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FINN CORPORATION

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T60 II HydroSeeder®
Manual

Model **RUA** Serial No. _____

INDEX

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 to stress safe operation.

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

This symbol is used throughout the operation and maintenance sections of this manual to call attention to safety procedures.
- Pay Attention -

DANGER: Immediate hazards which WILL result in severe personal injury or death.

WARNING: Hazards or unsafe practices which COULD result in severe personal injury or death.

CAUTION: Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

IMPORTANT: Indicates that equipment or property damage could result if instructions are not followed.

NOTE: Gives helpful information.

CALIFORNIA

Proposition 65 Warning

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

Finn Corporation

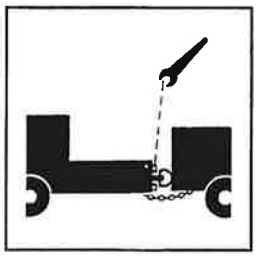
HYDROSEEDER® SAFETY SUMMARY SECTION

It is important that all operators of this machine are familiar with all of the safety aspects mentioned below 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 sheet. 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 sheet is written for this type of machine only. Practice all other usual and customary safe working precautions; and above all, remember that safety is up to you.

The FINN HydroSeeder® is designed to mix and apply water, seed, fertilizer, agricultural lime and hydraulic mulch to the prepared seed bed. 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):

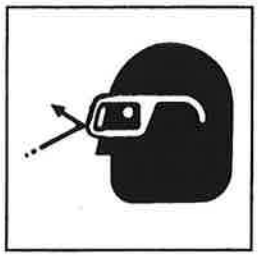
1. If you have a chassis mounted unit, check devices securing HydroSeeder® to the truck or trailer frame.
2. If HydroSeeder® is a trailer unit, check hitch and hitch bolts, safety chains, lights, brakes and breakaway switch. Verify that the hitch ball is the correct size for the coupler. Use only a 25000 lb. rated 2-5/16" ball.



3. Check that all guard railing is in place and secure.
4. Verify that all guards are in place.
5. With the ignition switch on, verify that the signal horn is operating correctly.
6. By carefully looking down through the loading hatch, inspect the slurry tank for foreign objects. Never enter the tank without following the procedures described in #3 of the Maintenance section in this sheet.
7. Remove unnecessary objects (or material) from the tank top.
8. Make sure no one is working on or inside the machine. Signal "All Clear" before starting the engine.
9. Inspect all hydraulic hoses for cracks, bulges or damage. If hoses are bad, replace immediately.
10. Inspect all discharge hoses for cracks, bulges or damage. If hoses are bad, replace immediately.

II. MACHINE OPERATION

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



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

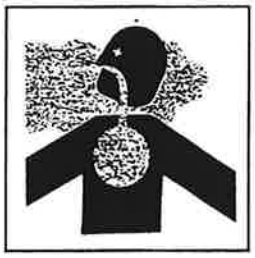
3. Do not load the unit while in transit. Load only when parked and unit is as level as possible. Take care not to drop pens, lighters, etc. or pieces of paper or plastic bags into the tank, as these objects might plug the slurry system. Should any object be dropped into the tank, do NOT reach into the tank to retrieve the foreign object. See #3 under Maintenance before allowing any personnel to enter the tank.

4. Make sure area to be sprayed is clear of all persons, animals, etc.

5. The driver of the carrying or towing vehicle is responsible for the safety of the operator(s) of the machine. Make sure the driver is aware of and avoids all possible hazards to the operator(s) on the machine, such as low tree limbs, low power lines, etc. Vehicles on which equipment is mounted or towed must be started or stopped 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.

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 the 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 which 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 hose holding personnel is to firmly grasp the hose over the shoulder or under both arms. Never 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 holders should be positioned at the end of the hose.

5. Plan application so that the furthest area is covered first; working back toward the HydroSeeder®, so that the 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.

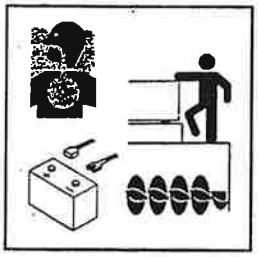
7. Except when loading materials keep loading hatch lid closed to protect operator and prevent splashing of wet material onto the tank top.

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. (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 requirements of 29 CFR 1910.146 including the following:

    A. Drain, flush and ventilate tank interior.
    B. Turn off engine and 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 stand-by individual outside of tank able to communicate with person inside and able to haul him out with 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, 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 re-inflating a repaired tire.

6. Battery maintenance: Lead-acid batteries contain sulfuric acid which damage eyes of skin on contact. Always wear a face shield to avoid acid in the eyes. If acid contacts 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.

7. Filling of fuel: Never fill the fuel 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 container are explosive. Never cut or weld on fuel lines, tanks or containers. Move at least 10 feet (3 meters) away from fueling point before starting engine. Wipe off any spilled fuel and let dry before starting engine.

NOTE: 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 properly.

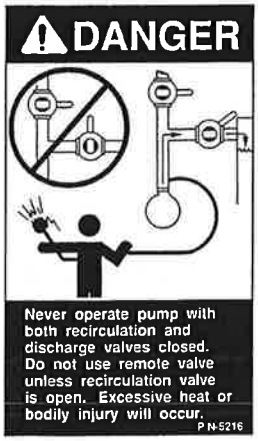
8. It is recommended that only authorized genuine FINN replacement parts be used on the machine.

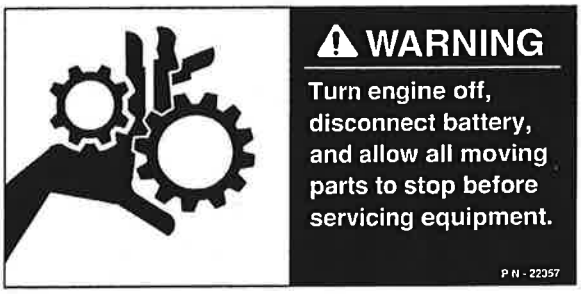
9. Do not use ether cold start fluid if engine is equipped with glow plug type preheater or other intake manifold type preheater. It could cause an explosion or fire and severe injury or death.

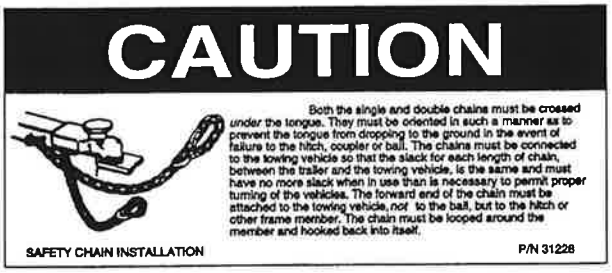
10. Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause injury, blindness or death. Pressure may build up in the hydraulic system; use caution when removing the cap.

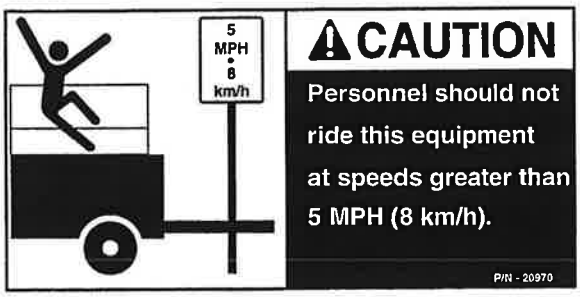
11. Make certain that all decals on the machine are maintained in good legible condition. Replacement decals are available through FINN Corporation by specifying part number shown in the lower right hand corner of the decal. See page 5 for the current safety decals mounted on the unit. See the Parts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

CURRENT SET OF SAFETY DECALS









OPERATION AND MAINTENANCE MANUAL FOR THE FINN T60 SERIES II HYDROSEEDER®

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

DEFINITION OF HYDROSEEDING:

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

THE FINN HYDROSEEDER® AND HOW IT WORKS:

The Finn HydroSeeder® will apply seed, fertilizer and/or lime, 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.

TOWING VEHICLE

The trailer mounted HydroSeeder®, is to be pulled with a truck which is built to take 1300 lbs. (590 kg.) vertical hitch load. The truck must be able to pull 8400 lbs. (3810 kg.). The trailer has electric operated brakes, an electric breakaway switch, a standard tread of 60" (152.4 cm.) and is available with either a ball hitch* or lunette eye.

HYDROSEEDER®		TRUCK REQUIREMENTS
Type	Maximum Weight (loaded)	
T60T II	8,400 lbs. (3,810 kg)	Truck must be able to support 1300 lbs. (590 kgs) down on its hitch and safely tow 8400 lbs. (3,810 kgs)
T60S II	7,800 lbs. (3,538 kg)	13,500 lbs. (6125 kg.) Approx. GVWR** (CA dimension 72"+)

* 2-5/16" Ball rated 25000 Lbs.

** Since truck weight will vary, insure 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.

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

A. Bolt the HydroSeeder® directly to the truck bed. Installer must insure that the bed to truck and HydroSeeder® to bed connections are adequate for the full load weights that are shown on page 6.

B. Mount the HydroSeeder® to the truck frame. The T60 II Skid HydroSeeder® is provided with an adapter frame which also allows the unit to be mounted directly to the truck's 34" wide frame using U-Bolts.

IMPORTANT: Mounting the HydroSeeder® to the truck must allow for tire clearance as well as frame twist. Place hard wood spacers along the length of truck rails or use Finn spring mounting kit (#011562) or equivalent.

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

IMPORTANT: When using a truck with a tilt bed be sure to chain the truck bed down to prevent the bed from being accidentally hoisted.

ATTACHMENTS:

1. Discharge hoses: Discharge hoses are available in 50 ft. (15 m) and 100 ft. (30 m) lengths up to a total of 150 ft. (45 m). Hose of a greater length may adversely affect the discharge distance, and the discharge time of the HydroSeeder®. The discharge hose is available in either semi-rigid polybraid or collapsible hose with 50 ft. (15 m) of either of these hoses coming standard with the unit. All connections are camlock quick operating fittings, including the connection to the end of the discharge piping. A nozzle is connected to the end of the hose next to the remote discharge valve. Once the hose is connected, the HydroSeeder® is ready to operate. Flow through the hose and the nozzle is controlled by the remote discharge valve. When using this valve, the recirculation valve on the HydroSeeder® MUST BE OPEN to allow flow at times when the remote valve is closed. See Figure 1 on page 10.

DANGER: **The recirculation valve must be open when using a remote valve. If valve is not open, extreme heat will occur resulting in damage and/or bodily injury.**

2. Operator's Platform: A bolt-on package is available to convert the base unit to include an operator's platform complete with: a discharge boom, guard rails, ladder, and all controls necessary to operate the unit (throttle, clutch control, signal horn, agitator control).

3. Hose Reel: There are three different hose reel packages that are available for this unit. A 150 ft.(45 m) capacity manual rewind reel for the collapsible hose and a 150 ft. (45 m) capacity electric rewind reels for the polybraid hose (available as a storage reel or a live reel).

4. Radio Remote Control: A radio remote control is available that allows the operator to control material flow by turning the clutch off and on from the end of the discharge hose.

PRE-START CHECK:

Safety check to insure operator safety:

1. A. Skid Unit - Check condition of all mounting hardware securing HydroSeeder® to truck bed and frame rails.
   B. Trailer Unit - Inspect hitch, safety chains, lights, brakes and breakaway switch.
2. Insure that all guards are in place.
3. Inspect that all railings are in place and secure (Platform Option only).

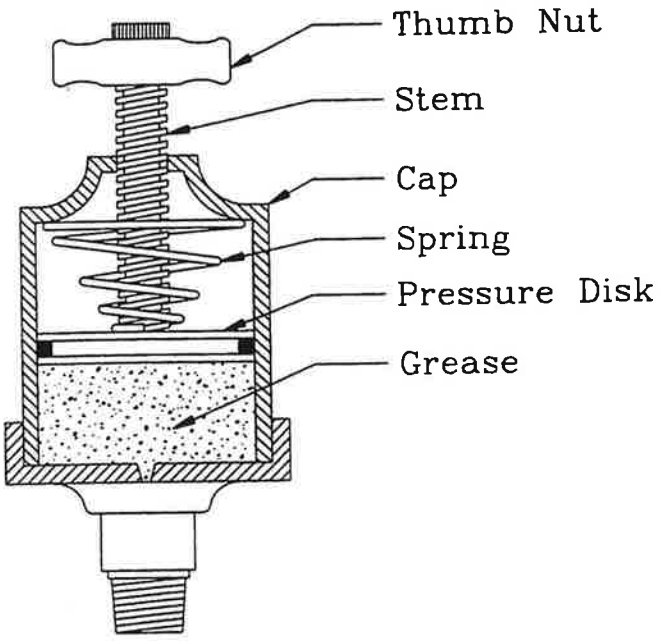
EQUIPMENT CHECK:

CAUTION: Equipment check is made with the engine off and all rotating parts stopped.

1. See that tool kit contains all the prescribed items (see tool kit list in parts book).
2. Inspect the "slurry-tank" for foreign objects. See numbers 2 and 3 in Maintenance Section (IV) of the Safety Summary Section page 4.
3. Check fuel level.
4. Check the hydraulic oil level (see hydraulic system for oil specifications).

5. Check engine oil level . . . for oil type refer to the engine manual.
6. Inspect air cleaner for dust and dirt, clean if necessary.
7. Secure the tank drain plug in the drain pipe located in the center of the bumper.
8. Check to be certain pump drain plug is in place.
9. Verify that suction line shut-off valve is completely open.
10. Lubricate equipment - See Lube Chart pages 20-21.
    A. Each lubrication point is marked.
    B. Check automatic pressure lubricator at pump. If the stem is fully extended with thumb nut all the way up, the pressure lubricator contains lubricant - if not, lubricant must be replaced by the following procedure:
        a) Turn thumb nut clockwise until stem rises to maximum height.
        b) Remove cap and fill cap with sodium (water soluble) base grease. (FINN part number 000698). Do not use lithium base (chassis lube) grease.
        c) Replace cap.
        d) Turn thumb nut counter-clockwise until the thumb nut is at the top of the stem. The spring and pressure disc in the lubricator forces the grease, under pressure, to the pump seal.

IMPORTANT: When the thumb nut has moved down to within ½" (1.25 cm) of touching the cap, reservice the automatic lubricator.



11. Check and clean the nozzles and hoses of any obstructions.
12. Check pump discharge, recirculation, and remote valve handles for free movement.

VALVE OPERATION:

A: VALVE OPERATION (Base Unit):

The base HydroSeeder® is equipped with three (3) independently operated ball valves to control slurry flow (see Fig. 1). The first valve is the recirculation valve. An open recirculation valve allows flow back into the tank. The second valve is the pump discharge valve. An open pump discharge valve allows slurry to flow through the discharge hose. The third valve, located at the end of the discharge hose is the remote valve. An open remote valve allows discharge of the slurry onto the area being covered.

WARNING: **Never engage (turn on) the slurry pump clutch when the recirculation valve and either the pump discharge or remote valve is closed. Pump is running with slurry flow closed-off which will result in extreme heat generation causing damage and/or bodily injury. The recirculation valve must always be open and material flowing back into the tank when using the remote valve. A closed remote valve in conjunction with a closed or plugged recirculation will cause extreme heat resulting in damage and/or bodily injury.**

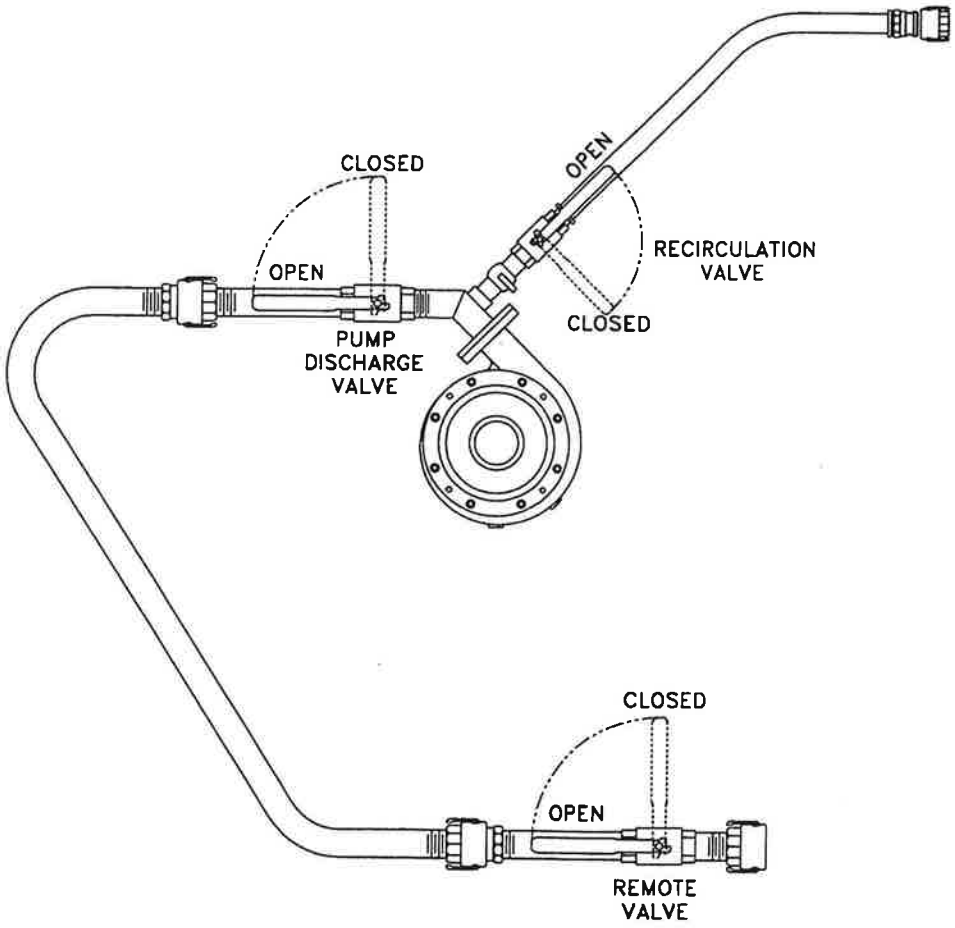


Figure 1

B: VALVE OPERATION (Platform/Boom Option):

The platform option is equipped with two (2) independently operated ball valves to control slurry flow (see Figure 2). With the platform option, discharge of the slurry is accomplished two different ways; either through the discharge boom or through a discharge hose which is coupled to the end of the discharge boom.

Through the boom - Since the operator controls engagement of the pump with the foot switch when discharging through the boom, the recirculation valve may be left open or closed. With the recirculation valve close full pump flow is directed through the boom resulting in additional distance and a decrease in discharge time.

Through the discharge hose - When discharging through the discharge hose both ball valves are used to control slurry. The recirculation valve is always open. The remote valve at the end of the discharge hose is the control device to allow application of the slurry. An open remote valve allows discharge of the slurry onto the area being covered.

WARNING: **Never engage (turn on) the slurry pump clutch when the recirculation valve and the remote valve are closed. Pump is running with slurry flow closed-off which will result in extreme heat generation causing damage and/or bodily injury. The recirculation valve must always be open and material flowing back into the tank when using the remote valve. A closed remote valve in conjunction with a closed or plugged recirculation will cause extreme heat resulting in damage and/or bodily injury.**

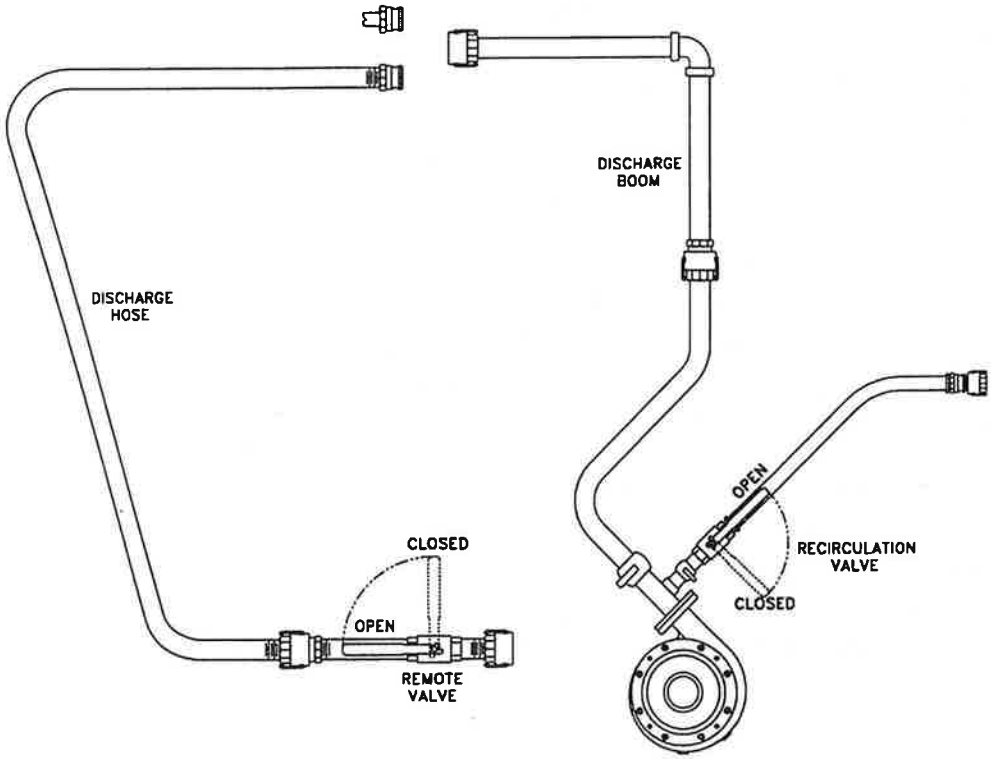


Figure 2

STARTING PROCEDURE:

CAUTION: **See safety section of the manual (pages 2-4) before operating the machine.**

Before starting, open the recirculation valve, close discharge valve, disengage (turn off) the clutch, and place the agitator control in the neutral position.

1 Set throttle about ¼ open.
2 Pull Choke control out.
3 Turn the key clockwise until the starter catches and engine fires.
4 Push the Choke control in for even running.

NOTE: This engine has a safety system which will shut the engine off if the engine temperature goes above or if the oil pressure decreases below an acceptable level.

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 "one step" (which is when the seed, fertilizer and mulch are applied proportionally per load) or "two step" (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 1000 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 6-10 pounds per 1000 square feet; fertilizer is applied at a rate of approximately 400 pound per acre; and fiber mulch is applied at 1500 to 2000 pounds 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 following tables show loading versus coverage rates for the Finn T60 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 (pounds(kilograms)) Seed	Fertilizer	Mulch	Coverage Area (sq. ft.(sq. m.))
T60 II	46 (21)	53 (24)	200 (91)	5790 (535)

Above Table is based on 1500 pounds of mulch, 400 pounds of fertilizer and 345 pounds of seed (8 pounds/1000 square feet) per acre.

Table A Example: For T60 II

$$\frac{\text{200 pounds Mulch per Tank}}{\text{1500 Pounds Mulch per Acre}} = .133 \text{ Acre per Load}$$

400 Pounds Fertilizer per Acre x .133 Acre = 53 Pounds Fertilizer per Load
345 Pounds Seed per Acre x .133 Acre = 46 Pounds Seed per Load

.133 Acre x 43560 Square feet per Acre = 5790 Square feet.

TABLE B

Seed and Fertilizer Only

Unit	Amount of Material in Tank (pounds(kilograms)) Seed	Fertilizer	Total	Coverage Area Sq. Ft. (Sq. m.)	Acreage (Hectare)
T60 II	522 (237)	600 (272)	1122 (509)	65,340 (6,070)	1.5 (.61)

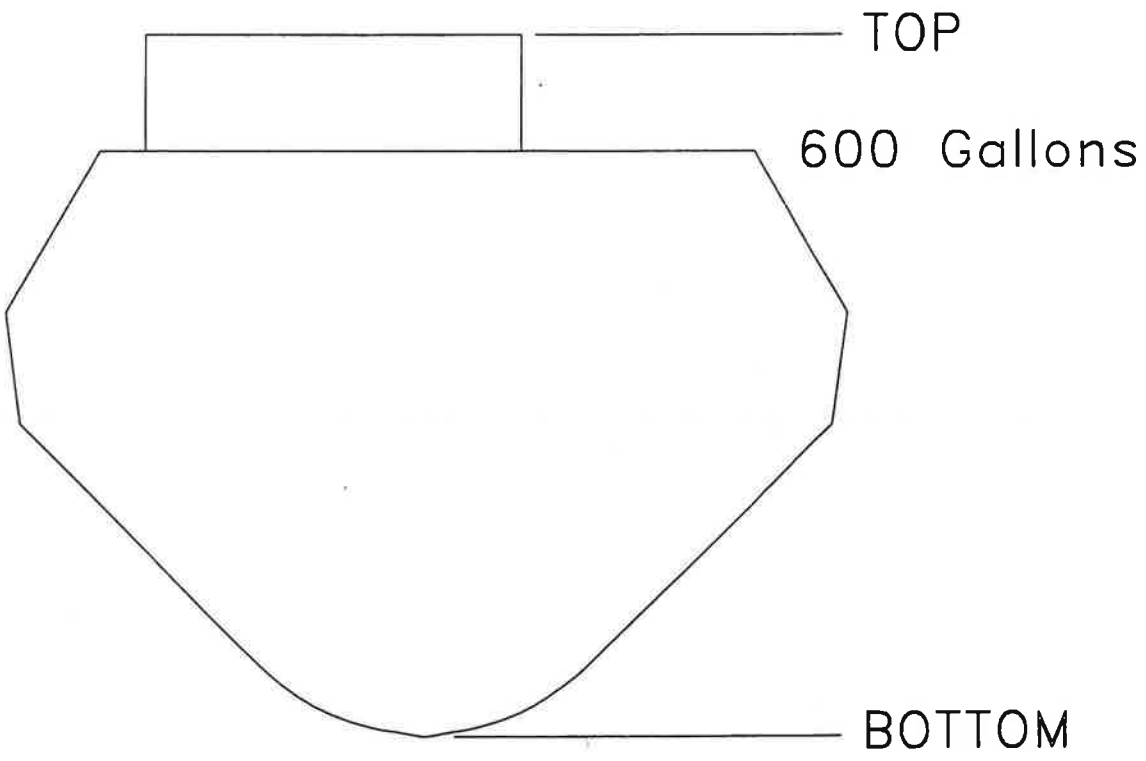
Above Table is based on rates of 8 pounds seed and 9.2 pounds fertilizer per 1000 square feet.

Table B Example: For T60 II

$$\frac{\text{1122 Pound Tank Capacity (Solids)}}{\text{8 Pounds (Seed) + 9.2 Pounds (Fertilizer) per 1000 Sq. Ft.}} = 65{,}340 \text{ Square Feet per Load}$$

$$\frac{\text{8 Pounds Seed}}{\text{1000 Sq. Ft.}} \times 65{,}340 \text{ Square Feet} = 522 \text{ Pounds Seed per Tank}$$

TANK CAPACITY CHART:



T60 II		
Gallons (liters)	in. (cm) from top	in. (cm) from bottom
600 (2271)	8 (20.3)	40.5 (102.8)
550 (2082)	11.25 (28.5)	37.25 (94.6)
500 (1893)	14.25 (36.2)	34.25 (87)
450 (1703)	16.75 (42.5)	31.75 (80.6)
400 (1514)	19.5 (49.5)	29 (73.6)
350 (1325)	22 (55.9)	26.5 (67.3)
300 (1135)	24.5 (62.2)	24 (61)
250 (946)	27 (68.6)	21.5 (54.6)
200 (757)	29.5 (74.9)	19 (48.2)
150 (568)	32.52 (82.5)	16 (40.6)
100 (378)	36.25 (92)	12.25 (31.1)
50 (189)	40.75 (103.5)	7.75 (19.7)

LOADING:

CAUTION: **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.**

1. With clutch disengaged (off) and agitator control in the neutral position, start engine and allow it to warm up (See starting procedure page 12).
2. Start filling the unit with water. When water reaches the top of the agitator shaft, move agitator control to full reverse position.

   Fill the tank with 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 which could damage the pump and unit. Other sources of water:

   1. Any pressure source, eg. fire hydrant. This unit is supplied with an air gap fill port but it is necessary to consult with local authorities before using water main in order to abide to all local ordinances.
   2. Water tanker.

3. Piping System Cleanout Procedure (Purging Line):
   - 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. Increase engine speed to approximately ½ to ¾.
   - E. Engage (turn on) the clutch.
   - F. When discharge stream is clear, open recirculation valve and close discharge valve. After recirculation stream is clear disengage (turn off) the 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 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 the seed bag and dump contents into the 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. Fiber mulch - Empty the entire bag in or cut bag 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 ¾ 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.**

C. Fertilizer - Cut the fertilizer bag and dump the contents into the 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 insure all material is mixed. It may be necessary to change the agitator direction more than once to insure a thorough mixture.
8. After material is thoroughly mixed, slow agitator in forward direction to ½ to ¾ 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 forward position.
9. Close the hatch lid on the slurry tank.

NOTE: If foaming occurs, reduce agitator speed.

PRIOR TO APPLICATION:

1. Operator should familiarize self with area to be seeded and develop a plan to insure uniform application.

Platform Option :

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 switches clutch control toggle switch (on the control panel) to "Stand-By" and then takes up position on the platform. From this point application will be controlled by the use of the clutch, discharge assembly and throttle.

DISCHARGE NOZZLE SELECTION:

Nozzles are stored in the tool box. This HydroSeeder® is equipped with 3 nozzles - one long distance and two ribbon fan nozzles. The following chart tabulates the approximate distance, width, and discharge time of the nozzles when used with the platform option. When using the base unit these factors will vary according to the type and length of hose being used.

Nozzle	Distance	Width	Discharge Time
Long Distance	Up to 100 ft (30m)	-	16 minutes
Narrow Ribbon	Up to 60 ft (18m)	10 ft (3m)	12 minutes
Wide Ribbon	Up to 50 ft (15m)	20 ft (6m)	12 minutes

APPLICATION OF SLURRY:

I. General Application Techniques

DANGER: **Do not spray toward power lines, transformers or other high voltage conductors.**

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.**

1. Determine which nozzle would best suit the application needs according to the nozzle selection chart on page 16.
2. Application of seed and fertilizer: Elevate discharge nozzle no less than 10° above the area to be sprayed, allowing the slurry to gently rain onto the seed bed.
3. Application of wood and paper fiber: Whenever possible aim the stream towards the ground to create a surface with small pock marks which help 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. Do NOT partially close the valve to control the distance.
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) the clutch. Re-engage the clutch to continue application.
7. It may be necessary to slow the agitator as the tank empties to reduce foaming.

II. 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 plugging.

A. DISCHARGE THROUGH HOSE 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) the clutch. When stream is flowing freely through the recirculation line, open the pump take off valve.

CAUTION: **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. 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.**

3. With the engine at ¾ speed, open the remote valve at the end of the hose to discharge the load.
4. When finished spraying, close the remote valve, disengage (turn off) the clutch, and stop the engine. 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 on page 18. If finished for the day, follow the clean up procedure and flush out the hose.

DANGER: **The recirculation valve must be open when using a remote valve. If not open, extreme heat which will cause damage and/or bodily injury will occur.**

III. DISCHARGE THROUGH THE BOOM (Platform option):

1. Move the clutch toggle switch to the "stand-by" position and close the recirculation valve. When ready to discharge the slurry step on the clutch activation button on top of the platform, which engages (turns on) the clutch. The slurry will discharge as long as this button is activated. To stop the slurry simply remove foot from the button.
2. When the tank is empty, or when discontinuing discharge for an extended period of time, disengage (turn off) the clutch and idle the engine. This will maintain moisture in the discharge piping and help prevent plugging. Move the agitator control to the neutral position.

RELOADING PROCEDURE:

1. Start at step 2 in loading procedure on page 15.
2. After last load of the day refer to the cleaning and maintenance section of the manual on pages 18-19.

CLEANING AND MAINTENANCE:

AFTER FIRST 4 - 8 HOURS OF OPERATION:

1. Retorque wheel lugs - again after 7 days. (Trailer option only)(75 ft.lbs.).

DAILY:

1. Cleaning the HydroSeeder®
   A. Fill the slurry tank to the center of the agitator shaft with clear water.
   B. Move agitator lever to full speed to flush off inside of tank top and walls.
   C. Remove discharge nozzle and coupler gasket from the remote valve coupler at the end of the discharge hose (or the boom on the platform option).
   D. While aiming discharge toward an open area, open discharge and remote valve and engage (turn on) the clutch. Allow to discharge until clear water is coming out.

E. Open the recirculation valve and allow to run until the stream is clear.
F. Disengage (turn off) the clutch, idle the engine, move discharge valve handle to discharge position, move agitator handle to neutral and turn off the engine. (Remember to replace the coupler gasket).
G. Always remove the drain plug and allow the 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 the HydroSeeder® to remove any corrosive materials.

2. Lubricating the HydroSeeder® (see lube chart pages 20-21).

IMPORTANT: Lubrication should be performed IMMEDIATELY AFTER cleaning of equipment. Engine not running.

A. Lubricate the agitator shaft bearings located on the outside front and rear of the slurry-tank.
B. Service the automatic lubricator on the pump as needed (for service see page 9).
C. Check the engine oil and replenish when necessary. Change oil and filter after first 5 hours then 100 hours thereafter. Consult the engine operator's manual for the correct grade of oil and the engine break-in procedure.
D. Lubricate the swivel on the discharge boom assembly (platform option only).

WEEKLY OR EVERY 40 HOURS OF OPERATING TIME:

1. Clean the air cleaner following the instructions in the engine operator's manual.
2. Lubricate all the points on the HydroSeeder® as outlined in the daily maintenance section and, in addition, lubricate the two grease fittings on the clutch/pump.
3. Check the level in the hydraulic oil reservoir - maintain level at sight gauge.
4. Inspect the slurry-tank for build up of residue in the suction area and clear if necessary.

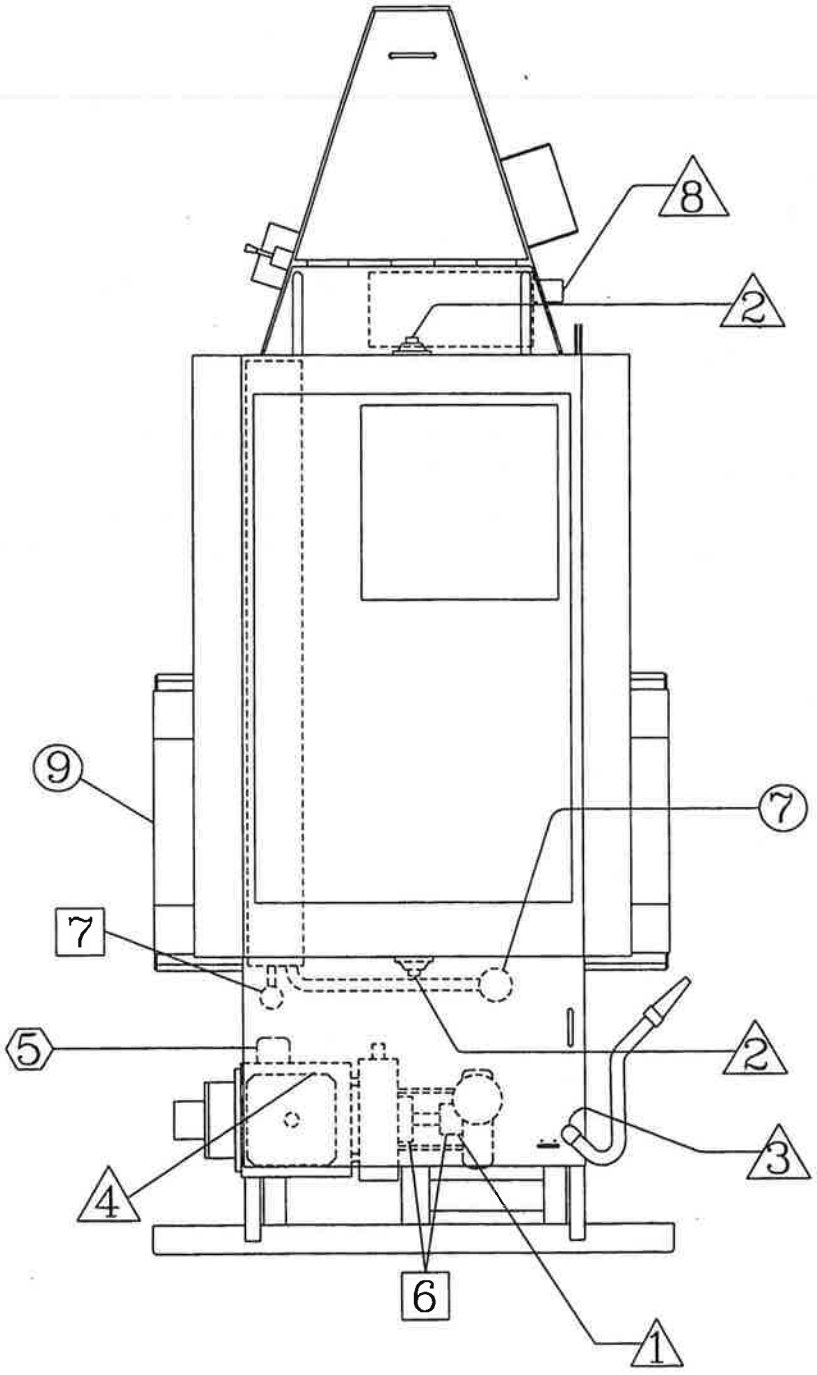
SEASONAL AND WINTER STORAGE MAINTENANCE:

1. Drain the slurry tank of all water prior to storage and leave the drain plug disconnected.
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 one quart 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 numbers 2 and 3 in Maintenance Section (IV) of the Safety Summary Section page 4.
7. Lubricate all fittings.
8. Lubricate equipment again just prior to starting operation after storage.
9. Change hydraulic oil and filter. (400 hours)
10. Disconnect battery cables. In cold weather, remove battery and store in safe warm place.
11. Add fuel stabilizer to fuel tank.

HYDRAULIC SYSTEM:

The hydraulic system on your Finn HydroSeeder® is designed to give trouble free service, when properly maintained. The most important areas of maintenance are the hydraulic oil and filtration. The reservoir holds 8 gallons of Mobil DTE25 or Gulf 46AW or Shell-Tellus 46 hydraulic oil or equivalent. The hydraulic oil should be replaced per the lubrication schedule or if the oil becomes milky or it gives off a burnt odor. The hydraulic oil filter must be replaced on schedule with a 10 micron filter - Finn part #021618. The hydraulic system relief is factory set at 2250 psi.

MACHINE LUBRICATION DIAGRAM



LUBRICATION AND FLUIDS CHART

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

LUBRICANT OR FLUID USED

SL	Seal Lube (Sodium Base)
CL	Chassis Lubricant
MO	Motor Oil See Engine Manual for Recommendations
HO	Hydraulic Oil, Gulf 46 AW, Mobile DTE25, or Shell Tellus 46
FU	Gasoline

TIME KEY

DAILY (8 hours) 

WEEKLY (40 Hours) 

SEASONALLY (500 hours) 

SEE ENGINE MANUAL 

FLUID CAPACITIES

Gasoline - 10 Gallons (38 l)
Engine Oil - 2 Quarts (2 l)
Hydraulic Fluid - 8 Gallons (30 l)

PUMP MAINTENANCE:

CAUTION: **Pump maintenance to be done only while engine is not running, and battery cables are disconnected.**

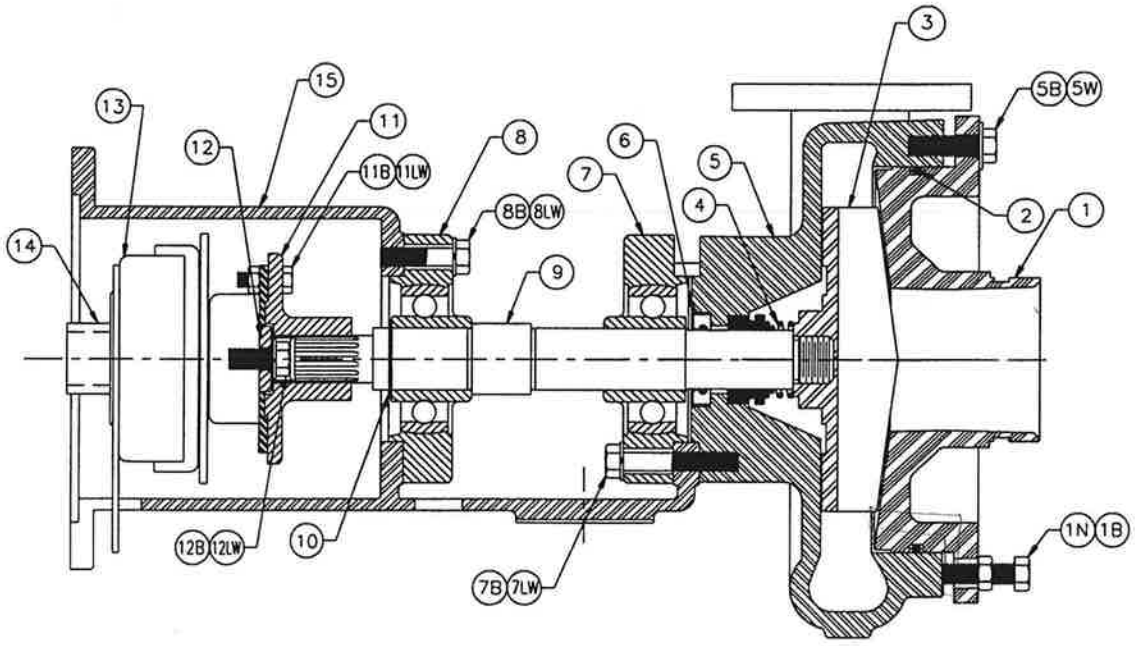


Figure 4

PUMP ASSEMBLY

Ref. No.	Description	No. Req'd	Ref. No.	Description	No. Req'd
1B	Suction Cover Bolt	4	8B	Bearing Bolt	4
1N	Suction Cover Nut	4	8LW	Bearing Washer	4
1	Suction Cover	1	9	Pump Shaft	1
2	O-Ring	1	10	Snap Ring	1
3	Impeller	1	11	Drive Hub	1
4	Mechanical Seal	1	11B	Drive Hub Bolt	2
5	Pump Casing	1	11N	Drive Hub Nut	2
5B	Suction Cover Bolt	8	12	Clutch Retainer	1
5W	Suction Cover Washer	8	12B	Retainer Bolt	1
6	Radial Lip Seal	1	12W	Retainer Washer	1
7	Casing Bearing	1	13	Clutch	1
7B	Bearing Bolt	4	14	Clutch Spacer	1
7LW	Bearing Washer	4	15	Pump Frame	1
8	Frame Bearing	1			

NOTE: See Parts Manual for Finn Part Number

A. FACTORY-TOLERANCES.

1. To check pump tolerances loosen the two clamps on the pump suction piping and remove the inlet elbow. Through the pump suction hole, insert a feeler gauge between the pump impeller (3) and the suction cover (1). This measurement on a new pump is between .030-.045 of an inch (.762 -1.15 mm).

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

1. Loosen adjusting cap screws (1B) and push suction cover (1) into casing (5) until suction cover hits impeller (3). Impeller should be in full contact with suction cover.
2. Tighten cap screws (5B) finger tight. Impeller should rub the suction cover and not turn easily through one revolution.
3. Tighten cap screws (1B) to 15 lb. ft.(165 kg/m).
4. Back off cap screws (5B) 3/4 turn.
5. Tighten cap screws (1B) 3/4 turn (15 lb.ft.(165 kg/m)) and tighten nuts (1N) to 15 lb.ft. (165 kg/m).
6. Tighten cap screws (5B) to 15 lb. ft. clearance gap should be about .040 inches (1.00 mm). Check to see if impeller turns freely through one revolution.

NOTE: Tightening of the cap screws should be in a criss-cross pattern. DO NOT TIGHTEN OVER 15 LB. FT.(165 kg/m). Overtightening will crack the flange of the suction cover.

C. CLEANING.

1. To clean pump impeller (3), loosen the two victaulic pipe clamps and remove the suction pipe assembly. The eye of the impeller can then be seen through the suction cover plate (1) and is readily accessible for cleaning.
2. For further access to the impeller, remove the eight bolts (5B) holding the cover plate (1) in place. Remove suction cover plate, being careful not to damage the O-Ring gasket (2).
3. To remove the impeller take the impeller wrench, which is stored in the tool box, 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° leg of the wrench should face in towards the impeller and be positioned between any two of the impeller fins. Bolt the wrench securely in place with one of the suction cover plate bolts (5B). Using a pipe wrench on the shaft (9) (See Figure 5 below), unscrew the impeller turning the shaft in a clockwise direction. Be careful not to unscrew the impeller too far before removing the puller wrench.

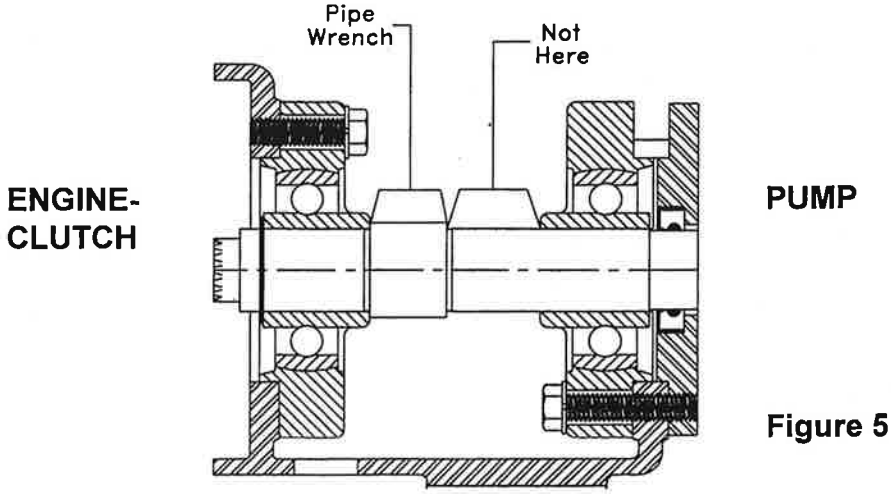


Figure 5

D. INSTALLING NEW SEAL ASSEMBLY (#4) (Do not unwrap the new seal assembly until you are ready to install. All parts of the assembly are packed in sequence of installation.)

1. To replace the seal assembly (4), perform the above operations under cleaning and remove pump casing (5) by removing the four bolts (7B) holding the casing and the casing bearing (7) to the pump frame (15).

2. After cleaning all parts including pump shaft, begin the reassembly of the pump. Install grease retainer seal (6) with the cavity portion of the seal facing inward. Rebolt the casing and the casing bearing (7) onto the clutch housing using the four cap screws (7B). Using a light oil lubricant (3 in 1), install the ceramic seat with its neoprene holder into the seal recess making sure it is square with the shaft. Lubricate the inside of the bellows assembly with a light oil and check to be sure the steel ring is stuck (glued) to the end of the assembly. Slide the bellows assembly onto the shaft and push till the steel ring is against the ceramic seat.

3. Install the seal spring on the hub of the impeller. After coating the threads on the pump shaft with an anti-seize compound, install the impeller - seating it securely.

4. Utilizing the rubber O-Ring gasket (2) reinstall suction cover using the eight cover bolts (5B). At this time, check to see that the pump runs freely. If the impeller rubs the cover plate, either the impeller is not tight on the shaft or the cover plate needs readjustment - see "impeller clearance". Tighten these bolts uniformly using 15 ft. pounds (165 kg/m) on the torque wrench.

5. After reinstalling the suction pipe assembly, lubricate and tighten the victaulic clamps. Service the automatic lubricator.

TROUBLE SHOOTING YOUR HYDROSEEDER®:

Because of the tremendous work load usually placed upon the HydroSeeder®, minor malfunctions will occur from time to time. If not remedied immediately, they could lead to poor performance and damage to the equipment. This section describes possible problems and the action to correct them.

1. Foam in the tank and air entrainment.

The mixture of dry materials with water will sometimes cause excessive foaming while others will cause air entrainment. This is exhibited by erratic discharge and/or a drop in pressure and distance.

Some solutions are:

A. As the slurry level drops in the tank, slow the agitator.
B. Add 2 or 3 ounces (4 to 6 cl) of an antifoaming agent to the tank.
C. If you can determine which additive is causing the air problem, either add it last or not at all - unless it's 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. Serious injury or death can result from moving parts or high pressure spray.**

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 instead of plugged. To remedy this, see "Foaming". Plugging can occur in any one of four places; the valve and recirculation nozzle, the discharge nozzle, the pump area and the sump area. The plugging is caused by either foreign objects or dewatered fiber.

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

a) Disengage (turn off) the clutch.
b) Remove the nozzle.
c) Clear the nozzle with the nozzle cleaning rod attached to the underside of the guard rail (platform option only).

DANGER: **Severe injury can result from opening clamps when piping is hot. Before loosening any clamps, determine if the pipe is hot. If so, let it cool before attempting repair.**

B. If the recirculation system is not working:

a) Disengage (turn off) the clutch and shut down the engine.
b) Remove the clamp attaching the recirculation valve.
c) Slide the rubber seal back and remove the valve assembly.
d) Check the valve assembly, the recirculation nozzle in the discharge pipe, and the recirculation pipe going into the tank. Clear any obstructions.
e) Replace the valve assembly and slide the seal back into place. Lubricate the outside of the seal.
f) Replace the clamp.

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

A. Disengage (turn off) the clutch and stop the engine.
B. Loosen the suction pipe clamps. If there is material in the tank, shut off the suction line valve
C. Remove the clamp closest to the pump.

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

E. Reach into the pump and remove the obstruction. If it is jammed, the pump suction cover may have to be removed.
F. Reassemble removing pipe "plug" in process.
G. Open suction line valve.

4. Obstruction in the sump area, which is located at the bottom of the tank on the inside where the suction pipe is attached:

A. The easiest way to clear the sump is to back flush through the discharge plumbing with the water supply hose.
B. Another method is to 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.
C. Use a pipe or pole through the loading hatch opening to dislodge the obstruction

TROUBLE SHOOTING YOUR HYDROSEEDER®:

Problem	Probable Causes	Suggested Solutions
LEAKS:		
Tank bearing leaks.	Lack of lubrication - seal worn.	Replace seal and follow lube schedule.
	Bolts not tightened properly.	Tighten uniformly to 25 ft. lbs.
Pressure Clamps .	Rubber seal cracked, pinched or torn.	Replace, always grease seal before clamping shut.
Suction.	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 #6969, 2 required).
Pump Shaft.	Pressure lubricator not serviced.	Replace pump seal, service pressure lubricator daily.
Pump Suction Cover.	Cover O-Ring bad.	Replace cover 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 fiber mulch into tank before tank is half full.	Straighten agitator paddle, realign agitator to run true.

FOAMING OF SOLUTION AND LACK OF DISTANCE:

Problem	Probable Causes	Suggested Solutions
Pump looses prime - lacks distance - leaves excessive amount in tank (100 gal(378 liters) 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 24.
	Low engine RPM. (Below 3600 RPM-No load)	Check throttle cable and linkage, See authorized engine dealer.
	Soft water.	Slow agitator.
	Too much agitation.	Slow the agitator.
	Pump worn.	Reset pump tolerance page 23.
	Suction partially plugged.	Clean out machine see page 18.
	Nozzle worn or plugged.	Clean nozzles, replace if necessary.
	Fertilizer.	Change type.

VALVE:

Valve stuck.	Frozen.	Thaw out ice, 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 page 15).
	Incorrect loading procedure.	Review loading procedure page 15.
	Improper operation by operator.	Reinstruct your operator. (Review Operator's Manual).
	Not moving valve handle far enough.	Valve should be fully open.

Problem	Probable Causes	Suggested Solutions
	Machine not being flushed out prior to reloading.	See page 15.
	Machine not being run at correct RPM during loading.	Reinstruct your operator. (See page 15).
Extension hose plugs after use.	Letting water run out, allowing fiber mulch to dry out.	If hose has to be uncoupled, seal ends to keep water in hose and prevent fiber mulch from drying out.

PUMP:

Excessive wear.	Fertilizer with highly abrasive filler.	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 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.

CAUTION: **Do not turn the shaft backwards with a pipe wrench - this will unscrew the impeller from the shaft. Consequently, when clutch is engaged, the impeller will screw onto the shaft with such force, great enough to break the impeller.**

FINN CORPORATION®
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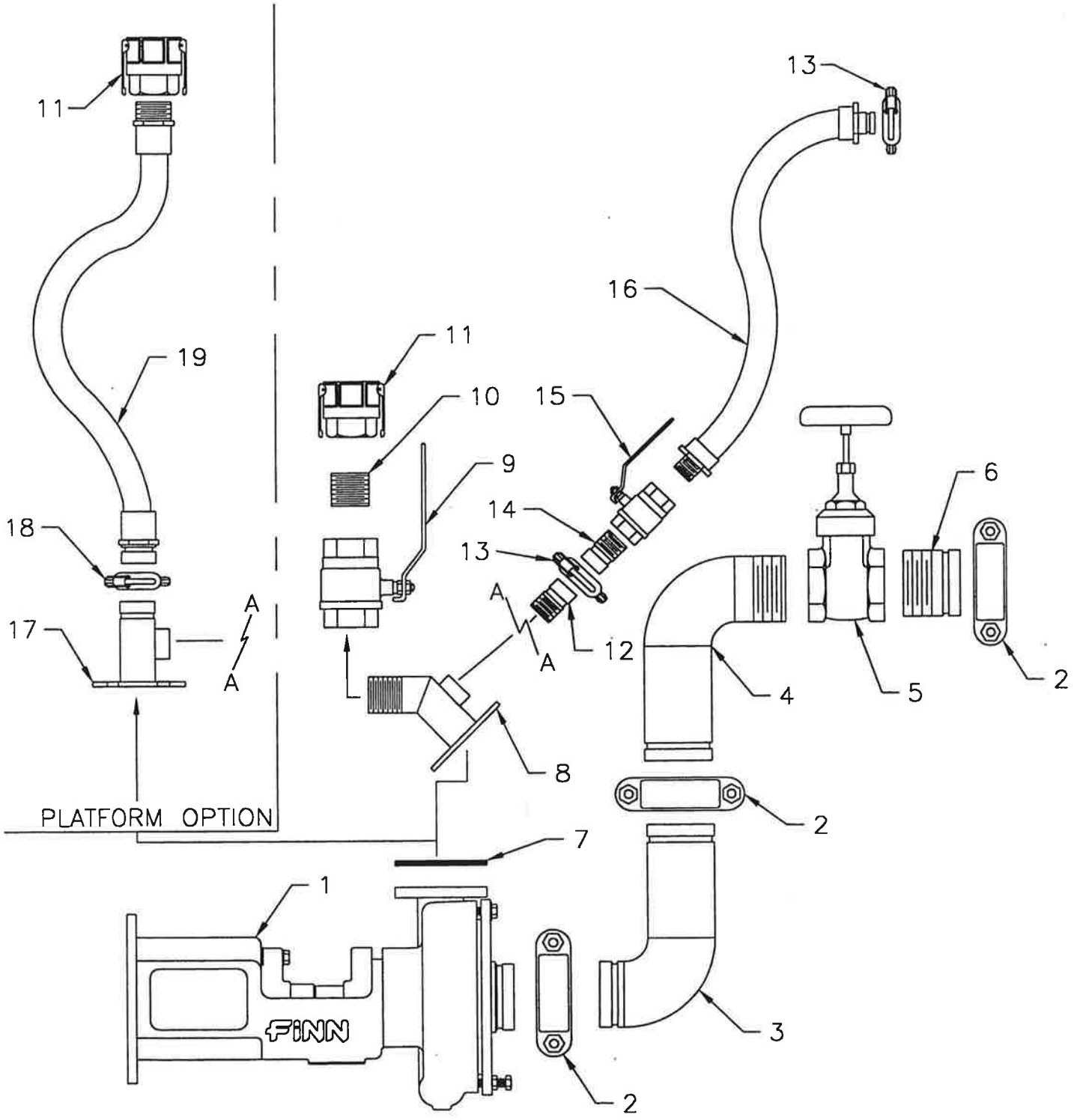
Toll Free (800) 543-7166

T-60 II HydroSeeder®
Parts Manual

Model No. **RUA** Serial No. _____

NOTE: The Parts Manual Section of this manual may be removed. The Operator's manual must remain with the machine at all times for continued reference.

INDEX

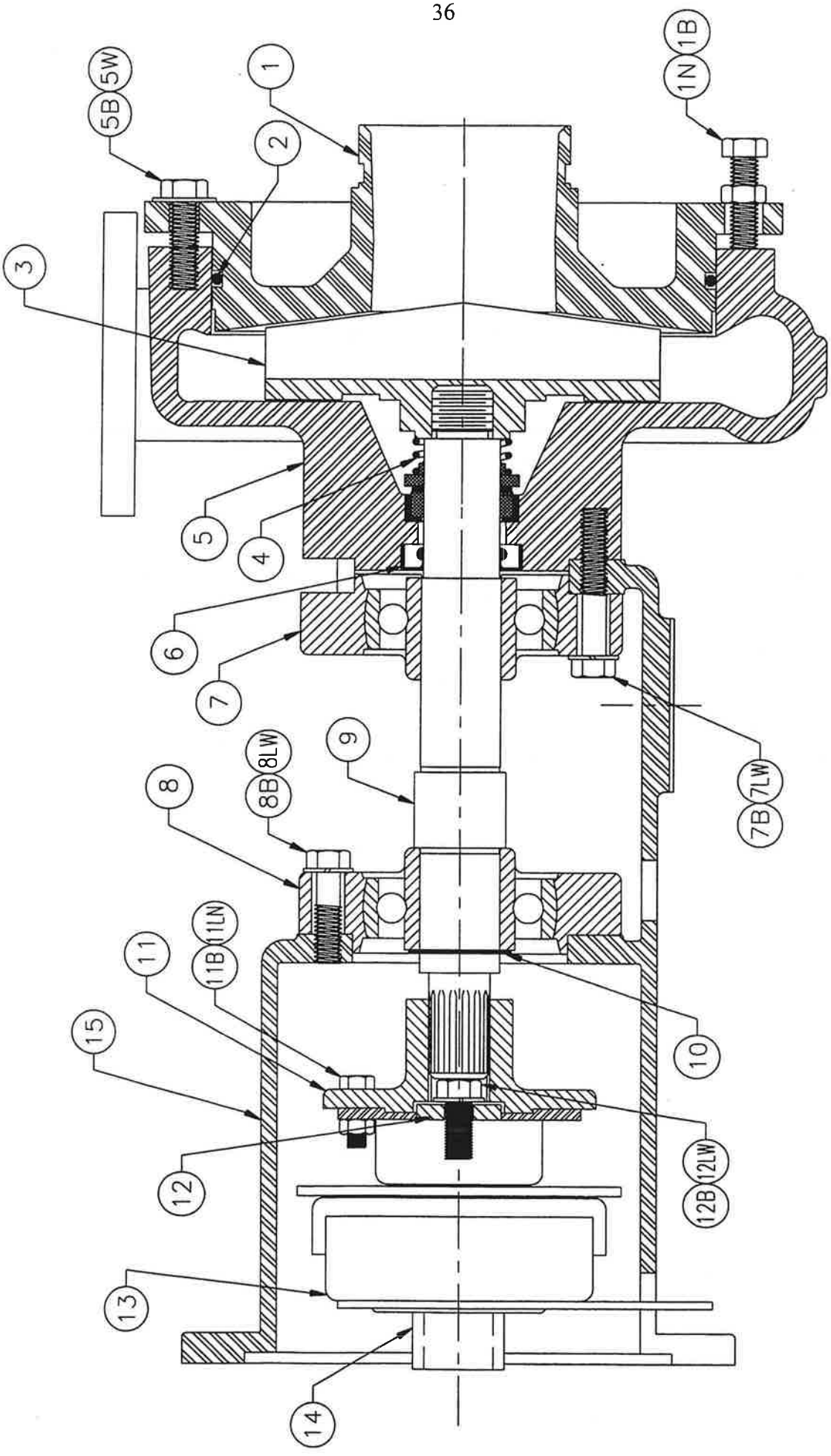


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

SUCTION, DISCHARGE, AND RECIRCULATION PIPING

Ref. No.	Part Number		Description	No. Req'd	
	Base	Platform		Base	Platform
1	080520	080520	Pump Assembly (See pages 36-37 for parts)	1	1
1A	002383	002383	Pressure Lubricator	1	1
1B	080516-01	080516-01	Pump Shaft Guard	1	1
2	080366	080366	Pipe Clamp	3	3
	002439	002439	Clamp Gasket	3	3
3	080556-01	080556-01	Suction Elbow Weldment - G.B.E.	1	1
4	080556-02	080556-02	Suction Elbow Weldment - G.O.E., T.O.E.	1	1
5	004737	004737	Suction Line Shut-Off Valve	1	1
6	080555-06	080555-06	Connector Pipe	1	1
7	008469	008469	Discharge Flange Gasket	1	1
8	080558-02	080558-02	Discharge Flange Pipe - Base Unit	1	0
9	007710	007710	Discharge Ball Valve	1	0
10	160309	160309	Close Nipple	1	0
11	080377	080377	Female Coupler	1	1
	006515	006515	Coupler Gasket	1	1
12	005083-07	005083-07	Recirculation Nozzle	1	1
13	005156	005156	Pipe Clamp	1	1
	005183	005183	Clamp Gasket	1	1
14	005083-08	005083-08	Recirculation Nozzle, Valve	1	1
15	021559	021559	Recirculation Ball Valve	1	1
16	080650	080650	Recirculation Hose	1	1
17	080558-01	080558-01	Discharge Flange Pipe – Platform Unit	0	1
18	006252	006252	Pipe Clamp	0	1
	006253	006253	Clamp Gasket	0	1
19	080494	080494	Discharge Hose	0	1
		011435	Lead in Hose (to # 11)		

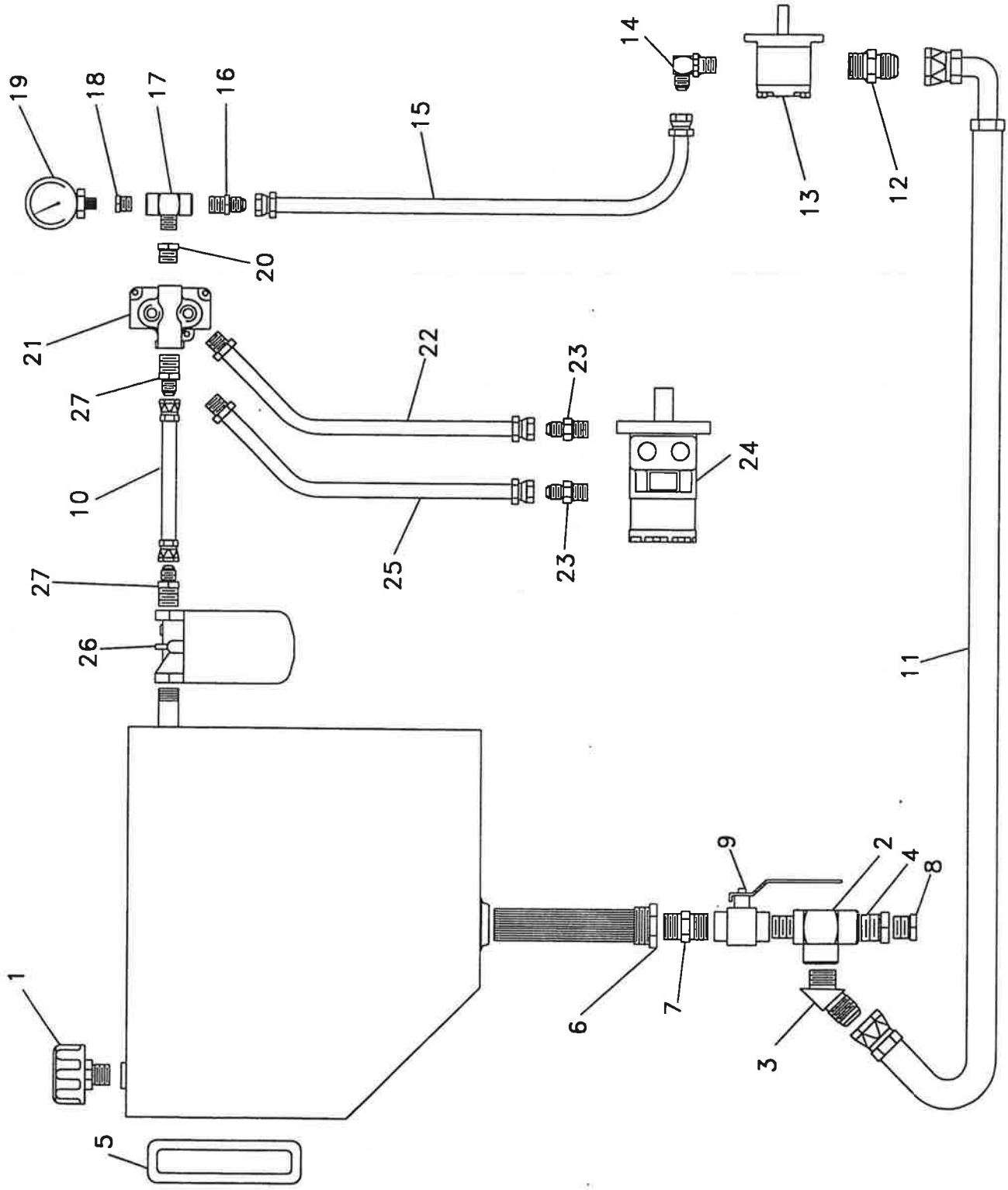
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE


1
2
3
4
5
5B
5W
6
7
7B
7LW
8
8B
8LW
9
10
11
11B
11LN
12
12B
12LW
13
14
15
1B
1N

PUMP ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
1	080489	Suction Cover	1
1B	X0720	Suction Cover Bolt	4
1N	Y07	Suction Cover Nut	4
2	080499	O-Ring	1
3	080488	Impeller	1
4	080485	Mechanical Seal	1
5	080487	Pump Casing	1
5B	X0720	Suction Cover Bolt	8
5W	W07	Suction Cover Washer	8
6	080493	Radial Lip Seal	1
7	080498	Casing Bearing	1
7B	X0740	Bearing Bolt	4
7LW	W07L	Bearing Lock Washer	4
8	080498	Frame Bearing	1
8B	X0728	Bearing Bolt	4
8LW	W07L	Bearing Lock Washer	4
9	080491	Pump Shaft	1
10	080497	Snap Ring	1
11	080490	Drive Hub	1
11B	X0516	Drive Hub Bolt	2
11LN	Y05L	Drive Hub Lock Nut	2
12	080590-07	Clutch Retainer	1
12B	XF0720	Retainer Bolt	1
12LW	W07L	Retainer Lock Washer	1
13	080484	Clutch	1
14	080509-08	Clutch Spacer	1
15	080486	Pump Frame	1

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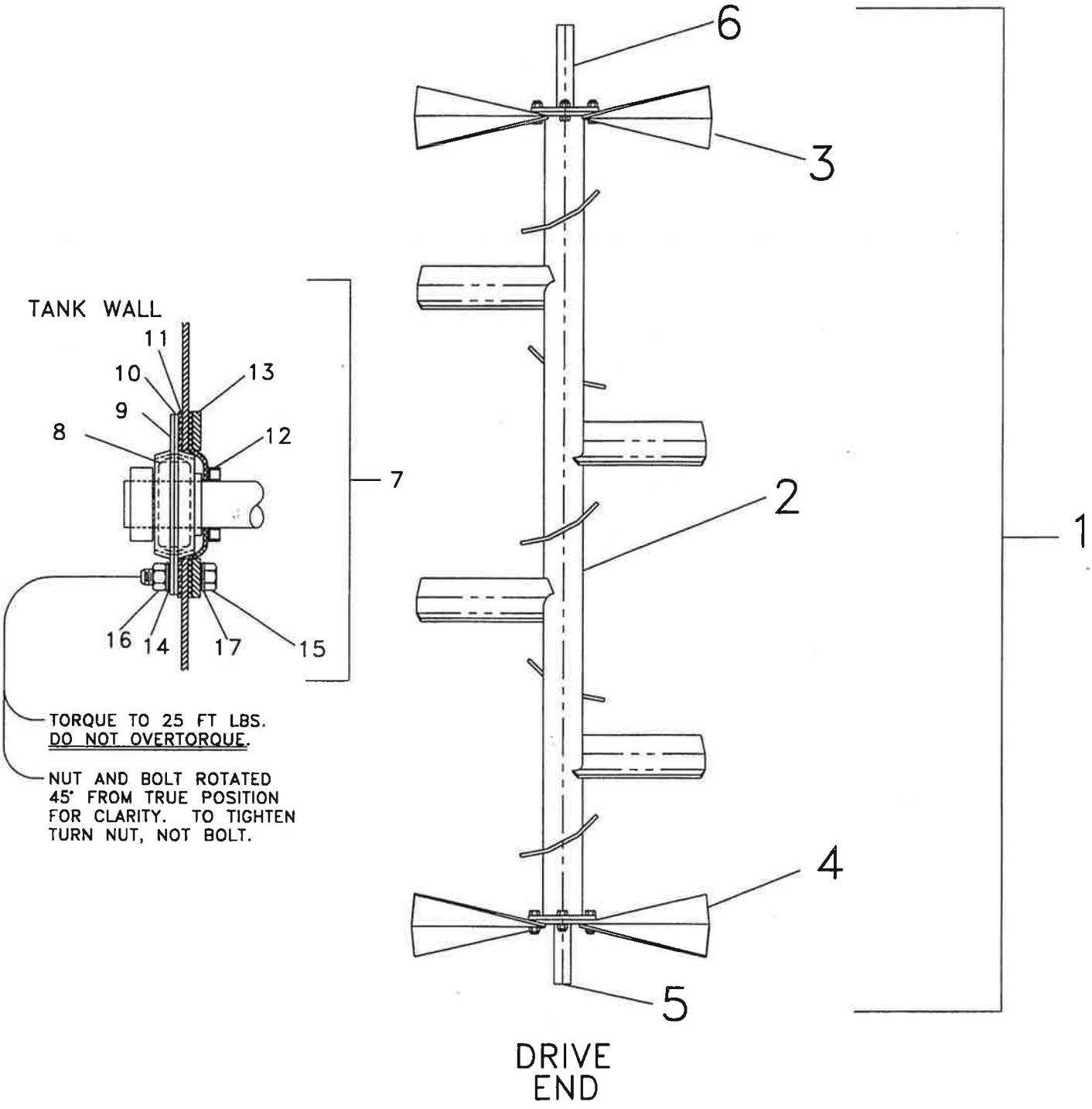
HYDRAULIC SYSTEM

Ref. No.	Part Number	Description	No. Req'd
1	004900	Filler Breather Cap	1
2	022346	Hydraulic Tee	1
3	080649	45° Male Elbow	1
4	011656	Reducer Bushing	1
5	080329	Sight Gauge	1
6	004618	Suction Strainer	1
7	023186	Straight Male Adapter	1
8	080575	Hex Head Plug	1
9	020658	Ball Valve	1
10	080648	Hydraulic Hose	1
11	080576	Suction Hose	1
12	012087	Straight Male Adapter	1
13	080642	Hydraulic Pump	1
14	055309	Male 90° Adapter Elbow	1
15	080578	Pressure Hose	1
16	055238	Straight Male Adapter	1
17	040362	Female Run Tee	1
18	FW71499	Reducer Bushing	1
19	012044	Pressure Gauge	1
20	080268	Reducer Bushing	1
21	022850	Hydraulic Valve	1
	080591-02	Valve Handle	1
	023120	Seal Kit for Hydraulic Valve	1
22	080580	Hydraulic Motor Hose	1
23	085014	Male Straight Adapter	2
24	080482	Hydraulic Motor	1
25	080579	Hydraulic Motor Hose	1
26	021617	Hydraulic Oil Return Filter	1
	021618	Filter Element	1
27	023617	Straight Male Adapter	2

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



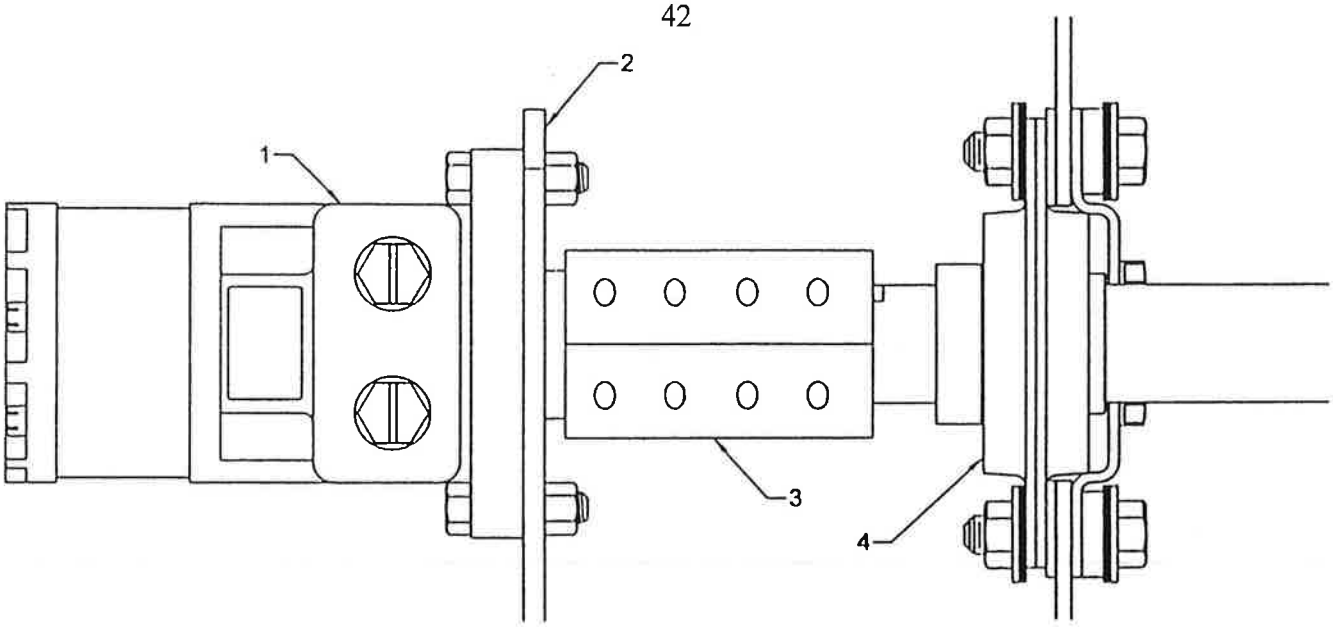
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

AGITATOR ASSEMBLY

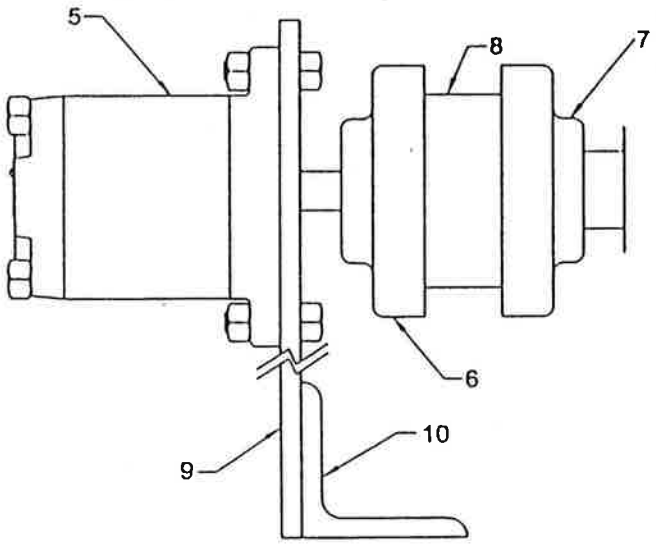
Ref. No.	Part Number	Description	No. Req'd
1	080352	T60 Agitator Shaft Assembly	1
2	080351	Main Agitator Section with Paddles	1
3	011725-01	Bolt-On Paddle, Front	2
4	011725-02	Bolt-On Paddle, Rear	2
5	005081-02	Agitator Stub Shaft, Drive	1
6	005081-03	Agitator Stub Shaft	1
7	007420	Bearing and Seal Assembly includes:	2
8	003022	Bearing	1 per
9	007211	Flangette with Lube Coupling	1 per
10	007212	Flangette	1 per
11	006975	Gasket	1 per
12	007416	Shaft Seal	1 per
13	007417	Clamping Ring	1 per
14	008008	Rubber Washer	8 per
*15	X0828SS	Agitator Seal Bolt	4 per
16	Y08SS	Agitator Seal Nut	4 per
17	W07FSS	Agitator Seal Washer	8 per

*NOTE: On T60 Series II the quantity of Part Number X0828SS is a total of 8 per unit, except for the T60 Series II Trailer unit, which replaces two of this part for Part Number X0840SS. The two replacement bolts are used on the lower two bolts on the front of the unit to hold the toe guard.

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

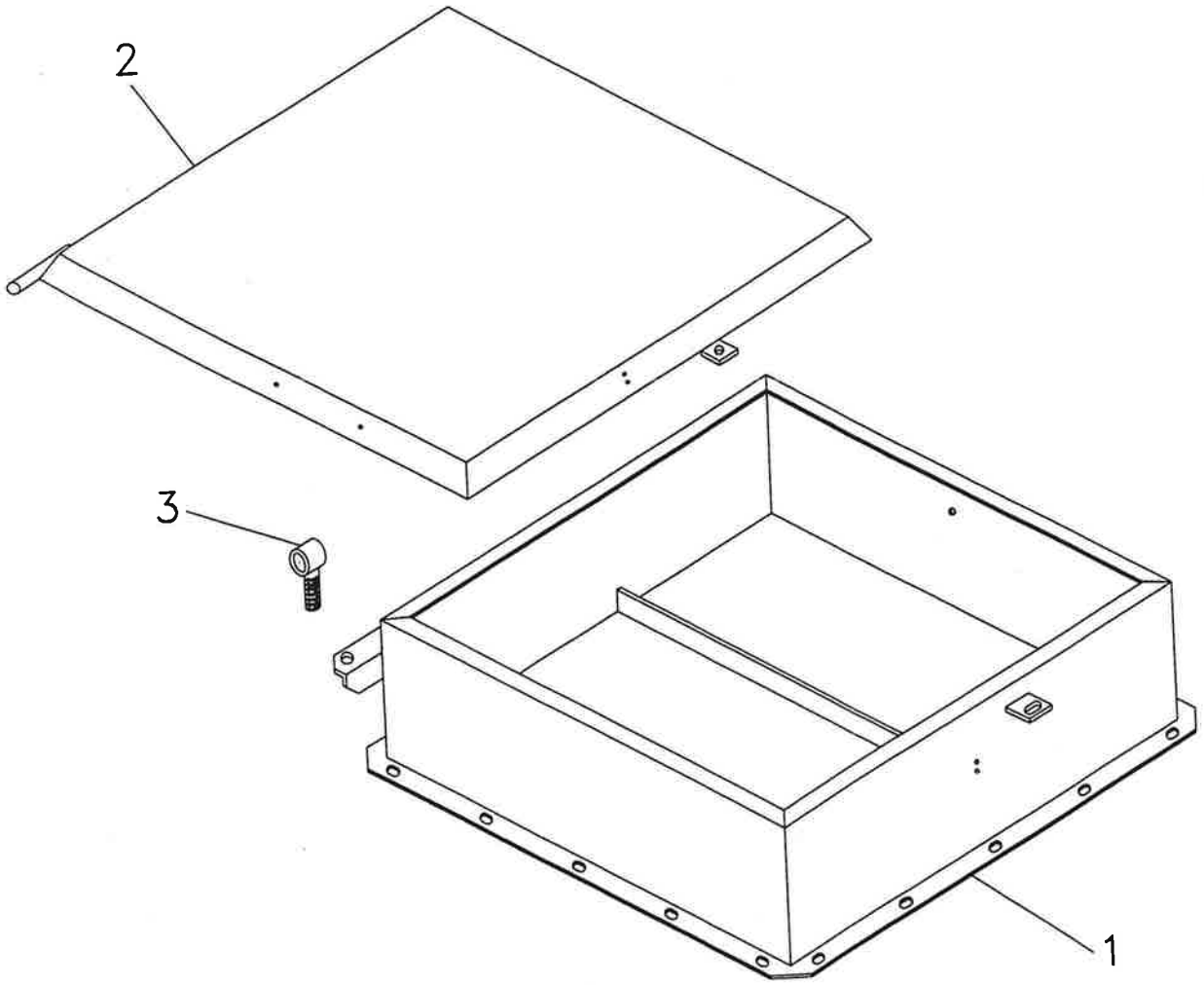


HYDRAULIC AGITATOR DRIVE



HYDRAULIC PUMP DRIVE

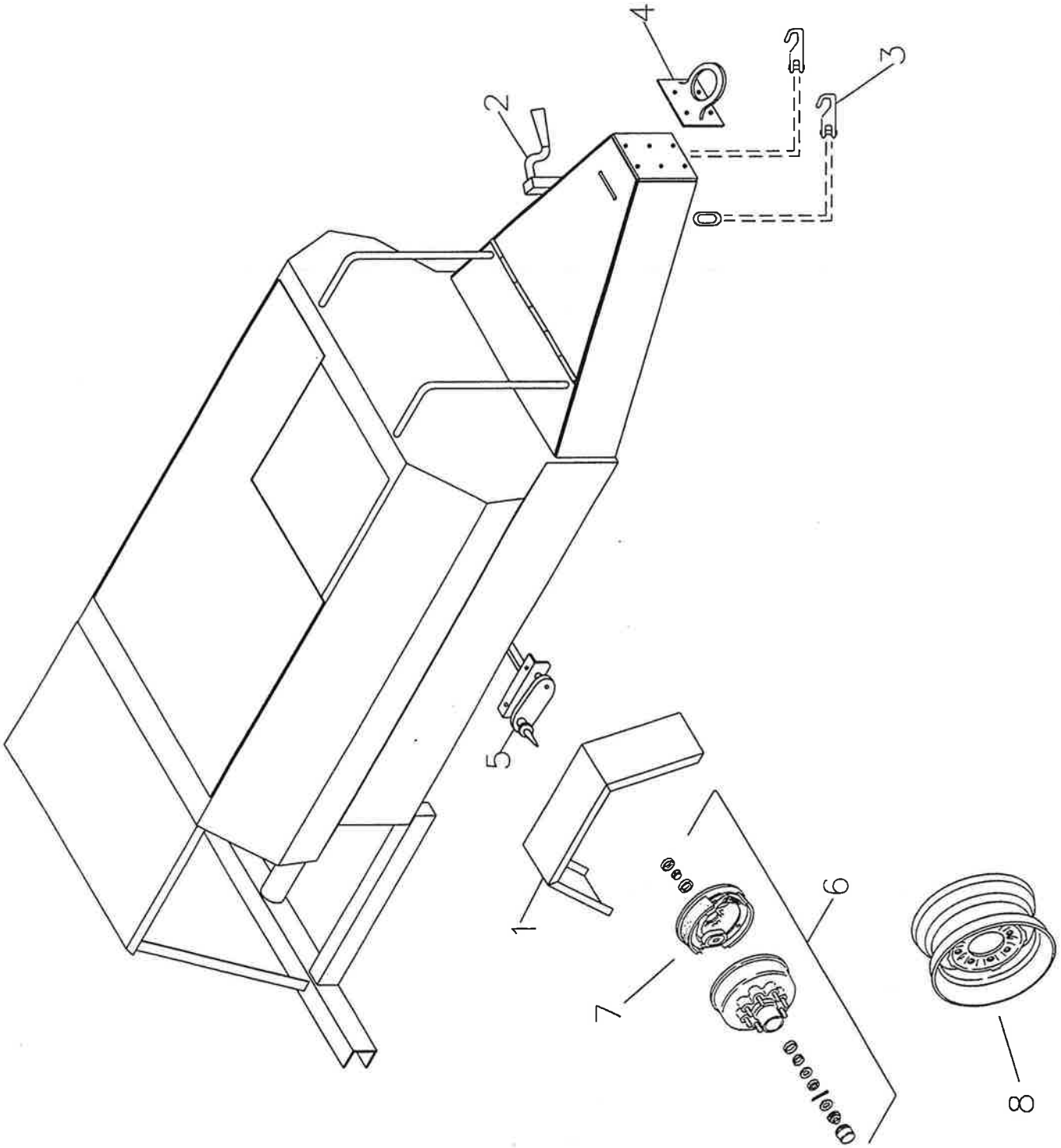
Ref. No.	Part Number	Description	No. Req'd
1	080482	Hydraulic Motor	1
2	080507-01	Torque Arrestor Plate	1
3	080523	Rigid Coupling Assembly	1
4	005088	Bearing Assembly (See pages 40-41 for parts)	2
	080591-01	Agitator Coupling Guard	1
	080583	Rubber Torque Arrestor Pad	1
	080582	Worm Gear Clamp	2
5	080642	Hydraulic Pump	1
6	080647	Coupling Half 5/8" Bore	1
7	085023	Coupling Half 1" Bore	1
8	080324	Coupling Insert	1
9	080507-02	Hydraulic Pump Mounting Plate	1
10	080590-02	Hydraulic Pump Mounting Plate Angle	1



HATCH ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
1	080564	Hatch Liner	1
2	080565	Hatch Lid	1
3	080565-02	Hatch Lid Hinge	2
	005433	Soft Latch	1
	002909	Handle	1
	005565	Hatch Lid Lanyard	1

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

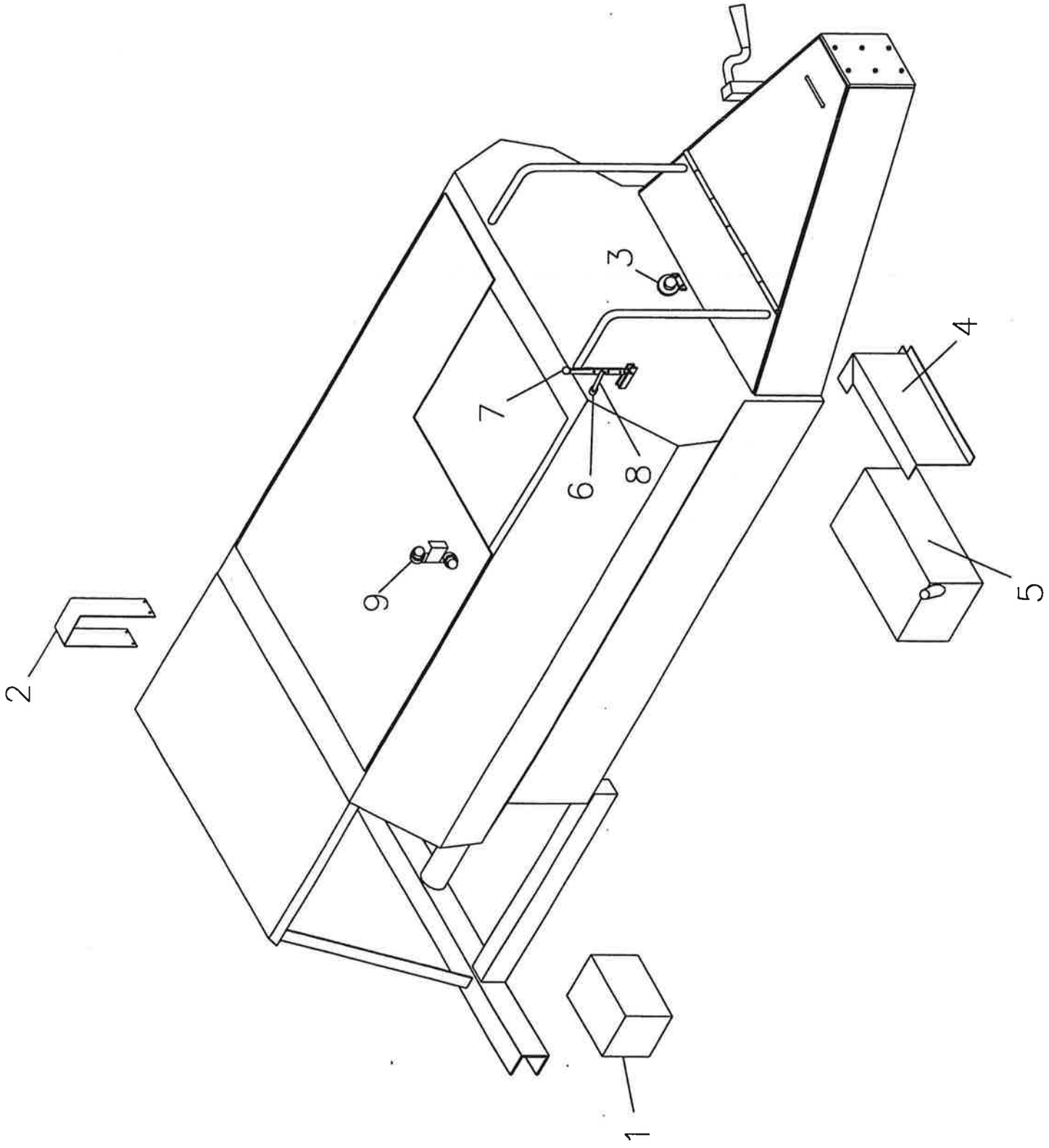


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

TRAILER ASSEMBLY PARTS

Ref. No.	Part Number	Description	No. Req'd
1	080519	Fender	2
2	005438	7000# Trailer Jack	1
3	190033	Safety Chain (3' lengths)	2
	023485	Grab Hook	2
	080591-03	Safety Chain Rod	1
4	080043	Tow Ring	1
	005134	Ball Coupler	1
	005135	Ball	1
5	080328	Axle with Spindle, Hub Drum, Brakes	1
6	100232	Hub and Drum Assembly	1
	WL10-1	Grease Seal	1 per
	WL25580	Inner Bearing	1 per
	WL25520	Inner Cup	1 per
	WL14276	Outer Cup	1 per
	WL14125A	Outer Bearing	1 per
	WL605	Grease Cap	1 per
	WL6-80	Wheel Nut	8 per
	WL7-122	Stud	8 per
	WL15-57	Washer	1 per
	WL6-1	Nut	1 per
7	WL23-180	Left Brake Assembly	1
	WL23-181	Right Brake Assembly	1
8	005057	Wheel	2
	005060	Tire (Not Shown)	2
	004644	Valve Stem	2

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

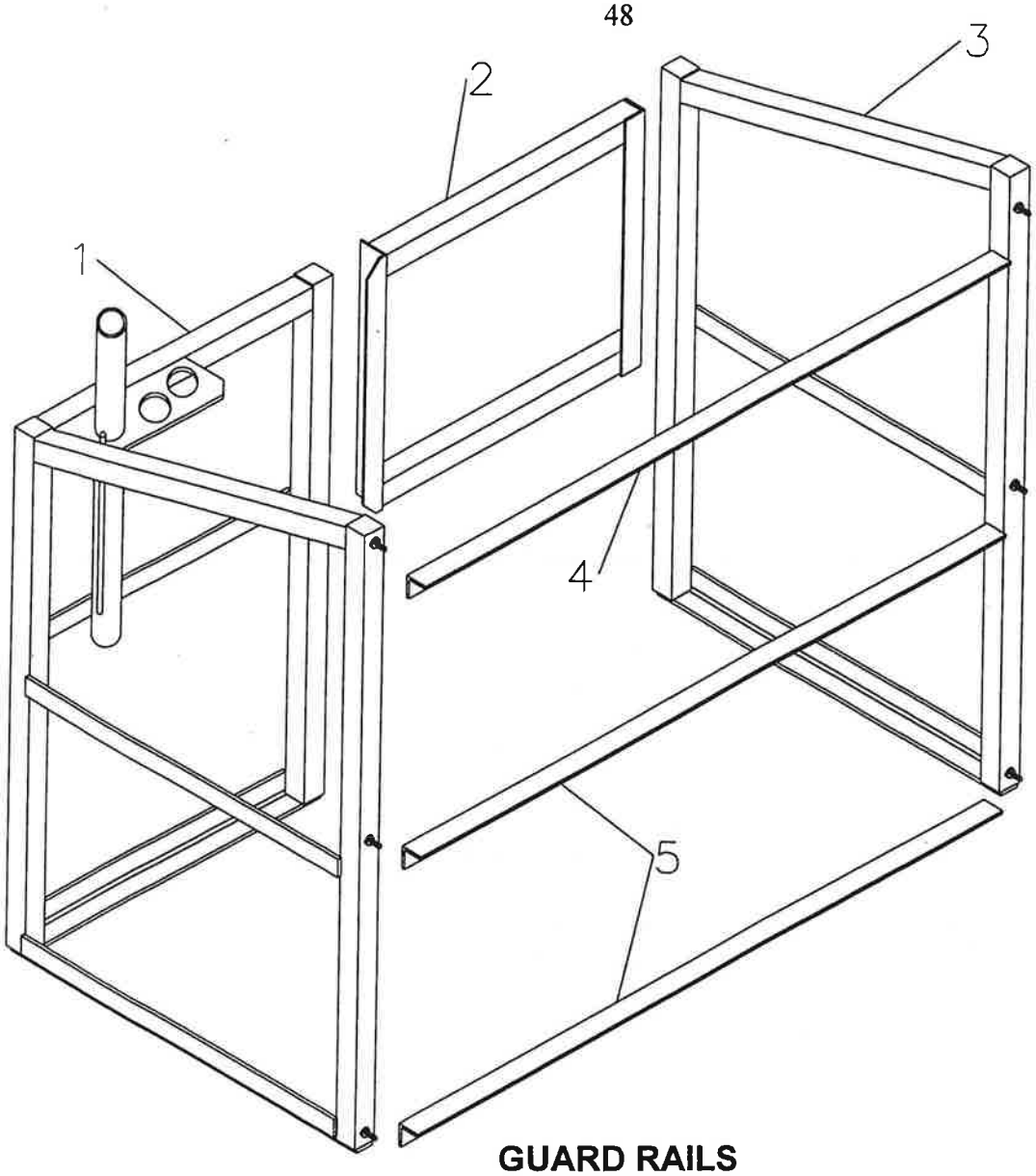


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

COMMON LOOSE PARTS & ENGINE

Ref. No.	Part Number	Description	No. Req'd
1	080524	Battery	1
	080223	Battery Case	1
	005559-03	Battery Holddown Strap	1
	000241	Ground Strap	1
	008171	Positive Battery Cable	1
2	080516-03	Coupling Guard	1
3	005399	Toe Guard	1
4	080513-01	Fuel Tank Guard	1
5	080570-01	Fuel Tank	1
	080629	Fuel Gauge	1
	080628	Breather Vent	1
6	080218	Agitator Control Rod Conduit	1
	005178	O-Ring	1
7	008475	Handle	1
8	080589-02	Agitator Control Rod	1
	022801	Clevis	1
9	080637	Fill Port Assembly	1
	080483	Engine	1
	080566	Throttle Cable	1
	080567	Choke Cable	1
	KL2406818	Muffler (Trailer Unit)	
	KL2406817	Muffler (Skid Unit)	
	KL2404149	Exhaust Gasket	
	KL1205001	Oil Filter	
	KL2488303-S1	Air Filter	
	KL2505002	In Line Fuel Filter	

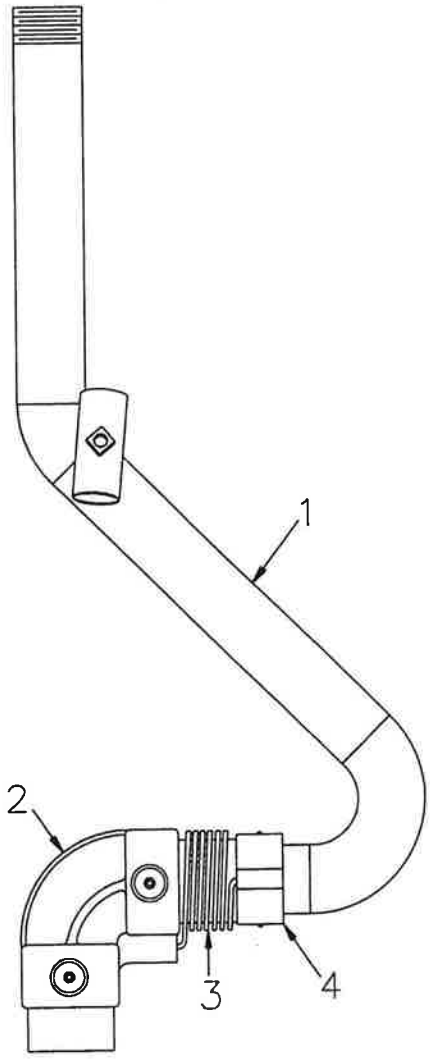
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



GUARD RAILS

Ref. No.	Part Number	Description	No. Req'd
1	080538	Right Guard Rail	1
2	080539-01	Gate	1
	080521	Gate Spring Hinge	1
3	080537	Left Guard Rail	1
4	080536-18	Top Cross Rail	1
5	080536-13	Cross Rail	2
	080543	Ladder	1
	005613	Square Tubing Plug	5
	007913	Rubber Strap	1

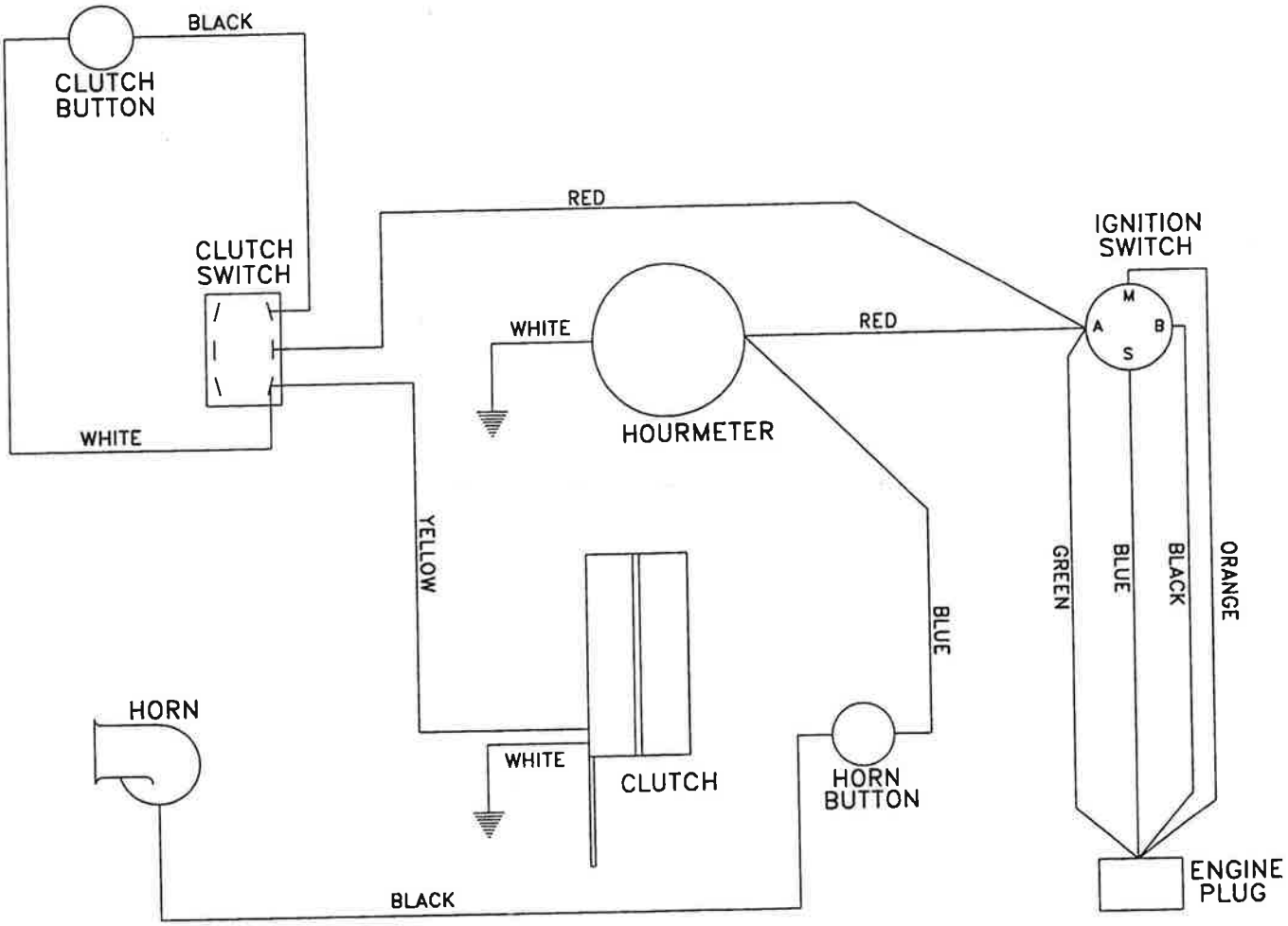
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



DISCHARGE BOOM

Ref. No.	Part Number	Description	No. Req'd
	080561	Discharge Boom Assembly Consisting of:	
1	080560-01	Boom Weldment	1
2	003207	1-1/2" Swivel Joint	1
3	003299	Discharge Balance Spring	1
4	080560-02	Adjusting Collar	1
	080559-01	Boom Handle	1
	080377	1-1/2" Part D Coupler	1
	006515	Gasket	1
	003355	Swivel Repair Kit	1

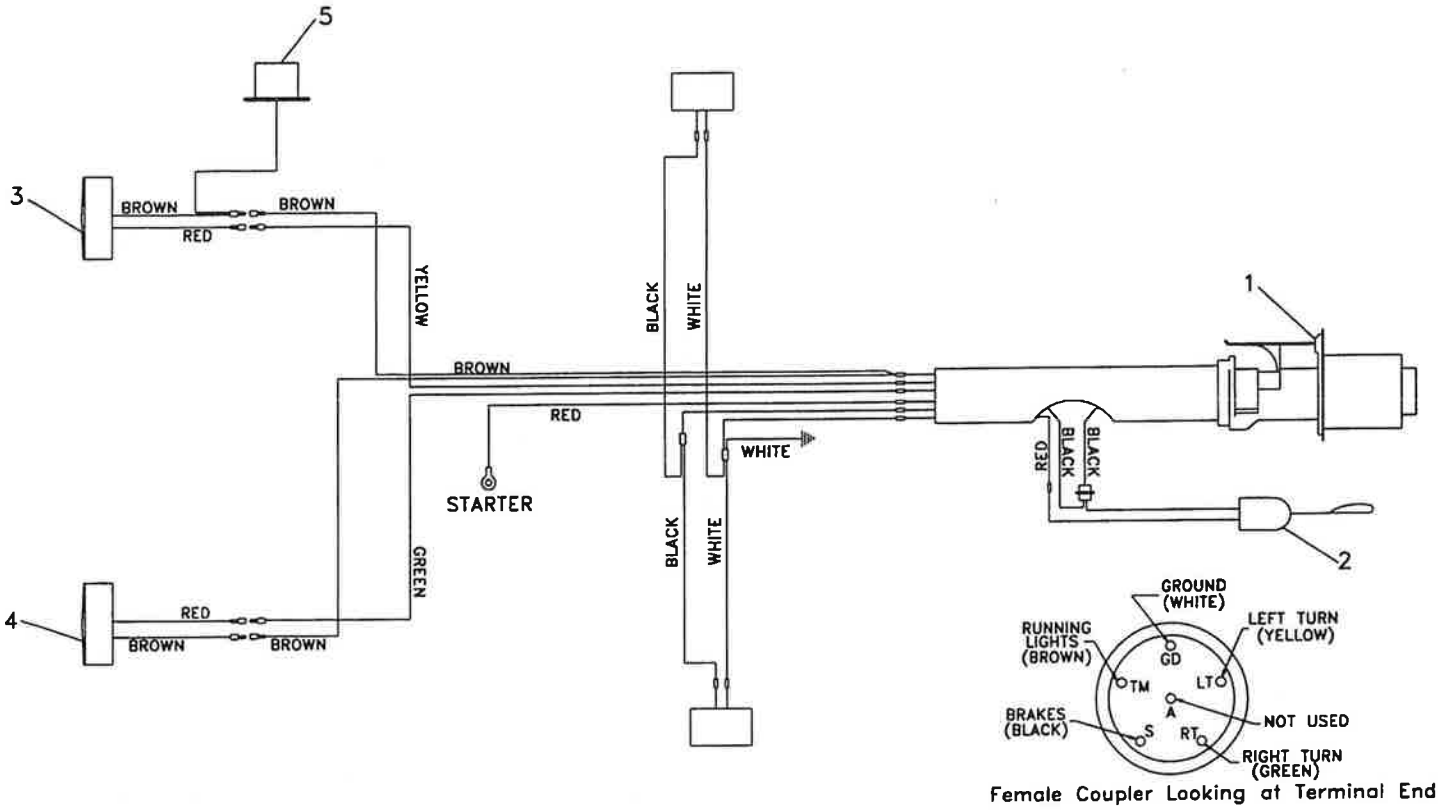
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



CONTROL PANEL WIRING

Part Number	Description	No. Req'd
	See Dwg 806 07/08	
007274	Hour Meter	1
[illegible]080654-4	Ignition Switch	1
020886	Horn Button	1
006499	Horn	1
020886	Clutch Button	1
080525	Clutch Toggle Switch	1
080526	Clutch Toggle Switch Dust Boot	1
080484	Electric Clutch	1
080654-K	Key for ignition switch	
080607-01	Control Panel Wiring Harness	

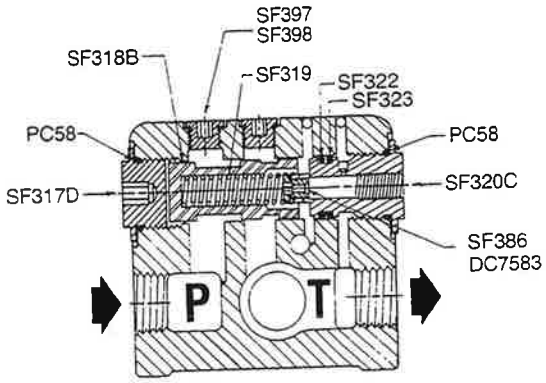
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

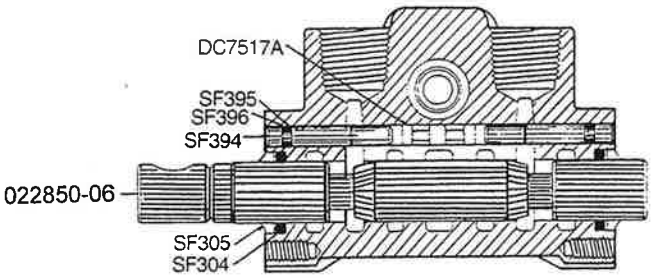


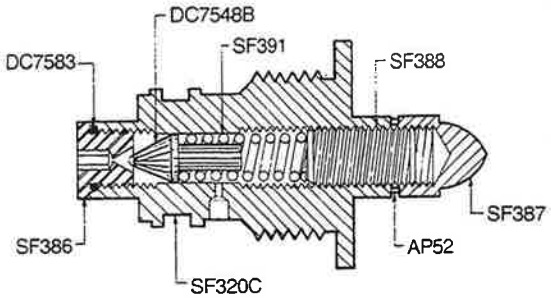
TRAILER WIRING

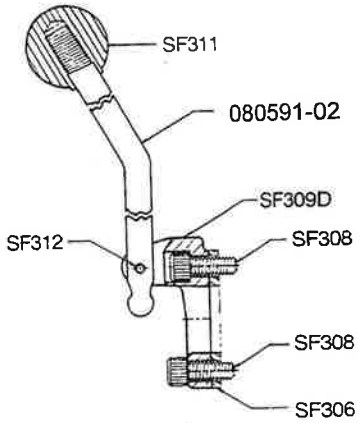
Ref. No.	Part Number	Description	No. Req'd
1	060069	Trailer Plug	1
2	023424	Breakaway Switch	1
	030934-01	Chain	1
	005016	"S" Hook	2
	005017	Snap	1
3	005137	Taillight- Left Hand Side	1
4	005138	Taillight-Right Hand Side	1
5	005436	License Light	1
	004720	License Light Bracket	1
	080609	Trailer Wiring Harness	1

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

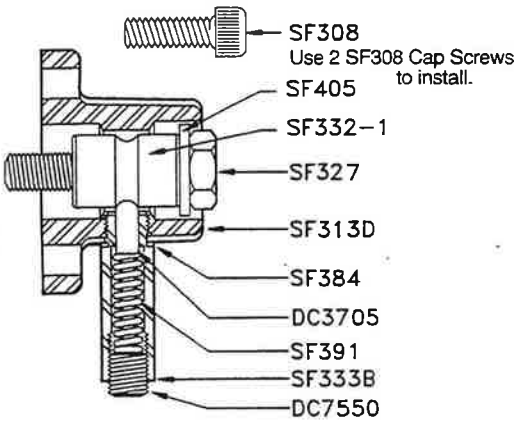








BRAND
Flow Control Valve
SCDF Series



All parts marked with a "●" make up Seal Kit, Part Number 023120

AP52	Washer	SF312	Roll Pin 1/8" x 1-3/8"	SF333B	Detent Housing
DC3705	Detent Plunger			SF384	Washer
DC7517A	Shuttle Spool	SF313-D	Detent End Cap	SF386	Seat
DC7548B	Poppet	SF317D	Plug	SF387	Acorn Nut
DC7550	Set Screw	SF3181B	Metering Spool	SF388	Set Screw
●DC7583	O-Ring	SF319	Metering Spring	SF391	Spring
●PC58	O-Ring	SF320C	Cartridge	SF394	Shuttle Stop
●SF304	Seal	●SF322	O-Ring	●SF395	O-Ring
SF305	Wiper	●SF323	Back Up	●SF396	Back Up
SF306	Seal Retainer	SF327	Cap Screw 5/16-18 x 1-1/2"	SF397	Plug
SF308	Cap Screw 1/4-20 x 3/4"	SF332-1	Friction Positioning Sleeve	●SF398	O-Ring
				SF405	Washer
023470	Handle Bracket			022850-06	Spool
SF311	Knob			080591-02	Handle

TOOL KIT

Part Number	Description	No. Req'd
000698	Automatic Pressure Lubricator Grease, 1# Tub	1
005220	Impeller Wrench	1
080273	Long Distance Nozzle Assembly	1
080131	Long Distance Nozzle	1
080260	Nyglass Adapter	1
160749	Reducer Bushing	1
080395	Narrow Ribbon Nozzle Assembly	1
006605	Wide Ribbon Nozzle	1
080260	Nyglass Adapter	1
160750	Reducer Bushing	1
080394	Wide Ribbon Nozzle Assembly	1
004805	Narrow Ribbon Nozzle	1
080260	Nyglass Adapter	1
160750	Reducer Bushing	1
080626	Drain Plug	1
006515	Coupler Gasket	1
FW71883	Touch Up Paint	1
080535	Remote Valve Assembly	1
012083	Full Port Ball Valve	1
080260	Nyglass Adapter	1
080261	Nyglass Coupler	1
160307	Close Nipple	1
	Engine Parts Manual	1
	HydroSeeder® Operator's Manual	1
	HydroSeeder® Parts Manual	1

SEAL REPAIR KITS

Part Number	Description	No. Req'd
023120	Seal Kit for Hydraulic Valve #022850	
080615	Seal Kit for Hydraulic Motor #080482	
080616	Seal Kit for Hydraulic Pump #080481	

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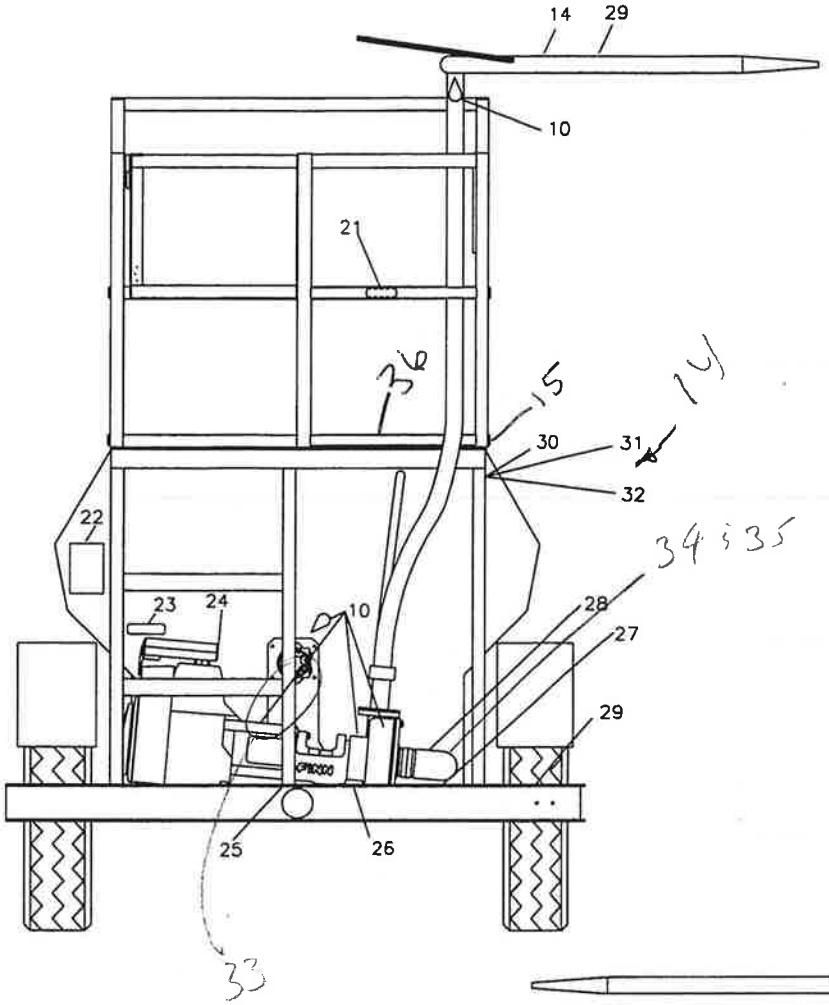
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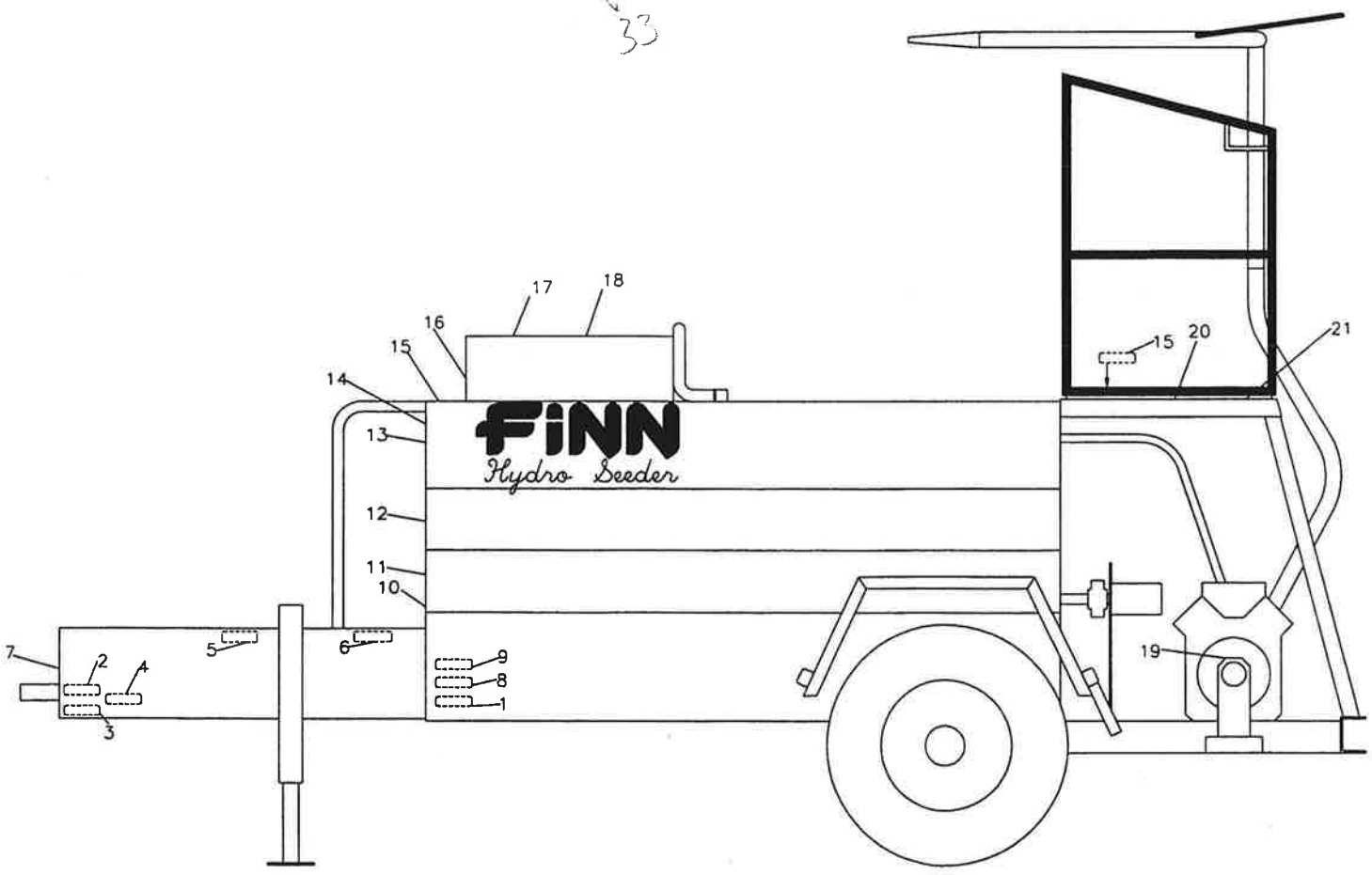
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Hydro Seeder
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DECALS

Ref. No.	Part Number	Description	No. Req'd
1	011690	FINN Name Plate	1
1A	023174	"FINN" Decal	2
1B	011595	"HydroSeeder" Decal	2
2	031227	Decal "ALWAYS INSPECT HITCH"	1
3	031228	Decal "SAFETY CHAIN"	1
4	023423	Decal "BREAKAWAY SWITCH"	1
5	080107	Decal "ALWAYS USE STEP"	1
6	031331	Decal "GASOLINE"	1
7	005022	Decal "USE 2-5/16" BALL ONLY"	1
8	020976	Decal "PATENT INFRINGEMENT"	1
9	011662	Decal "PATENT NUMBERS"	1
10	007230	Decal "SERVICE DAILY"	4
11	005184	Decal "250 GALLONS"	1
12	005185	Decal "400 GALLONS"	1
13	005186	Decal "500 GALLONS"	1
14	023519	Decal "CAUTION! WEAR EYE PROTECTION"	2
15	008286	Decal "AGITATOR SPEED"	3
16	020970	Decal "CAUTION! DO NOT RIDE"	1
17	012041	Decal "HYDROSEEDER OPERATION"	1
18	008097	Decal "DANGER! DO NOT ENTER TANK"	1
19	012179	Decal "WARNING! DO NOT RUN WITHOUT GUARDS"	1
20	006870-HORN	Decal "HORN"	1
21	007535	Decal "THROTTLE"	1
22	021665	Decal "HYDRAULIC INSTRUCTIONS"	1
23	012272	Decal "HYDRAULIC FLUID ONLY"	1
24	012278	Decal "DANGER! HOT EXHAUST"	1
25	012260	Maintain Safety Decal Plate	1
26	006869	Decal "PRESSURE LUBRICATOR"	1
27	022357	Decal "WARNING! TURN OFF ENGINE"	1
28	012180	Decal "TO AVOID DAMAGE TO SUCTION COVER"	1
29	011567	Decal "DANGER! DO NOT AIM STREAM"	2
30	080540	Decal "CLUTCH OPERATION"	1
31	KL2411303	Decal "IGNITION SWITCH"	1
32	KL2511317	Decal "STOPPING INSTRUCTIONS"	1
33	007231	" "Summer Warning"	2
34	005216	" "Pressure Valve"	1
35	008209	" "Danger - Chain Pins"	1
36	004661	" " "Clutch"	1

Must order:

080699 Safety Decal Kit

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