FORM NO. 3317-427 UK

TORO®

MODEL NO. 30739—50001 & UP
MODEL NO. 30741—50001 & UP

OPERATOR'S MANUAL

GROUNDSMASTER® 325-D

TRACTION UNITS

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Foreword

This operator's manual has instructions on safety, operation, and maintenance.

This manual emphasizes safety, mechanical and general product information. DANGER, WARNING and CAUTION identify safety messages. Whenever the triangular safety alert symbol appears, understand the safety message that follows. "IMPORTANT" highlights special mechanical information and "NOTE" emphasizes general product information worthy of special attention.

IDENTIFICATION AND ORDERING

MODEL AND SERIAL NUMBER

The model and serial number for the traction unit is on a plate that is mounted on the left front frame member. The model and serial number for the cutting unit is on a plate that is mounted on the top front of the center cutting unit. Use model and serial number in all correspondence and when ordering parts.

To order replacement parts from an authorized TORO Distributor, supply the following information:

1. Model and serial numbers of the machine.

2. Part number, description and quantity of parts desired.

NOTE: Do not order by reference number if a parts catalog is being used; use the part number.

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Safety

Training

1. Read the instructions carefully. Be familiar with the controls and the proper use of the equipment.

2. Never allow children or people unfamiliar with these instructions to use the lawnmower. Local regulations may restrict the age of the operator.

3. Never mow while people, especially children, or pets are nearby.

4. Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.

5. Do not carry passengers.

6. All drivers should seek and obtain professional and practical instruction. Such instruction should emphasize:
   - the need for care and concentration when working with ride-on machines;
   - control of a ride on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are:
     - insufficient wheel grip;
     - being driven too fast;
     - inadequate braking;
     - the type of machine is unsuitable for its task;
     - lack of awareness of the effects of ground conditions, especially slopes;

Preparation

1. While mowing, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.

2. Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.

3. **WARNING—Petrol is highly flammable.**
   - Store fuel in containers specifically designed for this purpose.
   - Refuel outdoors only and do not smoke while refueling.
   - Add fuel before starting the engine. Never remove the cap of the fuel tank or add petrol while the engine is running or when the engine is hot.
   - If petrol is spilled, do not attempt to start the engine but move the machine away from the are of spillage and avoid creating any source of ignition until petrol vapors have dissipated.
   - Replace all fuel tanks and container caps securely.

4. Replace faulty silencers.

5. Before using, always visually inspect to see that the blades, blade bolts and cutter assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.

6. On multi-bladed machines, take care as rotating one blade can cause other blades to rotate.

Operation

1. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.

2. Mow only in daylight or in good artificial light.

3. Before attempting to start the engine, disengage all blade attachment clutches and shift into neutral.

4. Do not use on slopes of more than:
   - Never mow side hills over 5°
   - Never mow uphill over 10°
   - Never mow downhill over 15°

5. Remember there is no such thing as a "safe" slope. Travel on grass slopes requires particular care. To guard against overturning:
   - do not stop or start suddenly when going up or downhill;
   - engage clutch slowly, always keep machine in gear, especially when travailing downhill;
   - machine speeds should be kept low on slopes and during tight turns;
   - stay alert for bumps and hollows and other hidden hazards;
   - never mow across the face of the slope, unless the lawnmower is designed for this purpose.

6. Use care when pulling loads or using heavy equipment.
   - Use only approved drawbar hitch points.
   - Limit loads to those you can safely control.
   - Do not turn sharply. Use care when reversing.
   - Use counterweight(s) or wheel weights when suggested in the instruction handbook .

7. Watch out for traffic when crossing or near roadways.

8. Stop the blades rotating before crossing surfaces other than grass.

9. When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation .

10. Never operate the lawnmower with defective guards, shields or without safety protective devices in place.

11. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speeds may increase the hazard of personal injury.

12. Before leaving the operator's position:
   - disengage the power take-off and lower the attachments;
   - change into neutral and set the parking brake;
   - stop the engine and remove the key.

13. Disengage drive to attachments, stop the engine, and disconnect the spark plug wire(s)or remove the ignition key
   - before cleaning blockages or unclogging chute;
   - before checking, cleaning or working on the lawnmower;
   - after striking a foreign object. Inspect the lawnmower for damage and make repairs before restarting and operating the equipment;
   - if the machine starts to vibrate abnormally (check immediately).

14. Disengage drive to attachments when transporting or not in use.

15. Stop the engine and disengage drive to attachment
   - before refueling;
   - before removing the grass catcher;
   - before making height adjustment unless adjustment can be made from the operator's position.

16. Reduce the throttle setting during engine run-out and, if the engine is provided with a shutoff valve, turn the fuel off at the conclusion of mowing.

Maintenance and Storage

1. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.

2. Never store the equipment with petrol in the tank inside a building where fumes may reach an open flame or spark.

3. Allow the engine to cool before storing in any

enclosure.

4. To reduce the fire hazard, keep the engine, silencer, battery compartment and petrol storage area free of grass, leaves, or excessive grease.

5. Check the grass catcher frequently for wear or deterioration.

6. Replace worn or damaged parts for safety.

7. If the fuel tank has to be drained, this should be done outdoors

8. On multi-bladed machines, take care as rotating one blade can cause other blades to rotate.

9. When machine is to be parked, stored or left unattended, lower the cutting means unless a positive mechanical lock is used.

Symbol Glossary

Safety alert symbol



Safety alert symbol



Read operator's manual



Consult technical manual for proper service procedures



Thrown or flying objects—whole body exposure



Thrown or flying objects—rotary side-mounted mower. Keep deflector shield in place.



Severing toes or foot—mower blade



Severing fingers or hand—mower blade



Rotating blade can cut off toes or fingers. Stay clear of blade as long as the engine is running.



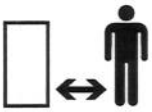
Do not open or remove safety shields while the engine is running.



Dismemberment—Mower in rearward position.



Stay a safe distance from the machine.



Stay a safe distance from the mower.



Keep children a safe distance from the machine.



Machine rollover—side hill



Machine rollover—up hill



Machine rollover—down hill



Machine rollover—roll over protection system



Fast 

Slow 

Decreasing/increasing 

On/Run 

Off/Stop 

Engine 

Engine start 

Engine stop 

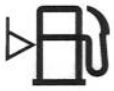
Choke 

Engine temperature 

Engine lubricating oil pressure 

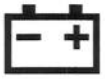
Engine lubricating oil pressure 

Fuel 

Fuel level 

Volume empty 

Volume full 

Battery charging condition 

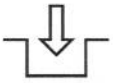
Head lights—Main/high beam 

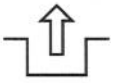
Brake system 

Parking brake 

Clutch 

PTO (Power Take Off) 

Engage 

Disengage 

Unlock 

Lock 

Cutting element—basic symbol



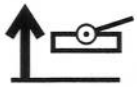
Cutting element—height adjustment



Cutting unit—lower



Cutting unit—raised



Cutting or entanglement of foot—rotating auger



Severing of fingers or hand—impeller blade



Keep a safe distance from snowthrower.



Stay a safe distance from snowthrower.



Tractors must be equipped with 45 kg rear wheel wheel weight with this attachment installed.



Machine rollover protection system snowthrower



Severing of hand—rotating knives



Severing of foot—rotating knives



Riding on this machine is allowed only on a passenger seat and only if the driver's view is not hindered.



Crushing of fingers or hands—force applied from the side



Kickback or upward motion—stored energy



Shut off engine and remove key before performing maintenance or repair work.



Machine travel direction—combined



Low — **L**

High — **H**

Reverse — **R**

Neutral — **N**

First gear — **1**

Second gear — **2**

Third gear up to a maximum number of forward gears. — **3**

Specifications

Engine: The 4-cycle, 3-cylinder, overhead valve Mitsubishi diesel engine Model K3D is water cooled and delivers 24.99 HP (18.6 kW) @3,600 rpm. Cylinder bore is 2-7/8 in. (73 mm), stroke is 3- 1/16 in. (78 mm) and displacement is 59.7 cu. in. (979 cc). Compression ratio is 23:1. Crankcase oil capacity with filter is 3.7 qt. (3.5 L). The filter is a full-flow, replaceable, screw-on type. Mechanical centrifugal type governor limits maximum no-load engine speed to 3,200 +/- 50 rpm. Idle speed is 1,500 +/- 50 rpm. Glow plug is installed in each cylinder for starting assist.

Air Cleaner: Heavy-duty, remote mounted.

Muffler: Volume equal to approximately six times engine displacement for excellent silencing. A park arrestor is incorporated with the muffler.

Cooling System: The radiator has a tube and fin construction with the hydraulic oil cooler in the lower tank. Cooling system capacity is approximately 6 quarts (5.7 L) of a 50% mixture of permanent, ethylene glycol antifreeze and water. The radiator is equipped with a 15 psi (103 kPa) pressure cap and the engine has a 170° F (76.5° C) thermostat.

Electrical: The 12-volt battery has 550-amp. cold cranking performance at 0° F (18° C), and a 12-volt negative ground, 35-amp. alternator with regulator for charging battery. An electric solenoid on the injection pump operates a shut-off device to stop fuel flow, thereby stopping the engine. A 40-amp. manual reset circuit breaker protects the electrical wiring.

Fuel System: The fuel tank holds 8-1/2 gal. (32 L) of No. 1 or 2 automotive type diesel fuel oil, per SAE J313c spec. 12-volt, electric (transistor type), fuel pump with replaceable filter mounted on the frame. The fuel filter/water separator with a replaceable cartridge is mounted on the frame.

Front Axle: The heavy-duty Dana GT 20 axle has a reduction of 20.9:1. The axle has an automotive type differential, bevel gear pinion and ring gear with a spur gear reduction from the transmission. All axle components are mounted in tapered roller bearings.

Transmission: A Sundstrand in-line hydrostatic transmission is mounted directly to the front axle and driven by flexible drive couplings. Operating pressure is 500 to 3,000 psi (3,447 to 20,685 kPa) and normal charge pressure is 70 to 150 psi (453 to 1,034 kPa). The implement relief valve setting is 700 to 900 psi (4,826 to 6,205 kPa). Displacement is 0.913 cubic inch (15 CM3) per revolution, and the transmission is controlled by a foot-actuated pedal. The front axle is the hydraulic fluid reservoir, and its capacity is 5 quarts (4.7 L) of SAE 10W-40 SF/CC or CD engine oil. The 25-micron hydraulic oil filter is a screw-on replaceable type. For replacement filters, order Toro part number 67-8110.

Ground Speed: Speed is infinitely variable from 0 to 9.5 mph (0 to 15 km/hr) forward and reverse.

Tires: The two rear tires are 16 x 6.50-8, 4-ply rating rib, on demountable, drop center wheels. The two front tires are 23 x 8.50-12, extra traction tread, 4-ply rating, on demountable, drop center wheels. Recommended air pressure for both the front and rear tires is 12 psi (83 kPa).

Brakes: The brakes are controlled by 3 pedals. Two are for the steering assist and are individually controlled by your left foot. The third pedal operates both brakes; it is controlled by either foot. A parking brake latch is provided for third pedal. The pedals are connected to the brakes by multi-stranded cable and conduit.

Steering: The 15-inch (38 cm) steering wheel is mounted on steering valve consisting of a control valve and metering section which regulates pressure and meters flow to the steering cylinder. Minimum turning radius is 18 in. (46 cm) from center of turn to closest side of drive wheel; however, zero turning radius results when individual wheel brakes are used. Steering wheel adjustable fore and aft for operator comfort.

Main Frame: The frame is welded, formed steel, reinforced with square and rectangular tubing.

Interlock Switches: PTO (Power Take Off) Switch—Shuts the engine off when the PTO is engaged with no operator on the seat. Traction Switch—Shuts the

engine off when the traction pedal is engaged with no operator on the seat. Seat Switch—Shuts the engine off if the operator leaves the seat without disengaging the PTO and/or the traction pedal. The engine will not start if the PTO or the traction pedal is engaged.

Instrument Panel And Controls: Ammeter, hour meter, fuel gauge, ignition switch, coolant temperature switch gauge to prevent overheating, oil pressure warning light, glow plug switch and glow plug indicator and the throttle control are on the instrument panel. A hand-operated PTO lever is located to the right of the seat. A foot pedal control for transmission operation is at the right of steering column.

PTO Drive: The PTO shaft is driven by a tight-slack double "A" section, torque team V-belt directly from the engine's output shaft. The shaft is clutched by pivoting the shaft support with a spring-loaded, over-center, hand operated lever. PTO speed—1,810 rpm @3,200 rpm engine speed. The connection to the implement is with a high quality, needle-bearing universal joint with a slip joint.

Implement Lift: The cutting unit or implement is lifted by a hydraulic cylinder that has a 3 in. (76 mm) bore and 3-1/4 in. (82 mm) stroke.

Dimensions and Weights (approx.):

Two-Wheel Drive Model:
Traction Unit Length: 112 in. (2.8 m)
With Width: 85-1/2 in. (2.17 m)

Cutting Unit Height: 50 in. (1.27 m)
Curb Weight: 1,650 lb (748 Kg)

Four-Wheel Drive Model:
Traction Unit Length: 115 in. (2.8 m)
With Width: 85-1/2 in. (2.17 m)

Cutting Unit Height: 78.5 in. (#) to the top of ROPS;
50 in. (1.27 m) to the top of the Steering Wheel

Curb Weight: 1,650 lb (748 Kg)

Before Operating

CHECK THE CRANKCASE OIL

The engine is shipped with 3.7 quarts (3.5 L) of oil in the crankcase; however, the level of the oil must be checked before and after the engine is first started.

1. Position the machine on a level surface.

2. Disengage the hood latch and open the hood.

3. Remove the dipstick and wipe it with a clean cloth (Fig. 1). Push the dipstick down into the tube and ensure it is fully seated. Pull the dipstick out of the tube and check the level of the oil. If the oil level is low, remove the filler cap (Fig. 2) and add enough oil to raise the level to the top notch on the dipstick (Fig. 1). DO NOT OVERFILL.

4. The engine uses any high-quality detergent having the American Petroleum institute—API—"service classification" SF/CC or CD. Oil viscosity recommendations are: SAE 10W-30.

   IMPORTANT: Check the oil level after every 5 hours of operation or daily. Change the oil after every 50 hours of operation and change the oil filter after the first 50 hours and every 100 hours thereafter. Change the oil and filter more frequently when the engine is operated in extremely dusty or dirty conditions.

5. Install the dipstick into tube.

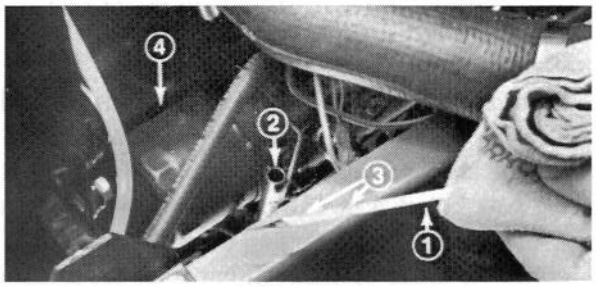


Figure 1

1. Dipstick
2. Dipstick tube
3. Keep oil level between notches
4. Engine oil filter

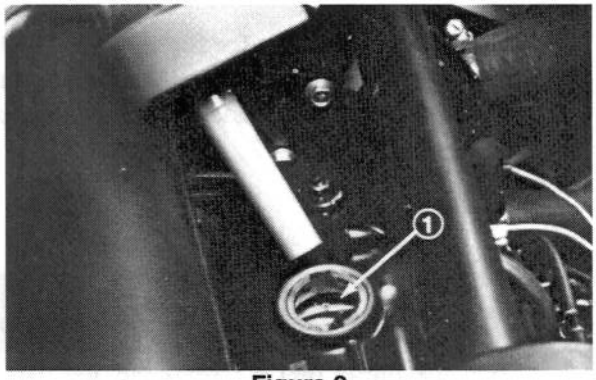


Figure 2

1. Oil fill hole

FILL THE FUEL TANK WITH DIESEL FUEL

The engine runs on No. 1-D or 2-D automotive type diesel fuel with a minimum octane rating of 40.

Note: Higher octane rated fuel may be required if you use the machine at high altitudes and low atmospheric temperatures.

Use No. 2-D diesel fuel at temperatures above 20° F (–7° C) and No. 1-D diesel fuel below 20° F (–7° C). Number. 1-D diesel fuel at lower temperatures provides a lower flash point and pour point characteristics, therefore easing startability and lessening chances of chemical separation of the fuel because of

low temperatures (wax appearance, which may plug filters).

Number 2-D diesel fuel above 20° F (–7° C) will contribute toward longer life of the pump components. Do not use furnace oil. Furnace oils usually contain heavy cracked distillates which are not suitable for diesel engines.

Store fuel outside of buildings in a convenient location. Tipping the front of the tank up slightly will allow contaminants to collect at the lower end away from the outlet. Never empty the tank below 4 in. (10 cm) from the bottom of the tank to avoid picking up water and other contaminants that may have collected at the bottom. Either filter the remainder at the bottom through a chamois or dispose of it periodically to prevent excessive build-up of contaminants.

Keep all fuel containers free of dirt, water, scale and other contaminants. Many engine difficulties can be traced to contaminants in the fuel.

Use only metal containers for fuel storage. DO NOT store fuel in a galvanized metal container. A chemical reaction will result, which will plug the filters and cause possible fuel system damage.

⚠ DANGER

Because diesel fuel is flammable, use caution when storing or handling it. Do not fill the fuel tank while the engine is running, hot or when the 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 the fuel tank outdoors and wipe up any spilled diesel fuel before starting the engine. Use a funnel or spout to prevent spilling diesel fuel and fill the tank to about 25 mm below the filler neck. Store diesel fuel in a clean, safety-approved container and keep the cap in place on the container. Keep diesel in a cool, well-ventilated place; never in an enclosed area such as a hot storage shed. To assure volatility and to prevent contamination, do not buy more than a 6-month supply.

If possible, fill the Groundsmaster 325-D fuel tank at the end of each day's operation. This will prevent possible build-up of condensation inside the fuel tank and possible engine damage. Let the engine thoroughly cool down before refueling.

1. Tip the seat forward and prop it with the support rod so it cannot fall accidentally. Using a clean rag, clean the area around the fuel tank cap.

2. Remove the cap from the fuel tank (Fig. 3) and fill the 8-1/2 gallon (30 L) tank to within 1 inch (25 mm) from the top with diesel fuel. Install the fuel tank cap tightly after filling the tank.

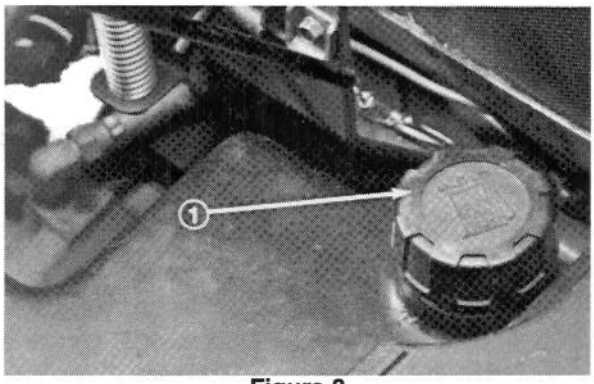


Figure 3

1. Fuel tank cap

CHECK THE COOLING SYSTEM

Clean debris off the screen and the front of the radiator daily, hourly if conditions are extremely dusty and dirty; refer to *Cleaning The radiator And The Screen.*

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol anti-freeze. Check the level of coolant at beginning of each day, before starting the engine. Capacity of cooling system is 6 quarts (5.7 L).

1. Carefully remove the radiator cap. Coolant is pressurized and may be hot if the engine has been running.

2. Check the level of coolant in the radiator. The level of coolant must be above the core and about 1 inch (25 mm) below the bottom of the filler neck.

3. If coolant level is low, replenish the system. DO NOT OVERFILL.

4. Install the radiator cap.

CHECK THE HYDRAULIC SYSTEM OIL

The hydraulic system is designed to operate on any high-quality detergent oil having the American Petroleum Institute—API—"service classification" SF/CC or CD. Oil viscosity—weight—must be selected according to anticipated ambient temperature. Temperature/viscosity recommendations are:

Expected Ambient Temperature	Recommended Viscosity and Type
(Extreme) over 90 F	SAE 30, Type SF/CC or CD engine oil.
(Normal) 40-1 00 F or CD engine oil.	SAE 10W-30 or 10W- 40, Type SF/CC
(Cool - Spring/Fall) 30-50 F	SAE 5W-30, Type SF/CC or CD engine oil.
(Winter) Below 30 F	Type "F" or "FA" ATF Automatic Transmission Fluid.

Note: Do not mix engine oil and automatic transmission fluid or hydraulic system component damage may result. When changing fluids, also change the transmission filter. DO NOT USE DEXRON 11 ATF.

Note: Fluid to operate the power steering is supplied by the hydraulic system transmission charge pump. Cold weather start-up may result in "stiff" operation of the steering until the hydraulic system has warmed up. Using correct weight hydraulic oil in the system will minimize this condition.

The axle housing acts as the reservoir for the system. The transmission and axle housing are shipped from the factory with approximately 5 quarts(4.7 L) of SAE 10W-30 engine oil. However, check the level of transmission oil before the engine is first started and daily thereafter.

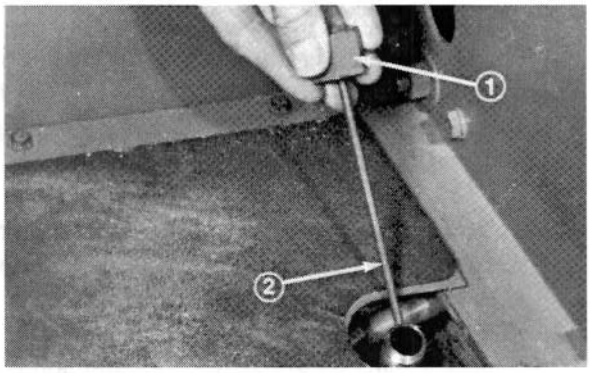


Figure 4

1. Dipstick cap
2. Groove

1. Position the machine on a level surface, raise the implement and stop the engine.

2. Unscrew the dipstick cap (Fig. 4) from the filler neck and wipe it with a clean rag. Screw the dipstick cap finger tight onto the filler neck. Unscrew the dipstick and check the level of oil. If the level is not within 1/2 inch (13 mm) from the groove in the dipstick (Fig. 4), add enough oil to raise the level to groove mark. DO NOT OVERFILL by more than 1/2 inch (13 mm) above groove.

   IMPORTANT: When adding oil to the hydraulic system, use a funnel with a fine wire screen—200 mesh—and ensure funnel and oil are immaculately clean. This procedure prevents accidental contamination of the hydraulic system.

3. Screw the dipstick filler cap finger-tight onto the filler neck. It is not necessary to tighten the cap with a wrench.

4. Lower the implement.

Controls

Traction Pedal (Fig. 5)—The traction pedal moves the machine forward and backward. Using the heel and toe of the right foot, depress the top of the pedal to move forward and the bottom of the pedal to move backward. Ground speed depends on how far you press the pedal. For maximum ground speed with no load, the traction pedal must be fully depressed while the throttle is in the FAST position. Maximum speed forward is approximately 9.5 mph (15 km/hr). To get maximum power under heavy load or when ascending a hill, have the throttle in the FAST position while depressing the traction pedal slightly to keep the engine rpm high. When the engine rpm begins to decrease, release the traction pedal slightly to allow the engine rpm to increase.

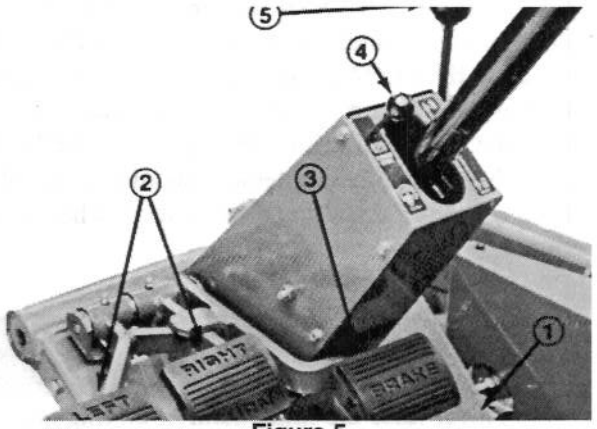


Figure 5

1. Traction pedal
2. Turn pedals
3. Brake pedal
4. Parking brake knob
5. Tilt steering control

⚠ CAUTION

When you remove your foot from the pedal, the machine should stop; it must not creep in either direction. If the machine does creep, do not operate it until the neutral assembly has been repaired and adjusted; refer to Adjusting *The Traction Drive For Neutral.*

Turn Pedals (Fig. 5)—The left and right turn pedals are connected to the left and right front wheel brakes. Since both brakes work independently of each other, the brakes can be used to turn sharply or to increase traction if one wheel slips while operating on a hillside. However, wet grass or soft turf could be damaged when the brakes are used to turn.

Tilt Steering Control (Fig. 5)—The lever on the right side of the steering column. Pull the lever rearward to adjust the steering wheel to the desired fore or aft operating position and push the lever forward to lock adjustment.

Brake Pedal (Fig. 5)—Whenever the engine is shut off, the parking brake must be engaged to prevent accidental movement of the machine.

The hydrostatic transmission will not, at any time, act as a parking brake for the machine. To engage the parking brake, push down fully on the brake pedal and pull the parking brake knob out; then release the pedal. To release the parking brake, depress the brake pedal until the parking brake knob retracts. To stop quickly, remove your right foot from traction pedal and depress the brake pedal. For straight stops, the brake cables

must be evenly adjusted.

Lift Lever (Fig. 6)—The hydraulic lift lever has three positions: FLOAT, TRANSPORT and RAISE. To lower the implement to the ground, move the lift lever forward into notch, which is the FLOAT position. To raise the implement, pull the lift lever backward to the RAISE position. After the implement is raised, allow the lift lever to move to the TRANSPORT position. Normally, the implement should be raised when driving from one work area to another, except when descending steep slopes.

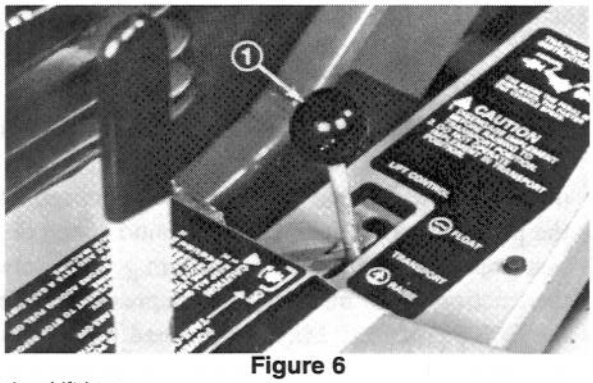


Figure 6

1. Lift lever

⚠ CAUTION

Never raise the implement or cutting unit while blades or other components are rotating. The exposed, rotating blades are hazardous.

PTO Lever (Fig. 7)—The PTO lever has two positions: ON (engage) and OFF (disengage). Slowly push the PTO lever fully forward to ON to start the implement or cutting unit blades. Slowly, pull the lever backward to OFF to stop implement operation. The only time the PTO lever should be in the ON position is when the implement or cutting unit is down in operating position.

IMPORTANT: If the switch ever must be overridden because of an emergency, the engine can be started and will continue to run while the reset button is held in.

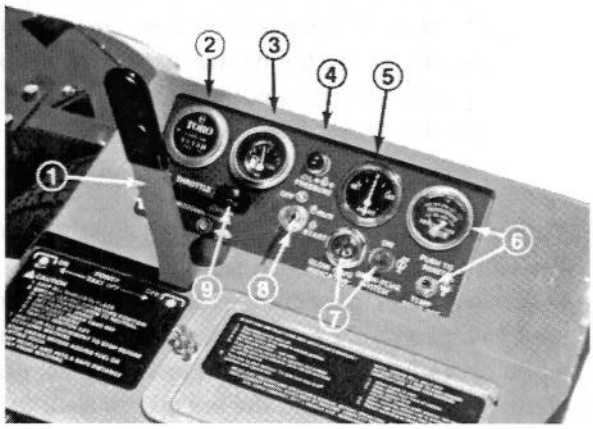


Figure 7

1. PTO lever
2. Hour meter and indicator
3. Fuel gauge
4. Oil pressure indicator
5. Ammeter
6. Temp gauge and reset
7. Glow plug switch
8. Key switch
9. Throttle control
10. Battery cover

Hour Meter (Fig. 7)—The hour meter registers the accumulated hours of engine operation. Use it to determine intervals for service maintenance and lubrication.

Fuel Gauge (Fig. 7)—Indicates the amount of fuel remaining in the fuel tank.

Oil Pressure Warning Light (Fig. 7)—The oil pressure warning light will glow and a buzzer will sound if the oil pressure in the engine drops below a safe level. If low oil pressure ever occurs, stop the engine and find out the cause. Repair the damage before starting the engine again.

Ammeter (Fig. 7)—The ammeter shows the charge rate of the battery by the alternator. When the engine is running, there usually is a slight charge, unless the engine is idling slowly. The needle will point to 0 when the battery is fully charged. By

contrast, the alternator is not charging the battery when the needle points to the (-) negative side of ammeter. If this happens, repair the charging system to prevent discharge of the battery.

Temperature Switch/Gauge and Reset Button (Fig. 7)—The temperature switch/gauge registers the temperature of the coolant in the cooling system. If the coolant temperature gets too high, the engine will shut off automatically. When this happens, turn the ignition key to OFF. Automatic shut-off of the engine usually results from debris on the front of the screen or the radiator, which reduces air flow. After cleaning the outside of the screen and radiator or repairing some other damage, press the reset button and start the engine.

Glow Plug Switch and Indicator (Fig. 7)—Use to preheat the engine cylinders before and during starting procedures. Push the switch lever upward and hold while watching the indicator. The indicator will glow red when sufficiently heated. The time necessary to preheat cylinders is determined by atmospheric temperature; refer to *Starting and Stopping The Engine*.

Key Switch (Fig. 7)—The key switch is used to start and stop the engine. It has three positions: OFF, RUN and START. Turn it clockwise to the START position to engage the starter motor. When the engine starts, release the key and it will move automatically to the ON position. To shut the engine off, turn the key counterclockwise to OFF.

Throttle Control (Fig. 7)—The throttle is used to operate the engine at various speeds. Moving the throttle forward increases the engine speed—FAST; backward decreases the engine speed—SLOW. The throttle regulates the speed of the cutter blades or other implement components and, together with the traction pedal, controls the vehicle's ground speed.

Electrical System Fuses (Fig. 8)—An engine temperature reset relay fuse—SFE 14-amp—is located at the rear of the reset relay. An in-line fuse—AGC 10-amp—is also incorporated to protect the engine control module. The fuses can be accessed by removing the instrument panel cover.

A 40-amp circuit breaker is also incorporated to protect the entire wiring circuit. A reset button is located on the lower side of the panel, which can be reached after removing the battery cover (Fig. 9). The button should be depressed if a total loss of all electrical functions should occur. However, the electrical system should first be checked to find the reason for the malfunction.

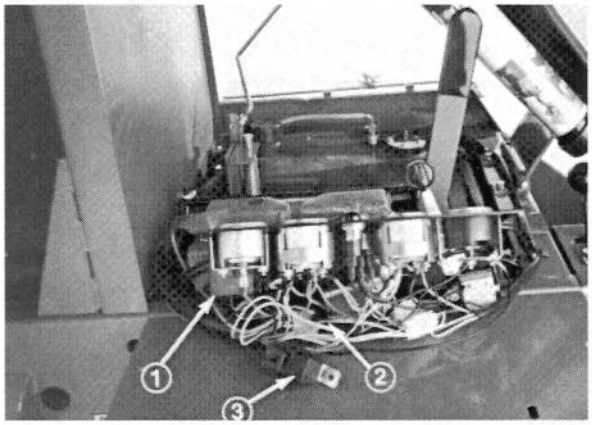


Figure 8

1. SFE 14-amp fuse—Engine temperature reset relay
2. In-line AGC 10-amp fuse—Engine control module
3. Engine start relay



Figure 9

1. Circuit breaker reset button

Engine Stop Lever (Fig. 10)—Located on the lower right side of the engine inboard of the air cleaner assembly. Provided as a means to stop the fuel flow, thereby stopping the engine, if an electrical malfunction should occur. Use only for emergencies.

Seat Adjusting Levers (Fig. 11)—To adjust a standard seat, push the lever backward and slide the seat to the desired position. Release the lever to lock the seat in place. The suspension seat may be adjusted forward or rearward by pulling out the lever at the right side of the seat, sliding the seat to the desired position, and releasing the lever. The weight adjustment knob may be adjusted for any operator's comfort.

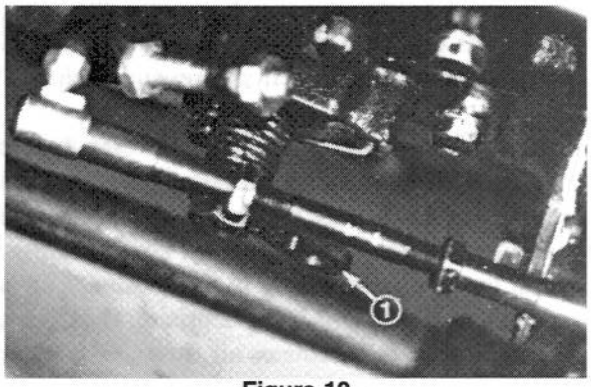


Figure 10

1. Engine stop lever

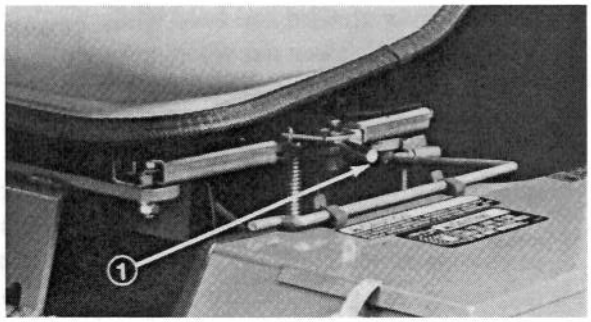


Figure 11

1. Seat adjusting lever

Operating

STARTING AND STOPPING THE ENGINE

IMPORTANT: The fuel system must be bled if any of the following situations have occurred:

A. Initial start-up of a new machine.

B. The engine has stopped running because of lack of fuel.

C. Maintenance has been done on the fuel system components; i.e., filter replaced, separator serviced, etc.

Refer to *Bleeding The fuel System*

1. Ensure the parking brake is set, the PTO lever is in the OFF position (Fig. 7)and the lift lever is in the TRANSPORT or FLOAT position (Fig. 6). Remove your foot from the traction pedal and make sure it is in neutral.

2. Move the throttle control (Fig.7) to the full FAST position.

3. Push the glow plug switch to ON and hold it there until the indicator glows red. Continue to hold the switch in position and turn the key in the key switch to START. Release the glow plug switch after the engine starts and allow the key to return to RUN. Move the throttle control to SLOW.

NOTE: Refer to chart indicating approximate preheat time suggested in various temperature ranges.

Temperature	Preheat time (sec)
above 41 IF (5° C)	10
23-F (–5° C)	20
below 23° F (–5° C)	30

Note: Do not run the starter motor more than 10 seconds at a time or premature starter failure may result. If the engine fails to start after 10 seconds, turn the key to OFF, recheck the controls and procedures, wait 10 additional seconds and repeat starter operation.

4. Turn the key to START (Fig. 7). Release the key immediately when the engine starts and let it return to RUN. Move the throttle control to SLOW.

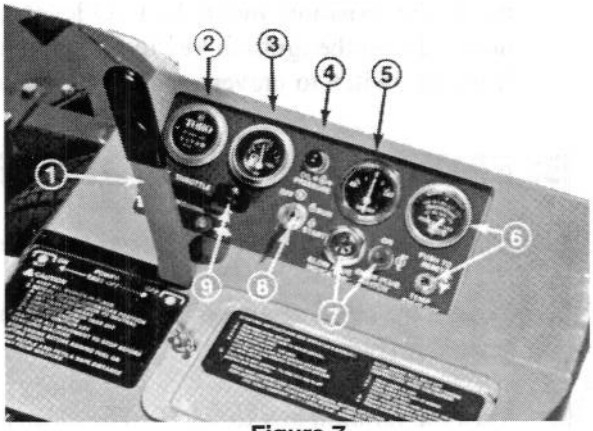


Figure 7

1. PTO lever
2. Hour meter and indicator
3. Fuel gauge
4. Oil pressure indicator
5. Ammeter
6. Temp gauge and reset
7. Glow plug switch
8. Key switch
9. Throttle control
10. Battery cover

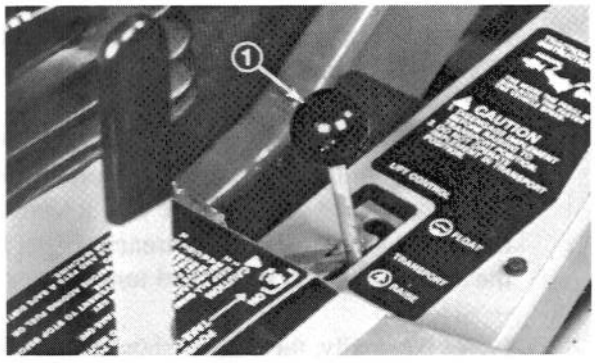


Figure 6

1. Lift lever

NOTE: Do not exceed 1 minute of continuous use or the glow plug prematurely burn out.

5. When the engine is started for the first time, or overhaul of the engine, transmission or axle, operate the machine in forward and reverse for one to two minutes. Also operate the lift lever and the PTO lever to assure proper operation of all parts. Turn the steering wheel to the left and right to check the steering response, then shut off the engine and check for oil leaks, loose parts and any other noticeable difficulties.

⚠ CAUTION

Shut the engine off and wait for all moving parts to stop before checking for oil leaks, loose parts or other difficulties.

6. To stop the engine, move the throttle control backward to the SLOW position, move the PTO lever to the OFF position and turn the ignition key to OFF. Remove the key from the switch to prevent accidental starting.

BLEEDING THE FUEL SYSTEM

1. Unlatch and raise the hood over the engine.

2. Loosen air bleed screw on the top of the fuel filter/water separator (Fig. 12).

3. Turn the ignition key to RUN. The electric fuel pump will begin operation, thereby forcing air out around the air bleed screw. Leave the key at RUN until a solid stream of fuel flows out around screw. Tighten the screw and turn the key to OFF.

4. Open the air bleed screw on the fuel-injection pump (Fig. 13) with a 12 mm wrench.

5. Turn the key in the ignition switch to RUN. The electric fuel pump will begin operation, thereby forcing air out around air bleed screw on the fuel injection pump. Leave the key in RUN until solid stream of fuel flows out around the screw. Tighten screw and turn the key to OFF.

Note: Normally, the engine should start after the above bleeding procedures. However, if the engine does not start, air may be trapped between injection pump and injectors; refer to Bleeding Air From Injectors.

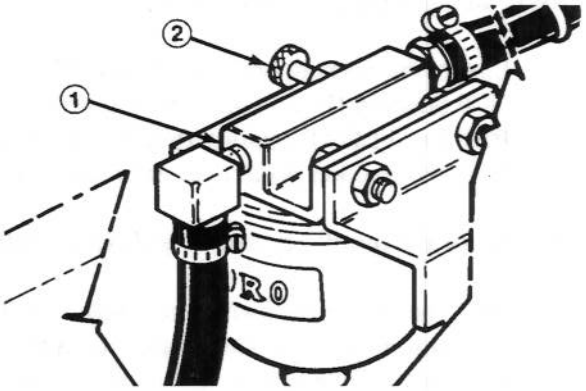


Figure 12
1. Fuel filter/water separator
2. Bleed screw

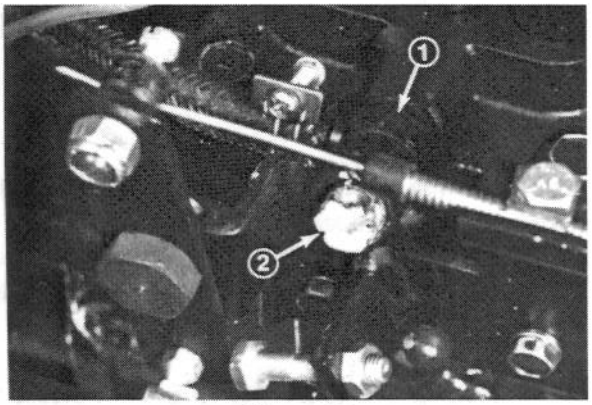


Figure 13
1. Fuel injection pump
2. Airbleed screw

CHECKING THE INTERLOCK SWITCHES

The machine has interlock switches in the electrical system. These switches are designed to stop the engine when you get off the seat while either the PTO lever is engaged or the traction pedal is depressed. However, you may get off the seat while the engine is running. Although the engine will continue to run if the PTO lever is disengaged and the traction pedal is released, it is strongly recommended that the engine be stopped before dismounting from the seat.

⚠ CAUTION

Do not disconnect the interlock switches. Check operation of the switches daily to assure the interlock system is operating correctly. If a switch is malfunctioning, replace it before operating the machine. To ensure maximum safety, replace all switches after every two years or 1,000 hours, whichever comes first.

To check operation of the interlock switches:

1. Move the PTO lever to OFF and remove your foot from the traction pedal so it is fully released.

2. Try to start the engine. If the engine starts, go to step 3. If the engine does not crank there may be a malfunction in the electrical system.

3. Raise off the seat and move the PTO lever to ON while the engine is running. The engine should stop. If the engine stops, the PTO switch is operating correctly so go to step 4. If the engine does not stop there is a malfunction in the safety interlock system.

⚠ WARNING

Do not operate the machine without an implement unless the PTO drive shaft is also removed.

4. Move the PTO lever to OFF. Raise off the seat and depress the traction pedal slowly while the engine is running. The engine should stop. If the engine stops, the neutral switch is operating correctly. If the engine does not stop, there is a malfunction in the electrical system.

5. If all the switches operated correctly, the machine can be operated.

PUSHING OR TOWING THE TRACTION UNIT

In an emergency, the traction unit can be pushed or towed for a very short distance. However, Toro does not recommend this as standard procedure.

IMPORTANT: Do not push or tow the traction unit faster than 2 to 3 mph (3 to 4.8 km/hr) because the transmission may be damaged. If the traction unit must be moved a considerable distance, transport it on a truck or trailer. Whenever the traction unit is pushed or towed, the by-pass valve must be open.

1. Reach under the traction unit and turn the by-pass valve (Fig. 14) ½ to 1 turn counterclockwise. Opening the valve opens an internal passage in the transmission, thereby bypassing the transmission oil. Because fluid is by-passed, the traction unit can be moved without damaging the transmission.

2. Before starting the engine, close the by-pass valve by rotating it clockwise until it is securely seated. Do not exceed 5 to 8 ft-lb (7–11 N-m). Do not start the engine when the valve is open.

IMPORTANT: Running the machine with the by-pass valve open will cause the transmission to overheat.

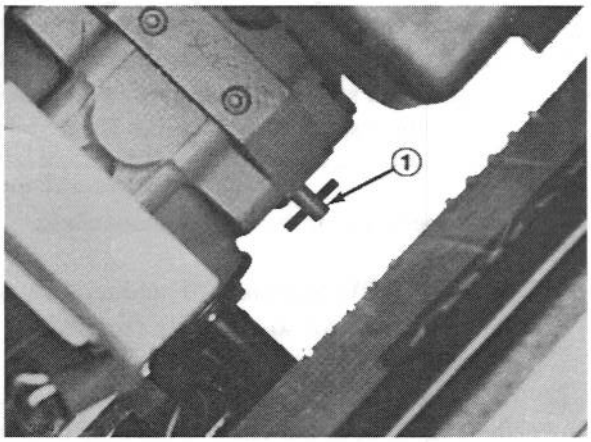


Figure 14

1. By-pass valve

OPERATING CHARACTERISTICS

Practice driving the GROUNDSMASTER 325-D because it has a hydrostatic transmission and its characteristics are different than many turf maintenance machines. Some points to consider when operating the traction unit, cutting unit or other implement are the transmission, engine speed, load on the cutting blades or other implement components, and the importance of the brakes.

To have enough power for the traction unit and implement while operating, regulate the traction pedal to keep the engine rpm high and constant. A good rule to follow is; decrease ground speed as the load on the implement increases; and increase ground speed as the load decreases.

Therefore, let the traction pedal move backward as engine rpm

decreases, and depress the pedal slowly as rpm increases. By comparison, when driving from one work area to another—with no load and cutting unit raised—have the throttle in the FAST position and depress the traction pedal slowly but fully to attain maximum ground speed.

Another characteristic to consider is operating the turning pedals that are connected to the brakes. The brakes can be used to assist in turning the machine; however, use them carefully, especially on soft or wet grass because the turf may be torn accidentally. Another benefit of the turning brakes is to maintain traction. For example: in some slope conditions, the uphill wheel slips and loses traction. If this situation occurs, depress the uphill turn pedal gradually and intermittently until the uphill wheel stops slipping, thereby increasing traction on the downhill wheel.

Before stopping the engine, disengage all controls and move the throttle to SLOW. Moving the throttle to SLOW reduces high engine rpm, noise and vibration. Turn the key to OFF to stop the engine.

The grass deflector must always be installed and in the lowest position on the side discharge cutting unit.

⚠ WARNING

This product is designed to drive objects into the ground where they lose energy quickly in grassy areas. However, when a person or pet appears suddenly in or near mowing area, STOP MOWING.

Careless operation, combined with terrain angle, ricochets, or improperly positioned safety guards can lead to thrown object injuries. Do not resume mowing until area is cleared

GREASING BEARINGS, BUSHINGS, GEAR BOX AND BRAKE CABLES

The traction unit must be lubricated regularly. If the machine is operated under normal conditions, lubricate all bearings and bushings after every 50 hours of operation.

The traction unit bearings and bushings that must be lubricated are: the PTO shaft and yokes (Fig. 15); lift arm pivots(Fig.16); right and left push arm ball joints (Fig. 15); push arm pivot bushings (Fig. 17); PTO pivot housing blocks (Fig. 18); brake pivot bushings (Fig. 19); rear wheel spindle bushings (Fig. 20, 21); steering plate bushings (Fig. 21); axle pin pushing (Fig. 21); and engine output shaft bearing (Fig. 22). Also apply grease to both brake cables at the drive wheel and brake pedal ends.

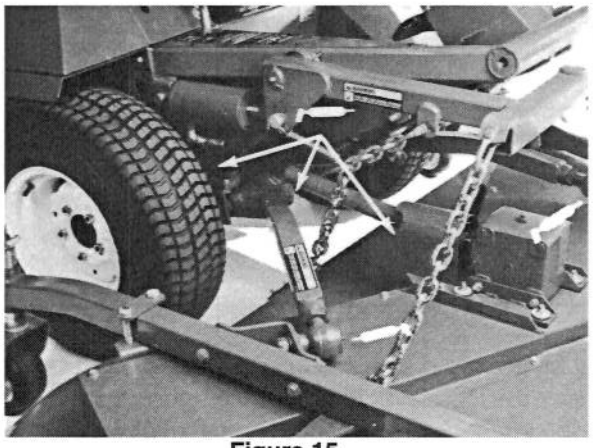


Figure 15

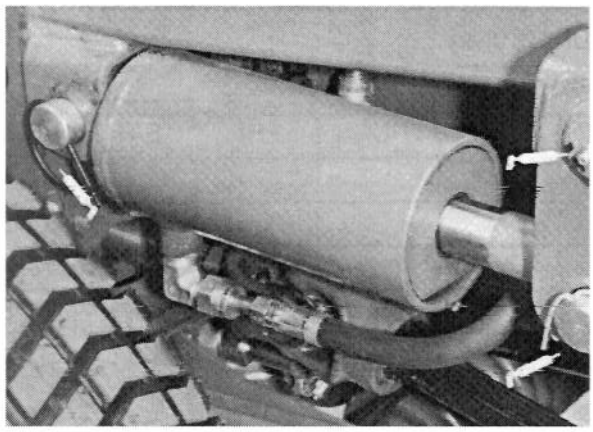


Figure 16

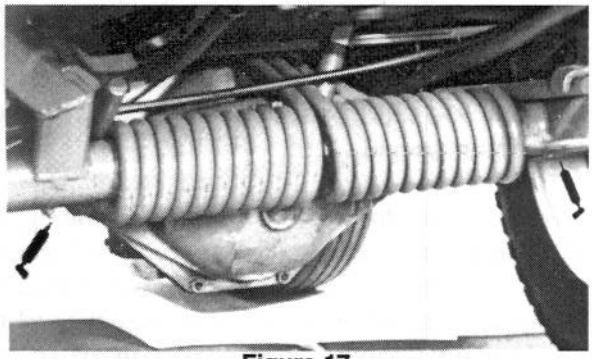


Figure 17

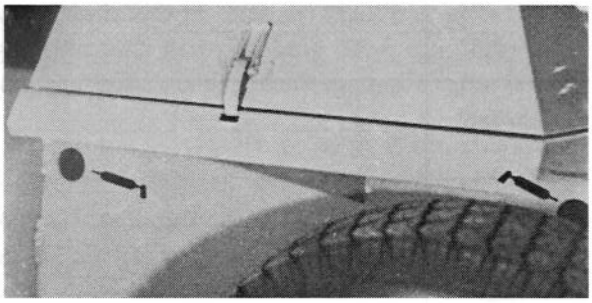


Figure 18

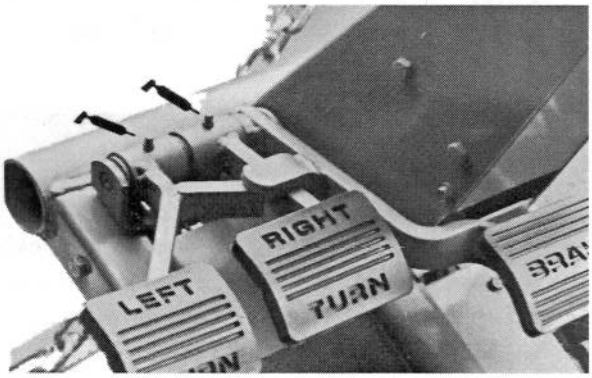


Figure 19

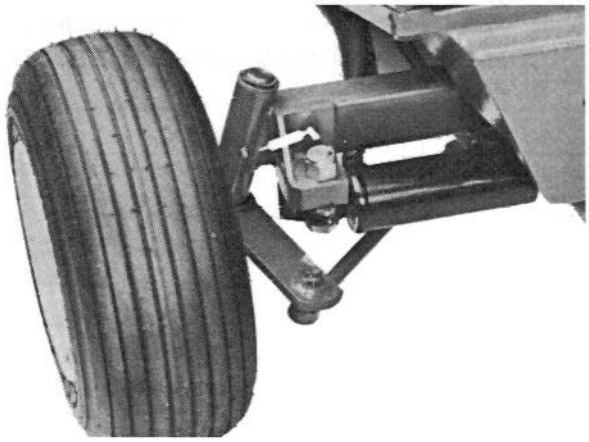


Figure 20

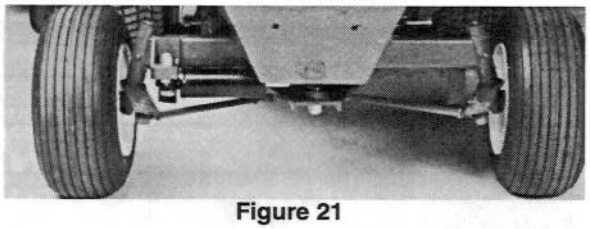


Figure 21

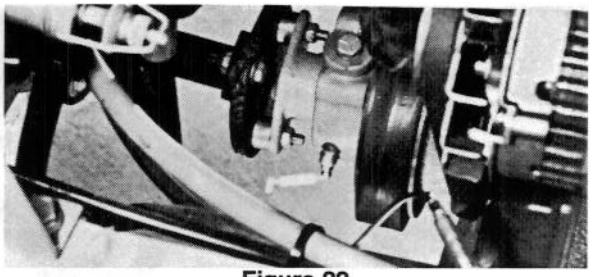


Figure 22

Maintenance Schedule

Service Interval	Hour Meter
Check The interlock System	Daily
Check Engine Oil Level	Daily
Check The transmission Oil Level	Daily
Check The radiator and Coolant (more often when conditions are dirty)	Daily
Drain The fuel Filter/Water Separator	Daily
Replace The hydraulic Oil Filter (initial)	10
Tighten Front Wheel Nuts (Initial)	2 & 10
Change Engine Oil Filter (initial)	50
Change Engine Oil (more often when conditions are dirty)	50
Check the traction Linkage Adj.	50
Check Brakes and Lubricate Cables	50
Check Tire Pressure (12 psi - 83kPa)	50
Lubricate Grease Fittings	50
Service Air Cleaner (Dust Cup & Baffle) (more often when conditions are dirty)	50
Check The Battery	50
Check the PTO Drive Belt	50
Change Engine Oil Filter (more often when conditions are dirty)	100
Check Engine Fan Belt and Alternator	100
Clean Muffler of Carbon	250
Tighten The front Wheel Nuts	250
Service Air Cleaner (Filter)	250
Change Transmission Oil and Filter	250
Check Rear Wheel Toe-In	250
Replace the Fuel Filter	400
Replace the Fuel Pump Filter	400
Check The Fuel Lines and Connections	400
Drain and Clean The fuel Tank	400
Pack Rear Wheel Bearings	500
Replace all Interlock Switches (2 years)	1,000
Drain and Flush Cooling System (2 years)	1,000

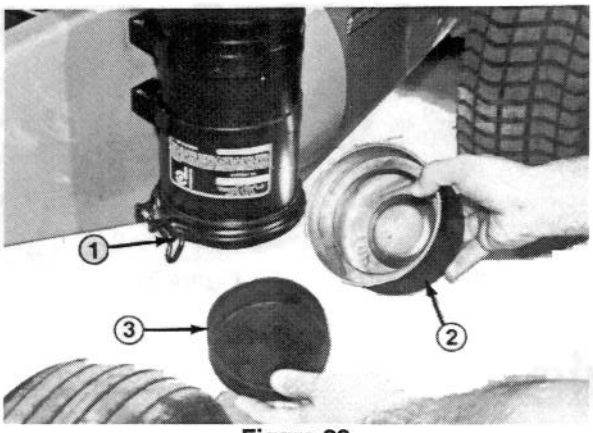


Figure 23

1. Thumbscrew
2. Dust Cup
3. Baffle

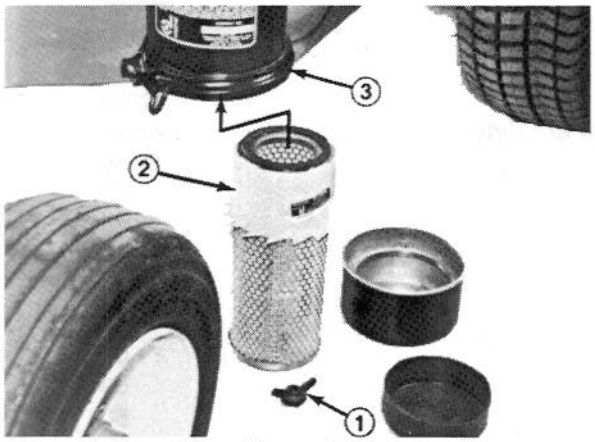


Figure 24

1. Wing nut with gasket
2. Filter element
3. Air cleaner body

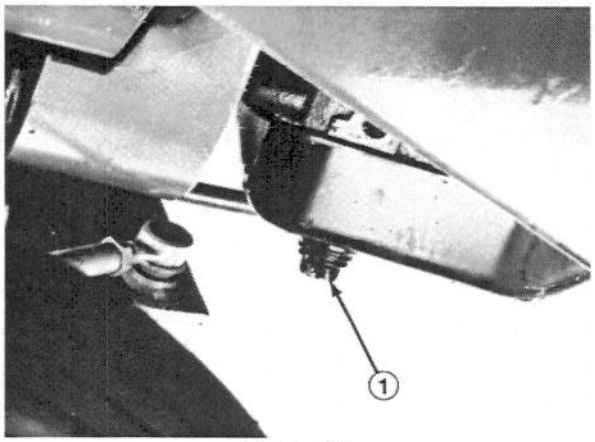


Figure 25

1. Oil drain plug

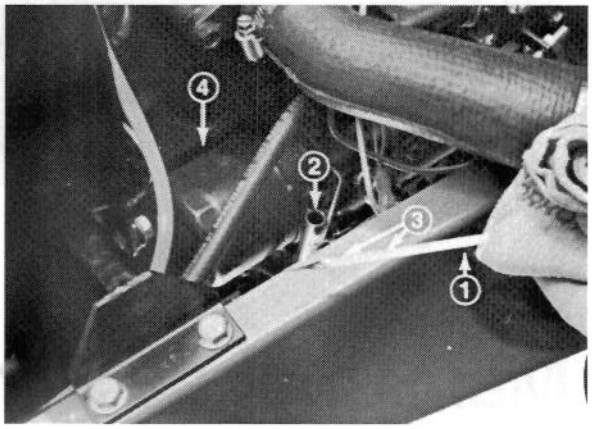


Figure 26

1. Dipstick
2. Dipstick tube
3. Keep oil level between notches
4. Engine oil filter

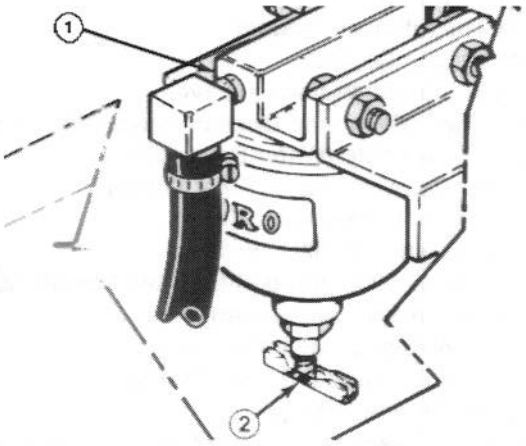


Figure 27

1. Fuel filter/water separator
2. Drain plug

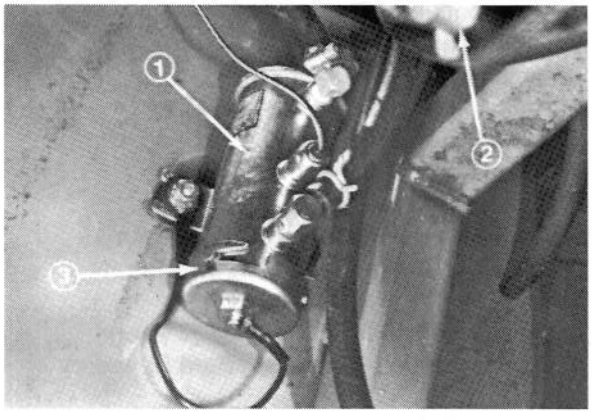


Figure 28

1. Fuel pump assembly
2. Drive coupling assembly
3. Fuel pump cover



Figure 29

1. Filter
2. Magnet

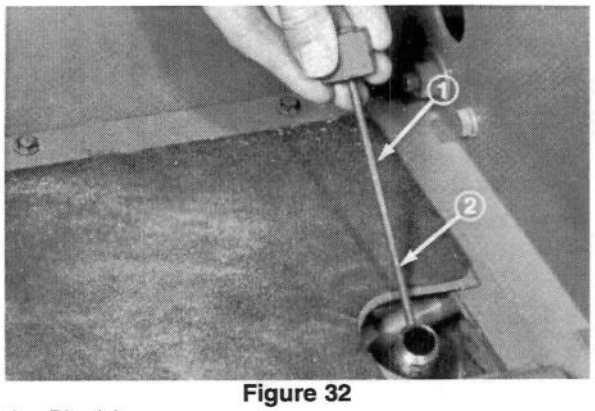


Figure 32

1. Dipstick
2. Groove

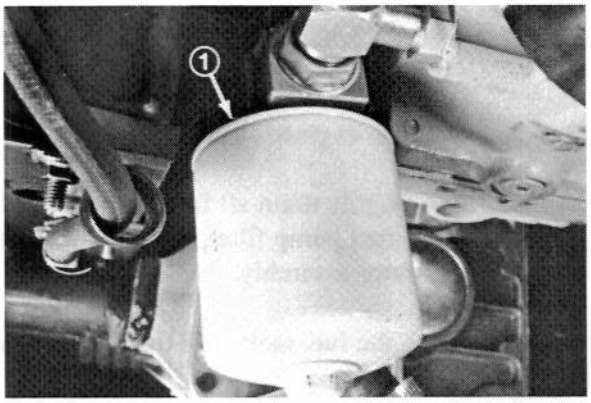


Figure 30

1. Hydraulic oil filter

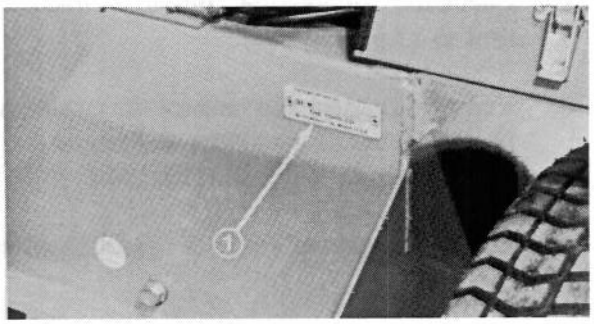
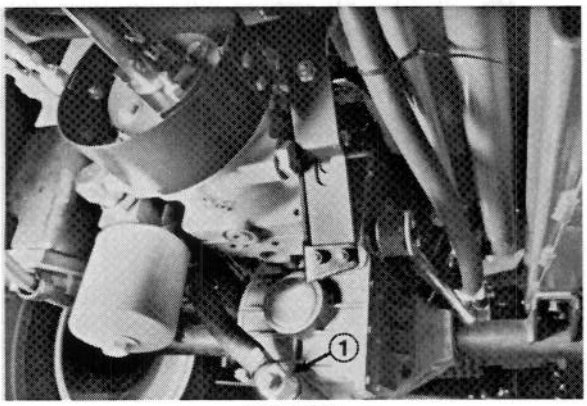


Figure 33

1. Traction unit model and serial number



Filter 31

1. Drain plug

Preparation For Seasonal Storage

Traction Unit

1. Thoroughly clean the traction unit, cutting unit and the engine, paying special attention to these areas:
   - radiator screen
   - underneath the cutting unit
   - under the cutting unit belt covers
   - counterbalance springs
   - PTO Shaft Assembly
   - all grease fittings and pivot points
2. Check the tire pressure. Inflate all traction unit tires to 12 psi (83 kPa).
3. Remove, sharpen and balance the cutting unit's blades. Reinstall the blades and torque the blade fasteners to 75-100 ft-Ib (102-136 N-m).
4. Check all fasteners for looseness; tighten as necessary.
5. Grease or oil all grease fittings and pivot points. Wipe off any excess lubricant.
6. Ensure that the PTO lever remains in the disengaged position.
7. Lightly sand and use touch-up paint on painted areas that are scratched, chipped or rusted. Repair any dents in the metal body.
8. Service the battery and cables as follows:
   a. Remove the battery terminals from the battery posts.
   b. Clean the battery, terminals and posts with a wire brush and baking soda solution.
   c. Coat the cable terminals and the battery posts with Grafo 112 X skin-over grease (Toro Part Number 505-47), or petroleum jelly to prevent corrosion.
   d. Slowly recharge the battery every 60 days for 24 hours to prevent lead sulfation of the battery.

Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Refill oil pan with 3.7 quarts (3.5 L) of SAE 10W-30 motor oil. Use API classification SF/CC or CD oil.
4. Start the engine and run at idle speed for approximately two minutes.
5. Stop the engine.
6. Thoroughly drain all fuel from the fuel tank, lines, fuel pump filter, and the fuel filter/water separator assembly.
7. Flush the fuel tank with fresh, clean diesel fuel.
8. Re-secure all fuel system fittings.
9. Thoroughly clean and service the air cleaner assembly.
10. Seal the air cleaner inlet and the exhaust outlet with weatherproof tape.
11. Check the anti-freeze protection and add as needed for expected minimum temperature in your area.