FINN®
CORPORATION

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B-70

Mulch Spreader

Parts and Operator's Manual

Model **RUA** Serial No. _____

WARRANTY

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, hose, batteries, magnetos, carburetors, engines or like or unlike equipment or accessories), such being subject to the warranty, if any, provided by their respective manufactures; or (b) secondhand, used, altered, or rebuilt machines. Further, the warranty herein expressed shall be rendered null and void to the extent any defect or failure of the products warranted hereby arises out of or is caused by accessories or component parts not manufactured or supplied by Finn, whether same are supplied by Purchaser, dealers or any other party. 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 OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Upon notification of Finn during the above-stated warranty period of any failure to conform to this warranty, and upon inspection by Finn to verify said nonconformity and 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 PART BENEFICIARY OF A SURVIVING WARRANTY UNDER THE LAW OF ANY JURISDICTION.

NOTICE

FINN CORPORATION URGES THE USE OF ONLY FINN CORPORATION SUPPLIED PARTS AND ATTACHMENTS TO ASSURE PROPER PERFORMANCE AND SAFE OPERATION OF FINN CORPORATION EQUIPMENT. INSIST ON PARTS AND ATTACHMENTS MANUFACTURED OR SUPPLIED BY FINN CORPORATION WHEN YOU PURCHASE, REPAIR OR REPLACE YOUR FINN EQUIPMENT AND ATTACHMENTS.

BECAUSE FINN CORPORATION CANNOT ASSURE THAT PARTS AND ATTACHMENTS NOT MANUFACTURED OR SUPPLIED BY FINN MEET FINN CORPORATION'S QUALITY STANDARDS, SPECIFICATIONS, OR OPERATING REQUIREMENTS, OUR WARRANTY IS NOT EFFECTIVE TO THE EXTENT ANY FAILURE OF OR DEFECT IN A FINN CORPORATION PRODUCT ARISES FROM OR IS CAUSED BY PARTS, ATTACHMENTS OR COMPONENTS NOT ORIGINATING WITH FINN CORPORATION. USE OF FINN CORPORATION EQUIPMENT WITH PARTS AND ATTACHMENTS NOT MANUFACTURED OR SUPPLIED BY FINN COULD RESULT IN PERSONAL INJURY.

Effective December 8, 1995

CALIFORNIA

Proposition 65 Warning

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

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SAFETY FIRST

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

Finn Corporation encourages you and your employees to familiarize yourselves with your new equipment and 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

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P/N 12304

Finn Corporation

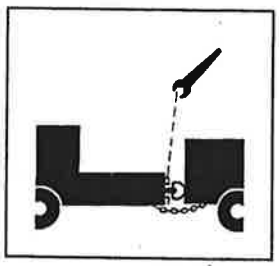
MULCH SPREADER SAFETY SUMMARY SECTION

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 MULCH SPREADER is intended to be used as an applicator of vegetative hay or straw mulches onto the seedbed. Its use with other products or for other applications must be by approval of the product's manufacturer. If there are any questions contact FINN Corporation at 1-800-543-7166.

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

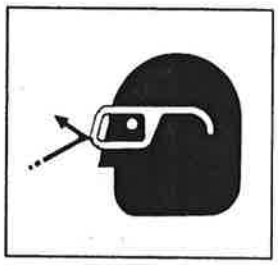
1. Check hitch and hitch bolts, safety chains, lights, brakes and breakaway switch. Verify that the hitch ball is the correct size for the coupler.



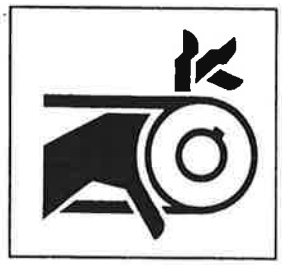
2. Check that all guard railing is in place and secure.
3. Verify that all guards are in place.
4. By carefully looking in the shredder box, inspect the shredder box for foreign objects.
5. With the ignition switch on, verify that the signal horn is operating correctly.
6. Make sure no one is working on or inside the machine. Signal "All Clear" before starting the engine.

II. MACHINE OPERATION:

1. Always wear safety goggles when operating or feeding 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 jobsite requirements. Remove rings, watches, etc. Avoid loose fitting clothing that may get caught in rotating machinery.



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



3. Make sure the discharge spray area is clear of all persons, animals, etc.

4. The driver of the carrying or towing vehicle is responsible for the safety of the operator(s) and feeder(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 tree limbs, low power lines, etc. Vehicles on which equipment is mounted or towed must be started or stopped gradually. Avoid abrupt starts and stops. Never operate on a slope or a hill that may endanger the operator(s). All personnel should review and be familiar with start/stop signals between the driver and operator(s) before operation of the equipment.

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

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

7. 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.

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

9. Use proper means for mounting and dismounting of machine. Never mount or dismount a moving machine.

10. Do not aim discharge at people, animals, etc. Only aim the discharge at the intended seedbed.

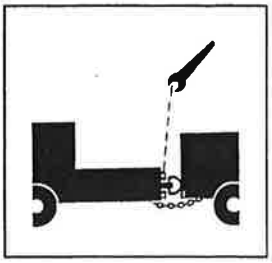
11. Do not open any doors or access panels while machine is in operation. Severe injury may result from rotating parts.

12. Do not attempt to pull anything out of the feed chute or shredder box when machine is in operation. Shut down the engine, using OSHA lockout/tagout procedure (29CFR 1910.147) before removing any foreign objects. Signal "All Clear" before restarting the machine.

III. MAINTENANCE:

1. Before servicing the machine, turn off engine and allow all moving parts to stop. Disconnect the battery cables to prevent accidental starting of the machine. Tag the engine operating area to show that the machine is being serviced. Use lockout/tagout procedure (29 CFR 1910.147).

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



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

4. Battery maintenance. Lead-acid batteries contain sulfuric acid which damage eyes or 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 gases. Keep arcs, sparks, flames, and lighted tobacco away.

5. 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 used fluids and dispose of them properly.

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

7. 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.

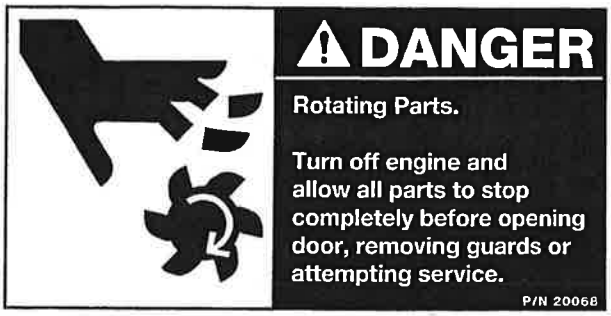
8. Diesel fuel under pressure can penetrate the skin or eyes and cause injury, blindness or death.

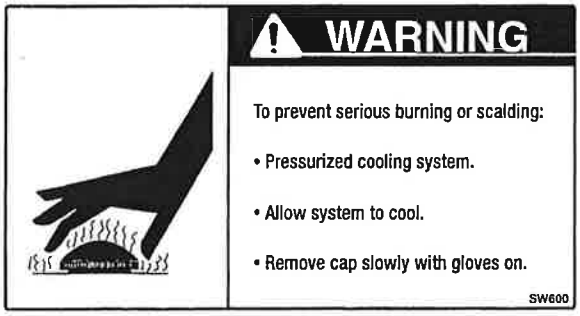
9. Make certain that all decals on the machine are maintained in good legible condition. Replacement decals are available through FINN Corporation by specifying the part number shown in the lower right hand corner of the decal. See page 5 for the current set of safety decals mounted on the unit. See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

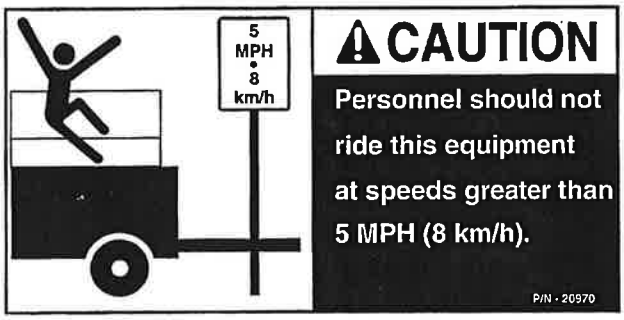
ASPHALT SYSTEM:

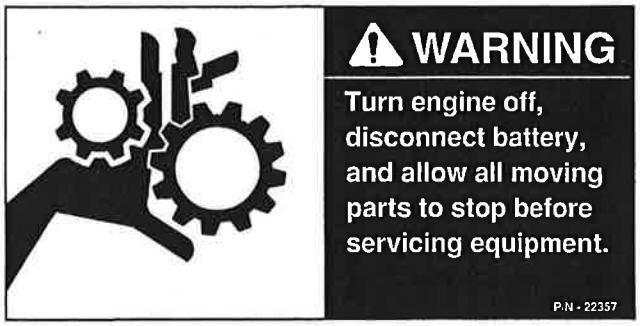
1. Clean the adhesive with fuel oil or kerosene. DO NOT USE GASOLINE. Collect all fluids and dispose of properly according to local codes.

CURRENT SET OF SAFETY DECALS









OPERATION AND MAINTENANCE MANUAL FOR THE B-70 MULCH SPREADER

This manual is designed for step by step instructions of the operation, care, and maintenance of the B-70 Mulch Spreader and, in addition, it contains illustration and descriptions of a complete list of parts and components for easy identification. 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 MULCHING:

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

THE FINN B-70 MULCH SPREADER AND HOW IT WORKS:

The Finn B-70 Mulch Spreader will apply vegetative mulch at a fast and uniform rate (with the specified amount of adhesive material, if so desired) utilizing a minimum amount of manpower.

The baled vegetative mulch material is placed on the feed chute and separated by the bale feeder as he feeds these bales into the shredder housing. In the shredder housing a combination of beater chains and air currents separates the mulch into individual fibers, which are drawn into the blower housing and blown through the discharge assembly onto the seedbed.

TOWING VEHICLE:

The truck used to tow the Finn B-70 Mulch Spreader should have a bed large enough to carry the quantity of mulch needed for economical operation. The truck must be equipped with a ball or pintle type hitch to tow the Mulch Spreader. This hitch should be mounted as near to the end of the truck bed as possible. Use a 2" ball rated 6000 lbs. (2721 kg). The tow vehicle must be able to support 600 lbs. (272 kg) down on its hitch.

ATTACHMENTS:

HAND HELD ASPHALT SPRAYBAR

The asphalt spray bar is used to spray emulsion independently of the built in system. The 50' hose connects to the asphalt system by a quick coupling that is plugged in 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.

LOADING BALES:

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 layer of bales "lengthwise" on the truck. The second layer of bales should be placed "crosswise". Alternate successive layers lengthwise and crosswise in order to secure the load.

Leave enough room at the rear of the truck bed for the bale handler to stand.

PRE-START CHECK:

Safety check to insure operator safety:

1. A. Skid Unit - Check condition of all mounting hardware securing the Mulch Spreader to the truck bed.
   B. Trailer Unit - Inspect hitch, safety chains, lights, brakes and breakaway switch.
2. Check the signal horn for proper operation.
3. Inspect that all railings are in place and secure.
4. Insure that all guards are in place.

EQUIPMENT CHECK:

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

1. Tool kit - see that it contains all prescribed items (see tool kit list page 43).
2. Check shredder box for foreign objects that could damage the equipment or injure workers.
3. Check fuel tank. Use 2-D diesel fuel oil. If operating at ambient temperature below 40°F (4°C) or at an altitude exceeding 5000 feet (1524m) use No. 1-D fuel oil.
4. Check engine oil - refer to engine operator's manual.

5. Check liquid level in radiator and overflow tank.
6. Inspect air cleaner for dust and dirt - refer to engine operator's manual.
7. Engage and disengage clutch to determine if it "snaps" in and out of engagement.
8. Check beater chains and their mounting pins for damage or wear. Replace if necessary.
9. Lubricate equipment - use hand gun only (see lube chart page 13).
10. When not using an adhesive, remove the belt that drives the asphalt pump (running the pump dry will permanently damage it).

STARTING PROCEDURE:

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

1. Disengage the clutch.
2. Set throttle about ¼ open.
3. Turn key counter clockwise and hold until the glow plug indicator light goes out.
4. While holding in the safety switch button, turn the key clockwise until the starter engages, and the engine starts.
5. Continue to hold safety switch in for approximately 10 seconds. Allow the engine to warm up for 3 to 5 minutes.

NOTE: This engine has a safety system that will shut the engine off if the engine oil pressure drops below 7 psi. or if the water temperature reaches 230° Fahrenheit (110° Centigrade).

6. With the engine still idling, engage the clutch slowly. Move the throttle to wide-open position and let the governor control the engine speed.

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 Handler operates from the truck bed and supplies the feeder with bales of mulch material, cut side up.
3. The Bale Feeder cuts and disposes of the twine or wire; separates the bale in 1½" to 2" bats and feeds those into the shredder box allowing about a 10" space between bats. Uniform feeding assures fast separation and more uniform application.

4. The Truck Driver follows the directions of the operator 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.

BLOWER DISCHARGE:

The B-70 Mulch Spreader should be towed to a point approximately 30 ft (9 m) from the area where the mulch is to be applied. The operator elevates the discharge spout about 10° 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 persons, or at the towing vehicle. Use the engine throttle to control the distance of the mulch.

Except for the side feed model the shredder box cover (see page 27 for picture) has two positions. The lower position directs material more quickly to the blower blade and provides higher capacity with bright straw. The upper position is better for most hay materials since it retains the material in the shredder box longer for more even distribution. The unit is shipped with the cover in the lower position.

Your B-70 Mulch Spreader has a beater roll on the extended blower shaft. Mounted on this beater roll are four beater chains installed opposite each other. This arrangement will work well for most materials. If a longer discharged fiber length is desired, remove two opposite chains.

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

If any obstruction stops the flow of mulch, immediately disengage clutch and shut off engine. Do not reach into the beater box or attempt any adjustment until the engine and all rotating parts have stopped. When the obstruction has been removed, the motor can be restarted and mulch application can continue.

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

ASPHALT EMULSION SYSTEM:

The Finn B-70 Mulch Spreader is 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 B-70 Mulch Spreader consists of:

1. A suction pipe with screen.
2. A pump which draws the adhesive from the drum carried on the Mulch Spreader.
3. A valve to control the flow of adhesive.
4. A tube which carries the adhesive to the end of the 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, 70-80 psi (4.9-5.6 kg/cm^2).

A. OPERATION INSTRUCTIONS:

1. Mount the asphalt drum in the rack and secure with tension binder.
2. Remove the plug from the top of asphalt drum and insert the suction assembly into the drum.
3. Install the drive belt on the asphalt pump and snug the belt with the tension adjustment bolt.
4. Install the nozzle in the fitting at the end of the discharge spout. See "Nozzle Selection" page 11. Close the asphalt valve.
5. Start the engine and let it warm up at an idle speed. The with the engine still idling, engage the clutch slowly.

Read the asphalt pressure gauge on the discharge spout. At this time you should have a pressure reading on the liquid pressure gauge of approximately 35 lbs. If the gauge shows no pressure, turn off the engine and prime pump by pouring some liquid into the barrel suction tube. After priming, again start the engine and check the pressure reading on the gauge. Open the asphalt valve momentarily to check spray pattern produced by the nozzle, be careful where the tube is aimed.

With the asphalt system ready for operation, move the throttle to wide-open position, and you are now ready to start operation.

When using adhesive, the operator keeps the valve handle in the "on" position when mulch material is being applied. As soon as mulching operations have stopped or the mulch flow is temporarily interrupted, turn the adhesive handle to the "off" position.

B. NOZZLE SELECTION:

From the three nozzles provided, select the one that will deliver the gallonage required. Install the nozzle in the holder 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 adhesive it will spray.

The nozzles spray at the following rates:

NOZZLE NO.	GALLONS PER MINUTE
2530	3
2560	6
25100	10

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

Tons per hour X gallons per ton required = Gallons per hour.

Tons per hour is determined by the quality of the mulch material.

The gallons per hour required is determined by the specifications for the particular job; normally this is around 100 gallons per ton.

EXAMPLE:

Assuming the mulch is of average quality; we assume you can blow 2 tons per hour. Assuming also your specifications read 100 gallons of adhesive per ton; then the formula looks as follows:

2 (tons per hour) X 100 (gallons per ton) = 200 Gallons per hour.

$$\frac{\text{200 Gallons per hour}}{\text{60minutes/hour}} = \text{3 GPM approx. (use nozzle No. 2530)}$$

C. ASPHALT SYSTEM CLEANING:

If the liquid asphalt emulsion stops flowing and the supply drum still holds material, the stoppage is in the strainer on the barrel sucker. Remove and clean strainer so that the flow of asphalt may resume.

Since the asphalt emulsion sets when exposed to air, the lines and nozzle 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 bucket of environmental friendly cleaning solution.

DANGER: Do not use gasoline when cleaning the asphalt system.

2. Engage the clutch, open the throttle halfway and move the asphalt valve handle to discharge until a clear 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 by-pass system to cleaned.

4. Disengage clutch and shut-off the engine. Remove barrel suction assembly from the cleaning solution and insert it in the holder in the frame.
5. Remove the pump drive belt. Pump will be permanently damaged if it is run without liquid being pumped.

CLEANING AND MAINTENANCE:

AFTER FIRST 4 - 8 HOURS OPERATION:

1. Check and adjust clutch - see page 14.
2. Retorque wheel lugs - again after 7 days. (Trailer option only).

DAILY CLEAN-UP MAINTENANCE:

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

1. Clean the air cleaner following the instructions in the engine operator's manual.
2. Check air cleaner connections. If they come loose or disconnected, warranty on your engine is subject to cancellation.
3. Clean the radiator and radiator guard with tap water.
4. Clean the beater chains, making sure to remove all twine, wire, and other foreign objects. Check pins and nuts.
5. Lock the discharge tube into place.
6. Check engine oil level.
7. Check hitch bolts and safety chains.
8. Remove asphalt emulsion strainer screen. Clean and re-install.
9. If the asphalt emulsion system has been used, the cleaning procedure previously described should be followed.

WEEKLY MAINTENANCE:

After each 50 hours of operation, follow this procedure:

1. Change engine oil, following engine manufacturer's recommendations after the first 50 hours and then every 200 hours.
2. Change the engine oil filter cartridge with every oil change (once every 200 hours).
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 35 pounds.
5. Check clutch adjustment to insure that it "snaps" in and out of engagement.

CAUTION: Adjust only while engine is off.

LUBRICATION AND FLUIDS CHART

Ref. No.	Location	Lubricant	Frequency	Number
1.	Grease drive shaft bearings	CL	Weekly	2
2.	Repack wheel bearings	CL	Annually	2
3.	Check engine oil level	MO	Daily	1
4.	Check air cleaner	MO	Daily	1
5.	Change engine oil & filter	MO	See Eng. Manual	1
6.	Grease clutch shaft bearings	CL	Daily	1
7.	Grease clutch lever bearing	CL	Daily	1
8.	Change engine coolant	AF	Seasonally	1
9.	Check fuel tank level	DF	Daily	1
10.	Check engine coolant	AF	Daily	1

LUBRICANT OF FLUID USED

CL	Chassis Lubricant
MO	Motor oil SAE 30 CD/SF
AF	50/50 Anti-freeze and water mixture
DF	Diesel Fuel

TIME KEY

DAILY

WEEKLY

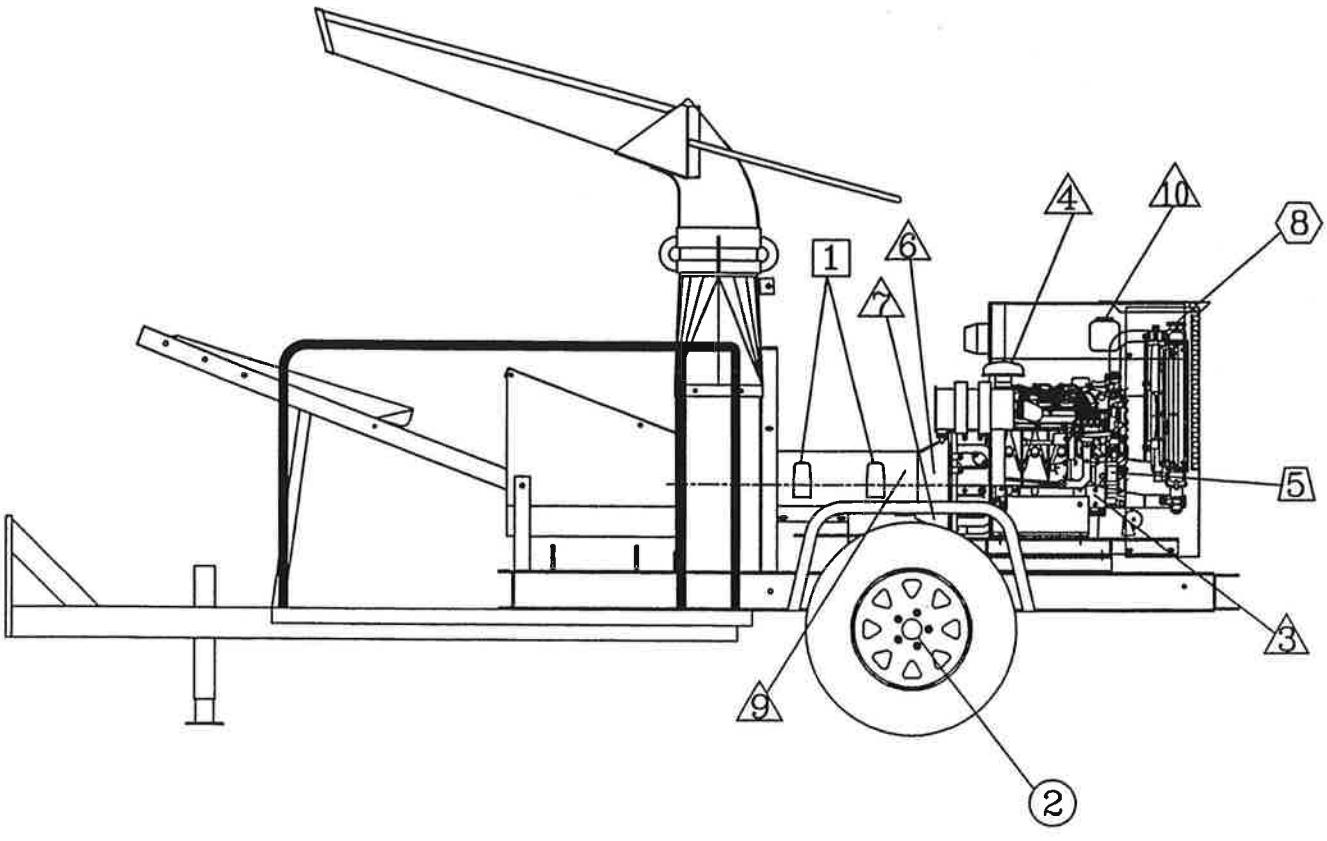
SEASONALLY (OR 500 HOURS)

ANNUALLY

SEE ENGINE MANUAL

FLUID CAPACITIES

Fuel - 13.5 gallons
Engine Oil - See engine manual
Engine coolant - (50/50 anti-freeze and water mixture)
4 gallons



CARE AND OPERATION OF 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.

CLUTCH ADJUSTMENT PROCEDURE:

Rockford power take-offs with HE clutches described in this manual do not automatically adjust to compensate for wear of the clutch facing(s). The operator must periodically adjust the clutch to ensure correct clutch operation.

The clutch should be adjusted if the force required to engage the clutch drops by 10-15% of the specified engagement force (see the table below). Clutch engagement force should be continually monitored so proper clutch adjustment is maintained. Destructive damage may have already occurred if engagement force is allowed to diminish to the point where the clutch fails to carry the load (slippage), if facing(s) have overheated, of if the clutch self-disengages (normally a result of improper clutch engagement).

Clutch Size	Reference Handle Length	Pressure at Lever
6-1/2"	35"	18-23#

NOTE: New clutches or new facings usually require several, frequent adjustments until the friction facing surfaces have "worn in". The clutch friction facing will become glazed, and possibly permanently damaged if the clutch is permitted to slip excessively.

ADJUST THE CLUTCH:

Remove the PTO nameplate, disengage the clutch and rotate it to gain access to the adjusting ring lock.

Remove the lock bolt and adjustment lock.

Rotate the adjusting ring counter-clockwise to tighten the clutch. Rotating the adjusting ring clockwise will loosen the clutch. Adjust to obtain the proper clutch handle engagement force.

When clutch is properly adjusted, reposition the locking finger in a slot. Tighten the adjustment lock bolt. Replace the PTO nameplate.

LUBRICATION:

LUBRICANT: Any high grade, Lithium Base #2, short fiber grease recommended for use in 2,100 RPM roller bearings operating at temperatures of 200° F (93° C).

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

LUBRICATION INTERVALS:

The following lubrication intervals are suggested as guidelines. The operator is responsible for establishing lubrication intervals appropriate to the duty cycle and environmental operating conditions to which the PTO is subjected.

Main Bearings: Grease every 100 hours of operation or less. Add grease until grease is forced out the labyrinth seal(s) around the shaft. Manually (not by starting the engine) rotate the shaft while adding grease.

PTO Cross Shaft: Grease every 500 hours of operation. Add one or two pumps of grease from a hand operated grease gun.

Clutch Linkage and Levers: Lubricate with engine oil every 500 hours of operation.

The lubrication intervals and the amount of grease used should be adjusted to minimize the amount of grease forced out of the bearing housing. A small amount of grease driven from the bearing housing is an indication that enough grease is being provided.

Bearing Operating Temperatures:

The main bearing operating temperature range is normally between 170°F and 200°F (76.7°C to 93.3°C). Locations with high ambient temperatures such as desert climates will cause the bearings to run hotter. More frequent lubrication intervals and/or specialized grease designed for higher operating temperatures will be required.

NOTE: There is a tendency to test temperature with the hand. However, it is difficult to hold a hand on a bearing housing operating at 150° F (65.6° C) although that temperature is below the normal 170° F (76.7°C). *operating temperature of the PTO. Therefore a thermometer (contact type) should be used to make reasonably accurate temperature measurements.*

DISASSEMBLE THE POWER TAKE-OFF:

(Refer to Figure 1 on page 20 for parts call out).

1. Remove all accessories or drives attached to the output shaft.

   ENGAGE THE CLUTCH.

   - Disconnect any linkage that may be attached to the clutch-actuating handle.
   - Loosen the bolt that fastens the handle to the cross-shaft.
   - Match-mark the handle and cross shaft so that the handle can be reinstalled at the same place on the shaft.
   - Slide the handle off the cross shaft spline.

2. Remove the power take-off from the engine.

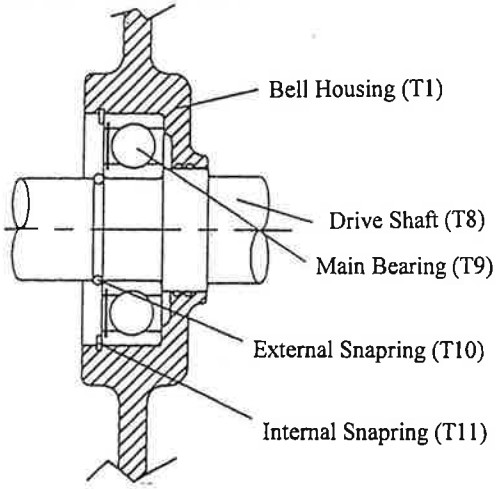
   - Attach a hoist or other suitable lifting device to the power take-off. Attach at three points spanning the center of gravity to hold the shaft in a horizontal position during removal.
   - Remove the mounting bolts, removing those located near the top last. The PTO should separate from the flywheel housing. If the PTO does not separate, install two 3/8"-16 UNC bolts in the threaded holes in the flange. Tighten the bolts alternately and evenly until the housing is removed from the engine flywheel housing pilot diameter.
   - Exercise caution when removing the PTO from the engine to avoid damage to the grease fittings, facing(s), and pilot bearing.

3. Remove the clutch from the PTO shaft.

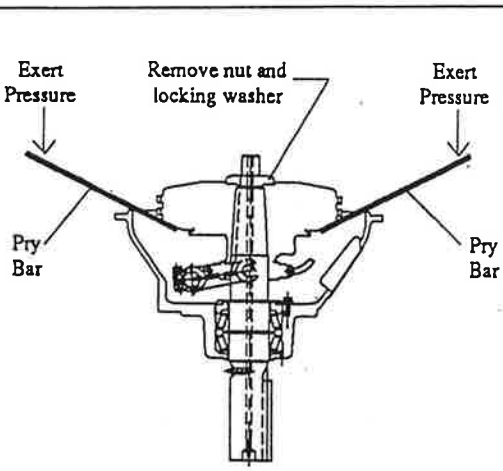
   - Remove the pilot bearing (T25) from the drive shaft with a bearing puller.
   - Position the PTO with the pilot bearing end up, resting with support beneath the end of the output shaft.
   - Bend the locking plate (T27) away from nut (T26), and remove the nut and locking plate.
   - Place pry bars under the pressure plate. While exerting pressure on the pry bars, strike the end of the shaft with a soft mallet to "jar" the clutch loose. Pull the clutch from the shaft. Use caution not to damage the end of the shaft.

4. Remove the shaft and bearings from the bearing housing.

   - Remove the internal snapring (T11).
   - Lift the drive shaft (T8) with bearing (T9) from the bearing housing (a hoist may be needed).



Bearing Configuration



Proper Technique for Prying Clutch off Shaft

5. Remove the main bearings from the drive shaft.

Wash the bearings with clean fuel oil or solvent. Dry and carefully examine for wear, corrosion, or rough spots. If it determined the bearings must be replaced, remove from shaft.

- Remove snapring (T10).
- Support beneath bearings (T9) on the bed of a press.
- Press the drive shaft from the bearing. Place a block of wood beneath the shaft to prevent it from being damaged as it falls loose.

6. Remove the cross shaft.

   - Loosen (2) bolts securing the yoke assembly (T16) to the cross shaft.
   - Slide the cross shaft through the housing until the yoke rests against a block of wood placed between the yoke and the housing.

- With a soft mallet, drive the cross shaft out of the yoke just far enough to expose the two woodruff keys (T15).
- Remove the woodruff keys.
- Slide or tap the cross shaft out of the yoke and housing.

INSPECT THE PTO COMPONENTS:

Ball Bearings: Visually examine for indications of wear, corrosion, or pitting on balls and races. Apply clean, lightweight engine oil and slowly rotate the outer race while holding the inner race. The balls must roll free. Rough or sticking spots must be checked to be sure they are not particles of dirt. If they are, clean and check again. If not dirt, replace the bearing.

Bell Housing:

- Check the bearing fit. Bearing races usually are designed with a sliding or slightly snug fit in the housing bore. They should not have side movement in the bore. Labyrinth seal bores at the output end of the bearing housing should be round, not oval and should be approximately .020"-.025" (.508mm-.635mm) diameter larger than the drive shaft.
- If a bearing failure has occurred, be sure the bearing has not spun in the housing, destroying the shoulder or bore contacted by the bearing.
- The mounting pilot O.D. and mounting face must be free of protruding metal, rust corrosion etc., which would prevent the housing from locating properly in the flywheel housing bore or against the bearing house face. An improper fit causes misalignment. Misalignment is a major cause of power take-off failure. The snapring should restrict bearing movement to .015" (.381 mm) maximum.
- Cross shaft holes should not be worn more than .015" (.381 mm) out of round. A little wear does not render the parts unserviceable, but excessive wear can cause binding of the cross shaft under load during clutch engagement.

Cross Shaft:

- Be sure the cross shaft moves freely in the bell housing. Remove rust or corrosion from the cross shaft and the holes in the bell housing. Wear on the cross shaft does not become detrimental until it inhibits smooth rotation during clutch engagement (creates a false clutch engagement pressure reading) or allows moisture, dirt, or other corrosives to enter the housing. This can be prevented by ample greasing through the grease fittings to keep the cross shaft lubed. If the cross shaft is excessively worn on only one side, it can be reinstalled with the worn area 180° from its original position. Most Rockford cross shafts are splined on both ends and may be reversed in the housing.
- Woodruff key slots must hold the keyways straight. If the release yoke has been loose on the cross shaft the keyways may have one side worn at an angle.

Clutch Release Yoke:

- Keyways must not be worn excessively.
- Replace if width of cradles is over .700" (17.78 mm).

Drive Shaft:

- Pilot bearing journal must not be worn. A new pilot bearing should have a sliding-but-snug fit or tight fit. Finn recommends that a new pilot bearing is installed whenever the PTO assembly is completely taken apart.
- Threads must not be damaged.
- Keyways must not be worn so as to allow side movement of keys.
- Clutch taper should not be worn, although a small amount of wear, if worn evenly 360° around the shaft may be serviceable as long as the clutch will seat securely and squarely and the jam nut will tighten against the clutch body. If too much wear has occurred the clutch will slide too far onto the taper and the jam nut will bottom out on the thread or shoulder before it contacts the clutch body.

DISASSEMBLE THE CLUTCH:

1. Preparation for disassembly.
   - Disengage the clutch.
   - Match -mark the clutch body (H1), pressure plate (H3), and release sleeve (H25).
2. Remove the release sleeve and bearing sub-assembly.
   - Remove the lever spring (H12).
   - Notice the direction of the clevis pins (H31 and H33) are installed. Upon reassembly of the clutch they must be installed from the same side so the head leads the direction of clutch rotation.
   - Remove retainers (H34) and clevis pins (H33) to separate the links (H30) from the levers (H13).

3. Disassemble the sleeve and bearing sub-assembly.

   - Remove the three retainers (H32) and clevis pins (H31) to remove the links from the release sleeve (H25).
   - Remove the external snapring (H28) from the release sleeve.
   - Using a split plate, support beneath the release bearing (H26) on the bed of a press. Press the release sleeve from the bearing.
   - Remove the internal snapring (H29).
   - Tap the bearing carrier (H27) off the bearing.

4. Remove the levers.

   - Note the direction the clevis pins (H14) are installed so they can be reinstalled in the same direction. Remove three retainers (H15) and clevis pins (H14) to separate the levers from the clutch body.

5. Remove and disassemble the pressure plate sub-assembly.

   - Lift the pressure plate sub-assembly from the clutch body.
   - Remove the wear ring (H9) from inside the adjusting ring.
   - Remove the adjustment lock bolt, lockwasher and adjustment lock (H19) from the pressure plate.
   - Rotate the adjusting ring counter-clockwise to remove it from the pressure plate.

6. Complete the disassembly of the clutch.

   - Remove the facing disc (H4).
   - Remove three separator springs (H36) from the pockets in the clutch body.

INSPECT THE CLUTCH COMPONENTS:

Clutch Body:

- Friction surfaces must not have heat cracks, must be smooth and must be flat within .005" (.127mm).
- Drive bosses must not have wear marks exceeding .003" (.076mm) depth due to wear from the pressure plate or center plate.
- Keyway must not be worn.
- Tapered bore must fit snugly and securely on shaft.

Pressure Plate:

- Friction surface must not have heat cracks, must be smooth and must be flat within .005" (.127mm).
- Drive slots must not be excessively worn. Measure the width of the clutch body drive lug in the worn contact area. Measure the width of the pressure plate drive slot in the (worn) contact area. If the difference between the two readings exceeds .012" (.305mm) the worn component(s) must be replaced.
- Threads for adjusting ring must not be damaged.

Release Sleeve:

- No fractures should exist in the bosses.
- Clevis pin holes must not be worn excessively. A small amount of wear is normal and will not be detrimental.
- The release sleeve bore should not be worn beyond the limits shown below:

Basic Size	Max. Allowable Dia.
7/8" (22.23mm)	.883" (22.43mm)
1-1/4" (31.75mm)	1.258" (31.95mm)
1-3/8" (34.93mm)	1.387" (35.23mm)
1-3/4" (44.45mm)	1.759" (44.68mm)
2" (50.80mm)	2.012" (51.10mm)
2-1/4" (57.15mm)	2.259" (57.38mm)
2-1/2" (63.50mm)	2.509" (63.73mm)

- Snapring groove must not be damaged or worn beyond:

Clutch Size	Max. Allowable Width
6-1/2" clutch	.130" (3.30mm)
8" clutch	.145" (3.68mm)
10" &11-1/2" clutches	.155" (3.94mm)

- Ball bearing must fit tight on the release sleeve.

Release Bearing. Hold the inner race and slowly rotate the outer race, feeling and listening for rough spots, catches or a sticking condition.

Bearing Carrier:

- Flat areas are usually worn on the trunnions. Measure across a worn and an unworn area for comparison. Maximum allowable wear is .015" (.38mm).
- The snapring groove must securely hold the snapring. Measure the dimension from the bearing shoulder inside the carrier to the farthest edge of the snapring groove and compare with below.

Clutch Size	Maximum Width
6-1/2"-8" clutches	.700" (17.78mm)
10" & 11-1/2" clutches	.814" (20.68mm)
or	.891" (22.63mm)

- The bearing fit may be a sliding fit, but must be snug. A slightly tight fit is desirable.

Facing Discs:

- Must be free of oil or grease. Must not be burned. Once burned, they normally are incapable of holding torque.
- Measure the amount of wear that has occurred on each friction surface (2 surfaces per facing disc). Total wear allowable in any clutch (add 2 or 4 surfaces together) is approximately ¼" (6.35mm). Thickness of a new facing plate is .375" (9.53mm).
- Teeth must not be worn excessively or broken.

ASSEMBLE THE CLUTCH:

1. Assemble the sleeve and bearing sub-assembly.

   - Install the release bearing (H26) in the bearing carrier (H27). The fit should be a snug sliding fit or a light press fit.
   - Install the internal snapring (H29).
   - Press the release bearing onto the release sleeve with the snapring located on the side nearest the three bosses of the release sleeve. Be sure to press against the inner race of the bearing - **do not** support, press or tap against the outer race (bearing carrier). Damage to the bearing could result.
   - Install external snapring (H28).
   - Place two links on one side of the bosses of the release sleeve (one on either side of the boss). The travel stop protruding from one side of each link should point toward the bottom of the release sleeve and must rest against the release sleeve.
   - Install the clevis pin (H31) through both links and the lever boss.

   NOTE: The clevis pin must be installed as previously noted so the head will lead the direction of clutch rotation.

   - Securely install the retainer (H32) in the groove of the clevis pin.
   - Repeat the previous 3 steps to install links on the remaining 2 lever bosses.

2. Assemble the clutch body sub-assembly.

   - Place the clutch body (H1) on the bench with the friction surface up.
   - Install three separator springs (H36) in the spring pockets of the clutch body.
   - Place one facing plate (H4) on the clutch body.
   - Thread the adjusting ring (H9) into the pressure plate (H3) *almost* to the bottom of the thread.
   - Place the wear ring in the adjusting ring.

3. Install the release levers.
   - Position the three levers (H13) in the lever bosses with the protruding tang against the wear ring up and the "long end" up.
   - Press down on the pressure plate to compress the separator springs and allow the clevis pin (H14) to be inserted through the lever and clutch body.

   NOTE: Be sure the clevis pins are installed so the heads will lead the direction of clutch rotation.

   - Securely install retainers (H15) on the clevis pins.

4. Install the release sleeve and bearing sub-assembly on the clutch.

   - Position the sleeve and bearing sub-assembly on the clutch so the links align with the levers.
   - Align the clevis pin holes and install a clevis pin (H33) through the links and levers so the head of the clevis pin will lead the direction of rotation during clutch operation.
   - Securely install the retainer (H34) in the groove of the clevis pin.
   - Repeat at remaining lever positions.
   - Install the lever spring over the release bearing. Locate a connector of the spring over each of two levers, and then stretch the spring to get it onto the third lever.
   - Using the drive ring as a gage, perfectly center the facing disc(s) relative to the clutch body.
   - Engage the clutch by pressing the release sleeve and bearing down to the stop. If the facings are not clamped tight, disengage the clutch, rotate the adjusting ring counter-clockwise and reengage the clutch. Repeat until the clutch is adjusted tight enough to hold the facings aligned.

   NOTE: If the facings are not perfectly aligned in the clutch, mounting the PTO onto the engine will be restricted by interference between the facing teeth and the teeth of the drive ring.

   - Insert the adjustment lock in a slot of the adjusting ring. Install the lock bolt and lockwasher. Tighten finger tight.

NOTE: Do not disengage the clutch until after the PTO has been mounted on the engine. Should the facings become misaligned repeat the

procedure explained above for aligning the facings.

ASSEMBLE THE POWER TAKE-OFF:

1. Install the main bearings on the drive shaft.

   - Support beneath the inner race of main bearing (T9) with a split plate on the bed of a press. Insert the drive shaft, pilot bearing end first, through the bearing. Press the shaft into the bearing until the shaft shoulder firmly stops against the bearing.
   - Install the external snapring (T10).

2. Install the drive shaft in the bearing housing.

   - Support beneath the bearing housing with the bore up.
   - Lower the drive shaft and main bearing (output end of the shaft first) to the bottom of the housing bore. The fit should be slightly snug. (Gently tap the outer race of the bearing if necessary to seat it in the bottom of the bore.

   CAUTION: *Do not drive the bearing into the housing by tapping on the shaft. To do so may damage the roller surface of the bearing.*

   - Securely install the internal snapring (T11) in the groove of the bearing housing.

3. Install the cross shaft and clutch release yoke.

   - Lubricate the cross shaft holes in the bell housing. Slide the cross shaft (T14) through one hole.
   - Slide the clutch release yoke (T16) onto the cross shaft. The bolt holes (unthreaded end) should face outward (toward the flywheel). Slide the cross shaft through the release yoke and into the other cross shaft hole in the bell housing.
   - Rotate and position the cross shaft so one keyway is exposed in the middle of the release yoke. The other keyway will be located outside the yoke. Install two woodruff keys (T15) in the cross shaft.
   - Slide the cross shaft and woodruff keys into the keyways of the release yoke until the keys are centered on the yoke.
   - Install two bolts and lockwashers in the clutch release yoke. Tighten and torque to 17-20 ft. lbs. (23-27 Nm).

4. Complete the assembly of the housing unit.

   - Install all pipe plugs and fittings to complete assembly of the bearing housing and bell housing.
   - Install grease fittings in the shaft and housings.

INSTALL THE CLUTCH ON THE DRIVE SHAFT:

1. Support the PTO under a hoist, with the output end of the drive shaft resting on a hard wood block. Carefully lower the clutch onto the drive shaft. As the release bearing approaches the clutch release yoke, rotate the yoke upward to engage the bearing carrier trunnions in the cradles of the release yoke.
2. Just before the clutch becomes seated on the taper of the drive shaft, rotate the clutch to align the keyways and install the key ½ way into the keyway.

NOTE: If the key is installed in the bottom of the keyway before the clutch is completely seated, it may restrict proper seating of the clutch.

3. Seat the clutch on the drive shaft.
4. Drive the key the rest of the way into the keyway.
5. Place the locking washer (T27) on top of the clutch. Locate the tab in the keyway.
6. Install and tighten nut (T26) against the locking washer. Torque to:

6-1/2",7-1/2",8" HE	165-170 lb.-ft.(224-231 Nm)
10" and 11-1/2" HE	175-180 lb.-ft. (237-244 Nm)
11-1/2" HE(DP)	225-230 lb.-ft. (305-312 Nm)

7. Using a soft but heavy mallet, strike the clutch body to drive it down onto the drive shaft. Check the torque on the nut to be sure that it has not loosened.

CAUTION: *Be sure the drive shaft is resting on the wood block before striking the clutch body so the force of the impact can be absorbed by the wood block rather than by the bearing races.*

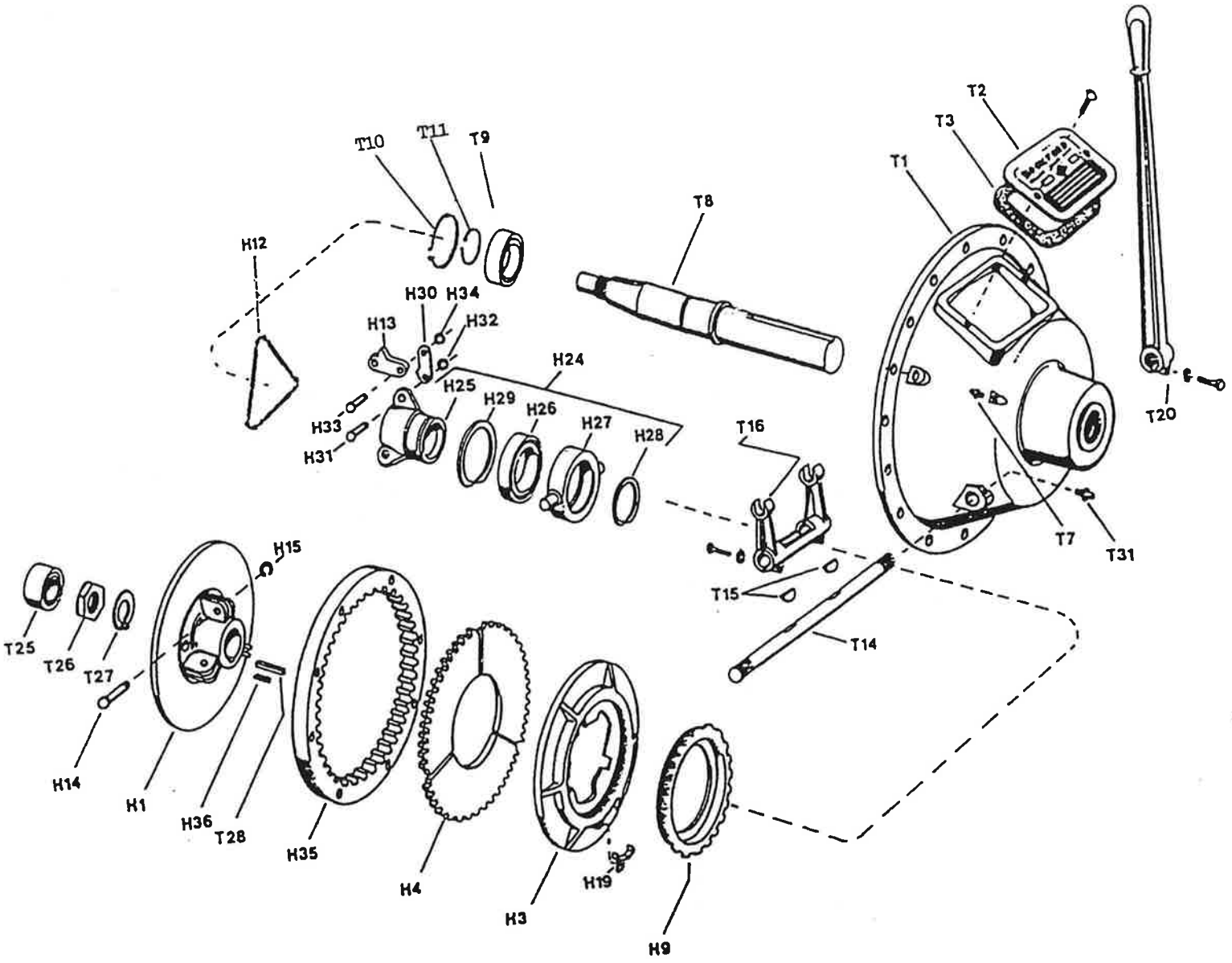


Figure 1

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

POWER TAKE OFF ASSEMBLY

Ref. No.	Part No.	Description	No. Req'd.
H1	100335	Body, Clutch	1
H3	100336	Plate, Pressure	1
H4	100337	Facing, Clutch (3 segr 's)	1
H9	100210	Ring, Adjusting	1
H12	100211	Spring Lever	1
H13	100212	Lever	3
H14	100213	Pin, Pivc	3
H15	100008	Ring	3
H19	100214	Lc	1
H24	100327	earing Assembly	1
H25	100328		1
H26	100330	ase	1
H27	100329	aring	1
H28	1003?	ing, External	1
H29	10?	p Ring, Internal	1
H30		ink, Connecting	6
H31 & 3	1.	Pins, Link	6
H32 & 4	10(	Ring, Retaining	6
H35	1003.	Ring, Driving	1
H36	100215	Spring, Separator	3
H's	100334	Clutch Assembly	1
T1	100339	Housing Clutch	1
T2	100222	Plate, Instruction	1
T3	100054	Gasket, Cover	1
T7	100043	Fitting, Lubrication	1
T8	100223	Shaft, Drive	1
T9	100060	Bearing	1
T10	100055	Snap Ring, External	1
T11	100059	Snap Ring, Internal	1
T14	100041	Shaft Yoke	1
T15	100042	Key, Woodruff	2
T16	100073	Yoke, Clutch	1
T20	031219	Lever, Shifting	1
T25	005151	Bearing, Pilot	1
T26	100045	Nut, Drive Shaft	1
T27	100047	Washer, Lock	1
T28	100056	Key, Clutch	1
T31	100224	Lube, Fitting Yoke Shaft	2
	080330	Power Take-Off Assembly (4-34192)	

Please do not use this page to obtain clutch part numbers. See the Clutch Addendum Manual

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

FINN CORPORATION
9281 LeSaint Drive • Fairfield, Ohio 45014
Phone (513) 874-2818 • Fax (513) 874-2914
Toll Free (800) 543-7166

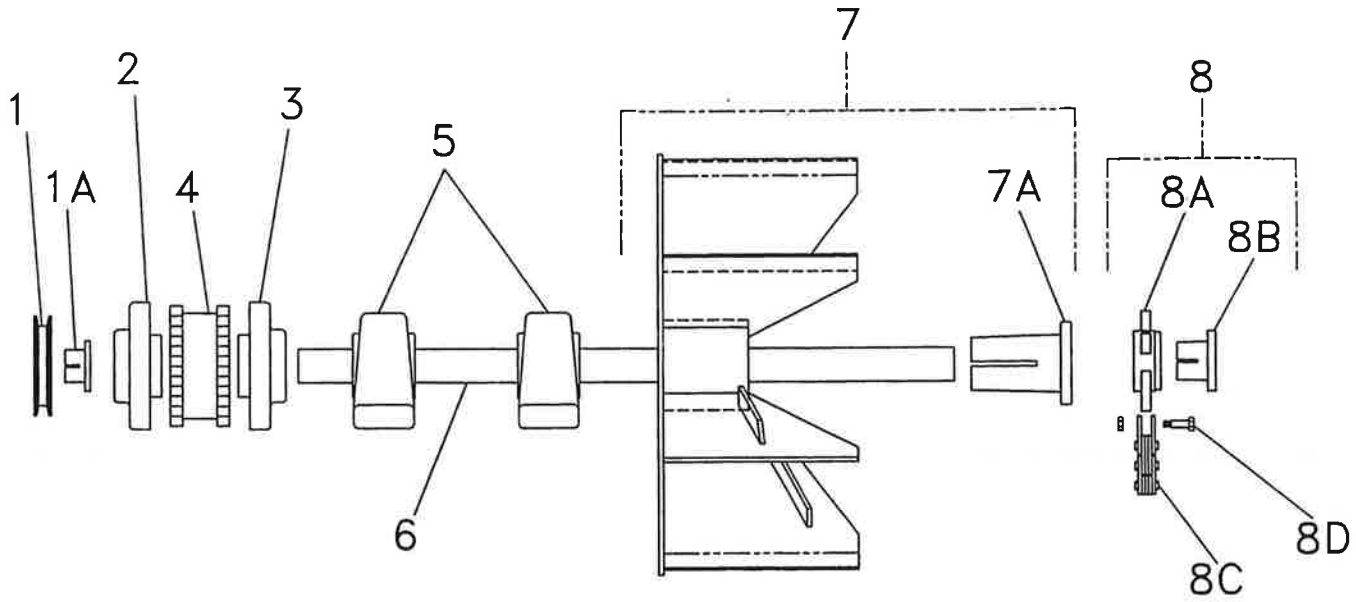
B-70

Mulch Spreader 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.

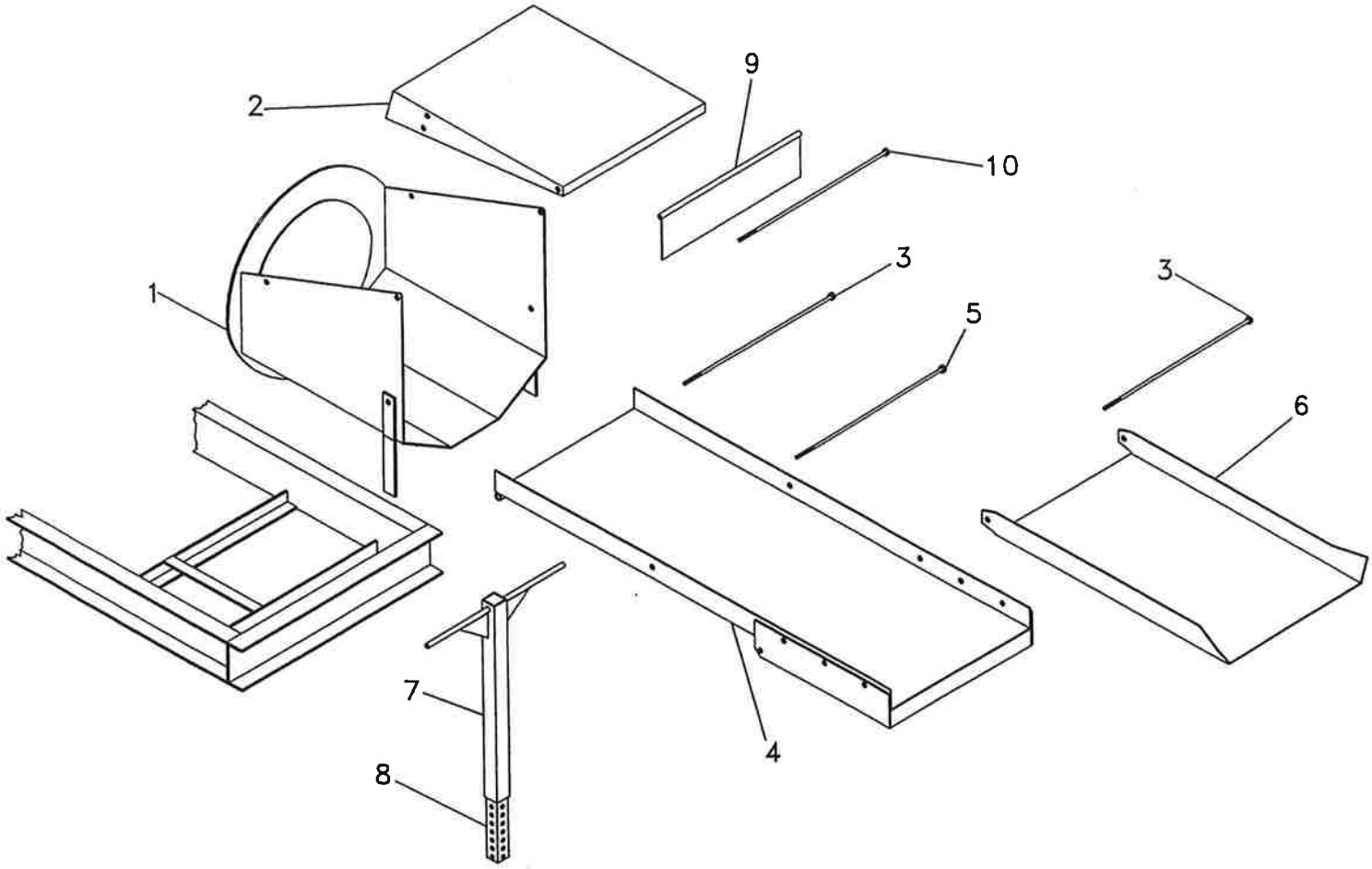
INDEX



BLOWER AND DRIVE

Ref. No.	Part Number	Description	No. Req'd.
1	000527	Sheave, Motor	1
1A	020362B	Bushing, Motor	1
2	031273	Coupling Half, Motor	1
3	031272	Coupling Half, Blower	1
4	031274H	Coupling Insert	1
5	030712	Bearing	2
6	030904	Blower Shaft	1
7	031029	Blower Blade w/Hub	1
7A	030877	Blower Hub	1
	030874	Key, Bushing to Shaft	1
	030873	Key, Hub to Bushing	1
8	030950	Beater Roll Assembly	1
8A	030872	Beater Roll Hub	1
8B	030876	Beater Roll Bushing	4
8C	020111	Chain	4
8D	020119	Pin	1
	031278	Guard	1
	031389	Tool Box	1

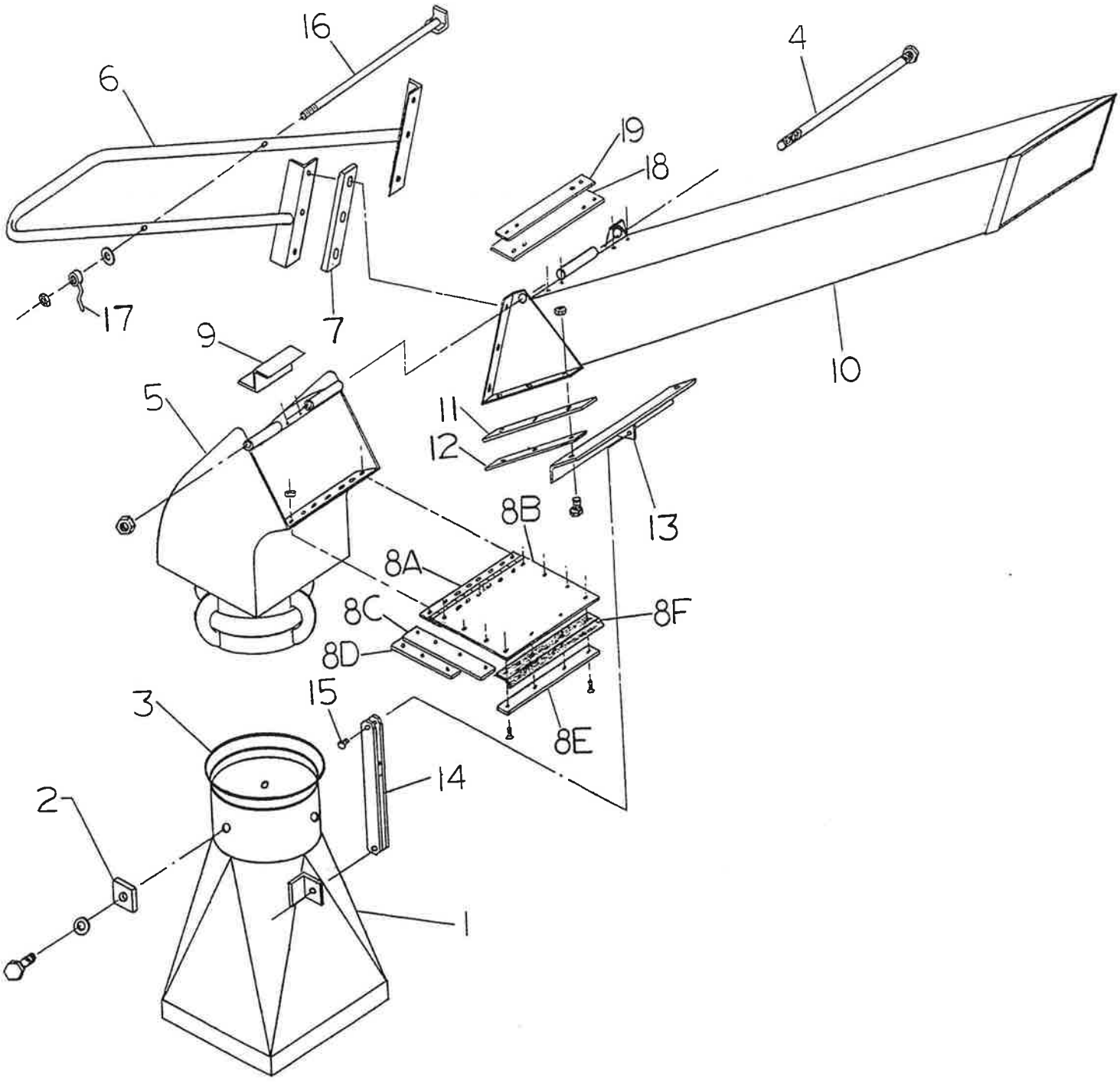
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



SHREDDER BOX AND FEED CHUTE

Ref. No.	Part No.	Description	No. Req'd.
1	031287	Shredder Box	1
2	031284	Shredder Box Cover	1
3	031158-04	Feed Chute Hinge Pin w/ Nuts	2
4	031157	Feed Chute	1
5	031158-05	Feed Chute Stop w/ Nuts	1
6	030898	Feed Chute Extension	1
7	031184-01	Upper Feed Chute Stand	1
8	031184-03	Lower Feed Chute Stand	1
	030893	Clevis Pin	1
	030894	Hairpin Cotter	1
9	031096-01	Shredder Door	1
10	031096-04	Shredder Door Hinge Pin w/Nut	1

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

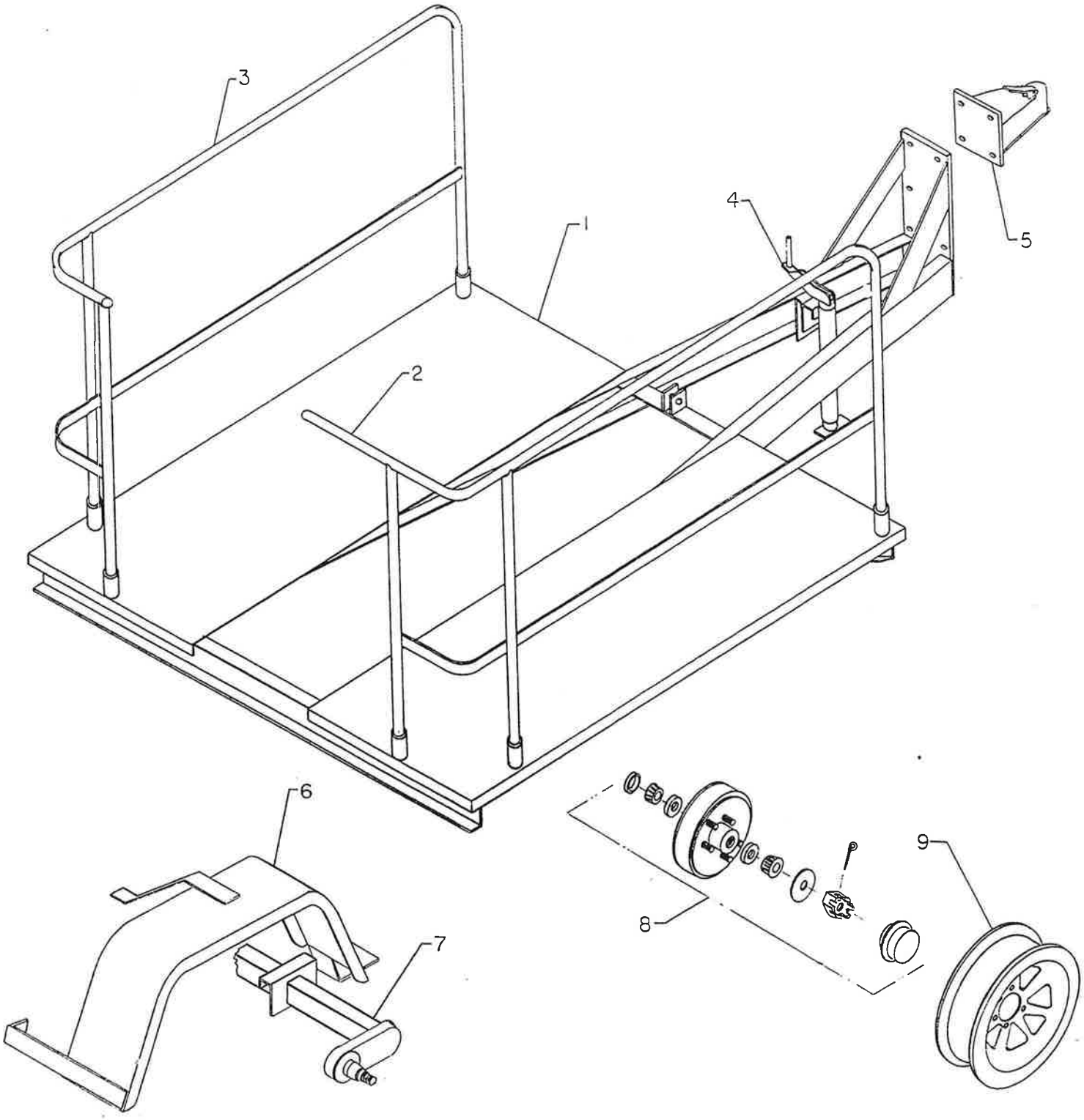


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

DISCHARGE ASSEMBLY

Ref. No.	Part No.	Description	No. Req'd.
1	031247	Transition Assembly	1
2	031018-01	Elbow Bearing	3
3	031086	Transition Seal	1
	031109	Seal Banding	32"
4	031243-08	Elbow Hinge Rod	1
5	031239	Elbow Assembly	1
6	031241	Elbow Handle	1
7	031242-03	Elbow Seal-Upper	2
8	031341	Seal Plate Assembly	1
8A	031338-01	Seal Plate Hinge	1
8B	031238-04	Seal Plate	1
8C	031338-08	Side Seal	2
8D	031338-07	Side Seal Retaining Strap	2
8E	031338-03	End Flap Seal Retaining Strap	1
8F	031338-04	End Flap Seal	1
9	031238-05	Hinge Seal	1
10	031240	Discharge Tube	1
11	031242-04	Elbow Seal-Lower	2
12	031242-07	Elbow Seal Retainer Strap	2
13	031243-01	Discharge Tube Hold Down Bracket	1
14	031243-04	Discharge Tube Hold Down Arm	1
15	031245	Snapper Pin	1
16	031243-07	Elbow Tensioning Rod	1
17	031258	Lever Nut	1
18	031338-09	Top Seal	1
19	031338-10	Top Seal Retaining Strap	1
20	031338-12	Side Elbow Seal	2
21	031338-11	Hinge Seal	1

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

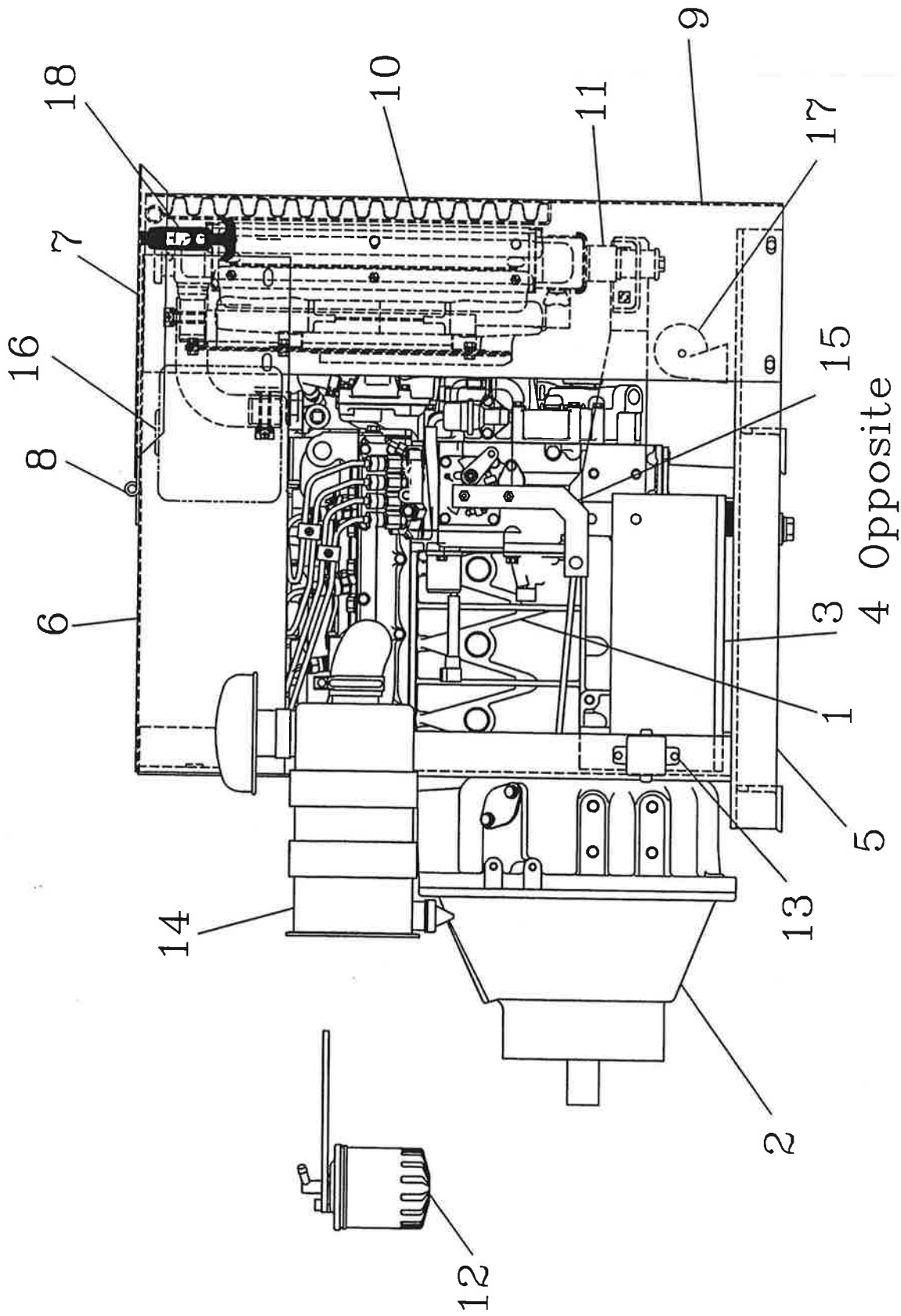


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

TRAILER ASSEMBLY

Ref. No.	Part No.	Description	No. Req'd.
1	031205	Platform Assembly	1
2	031183-01	Guard Rail-Right	1
3	031183-02	Guard Rail-Left	1
4	031189	Jack	1
5	031202	2" Ball Hitch Assembly	1
	030482	2" Ball (Optional)	
6	031196-01	Fender Assembly - Right	1
	031196-02	Fender Assembly - Left	1
7	031167	Axle Assembly: Includes	1
	031220	Axle Shim Plate	2
8	031221	Complete Hub Assembly	2
	WL9103305	Grease Seal	2
	WLLM68149	Bearing, Inner Cone	2
	WLL68111	Inner Cup	2
	WL9080607	Hub/Drum	2
	WLL44610	Outer Cup	2
	WLL44649	Bearing, Outer Cup	2
	WL90509	Spindle Washer	2
	WL90601	Spindle Nut	2
	WL91901	Cotter Pin	2
	WL92102	Grease Cap	2
	WL9251510	Wheel Stud	2
	WL90608	Wheel Nut	2
	031222	Right Brake Assembly	1
	031223	Left Brake Assembly	1
9	031187	Wheel	2
	031188	Tire	2
	031179	Safety Chain	2
	031180	Clevis Grab Hook	2
	031181	Chain Connecting Link	2
10	031269	Bumper (Not Shown)	1

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



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

ENGINE PARTS

1	031390	Kubota V1505B-86 Engine	1	
2	031452	Clutch Assembly	1	
	031219	Clutch Arm		1
	031144	Clutch Handle		1
3	031424	Engine Mount		1
	031376	Center Bushing Mount		4
	055504	Snubbing Washer		4
4	031400	Engine Cradle Weldment		1
5	031395	Engine Top Cover		1
6	031419	Engine Cover Lid		1
7	031404-01	Engine Lid Hinge		1
8	031402	Radiator Shroud		1
9	031403	Radiator Screen		1
	190087	Screen Rubber Trim		1.5'
10	KU16665-72061	Radiator Assembly		1
	031444	Upper Radiator Hose		1
	031445	Lower Radiator Hose		1
	KU16285-74110	Fan		1
11	KU15224-43018	Fuel Filter Assembly		1
	KU70000-43081	Filter Element	1	
	005502-01	Filter Support Arm		1
	080105	Pre-Fuel Filter		1
12	080103	Fuel Pump		1
13	KU16616-11010	Air Cleaner Assembly		1
	KU15741-11080	Element	1	
	031442	Pre Cleaner	1	
	055548	Mounting Band		2
	031441	Rubber Shock Mount		4
14	031397-02	Throttle Plate		1
	005176	Throttle Cable		1
	007675	Ball Joint		1
15	KU155501-72400	Coolant Recovery Tank w/Bracket		1
16	006499	Horn & Bracket		1
17	023758	Soft Latch		2
	KU37410-88518	Muffler		1
	055568	Temperature Switch		1
	KU16271-32090	Oil Filter		1
	031197	Fuel Tank		1
	007914	Fuel Cap		1
	031215	Fuel Level Gauge		1
	031197-06	Fuel Suction Tube		1

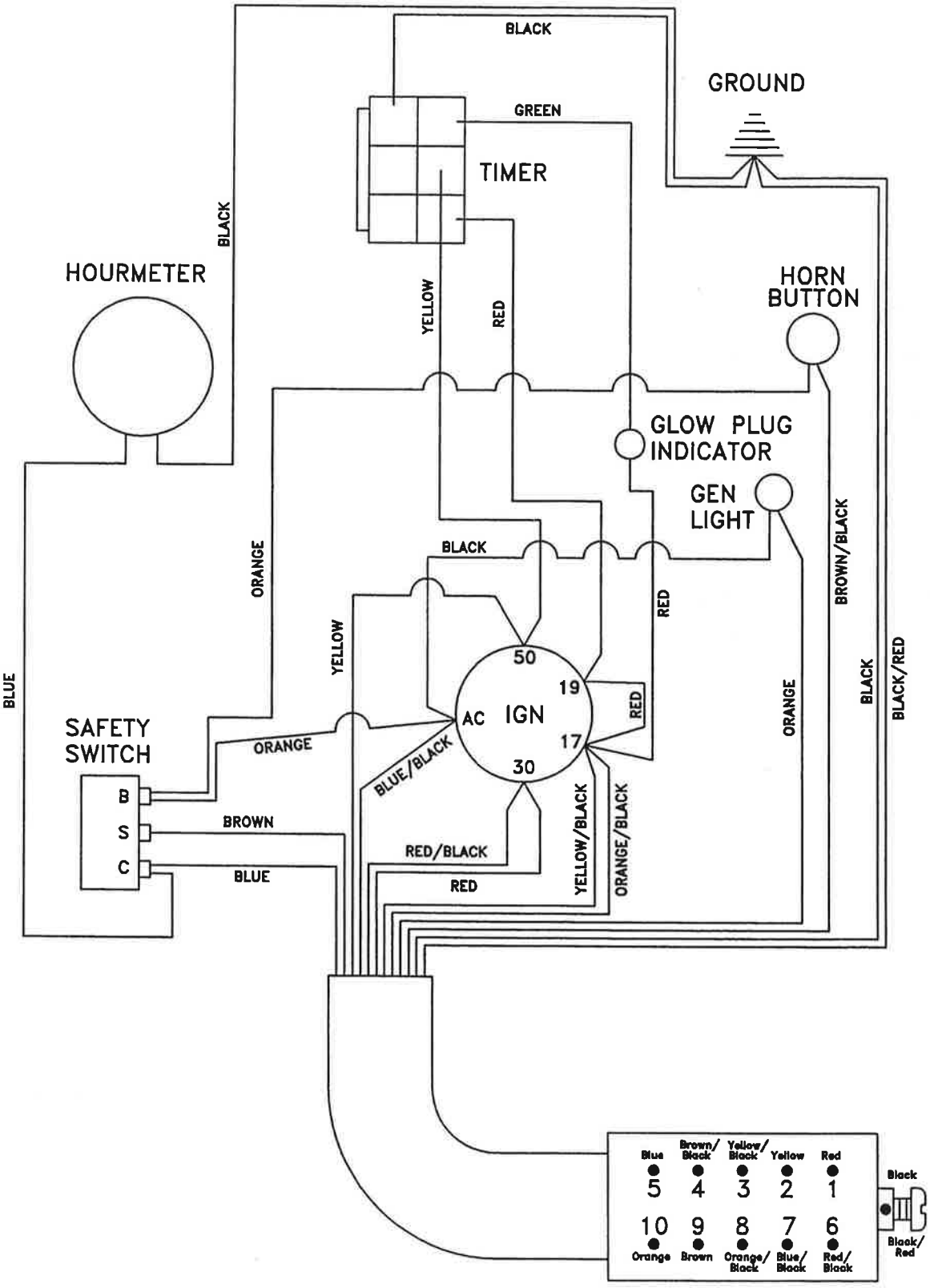
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

See Next page for Exhaust parts

ENGINE WIRING HARNESS

Part No.	Description	No. Req'd.
005687	Wiring Harness	1
002256-12	Battery	1
080096	Battery Cable	1
031350	Ground Strap	1
006499	Horn Assembly	1
007274	Hourmeter	1
020886	Horn Button	1
055568	Temperature Switch	1
022119	Safety Switch	1
KU66711-55131	Ignition	1
004934	Oil Switch	1
KU15403-64490	Glow Plug Indicator	1
080103	Fuel Pump	1
170028	Fuse with Holder	1
KU15694-65990	Glow Plug Timer	1
006245	Generator Light	1
031368	Battery Holddown Strap	1
005561	Electrical Housing	1
023602	Electrical Housing Insert	1
KU16616-60010	Fuel Shut Down Solenoid	
KU66711-55140	Key for Ignition Switch	

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

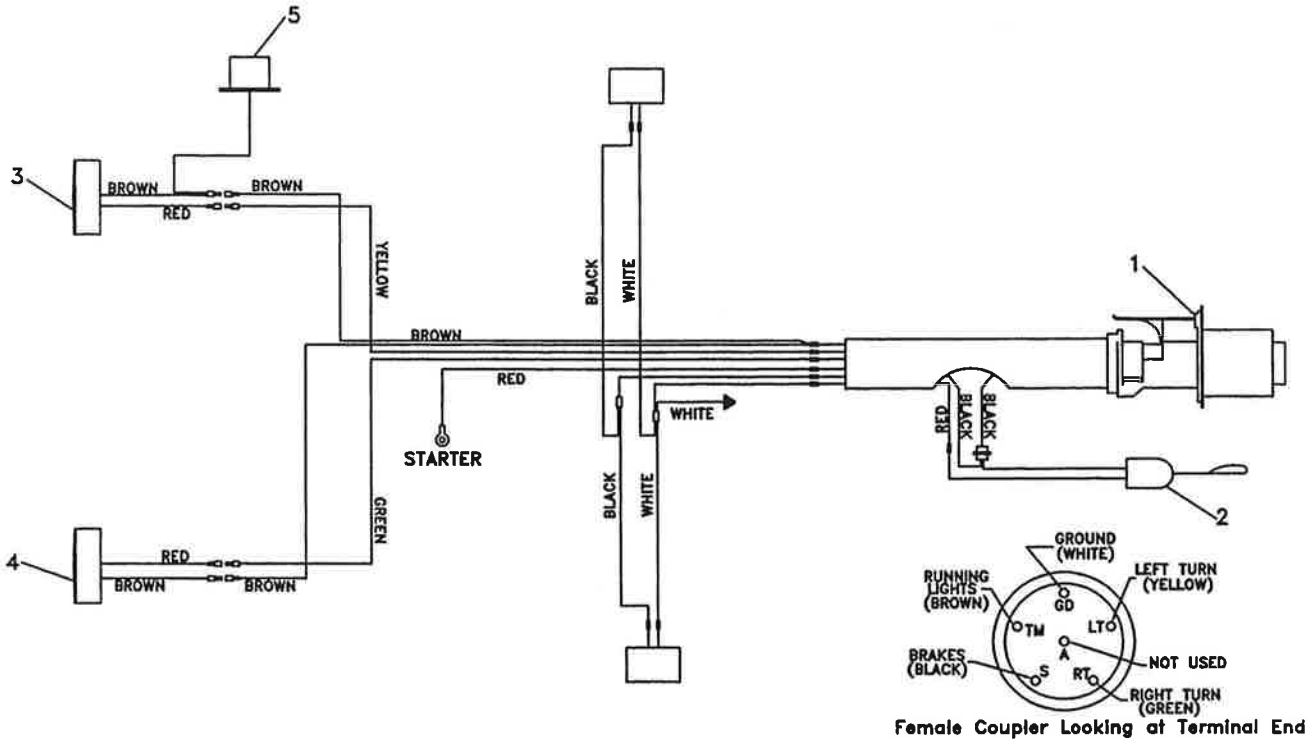


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

CONTROL BOX WIRING

Part Number	Description	No. Req'd
007274	Hour Meter	1
022119	Safety Switch	1
KU15694-65592	Glow Plug Timer	1
020886	Horn Button	1
KU15403-64491	Glow Plug Indicator Light	1
006245	Generator Light	1
KU66711-55131	Ignition Switch	1
023604	Electrical Housing	1
023601	Electrical Housing Plug	1
080304	Liquid Tight Fitting	3
005589	Control Box Wiring Harness	1
KU66711-55140	Key for Ignition Switch	

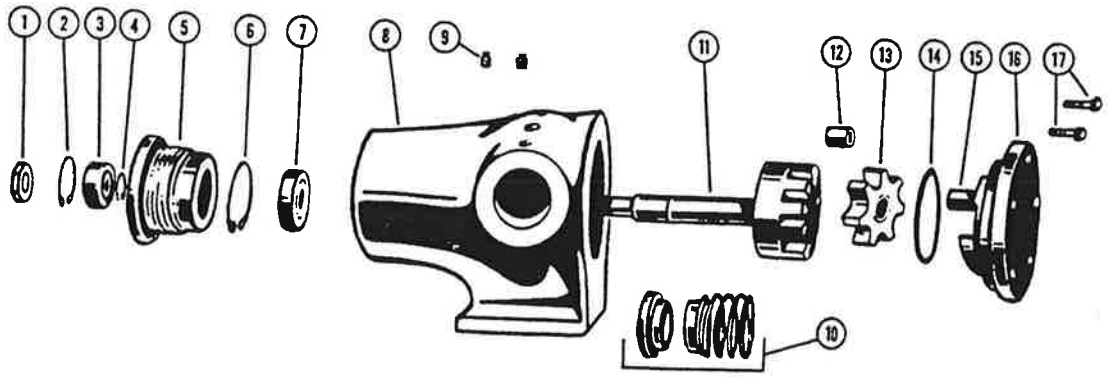
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



TRAILER WIRING

Ref. No.	Part No.	Description	No. Req'd.
	031210	Trailer Wiring Harness	1
1	060069	Trailer Plug	1
2	023424	Breakaway Switch	1
3	005138	Right Tail Light	1
4	005137	Left Tail Light	1
5	005236	License Light	1
	004720	License Plate Bracket	1

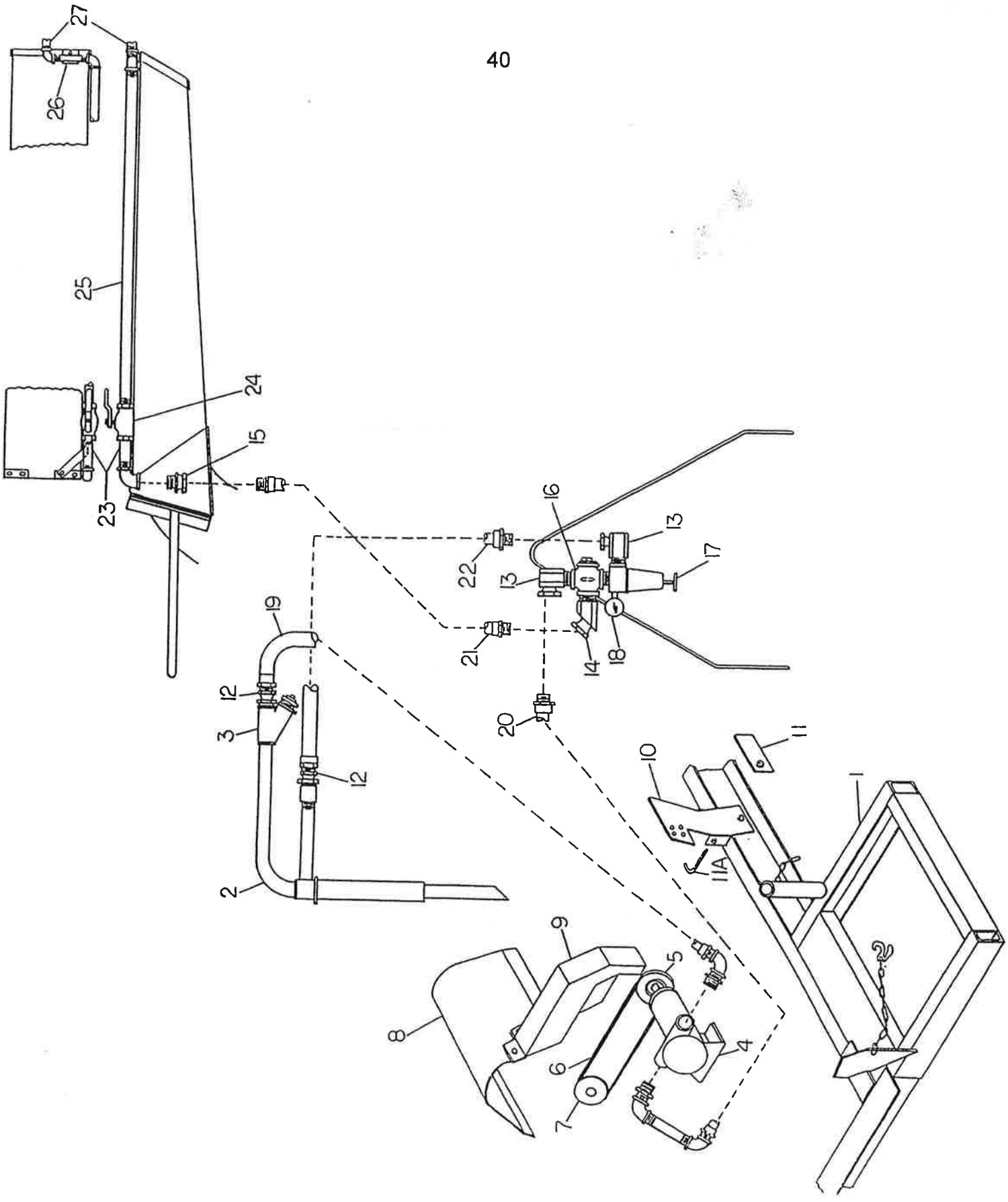
WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE



031316 ADHESIVE PUMP ASSEMBLY

Ref. No.	Part No.	Description	No. Req'd.
1	031316-01	Locknut	1
2	031316-02	Snap Ring, Outer	1
3	031316-03	Ball Bearing, Outer	1
4	031316-04	Snap Ring for Shaft	1
5	031316-05	Bearing Housing	1
6	031316-06	Snap Ring, Inner	1
7	031316-07	Ball Bearing, Inner	1
8	031316-08	Casing	1
9	031316-09	Pipe Plug	2
10	031316-10	Mechanical Seal	1
11	031316-11	Rotor and Shaft	1
12	031316-12	Idler Bushing	1
13	031316-13	Idler and Bushing	1
14	031316-14	Head Gasket	1
15	031316-15	Idler Pin	1
16	031316-16	Head and Idler Pin	1
17	031316-17	Capscrew for Head	2

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

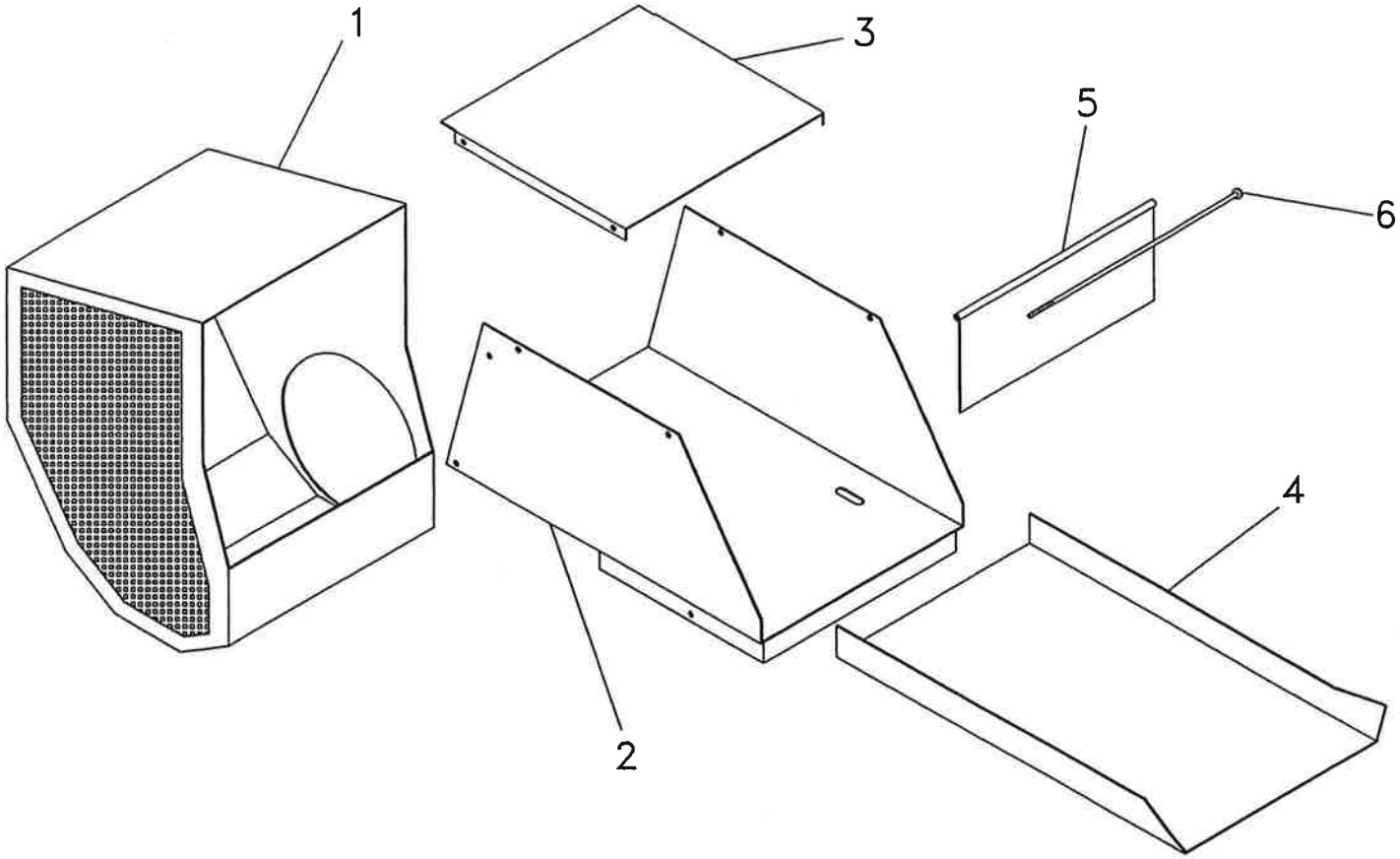


WHEN ORDERING PARTS, BE SURE TO STATE SERIAL NUMBER OF MACHINE

ADHESIVE SYSTEM

Ref. No.	Part No.	Description	No. Req'd.
1	031198	Barrel Mount	1
	030660	Spring Binder	1
2	030169	Barrel Sucker	1
3	030170	Suction Strainer	1
	030171	Screen	1
4	031316	Pump	1
5	031317	Sheave, Pump	1
6	000998	Drive Belt	1
7	000527	Sheave, Drive	1
7A	020362B	Bushing (not shown)	1
8	031279	Coupling Guard	1
9	031203-02	Belt Guard	1
10	031318	Pump Base	1
10A	031200-03	Pump Pivot Bracket (not shown)	1
11	031200-04	Belt Adjusting Nut	1
11A	031200-06	Belt Adjusting Bolt	1
12	000668	Adapter Union	2
13	022862	Adapter Union - 90 Degrees	2
14	080234	Adapter Union - 45 Degrees	1
15	022305	Adapter Union	1
16	030930	Cross Manifold	1
17	000876	Relief Valve	1
18	000262	Gauge	1
19	030407	Suction Hose	1
20	031322	Pump Discharge Hose	1
21	031320	Manifold Discharge Hose	1
22	031321	Return Hose	1
23	031248-02	Pipe Mount	1
24	070122	Valve	1
25	031248-07	Discharge Pipe	1
26	031248-04	Nozzle Mount	1
27	031250-01	Nozzle 2530	1
	031250-02	Nozzle 2560	1
	031250-03	Nozzle 25100	1

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



SIDE FEED ASSEMBLY

Ref. No.	Part No.	Description	No. Req'd.
1	031292	Shredder Box Weldment	1
2	031293	Feed Chute Weldment	1
3	031289-01	Feed Chute Cover	1
4	031294	Feed Chute Extension	1
5	031295-01	Door Weldment	1
6	031096-04	Hinge Pin	1
	031295-04	Left Leg Weldment	1
	031295-05	Right Leg Weldment	1

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

TOOL KIT

Part No.	Description	No Req'd.
020057	#13 Twine Knife	1
020063	#11 Twine Knife	1
	Manual, Engine	1
	Manual, Parts & Operation	1

MISCELLANEOUS PARTS

011666	Paint, Neutral	1 gal.
011667	Paint, Prime	1 gal.
011690	Name Plate	1
031235	"Finn" Decal	2

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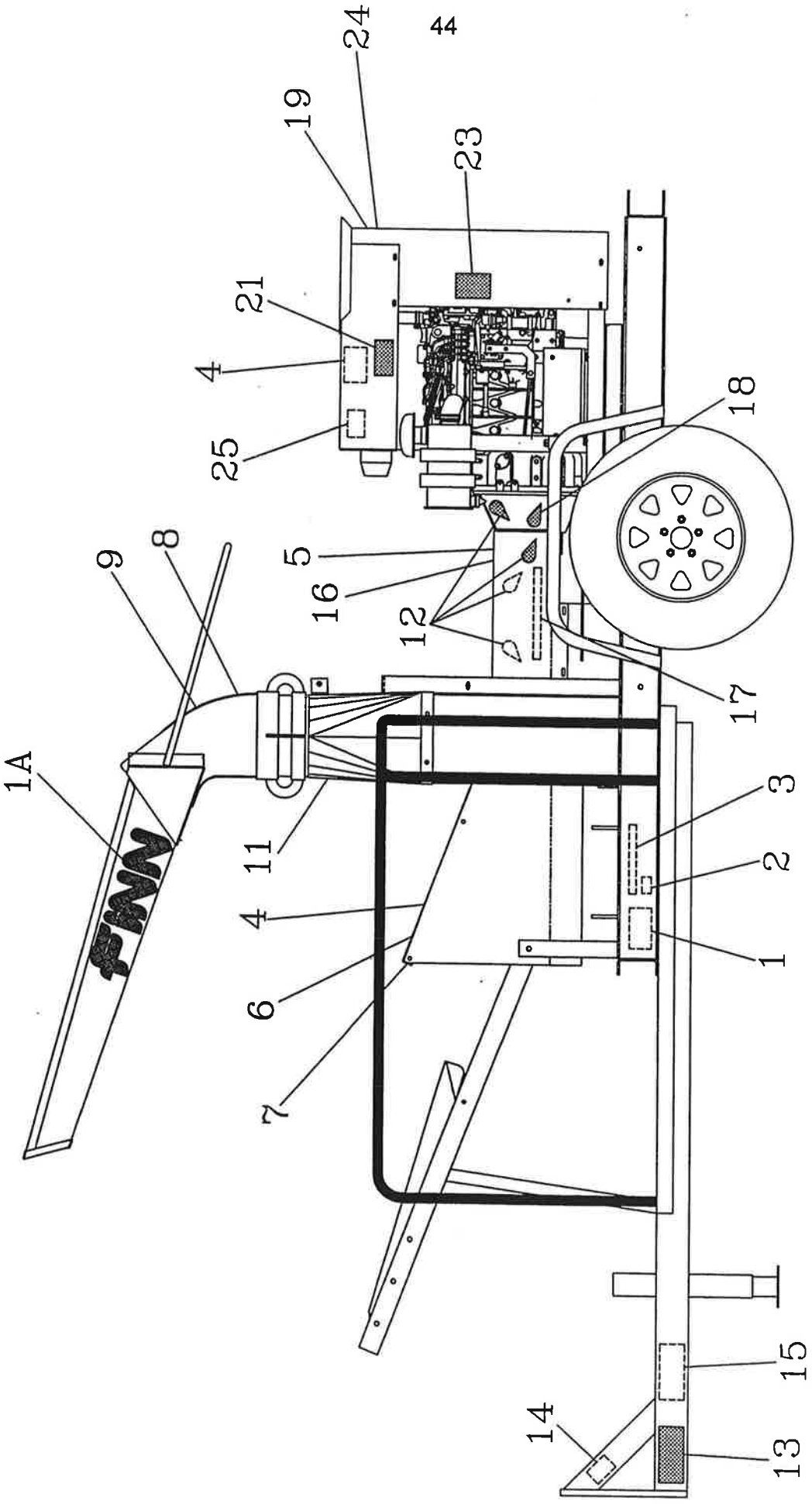
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B70 DECALS

Ref. No.	Part No.	Description	No. Req'd.
1	011690	Finn Name Plate	1
1A	031235	"Finn" Decal	2
2	020976	Patent Infringement	1
3	031168	Patent Numbers	1
4	022357	Caution: Turn Off Engine	2
5	031297	Important: Clutch Adjustment	1
6	020068	Danger: Do Not Open	1
7	022690	Caution: Eye Protection	1
8	020970	Caution: Do Not Ride Over 5MPH	1
9	023519	Caution: Wear Eye Protection	1
10	006870-HORN	"HORN"	1
11	080442	"Throttle"	1
12	007231	"Service Weekly"	5
13	031227	Caution: Tighten Hitch	1
14	023423	Warning: Breakaway Switch	1
15	031228	Caution: Safety Chain Installed	1
16	012179	Warning: Do Not Operate	1
17	023391	"Diesel Fuel Only"	1
18	007351	"Hand Gun Only"	1
19	007429	"Radiator Protection"	1
20	006870-GEN	"Gen"	1
21	012260	Maintain Decals Plate	1
22	080108-03	"Glow Plug"	1
23	012251	Warning: Rotating Fan Hazard	1
24	012279	Warning: Radiator Cap	1
25	012278	Danger: Hot Exhaust	1
26	22082		

Note: Note: Safety Decals must be purchased as a kit
Part # 031460

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