

FINN

CORPORATION



OPERATOR'S MANUAL

MODEL NO. RS SERIAL NO. _____

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.



This symbol is used throughout this manual to call attention to safe procedures.
- Pay Attention -

Finn Corporation

INDEX

GENERAL - TOW VEHICLE - STACKING THE MULCH	1
POSITIONING THE FEED CHUTE	2
STARTING PROCEDURE	2-3
CREW MEMBER DUTIES	3
FEEDING AND DISTRIBUTING THE MULCH	3-5
HYDRAULIC SYSTEM	6
ADHESIVE SYSTEM	7-9
CLEAN-UP AND MAINTENANCE	9-10
ATTACHMENTS	10-11
AXLE AND WHEEL BEARINGS	12-13
ALTERNATOR AND REGULATOR	14-15
CLUTCH CARE AND OPERATION	16-20

OPERATION AND MAINTENANCE
OF THE
FINN B260 MULCH SPREADER

DEFINITION OF MULCHING: Mulching is the process whereby a vegetative mulch such as hay or straw, sometimes excelsior or other wood product or any other vegetative material is spread on previously seeded areas to promote germination, while providing for temporary erosion control.

THE FINN B260 MULCH SPREADER AND ITS FUNCTION: The Finn Mulch Spreader will apply any vegetative mulch at a fast and uniform rate (with the specified amount of adhesive material, if so desired) utilizing a minimum amount of manpower.

This manual is designed for step by step instructions of the operation, care and maintenance of the B260 Mulch Spreader and in addition, it contains illustrations.

HOW THE MULCH SPREADER WORKS: The baled vegetative mulch material, when placed on the feed chute is being moved to the shredder housing by the variable speed power feed system. In the shredder housing a combination of beater chains and air currents separate the mulch into individual fibers, which are drawn into the blower housing and blown through the discharge assembly onto the seedbed.

IMPORTANT: For best results and to insure long life of the equipment please follow the operation instructions carefully.

TOWING TRUCK

The truck used to tow the Finn Mulch Spreader should have a bed large enough to carry the quantity of mulch needed for economical operation. If the Mulch Spreader is going to be used on rough hilly terrain, a truck with a two speed axle is suggested. This will provide the necessary slow speed required for careful, uniform application. The truck must be equipped with a ball or pintle hitch with a large enough rating to tow the Mulch Spreader. There must be provisions for the safety chains to be attached. The hitch should be mounted as near the end of the truck bed as possible.

STACKING THE BALES ON THE TRUCK

Load the bales of mulch on the truck bed with binder twine or wire on top rather than on the side. This makes it easier to grab the bales while the Mulch Spreader is in operation.

Place the first layers of bales "lengthwise" on the truck. The second layer of bales should be placed "crosswise". Then, alternate successive layers lengthwise and crosswise so that the load is secure.

Leave enough room (at least the width of one bale) at the rear so the truck bed where the bale handlers have to work.

POSITIONING THE FEED CHUTE EXTENSION

The feed chute extension should extend at least 18 inches (45 cm) over the rear edge of the truck bed. Achieve this as follows:

1. Unhook the discharge spout holddown, and fold it down to the horizontal position.
2. Swing the discharge tube to side.
3. Swing the feed chute extension down to the feed position. If the extension is short of the edge of truck bed, move it to the rear set of mounting holes.
4. The feed chute should then be adjusted so that it is 6 to 12 inches (15 to 30 cm) higher than the bed of the truck.
5. Be sure that when turning the truck, the truckbed will not come in contact with the power feed mechanism.

BEFORE STARTING THE ENGINE

Pre-start check-to insure operator safety:

1. Check the bolts on the hitch and safety chains, the brakes, and the trailer lights.
2. With ignition "on", check the amber safety light.
3. Check the signal horn.

Pre-start check-equipment

1. Tool kit - see that it contains all prescribed items (see tool kit list in parts manual).
2. Lubricate equipment - use handgun only (see lube chart in parts manual).
3. Check engine oil and fuel. Refer to the engine manual for proper oil and fuel. Also, check hydraulic oil level (see hydraulic system for oil spec.).
4. Inspect air cleaner for dust and dirt and clean if necessary.
 - A. Knock the loose particles from element.
 - B. Wash with water and detergent.
 - C. Rinse and allow to dry...Do not force dry, do not use compressed air or heat.
5. Check belts for proper tightness. Belts are in proper adjustment when 8 pounds (3.6 kg) pressure in the center of the belt produces 3/8" (1 cm) depression.
6. Engage and disengage clutch to determine if it "snaps" in and out of gear.
7. When not using an adhesive, remove the belts which drive the asphalt pump (running the pump dry will permanently damage it).
8. Check radiator liquid level (protected to -34 deg. F. (-37 deg. C) when shipped).
9. Check shredder box for foreign objects which could damage the equipment or injure workers.

STARTING THE ENGINE

1. Disengage the clutch, power feed handle in "off" position.
2. Turn ignition switch to "on" position. The magnetic safety switch button on the panel should pop out.
3. Engage starter to turn over engine. At the same time, depress and hold the magnetic switch button. After engine has run for 10 seconds the magnetic switch should stay engaged when you remove your thumb from the button. Low oil pressure or high water temperature will disengage this switch and shut off the engine. The voltmeter indicates whether the alternator is charging or not. Allow the engine to warm up at fast idle for 3 to 5 minutes.
4. With the engine still idling, engage the clutch slowly. Move the throttle to wide open position and let the governor control the engine speed. Governed speed of the engine on the Finn Mulch Spreader should be 2550 to 2600 RPM under load.



CAUTION: Before engaging the clutch, be certain that the discharge tube is under control and is pointed in the proper direction.

IMPORTANT: AFTER FOUR (4) HOURS OF OPERATION, THE "V" BELTS AND ENGINE CLUTCH SHOULD BE RETIGHTENED.

CREW MEMBERS AND THEIR DUTIES

1. The Operator controls the placement of the mulch on the seedbed by moving the discharge assembly. He also controls the movement of the towing truck along the seedbed by using a predetermined set of signals with the signal horn.
2. The Bale Handlers operate from the truckbed and supply the power feed assembly with bales of mulch material; they cut and dispose of the bale twine or wire, and keep the power feed chute full of material with no gaps so that there will be no interruption in distribution of the mulch to the seedbed.
3. The Truck Driver follows the directions of the crew chief for the movement of the towing truck. The truck driver should be cautious in starting or stopping the truck so that the crew members are not thrown off balance.

FEEDING THE MULCH

The power feed assembly of the Finn Mulch Spreader has been designed to give fast, uniform, mechanical feeding. The adjustable feeding rate allows the use of varied materials and at the same time obtain maximum production.

The power feed assembly, by means of a power feed chain, feeds the mulch material at an adjustable rate to the separator roll which drops the bats into the shredder housing.

The power feed assembly is driven by a hydraulic motor mounted on the top side of the power feed chute and is controlled by the operator at the discharge control station. The power feed control is a lever which, when it is pulled back from center position, makes the power feed chain run away from and when pushed forward from center position causes the power feed chain to move toward the shredder housing. Either forward or rearward, the further the lever is moved, the faster the chain travels. Once a speed has been selected, centering the lever stops the chain and returning the lever to the same position gives the same speed. Through the use of the power feed control lever, the operator can momentarily stop the feeding cycle when wet bales are encountered or when it is necessary to stop application because of driveways, bridge abutments, etc. The operator can slow down or speed up the rate of feed depending on the type of material that is being encountered bale by bale.

To start the power feed, push the control lever slowly until the desired speed is reached. It is necessary that the bale handlers keep the power feed chute completely full at all times to get the maximum production rate of the Finn Mulch Spreader.

The operator should have a full stream of mulch coming at all times, directing the material to the area to be mulched. He has complete control of the power feed mechanism by the use of the control lever and can vary his rate of feed instantaneously to fit all conditions. If the bale handlers are unable to keep the feed chute full, the operator should slow the feed down slightly until the bale handlers can keep up. This gives a more uniform application. If the feed rate is not fast enough for the good bright straw, and the control handle is full forward, move the handle to the right and then forward into the high speed forward slot.

It is suggested that after every truck load of mulch, the power feed tray is emptied to allow the operator to remove any wire or twine from around the feeder roll.

At no time should the rate of feed be set beyond the capacity of the machine (because of poor quality of the mulch material being used) as overloading the machine will occur, thus causing extensive wear and maintenance problems.

DISTRIBUTING THE MULCH

The Mulch Spreader should be towed to a point approximately 60 feet (18 m) from the area where the mulch is to be applied. The operator elevates the discharge spout about 10 degrees above the plain of the seedbed so that the mulch floats onto the seedbed.

Do not drive the mulch into the seedbed with air pressure. The higher the tube is held, the more uniform the application will be.

A full circle horizontal travel of the discharge spout allows the operator to vary the direction of the discharge spout according to the prevailing winds. The tube should never be directed into the wind, towards any person, or at the towing vehicle.

SMOOTHING OUT MULCH PATTERNS

The lower roll assembly in the shredder housing which is driven by the blower power band, is equipped with mounting points for 8 beater chains and 6 fingers. For normal straw application 4 or 6 chains are all that are needed. If you have material coming out in lumps or find it impossible to handle because the mulch material is wet or hard, install extra chains in pairs until the smoothness of mulch application is reached.



CAUTION: Be sure beater chains are mounted opposite each other at all times to avoid throwing the blower shaft out of balance.

If your equipment is still throwing mulch material out in lumps and does not have a good discharge pattern, then move the last beater hub closer to the blower housing, but leave it in the shredder box.

CLOGGING OF THE MULCH BLOWING SYSTEM

If during operation the machine gets plugged, simply shut off the power feed and if the machine does not clear up, disengage the clutch and let the machine coast to a stop; before turning off the engine the operator can reverse the power feed chain using the control lever to unload the power feed chute to facilitate cleaning of the machine.



DANGER: Do not reach into the beater box or attempt any adjustment until the engine and all rotating parts have stopped.

Four locations have been provided to help remove any obstructions:

1. The opening into the beater box into which the mulch material is fed.
2. The access door in the shredder housing.
3. The access door into the blower discharge transition.
4. The discharge tube itself.

When the obstruction has been removed and access doors closed, the motor can again be started and mulch application continued.

If consistent plugging occurs, it can be caused by one of several reasons:

1. The bale handlers do not feed the bales at a consistent rate and/or do not guide the bales properly onto the power feed mechanism after they remove the strings or wires, leaving gaps in the stream of bales or the bales lay flat on the tray.
2. The power bands are out of adjustment, causing them to slip.
3. Check that the necessary beater chains are installed.
4. Operator is feeding the mulch material too fast and overloading the shredder housing. The blower will only suck separated mulch fibers into the blower housing; this separation process takes longer with wet and hard material than with dry mulch material.

HYDRAULIC SYSTEM

The hydraulic system on your Finn Mulch Spreader consists of a pump, reservoir with suction strainer, oil filter, and power feed hydraulic motor with flow control valve set to operate at 2000 PSI (140 kg/cm²). The most important areas of maintenance are the hydraulic oil and the filtration. The reservoir holds 8 gallons of ISO Grade 46 Hydraulic Oil such as Mobil DTE25, Gulf 46AW, Shell-Tellus 46 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 #21618. The following checks will keep your Finn Mulch Spreader in proper operating condition:

1. Check oil level once a week, add additional oil when level goes down below 1-1/2" 94 cm).
2. Change filter on oil tank every 500 hours of operation.
3. Check and clean suction strainer once a year or whenever the oil is changed.
4. Change hydraulic oil whenever the color turns to milky white, (change is caused by water getting into hydraulic system) or if oil gives off a burnt odor.
5. Keep all fittings and hoses tight and leak free.
6. Keep system clean at all times.
7. **CAUTION: DO NOT START OR RUN ENGINE WITHOUT HYDRAULIC OIL IN RESERVOIR AS PERMANENT DAMAGE TO PUMP WILL OCCUR.**

TROUBLE SHOOTING THE HYDRAULIC SYSTEM

First - check the oil level in the reservoir. Add oil if necessary. All checks should be made with the engine running at least half throttle.

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
Power feed motor will not run in either direction	Plugged suction strainer	Clean strainer
	Suction line valve closed	Open valve
	Collapsed suction hose	Replace hose
	Worn pump	Repair or replace
Power feed chain runs unevenly	Loose chain	Adjust tension on chains
Power feed motor runs in reverse only	Flow control stuck or plugged	Repair or replace
	Flow control cable inoperative	Repair cable

ASPHALT EMULSION SYSTEM

The Finn Mulch Spreader could be equipped to spray asphalt emulsion adhesive on the mulch material as it leaves the end of the discharge spout. This adhesive effectively keeps the mulch in place on the seedbed. The asphalt emulsion system for the Finn Mulch Spreader consists of:

1. A suction pipe with strainer screen.
2. A pump which draws the adhesive from the portable supply tank being towed behind the Mulch Spreader, or the tank mounted on the truck bed, or a drum carried on the Mulch Spreader.
3. A valve to control the flow of adhesive.
4. Tubes which carry the adhesive to the end of discharge spout.
5. Injection nozzles for spraying adhesive on the mulch at the end of the discharge spout.
6. A relief valve, which has been pre-set at the factory.

Prepare the asphalt system for operation as follows:

1. Remove the 2" plug from the top of the adhesive tank and insert the suction assembly into the tank.
2. Install the drive belts on the adhesive pump.
3. Install the nozzles into the pipe elbows at the top end of the discharge tube. Install each nozzle so that its slot is parallel to the top of the discharge top and turned slightly downward toward the discharge tube outlet.
4. Start the engine and let it warm up at an idle speed. Then with the engine still idling, engage the clutch slowly.

Read the asphalt pressure gauge on the discharge spout. It should show at least 35 pounds (2.5 kg/cm^2). If the gauge shows no pressure, air is trapped in the line. Bleed the line by opening the bleed valve below the pressure relief valve. After bleeding the line, close the valve. You should then have a pressure reading on the gauge. Open the asphalt valve momentarily to check the spray pattern produced by the nozzles, be careful where the tube is aimed.

With the asphalt system ready for operation, move the throttle to wide open position, let the governor control the engine speed and you are now ready to commence operation.

When using adhesive, the operator keeps the valve handle in the "on" position, when mulch flow is temporarily interrupted, turn the adhesive handle to the "off" position; the asphalt droplets will drift quite far if there is not mulch to tack on to.

ADHESIVE NOZZLES

From the six sets select the nozzles which will deliver the gallonage required. Install the nozzles in the holders at the end of the discharge spout.

The faster you apply the mulch, the larger the nozzle you will need. Naturally, the larger the nozzle opening the more more adhesive it will spray.

The nozzles spray at the following rates:

<u>Nozzle No.</u>	<u>Gallons Per Minute*</u>	<u>Liters Per Minute</u>
1/4"-1506	1	4
1/4"-1520	2	8
1/4"-1540	4	15
1/4"-1560	7	27
3/8"-12	12	45
3/8"-15	15	57

*Note: This is the quantity delivered in one minute by each individual nozzles

SELECTION OF NOZZLES

Use the following formula to find out which nozzles to use to apply the proper amount of adhesive material:

$$\frac{\text{Tons per hour} \times \text{gallons (L) per ton required}}{60} = \text{Gallons (L) per minute for 2 nozzles}$$

Tons per hour is determined by the quality of the mulch material and the ability of the bale handlers on the truck.

The gallons (liters) per ton required is determined by the specifications for the particular job; normally this is around 100 gallons per ton (418 liters per metric ton).

ILLUSTRATION

Assuming you have two (2) able bodied men feeding the mulch to the Mulch Spreader; and the mulch is of average quality; so we assume you can blow 7 tons per hour. Assuming also your specifications read 120 gallons (500 liters) of adhesive per ton; then the formula looks as follows:

$$\frac{7 \text{ (tons per hour)} \times 120 \text{ (gallons per ton)}}{60 \text{ minutes}} = \frac{840}{60} = 14 \text{ GPM approx.}$$

$$\frac{6.3 \text{ (metric ton per hour)} \times 500 \text{ (liters per metric ton)}}{60 \text{ minutes}} = \frac{3150}{60} = 53 \text{ liters per minute}$$

Since you will use 2 nozzles, select 2 nozzles which are closest to each other in gallonage, in this case 2 nozzles of 7 gallons (27 liters) per minute (1560). For 27 gallons (102 liters) per minute one would select 1 nozzle of 15 gallons (57 liters) per minute (3/8"-15) and 1 nozzle of 12 gallons (45 liters) per minute (3/8"-12).

If during operation, the flow of asphalt stops, check the following items:

1. Tank - for quantity of adhesive.
2. Screen in the suction pipe (use exhaust of engine to clean).
3. Loose belt on pump.

CLEAN ADHESIVE SYSTEM IF WORK IS INTERRUPTED

Since asphalt emulsion sets when exposed to air, the lines and nozzles must be cleaned soon after mulching is stopped. For shut downs longer than 10 minutes and at the end of each day's operation, the following clean-up procedure should be used:

1. With the clutch disengaged and all moving parts stopped, insert the suction tube into a barrel of fuel oil or kerosene.



DANGER: DO NOT USE GASOLINE

2. Engage the clutch, open the throttle half-way and move the asphalt valve handle to discharge until a clear white fog appears at the end of the spout.
3. Close the valve and let the machine run for at least 30 seconds. this allows time for all supply lines and bypass system to be cleaned.
4. Disengage the clutch and shut-off the engine. Remove barrel suction assembly from the fuel oil barrel and insert it in the holder in the frame.
5. Remove pump drive belt. Pump will be permanently ruined if it is run without liquid being pumped.

DAILY CLEAN-UP AND MAINTENANCE

Follow this procedure daily to keep the equipment in good operation condition:

1. Remove asphalt emulsion strainer screen. Clean and reinstall (use exhaust of engine).
2. Check the air cleaner per clean by sight, if dirty empty the plastic cup.
3. Check the air cleaner on the engine by removing the element and checking the cleanliness of the element by using a light inserted inside. If the light cannot be seen, element is dirty. Wash it with clean water and detergent; do not use the pressure hose. If you cannot get it clean enough to see light, element should be replaced.

4. Wash crankcase breather cap in cleaning solvent.
5. Check crankcase oil level and add oil if necessary.
6. Check tension on the power band (3/8" (1 cm) depression at the center of the band) and adjust if necessary.
7. Clean the beater rolls, making sure to remove all twine, wire and other foreign objects.
8. Lock the discharge tube (using the holddown strap) into the carrying saddle.
9. Fill the fuel tank.
10. Fill your clean-out barrel with fuel oil or kerosene.
11. If the asphalt emulsion system has been used, the cleaning procedure previously described should be followed.
12. Check hitch bolts, safety chains, and brakes.

Be sure to seal your asphalt tank to prevent setting up of emulsion. Refill tank with adhesive. For longer storage, add a quart of oil to the filled tank. If asphalt supply tank is to be stored empty, it must be washed and cleaned inside and out.

WEEKLY MAINTENANCE

After each 40 hours of operation, follow this procedure:

1. Change engine oil, following the engine manufacturer's recommendations.
2. Change the engine oil filter cartridge with every other oil change.
3. Lubricate bearings with general purpose chassis lubricant, using a grease gun. Wipe each bearing before lubrication to remove dirt and prevent overheating.
4. Inflate tires to the proper pressure as specified on the tire.
5. Check clutch adjustment. If clutch does not smartly snap in or snap out, clutch needs adjustment. Refer to your engine manual for instructions.



CAUTION: Adjust clutch only while engine is shut down.

ATTACHMENTS

HAND HELD ASPHALT SPRAY BAR

The asphalt spray bar is used to spray asphalt emulsion independently of the built-in system. The 50' (15 m) hose connects to the asphalt system by a quick coupling which is plugged in at the side of the blower housing opposite the relief valve. The rate of asphalt discharge is controlled by the size nozzles inserted in the hand held spray bar. Clean the accessory spray bar and hose by connecting to the asphalt system while the system is being flushed with clean out liquid.

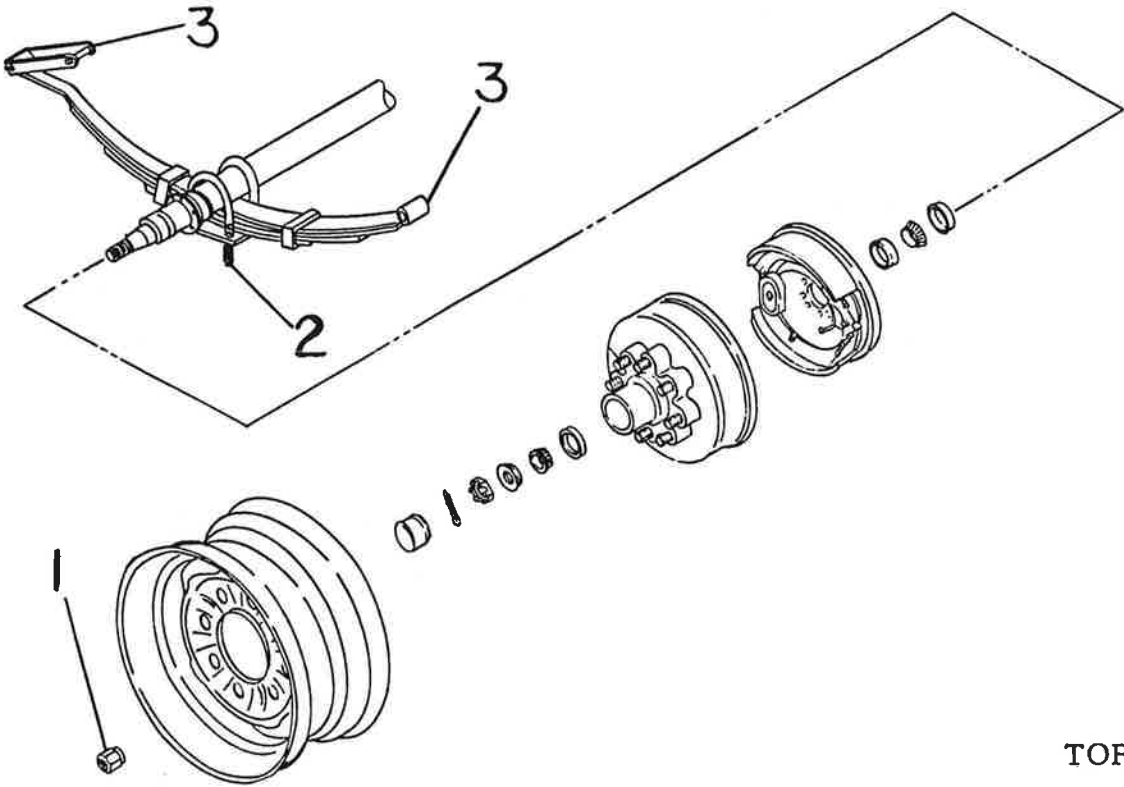
50' EXTENSION FOR DISCHARGE SPOUT (15 m)

The collapsible tube, when secured to the spout of the adapter provided, will extend the length of the discharge spout 50' (15 m). When this tube is attached, mulch material must be pushed farther before discharge. Thus, it is important to keep the air pressure as high as possible. This can be done by feeding not more than two (2) bales per minute of good bright material, less if the material being used is of poor quality. KEEP THE TUBE AS STRAIGHT AS POSSIBLE. DO NOT FEED MULCH UNTIL TUBE IS FILLED WITH AIR.

Asphalt hoses for the discharge spout extension are connected to the manifold at the side of the blower housing using a quick connect coupling. The valve on the extension is used the same way as the main valve on your Finn Mulch Spreader.

Since less mulch is being fed into the machine, less asphalt is required and smaller asphalt spray nozzles are used when the spout extension is in place. Clean the hoses and nozzles by the same technique as used with the hand held asphalt spray bar.

TORQUE REQUIREMENTS



		TORQUE FT. -LB.	
		MIN.	MAX
1.	All 1/2" & 9/16" Bolts & Nuts for Wheel Mounting	85	95
2.	1/2"-20 Nut for 1/2" U-Bolt	40	60
3.	9/16"-18 Locknut for Shackle Bolt (6 places per axle)	snug fit	

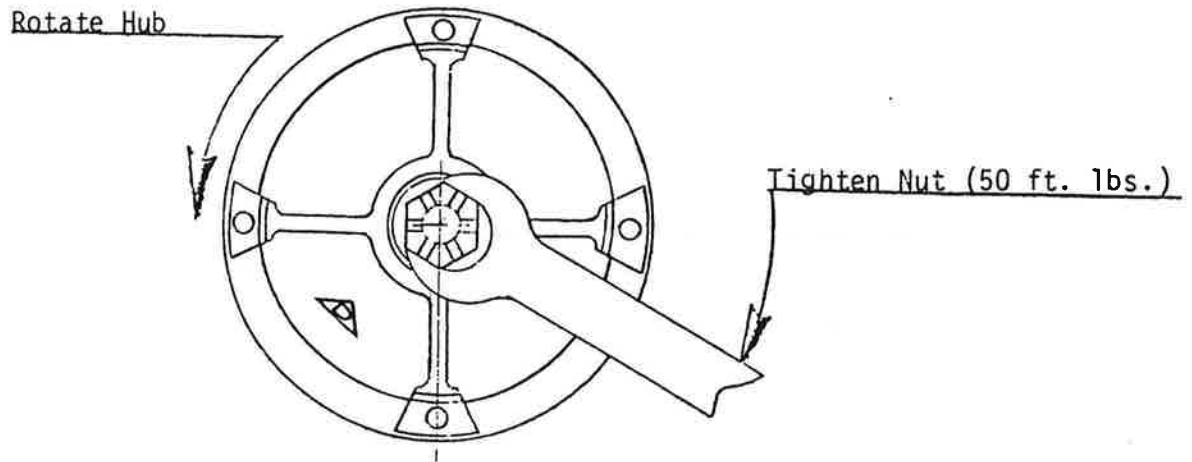
PHILIPS INDUSTRIES INC.

ELKHART, INDIANA

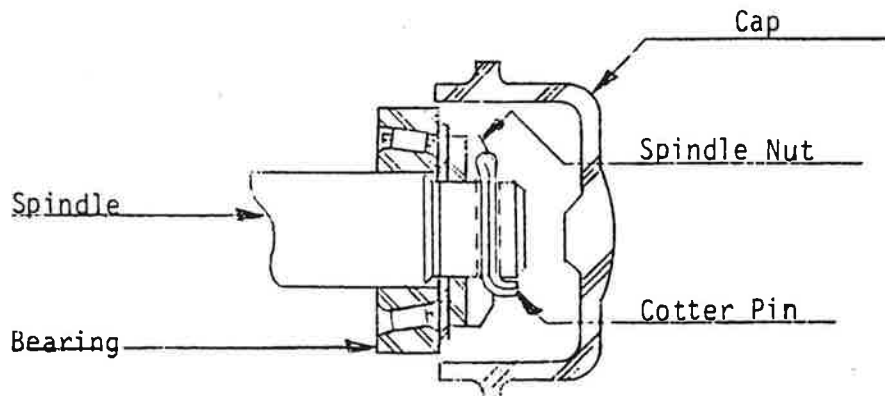
ENGINEERING SPECIFICATION #10

The correct adjustment for all bearings is .001 to .012 end play.

1. Tighten spindle nut to 50 ft.lbs. while rotating hub to seat the bearings.



2. Loosen the nut to remove pre-load torque. Do not rotate hub.
3. Finger tighten nut and place cotter pin in the first nut castellation which lines up with cotter pin hole in the spindle. Bend cotter pin legs to clear grease or oil caps.



4. Nut should be free to move with the only restraint being the cotter pin.



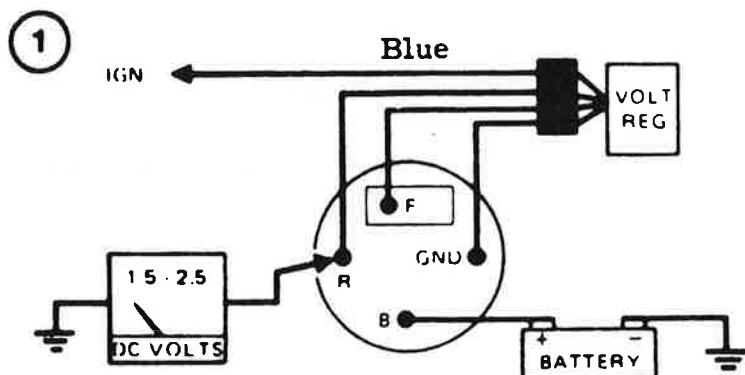
MOTOROLA DIAGNOSIS DIAGRAMS

The following tests are made with the alternator in the vehicle with output and regulator connections maintained to the alternator except as noted in Steps 3 and 5. The field lead and voltage regulator are disconnected for these tests.

Test Precautions:

- DO NOT disconnect alternator output lead while alternator is operating.
- DO NOT disconnect voltage regulator while alternator is operating.
- DO NOT ground field terminal.
- Check battery condition. Use a fully charged battery when testing alternator.
- Disconnect ground cable of battery when removing and installing the alternator.

• READINGS INDICATED ARE FOR CORRECT OPERATION.

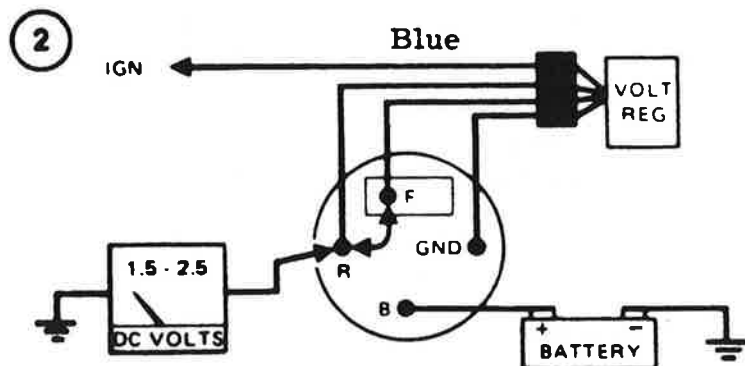


IGNITION ON — ENGINE NOT RUNNING

Correct voltage at regulator terminal is approximately 1.5 to 2.5 V. This test evaluates excitation circuit. If voltage at regulator terminal is:

- 5.0 to 7.0 volts - open rotor (field) circuit
- 7.5 to 1.1 volts - grounded rotor circuit
- 8.5 to 10.0 volts - open in regulator's load circuit
- 0 volts - open ignition switch or excitation resistor

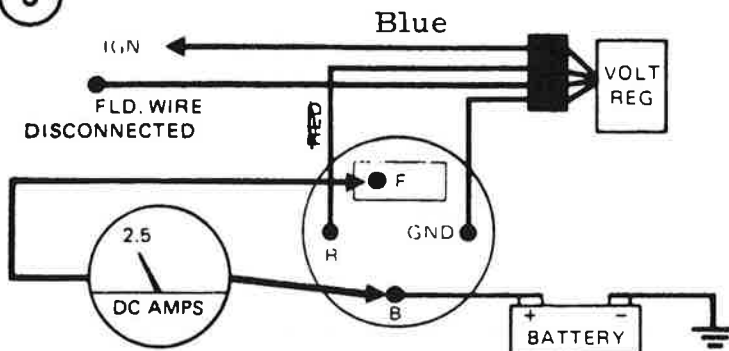
If test results are uncertain, make Test 2.



IGNITION ON — ENGINE NOT RUNNING

The voltage regulator may be bypassed with a short jumper between the regulator and field terminals. If jumper provides approximate correct voltage, fault is in the regulator. No change from high voltage indicates that the defect is in the brush or rotor circuit.

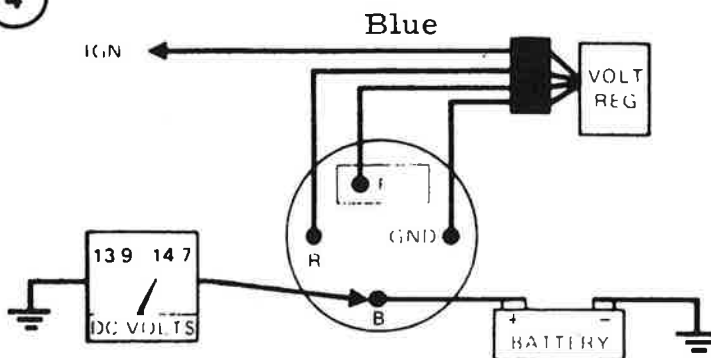
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FIELD DRAW TEST IGNITION OFF

This test evaluates complete field circuit, independent of voltage regulator. Circuit is through brushes, slip rings, field coil to ground. Current should be 2 to 2.5 amps. If less than this, check brushes and slip rings. It is desirable to use a field rheostat in series with meter for protection of the meter. If field is shorted, excessive current would flow through meter and possible damage would result.

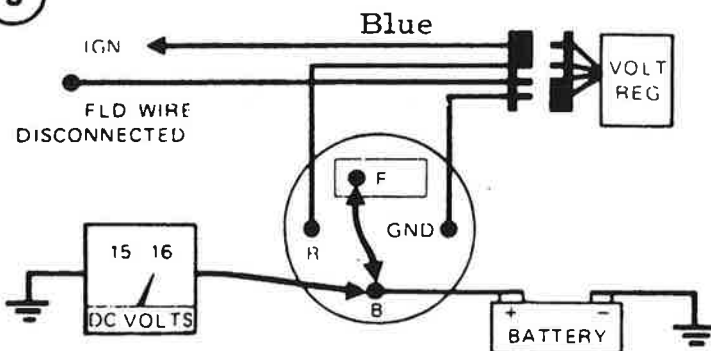
4



IGNITION ON — ENGINE RUNNING AT FAST IDLE

Voltage indicated is usually 13.9 to 14.7 volts depending on regulator ambient temperature. High voltage may be due to a poor ground connection. If ground connection is not faulty, regulator will require replacement.

5



FIELD TERM DISCONNECTED VOLT. REG. PLUG DISCONNECTED BAT. TERM. SHORTED TO FLD. TERM. IGNITION ON — ENGINE RUNNING AT IDLE

This test isolates defect to either the alternator or regulator. If voltage at auxiliary terminal rises to 15-16 volts now, when it did not in test 4 with regulator connected, then defect is in regulator and it should be replaced. If voltage does not rise at auxiliary terminal, defect is in alternator stator or rectifier diodes, if field circuit checked out properly. For defects in stator or diodes, remove alternator.

ROCKFORD POWER TAKE-OFF

The following brief instructions are a simple outline of duties that the owner and operator must perform for long and satisfactory service from any Rockford Power Take-Off.

ADJUSTMENT

CLUTCH If the clutch does not pull, overheats, or the clutch operating lever jumps out, the clutch must be adjusted. To adjust the clutch remove the hand hole plate in the housing and rotate the clutch until the adjusting lock and lock screw can be reached. Remove or disengage the adjustment ring lock.

HE CLUTCH Turn the adjusting ring counter clockwise to obtain recommended operating lever pressure.

HANDLE PRESSURE

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

CLUTCH SIZE	REFERENCE HANDLE LENGTH	PRESSURE AT lever
10"	10"	120#-140#

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

BEARINGS Power Take-Offs with ball type shaft bearings do not require bearing adjustment.

The approved method for field adjustment of tapered roller bearings in Rockford Power Take-Off units is by use of a dial indicator to measure actual shaft end play.

Adjust tapered roller bearings as follows: For units with the bearing retainer inside the unit housing, remove the housing hand hole plate. Remove the retainer lock.

1. Tighten retainer to firmly seat both bearings. Mark notch for reference.
2. Back off bearing retainer three or four notches.
3. Tap output end of shaft with soft hammer to seat bearing cup against bearing retainer. This should be the approximate end play required.
4. Measure actual end play with a dial indicator.
5. Indicator readings should be taken with the indicator anchored to the housing and the indicator tip resting on the end of the shaft. Hold housing firmly and pry shaft axially in and out to get indicator reading.
6. Adjust bearing retainer until measured end play is within limits given .004 - .006
7. Lock bearing retainer.

INSTALLATION OF POWER TAKE-OFF

Avoid jamming, excessive wear or scrubbing of parts. Also misalignment between engine and power take-off.

LUBRICATION

LUBRICANT Any high grade, Lithium Base #2, short fiber grease having an operating temperature of 200° F recommended for roller bearings may be used.

CAUTION

Do not mix Sodium or Calcium base grease with Lithium grease.

THROWOUT COLLAR Apply one or two shots of lubricant each day before starting or after each 8 hours of operation. Do not over grease.

ANTI-FRICTION BEARINGS Shaft bearings should be lubricated after each 50 hours of operation through fittings, with a short fiber, high grade, high temperature, Lithium Base #2 lubricant having an operating temperature of 200° F.

CLUTCH LEVERS AND LINKAGE Levers and linkage should be lubricated with engine oil after every 500 hours of operation.

LUBRICATE SPARINGLY TO AVOID OIL ON CLUTCH FACINGS.

REMOVAL OF PTA FROM THE ENGINE

1. Remove all attached parts such as guards, belts, and drive components.
Engage clutch operating handle to hold clutch facings in place, when removing PTA from engine.
2. Attach a suitable lifting device to the power take-off. Remove the hex-head cap screws that secure the power take-off housing to the flywheel housing.

CAUTION should be exercised when removing the power take-off from the engine so that the facings and pilot bearing are not damaged.

3. Support the power take-off on blocks with output end of the shaft down.
4. Remove the (2) screws (T4) and name plate (T2) from the power take-off housing (T1).

DRIVE PLATE REPLACEMENT ONLY A common indication that friction surface is worn out is that the adjusting ring cannot be turned any tighter.

1. Remove all accessory components that would prevent Power Take-Off removal from engine.
2. Remove bell housing to fly wheel housing bolts.
3. With suitable lifting device remove Power Take-Off from engine.
4. In replacing segmented facings the clutch assembly need not be removed from the shaft.

DISASSEMBLY OF HE CLUTCH

REMOVAL OF CLUTCH FROM SHAFT

1. Bend lock tab on lock (T27) away from nut (T26).
2. Remove nut (T26) and lock (T27).
3. Remove clutch from shaft as follows:
Place prybars at opposite side of the clutch housing and behind pressure plate. Exert pressure outward (away from the roller bearings), rap pilot end of the shaft sharply with soft hammer to jar clutch assembly off the taper of the drive shaft.

DISASSEMBLY OF HE CLUTCH

1. Remove clutch release lever (holdback) spring (H12) from clutch release sleeve.
2. Match mark each half of release sleeve collar (H23) to assure that they will be assembled in their same relative position, if so equipped.
3. Remove the two nuts and bolts holding the collar (H23) together, then remove collar from release sleeve (H22), if so equipped.
4. Remove retaining rings (H34) from pins (H33). Remove pins (H33) from links (H30) and levers (H13).
5. Remove retaining rings (H15) from pins (H14) that connect release levers (H13) to the bosses on the clutch body (H1). Remove pins and levers from clutch body. Note the direction the heads of the link to release sleeve and release lever to pressure plate pins are facing before removing so they may be installed in the same direction as they were removed.
6. Remove the adjusting ring lock retaining bolt (H17) lock washer (H18) and lock (H19) from pressure plate (H3).
7. Remove clutch adjusting ring (H9) by turning COUNTERCLOCKWISE out of the clutch pressure plate.
8. Lift clutch pressure plate (H3) straight up, off bosses of clutch body (H1).
9. Remove the three clutch pressure plate separator springs (H36) from holes in clutch body.
10. **ROUGH OR STICKING SPOTS OF THE BEARINGS ARE CAUSE TO REJECT THE BEARINGS FROM FURTHER USE.**
2. **CLUTCH FACINGS** Examine the clutch FACINGS for being scored, burned or cracked; inspect driving TEETH for wear or damage and measure thickness of the facings. Replace any clutch facing that is badly scarred, burned, or has driving teeth which are worn and/or damaged, or if the facing thickness is worn to under 5/16 of an inch.
3. **PRESSURE PLATES** Inspect the FRICTION SURFACES on the clutch body and pressure plate for being flat, smooth, and free from cracks and heat checks. The drive BOSSES and KEYWAY of the clutch body, and the adjusting ring THREADS and boss NOTCHES of the pressure plate should be examined for wear, and if worn excessively, should be replaced.
4. Inspect the INNER FACE and THREADS of the adjusting ring for wear or damage. If worn excessively, replace adjusting ring.
5. **PINS AND PIN HOLES** Examine all lever and link pins and pin holes in links, release levers, release sleeve and pressure plate for wear. If pins and pin holes in parts are worn excessively, parts must be replaced.
6. **LOCK** Inspect the FINGERS of the adjusting ring lock for wear. Replace lock if fingers are worn excessively or have been damaged. Lock must have sufficient tension to hold adjusting ring from turning when clutch is operating.
7. **CLUTCH RELEASE SLEEVE & COLLAR** Examine the WEARING SURFACE of release sleeve collar and mating surface on release sleeve. If parts show excessive wear, they must be replaced.
8. **CLUTCH RELEASE YOKE** Inspect the surface of the clutch release yoke fingers and mating TRUNNIONS on the release sleeve collar for wear. If parts are worn excessively, they must be replaced.
9. **CLUTCH DRIVE SHAFT** Examine threads, keyways, and pilot bearing surface of drive shaft.
10. **SEPARATOR SPRINGS** Check the pressure plate separator springs for being broken or weak. Approximate spring pressure is 15 to 20 lbs. with spring compressed to 13/16 of an inch.

INSPECTION

Wash all parts of the Power Take-Off EXCEPT the CLUTCH FACINGS in clean fuel oil or a good solvent, then, blow dry before inspection.

1. **BALL AND ROLLER BEARINGS** Examine CUPS, RACES, BALLS, and ROLLERS for indications of corrosion or pitting. Apply light engine oil to the bearings, then, while holding the inner race, revolve the bearing and outer race slowly to check for free rolling of the balls or rollers on the races and cup.

ASSEMBLY OF CLUTCH

With all the clutch parts cleaned and inspected and necessary parts on hand, the Power Take-Off may be reassembled as outlined in the following:

CLUTCH ASSEMBLY Having cleaned, inspected, and replaced all worn parts, assemble clutch as follows:

1. Place the clutch body (H1) on workbench with hub end (release lever bosses) of pressure plate up.

2. Place clutch pressure plate separator springs (H36) in holes provided in plate next to release lever bosses. Note: If whole ring facing is to be used it must be installed at this time.
3. Place the pressure plate (H3) on top of the clutch body (smooth face down) with notches in pressure plate in line with the release lever bosses of the clutch body, then lower pressure plate down on the three pressure plate separator springs (H36).
4. Lubricate threads on clutch adjusting ring (H9) and turn it **CLOCKWISE** into pressure plate (H3) until it bottoms.
5. Install clutch release levers (H13) in opening of bosses or clutch body (H1) with notch end of lever up and out.

NOTE

Determine the direction the clutch will rotate when attached to the engine, then install lever pins (H14) with the heads of the pins leading the rotation of the clutch.

CAUTION

Be sure retaining rings (H15) are securely locked on pins (H14).

6. Align holes in levers (H13) with holes in bosses of outer plate then insert pins (H14) through pin holes and secure with retaining rings (H15).
7. Heeding the match marks previously placed on the two halves, lubricate inside diameter of clutch release sleeve collar (H23). Place the two halves together over the shoulder on release sleeve (H22) with machined side of collar down and secure them together with two bolts and nuts. Rotate collar on sleeve to check for free turning. If collar binds on sleeve, it may be necessary to shim between the collar halves to allow running clearance, if so equipped.

CAUTION

Be sure that the tapped hole in release sleeve is facing grease tube when assembled in Power Take Off

8. Place clutch release lever (holdback) spring (H12) over end of release sleeve H25 and up against release collar before installing links (H30) to release sleeve H25.
9. Place one release lever link (H30) on each side of each hole on clutch release sleeve H25 with triangular end of release lever link at release sleeve and point of triangle facing toward center of release sleeve.
10. Attach links to release sleeve with link pins (H31) and retaining rings (H32).
11. Place the clutch release sleeve (H25), with other parts assembled, down on clutch with each pair of release links (H30) astride release lever (H13).

CAUTION

When installing pins, all pins must be installed with head leading rotation

Connect links to levers with pins (H33) and retaining rings (H32).

NOTE

Be sure retaining rings (H32) are securely locked on pins (H33).

12. With the clutch release links (H30) and release levers (H13) connected, slide clutch release lever (holdback) spring (H12) over ends of release lever links and into place on release levers (H13).
13. Insert the clutch facings (H4) (three segments) in between the clutch body (H1) and pressure plate (H3), and center.
14. Lock clutch facings between the pressure plates as follows:
 - A. With the clutch assembly resting on workbench, turn the clutch adjusting ring (H9) **COUNTER-CLOCKWISE** until pressure plate (H3) almost contacts clutch facing (H4).
 - B. Place clutch driving ring over clutch facings with teeth in driving ring in mesh with teeth of clutch facings, and locate the driving ring centrally relative to the pressure plate and clutch body.

NOTE

If driving ring is not properly located relative to 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.

- C. Engage the clutch by applying pressure on top of release sleeve and collar assembly and lock clutch facings between the pressure plate and clutch body. If clutch facings are still free to move, disengage the clutch and turn adjusting ring **COUNTER-CLOCKWISE** just enough to lock the clutch facings in place when clutch is engaged.

NOTE

The clutch must now be kept engaged until the Power Take-Off assembly is attached to engine.

15. Remove clutch driving ring (H35) from the clutch facings and attach it to the flywheel with the specified bolts and lock washers.

DISASSEMBLY OF TAPER ROLLER BEARINGS AND INTERNAL ADJUSTMENT

DISASSEMBLY OF TAPER ROLLER BEARING AND INTERNAL ADJUSTMENT

1. With the Power Take-Off housing supported on blocks, use a standard bearing puller and remove the pilot bearing from the clutch shaft.
2. Straighten the tang on lock washer (T27). Hold clutch and shaft, remove clutch shaft nut (T26).
3. Remove the clutch from the clutch shaft (T8) as follows:
Place Prybars at opposite sides over the housing and back of the clutch pressure plate. Hold pressure on both bars and rap the pilot bearing end of the shaft sharply with a babbit hammer to free clutch from shaft.
4. Remove clutch and drive key (T28) from drive shaft (T8).
5. Loosen clamp bolt (T22) and remove operating handle (T20) from cross shaft (T14).
6. Loosen the (2) bolts (T18) in yoke (T17).
7. Slide yoke left or right on the cross shaft to expose woodruff keys (T15).
8. Remove woodruff keys (T15) from cross shaft (T14).
9. Withdraw shaft (T14) from yoke (T17) and housing (T1).
10. Remove bearing retainer lock bolt (T12) and lock (T11).
11. Remove bearing retainer (T10). To remove rotate counter clockwise.

12. Remove the clutch shaft from the front of the housing. Tap the output end of the shaft if the bearing cup sticks in the housing.
13. The cup of the rear roller bearing will remain in the housing after the clutch shaft has been removed.

Note

Turn the housing face down.

14. There are three holes* provided at the rear of the housing for removal of the rear bearing cup. Insert a punch in the holes and tap alternately at three points. Avoid cocking and cramping the bearing during removal.
15. Wash the bearings thoroughly with clean fuel oil or solvent. Blow dry with compressed air and examine for wear, corrosion or rough spots. If it is determined that the bearings are unsatisfactory for further use they must be removed from the clutch shaft as follows:
 - A. Place a split type bearing remover between the two roller bearings.
 - B. Place clutch shaft and bearing removed on bench press and push bearing from the shaft.
 - C. Invert the shaft in the press and remove the other bearing in the same manner.

***NOTE:** On some housings these three holes may be plugged with screws.
Remove screws and proceed per above instructions.

ASSEMBLY OF POWER TAKE-OFF

ASSEMBLY OF POWER TAKE-OFF

If roller bearings (T9) were removed from clutch shaft (T8), they must be installed as follows:

1. Lubricate inside diameter of roller bearing cone, then start cone straight on clutch drive shaft with wide face of the bearing cone facing shoulder on drive shaft.
2. Place Steel ring approximately 1/4" thick over end of shaft and rest on inner cone of bearing.

CAUTION

The steel ring must bear against the inner cone of bearing. Do not allow any pressure to be applied against the rollers or bearing may be damaged.

3. Place clutch drive shaft and bearing on steel ring in press.
4. With ram of press bearing on the upper end of shaft, press bearing cone tight against shoulder on the shaft.

Install Clutch Shaft in Power Take-Off Housing:

Install bearing cup in housing then shaft and bearings as follows:

1. Support the Power Take-Off housing (T1) on wooden blocks, forward (bell) side of housing up.
2. Lubricate outside diameter of roller bearing cup and start cup straight into bearing bore of Power Take-Off housing with back face of bearing cup down.
3. Use a hard wood block about 15" long, placed on front face of bearing cup to set cup in bore, tap block on cup alternately in several places to prevent cramping of cup.

CAUTION

Be sure cup is fully set in Power Take-Off housing bore square.

4. Lubricate roller bearings with light oil; insert output end of clutch drive shaft through bearing bore from forward side of Power Take-Off housing, until shaft bearing contacts bearing cup.
5. Lubricate second bearing cup and place over clutch drive shaft front face down.
6. Start bearing cup straight in bearing bore of Power Take-Off housing, using hard wood block and hammer, tap bearing cup to contact bearing rollers.
7. Lubricate threads of bearing retainer (T10). Place retainer over pilot bearing end of clutch shaft with notches of bearing retainer up.
8. Thread bearing retainer into Power Take-Off bearing bore up against bearing cup. Tighten bearing retainer while rotating clutch shaft, until bearing retainer is tight and bearing cups are fully set. Full set of bearing cups can be determined by increased effort required to rotate clutch drive shaft.

9. Back bearing retainer out two or three notches, shaft end play should be as charted on page 3.

CLUTCH DRIVE SHAFT END PLAY

1. Support the Power Take-Off housing with a sling or chain hoist, drive (pulley) end of shaft down.
2. Lower Power Take-Off until end of drive shaft rests on wood block on floor.
3. Take up space between bearing retainer and drive shaft by inserting four pieces of suitable shim stock equally spaced around shaft. The four pieces of shim stock must be of same thickness.
4. Mount a dial indicator to pilot bearing end of drive shaft, position indicator to contact face of Power Take-Off housing next to bearing retainer. Set dial indicator at zero.
5. Lift Power Take-Off housing and drive shaft assembly from wood block.
6. Tap pilot bearing end of shaft lightly to set shaft and outer bearing assembly against the outer roller bearing cup.

CAUTION

Do not hit the shaft hard enough to disturb the dial indicator.

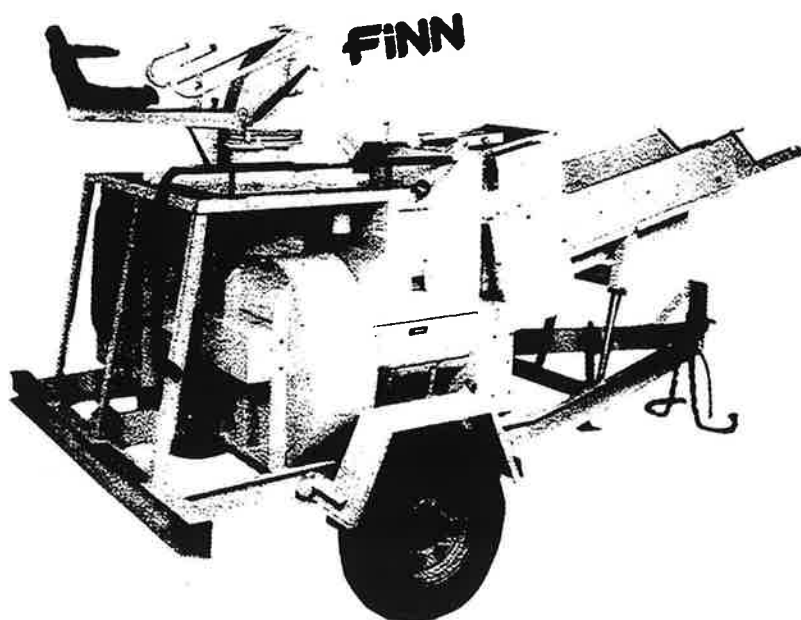
7. Note reading of dial indicator. Indicator will show amount of end play between drive shaft and housing.
8. Lower Power Take-Off until end of drive shaft again rests on wood block and weight of Power Take-Off is no longer supported by hoist.
9. Tap lightly on inner side of Power Take-Off Housing, alternately around bearing retainer to insure that inner roller bearing is set against bearing cup. Dial indicator should again be at zero.
10. Readjust end play if necessary, by turning bearing retainer CLOCKWISE to decrease or COUNTER CLOCKWISE to increase drive shaft end play.
11. Repeat steps 5 thru 9 to insure shaft end play readings are correct. .004 - .006
12. Install bearing retainer lock and bolt.
13. Remove shim stock and dial indicator.
14. Support Power Take-Off on wood blocks in horizontal position.
15. Fill bearing cavity with Lithium Base #2 grease, until grease starts to seep out around the clutch shaft at each end of Power Take-Off housing.

NOTE

Rotate the clutch drive shaft when filling bearing cavity to be sure that bearings and housing are full of grease.

FINN

CORPORATION



Mulch Spreader

PARTS MANUAL

MODEL NO. B260 SERIAL NO. RS

W A R R A N T Y

Finn warrants to the original Purchaser for use (or rental to others for use) all new construction machinery and attachments therefore manufactured by Finn to be free from defects in material and workmanship for a period of 12 months from date of purchase or 1200 hours of use, whichever comes first. Replacement parts provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product in which installed, as if such parts were original components of that product. Finn makes no warranty with respect to (a) allied equipment or trade accessories not manufactured by it (such as, but not limited to tires, ignitions, starters, batteries, magnetos, carburetors, engines or like or unlike equipment or accessories), such being subject to the warranty, if any, provided by their respective manufacturers; or (b) second-hand, used, altered, or rebuilt machines. THE WARRANTY DESCRIBED IN THIS PARAGRAPH SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Upon notification of Finn within the above-stated warranty period of any failure to conform to this warranty, and upon inspection by Finn to verify said nonconformity and to verify the continuing existence of the warranty period, Finn will provide a new part or a repaired part, whichever Finn elects, to replace the part found to be defective. Such parts will be provided without charge to the Purchaser during normal working hours at a place of business of a Finn dealer or other establishment authorized by Finn to effect said repairs or replacements, but Purchaser shall bear all costs of transporting the product to and from such place of business or establishment. Correction of nonconformities, in the manner and for the period time provided above, shall constitute fulfillment of all liabilities of Finn under this contract.

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. The essential purpose of this exclusive remedy shall be to provide the 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.

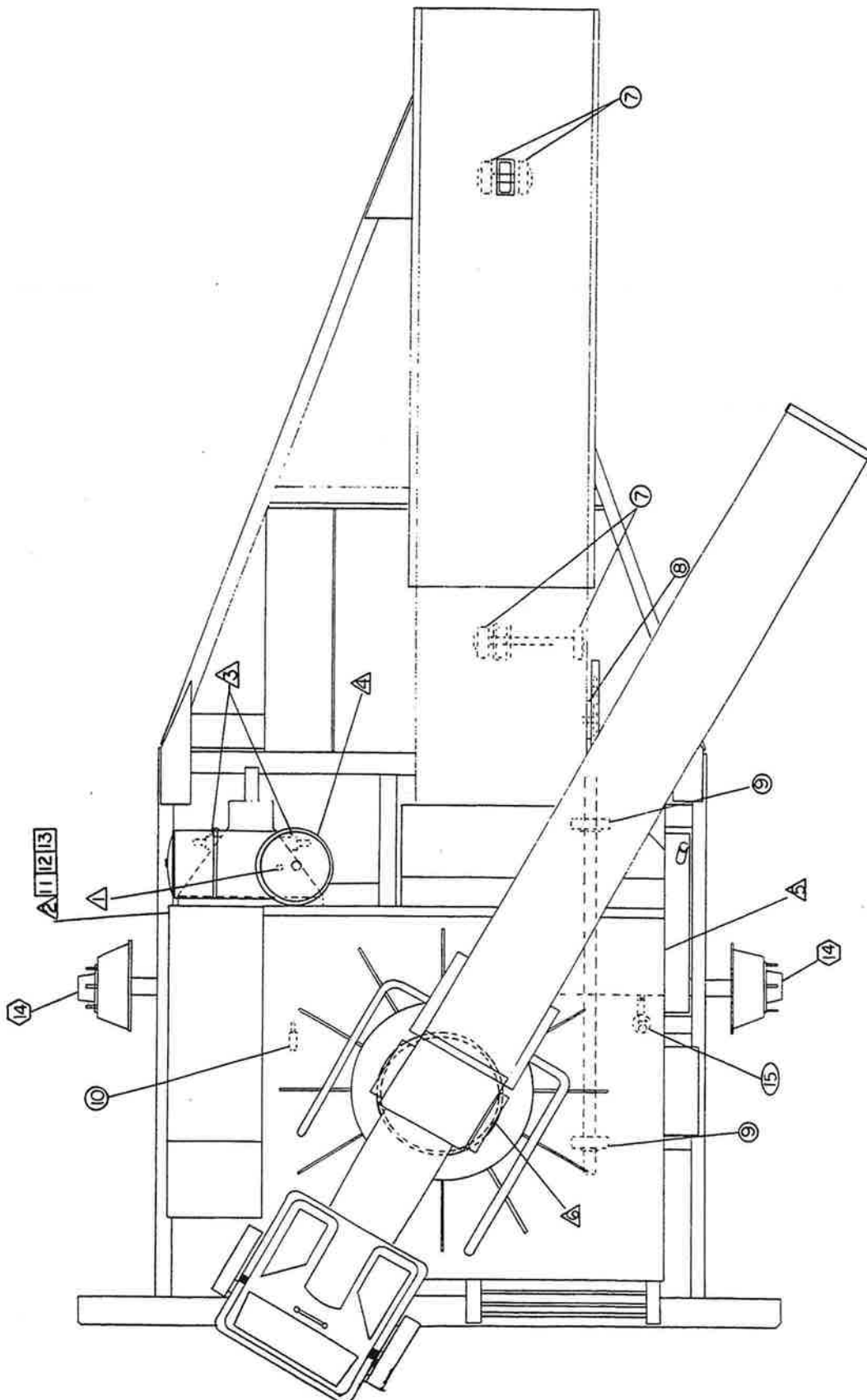
IN NO EVENT SHALL FINN BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL OR INDIRECT DAMAGES, INCLUDING LOST PROFITS OR LOST COMMERCIAL OPPORTUNITIES, WITH RESPECT TO THE SALE OF THE ABOVE-WARRANTED PRODUCT OR ANYTHING DONE IN CONNECTION THEREWITH, OR FOR PROPERTY DAMAGE SUSTAINED BY A PERSON CLAIMING TO BE A THIRD-PARTY BENEFICIARY OF A SURVIVING WARRANTY UNDER THE LAW OF ANY JURISDICTION.

Effective October 1, 1989

INDEX

LUBRICATION CHART	2 - 3
MISCELLANEOUS PARTS	4 - 5
BLOWER/SHREDDER ASSEMBLY	6 - 7
FEED CHUTE ASSEMBLY	8 - 9
DISCHARGE HEAD ASSEMBLY	10-11
HYDRAULIC SYSTEM	12-13
POWER SYSTEM	14-15
AIR INTAKE AND EXHAUST	16
ELECTRICAL SYSTEMS	17-18
AXLE ASSEMBLY	19
POWER TAKE OFF (CLUTCH) ASSEMBLY	20-21
DECALS AND LOCATION	22-23
ADHESIVE SYSTEM	24-25
ADHESIVE PUMP	26
SPRAYBAR ATTACHMENT	27
MULCH DISCHARGE EXTENSION ATTACHMENT	28
TOOL KIT	29
SPARE PARTS AND REPAIR KITS	30

LUBRICATION CHART



LUBRICATION CHART

			NUMBER
①	Clutch Shaft Bearing	C.L.	1
②	Check Oil Level - See engine manual		1
③	Clutch Yoke Shaft	C.L.	2
④	Check Air cleaner		1
⑤	Check Hydraulic Oil Level	H.O.	1
⑥	Discharge Elbow Swivel Rotate elbow to 6 or 8 different positions	C.L.	1
⑦	Power Feed Shaft Bearings	C.L.	4
⑧	Feeder Roll Bearing	C.L.	1
⑨	Blower Shaft Bearings	C.L.	2
⑩	Oil Throttle Linkage	M.O.	1
⑪	Change Oil - see engine manual		
⑫	Oil Breather Cap - see engine manual		
⑬	Oil Filter - see engine manual		
⑭	Wheel Bearings - Repack	C.L.	2
⑮	Hydraulic Oil Filter		

C.L. - Chasis Lubricant

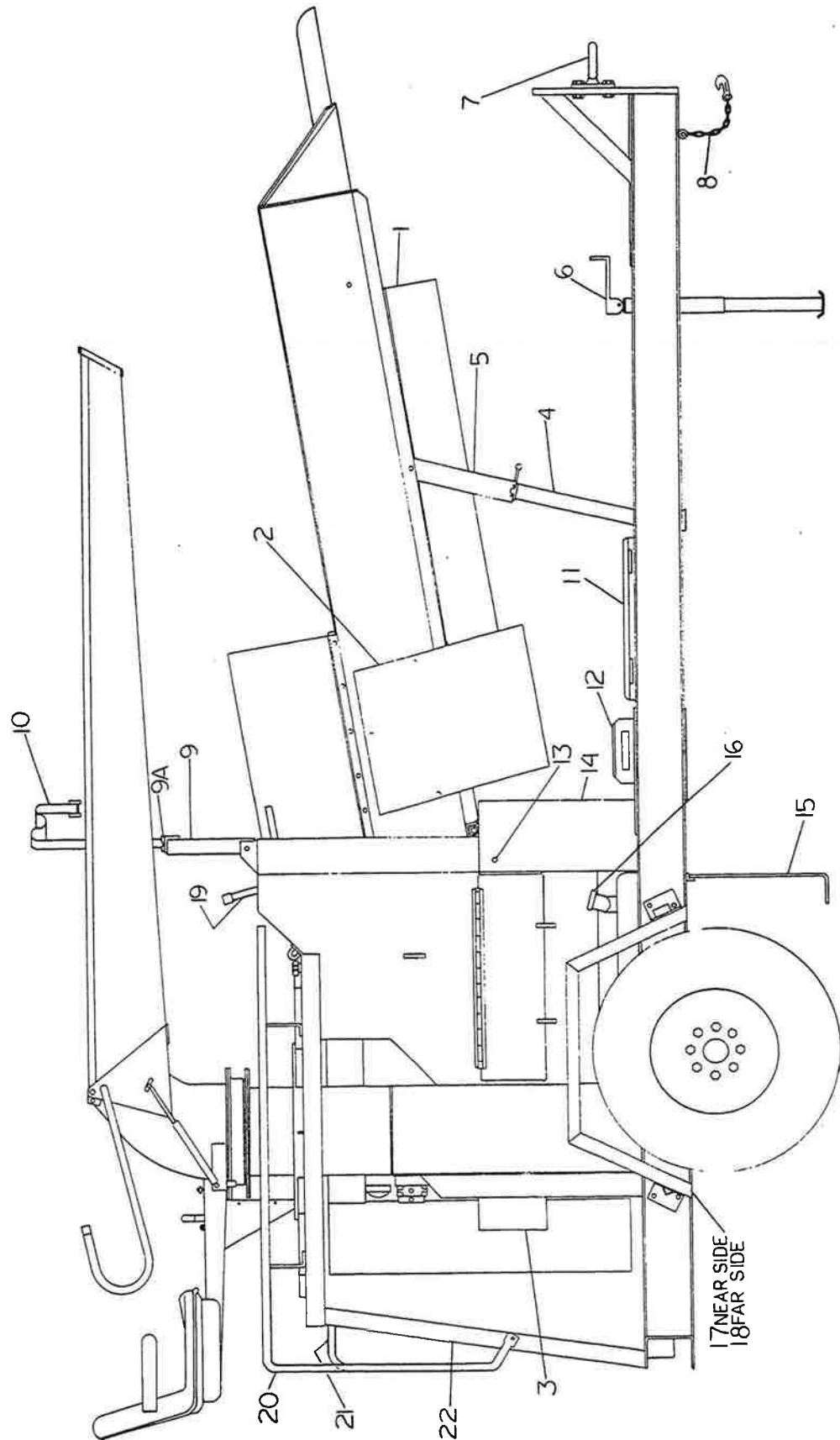
M.O. - Motor Oil(see engine manual)

H.O. - Hydraulic Oil: Mobile DTE25
 (ISO Grade 46, Gulf 46 AW
 ASTM Grade 215) Shell Tellus 46

TIME KEY

△	DAILY
○	WEEKLY
□	SEE ENGINE MANUAL
⬡	ANNUALLY
⊗	500 HOURS

MISCELLANEOUS PARTS

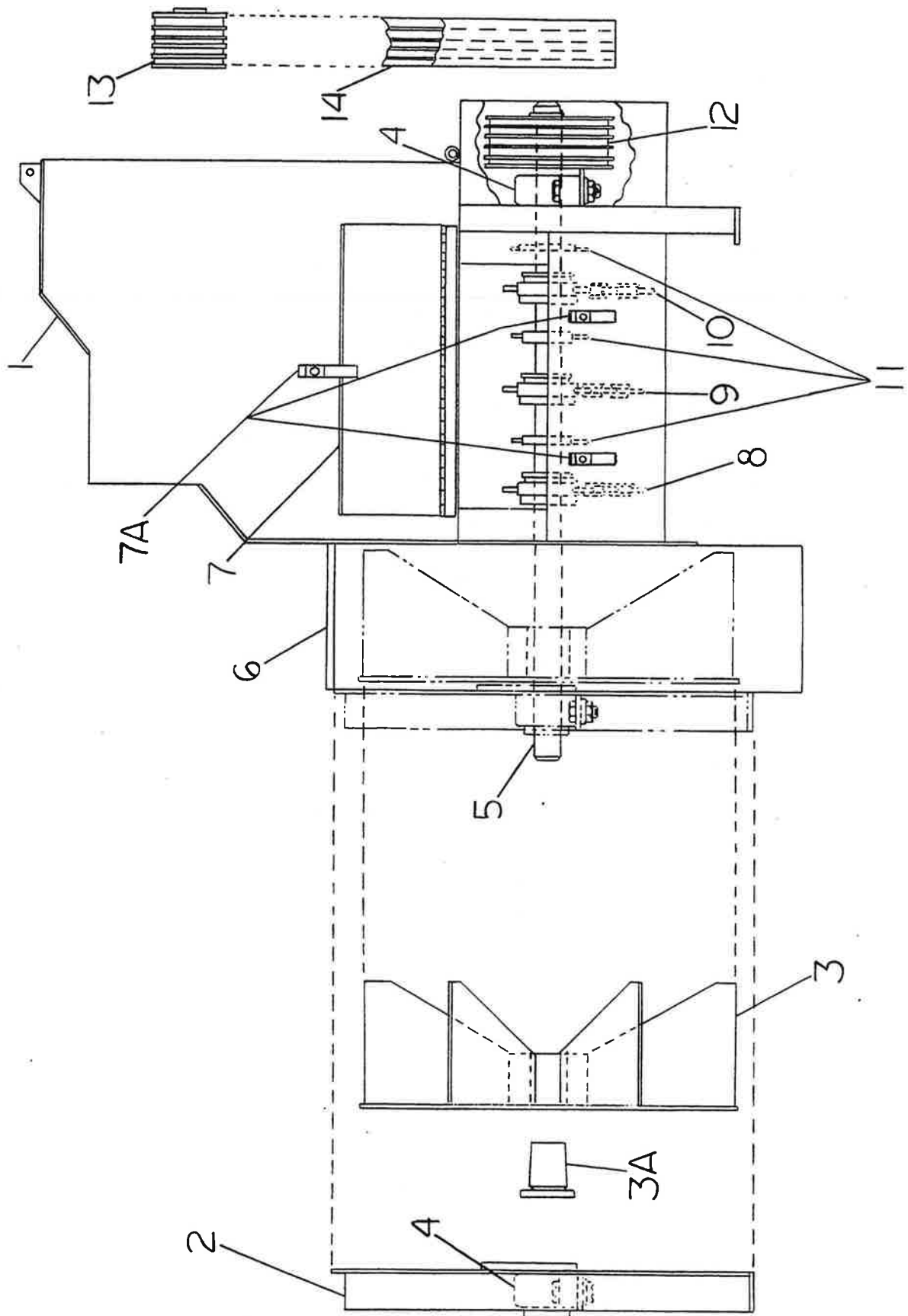


MISCELLANEOUS PARTS

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	023590	Feed Chain Guard	1
2	023361	Drive Chain Guard	1
3	023418	Blower Shaft end Cover	1
4	023654	Dual Jack Arrangement	1
		023636 Jack w/Crank	1
		023637 Jack w/Stub Shaft	1
		023591-06 Connecting Pipe	1
5	023592	Dual Jack Mount	1
6	022588	Frame Jack	1
7	080043	Tow Ring (Standard)	1
	005134	Coupler (Optional)	1
	005135	2-5/16" Ball (Optional)	1
		XF1036H Hitch Bolts	4
		YF10H Hitch Nuts	4
		W10HF Hitch Washers	4
8	023492	Safety Chain w/Hook & Coupling	2
9	023593	Tube Holddown	1
9A	023583-06	Holddown Belt	1
10	023527	Tube Holddown Strap Assembly	1
11	011313	Tool Box	1
11A	011398	Rubber Mounts (not shown)	4
12	011770	Battery Box	1
12A	080220	Battery Tie Down Strap (not shown)	1
13	023266	Grease Line	1
14	023527	Belt Guard	1
14A	023536	Dust Guard (Not shown)	1
15	000489	Static Strap	1
16	023126	Fuel Tank Assembly	1
		007914 Cap	1
		022739-04 Fuel Guage	1
16A	023529-11	Fuel Tank Support Straps (not shown)	2
17	023548-01	Fender R.H.S.	1
18	023548-02	Fender R.H.S.	1
19	023533	Clutch Handle	1
19A	022871	Plastic Cap (not shown)	1
20	023638	Guard Rail	1
21	023638-03	Hand Rail	1
22	023551	Ladder	1
22A	023551-02	Platform Support (not shown)	1

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

BLOWER SHAFT/SHREDDER BOX ASSEMBLY

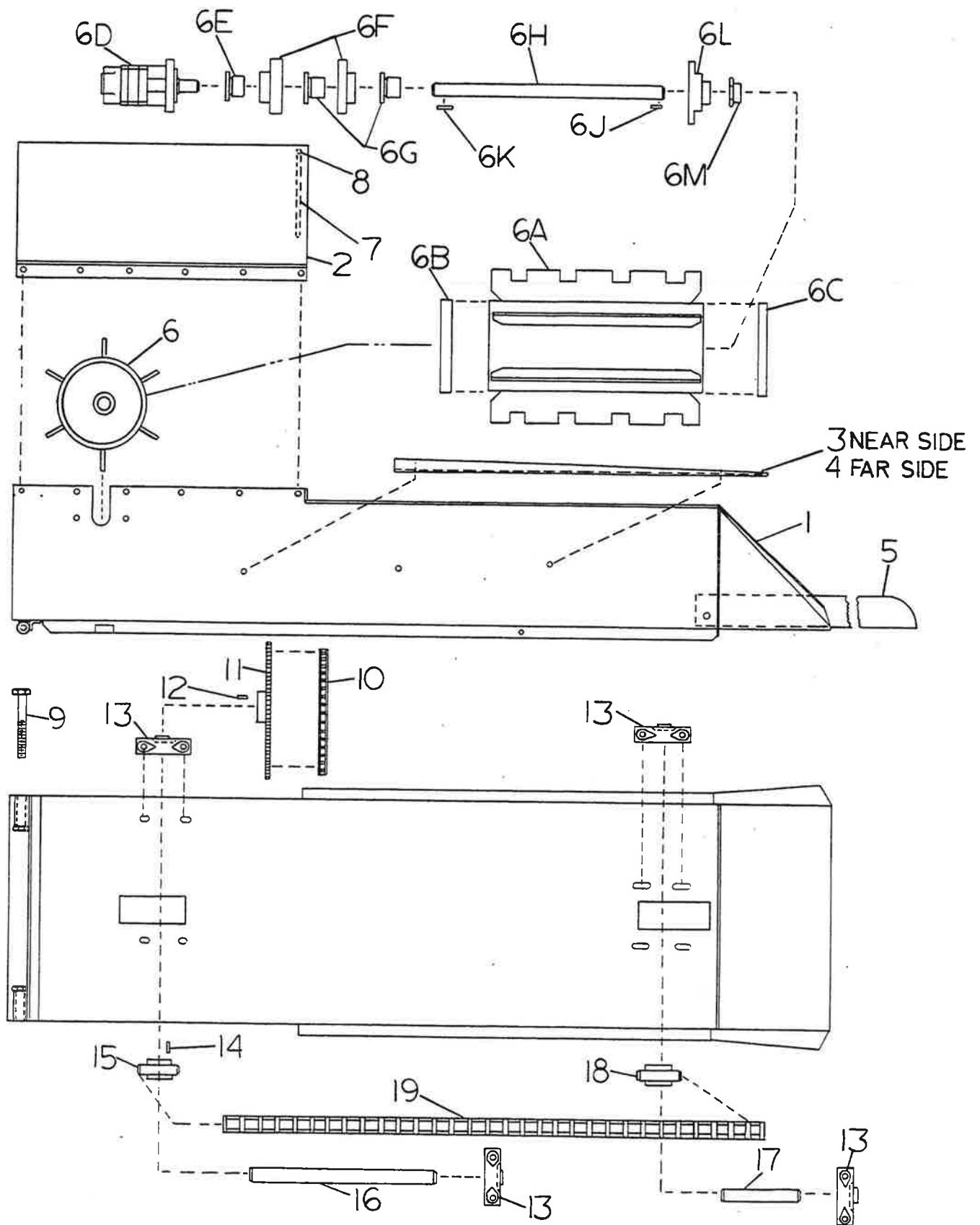


BLOWER SHAFT/SHREDDER BOX ASSEMBLY

REF NO.	PART NO.	DESCRIPTION	NO.	REQ"D
1	023571	Shredder Box Weldment	1	
2	023632	Blower Cover Weldment	1	
3	023311	Blower Blade	1	
3A		021512 Bushing	1	
		022159 Key	1	
4	021511	Bearing		2
		X1048H Bearing Bolt	4	
		Y10HL Bearing Nut	4	
		W10HL Bearing Washer	4	
5	021365	Blower Shaft	1	
6	023199	Blower Housing	1	
7	023574	Access Door	1	
7A	023572-09	Door Latch	3	
7B	022202	Handle Grip (not shown)	3	
8	021361	Shredder Roll - 3 Pitch	1	
		021555 Hub & Pivot Assembly	1	
		021363 Bushing	1	
		020111 Chain - 3 Pitch	4	
		020119 Pin	4	
9	021822	Shredder Roll - 4 Pitch		1
		021824 Hub & Pivot Assembly	1	
		021363 Bushing	1	
		020110 Chain -4 Pitch	2	
		020119 Pin	2	
10	023228	Shredder Roll - 5 Pitch		1
		021824 Hub & Pivot Assembly	1	
		021363 Bushing	1	
		023363 Chain - 5 Pitch	2	
		020119 Pin	2	
11	023334	Breaker Collar		3
12	060032	Blower Shaft Sheave		1
		021666 Bushing	1	
		023649 Key	1	
13	023595	Engine Clutch Sheave		1
		021504B Bushing	1	
		011441 Key	1	
14	023600	Drive Belt		1

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

FEED CHUTE ASSEMBLY

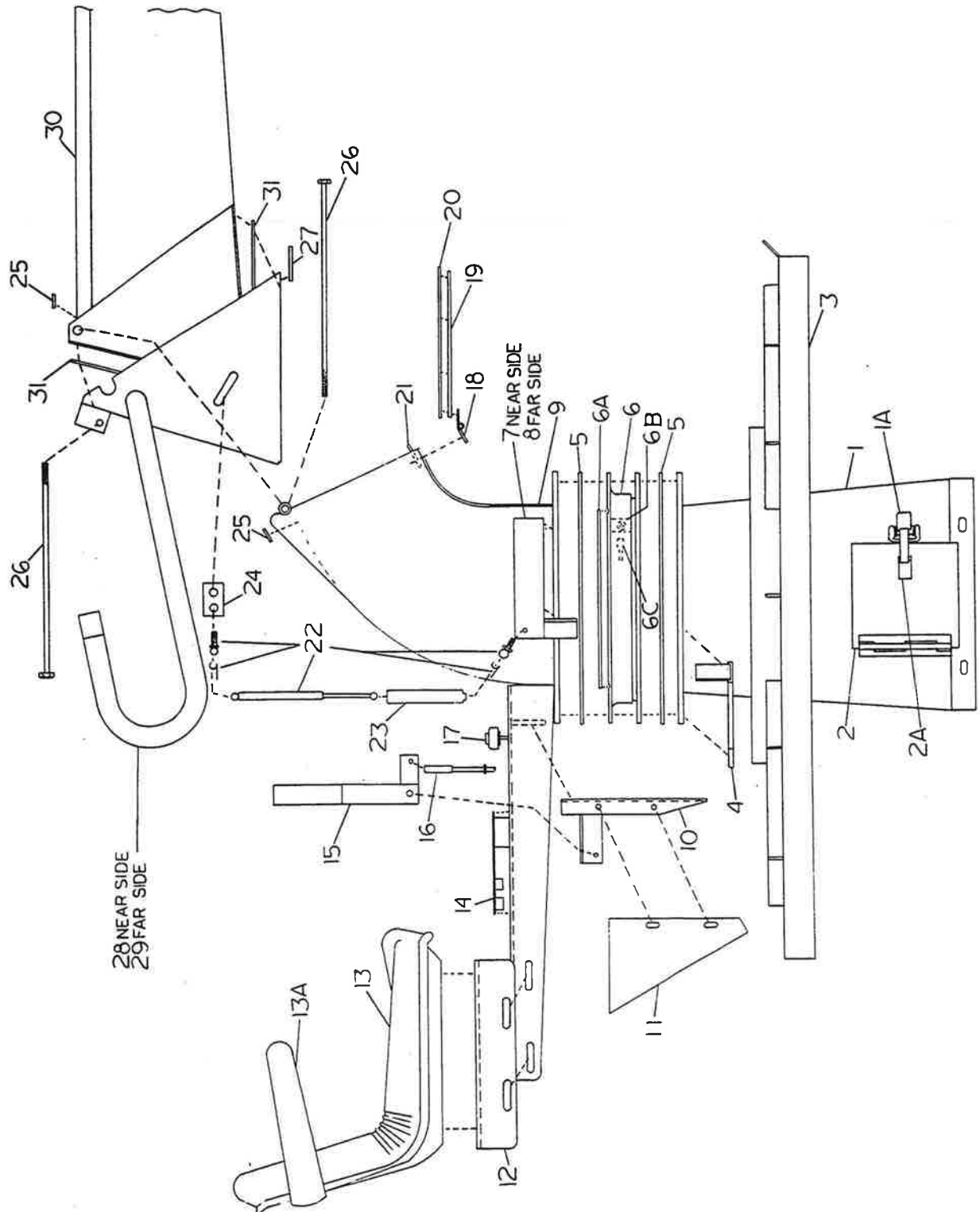


FEED CHUTE ASSEMBLY

REF NO.	PART NO.	DESCRIPTION	NO.REQ'D
1	023570	Feed Chute Weldment	1
2	023171-01	Feed Chute Cover	1
3	023158-01	Bale Holder - R.H.S.	1
4	023158-02	Bale Holder - L.H.S.	1
5	023542	Feed Chute Extension	1
6	023189	Feeder Roll Assembly	1
6A		023123 Feeder Roll	1
6B		023125 Feeder Roll End Cap (brg.sd)	1
6C		023152 Feeder Roll End Cap (mtr.sd)	1
6D		023599 Hydraulic Motor	1
6E		000393B Taper Bushing	1
6F		023156 Shaft Coupling	1
6G		021440 Taper Bushing	2
6H		023190 Feed Roll Shaft	1
6J		023249 Key	1
6K		023250 Key	1
6L		020586 Flange Bearing	1
6M		023596 Drive SProcket	1
7	023348-01	Air Baffle Door	1
8	023348-02	Baffle Door Rod	1
9	X12112	Hinge Bolt	2
10	023153	Drive Chain	1
11	023134	Drive Sprocket	1
12	023249	Key	1
13	020386	Feed Chain Shaft Bearings	4
14	023250	Key	1
15	021517-02	Sprocket w/Key	1
16	023198	Drive Shaft	1
17	023197	Idler Shaft	1
18	021517-01	Sprocket Plain (w/o Key)	1
19	021516	Feed Chain	1

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

DISCHARGE HEAD ASSEMBLY

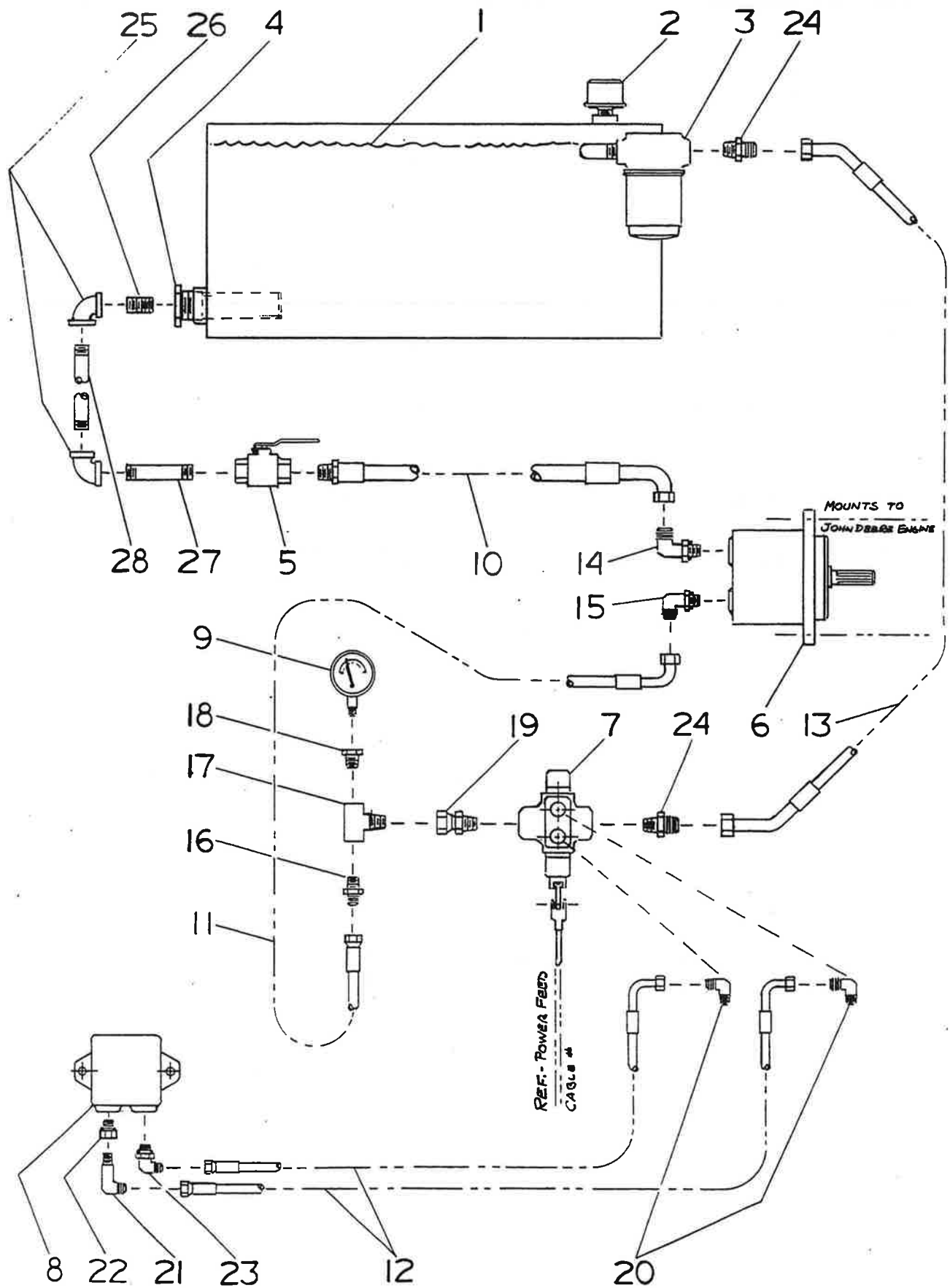


DISCHARGE HEAD ASSEMBLY

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	023626	Lower Transition	1
1A	000765	Clamp	1
2	023626-03	Access Door	1
2A	000766	Strike	1
3	023550	Platform	1
4	023633-02	Rotary Stop	1
5	023368	Gasket	2
6	023374	Bearing Assembly	1
6A		023351 O Ring	1
6B		023473 Allen Wrench Pipe Plug	1
6C		021823 Grease Fitting	2
6D		023350 Bearing Balls (not shown)	81
7	023633-01	Gas Spring Lower Mount R.H.S.	1
8	023633-03	Gas Spring Lower Mount L.H.S.	1
9	023625	Elbow Weldment	1
10	023555-02	Control Cable Plate	1
11	023554-01	Control Cable Guard	1
12	023553-01	Seat Mounting Angle	2
13	023607	Seat Assembly	1
13A	023608	Armrest Kit	1
14	023653-02	Seat Panel Assembly	1
15	023569	Power Feed Handle	1
15A	022202	Handle Grip (notshown)	1
16	023639	Power Feed Cable	1
		020682 Clevis & Pin	2
17	023644	Throttle Cable	1
		007675 Ball Joint	1
		020681 Clamp & Shim	2
18	023583-03	Elbow Hinge	1
19	023583-02	Side Seal	2
20	023560-03	Seal Plate	1
21	023583-01	Hinge Seal	1
22	023657	Gas Spring Assembly	2
		023609 Gas Spring	1 per
		023610 Ball Stud	2 per
		023611 Safety Clip	2 per
23	023160	Gas Spring Cover	2
24	023587-02	Ball Stud Strap	2
25	023583-05	Discharge Tube Seal	3
26	023586-05	Hinge Pin	2
27	023587-01	Elbow Stop Plate	1
28	023588-02	Handle Weldment R.H.S.	1
28A	022871	Plastic Cap (not shown)	1
29	023588-01	Handle Weldment L..H.S.	1
29A	022871	Plastic Cap (not shown)	1
30	023629	Discharge Tube	1
31	023583-04	Elbow Seal	4

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

HYDRAULIC SYSTEM



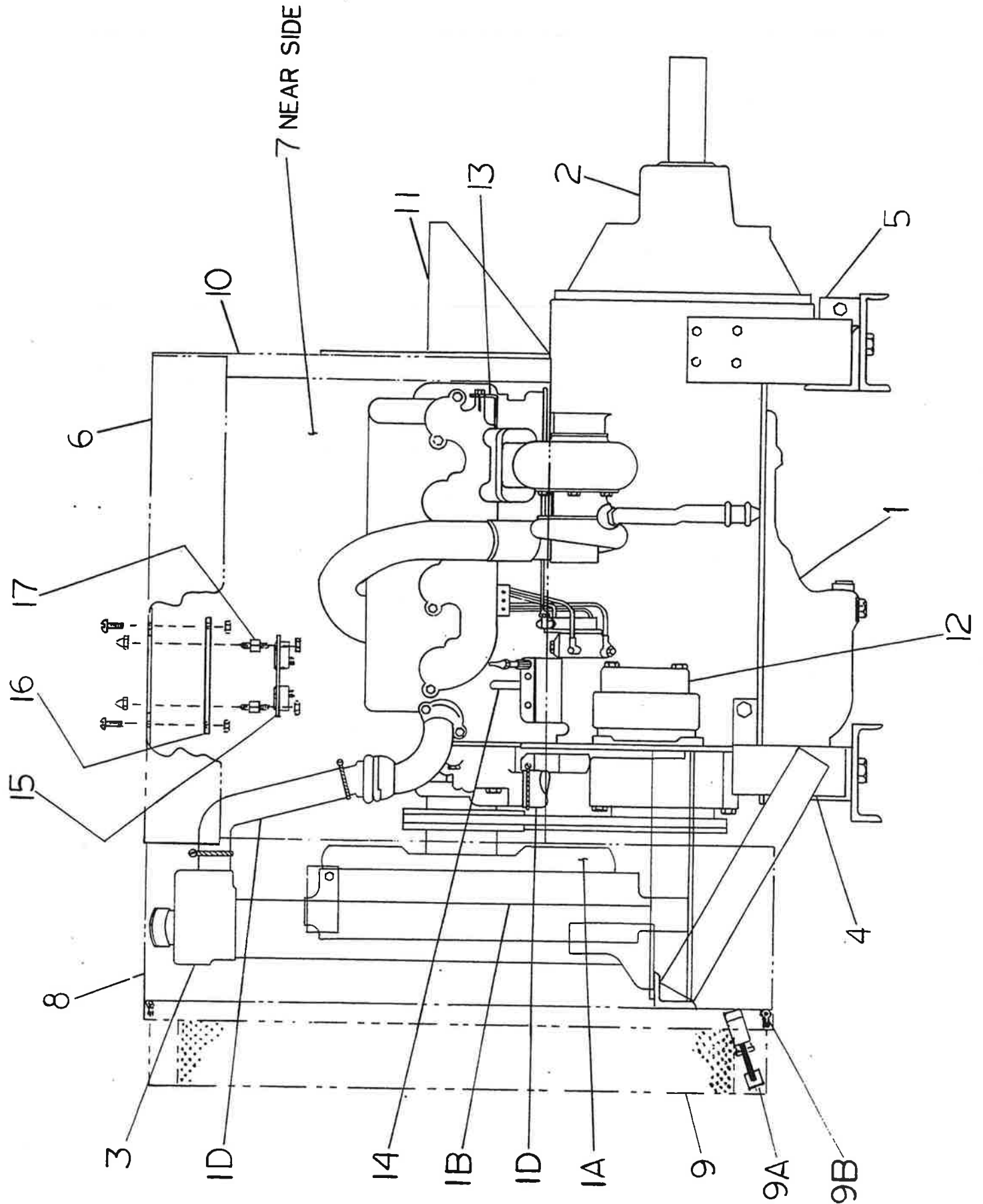
HYDRAULIC SYSTEM

REF NO	PART NO.	DESCRIPTION	NO. REQ'D
1	190074	Hydraulic Oil, ISO Grade 46	16 Gal.
2	004900	Filler Breather	1
3	021617	Return Line Filter Assembly	1
4	011466	Suction Strainer	1
5	021559	Suction Shut Off Valve	1
6	023606	Hydraulic Pump	1
7	008293	Speed & Direction Control Valve	1
8	023599	Hydraulic Motor	1
9	012044	Pressure Gauge	1
10	023615	Suction Hose	1
11	023613	Pressure Hose	1
12	023612	Motor Hose	2
13	023614	Return Hose	1
14	023620	90 deg. Adapter Fitting	1
15	023619	90 deg. Adapter Fitting	1
16	023617	Straight Adapter Fitting	1
17	011625	Female Run Tee	1
18	011936	Hex Reducer Fitting	1
19	070492	Straight Adapter Union	1
20	023652	90 deg. Adapter Fitting	2
21	023618	90 deg. Long Adapter Fitting	1
22	070408	Female Connector	1
23	023621	90 deg. Adapter Fitting	1
24	023616	Straight Adapter Fitting	1
25	160010	90 deg. Pipe Elbow	2
26	160305	1" Close Nipple	1
27	160492	1" Nipple	1
28	023628-04	1" Nipple	1

021618 Filter Element for 021617

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

POWER SYSTEM

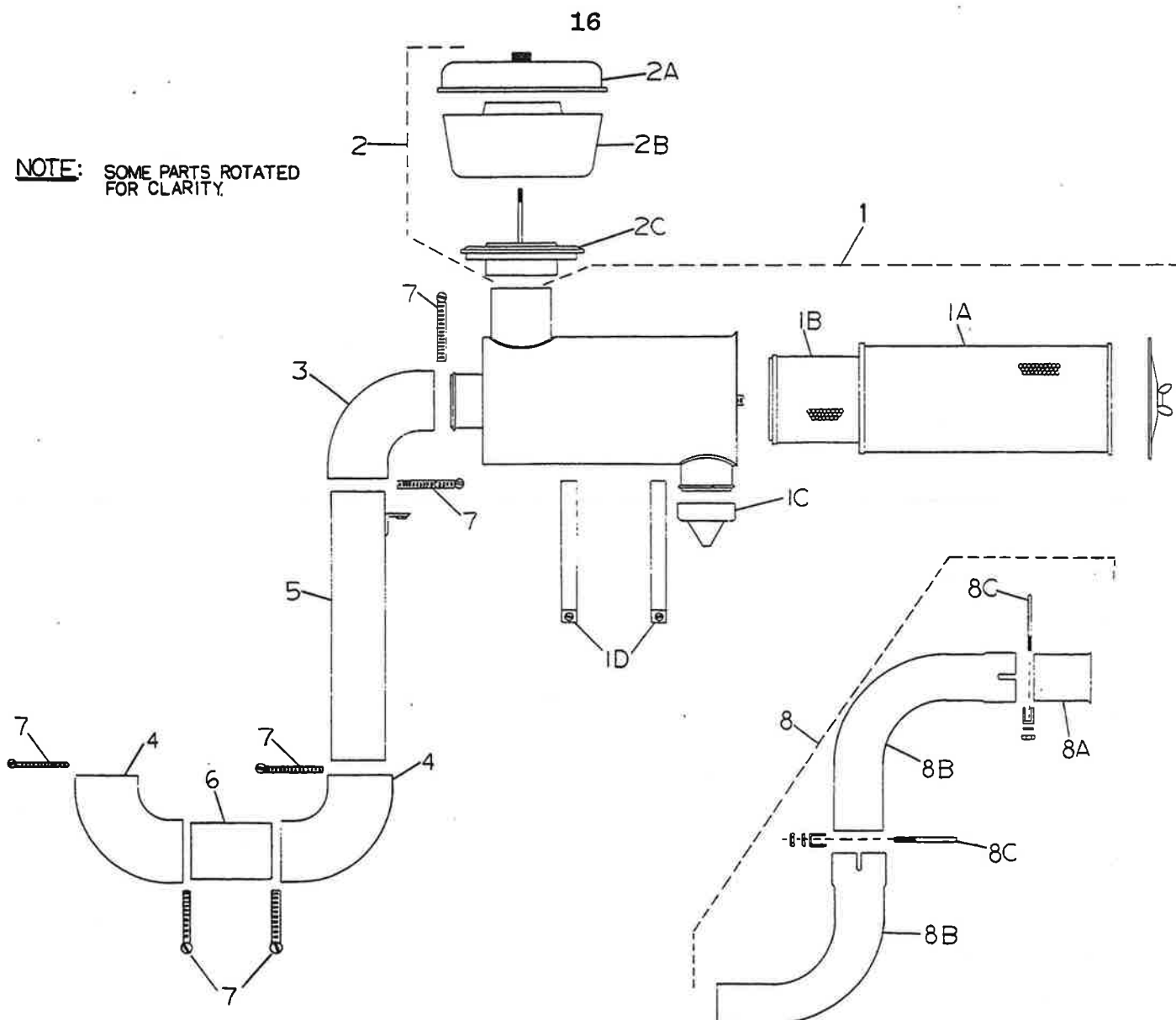


POWER SYSTEM

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	011714	Turbo Engine Assembly	1
1A	011747	Fan	1
1B	JDR53456	Fan Shroud	1
1C	JDR53550	Lower Radiator Hose	1
	022450	Clamp	2
1D	JDR54534	Upper Radiator Hose	1
	022450	Clamp	2
2	022816	Clutch Assembly (see page28)	1
2A	022314	Pilot Bearing (not shown)	1
3	022491	Radiator Assembly	1
3A	008279	Rubber Mount (not shown)	2
3B	022452	Drain Cock (not shown)	1
3C	007878	Cap (not shown)	1
4	023541	Front Engine Mount	1
4A	023167-01	Front Jacking Bolt (not shown)	1
5	023539	Rear Engine Mount	1
5A	023166	Rear Jacking Bolt (not shown)	1
6	023575-01	Engine Top Cover	1
7	011834	Engine Side Panel	1
8	023665	Radiator shroud	1
9	023666	Radiator Chaff Screen	1
9A	023667	Chaff Screen Latch	2
9B	190087	Chaff Screen Seal	124"
10	023579	Rear Engine Cover	1
10A	008317	Spacer (not shown)	2
11	023526	Air Cleaner Mount	1
12	023606	Hydraulic Pump	1
13	011885-04	Throttle Control Mounting Bracket	1
14	007675	Ball Joint	1
15	023653-01	Engine Instrument Panel Assembly	1
		007274 Hourmeter	1
		007706 Pressure Gauge	1
		007958 Voltmeter	1
		021839 Temperature Gauge	1
16	023557	Clear Plexiglass Cover	1
17	022991	Rubber Mounts - Panel	4
NOT ILLUSTRATED			
	190013 (60")	Fuel Line, Suction	1
	190034 (48")	Fuel Line, Return	1
	023641	Engine Wiring Harness (see page18)	1
	022890	Oil Line Kit	1
	JD6359	Parts Book	1

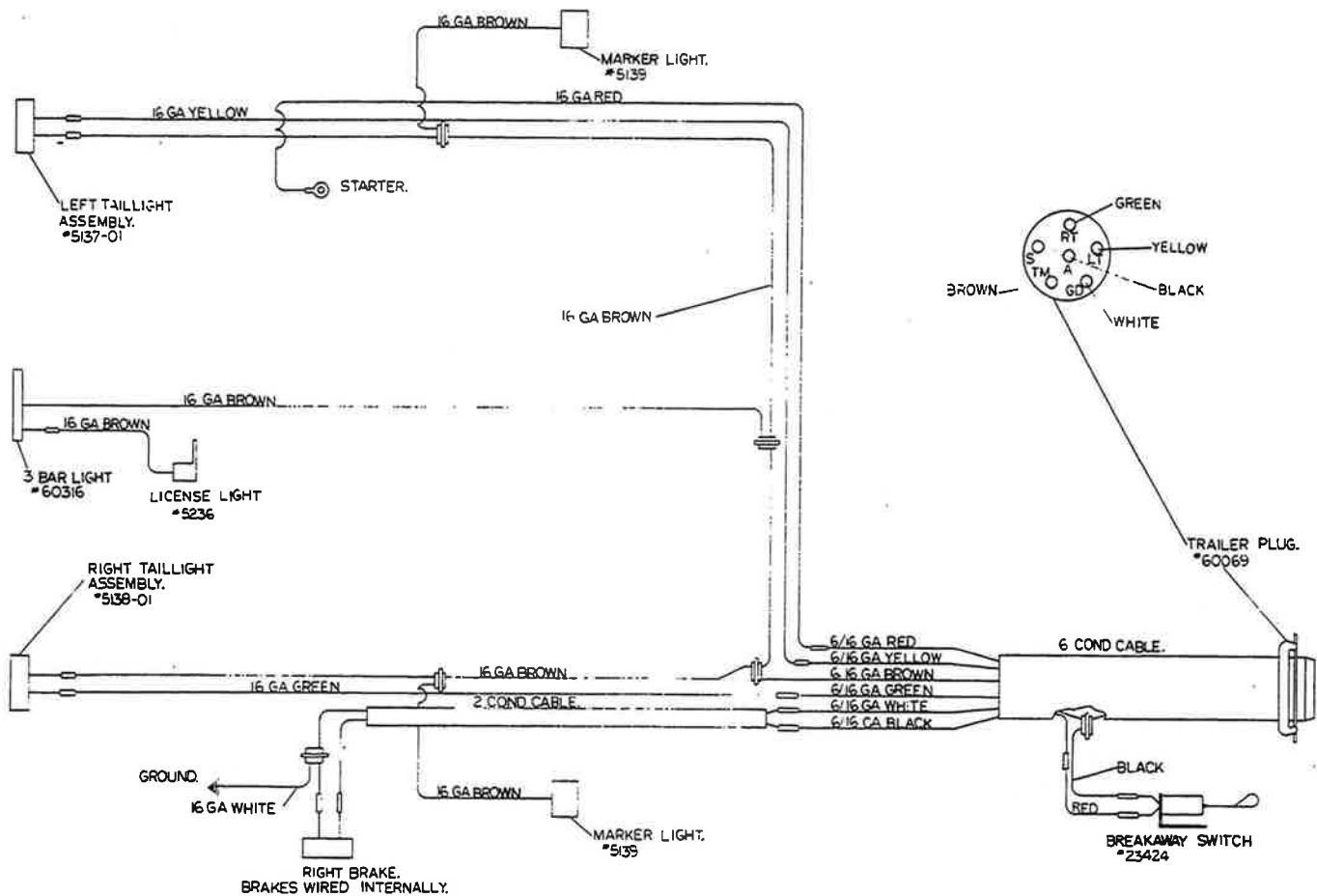
NOTE:(See page16for air intake and exhaust assemblies).

**WHEN ORDERING PARTS, BE SURE TO STATE
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AIR INTAKE AND EXHAUST

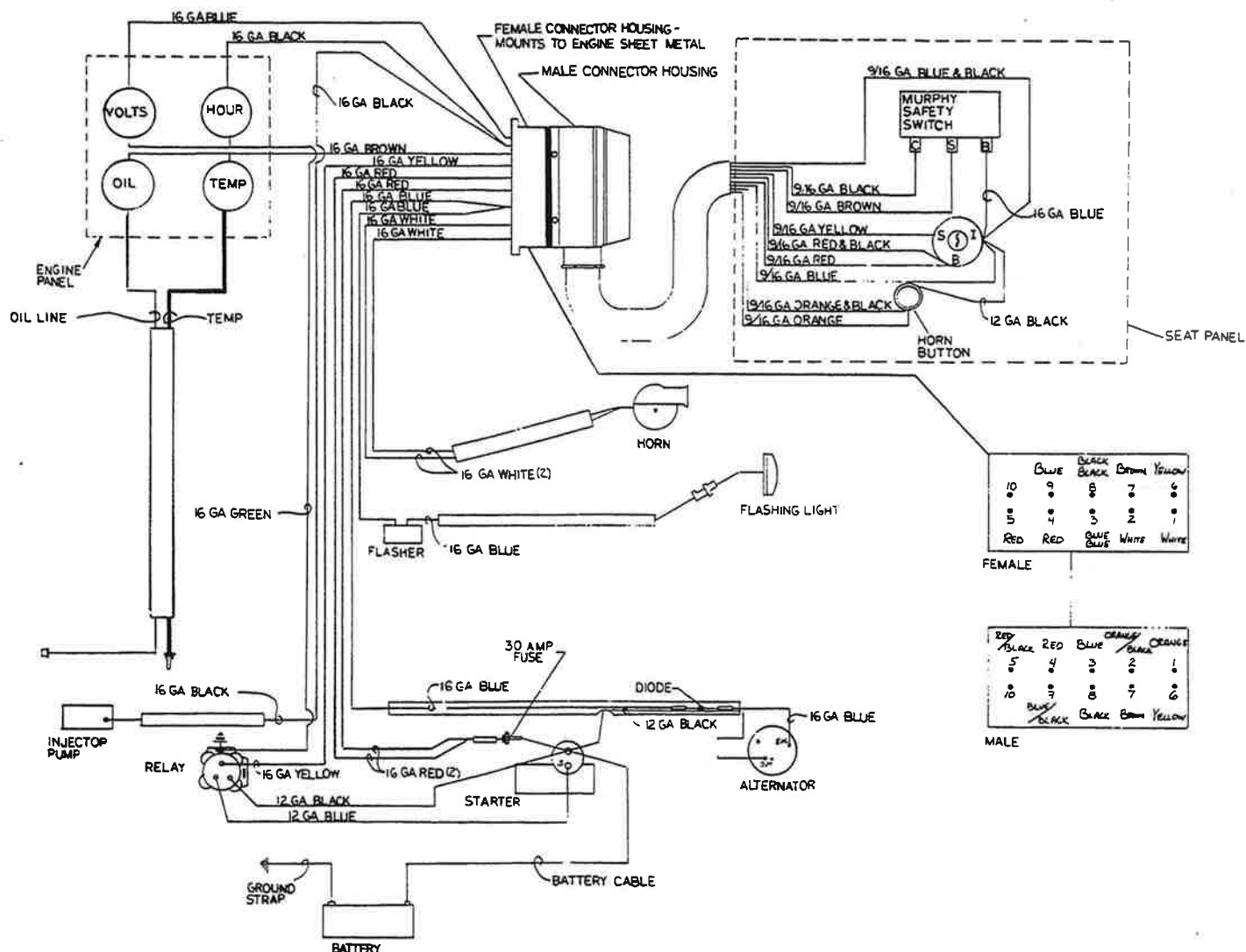
REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	022642	Air Cleaner Assembly	1
1A		022644 Primary Element	1
1B		022645 Safety Element	1
1C		022646 Vacuator Valve	1
1D	022647	Mounting Band	2
2	022643	Pre Cleaner Assembly	1
2A		DNP01-6548 Cover	1
2B		DNP01-6330 Bowl	1
2C		DNP01-6333 Sleeve	1
3	060325	Rubber Reducing Elbow	1
4	011852	Rubber Elbow	2
5	023581-01	Long Connecting Pipe	1
6	023581-04	Short Connecting Pipe	1
7	022657	Hose Clamp	6
8			1
8A		011873 Exhaust Flare	1
8B		023471 Exhaust Elbow	2
8C		022315 Muffler Clamp	2
8D		011874 V-Band Clamp (not shown)	1



TRAILER WIRING DIAGRAM

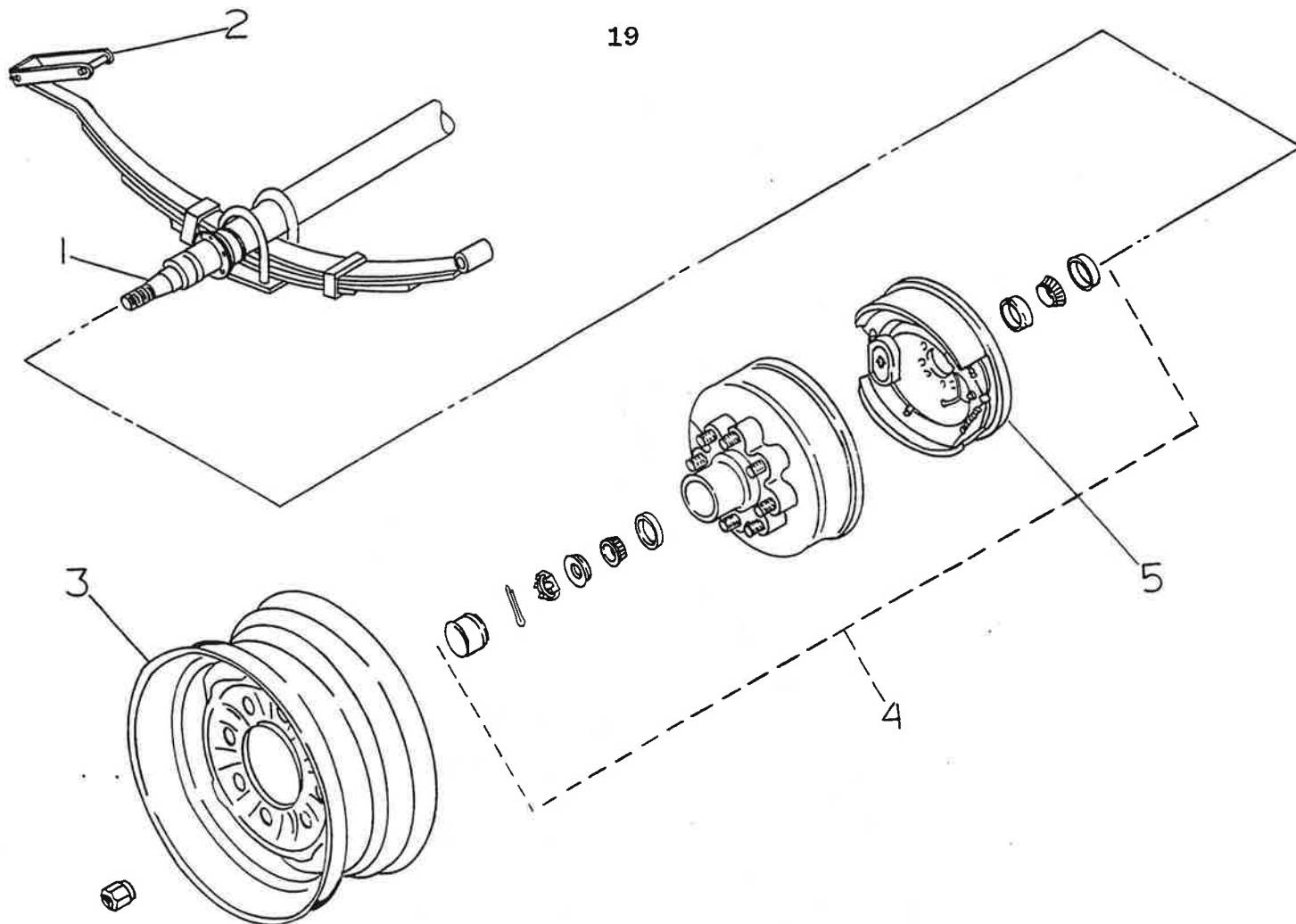
PART NO.	DESCRIPTION	NO. REQ'D
023635	Trailer Wiring Harness	1
060069	Plug and Receptacle	1
023424	Breakaway Switch	1
	030934-01 Chain	1
	005016 "S" Hook	1
	005017 Snap	1
005139	Marker Light	2
005138-01	Right Tailight Assembly	1
005137-01	Left Tailight Assembly	1
005236	License Light	1
060316	3 Bar Light	1

**WHEN ORDERING PARTS, BE SURE TO STATE
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ELECTRIC SYSTEM

PART NO.	DESCRIPTION	NO REQ'D
023641	Engine Wiring Harness	1
023640	Seat Wiring Harness	1
023653-01	Engine Panel Assembly	1
	007274 Hourmeter	1
	007706 Pressure Gauge	1
	007958 Voltmeter	1
	021839 Temperature Gauge	1
023653-02	Seat Panel Assembly	1
	020886 Horn Button	1
	022119 Magnetic Safety Switch	1
	022948 Ignition Switch	1
011851	Battery (12 volt)	1
023511	Alternator/Regulator	1
007336	Amber Warning Light	1
	007344 Amber Lens	1
021198	Warning Light Flasher	1
000241	Ground Strap	1
080096	Battery Cable	1
021838	Horn	1
	022161 Mount	1
022425	Bead Diode	1
170028	30 AMP Fuse & Holder	1
022891	Starter Solenoid Relay	1



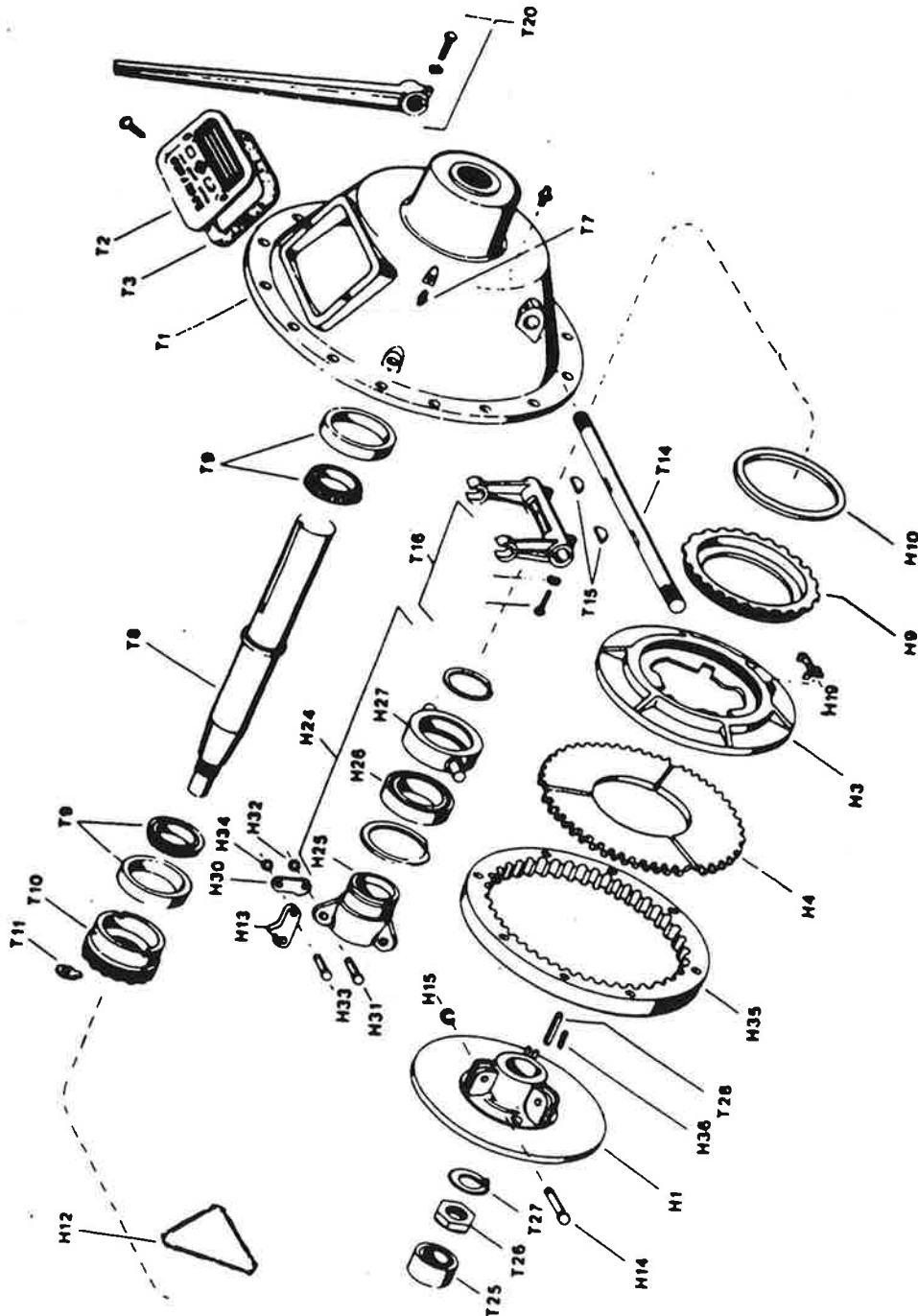
19

AXLE ASSEMBLY

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	023597	Axle	1
	023101	Spring	2
2	022440	Spring Shackle	2
	023104	U Bolts, Axle Mount	4
3	005057	Wheel	2
4	100232	Hub & Drum Assembly	2
		100163 Grease Seal	1 per
		100158 Inner Bearing	1 per
		100157 Inner Cup	1 per
		100229 Outer Cup	1 per
		100156 Outer Bearing	1 per
		100166 Grease Cap	1 per
		100230 Wheel Nut	8 per
		100231 Stud	8 per
		100159 Washer	1 per
		100160 Nut	1 per
5	WL23-181 Right Brake Assembly	ably	1
	022444	Electric controller (optional)	2
	005060	Tire	2
		004644 Valve Stem	2
	WL23-180 Left Brake Assembly		

**WHEN ORDERING PARTS, BE SURE TO STATE
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POWER TAKE-OFF ASSEMBLY



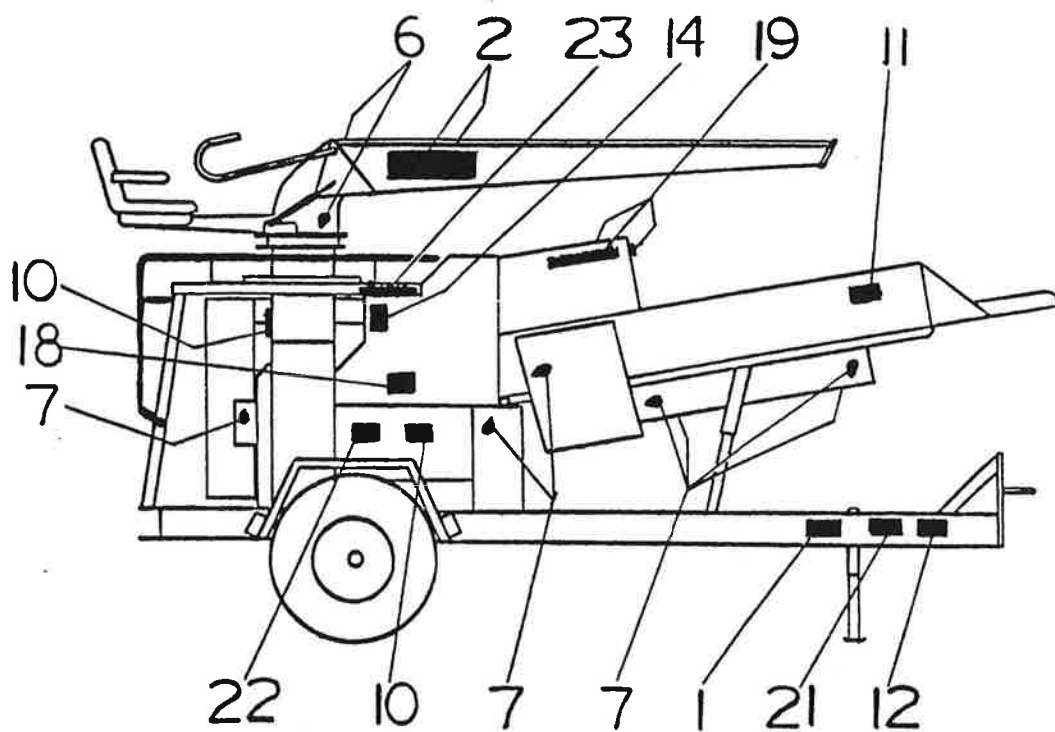
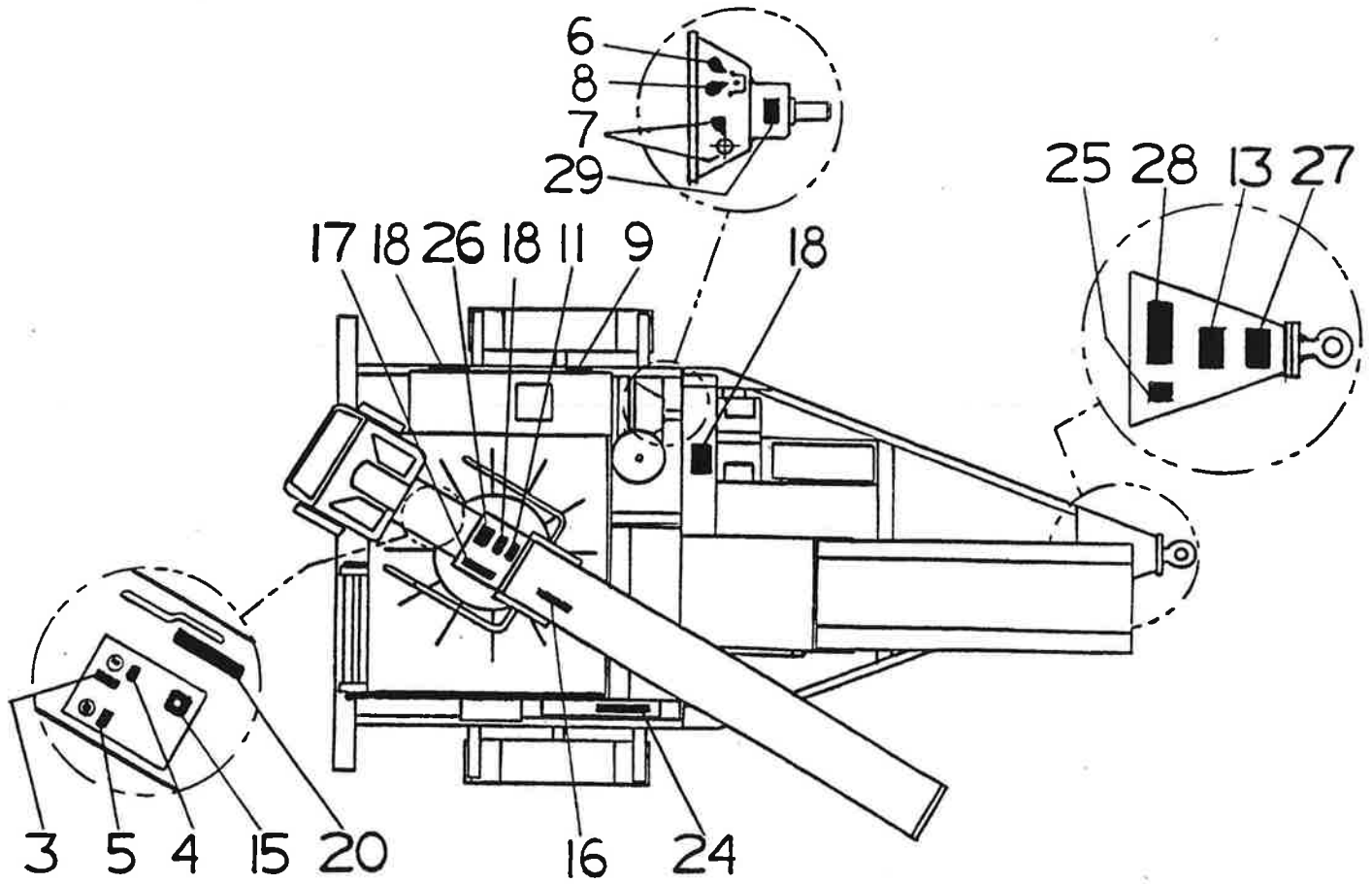
**WHEN ORDERING PARTS, BE SURE TO STATE
SERIAL NUMBER OF MACHINE**

POWER TAKE OFF ASSEMBLY

Ref No.	Part No.	Description	No. Req'd
	022816	Power Take Off	1
		Includes:	
H1	100011	Body, Clutch	1
H3	100028	Pressure Plate	1
H4	100004	Clutch Fac (3 segment)	1
H9	100013	Ring, Adjusting	1
H10	100032	Plate, Clutch Wear	1
H12	100026	Spring, Clutch	1
H13	100018	Lever, Clutch	3
H14	100010	Pivot Lever	3
H15	100007	Retaining	3
H19	100024	Lock, Adjusting	1
H24	100071	Release, Sleeve, & Bearing Assy	1
H25	100029	Sleeve, Release	1
H26	100031	Bearing, Release	1
H27	100030	Carrier, Bearing	1
H30	100019	Link, Connecting	6
H31, H33	100009	Pins, Link	6
H32, H34	100008	Ring, Retaining	6
H35	100003	Ring, Driving	1
H36	100017	Spring, Separator	3
All H's	100035	Clutch Assembly	1
T1	100304	Clutch Housing	1
T2	100063	Instruction Plate	1
T3	100054	Gasket, Cover	1
T7	100043	Fitting, Lubrication	1
T8	100053	Drive Shaft	1
T9	100052	Bearing Cup & Cone (394A-390)	2
T10	100048	Retainer Bearing	1
T11	100039	Lock, Retainer	1
T14	100040	Shaft, Yoke	1
T15	100305	Key, Woodruff	2
T16	100306	Yoke, Clutch	1
T20	010284	Lever, Shifting	1
T25	022314	Pilot Bearing	1
T26	100307	Nut, Drive Shaft	1
T27	100308	Lock Washer	1
T28	100061	Key, Clutch	1
T31	100224	Lube Fitting, Yoke Shaft	2

**WHEN ORDERING PARTS, BE SURE TO STATE
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DECALS AND LOCATION



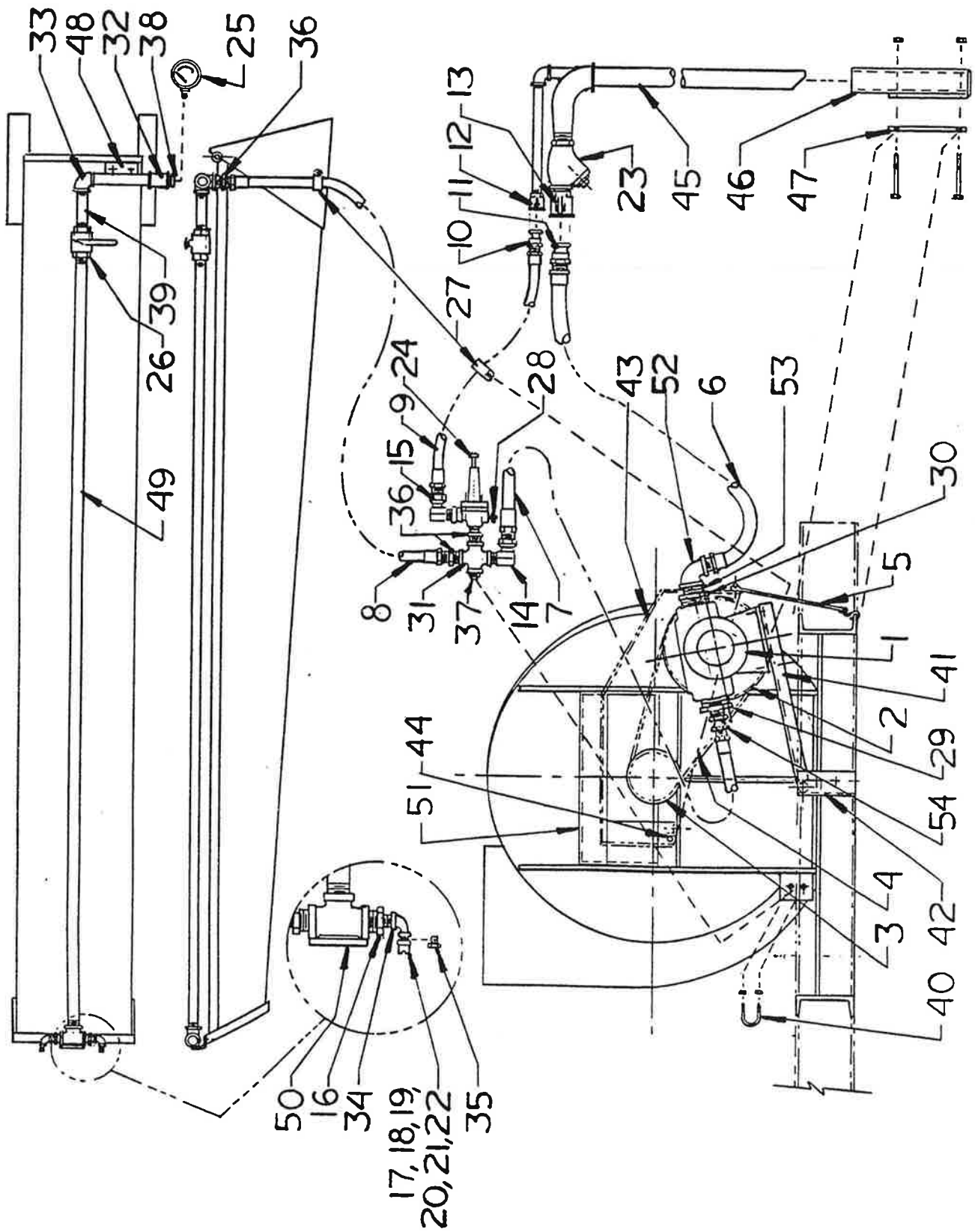
DECALS AND LOCATION

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	011690	Finn Name Plate	1
2	023174	"Finn" Decal	2
3	006870	Start	1
4	006870	IGN	1
5	006870	Horn	1
6	007230	Service Daily	3
7	007231	Service Weekly	3
8	007351	Hand Gun Only	1
9	007607	Drain Water Daily	1
10	020068	Danger: Do Not Open Door	2
11	020970	Caution: Do Not Ride	2
12	020976	Patent Infringement	1
13	021664	Caution: Do Not Tow	1
14	021665	Hydraulic Instructions	1
15	022082	Hold Button In	1
16	022198	Adhesive (if machine has adhesive option)	1
17	022199	Throttle	1
18	022357	Important: Turn Off Engine	4
19	022690	Caution: Wear Eye Protection	3
20	023247	Power Feed	1
21	023286	Protected by Patents	1
22	023389	Notice: For More Material Flow	1
23	023390	Hydraulic Oil Only	1
24	023391	Diesel Fuel Only	1
25	023423	Warning: Breakaway Switch	1
26	023519	Caution: Eye Protection	1
27	031227	Caution: Always Inspect Hitch	1
28	031228	Caution: Safety Chain Installation	1
29	031297	Important; Clutch Adjustment	1

NOTE: Note: Safety Decals must be purchased as a kit
 Part # 023881 reference
 numbers 3 through 29

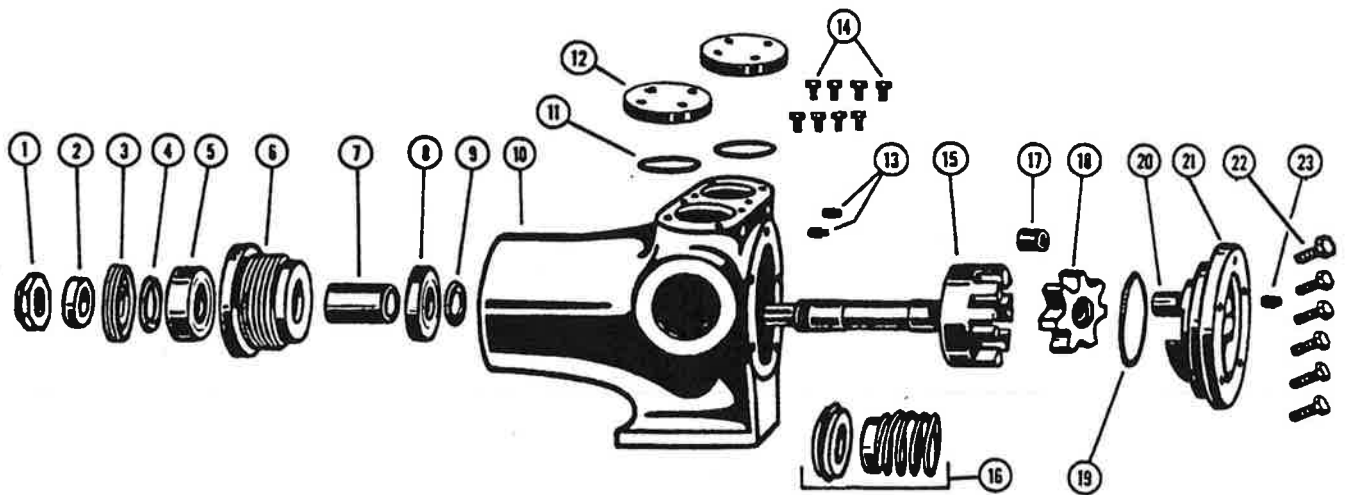
**WHEN ORDERING PARTS, BE SURE TO STATE
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ADHESIVE SYSTEM



ADHESIVE SYSTEM

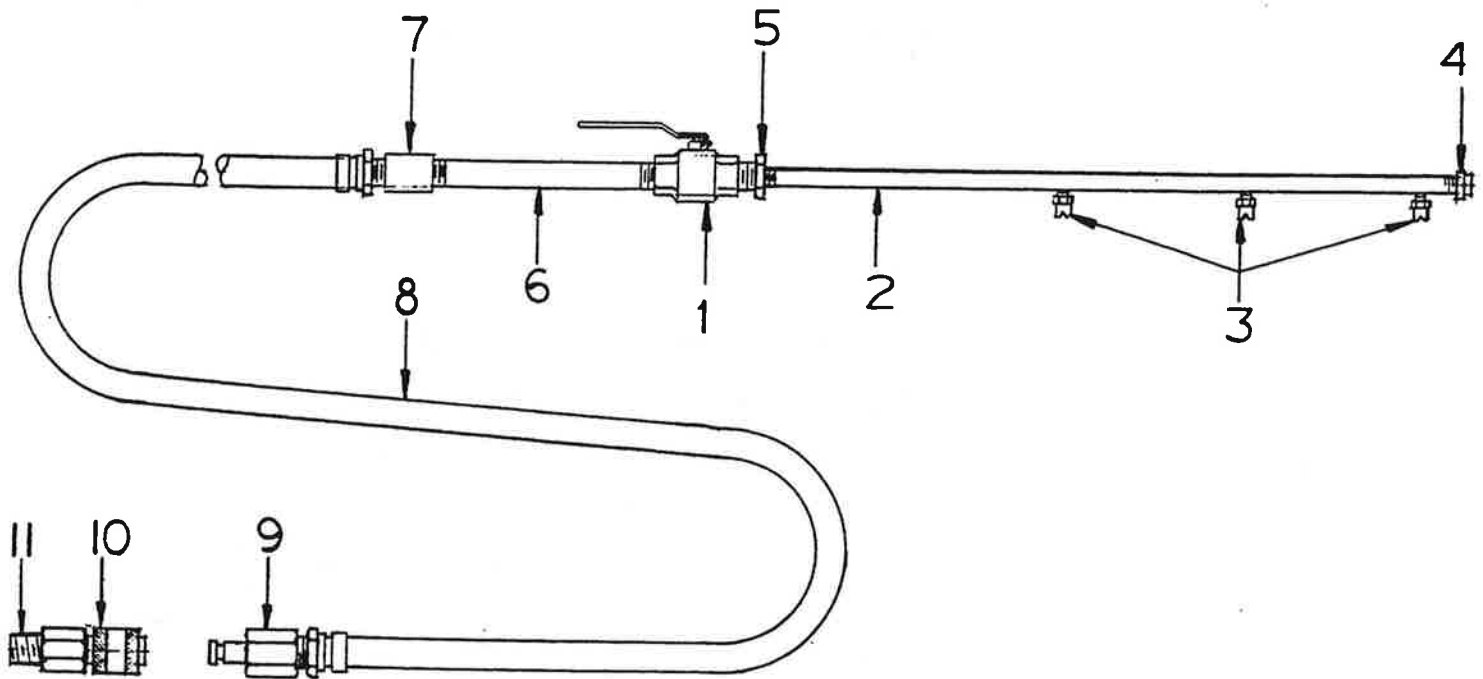
REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	023661	Pump Assembly	1
2	022978	Sheave	1
		020813B Bushing	1
3	021507	Sheave	1
		021363 Bushing	1
4	023670	Drive Belts (set of 2)	1
5	007913	Rubber Strap w/Hook	1
6	023671	Suction Hose	1
7	023292	Pressure Hose	1
8	023672	Discharge Hose	1
9	021615	Return Hose	1
10	023444	Coupling Adapter	1
11	002158	Coupling Adapter	1
12	023445	Coupler	1
13	001207	Coupler	1
14	070465	90 deg Adapter Union	1
15	023063	90 deg Adapter Union	1
16	023673	Reducer Nipple	2
17	021225	3/8" -15 Nozzle	2
18	021224	3/8" 12 Nozzle	2
19	000660F	1/4" -1560 Nozzle	2
20	000660E	1/4" -1540 Nozzle	2
21	000660C	1/4" -1520 Nozzle	2
22	000660A	1/4" -1506 Nozzle	2
23	020745	Strainer	1
24	000876	Relief Valve	1
		020286 Body	1
		020287 Diaphragm	1
		020376 Disk	1
25	000262	Pressure Gauge	1
26	021559	Valve	1
27	008330	Clamp	2
28	000575	Drain Cock	1
29	160766	Reducer Bushing	1
30	160768	Reducer Bushing	1
31	160274	Pipe Cross	1
32	160214	Pipe Tee	1
33	160010	Pipe Elbow	1
34	160106	Reducer Elbow	2
35	160733	Reducer Bushing	8
36	160745	Reducer Bushing	3
37	160240	Pipe Plug	1
38	160706	Reducer Bushing	1
39	160490	Pipe Nipple	1
40	023643	U Bolt	1
41	023663-07	Pump Base	1
		023088 Plastic Bushing	2
42	023663-06	Pivot Shaft, Base	1
43	023416-02	Belt Guard	1
44	023663-08	Hinge Pin, Guard	1
45	021695	Sucker w/Strainer & Coupler	1
46	023675-01	Sucker Support	1
47	023674-02	Support Mounting Plate	1
48	023669-01	Manifold	1
49	023669-08	Valve Pipe	1
50	023669-02	Nozzle Tee	1
51	023416-01	Bearing Guard	1
52	160014	Pipe Elbow	1
53	160309	Close Nipple	1
54	021802	Straight Adapter Union	1



#023661 ADHESIVE PUMP ASSEMBLY

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	023661-01	Locknut	1
2	023661-02	Bearing Spacer Collar	1
3	023661-03	End Cap, Bearing Housing	1
4	023661-04	Lip Seal, Bearing Housing	1
5	023661-05	Ball Bearing, Outer	1
6	023661-06	Bearing Housing	1
7	023661-07	Bearing Spacer	1
8	023661-08	Ball Bearing, Inner	1
9	023661-09	Bearing Retainer Washer	1
10	023661-10	Casing	1
11	023661-11	Gasket, Relief Ports	2
12	023661-12	Cap, Relief Ports	2
13	023661-13	Pipe Plug	2
14	023661-14	Capscrew, Relief Ports	8
15	023661-15	Rotor and Shaft	1
16	023661-16	Mechanical Seal	1
17	023661-17	Idler Bushing	1
18	023661-18	Idler and Bushing	1
19	023661-19	Head Gasket	1
20	023661-20	Idler Pin	1
21	023661-21	Head and Idler Pin	1
22	023661-22	Capscrew, Head	6
23	023661-23	Pipe Plug	1

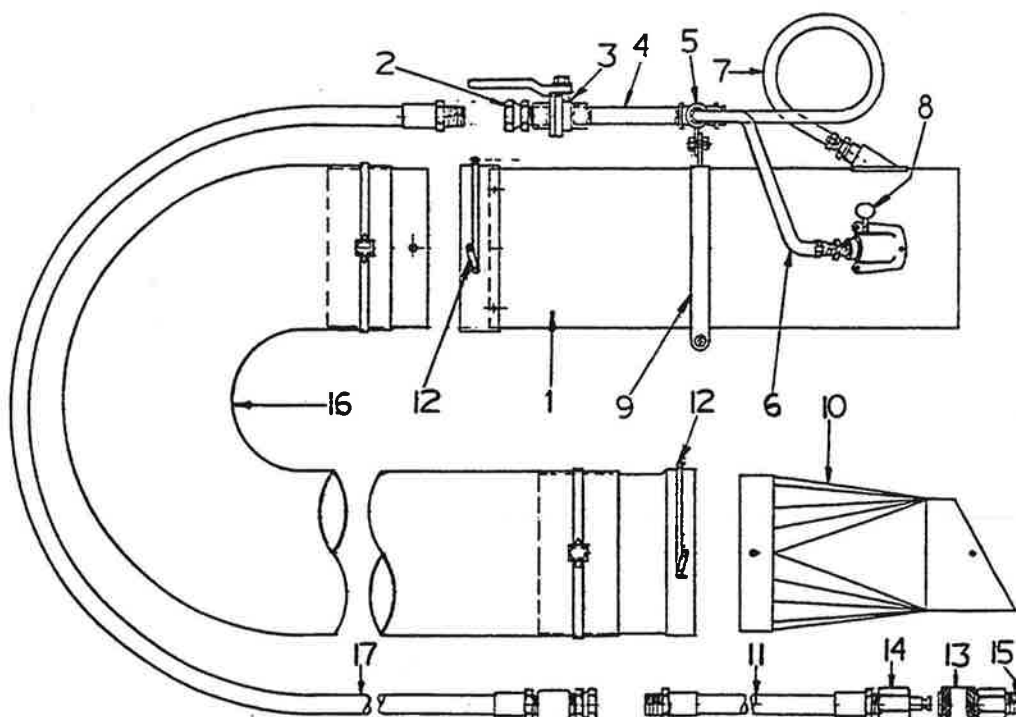
**WHEN ORDERING PARTS, BE SURE TO STATE
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#000659 SPRAYBAR ATTACHMENT

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	021284	Ball Valve	1
2	000721	Aluminum Tube	1
3	000660B	Spray Nozzle	3
4	160259	Pipe Cap	1
5	160740	Reducer Bushing	1
6	160478	Pipe Nipple	1
7	160168	Pipe Coupling	1
8	000755	Hose Assembly	1
9	023103M	Male Quick Coupler	1
10	023103F	Female Quick Coupler	1
11	160303	Close Nipple	1

**WHEN ORDERING PARTS, BE SURE TO STATE
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#021490 MULCH DISCHARGE EXTENSION
with Valve and Bridle Assembly

REF NO.	PART NO.	DESCRIPTION	NO. REQ'D
1	020293	Tip Assembly	1
2		000668 Adapter Fitting	1
3		021284 Valve	1
4		160466 Pipe Nipple	1
5		021614 Discharge Manifold	1
6		020935 Hose, Side	2
7		020934 Hose, Top	1
8		000974 Thumb Screw	3
9		020653 Mounting Band	1
10	023662	Adapter, Flexible Hose	1
11	020294	Hose, Asphalt Supply	1
12	021776	Clamp, Spring	1
13	023103F	Coupling, Female	1
14	023103M	Coupling, Male	1
15	160303	Close Nipple	1
16*	020292	Hose, 50 FT. Flexible	1
17*	000754	Hose, 50 FT. Adhesive Supply	1
12*	021776	Clamp, Spring	1

*NOTE: These parts make up the mulch discharge
insert assembly #021491

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TOOL KIT
(Not Illustrated)

Part No.	DESCRIPTION	NO. REQ'D
021375	Grease Gun w/021741 Hose	1
020365	Grease Cartridge	1
008204	Paint, Touch Up	1
020057	Twine Cutter	2
	Engine Parts Manual	1
	Engine Operators Manual	1
	Mulch Spreader Parts Manual	1
	Mulch Spreader Operators Manual	1

ADHESIVE ONLY

023670	Belts, Pump Drive	2
000660A	Nozzle, 1/4" -1506	2
000660C	Nozzle, 1/4" -1520	2
000660E	Nozzle, 1/4" -1540	2
000660F	Nozzle, 1/4" -1560	2
021224	Nozzle, 3/8" -12	2
021225	Nozzle, 3/8" -15	2
160733	Bushings, for 1/4" Nozzles	8

**WHEN ORDERING PARTS, BE SURE TO STATE
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RECOMMENDED SPARE PARTS AND REPAIR KITS

Recommended spare parts are available to help avoid unnecessary down time. Repair kits are available to recondition parts which periodically need service.

RECOMMENDED SPARE PARTS

PART NO.	DESCRIPTION	NO REQ'D
022644	Air Cleaner, Primary	1
022645	Air Cleaner, Safety	1
JDAR50041	Filter, Fuel	1
JDT19044	Filter, Oil	1
JDH79235	Belts, Fan (Set of 2)	1
020111	Chains w/020119 Pins	4
020110	Chains, w/020119 Pins	2
023363	Chains, w/020119 Pins	2
020686	Links, Feed Chain	3
020687	Links, Feed Chain w/attachment	3

ADHESIVE ONLY

023670	Belts, Pump (set of 2)	1
021807	Coupler Gasket, Return	2
006515	Coupler Gasket, Suction	2
020287	Diaphragm, Relief Valve	1
020286	Body, Relief Valve	1

REPAIR KITS

023120	Seal Kit for 008293 Hydraulic Valve
023677	Seal Kit for 023599 Hydraulic Motor
023678	Seal Kit for 023606 Hydraulic Pump

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