FORM NO. 92-0259

TORO®

MODEL NO. 41410-30101 & UP
MODEL NO. 41020-30101 & UP
MODEL NO. 41120-30101 & UP
MODEL NO. 41122-30101 & UP

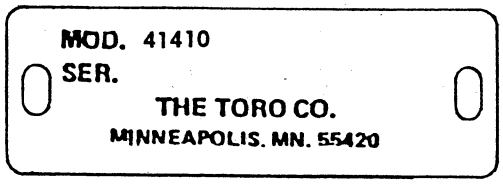
OPERATOR'S MANUAL

SKID SPRAYER

To assure maximum safety, optimum performance, and to gain knowledge of the product, it is essential that you or any other operator of this Vehicle read and understand the contents of this manual before the engine is ever started. Pay particular attention to the SAFETY INSTRUCTIONS highlighted by this symbol —

⚠ The safety alert symbol means CAUTION, WARNING or DANGER — personal safety instruction. Failure to comply with the instruction may result in personal injury.

PRODUCT IDENTIFICATION



Located on the front left hand corner of the Skid Frame.

Located on the left hand engine shroud.

Skid Sprayer
Model No. 41410
Serial No. _____

Kohler Engine
Model No. CH6T
Serial No. _____

Record these serial numbers in the space above as soon as possible, as it is necessary to include this information when ordering service parts or requesting information. Please fill out the Product Registration Card and return it to:

The TORO Company
8111 Lyndale Ave. South
Minneapolis, MN 55420

Date Purchased _____

SPARK ARRESTOR

When the machine is used or operated on any California forest, brush or grass covered land, a properly operating spark arrestor must be attached to the muffler. The operator is violating state law, Section 442 Public Resources Code if a spark arrestor is not used.

SAFETY INSTRUCTIONS

Keep these Operator's Instructions and the Engine Manual in the plastic tube on the side of the Belt Guard.

It is very important that all persons operating this equipment have easy access to these instructions at all times!

Carefully read and follow the "set-up" instructions that are provided with this equipment. The installment of accessories on the TORO Skid Frame, other than those designed and sold for that express purpose by TORO, may adversely affect the performance and safety characteristics of this equipment.

RECOGNIZE SAFETY INFORMATION

This safety-alert symbol is used to call attention to a **dangerous** situation, which could result in serious injury or death to the operator or a bystander.

Safety, mechanical and some general information in this manual are emphasized. **DANGER, WARNING** and **CAUTION** identify safety messages. Whenever the triangle safety appears, it is followed by a safety message that must be read and understood. For more details concerning safety, read the Safety Instructions on pages 3 and 4. **IMPORTANT** identifies special mechanical information and **NOTE** identifies general information worthy of special attention.

These instructions are provided as a guide for the safe operation and maintenance of this equipment. However, the operator's personal safety, as well as those persons in the work area, will depend on the careful actions and good judgement of the operator.

To reduce the potential for injury or death, comply with the following safety instructions.

BEFORE OPERATING:

1. Operate this machine only after reading and understanding the contents of this manual. A replacement manual is available by sending complete model and serial number to: The Toro Company, 8111 Lyndale Ave. South, Minneapolis, Minnesota 55420.

2. Learn how to operate the Sprayer and how to use the controls properly. DO NOT let anyone operate this equipment without first receiving thorough instructions.

3. Keep all shields, safety devices and decals in place. If a shield, safety device or decal is malfunctioning, illegible or damaged, repair or replace it before operating the machine.

4. Since gasoline is highly flammable, handle it carefully.

A. Use an approved gasoline container.

B. Do not remove cap from fuel tank when engine is hot or running.

C. Do not smoke while handling gasoline.

D. Fill fuel tank outdoors and to about one inch below top of tank, (bottom of filler neck). Do not overfill.

E. Wipe up any spilled gasoline.

5. When the Diaphragm (high pressure) Pump System is to be used:

A. Secure the Sprayer Hand Gun and Hose before starting the Pump. The highly pressurized discharge of spray solution may cause a "whipping" action, causing personal injury and/or property damage.

B. Check hoses for weak or worn condition before each use. Make sure that all connections are tight and secure.

C. Make sure there are no restrictions in the hoses serving the Diaphragm Pump. Liquids under high pressure are dangerous!

WHILE OPERATING:

Drive the transport vehicle safely.

A. Always SLOW the vehicle when approaching and while making a turn.

B. Always SLOW the vehicle when driving in unfamiliar areas or over rough terrain.

C. Always SLOW the vehicle when changing the direction of travel or preparing to stop.

D. When turning or driving on slopes, always SLOW the vehicle, then turn the vehicle to prevent loss of control and possible upset.

SAFETY INSTRUCTIONS

E. DO NOT make sudden or sharp turns. DO NOT suddenly change direction of travel on an incline, ramp, grade, slope or similar surface.

F. Always adjust the vehicle speed to allow for existing conditions such as wet, slick surfaces, low visibility, etc.

G. Be especially careful when driving a heavily loaded vehicle down an incline or slope. Drive the vehicle UP and DOWN the face of slopes, inclines or grades whenever possible. DO NOT DRIVE ACROSS the face if at all possible. There is a risk of upsetting the vehicle, which can result in serious injury or death.

6. DO NOT OVERLOAD THE TRANSPORT VEHICLE. Failure to position loads carefully can result in their shifting or tipping over. Distribute loads evenly, keeping them low as possible to prevent them from becoming top-heavy.

7. Make certain everyone is clear of the machine before starting the engine to move the transport vehicle or to engage the Sprayer Pump drive.

8. Before backing up, look to the rear and assure no one is behind. Back up slowly.

9. Watch out for traffic when near or crossing roads. Always yield the right of way to pedestrians and other vehicles.

10. Do not touch engine, muffler or muffler shield while engine is running or soon after it has stopped, because these areas may be hot enough to cause burns.

11. If equipment begins to vibrate abnormally, stop **immediately**. Shut off the Skid Sprayer engine and disengage all power. Repair all damage before commencing operation.

MAINTENANCE:

WARNING: Engine exhaust contains carbon monoxide which is an odorless, deadly poison. Carbon monoxide is also known to the State of California to cause birth defects. Do not run engine indoors or in an enclosed area.

12. Before servicing or making any adjustments to the Skid Sprayer:

A. Stop the transport vehicle and set the parking brake.

B. Shut off the Skid Sprayer's engine and pull wire off the spark plug. Make sure wire cannot contact plug accidentally.

C. Disengage all power and wait until all moving parts have stopped.

D. Keep hands, feet and clothing away from all power driven parts.

13. Keep all nuts, bolts and other fasteners tightened securely. Replace any shields removed during servicing or adjustments.

14. To reduce potential fire hazard, keep the engine area free of excessive grass, leaves and accumulation of dirt.

15. Before servicing or making any adjustments to the Diaphragm Pump:

A. Release all pressure within the system; shut off the engine and lift the relief valve lever at the pump.

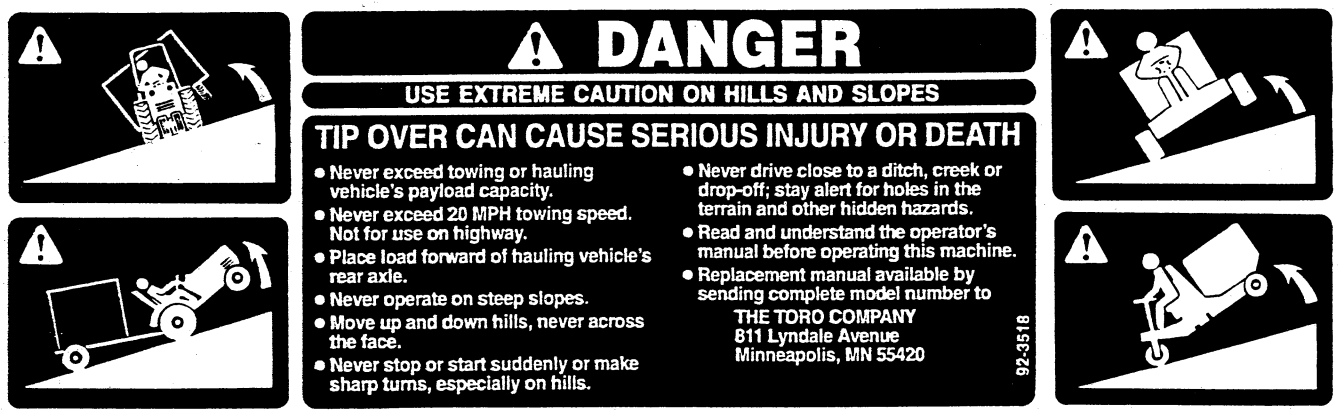
B. Drain all liquids from the system.

C. When replacing any parts, pipe, fittings, accessories, hoses, etc., they must be rated for the maximum pressure (600 PSI) of the Diaphragm Pump.

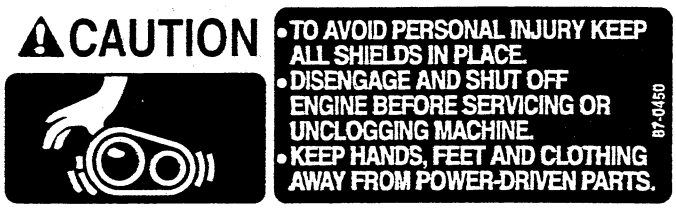
16. To be sure of optimum performance and safety, always purchase genuine TORO replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous. Altering this equipment in any manner may affect the machine's operation, performance, durability or its use may result in injury or death. Such use could void the product warranty of the TORO Company.

SAFETY AND INSTRUCTION DECALS

The following decals are installed on the machine. If any become damaged or illegible, replace it. The decal part number is listed below and in your parts catalog. Replacement can be ordered from your Authorized Toro Distributor.



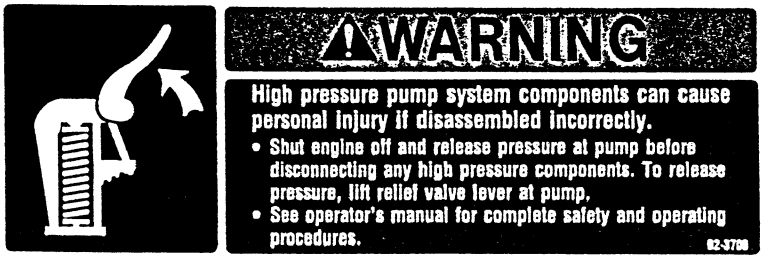
Part No. 92-3518 Located on Belt Shield



Part No. 87-0450 Located on top of Drive Shaft Cover.

Part No. 65-3090 Located on top of Belt Guard.

Part No. 92–0313 Located on top of Optional Control Box.



Part No. 92-3709 located on Skid Frame, near Diaphragm Pump.

Part No. 92-0239 located on Skid Frame, near Centrifugal Pump.

BEFORE OPERATING

FILL ENGINE CRANKCASE WITH OIL:

IMPORTANT! The Skid Sprayer is shipped from the factory **without oil** in the engine's crankcase.

1. Position the Skid Sprayer on a level surface.

2. Clean the area around the oil fill/check plug and remove it.

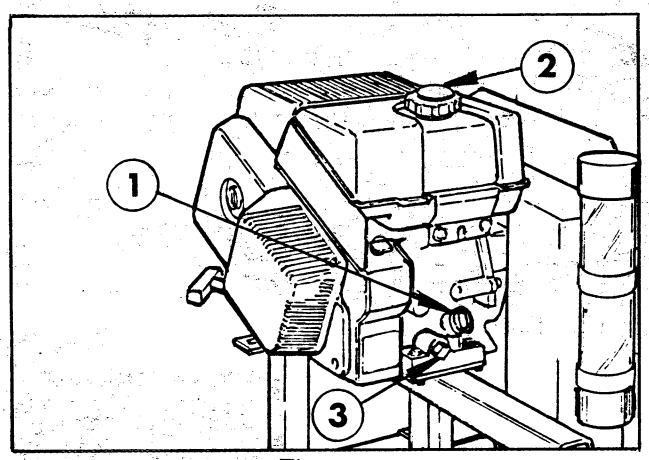


Figure 1

1. Oil Fill/Check Plug 2. Fuel Tank Cap 3. Oil Drain

3. Insert a funnel into the oil fill tube and slowly pour engine oil into the crankcase. The engine uses any high-quality oil having the American Petroleum Institute-API-"service classification" SF or SG. See viscosity chart for recommended weight to use. The capacity of the crankcase is approximately 23 ounces (.66L).

4. The level should be up to, but not over, the point of overflowing the filler neck.

5. Reinstall the oil fill/check plug and tighten securely. Make sure it is tightened to 13 ft. lbs. (17.6 N m) torque.

IMPORTANT! Check the oil level every five (5) operating hours or each time the engine is started. For a new engine, drain the oil and replace it after the first five (5) hours of operation: thereafter, under normal conditions, change oil after every 100 hours of operation. Change the oil more frequently when the engine is operated in dusty or dirty conditions.

FILL FUEL TANK WITH GASOLINE:

Fuel tank capacity is approximately 3 U.S. quarts. (3.18 L)

DANGER

Because gasoline is flammable, caution must be used when storing or handling it. Do not fill fuel tank while engine is running, hot or when machine is in an enclosed area. Vapors may build up and be ignited by a spark or flame source many feet away. DO NOT SMOKE while filling the fuel tank to prevent the possibility of an explosion. Always fill fuel tank outside and wipe up any spilled gasoline before starting engine. Use a funnel or spout to prevent spilling gasoline, and fill tank to about 1/2 inch (13 mm) below the filler neck. Store gasoline in a cool, well-ventilated place; never in an enclosed area such as a hot storage shed. To ensure volatility, do not buy more than a 30 day supply of gasoline. Gasoline is a fuel for internal combustion engines; therefore, do not use it for any other purpose. Since many children like the smell of gas, keep it out of their reach because the fumes are explosive and dangerous to inhale.

1. Clean area around fuel tank cap so foreign matter cannot enter tank when cap is removed. (Fig. 1)

2. Remove cap from fuel tank and fill tank with unleaded gasoline to within 1/2" (13 mm) from top of tank. Then reinstall fuel tank cap.

3. Wipe up any gasoline that may have spilled.

CONTROLS

IDLER ENGAGEMENT CHAIN: Used to bring the Idler Pulley into contact with the Drive Belt, creating tension to allow the engine to drive the selected pump system. DO NOT DISENGAGE THE BELT WHILE THE ENGINE IS RUNNING!

IMPORTANT! For the sake of clarity, the safety shields have been removed in this illustration. NEVER operate the Sprayer with the Belt Cover or the Belt Shield removed!

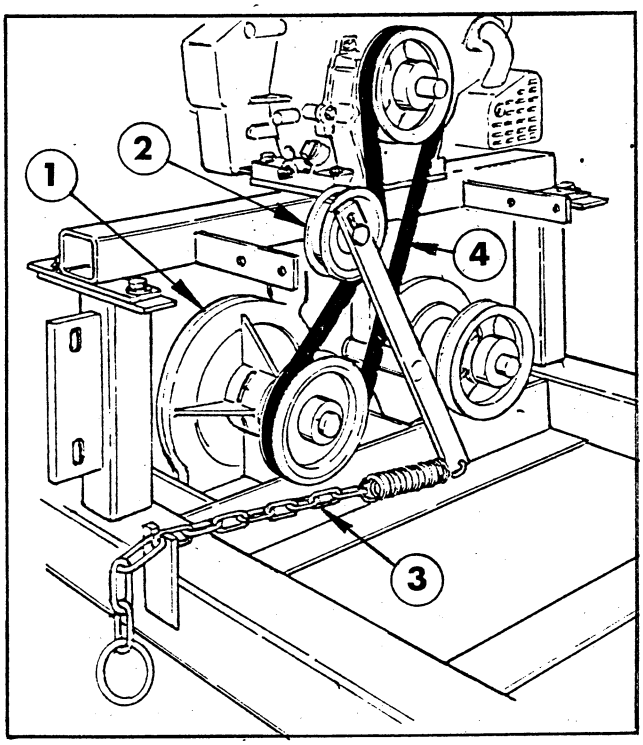


Figure 2

1. **Centrifugal Pump (High Volume)**
2. **Idler Pulley**
3. **Idler Engagement Chain**
4. **Drive Belt**

The Drive Belt shown in Fig. 2 is installed correctly for driving the Centrifugal (high volume) Pump ONLY. See Fig. 9 on page 11, for the correct Belt installation for driving the Diaphragm (high pressure) Pump.

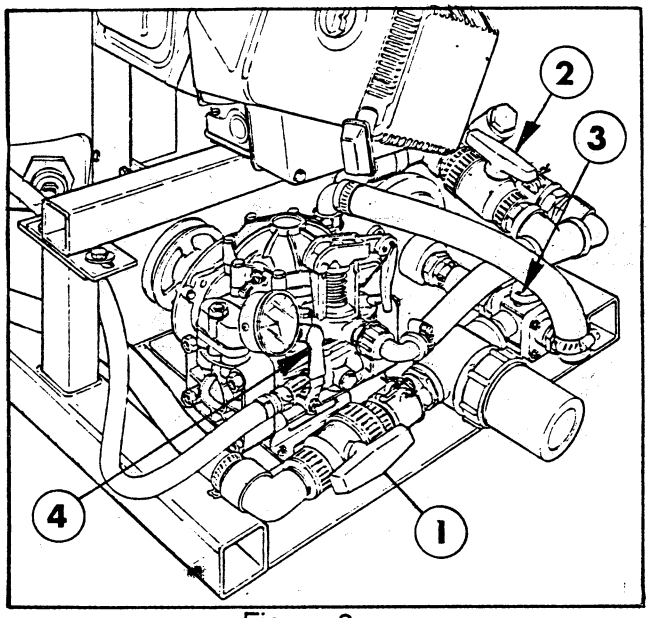


Figure 3

1. **Suction Line Valve (Open)**
2. **Agitator Valve (Open)**
3. **Directional Valve (High Pressure)**
4. **High Pressure Valve (Closed)**

SUCTION LINE VALVE: Opens and closes the Suction Line, which draws spray solution from the Tank to the Pump. The Valve is OPEN when the lever is positioned as shown in Fig. 3.

IMPORTANT! Be certain the Suction Line Valve is open and liquid has reached the Pump before the Pump is activated. The Pump will be damaged if it is allowed to run dry!

JET AGITATOR VALVE: Opens and closes the By-Pass Line to activate, adjust or stop the agitation of the spray solution in the Tank. The Agitator Valve must be OPEN when the Centrifugal (high volume) Pump is being used. The Agitator Valve must be CLOSED when the Diaphragm (high pressure) Pump is being used.

DIRECTIONAL VALVE: Directs the spray solution to either the Centrifugal (high volume) Pump or to the Diaphragm (high pressure) Pump. Turn the Valve lever as shown on the decal, to direct the spray solution to the Pump to be used.

HIGH PRESSURE VALVE: Is the ON/OFF control for the flow of the spray solution from the Diaphragm pump to the Sprayer Hand Gun.

CONTROLS

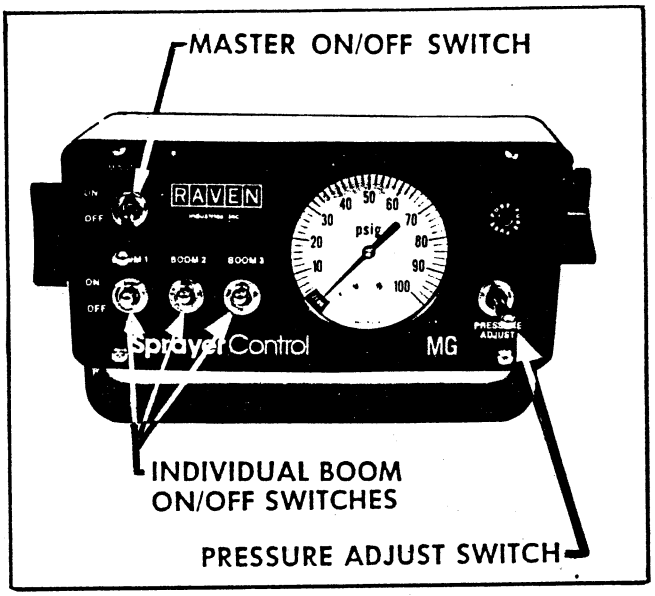


Figure 4

Used when spraying with Centrifugal (high volume) Pump ONLY:

ELECTRIC SPRAY CONTROL SYSTEM: Controls the pressure and flow of spray solution to the Boom sections. See Fig. 4.

a. **Pressure Adjust Switch:** Hold to INCREASE or DECREASE spraying pressure to desired level.

b. **Master ON/OFF Switch:** Activates all three Boom Valves to control the flow of spray solution to the Boom sections.

c. **Individual Boom ON/OFF Switches:** Allows selection of individual Boom sections and controls the flow of spray solution to left (Boom #1), center (Boom #2) or right (Boom #3) Booms.

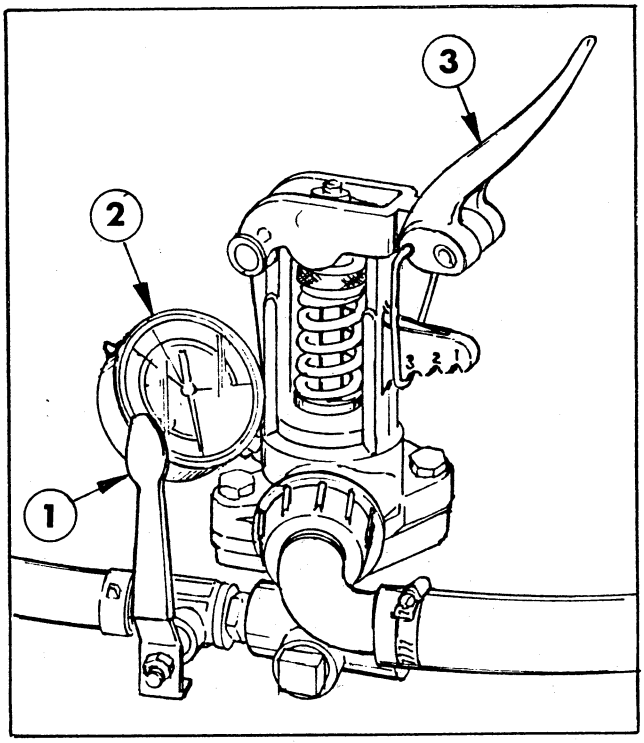


Figure 5

1. High Pressure Valve (Closed)
2. Pressure Gauge
3. Pressure Relief/ Adjustment Valve (Open)

Used when spraying with Diaphragm (high pressure) Pump ONLY:

PRESSURE CONTROL UNIT: Controls the operating pressure and flow of spray solution.

a. **High Pressure Valve:** Opens and closes to control the supply of spray solution to the Hand Spray Gun. See Fig. 5.

b. **Pressure Relief/Adjustment Valve:** Controls the operational pressure of the spray system. Raise the lever to relieve the pressure in the system. Push the lever down and clamp it into a selected position for the desired operating pressure.

c. **Pressure Gauge:** Indicates the operating pressure of the sprayer system.

CONTROLS

CENTRIFUGAL PUMP SYSTEM SET-UP:

1. Install the Drive Belt on the Engine and Pump Pulleys as shown in Fig. 6. The Centrifugal Pump is used for high volume spraying, i.e. Boom spraying.

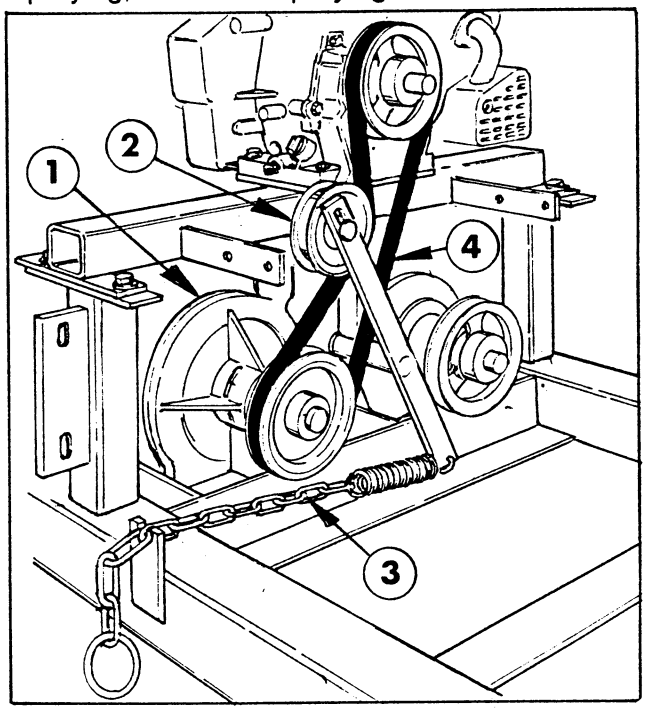


Figure 6

1. **Centrifugal Pump (High Volume)**
2. **Idler Pulley**
3. **Idler Engagement Chain**
4. **Drive Belt**

2. Pull the Idler Engagement Chain to bring the Idler Pulley into contact with the Drive Belt. At the point of resistance by the Drive Belt, pull the Chain the distance of another two links and insert that link into the lug on the Skid Frame. See Fig. 6.

3. OPEN the Suction Line Valve and the Agitator Valve and position the Directional Valve Lever as shown in Fig. 7.

IMPORTANT! Be certain the Suction Line Valve is open and liquid has reached the Pump before the Pump is activated. The Pump will be DAMAGED if it is allowed to run dry!

4. Fill the Tank with clean, clear water. Do NOT add chemical to the Tank until just before beginning to spray. Follow the chemical manufacturer's instructions for mixing the spray solution, to obtain desired application rate and effect.

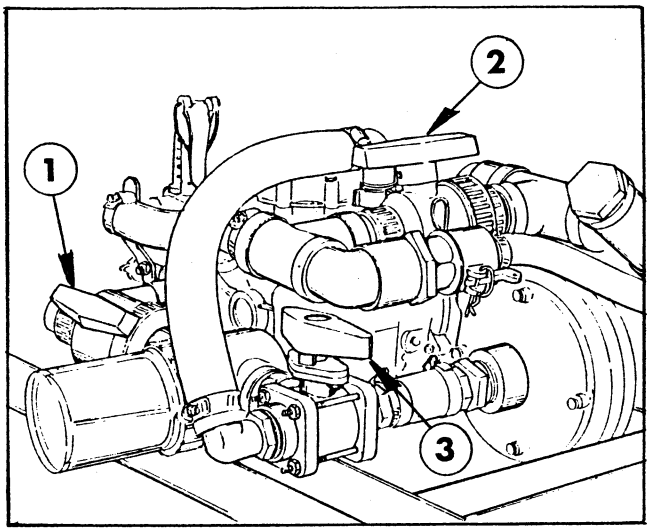


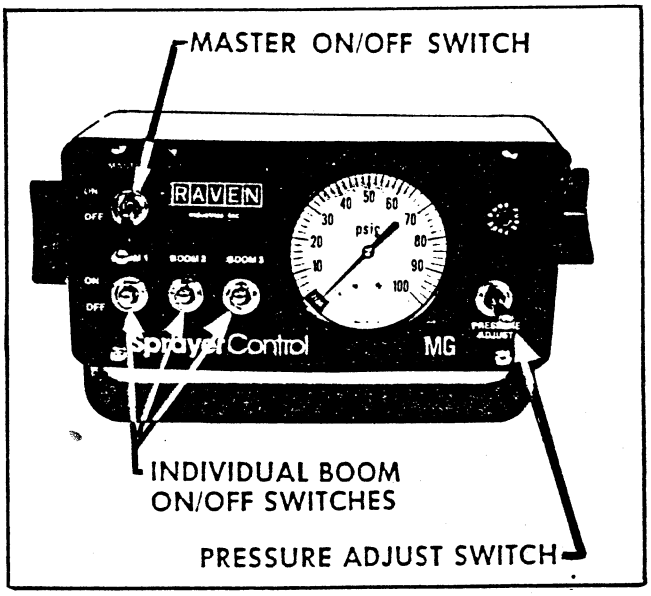
Figure 7

1. **Suction Line Valve (Open)**
2. **Agitator Valve (Open)**
3. **Directional Valve (High Volume)**

5. Start the Skid Sprayer's engine.

6. Turn "ON" the Master Boom Switch and all three individual Boom Switches.

7. Set the Pressure Gauge to the desired operating pressure.



CONTROLS

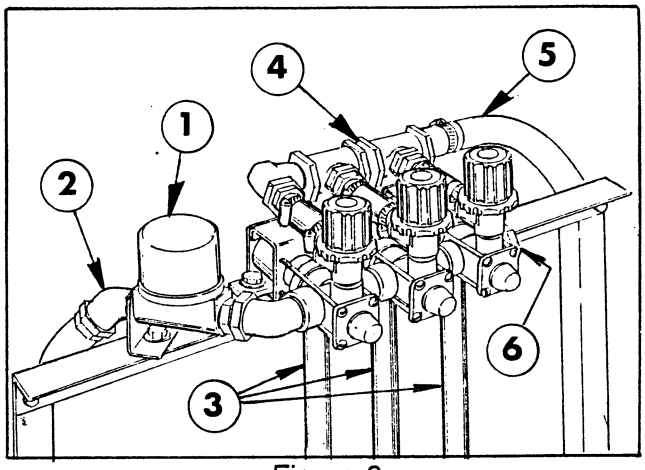


Figure 8

1. Control Valve
2. Supply Hose
3. Feeder Hoses
4. Solenoid Assem.
5. Overflow Hose
6. Gauge Tube Fitting

At this point, the Throttling Valves must be adjusted. See Fig. 8. This is accomplished as follows:

8. With all three Boom sections "ON", switch Boom #1 to "OFF". You will notice a change in pressure at the Gauge. Loosen the Locking ring on #1 Boom's Throttling Valve and turn the Adjusting Cap until the original pressure setting is reached. Tighten the Locking Ring.

9. With Boom #2 and #3 "ON", switch Boom #2 to "OFF" and adjust the #2 Boom's Throttling Valve to reset the original pressure.

10. Switch Boom #3 to "OFF" and repeat this procedure for setting the #3 Boom's Throttling Valve.

To double check these settings, switch Boom sections ON and OFF. Verify that the pressure does not change at the Gauge.

NOTE: This entire procedure must be repeated whenever changing to a different operating pressure.

DIAPHRAGM PUMP SYSTEM SET-UP:

1. Install the Drive Belt on the Engine and Pump Pulleys as shown in Fig. 9. The Diaphragm Pump is used for high pressure spraying, i.e. Hand Gun spraying.

2. Pull the Idler Engagement Chain to bring the Idler Pulley into contact with the Drive Belt. At the point of resistance by the Drive Belt, pull the Chain the distance of another two links and insert that link into the lug on the Skid Frame See Fig. 9.

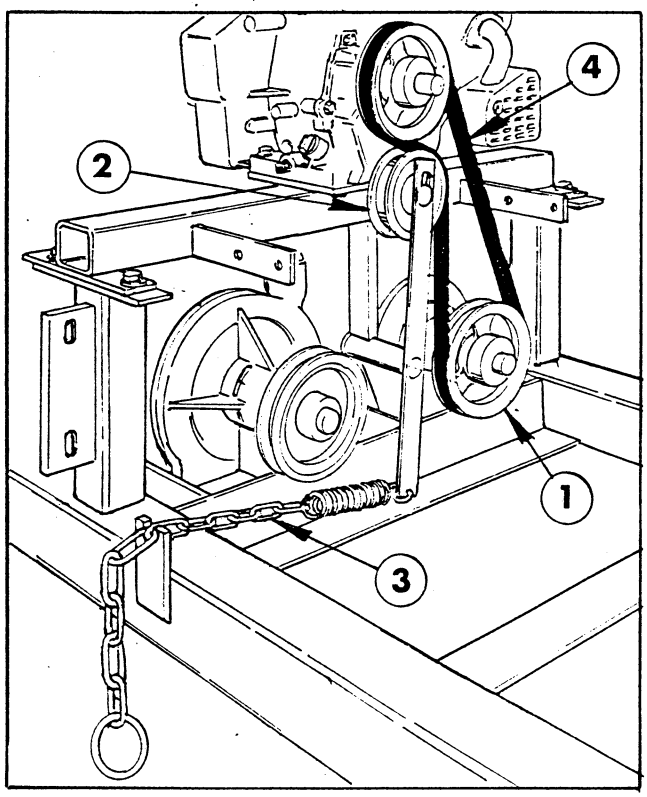


Figure 9

1. Diaphragm Pump (High Pressure)
2. Idler Pulley
3. Idler Engagement Chain
4. Drive Belt

CONTROLS

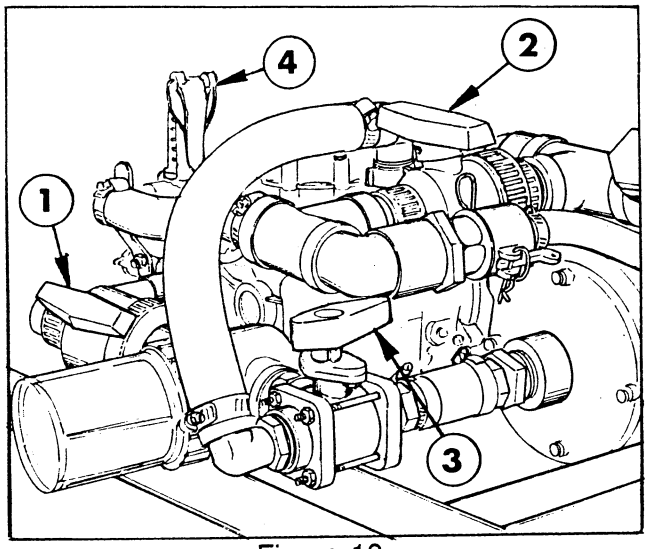


Figure 10

1. Suction Line Valve (Open)
2. Agitator Valve (Closed)
3. Directional Valve (High Pressure)
4. Pressure Relief/ Adjustment Valve

3. OPEN the Suction Line Valve and CLOSE the Agitator Valve. Position the Directional Valve Lever as shown in Fig. 10.

IMPORTANT! Be certain the Suction Line Valve is open and liquid has reached the Pump before the Pump is activated. The Pump will be DAMAGED if it is allowed to run dry!

4. Fill the Tank with clean, clear water. Do NOT add chemical to the Tank until just before beginning to spray. Follow the chemical manufacturer's instructions for mixing the spray solution, to obtain desired application rate and effect.

5. Lift the Relief Valve Adjustment Lever with the ball hook on the number one position to relieve any pressure build-up. Close the High Pressure Valve.

6. Start the Skid Sprayer's engine.

7. Adjust the Diaphragm Pump to the desired pressure as follows:

a. Clamping the Relief Valve Lever down with the ball hook in number one position, the pressure is about 100 PSI.

b. In the number two position, the pressure is about 250 PSI.

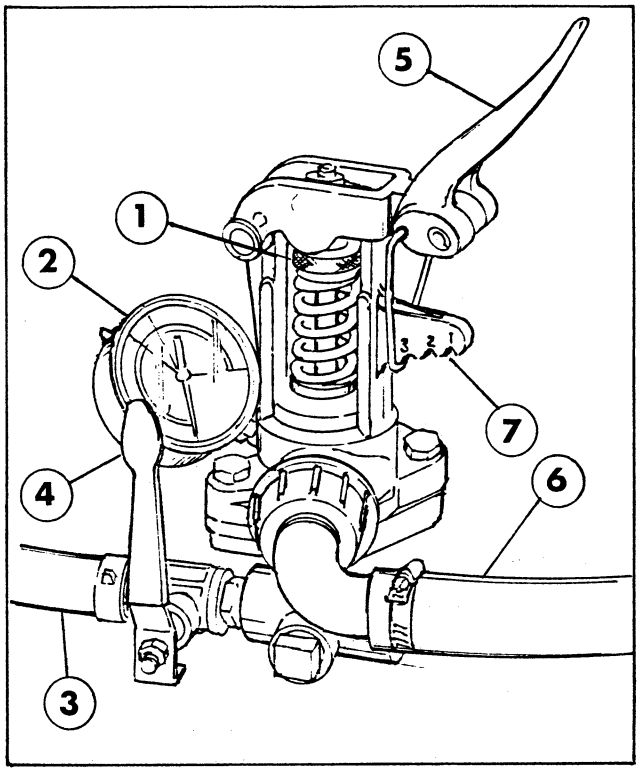


Figure 11

1. Fine Adjustment Nut
2. Pressure Gauge
3. High Pressure Hose
4. High Pressure Valve (Closed)
5. Adjustment Lever
6. By-Pass Hose
7. Pressure Adjustment Settings

c. In the number three position, the pressure is about 450 PSI.

d. In the number four position, the pressure is about 550 PSI.

These pressures can be adjusted by using the fine adjustment knob located on top of the relief valve spring. The fine adjustment knob can be rotated when the relief valve lever is in the up position.

8. When adjustment is complete and you have the hose line secured, to prevent any whipping action, open the High Pressure Valve to begin spraying.

OPERATING INSTRUCTIONS

BEFORE STARTING THE ENGINE TO BEGIN THE DAYS SPRAYER APPLICATION:

- Check the engine crankcase oil
- Check the Air Cleaner
- Check cooling air intake areas
- Check the fuel tank

TAKE MACHINE TO WORK SITE:

1. Select either the Centrifugal or the Diaphragm Pump System, depending on the type of sprayer application needed. CAUTION! DO NOT use the Diaphragm (high pressure) Pump for Boom spraying!

2. Install the Drive Belt on the Pump of your choice. See Fig. 2, page 7 or Fig. 9, page 10. Position the Idler Engagement Chain to engage the Pump drive.

3. Pull the Idler Engagement Chain to bring the Idler Pulley into contact with the Drive Belt. At the point of resistance by the Drive Belt, pull the Chain the distance of another two links and insert that link into the lug on the Skid Frame

4. Fill the Tank. IMPORTANT! DO NOT add chemical to the Tank until just before use. Instructions on the chemical manufacturer's container labels, regarding mixing proportions, should be read and STRICTLY followed. The concentrate should not be poured into an empty Tank. Fill the Tank about one-half full with clean, clear water, add chemical concentrate and then finish filling the Tank with water.

5. OPEN the Suction Line Valve. Position all other valves as instructed in the "SYSTEM SET-UP" for the selected Pump System, (high volume or high pressure).

START THE SPRAYER SKID'S ENGINE:

1. Open the fuel shut-off valve.

2. **For a Cold Engine:** Place the throttle control midway between the "slow" and "fast" positions. Place the choke control into the "on" position. Gradually return the choke control to the "off" position after the engine starts and warms up.

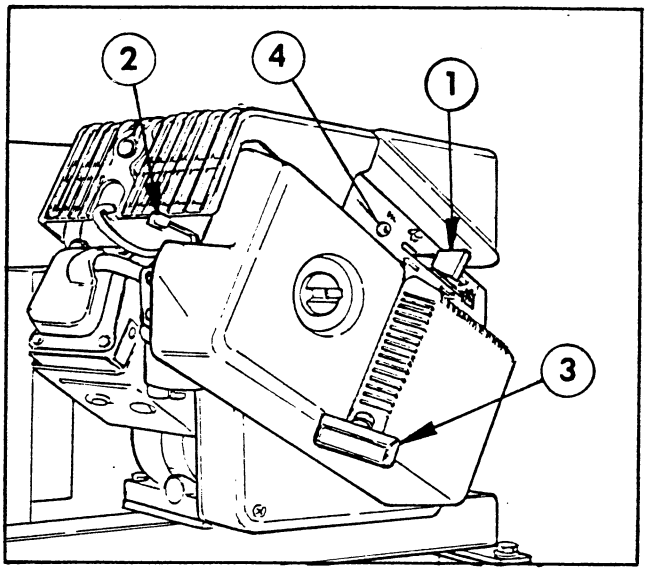


Figure 12

1. Throttle Control
2. Choke Control
3. Starter Handle
4. Oil Sentry

For a Warm Engine: (normal operating temperatures) Place the throttle control midway between the "slow" and "fast" positions. Place the choke control into the "off" position.

3. Pull the starter handle with a smooth, steady motion. Pull the handle straight out to avoid excess rope wear.

NOTE: The TORO Skid Spreader is designed to operate most effectively with the engine at full or nearly full 3600 RPM.

STOPPING THE ENGINE:

1. Move the throttle control to the "off" position.

2. Close the fuel shut-off valve.

WHEN USING THE CENTRIFUGAL (HIGH VOLUME) SPRAYING SYSTEM:

1. Place the Master ON/OFF Switch, on the Spray Control Console, at "ON".

2. Use the individual Boom Switches to activate the Boom Section (or Sections) to be used in the sprayer application.

3. Regulate the pressure with the Pressure Adjust Switch.

OPERATING INSTRUCTIONS

WHEN USING THE DIAPHRAGM (HIGH PRESSURE) SPRAYING SYSTEM:

With Hose Assembly and Hand Gun (or optional Hose Reel) installed:

1. Adjust the Diaphragm Pump to the desired pressure as described on page 11.

2. OPEN the High Pressure Valve.

NEVER USE DIAPHRAGM PUMP WHEN SPRAYING WITH A HOSE AND/OR A SPRAY GUN RATED AT LESS THAN 600 P.S.I.

WHEN JOB IS COMPLETED:

Flush the entire spraying system with clear water and flushing agent after each spray job. Failure to clean the system can result in a chemical residue which will seriously damage the Pumps and plug the Control Valve, Hoses and Nozzle Tips.

Wash spray tips thoroughly with water or a cleaning solution that is appropriate for the chemical used. Blow out the orifice, clean and dry. If orifice remain clogged, clean it with a soft bristled brush...never use a metal object.

MAINTENANCE SCHEDULE

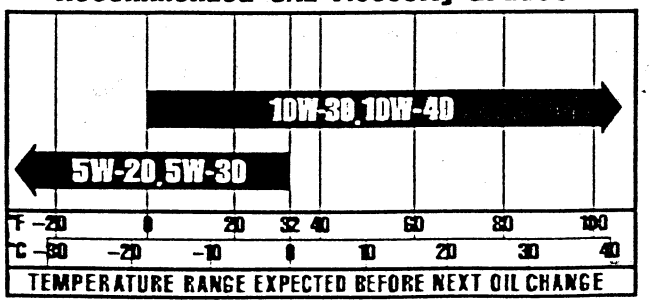
These required maintenance procedures should be performed at the frequency stated in the table. They should also be included as part of any seasonal tune-up.

FREQUENCY	MAINTENANCE REQUIRED
Daily Or Before Starting Engine	• Fill fuel tank. • Check oil level. • Check air cleaner for dirty[1], loose, or damaged parts. • Check air intake and cooling areas, clean as necessary[1].
Every 25 Hours	• Service precleaner element[1].
Every 100 Hours	• Service air cleaner element[1]. • Change oil. • Check spark plug condition and gap. • Remove cooling shrouds and clean cooling areas[1].
Annually Or Every 500 Hours	• Have valve to rocker arm clearance checked[2]. • Have Oil Sentry™ float switch checked[2].

[1]Perform these maintenance procedures more frequently under extremely dusty, dirty conditions.

[2]Have a Kohler Engine Service Dealer perform these services.

Recommended SAE Viscosity Grades



IMPORTANT! To prevent extensive engine wear or damage, always maintain the proper oil level in the crankcase. NEVER operate the engine with the oil level below the point of over-flowing the filler neck.

MAINTENANCE

DANGER!

Before servicing or making adjustments to the Skid Sprayer, stop the transport vehicle and set the parking brake. Shut off the Skid Sprayer engine and pull wire off the spark plug to prevent the engine from starting accidentally.

AFTER THE INITIAL RUN-IN PERIOD (APPROXIMATELY 5 HOURS):

1. Change the oil in the engine's crankcase as described on page 15

AFTER EVERY 10 HOURS OF OPERATION:

CHECK OIL LEVEL:

1. Make sure the engine is stopped, level, and is cool so the oil has had time to drain into the sump.

2. Clean the area around the oil/fill check plug and remove it.

3. The level should be up to but not over, the point of overflowing the filler neck.

4. If the level is low, add API "service classification" SF or SG. See viscosity chart on page 12 for the recommended weight.

5. Reinstall the oil fill/check plug and tighten securely. Make sure it is tightened to 13 ft. lbs. (17.6 N m) torque.

IMPORTANT! The Oil Sentry light will turn red when the engine oil is low, but the oil level should be checked BEFORE EACH USE.

SUCTION LINE STRAINER:

After every 50 hours of operation, or daily if spraying wettable powders.

1. Turn off the Suction Line Valve, if the Tank has been filled.

2. Remove the clear plastic bowl and clean the strainer screen.

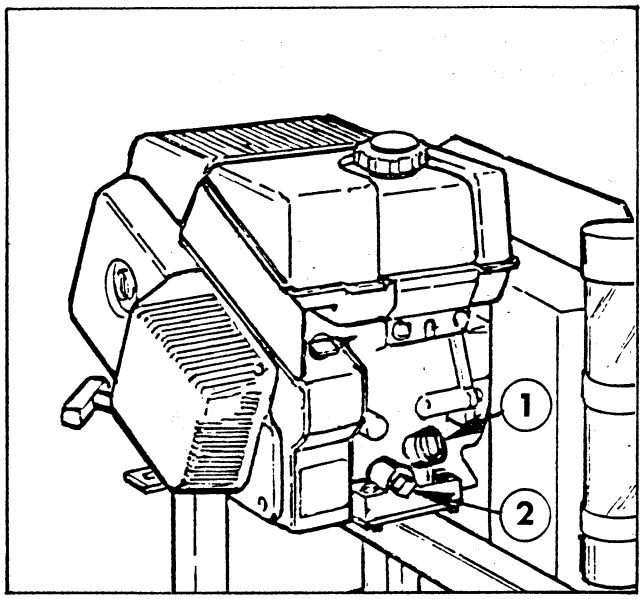


Figure 13

1. Oil Fill/Check Plug 2. Oil Drain

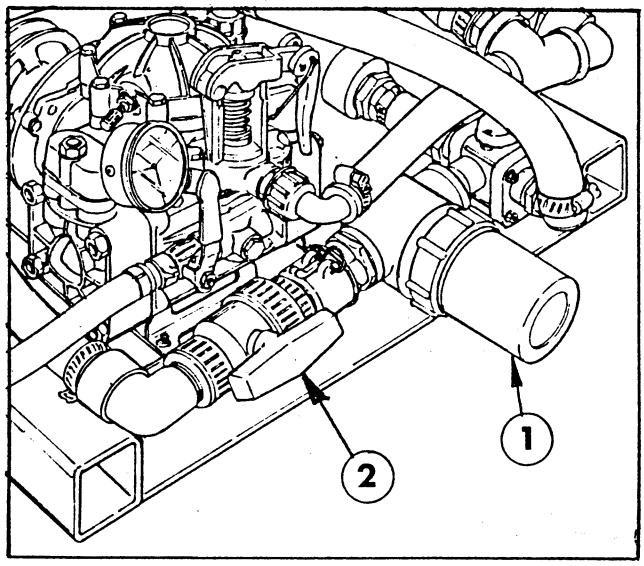


Figure 14

1. Suction Line Strainer 2. Suction Line Valve (Open)

IMPORTANT! Be certain the Suction Line Valve is OPENED and liquid has reached the Spray Pump, before the Pump is activated when spraying is resumed. The Spray Pump will be seriously damaged if it is allowed to run dry!

MAINTENANCE

AFTER EVERY 100 HOURS OF OPERATION:

CHANGE OIL:

Change the oil while the engine is still warm. The oil will flow freely and carry away more impurities. Make sure the engine is level when filling, checking and changing the oil.

1. Remove the oil drain plug and the oil fill/ check plug. Be sure to allow ample time for complete drainage.

2. Reinstall the drain plug. Make sure it is tightened to 13 ft. lbs. (17.6 N m) torque.

3. Fill the crankcase with new oil of the proper type, up to the point of overflowing the filler neck. Refer to "Oil Type" on page 12. Always check the oil level before adding more oil.

4. Reinstall the oil fill/check plug and tighten securely.

SERVICE PRECLEANER AND AIR CLEANER:

Check the Air Cleaner daily or before starting the engine. Check for and correct heavy buildup of dirt and debris, as well as loose or damaged components.

Service Precleaner:

Wash and reoil the precleaner after every 25 hours of operation (more often under dusty or dirty conditions).

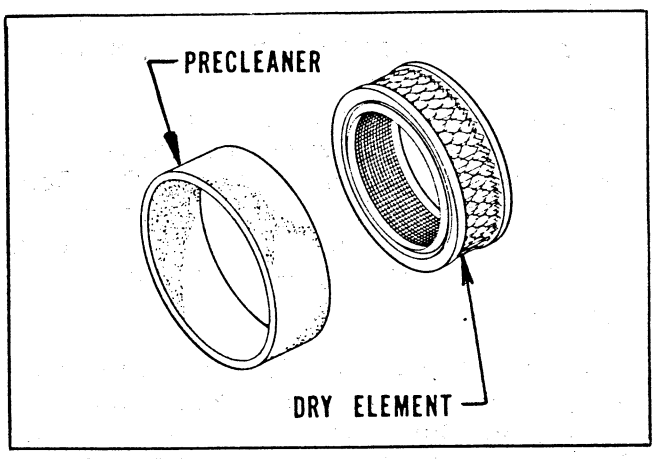
1. Loosen air cleaner cover retaining knob. NOTE: Choke control must be in the "OFF" position.

2. Slide the air cleaner cover off of the air cleaner base (away from the starter handle.) and remove the precleaner from the air cleaner element.

3. Wash the precleaner in warm water with detergent. Rinse the precleaner thoroughly until all traces of detergent are eliminated. Squeeze out excess water (do not wring). Allow the pre-cleaner to air dry.

4. Saturate the precleaner with new engine oil. Squeeze out all excess oil.

5. Reinstall the precleaner over the element. Reinstall the air cleaner cover and tighten the retaining knob.



Service Paper Element:

Every 100 hours of operation (more often under dusty or dirty conditions), check the paper element. Replace the paper element as necessary.

1. Remove the air cleaner cover and the pre-cleaner from the air cleaner element as described above (steps 1 and 2).

2. Remove the air cleaner cover ring, element cover w/grommet, washer and wing nut. Pull the element cover w/grommet off. Remove the paper element.

3. Replace a dirty, bent or damaged element. Do not wash the paper element or use pressurized air as this will damage the element. Handle new elements carefully; do not use if the sealing surfaces are bent or damaged.

4. When servicing the air cleaner, check the air cleaner base. Make sure it is secured and not bent or damaged. Also check the air cleaner element cover for damage or improper fit. Replace all bent or damaged air cleaner components.

5. Install new or serviced paper elements and components as follows:

   A. Position paper element on base.

   B. Slide element cover w/grommet, then washer, onto stud. Secure with wing nut.

   C. Reinstall the precleaner over the paper element.

   D. Reinstall air cleaner cover ring into element cover.

   E. Reinstall air cleaner cover and secure with retaining knob.

MAINTENANCE

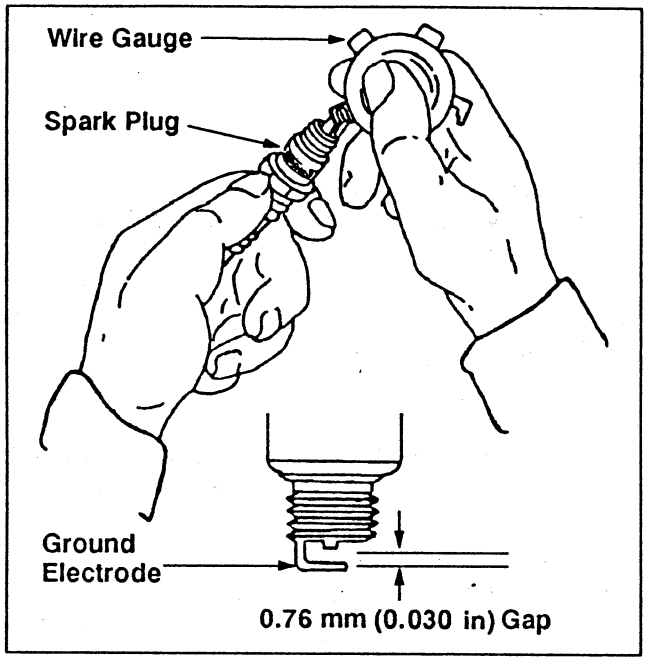
CLEAN AIR INTAKE/COOLING AREAS:

To insure proper cooling, make sure the screen, cooling fins and other external surfaces of the engine are kept clean at all times. **NOTE:** Operating the engine with a blocked screen, dirty or plugged cooling fins, and/or cooling shrouds removed, will cause engine damage due to overheating.

Every 100 hours of operation (more often under dusty, dirty conditions), remove the blower housing and other cooling shrouds. Clean the cooling fins and external surfaces as necessary. Make sure the cooling shrouds are reinstalled.

CHECK SPARK PLUG:

Every 100 hours of operation, clean the area around the base of the plug and check its condition. Reset the gap to .030 in. (0.76 mm) or replace with a new plug as necessary. Use a Champion type RC12YC or equivalent. Torque to 18-22 ft lb (24.4 - 29.8 Nm).



MAINTENANCE

DANGER

LIQUID IS DISCHARGED FROM THE DIAPHRAGM PUMP UNDER PRESSURES THAT ARE HIGH ENOUGH TO CAUSE PERSONAL INJURY!

BEFORE DISCONNECTING ANY HIGH PRESSURE COMPONENTS:

- Shut engine off and lift relief valve lever at pump to relieve any build-up of pressure.

DIAPHRAGM PUMP:

After every 500 hours of operation change oil and diaphragms.

1. Remove cap from oil sight tube, turn Pump upside down and rotate the shaft until oil stops flowing out.

2. Refill Pump with oil; slowly pour oil into sight tube while turning the Pump shaft. Turning the shaft purges all the air out of the crankcase. Always change oil when replacing diaphragms.

VALVE AND O-RING REPLACEMENT:

Occasionally debris can cause the valves to not seat properly or damage the O-Rings. To check for this problem follow these steps:

1. Remove the Pump manifold (See Parts List). Use a 17mm box wrench to remove manifold nuts. With manifold removed, valves can readily be removed and checked for debris or wear.

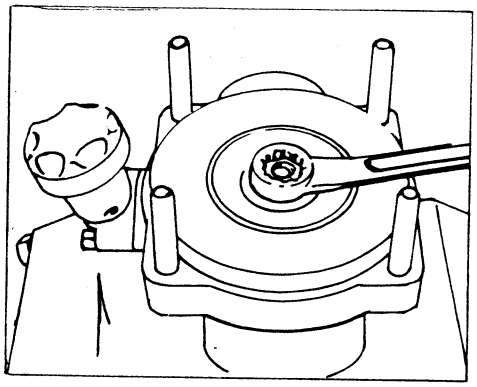
2. To replace valves or O-Rings, see your TORO Dealer for the appropriate kits.

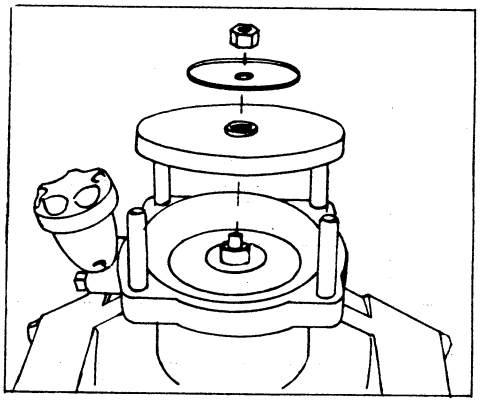
DIAPHRAGM REPLACEMENT:

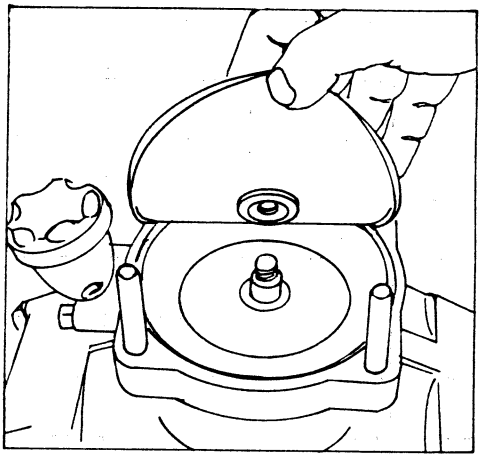
1. Drain the oil from the Pump by removing cap from oil sight tube and inverting the Pump. Rotate the shaft to remove excess oil.

2. Remove the Pump manifold. Use a 17mm box wrench to remove manifold nuts.

3. Use a 13mm box wrench to remove the diaphragm retaining bolt, support washer and diaphragm.







4. To replace diaphragms, see your TORO dealer for the appropriate repair kit.

5. Turn the crankshaft to bring the piston to its downstroke and seat the new diaphragm into the sleeve groove. Install retaining washer and tighten nut.

6. Replace the pulsation damper diaphragm by first bleeding the air from the damper. Use a 13mm box wrench to remove the bolts holding the damper assembly together, then replace diaphragm. Recharge damper to 20% of operation pressure.

7. Refill crankcase with 30W oil. Rotate the shaft to distribute and fill to proper level.

MAINTENANCE CHART

Date	Hours Used	Oil Change	Air Cleaner Service	Lubrication	Winter Storage	Spring Service	Spark Plug Gap	

TABLE OF CONTENTS

Page

SAFETY INSTRUCTIONS 3

Before Operating 3
While Operating 3
Maintenance 4

SAFETY AND INSTRUCTION DECALS 5

BEFORE OPERATING 6

CONTROLS 7

Idler Engagement Chain 7
Suction Line Valve 7
Jet Agitator Valve 7
Directional Valve 7
High Pressure Valve 7
Electric Spray Control 8
Pressure Control Unit 8
Centrifugal Pump System Set-Up 9
Diaphragm Pump System Set-Up 10
Diaphragm Pump Pressure Adjustment 11

OPERATING INSTRUCTIONS 12

Starting and Stopping the Engine 12
Centrifugal (High Volume) Pump System 12
Diaphragm (High Pressure) Pump System 12
Flushing the System 13

MAINTENANCE SCHEDULE 13

MAINTENANCE 14

Engine 14
Suction Line Strainer 14
Air Cleaner 15
Diaphragm Pump 16

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A ONE YEAR LIMITED WARRANTY

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If you feel your TORO product is defective and wish to rely on The Toro Promise, the following procedure is recommended:

1. Contact your Authorized TORO Distributor or Commercial Dealer (the Yellow Pages of your telephone directory is a good reference source).
2. The TORO Distributor or Commercial Dealer will advise you on the arrangements that can be made to inspect and repair your product.
3. The TORO Distributor or Commercial Dealer will inspect the product and advise you whether the product is defective and, if so, make all repairs necessary to correct the defect without an extra charge to you.

If for any reason you are dissatisfied with the distributor's analysis of the defect or the service performed, you may contact us.

Write:

TORO Commercial Products Service Department
8111 Lyndale Avenue South
Minneapolis, Minnesota 55420

The above remedy of product defects through repair by an Authorized TORO Distributor or Commercial Dealer is the purchaser's sole remedy for any defect.

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