceed as follows:

1. Loosen four bolts (1B), and push pump suction cover (1) into pump casing (5) until pump suction cover touches the pump impeller (3). Pump impeller should be in full contact with pump suction cover.
2. Tighten eight bolts (5B) finger-tight. Pump impeller should rub the pump suction cover and not turn easily through one revolution.
3. Tighten four bolts (1B) hand tight until they touch the pump casing (5).

4. Back off eight bolts (5B) 1-1/2 turn.
5. Tighten four bolts (1B) 1-1/2 turn and tighten four nuts (1N) to 15 lb-ft (20 N•m).
6. Tighten eight bolts (5B) to 15 lb-ft (20 N•m). Clearance gap should be about 0.040 in. (1.00 mm). Check to make sure if pump impeller turns freely through one revolution.

C. CLEANING

1. To clean pump impeller (3), loosen the two victaulic pipe clamps and remove suction pipe assembly. The eye of the pump impeller can then be seen through the pump suction cover (1) and is readily accessible for cleaning.
2. To further access pump impeller, remove eight bolts (5B) holding pump suction cover (1) in place. Remove pump suction cover, being careful not to damage O-ring (2).
3. To remove pump impeller, take the pump impeller wrench, which is stored in the toolbox, and position it so that the hole is aligned with any of the eight tapped holes in the front of the pump casing (5). The 90 degree leg of the wrench should face inward toward the pump impeller and be positioned between any two of the pump impeller fins. Bolt wrench securely in place with one of the pump suction cover bolts (5B). Using a pipe wrench on the clump shaft (11), unscrew pump impeller by turning clump shaft in a clockwise direction. Be careful not to unscrew pump impeller too far before removing the pump impeller wrench.

⚠CAUTION

Do not turn the shaft backward with a pipe wrench. This will unscrew pump impeller from pump shaft. Consequently, when clutch is engaged (turned on), the pump impeller will screw onto pump shaft with a force great enough to break pump impeller. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

D. INSTALLING NEW SEAL ASSEMBLY

NOTICE

(Do NOT unwrap new seal assembly until you are ready to install. All parts of seal assembly are packed in sequence of installation.)

1. To replace seal assembly (4), perform above steps in CLEANING, and remove pump casing (5) by removing four bolts (10B) that hold casing to the clutch/pump drive housing (10).
2. After cleaning all parts, including pump shaft, begin reassembly of pump. Install seal grease retainer (6) with the cavity portion of the seal facing outward. Rebolt the pump casing onto the clutch drive housing using three bolts (10B). Using a light oil lubricant (such as 3-in-1 oil), install the ceramic seat with its neoprene holder into the seal recess, making sure it is square with the pump shaft. Lubricate the inside of the bellows assembly with a light oil lubricant and check to make sure the steel ring is stuck (glued) to the end of the assembly. Slide the bellows assembly onto pump shaft and push till the steel ring is against the ceramic seat.
3. Install the seal spring on the hub of pump impeller. After coating the threads on pump shaft with an antiseize compound, install pump impeller and seat it securely.
4. Utilizing O-ring (2), reinstall suction cover using eight bolts (5B). At this time, check to see that pump runs freely. If pump impeller rubs suction cover, you do not have pump impeller tight on pump shaft or the suction cover needs to be readjusted. See IMPELLER CLEARANCE on current page. Tighten bolts uniformly using 15 lb-ft. (20 N•m) on the torque wrench.
5. After reinstalling suction pipe assembly, lubricate, and tighten victaulic clamps. Service the automatic pressure lubricator. See page 9.

CLUTCH MAINTENANCE SECTION

⚠CAUTION

Clutch maintenance should be done only while engine is not running and battery cables are disconnected. Failure to comply could result in minor or moderate personal injury. Failure to comply could also result in product or property damage.

A. ADJUSTMENT

If the clutch does not pull, overheats, or the clutch operating lever pops out, the clutch must be adjusted. Proceed as follows:

1. Remove clump nameplate (10A) in the drive housing (10), and rotate clutch until adjusting lock collar and lock screw (28) can be reached. To avoid dropping the adjusting lock (28) into the housing, use caution when removing or disengaging.
2. Turn adjusting ring (27) counterclockwise to obtain recommended operating lever pressure.

HANDLE PRESSURE

Variation in handle length directly affects the required handle pressure needed for clutch adjustment. See the table below to determine the correct handle pressure.

Clutch Size	Reference Handle Length	Pressure at Lever
7-1/2"	7-5/8"	110–130 lb

NOTICE

A new clutch generally requires several adjustments until the friction surfaces are worn in. Do not let clutch slip, as this will glaze the friction plates and may ruin them

B. LUBRICATION

1. Lubricant – Use any high grade, lithium-based number 2, short-fiber grease having an operating temperature of 200˚F (93˚C) that is recommended for roller bearings.

NOTICE

Do not mix sodium- or calcium-based grease with lithium-based grease. Lubricate sparingly to avoid oil seepage onto clutch facings.

2. Anti-Friction Bearings – Shaft bearings should be lubricated after every 50 hours of operation. Shaft bearings can be lubricated through the fittings (41) with a short-fiber, high-grade, high-temperature, lithium-based number 2 lubricant that has an operating temperature of 200˚F (93˚C). On occasion, use the same lubricant to lubricate the two fittings at the cross-shaft (26).
3. Clutch Lever and Linkage – Clutch levers and linkage should be lubricated with engine oil after every 500 hours of operation.

NOTE:

C. REMOVAL OF CLUTCH/PUMP ASSEMBLY (CLUMP) FROM ENGINE

1. Remove clamps and piping from the suction and discharge side of pump.
2. Place a jack under bell housing of engine to support the rear of the engine after clump has been removed.

3. Place clutch control in the ENGAGE position to hold clutch facings in place when removing clutch from engine. Unbolt the rod that connects the clutch operating lever to operator's platform clutch handle
4. Attach a suitable lifting device to clutch/pump drive housing (10). Remove bolts that secure the drive housing to the engine flywheel housing and the two bolts holding the drive housing to the HydroSeeder® frame.

⚠CAUTION

Caution should be exercised when removing clutch/pump housing from the engine so that the facings and pilot bearing are not damaged.

5. Support the housing assembly on blocks, making sure the output end of the shaft is facing downward.
6. Remove the clump nameplate (10A) from the housing for improved access to internal parts.

D. CLUTCH FACING PLATES (ITEM 30) REPLACEMENT

A common indication that the facing's friction surface is worn out is that the adjusting ring cannot be turned any tighter. To replace the facing plates, remove the clutch/pump from the engine as described above and proceed as follows:

1. Disengage (turn off) clutch operating lever, and remove the old facing plates (30).
2. Insert the new facing plates (three segments) in between clutch body (34) and pressure plate (29), and center facings as close as possible.
3. Lock clutch facings between pressure plates as follows:
    A. Remove drive ring (31) from engine flywheel so that it can be used to center the facings.
    B. With clutch assembly resting on a workbench, turn clutch adjusting ring counterclockwise until pressure plate (29) almost contacts clutch facing (30).
    C. Place clutch driving ring over clutch facings with teeth in driving ring in mesh with teeth of clutch facings, and locate driving ring centrally relative to the pressure plate and clutch body.

NOTICE

If driving ring is not properly located relative to the pressure plate and clutch body, the clutch cannot be assembled to the flywheel, as the teeth of clutch facings will not enter the teeth of driving ring, even though the clutch drive shaft enters the pilot bearing.

    D. Engage (turn on) clutch by applying pressure on top of release sleeve and collar assembly (20), and lock clutch facings between pressure plate and clutch body. If clutch facings are still free to move, disengage (turn off) clutch, and turn adjusting ring counterclockwise just enough to lock the clutch facings in place when clutch is engaged (turned on).

NOTICE

Engage clutch (turn on) until the clutch assembly is attached to the engine.

4. Remove clutch driving ring (31) from clutch facings and attach it to the flywheel with the specified bolts and lock washers.
5. Before reinstalling clutch onto engine, lubricate release sleeve (21) through the grease fitting mounted on its side.
6. To reinstall the clutch/pump assembly onto the engine, reverse the procedure outlined under REMOVAL OF CLUTCH/PUMP FROM ENGINE on page 28.
7. When clutch/pump are reinstalled, check handle, engage pressure, and adjust if necessary.

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 the corrective actions to take.

1. Foam in tank and air entrainment:

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

   Some solutions are:

   A. As slurry level drops in tank, slow the agitator.
   B. Add 2 to 3 oz (59 to 89 ml) of an anti-foaming agent to tank.
   C. If you can determine which additive is causing the air problem, either add it last or not at all – unless it is the water.
   D. Reduce recirculation time as much as possible.

2. Plugging or clogging:

⚠ DANGER

Turn off engine and disconnect battery cables before working on equipment. Failure to comply will 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 became airbound. To remedy this, see FOAMING OF SOLUTION AND LACK OF DISTANCE on page 32. Plugging is caused by either foreign objects or dewatered fiber. Plugging can occur in any of four places: the valve and recirculation nozzle, the discharge nozzle, the pump area, and the sump area. If plugging does occur, perform any of the following tasks to clear the obstruction:

A. Obstruction in discharge nozzle is determined by a change in or stoppage of the spray pattern. To clear an obstruction, perform the following steps:

   1. Disengage (turn off) clutch.
   2. Remove nozzle.
   3. Clean the discharge nozzle. To clean the discharge nozzle, use the nozzle cleaning rod attached to the underside of the guard rail. Insert the nozzle cleaning rod into nozzle to push and buildup out of the nozzle. Repeat procedure until nozzle is completely cleaned. (Platform option only.)

⚠ DANGER

Before loosening any clamps, determine if the pipe is hot. If so, let it cool before attempting to perform repairs. Failure to comply will result in death or serious injury.

B. If the recirculation system is not working:
    1. Disengage (turn off) clutch and stop engine.
    2. Remove clamp attaching recirculation valve.
    3. Slide rubber seal back and remove valve assembly.
    4. Check valve assembly, recirculation nozzle in discharge pipe, and recirculation pipe going into tank. Clear any obstructions.
    5. Replace valve assembly and slide seal back into place. Lubricate outside of seal.
    6. Replace clamp.

C. Obstruction in pump can be indicated by a drop in pressure. If a drop in pressure is accompanied by a frothy or whitish discharge stream, blockage is in the suction line or sump area. To clear the pump:
    1. Disengage (turn off) clutch and stop engine. Close suction shutoff valve if applicable.
    2. Loosen suction pipe clamps. If there is material in tank, stuff a rag into the suction piping.
    3. Remove suction pipe clamp closest to pump.
    4. Remove elbow and slowly open suction shutoff valve.

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

    5. Reach into pump and remove obstruction. If it is jammed, the pump suction cover may have to be removed.
    6. Reassemble, removing rag plugging the suction piping.

D. Obstruction in sump area, which is located at the bottom of the tank on the inside where the suction pipe is attached. Three methods to remove an obstruction in the sump area are as follows:
    1. Clear the sump by backflushing through the discharge plumbing with the water supply hose. This is the easiest method.
    2. 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.
    3. Use a pipe or pole through the loading hatch opening to dislodge the obstruction.

TROUBLESHOOTING YOUR HYDROSEEDER®:

Problem	Probable Causes	Suggested Solutions
LEAKS:		
Tank Bearing	Lack of lubrication – seal worn	Replace seal and follow lube schedule.
	Bolts not tightened	Tighten uniformly to 25 lb–ft (34 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	Rebuild swivels w/repair kit (part number 006969, qty. 2 required).
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.
MACHINE JUMPS DURING OPERATION:		
Agitator	Agitator bent by heavy object falling on it	Straighten agitator or shim so it runs true.
Bent Paddles	Loading wood fiber mulch into tank before tank is half full	Straighten agitator paddle; realign agitator to run true.
FOAMING OF SOLUTION AND LACK OF DISTANCE:		
Pump loses prime – lacks distance – leaves excessive amount in tank – 100 gal (378 L) or more	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 page 30.
	Low engine rpm (Below 3,600 rpm – No load)	Check throttle cable and linkage. See authorized engine dealer.
	Soft water	Slow the agitator.
	Too much agitation	Slow the agitator.
	Pump worn	Reset pump tolerance. See page 26.
	Suction partially plugged	Clean out machine. See page page 22.
	Nozzle worn or plugged	Clean nozzles; replace if necessary
	Fertilizer	Change type.
	Clutch slippage	Readjust clutch; See page 28.

TROUBLESHOOTING YOUR HYDROSEEDER®:

Problem	Probable Causes	Suggested Solutions
VALVE:		
Valve stuck	Frozen	Thaw out ice and lubricate; leave in discharge position during storage.
Constant plugging during operation	Foreign material in slurry	Drain and clean out tank; check storage for foreign materials.
Constant plugging during loading and discharging	Loading HydroSeeder® before tank is half full of water	Reinstruct your operator. See pages 14 and 15.
	Incorrect loading procedure	See pages 14 and 15.
	Improper operation by operator	Reinstruct your operator. Review Operator's Manual.
	Not moving valve handle far enough	Valve should be fully open.
	Machine not being flushed out prior to reloading	See Loading on page 14.
	Machine not being run at correct rpm during loading	Reinstruct your operator. See Loading on page 14.
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.
CLUTCH:		
Does not pull load or overheats	Out of adjustment	Readjust clutch. See page 28.
Jumps out of engagement	Too loose or too tight	Readjust clutch. See page 28.
PUMP:		
Excessive wear	Fertilizer with highly abrasive fillers	Change fertilizer – avoid abrasive fillers.
	Overloading machine with dry material	Load machine to recommended capacities.
	Too much time allowed between loading and discharging	After loading and mixing has been completed, set agitator at 1/2 discharging speed in reverse and disengage (turn off) pump.
	Recirculating all the time	Close recirculation valve when discharging through the boom.
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.

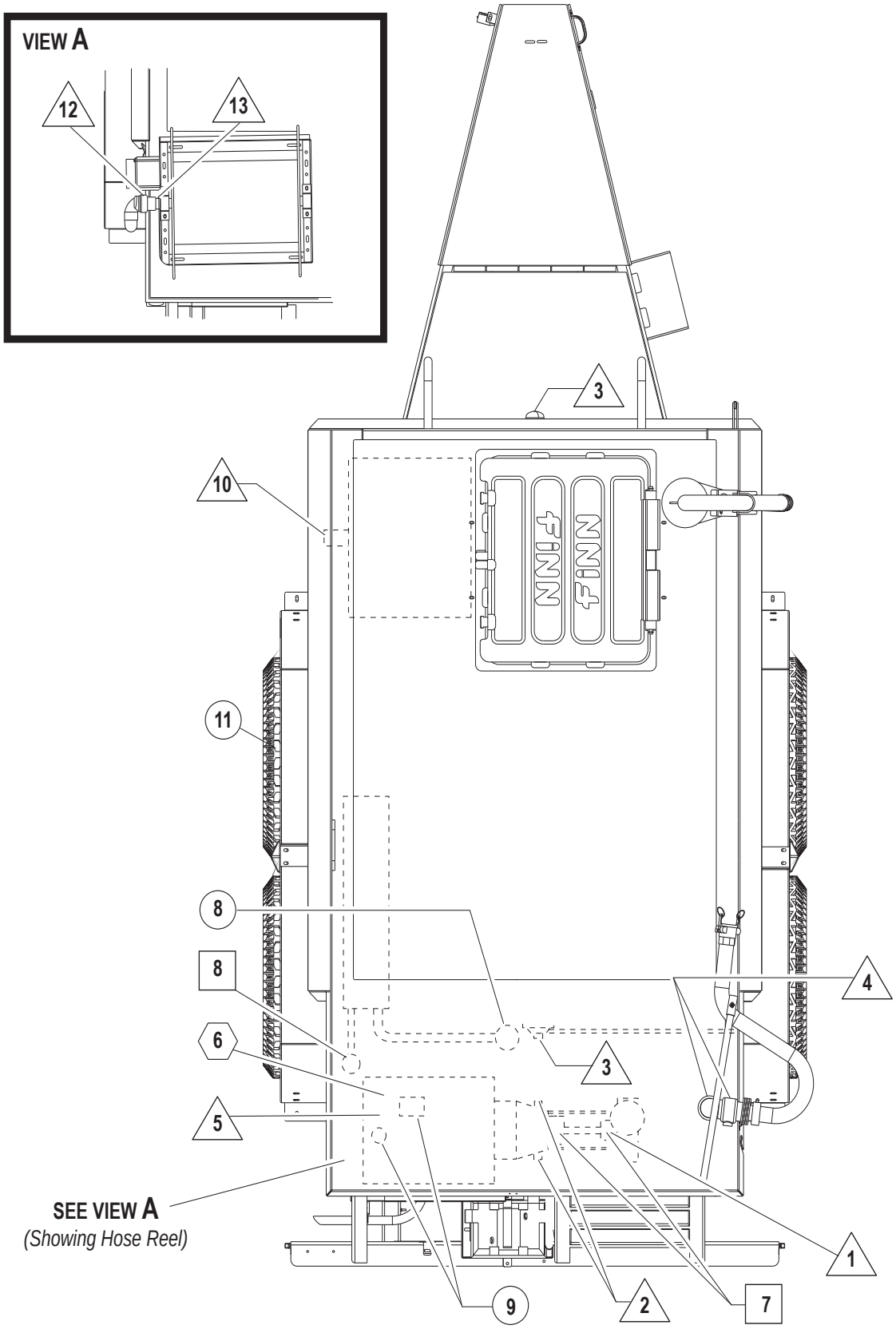


Figure 7 – Lubrication and Adjustment Points

LUBRICATION AND FLUIDS CHART

(Reference Figure 7)

Ref. No.	Location	Lubricant	Frequency	Number
1	Check Grease Level in Automatic Pressure Lubricator	SL	Daily	1
2	Check Clutch Lever Bearings	CL	Daily	2
3	Grease Agitator Shaft Bearings	CL	Daily	2
4	Grease Discharge Swivels	CL	Daily	1
5	Check Engine Oil Level	MO	Daily	1
6	Change Engine Oil and Filter	MO	See Engine Manual	1
7	Grease Pump Bearings	CL	Weekly	2
8	Check Hydraulic Fluid Level	HO	Weekly	1
	Check Hydraulic Fluid and Filter	HO	Seasonally	1
9	Change Engine Coolant	AF	Seasonally	1
10	Check Fuel Tank	DF	Daily	1
11	Repack Wheel Bearings	CL	Seasonally	4
12	Check Hose Reel Swivel	CL	Daily	1
13	Hose Reel Hank Crank Shaft	CL	Weekly	1

LUBRICANT OR FLUID USED

SL	Bearing Lube (Sodium-Based)
CL	Chassis Lubricant
MO	Motor Oil (See Engine Manual Recommendations)
HO	Hydraulic Oil, ISO Grade 46
AF	50/50 Anti-Freeze and Water Mixture
DF	Diesel Fuel

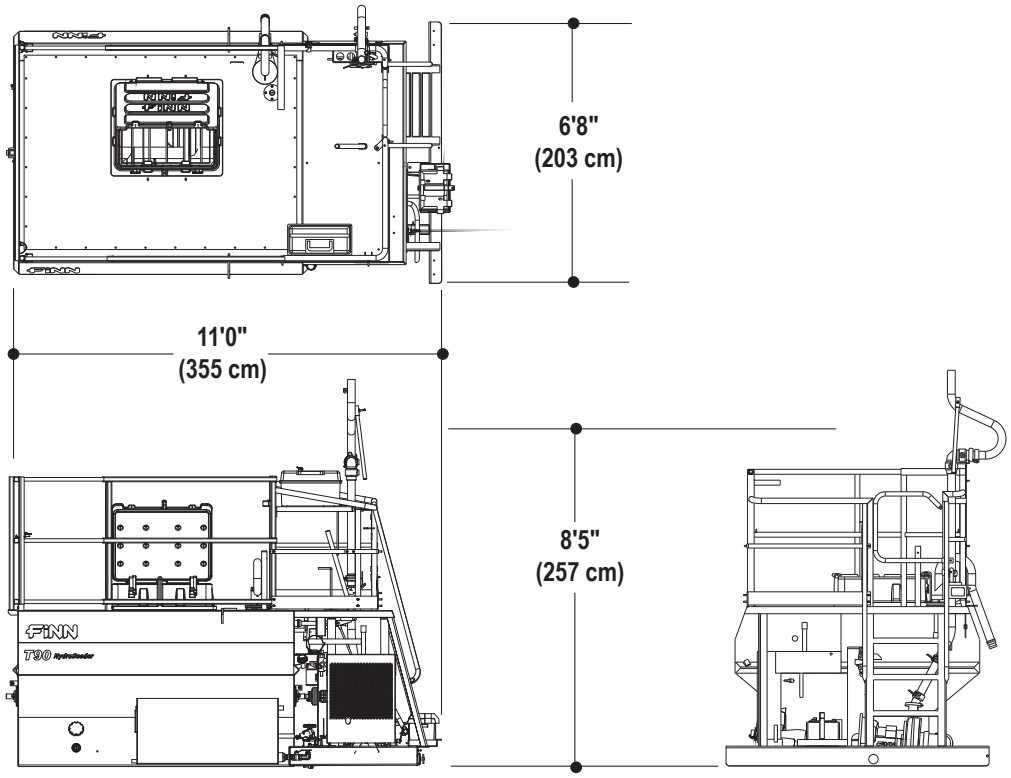
TIME KEY

Daily (8 Hours) △
Weekly (40 Hours) □
Seasonally (500 Hours) ○
See Engine Manual ⬡

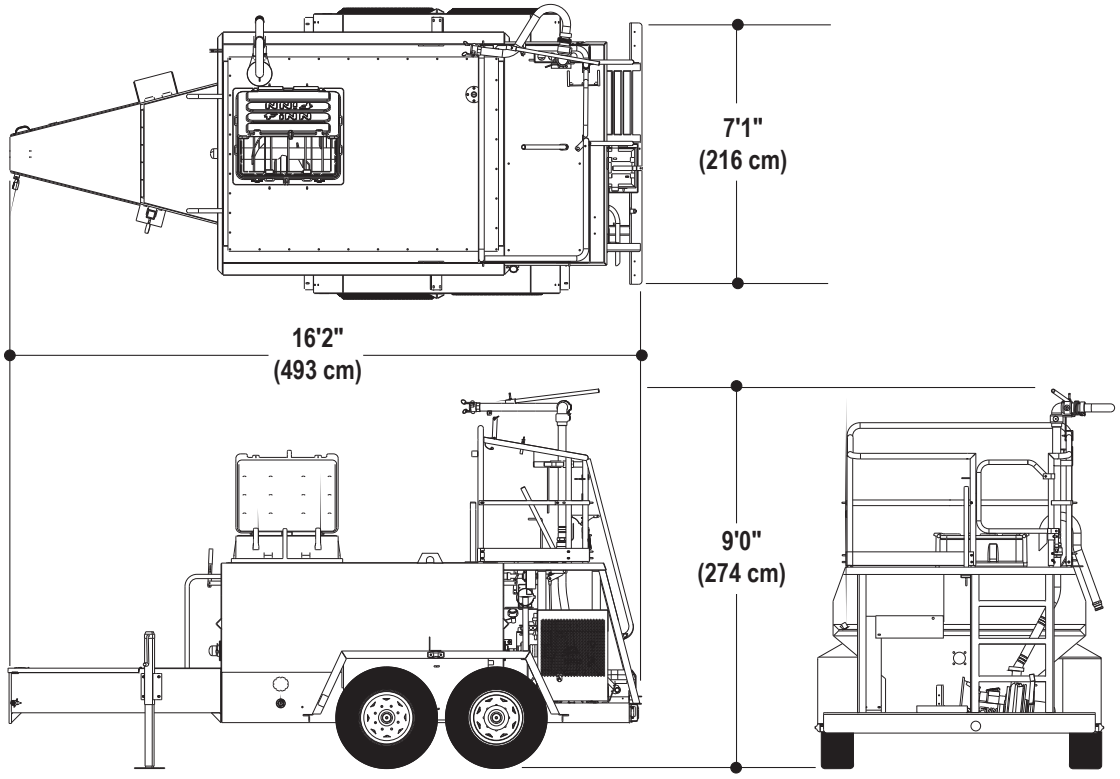
FLUID CAPACITIES

Diesel Fuel – 14 gal (53 L)
Engine Oil – 6 qt (6 L)
Engine Coolant – 1.5 gal (6 L) 50/50 Mix Only
Hydraulic Fluid – 19 gal (72 L)

T90 SKID-MOUNT HYDROSEEDER® TECHNICAL SPECIFICATIONS



T90 TRAILER HYDROSEEDER® TECHNICAL SPECIFICATIONS



FINN T90 HYDROSEEDER® TECHNICAL SPECIFICATIONS

POWER	Diesel Kubota V1505, 33.5 hp (25 kw), 4 cylinder water-cooled	
ENGINE SAFETY SYSTEM	Low oil pressure, high temperature shutoff	
TANK SIZE	940 gal (3,558 L) liquid capacity 800 gal (3,028 L) working capacity	
FUEL TANK CAPACITY	14 gal (53 L)	
PUMP	Centrifugal 4 in. x 2 in. (10 cm x 5 cm) 170 gpm @ 100 psi (689 kPa) (646 LPM @ 7 kg/cm2), 3/4 in. (1.9 cm) solid clearance, external adjustment	
PUMP DRIVE	Direct drive with over center clutch, pump drive is independent of agitator operation	
AGITATION	Mechanical paddle agitation and liquid recirculation	
AGITATOR DRIVE	Reversible, variable speed hydraulic motor drive (0–110 rpm)	
DISCHARGE DISTANCE	Up to 180 ft (55 m) from end of discharge tower	
MAX. MATERIAL CAPACITY	2,500 lb (1,134 kg) granular solids 400 lb (181 kg) fiber mulch	
NOZZLES	(1) narrow fan, (1) wide fan, (2) long distance	
EMPTY WEIGHT	T90T	5,240 lb (2,458 kg)
	T90S	4,000 lb (1,814 kg)
WORKING WEIGHT*	T90T	14,670 lb (6,654 kg)
	T90S	13,250 lb (6,010 kg)
BRAKES	Electric on both axles with breakaway switch	
LIGHTS	D.O.T. including side marker lights, an identification light, and a license plate light	
TIRES	9.5 in. x 16.5 in. tubeless with highway tread, load range E	
TRAILER AXLES	Tandem 7,000 lb (3,176 kg) rubber torsion with adjustable fenders	
HITCH WEIGHT	Approx. 1,600 lb (762 kg)	

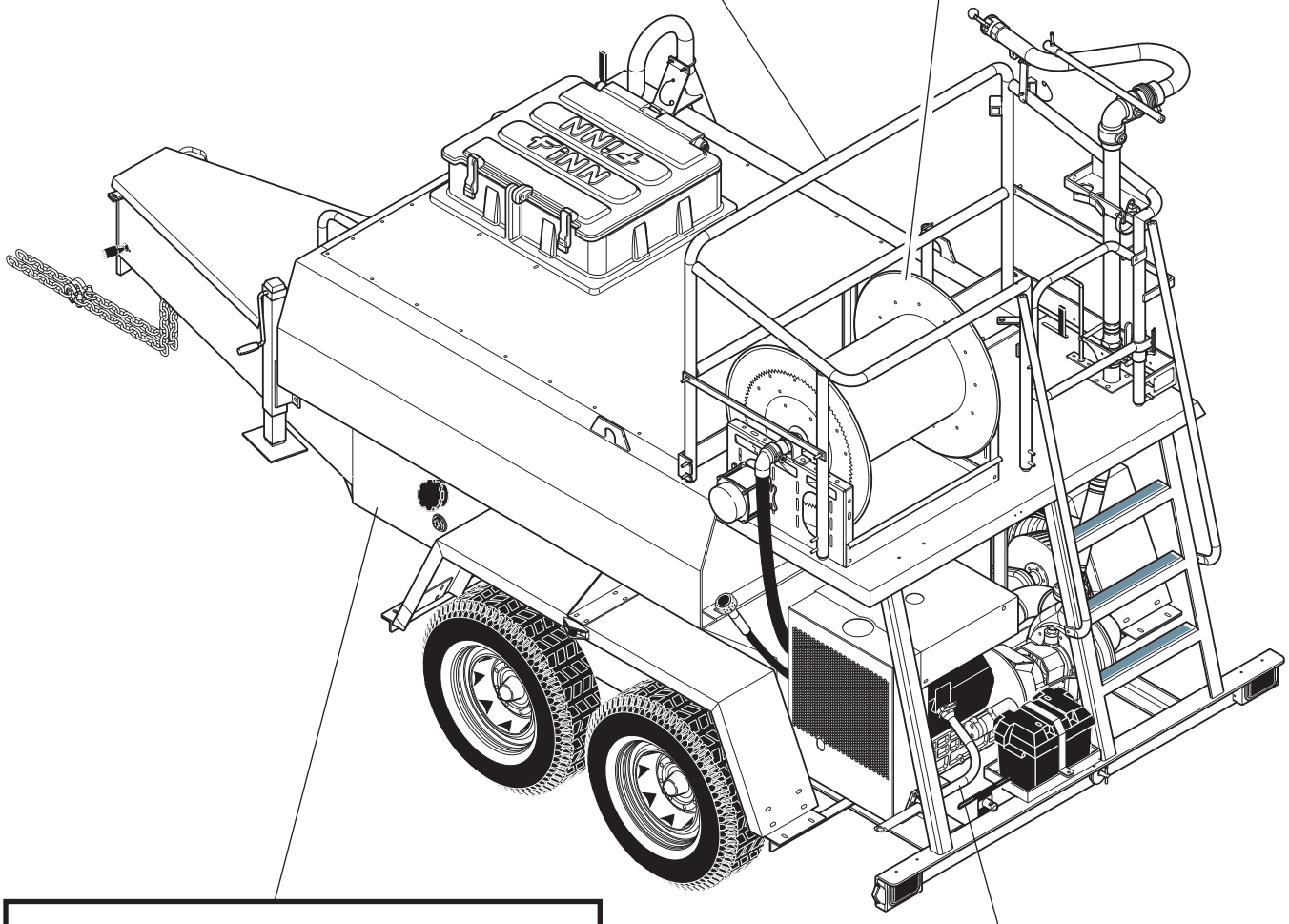
** Working weights are approximate and do not include options or stored materials.*

NOTES

T90-II
HydroSeeder®
Parts Manual

Model MO

T90 TRAILER PICTORIAL REFERENCE



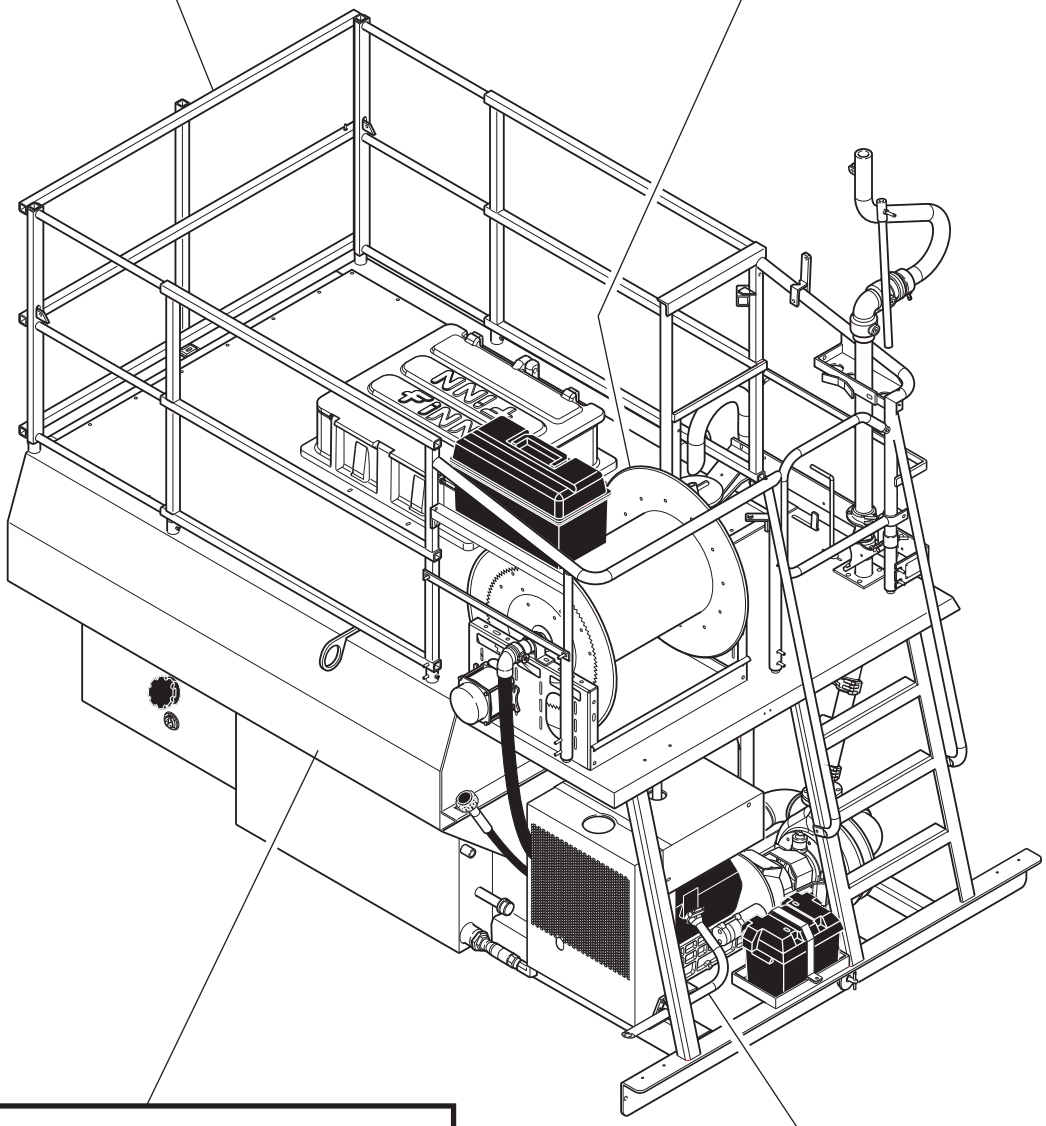
OPERATOR'S PLATFORM

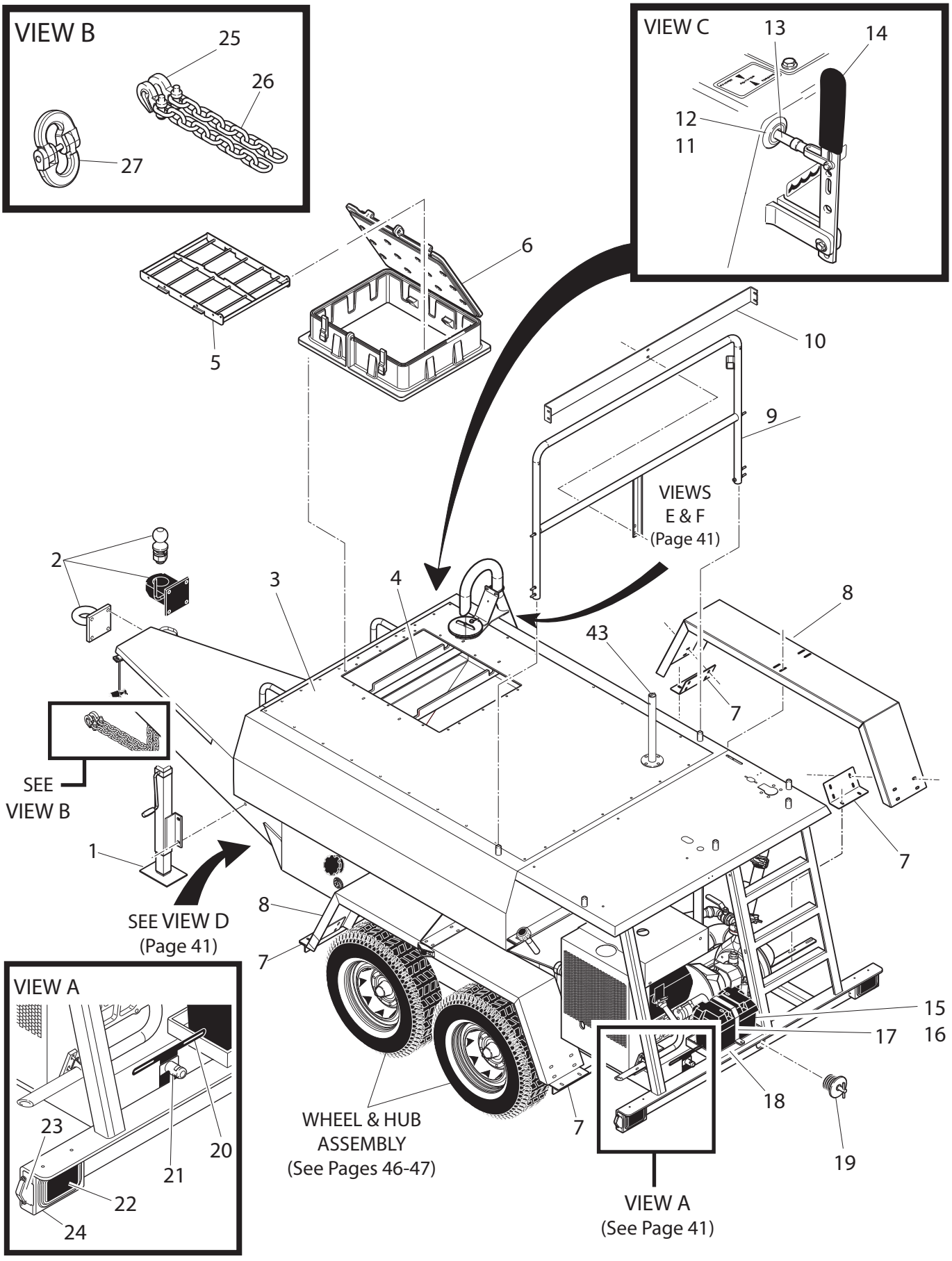
HOSE REEL

TRAILER

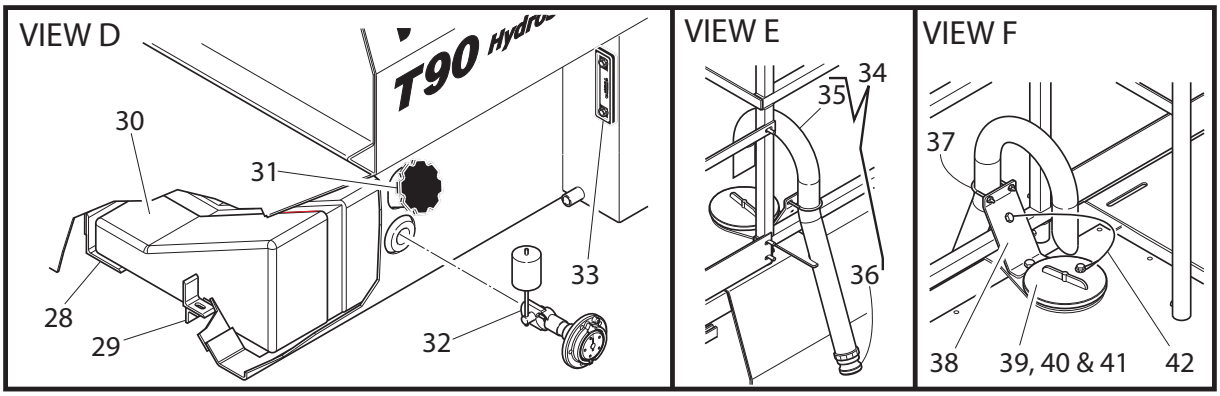
PIPING, CLUMP & ENGINE

T90 SKID PICTORIAL REFERENCE



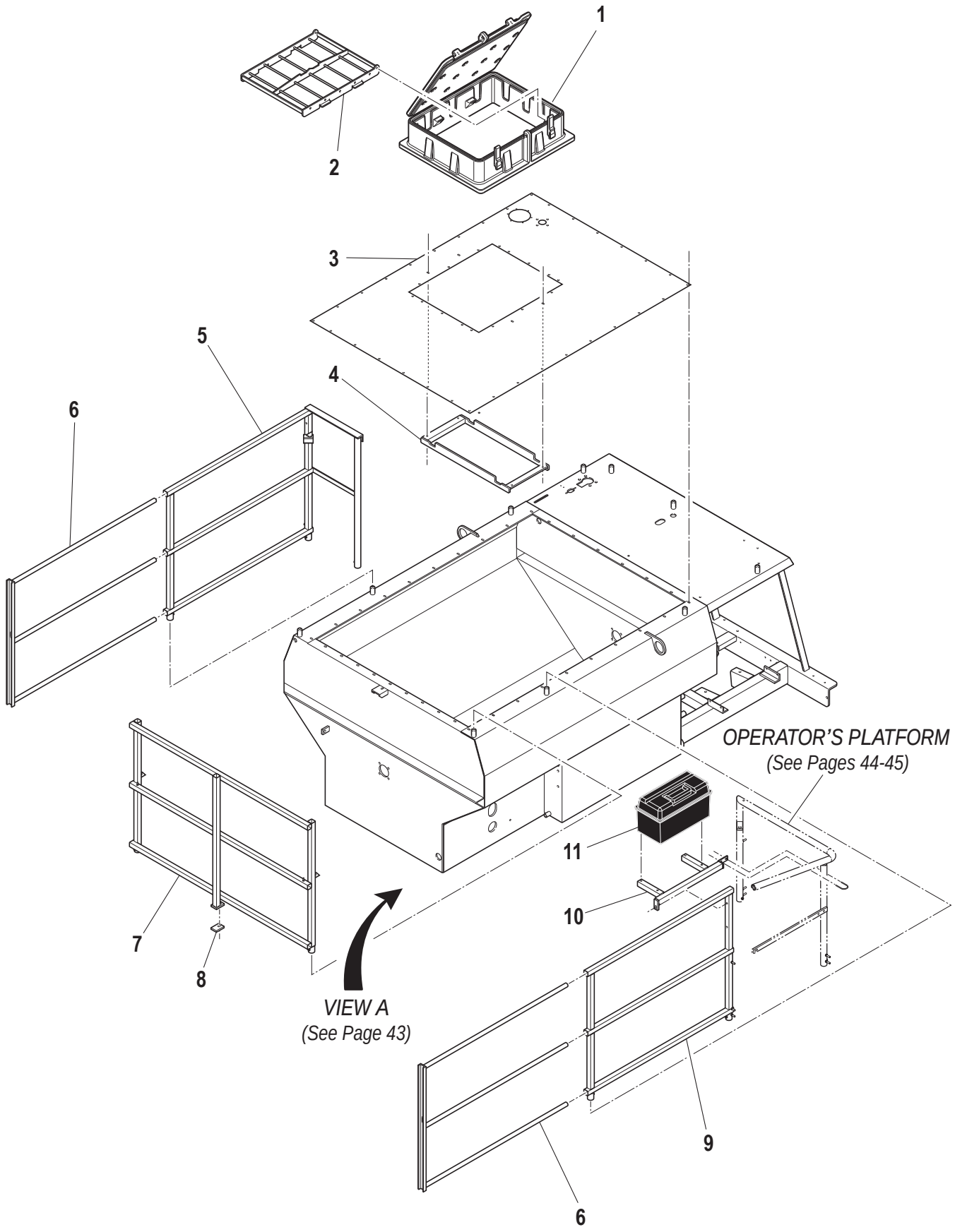


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

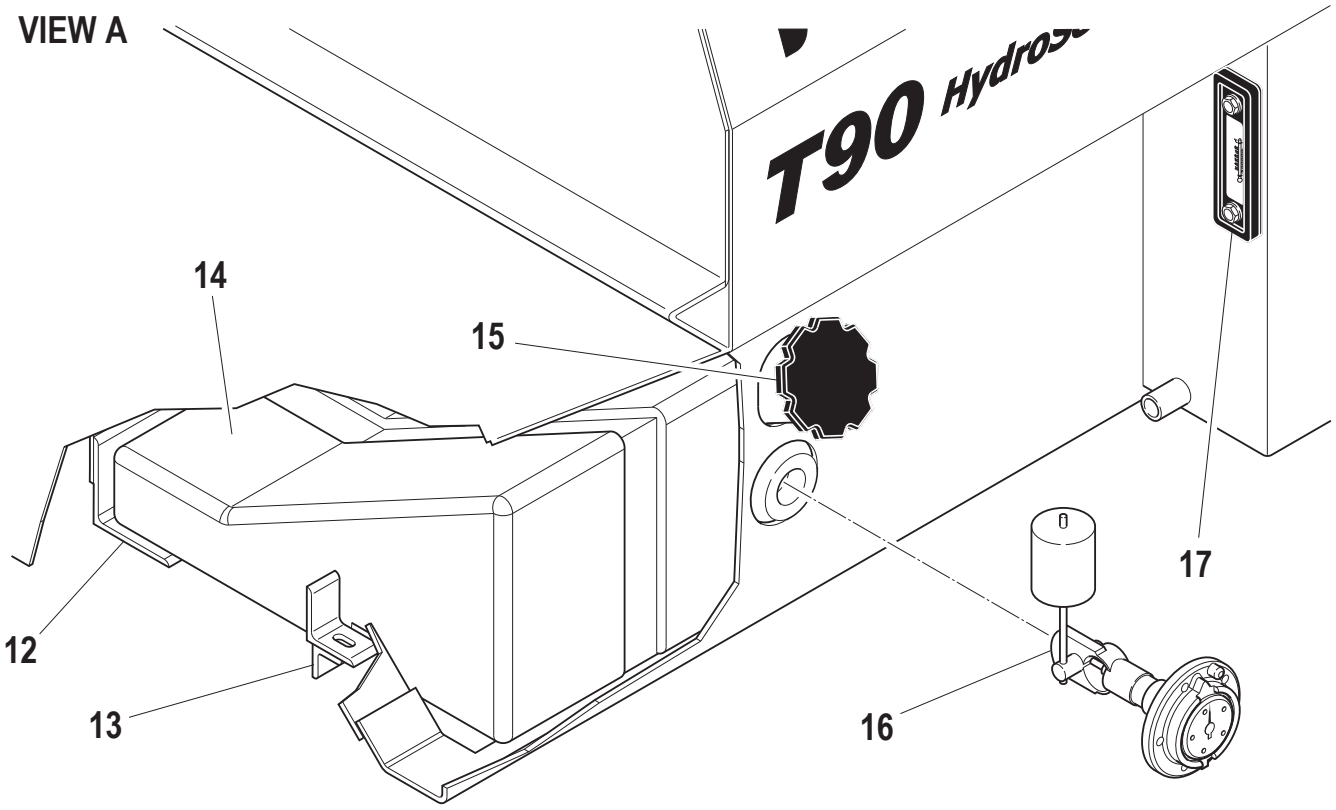


TRAILER

Ref. No.	Part Number	Description	No. Required
1	080701	Jack Weldment w/ Bracket	1
2	080043	Lunette Eye 2-1/2" Pintle Hitch } *OPTIONAL*	1
	005134	2-5/16" Ball Coupler } *OPTIONAL*	1
	005135	2-5/16" Ball } *OPTIONAL*	1
3	F90-0020	Tank Top	1
4	F120-0006	Hatch Safety Rail	1
5	012834	Bag Cutter – Stainless Steel	1
6	012833	Poly Hatch Assembly	1
7	F90-0006	Fender Mounting Bracket	4
8	F90-0011	Fender	2
9	005536	Front Cross Rail Weldment	1
10	005462-01	Platform Cross Toe Rail	1
11	005515-01	Agitator Control Rod Conduit	1
12	005178	O-ring	1
13	005516-01	Agitator Control Rod Weldment	1
14	F60-0020	Agitator Control Handle	1
	022202	Black Handle Grip	1
15	080223	Battery Box	1
16	002256-12	12V Battery - Interstate Battery MT34	1
17	F90-0016	Battery Box Hold Down	1
18	F330-0054	Battery Box Holder	1
19	004593	Expansion Plug	1
20	004720	License Plate Bracket	1
21	005436	License Plate Light	1
22	005434	Taillight Assembly	2
	005434A	Taillight Lens	1
23	005435	Side Marker Light	2
24	005467	Tail Light Bracket	2
25	005796	Clevis Grab Hook – Self-Lock	2
26	190033	Binder Chain	6 ft
27	004888	Binder Chain Coupling Link	2
28	005500-02	Fuel Tank Support Angle	1
29	005500-12	Fuel Tank Angle – Long	1
30	005724	Poly Fuel Tank	1
31	005726	Diesel Fuel Cap	1
32	005721	Fuel Tank Gauge	1
33	080329	Hydraulic Level Sight Gauge	1
34	005745	Fill Port Weldment	1
35	005745-01	Fill Port Pipe	1
36	006096	2" Male Coupler	1
37	011115	U-Bolt for 2" Pipe	1
38	F90-0017	Fill Port Support	1
39	005441	Fill Port Cover	1
40	005440	Fill Well	1
41	005544-01	Fill Port Gasket	2
42	005700	Nylon Lanyard	1
43	005714-01	Vent Port Weldment	1



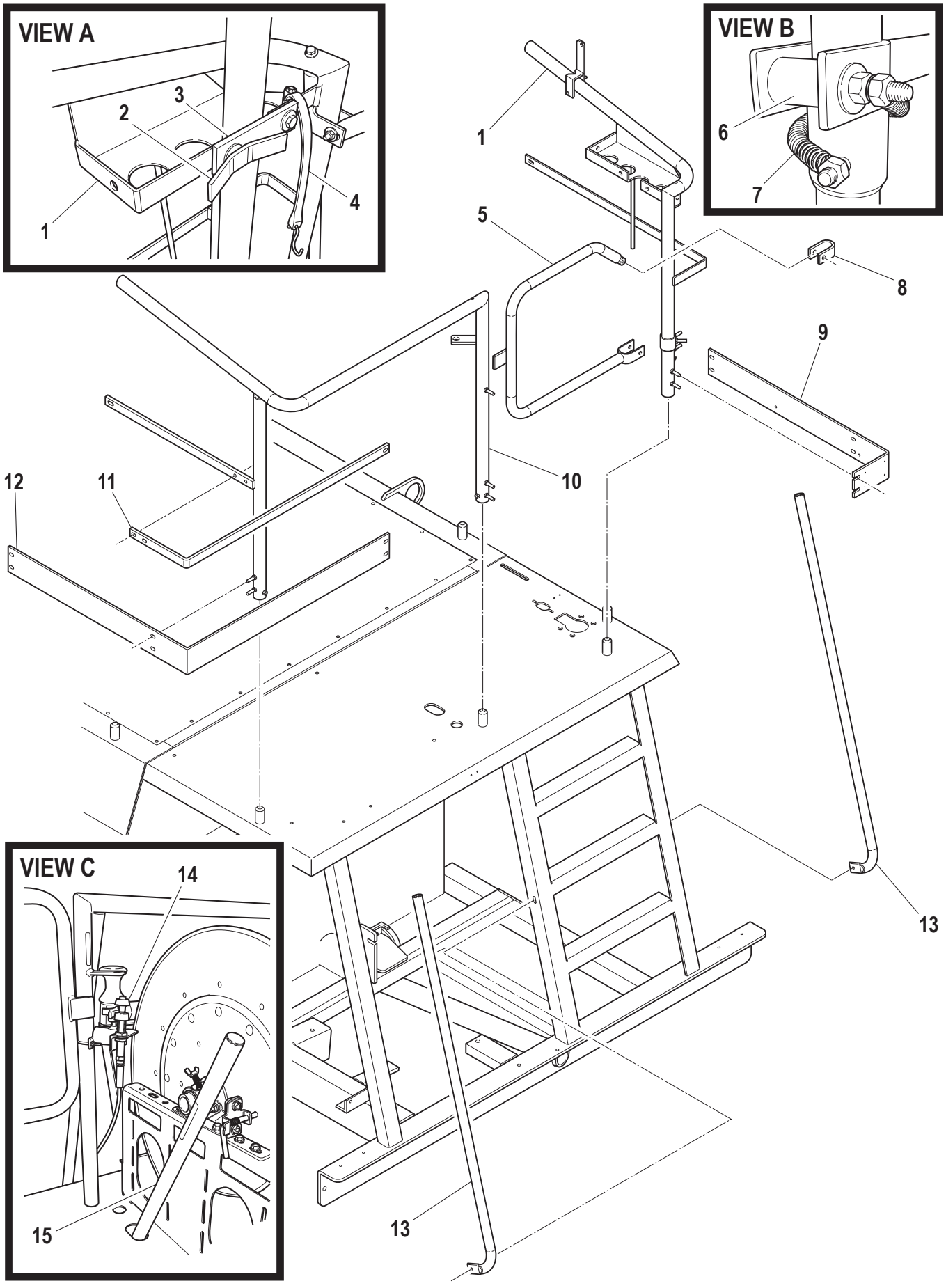
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



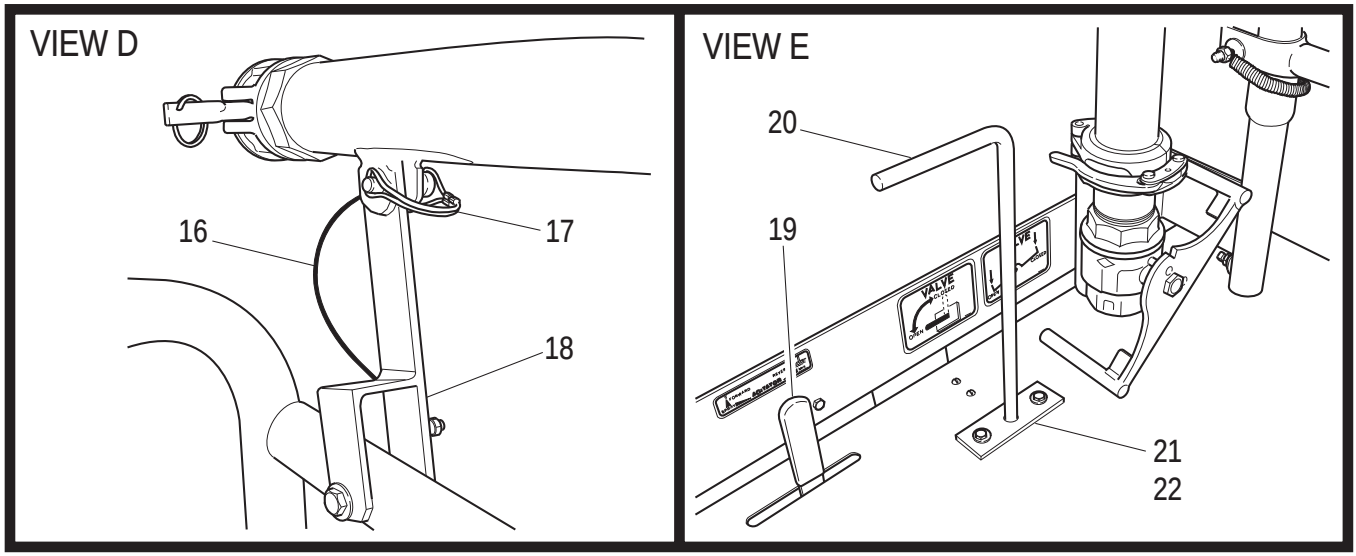
SKID

Ref. No.	Part Number	Description	No. Required
1	012833	Poly Hatch Assembly	1
2	012834	Bag Cutter – Stainless Steel	1
3	F90-0021	Tank Top	1
4	F120-0006	Hatch Safety Rail	1
5	005600	Right Rear Rail	1
	005613	Square Tubing Plug	11
6	005596	Slide Gate	2
7	005652	Front Cross Rail	1
8	052136-07	Rubber Mount Pad	1
9	005598	Left Rear Rail	1
10	005698	Tool Box Mount Weldment	1
11	052160	Toolbox	1
12	005500-02	Fuel Tank Support Angle	1
13	005500-12	Fuel Tank Angle – Long	1
14	005724	Poly Fuel Tank	1
15	005726	Diesel Fuel Cap	1
16	005721	Fuel Tank Gauge	1
17	080329	Hydraulic Level Sight Gauge	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



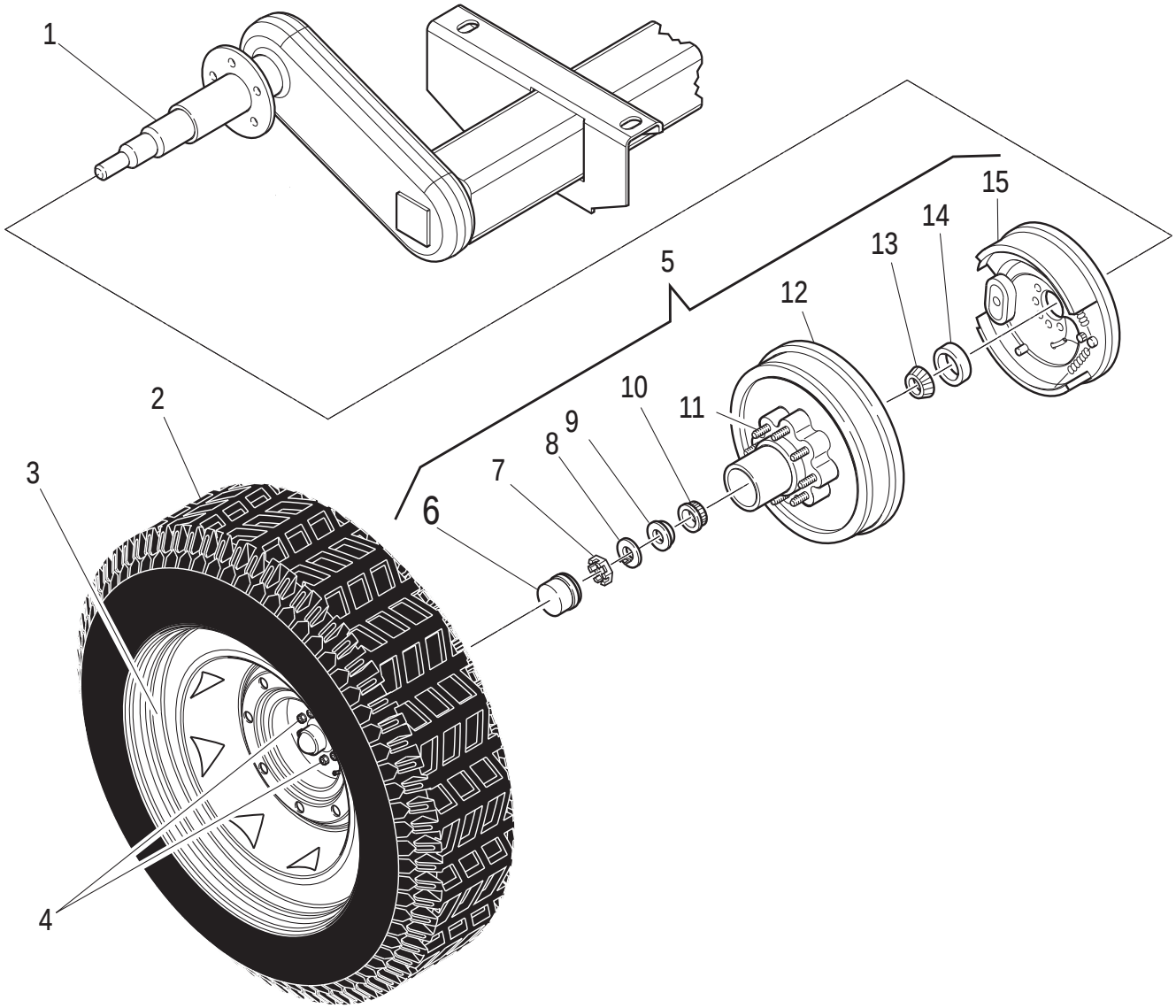
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



OPERATOR'S PLATFORM

Ref. No.	Part Number	Description	No. Required
1	005538	Right Rear Rail Weldment	1
2	002258	Clamp Handle Weldment	1
3	012487-05	Boom Clamping Strap	1
4	005161	Rubber Strap w/ "S" Hooks	1
5	005533	Gate Weldment	1
6	005532-03	Spacer	1
7	012052	Gate Spring	1
8	005532-05	Hinge Mounting Strap	1
9	005462-03	Platform Right Toe Rail	1
10	005540	Left Rear Rail Weldment	1
11	005534-01	Left Rear Guard Rail Strap	1
12	005462-02	Platform Left Toe Rail	1
13	005531-01	Hand Rail Weldment	2
14	005675	Throttle Cable (84")	1
	007675	Ball Joint	1
15	005514-01	Clutch Handle Assembly	1
16	005700	Nylon Lanyard	1
17	031245	Snapper Pin	1
18	005528-02	Boom Hold Down Weldment	1
19	F60-0020	Agitator Control Handle	1
	022202	Black Handle Grip	1
20	005512-01	Extension Handle	1
21	005511-02	Top Seal	1
22	005511-03	Bottom Seal	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

WHEEL AND HUB ASSEMBLY

Ref. No.	Part Number	Description	No. Required
1	005805	Axle Assembly *(Includes Hub, Drum, and Brakes)*	2
2	075625-GAL	Duro 12Ply Tire 9.50-16.5, LR-F Hi-way	4
3	005057	Wheel, 16.5 x 6.75	4
4	WL0190016	9/16 Lug Nut	16
5	WL8-219-4	Hub and Drum Assembly	4
6	005805-18	Dust Cover	1 per*
7	005805-17	Spindle Nut	1 per*
8	005805-16	Tanged Washer	1 per*
9	005805-15	Spindle Washer	1 per *
10	005805-12	Outer Bearing	1 per *
11		9/16-18 Press-In Stud	8 per*
12	005805-11	Brake Drum	1 per*
13	005805-13	Inner Cone	1 per*
14	005805-14	Grease Seal	1 per *
15	005805-09	Right Hand Brake Assembly	2
	005805-08	Left Hand Brake Assembly	2
		NOT ILLUSTRATED	
	005805-10	Hub Assembly Retaining Nut	5*

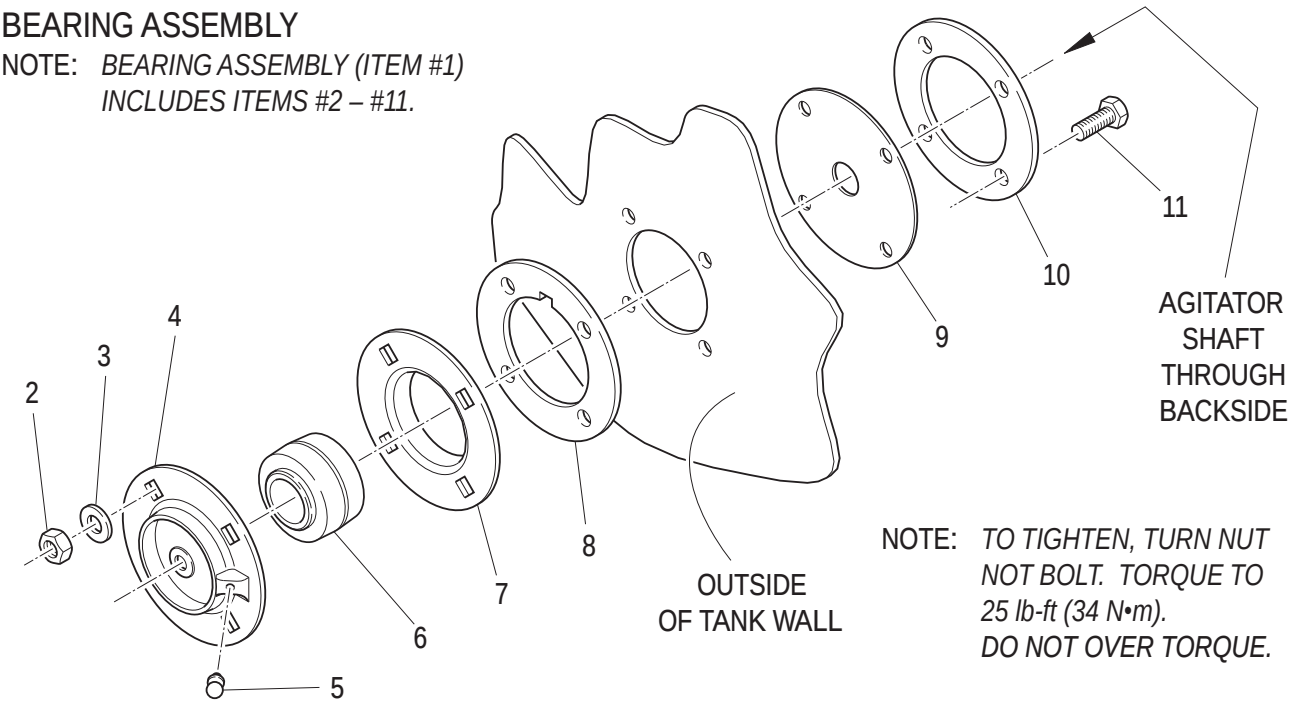
**NOTE:*

All of these required quanitities are quantities required per Hub and Drum Assembly, not per axle.

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

BEARING ASSEMBLY

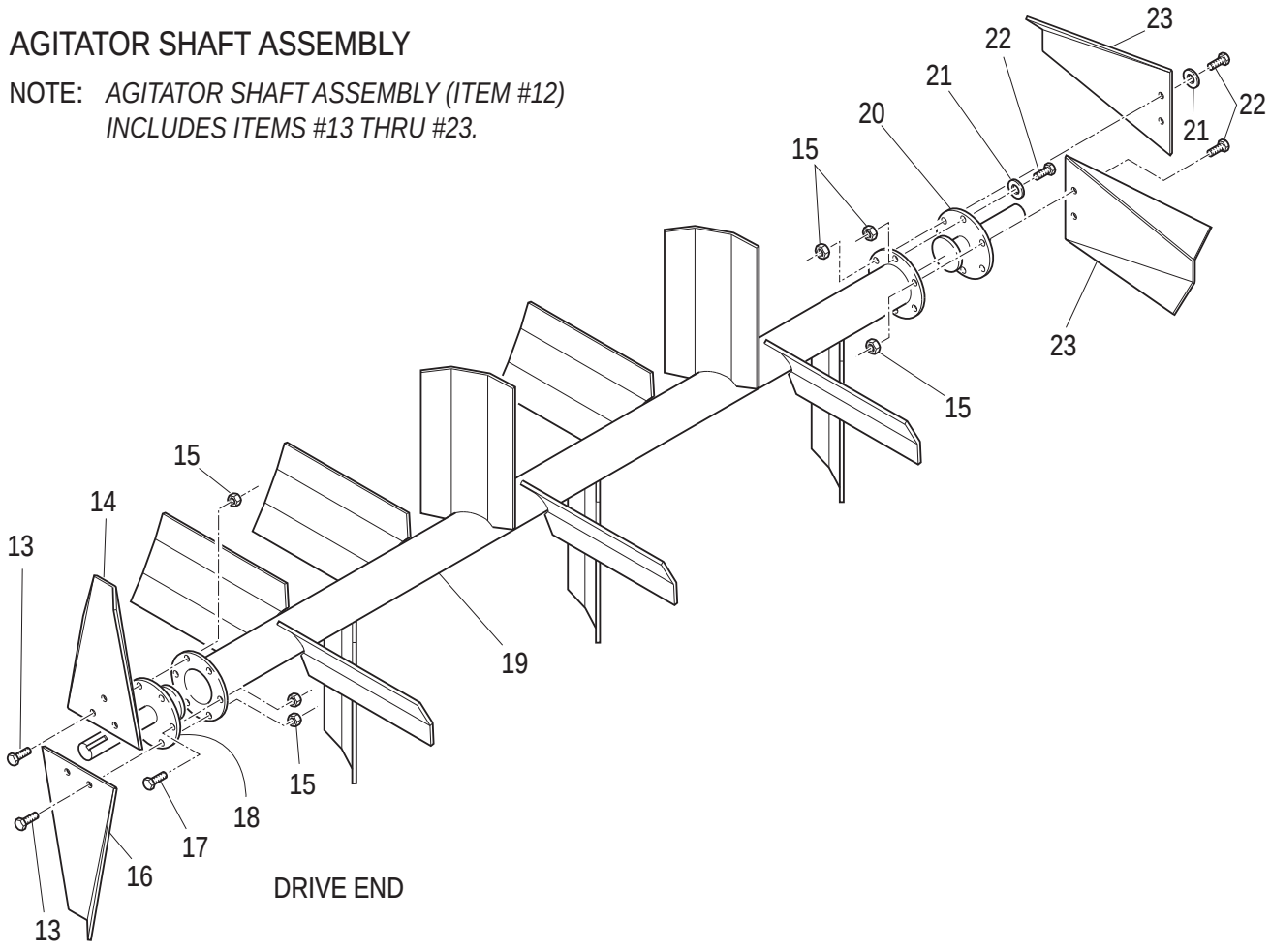
NOTE: *BEARING ASSEMBLY (ITEM #1) INCLUDES ITEMS #2 – #11.*



NOTE: *TO TIGHTEN, TURN NUT NOT BOLT. TORQUE TO 25 lb-ft (34 N•m). DO NOT OVER TORQUE.*

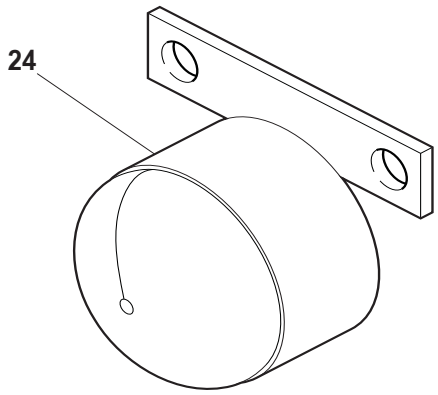
AGITATOR SHAFT ASSEMBLY

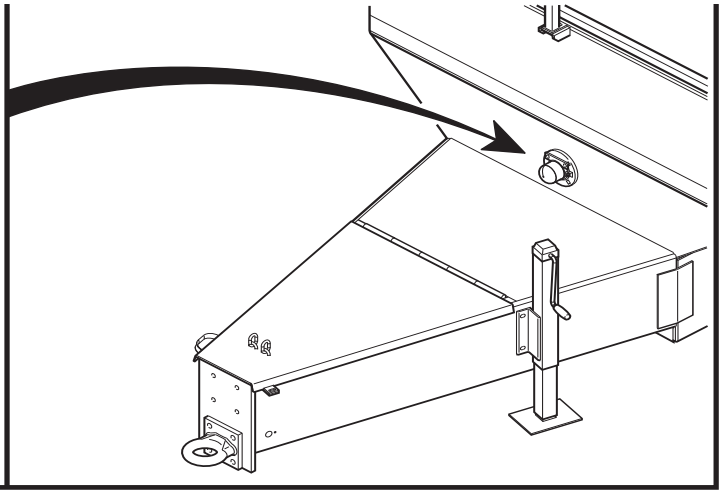
NOTE: *AGITATOR SHAFT ASSEMBLY (ITEM #12) INCLUDES ITEMS #13 THRU #23.*



WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

TOE GUARD DETAIL



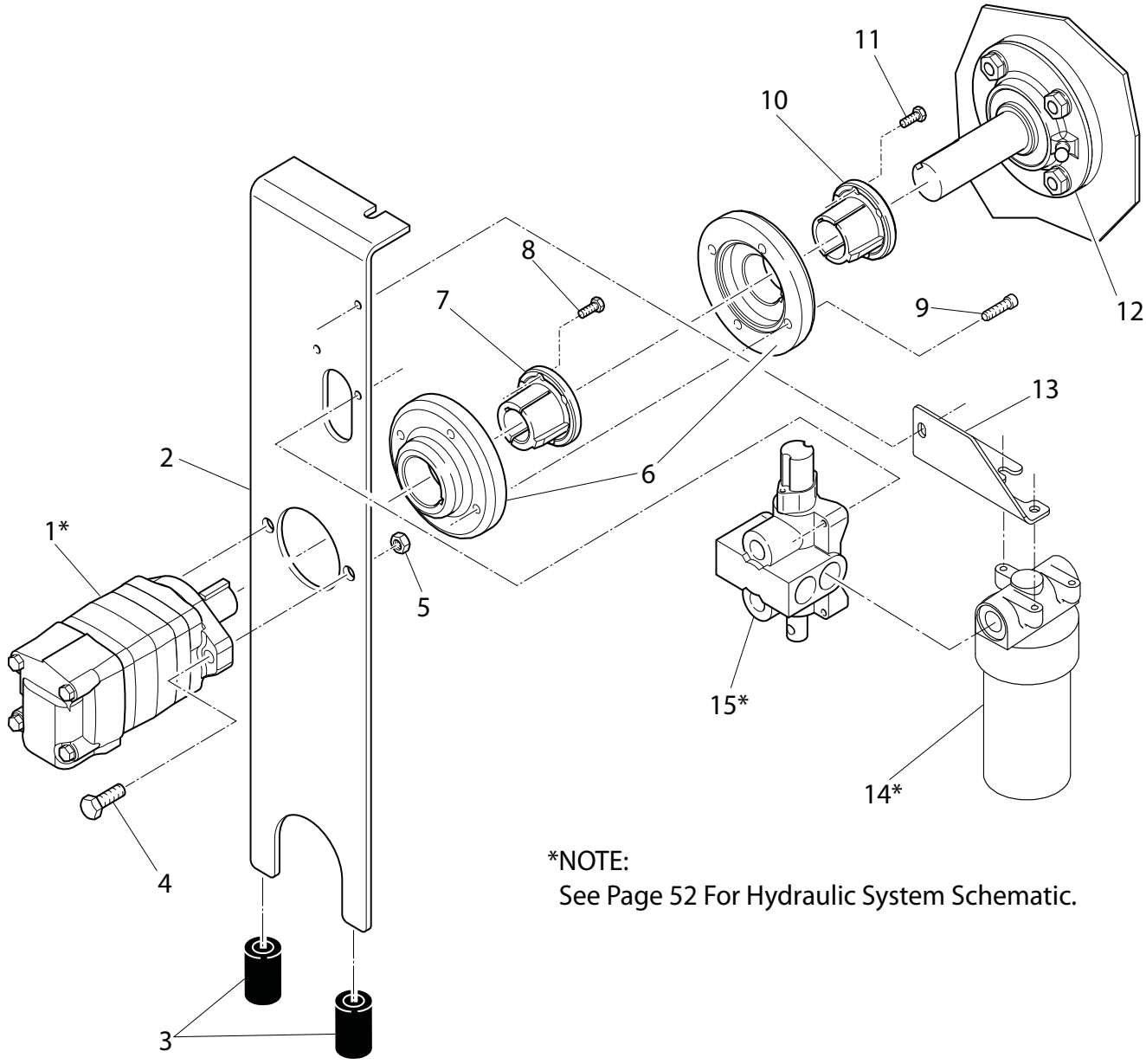


AGITATOR ASSEMBLY

Ref. No.	Part Number	Description	No. Required
1	007420	Bearing and Seal Assembly *(Includes Items 2–11)*	2
2	0Y08SS	Agitator Nut	4 per
3	012605	Bevel Sealing Washer	4 per
4	007211-02	Flangette w/ Lube Coupling	1 per
5	007705	Grease Fitting	1 per
6	003022	Bearing	1 per
7	007212-02	Flangette	1 per
8	006975	Agitator Bearing Gasket	1 per
9	007416	Agitator Rotary Gasket	1 per
10	007417	Clamping ring	1 per
11	X0828SS	Agitator Bolt	4 per
	. **NOT SHOWN**		
	022407	Grease Line Elbow	1
	008154	Male-To-Female Adapter	1
	012520	Brass Anchor Connector	1
	012521	Grease Line Hose	1
12	REF.	Agitator Shaft Assembly	1
13	0X0824	1/2-13 UNC x 1-1/2" Lg. Hex Hd. Cap Screw	8
14	005027-02	Rear Bolt-On-Paddle w/ Hole	1
15	00Y08L	1/2-13 UNC Locknut	12
16	005027-01	Rear Bolt-On-Paddle	1
17	0X0820	1/2-13 UNC x 1-1/4" Lg. Hex Hd. Cap Screw	4
18	005081-02	Agitator Drive Stub Shaft	1
19	005080	Main Agitator Section w/ Paddles	1
20	005081-03	Agitator Stub Shaft	1
21	00W08F	1/2" Flat Washer	6
22	0X0820	1/2-13 UN. x 1-1/4" Lg. Hex Hd. Cap Screw	2
23	005027-03	Front Bolt-On-Paddle	2
24	005399	Stub Shaft Toe Gaurd	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

HYDRAULIC AGITATOR DRIVE



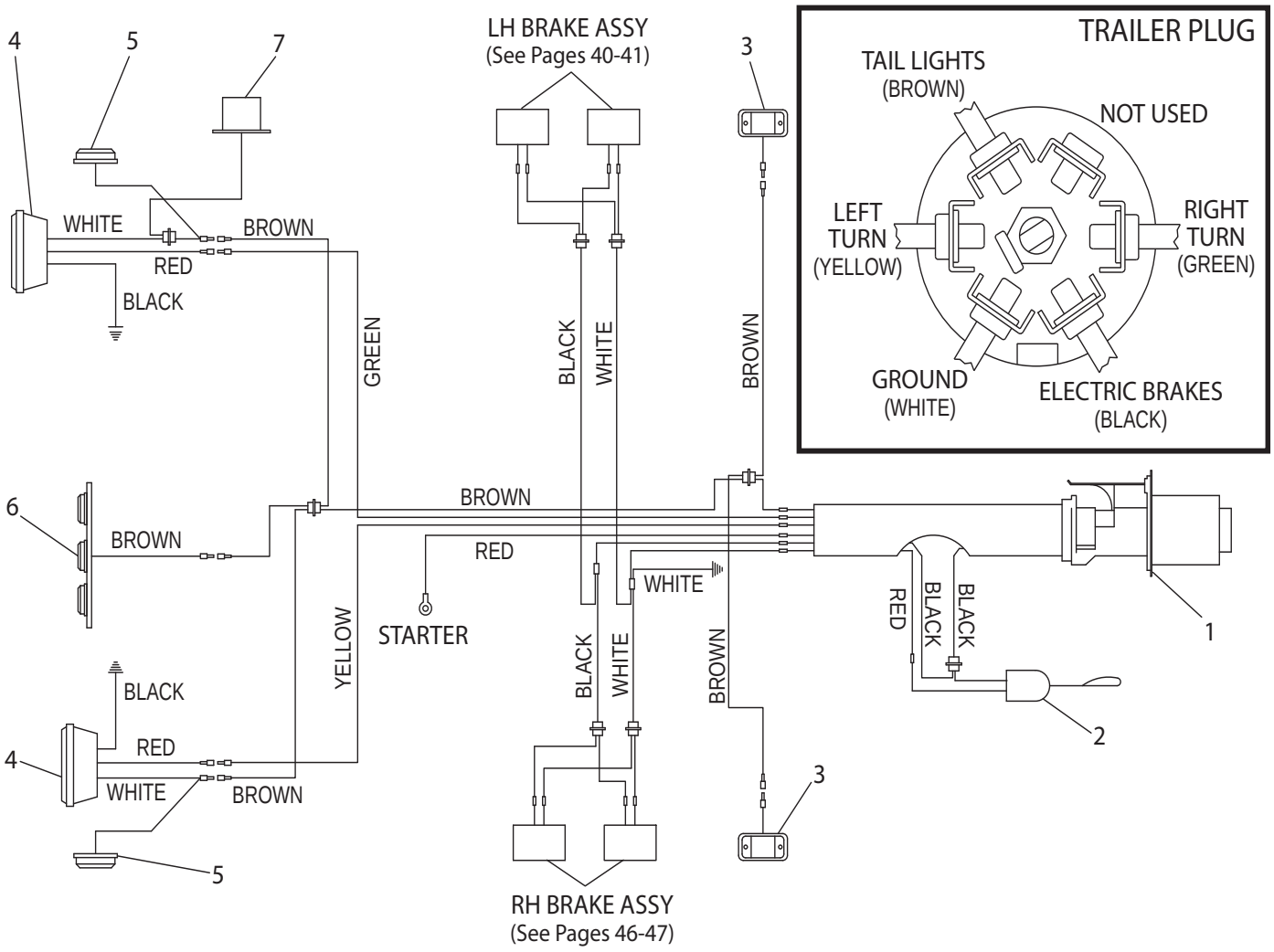
*NOTE:
See Page 52 For Hydraulic System Schematic.

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

HYDRAULIC AGITATOR DRIVE

Ref. No.	Part Number	Description	No. Required
1	070660	Hydraulic Motor	1
	023295-006	Seal Kit for 070660	1
	070660K	1/4" x 5/16" x 1-1/2" Key	1
2	005463	Torque Arrestor Plate	1
3	004630	Torque Arrestor Rubber Tubing	2
4	X0824	1/2-13 UNC x 1-1/2" Lg. Hex Hd. Cap Screw	2
5	Y08L	1/2-13 UNC Locknut	2
6	023156	Coupling Assembly	1
7	021440	Hydraulic Motor Bushing	1
	190125-12	3/8" x 3/8" x 3/4" Key	1
8	X0516	5/16-20 UNC x 1" Lg. Hex Hd. Cap Screw	3
9	X0625SH	1/2-13 UNC x 1-1/2" Lg. Socket Head Cap Screw	4
10	004635	Agitator Shaft Bushing	1
	004635K	3/8" x 1/2" x 1-15/16" Key	1
11	X0516	5/16-20 UN. x 1" Lg. Hex Hd. Cap Screw	3
12	007420	Bearing and Seal Assembly *(See Pages 48–49 for Parts)*	2
13	F90-0025	Hydraulic Filter Mount	1
14	023913	Hydac Filter Assembly	1
	023914	Filter Element	1
15	008686	Hydraulic Valve	1
	023120	Seal Kit for 008686	1
	023379-01	Valve Handle	1
	0SF311	Handle Knob	1
	0SF312	1/8 in. x 1-3/8 in. Roll Pin	1
	023470	Handle Bracket	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

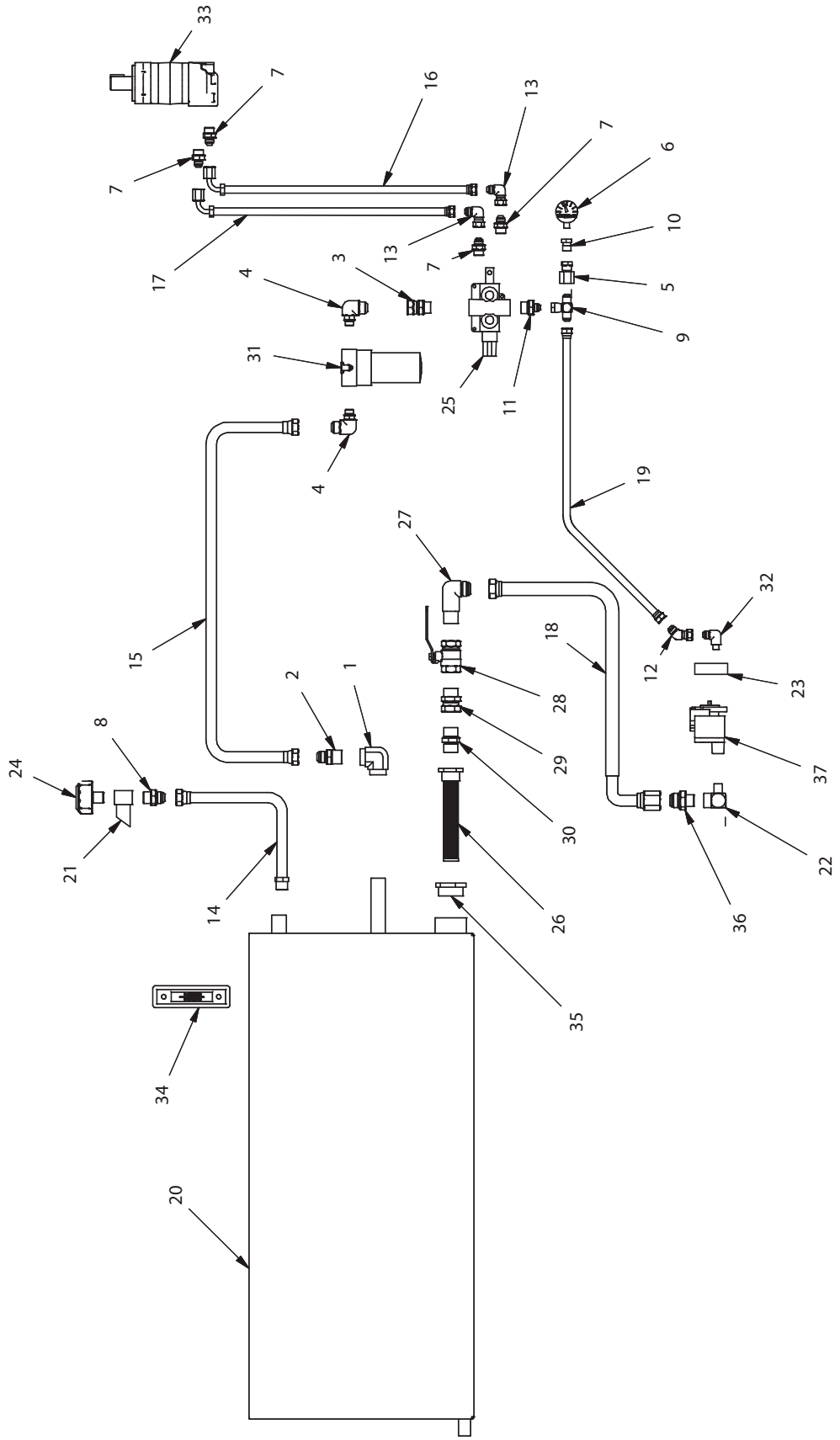


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

TRAILER WIRING

Ref. No.	Part Number	Description.	No. Required
1	075592	7-Blade Trailer Plug	1
2	023424	Breakaway Switch	1
. .	190029	Chain – 2 Tenso Weldless	2 ft
	005016	“S” Hook	3
	005017	Snap Hook	1
3	FW71090	Amber Corner Marker Light	2
4	005434	Tail Light Assembly	2
	005434A	Tail Light Lens	1
	005467	Tail Light Mounting Bracket	2
5	005435	Side Marker Light – Red	2
6	005437	Identification Light	1
7	005436	License Plate Light	1
	004720	License Plate Bracket	1
	005585-02	Trailer Wiring Harness	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



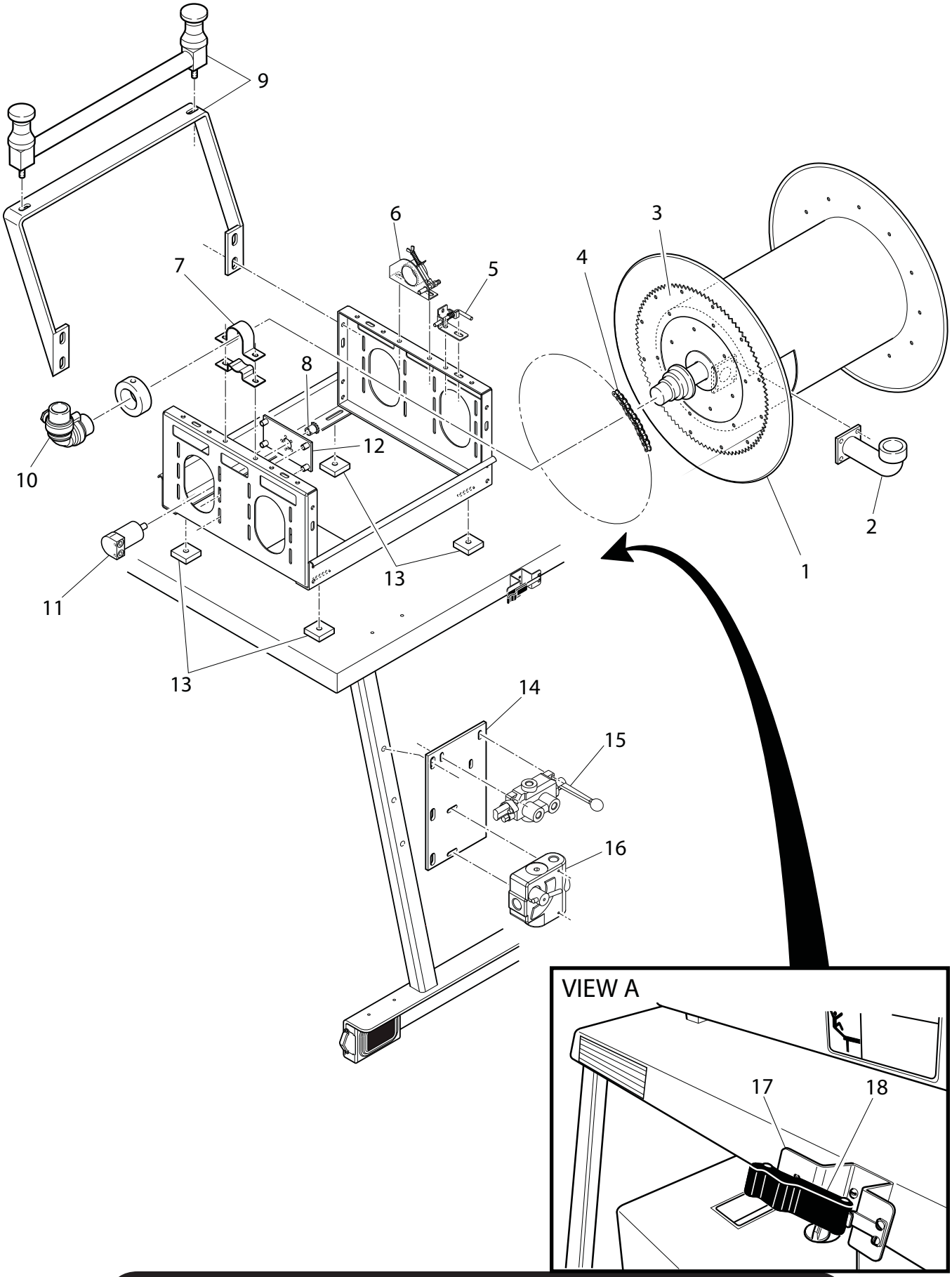
Note:
Items 1-19 are part of Hydraulic Kit #005795

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

HYDRAULIC SYSTEM

Ref. No.	Part Number	Description	No. Required
1	005639	Female NPT Elbow	1
2	005640	MNPT – FJIC Adapter	1
3	005757	MSAE – FJIC Adapter	1
4	005794	MSAE – MJIC 90° Elbow	2
5	008690	FJIC – FNPT Adapter	1
6	012044	Pressure Gauge	1
7	012086	MSAE – MJIC Adapter	4
8	023616	MNPT – MJIC Adapter	1
9	052095	Swivel Branch Tee	1
10	055229	NPT Bushing	1
11	055359	MNPT – MJIC Adapter	1
12	FW71504	JIC 45° Elbow	1
13	FW71870	JIC 90° Elbow	2
14	005551	3/4" Hyd. Hose x 18"	1
15	005552	3/4" Hyd. Hose x 46"	1
16	005554	1/2" Hyd. Hose x 29"	1
17	005555	1/2" Hyd. Hose x 34"	1
18	005688	1" Suction Hose x 29-1/2"	1
19	005689	1/2" Hyd. Hose x 22-1/2"	1
20	005489	Hydraulic Reservoir	Ref.
21	005501-02	Hydraulic Fill Coupling	Ref.
22	005684	FNPT – MNPT 90° Elbow	1
23	005719	Hydraulic Block	1
24	005793	Hydac Filler/Breather	1
25	008686	Hydraulic Valve	1
26	011466	Hydraulic Suction Strainer	1
27	012358	MNPT – MJIC 90° Elbow	1
28	021559	Ball Valve	1
29	021802	NPT Union Adapter	1
30	041162	Hex Pipe Nipple	1
31	023913	Hydac Filter Assembly	1
	023914	Filter Element	1
32	055235	MNPT – MJIC 90° Elbow	1
33	070660	Hydraulic Motor	1
34	080329	Hydraulic Level Sight Gauge	1
35	160763	NPT Reducer Bushing	1
36	FW71713	MNPT – MJIC Adapter	1
37	KUK3511	Hydraulic Pump Kit	Ref.

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

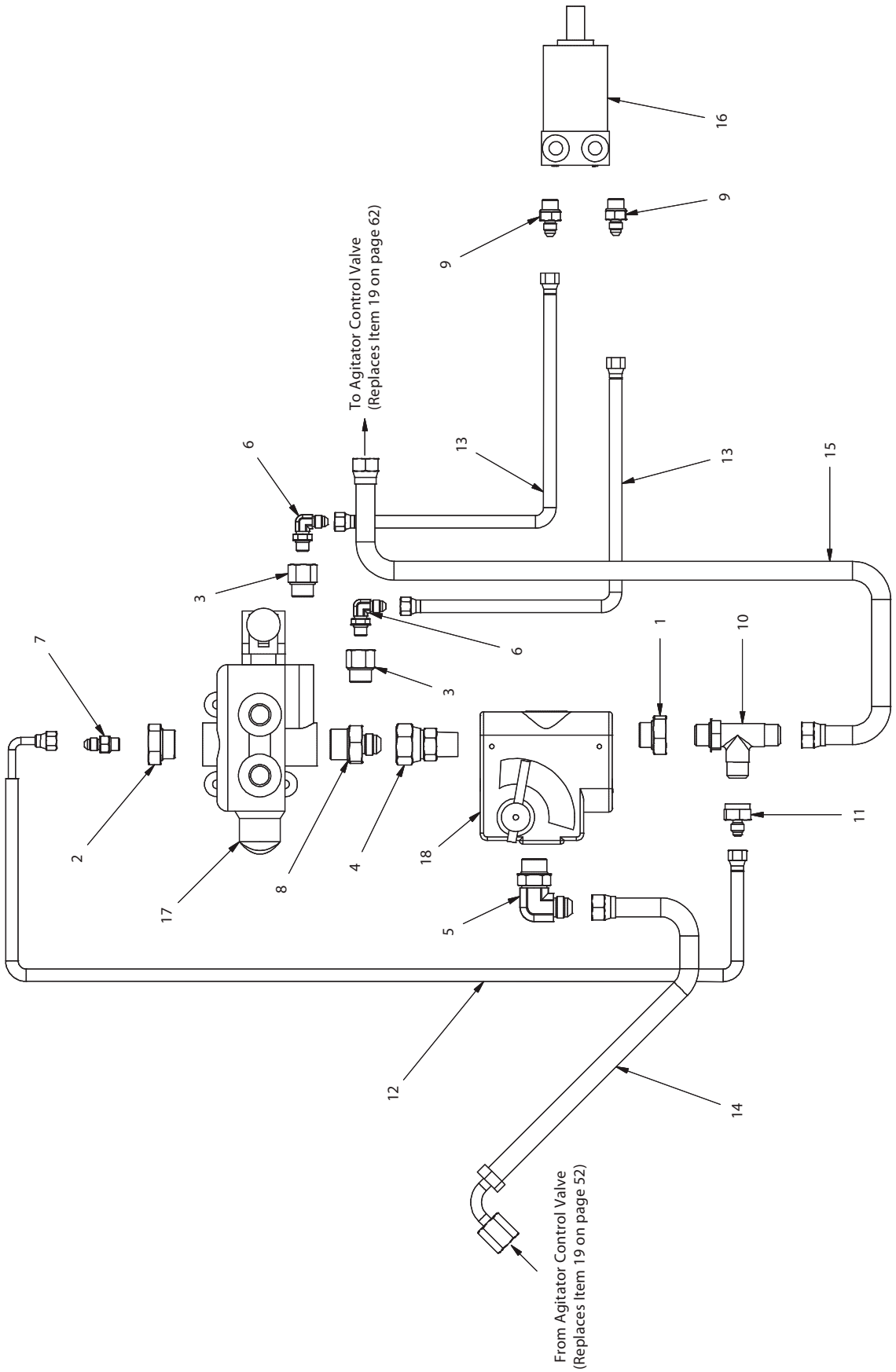


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

HYDRAULIC HOSE REEL ASSEMBLY (OPTION)

Ref. No.	Part Number	Description	No. Required
1	008212A	Hose Reel	1
2	080302	Flanged Riser	1
	080302G	Hose Reel Riser Gasket	1
3	008144	Hose Reel ring Gear	1
4	008200	Hose Reel Chain w/Connecting Link – 69" Lg.	1
5	008433	Pin Lock w/Brackets Assembly	1
6	008313	Idler Side Bearing	1
7	008314	Drive Side Bearing	1
8	008199	Chain Sprocket – 11 Tooth	1
NOT ILL.	008111	Brake Pad	1
NOT ILL.	008112	Brake Spring	1
NOT ILL.	008109	Brake Wheel	1
9	011894	Hose Roller and Spool Guide	1
	011894-G	Guide Spool	1
10	008210	90º Swivel Elbow	1
10A	080183	Swivel Repair Kit	1
11	008635	Hydraulic Motor *(See Pages 56-57)*	1
12	008634	Motor Mounting Plate	1
13	031018-01	Hose Reel Bearing Block	4
14	012866	Valve Mounting Plate	1
15	012857	Direction Control Valve *(See Pages 56-57)*	1
16	023890	Flow Divider *(See Pages 56-57)*	1
17	005593	Remote Holder	1
18	005592	Soft Latch	1
		NOT ILLUSTRATED	
	041109	1-1/2" Dia. x 90" Lg. Lead-In Hose	1
	007710	Pump Take-Off Valve	1
	007711	Take-Off Valve Assembly	1
	001207	1-1/2" Male Brass Adapter	1
	002158	1-1/2" Female Brass Coupler	1
	160756	1-1/2" x 1-1/4" Galvanized Reducer Bushing	1
	160309	1-1/2" Galvanized Close Nipple	1
	160040	1-1/2" 45º Elbow	1
	008422	Loop Clamps	2

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



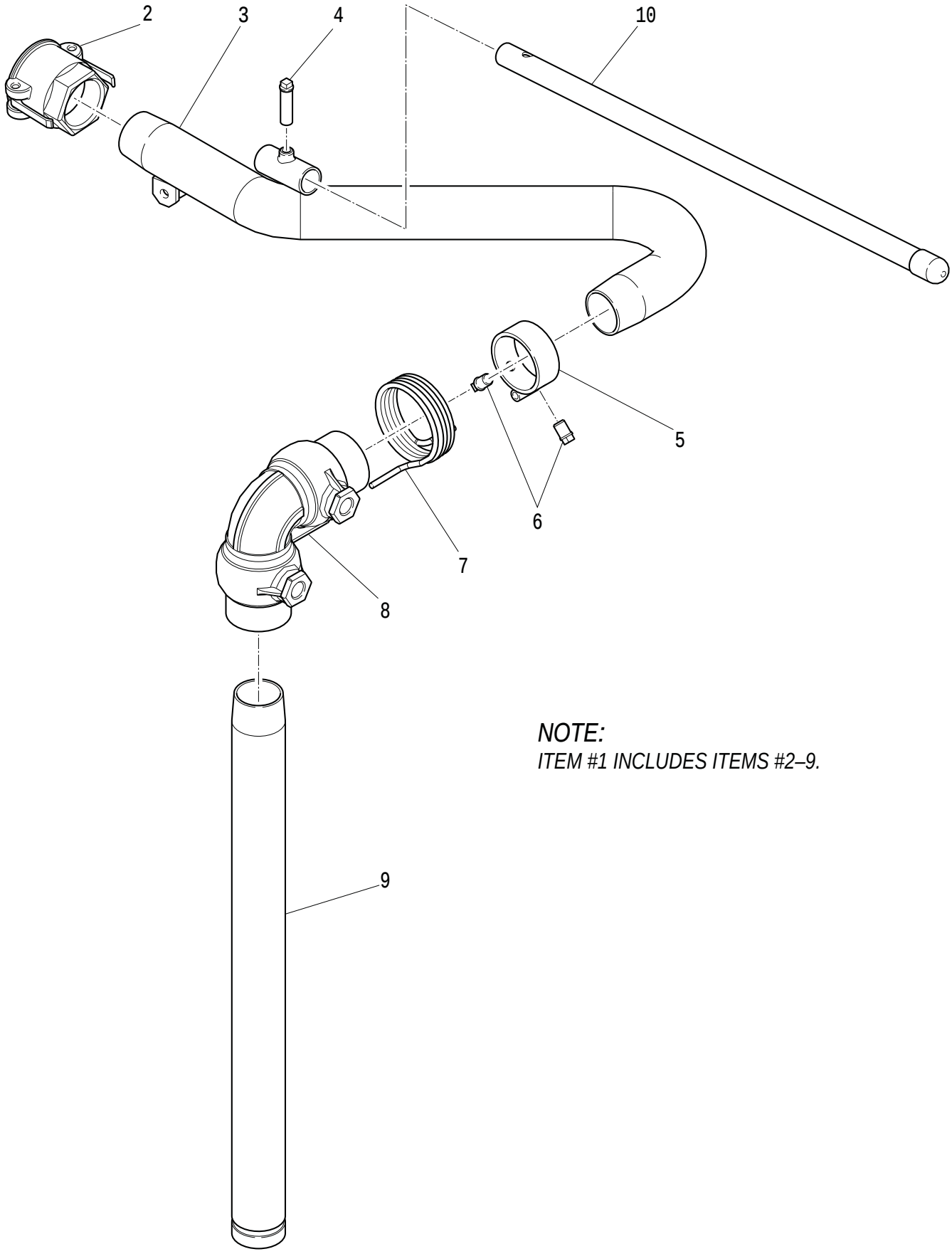
Note: Items 1-15 are part of Hydraulic Kit #5673

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

HYDRAULIC SYSTEM w/ HOSE REEL

Ref. No.	Part Number	Description	No. Required
1	008696	SAE Reducer	1
2	012871	SAE Reducer	1
3	012872	SAE Reducer	2
4	012873	MSAE – FJIC Swivel Adapter	1
5	023621	MSAE – MJIC 90° Elbow	1
6	055274	MSAE – MJIC 90° Elbow	2
7	055308	MSAE – MJIC Adapter	1
8	055359	MSAE – MJIC Adapter	1
9	FW65217	MSAE – MJIC Adapter	2
10	FW71869	SAE Run Tee	1
11	FW71908	JIC Reducer	1
12	008695	1/4" Hyd. Hose x 23"	1
13	SX970331	1/4" Hyd. Hose x 46"	2
14	SX970402	1/2" Hyd. Hose x 68"	1
15	SX970403	1/2" Hyd. Hose x 80"	1
16	008635	Hydraulic Motor	1
17	012857	Directional Control Valve	1
	023120	Seal Kit for 012857	1
	SF310B	Hydraulic Valve Handle	1
	0SF311	Handle Knob	1
	0SE312	Roll Pin	1
	023470	Handle Bracket	1
	008293-RC	Brand Valve Relief Cartridge	1
18	023890	Flow Divider	1
	023890-K	Indicator Lever Knob	1
	023890-SK	Seal Kit for 023980	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



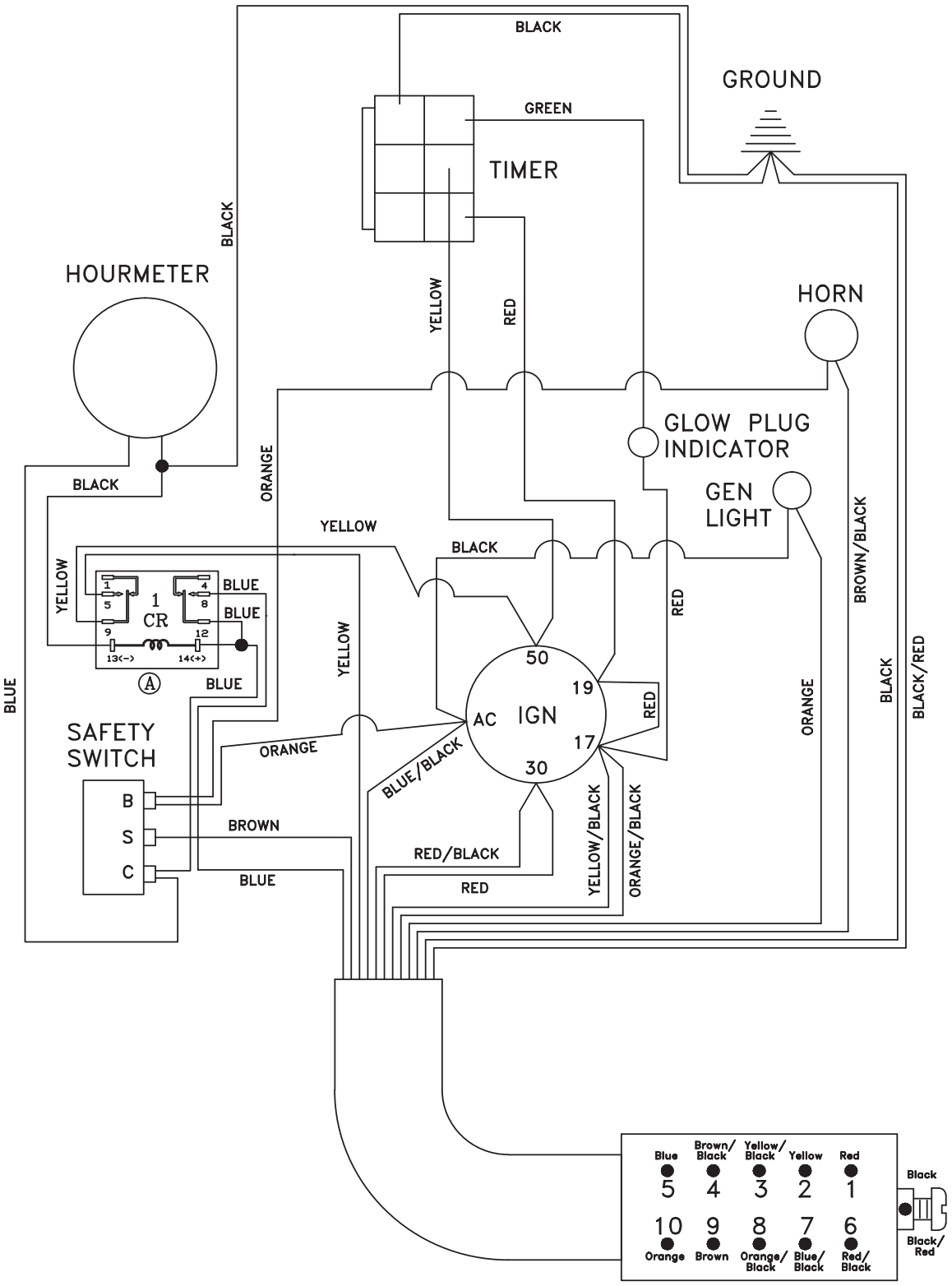
NOTE:
ITEM #1 INCLUDES ITEMS #2–9.

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

DISCHARGE BOOM ASSEMBLY

Ref. No.	Part Number	Description	No. Required
1	005529	Discharge Boom Assembly	
2	006102	Female Coupler	1
	006514	Coupler Gasket	1
3	005734	Boom Pipe Weldment	1
4	Z0632SCP	Boom Handle Set Screw	1
5	005528-03	Boom Collar Weldment	1
6	Z0612SCP	Boom Collar Set Screw	2
7	007286	Discharge Boom Torsion Spring	1
8	007288	Swivel Joint	1
	006969	Swivel Repair Kit	2
9	005525-02	Stand Pipe	1
10	080559-01	Boom Handle	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

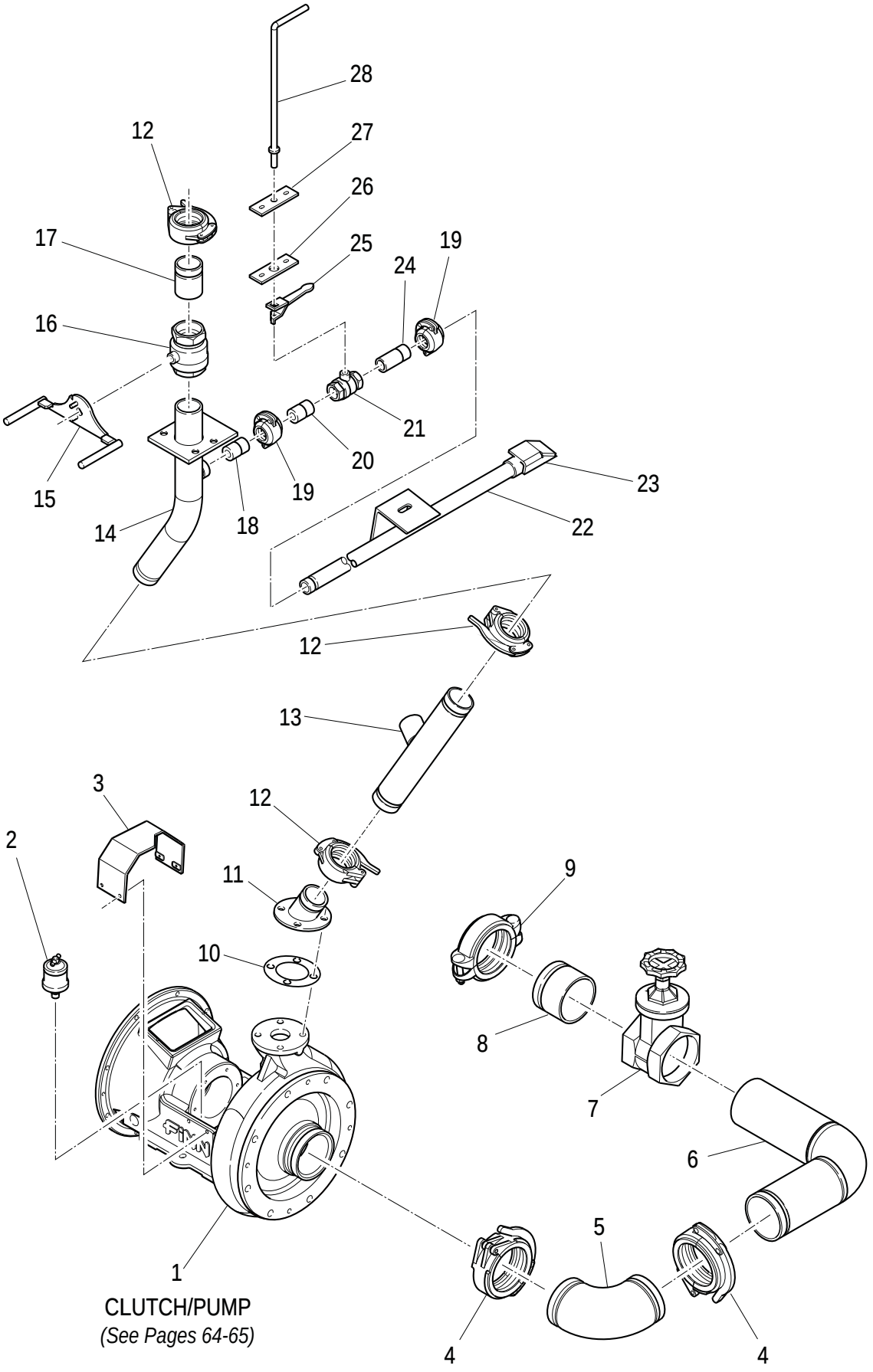


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

CONTROL BOX WIRING

Ref. No.	Part Number	Description	No. Required
	005604A	Control Box Assembly	1
1	007274	Hour Meter	1
2	022119	Magnetic Safety Switch	1
3	KU15694-65990	Glow Plug Timer	1
4	020886	Horn Button	1
5	KU15403-64490	Glow Plug Indicator Light	1
6	006245	Pilot Light	1
7	KU66711-55131	Ignition Key Switch	1
	KU66711-55140	Ignition Key *(Not Included w/ Switch) (Set of 2)*	1
8	023604	Electrical Housing	1
9	023601	Electrical Housing Plug	1
10	080304	Liquid Tight Fitting	2
11	005589A	Control Box Wiring Harness	1
12	055120	IDEC Relay	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



CLUTCH/PUMP

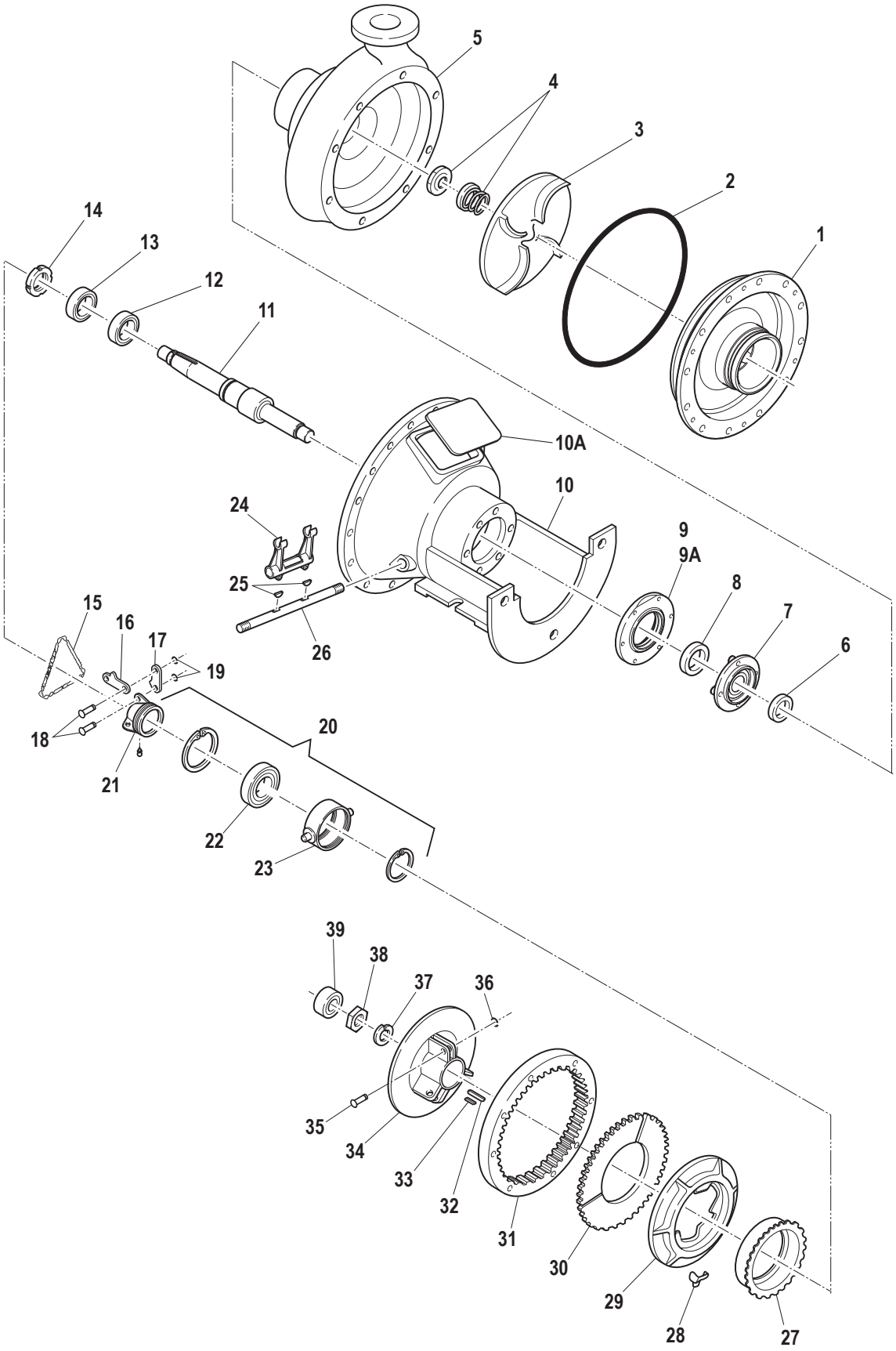
(See Pages 64-65)

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

PIPING

Ref. No.	Part Number	Description	No. Required
1	005682	Clump Assembly *(See Pages 64–65 for Parts)*	1
2	002383	Automatic Pressure Lubricator	1
3	005470	Pump Shaft Guard	1
4	006144	Pipe Clamp	2
	006145	Pipe Clamp Gasket	2
5	006359	90° Victaulic Pipe Elbow	1
6	005524-02	Suction Pipe Elbow Weldment	1
7	008280	Suction Line Shut-Off Valve	1
8	005523-06	Valve Outlet Pipe	1
9	006710	Pipe Clamp	1
	006145	Pipe Clamp Gasket	1
10	008469	Discharge Flange Gasket	1
11	005526-03	Discharge Flange Weldment	1
12	006250	Pipe Clamp	3
	006251	Pipe Clamp Gasket	3
13	005526-02	Lower Discharge Pipe Weldment	1
14	005526-01	Upper Discharge Pipe Weldment	1
15	005674	Foot Pedal Weldment	1
16	012287	Discharge Ball Valve	1
17	006483	Boom Connector Pipe	1
18	005083-07	Recirculation Nozzle	1
19	005156	Pipe Clamp	2
	005183	Pipe Clamp Gasket	2
20	005083-08	Recirculation Nozzle	1
21	021559	Recirculation Ball Valve	2
22	005706-02	Recirculation Pipe Weldment	1
23	005703-01	Recirculation Coupling Deflector	1
24	005083-09	Recirculation Nozzle	1
25	005512-02	Recirculation Valve Handle	1
26	005511-03	Lower Valve Handle Seal	1
27	005511-02	Upper Valve Handle Seal	1
28	005512-01	Extension Handle	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



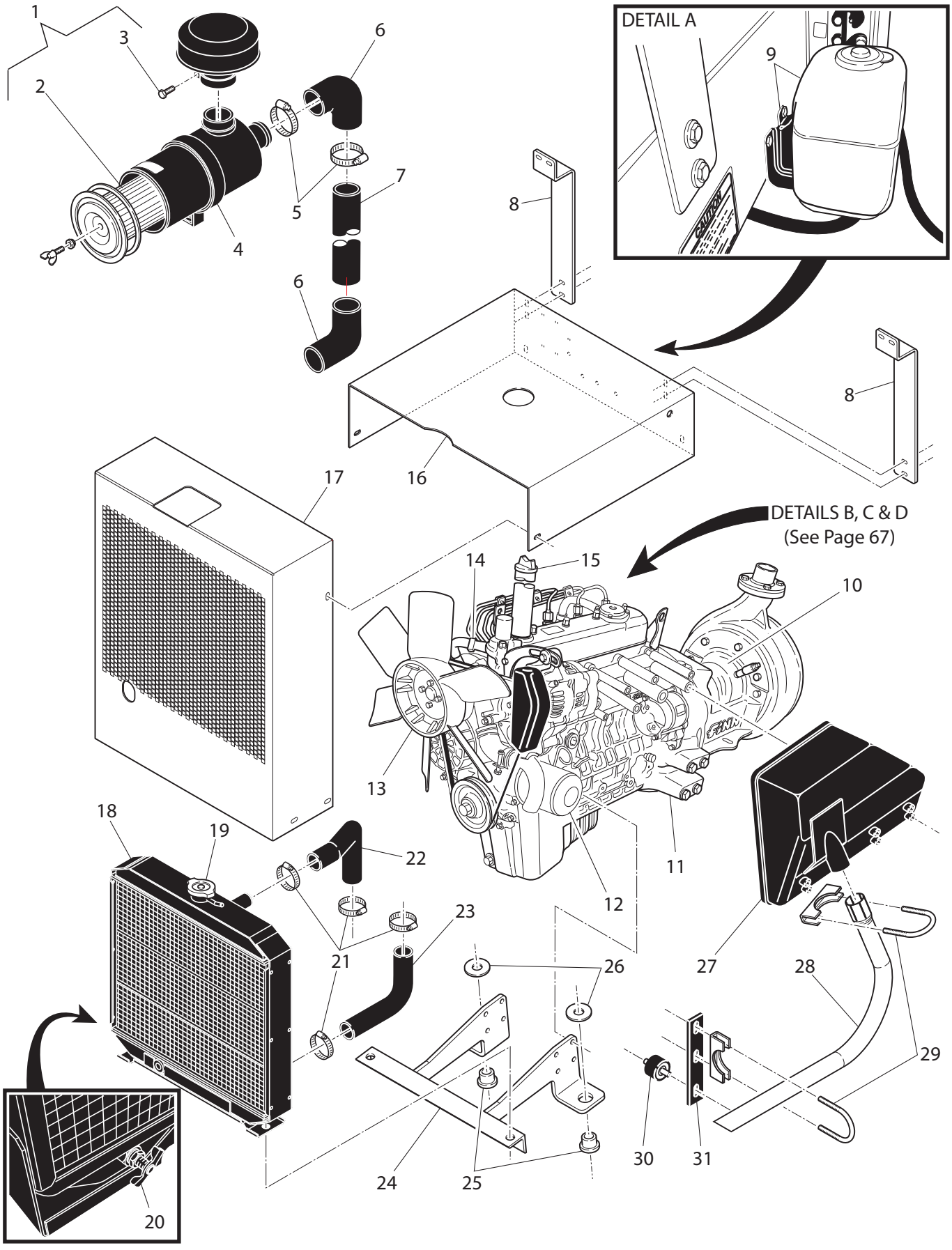
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

CLUTCH/PUMP (CLUMP) ASSEMBLY

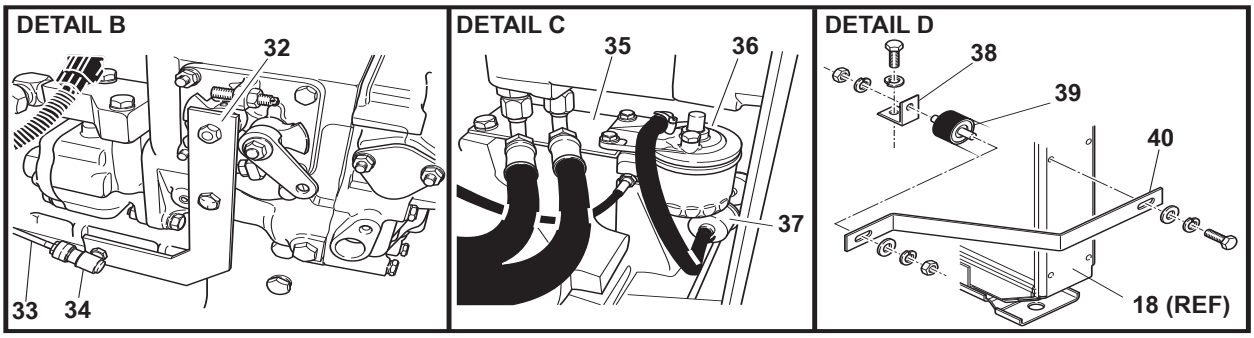
Ref. No.	Part Number	Description	No. Required
	005682	Clump Assembly	
1	005146	Pump Suction Cover	1
2	005150	O-ring	1
3	005543	Pump Impeller	1
4	006443	Mechanical Shaft Seal	1
5	005144	Pump Casing	1
6	006444	Grease Retainer Seal	1
7	005446	Flange Pilot Bearing	1
8	005447	Shaft Seal	1
9	005475	Thrust Bearing Retainer	1
9A	005544-02	Bearing Retainer Gasket	1
10	005670	Clutch/Pump Drive Housing	1
10A	005570	Clump Nameplate	1
11	005541	Clump Shaft	1
12	005450	Radial Ball Bearing	1
13	005449	Radial Ball Bearing w/ Seal	1
14	005448	Bearing Locknut	1
15 *	100211	Lever Spring	1
16 *	100212	Lever	3
17 *	100215	Connecting Link	6
18 *	100216	Link Pin	6
19 *	100217	Retaining ring	6
20 *	100327	Release Sleeve and Link	1
21 *	100328	Release Sleeve	1
22 *	100330	Ball Bearing	1
23 *	100329	Bearing Carrier	1
24	100073	Clutch Yoke Assembly	1
25	100042	Woodruff Key	2
26	100041	Yoke Shaft	1
27 *	100210	Adjusting ring	1
28 *	100214	Adjustment Lock	1
29 *	100336	Pressure Plate	1
30 *	100337	Clutch Facing	1
31	100338	Drive ring	1
32 *	100056	Clutch Key	1
33 *	100219	Separator Spring	1
34 *	100335	Clutch Body	1
35 *	100213	Pivot Lever Pin	3
36 *	100008	Retaining ring	3
37	100047	Lockwasher	1
38	100045	Drive Shaft Nut	1
39	005151	Pilot Bearing	1

**NOTE:*
Clutch Assembly (Part number 100334) consists of these parts.

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



ENGINE AND RADIATOR

Ref. No.	Part Number	Description	No. Required
1	031354	Air Cleaner Assembly	1
2	KU15741-11080	Air Filter Element	1
3	KU01123-50835	Bolt	1
4	055548	Mounting Band	2
5	022450	Worm Gear Clamp	4
6	KU16616-11621	Air Cleaner Inlet Pipe (1 x 180. Elbow cut to fit 2 x 90° Elbows)	1
7	005681-07	Air Cleaner Extension Pipe	1
8	F90-0012	Sheet Metal Hanger	2
9	KU15501-72400	Coolant Recovery Tank w/ Bracket	1
10	005682	Clump Assembly *(See Pages 64-65)*	1
11	031473	Kubota V1505B-86 Engine (33.5 hp)	1
12	KU16271-32090	Oil Filter	1
13	KU16299-74110	Fan	1
14	055568	Temperature Switch	1
15	005690	Oil Fill Extension Assembly	1
	004987	O-ring	1
	004988	Conduit Nut	1
16	005680	Engine Top Cover	1
17	F90-0024	Radiator Shroud	1
18	031470	SRF Radiator Assembly	1
	KU1511-72180	Radiator Cushion	1
	KU1511-72190	Radiator Cushion	1
19	031470-C	Radiator Cap	1
20	031470-DC	Radiator Drain Cock	1
21	007695	Worm Gear Clamp	4
22	031444	Upper Radiator Hose	1
23	031445	Lower Radiator Hose	1
24	005694	Radiator/Engine Mount	1
25	005676	Center Bushing Mount	4
26	055505	Snubbing Washer	4
27	KU1G994-12110	Manifold Muffler	1
	KU16271-92010	Muffler Nuts	8
	KU16251-91510	Muffler Studs	4
	KU16251-91520	Muffler Studs	4
	KU37560-12360	Muffler Gasket	1
28	005710	Exhaust Elbow	1
29	031421	Exhaust Clamp	2
30	031376	Air Cleaner Rubber Shock Mount	1
31	005574-03	Tailpipe Support Bracket	1
32	031397-02	Throttle Plate	1
33	005675	Throttle Cable (84")	1
34	007675	Ball Joint	1
35	005502-01	Filter Support Arm	1
36	031355	Fuel Filter Kit	1
	KU70000-43081	Filter Element	1
37	080105	Pre-Fuel Filter	1
38	031428-02	Radiator Stay Angle	1
39	031441	Isolator Mount	1
40	031428-05	Radiator Stay Strap	1

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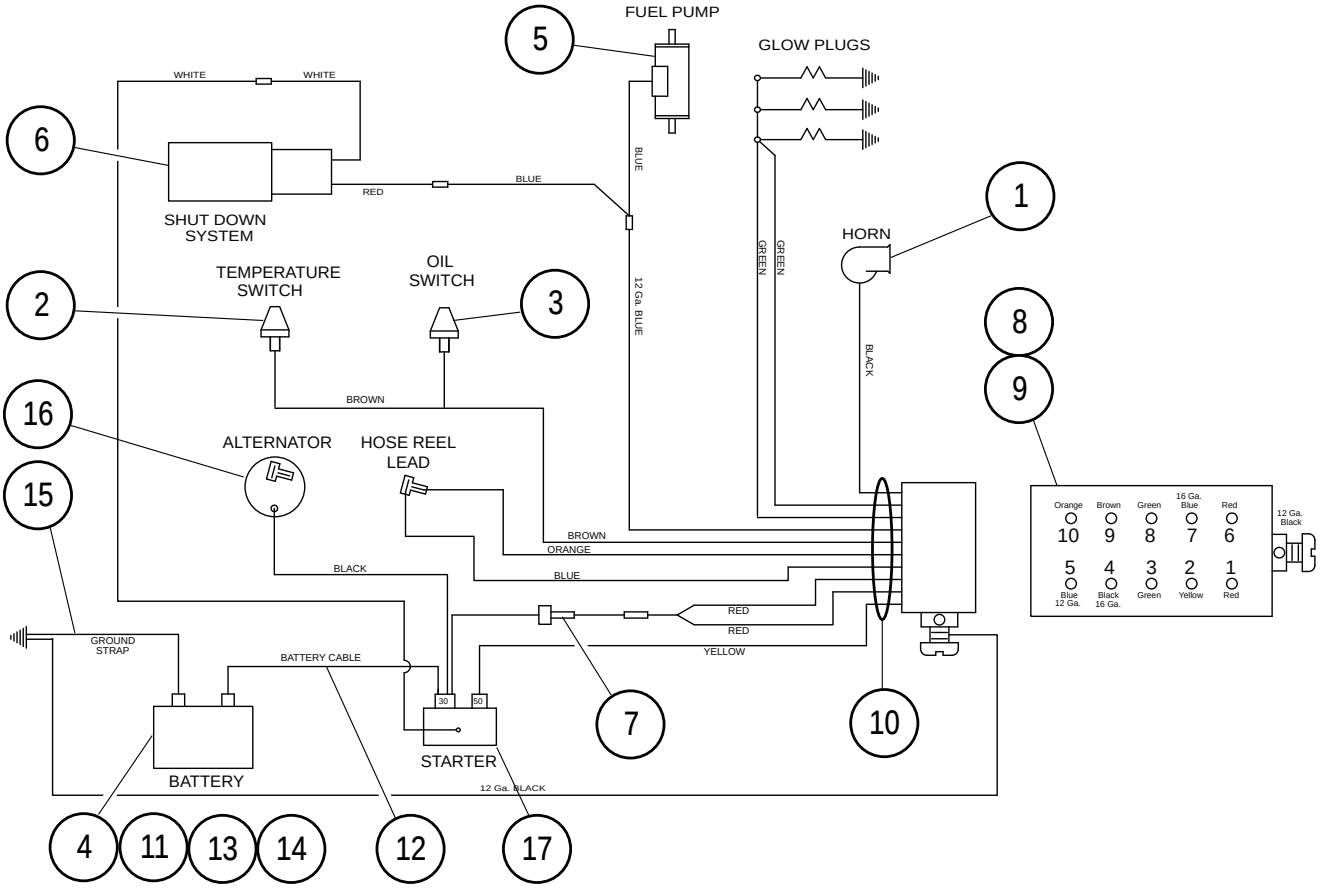

ENGINE WIRING

Ref. No.	Part Number	Description.	No. Required
1	006499	Horn Assembly	1
2	055568	Temperature Switch	1
3	004934	Oil Switch	1
4	002256-12	12V Battery - Interstate Battery MT34	1
5	080103	Fuel Pump	1
6	031458-01	Shutdown Solenoid	1
7	170028	Fuse w/ Holder	1
8	005561	Electrical Housing	1
9	023602	Electrical Housing Plug	1
10	031457B	Engine Wiring Harness	1
11	080223	Battery Box	1
12	008171	Battery Cable	1
13	F330-0054	Battery Box Holder	1
14	F90-0016	Battery Box Hold Down	1
15	000241	Ground Strap	1
16	KU16231-64010	Alternator	1
17	KU37560-63010	Starter	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

HOSE REEL NOZZLE/REMOTE VALVE/TOOL KIT

Part Number	Description	No. Required
	HOSE REEL NOZZLES	
080273	Long Distance Hose Reel Nozzle Assembly	A/R
080131	Long Distance Nozzle	1 per
080260	Adapter	1 per
160749	Reducer Bushing	1 per
080394	Wide Fan Hose Reel Nozzle Assembly	A/R
006604	Wide Fan Nozzle	1 per
080260	Adapter	1 per
160750	Reducer Bushing	1 per
080395	Narrow Fan Hose Reel Nozzle Assembly	A/R
006605	Narrow Fan Nozzle	1 per
080260	Adapter	1 per
160750	Reducer Bushing	1 per
	REMOTE VALVE	
080535	Remote Valve Assembly	A/R
080260	Adapter	1 per
160307	Close Nipple	1 per
012083	Ball Valve	1 per
160520	Nipple	1 per
080261	Coupler	1 per
006515	Gasket	1 per
	TOOL KIT	
000698	Automatic Pressure Lubricator Grease, 1 lb Can	1
005220	Impeller Wrench	1
008187	Long Distance Nozzle	1
006632	Long Distance Nozzle Assembly	1
001042	Long Distance Nozzle	1
006096	Male Coupler	1
160309	Close Nipple	1
160763	Reducer Bushing	1
006619	Wide Fan Nozzle Assembly	1
006493	Wide Fan Nozzle	1
006096	Male Coupler	1
160762	Reducer Bushing	1
005603	Narrow Fan Nozzle Assembly	1
012117	Narrow Fan Nozzle	1
006096	Male Coupler	1
160762	Reducer Bushing	1
004593	Drain Plug	1
006102	Female Coupler	1
006514	Coupler Gasket	1
KU70000-73886	Engine Parts Manual	1
	T90-SN HydroSeeder® Parts and Operator's Manual	1

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

DECALS

Ref. No.	Part Number	Description.	No. Required
*1	023174	"FINN" Decal – Large	2
*2	012661-05	"T90" Decal	2
*3	011595	"Hydro Seeder" Decal	2
4	022199	"Throttle" Decal	1
5	011567	"Do Not Aim . . ." Decal	1
6	007230-02	"Service Daily" Decal	2
7	007230	"Service Daily" Decal	3
8	023391	"Diesel Fuel Only" Decal	1
*9	005730	T90T GVWR Decal *(Trailer Version Only)*	1
10	005187	"800 Gallon" Decal	1
11	005186	"500 Gallon" Decal	1
12	005184	"250 Gallon" Decal	1
13	020970	"CAUTION! Fall Hazard – Do Not Ride . . ." Decal	2
14	007230-01	"Service Daily" Decal	1
15	011662	"U.S. Patent Nos." Decal	1
16	080107	"CAUTION. Always Use Step" Decal *(Trailer Version Only)*	1
17	031461	"WARNING! Runaway Vehicle Hazard" Decal *(Trailer Version Only)*	1
*18	011690	FINN Name Plate	1
19	012180	"Tighten Suction Cover" Decal	1
20	031297	"Clutch Adjustment" Decal	1
21	005735	"VALVE – Open/Close" Decal	1
22	005736	"VALVE – Open/Closed" (Handle) Decal	1
23	008286-02	"AGITATOR – Forward (Spray) / Reverse (Mix)" Decal	1
24	005737	"CLUTCH – Disengage/Engage" Decal	1
25	005216	"DANGER. Do Not Use Remote . . ." Decal	2
26	012597	"IMPORTANT. This Is A Vent . . ." Decal	1
*27	012260	"IMPORTANT" Metal Plate	1
28	007535	"Throttle" Decal	1
29	004661	"CLUTCH – Engage/Disengage" Decal	1
30	011569	"CAUTION! Hose Reel, Remote . . ." Decal	1
31	012278	"DANGER. Hot . . ." Decal	1
32	031463	"WARNING. Sever Hazard . . ." Decal	1
33	012687	"CAUTION. Hydraulic System Instructions" Decal	1
34	19426-87903	"CAUTION. Do Not Use Ether Or . . ." Decal	1
35	012688	"CAUTION!. Fall Hazard" Decal	1
36	007231	"Service Weekly" Decal	3
37	006869	"Pressure Lubricator" Decal	1
38	031462	"WARNING! Burn Hazard . . ." Decal	1
39	008286-01	"Agitator Operation" Decal	1
40	012686-02	"DANGER! Confined Space Hazard" Decal	1
41	012041-01	"Operating Instructions – HydroSeeder" Decal	1

**** NOTE:***

All of the decals depicted and listed on Pages 70–71 (except those identified with an asterisk) are shown for location purposes only. To order replacements you must order T90 Decal Kit (part number 005738). Replacement decals and plates for those identified with an asterisk are not part of the decal kit and must be ordered separately.

WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE