FORM NO. 3318-295 GB Rev A

TORO®

MODEL NO. 03702—60001 & UP
MODEL NO. 03704—60001 & UP

OPERATOR'S MANUAL

REELMASTER® 4500-D

TRACTION UNITS



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 lawn mower. 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;
     – ##incorrect hitching and load distribution.

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.

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 the clutch slowly, and always keep the 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 lawn mower 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 lawn mower 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 the drive to attachments when transporting or not in use.

14. Stop the engine and disengage the drive to the attachment

- before refueling;
- before removing the grass catcher;
- before making height adjustments unless the adjustment can be made from the operator's position.
- before clearing blockages;
- 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.

15. Reduce the throttle setting during engine runout 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. Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.

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

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

Sound & Vibration Levels

Sound Levels

This unit has an equivalent continuous A-weighted sound pressure at the operator ear of: 90 dB(A), based on measurements of identical machines per SAE J1174—Mar 85 procedures.

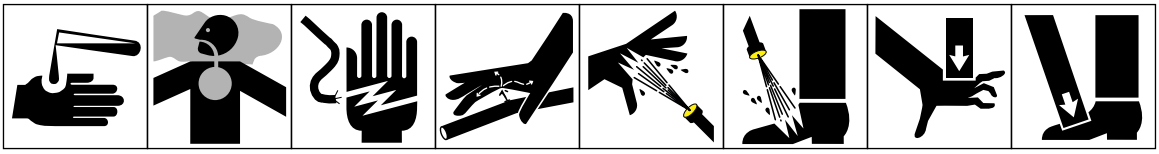
This unit has a sound power level of 105 dB(A)/1pW, based on measurements of identical machines per procedures outlined in Directive 79/113/EEC and amendments

Vibration Levels

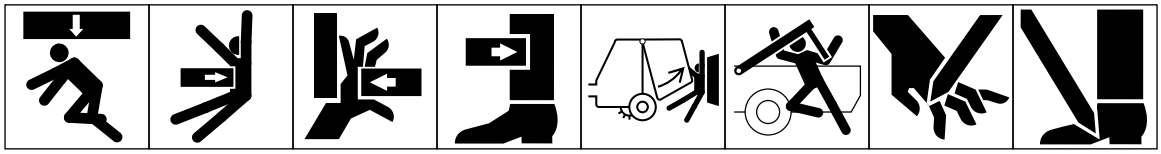
This unit has a vibration level of 4.5 m/s^2 at the posterior, based on measurements of identical machines per ISO 2631 procedures.

This unit does not exceed a vibration level of 0.5 m/s^2 at the posterior based on measurements of identical machines per ISO 2631 procedures.

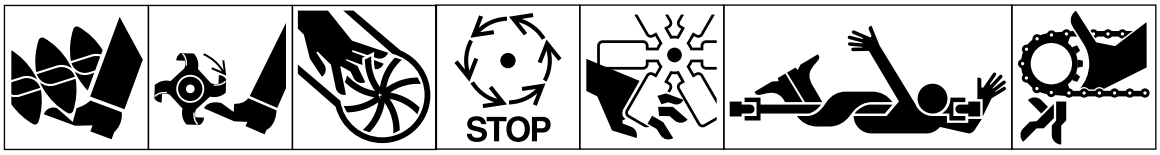
Symbol Glossary



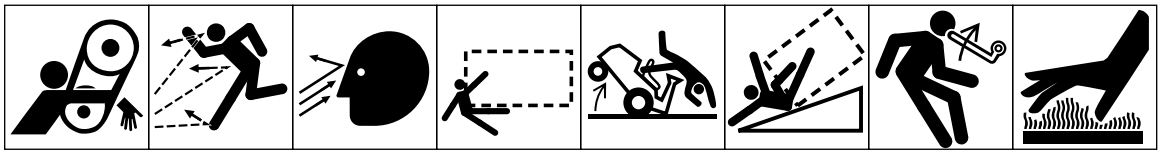
Caustic liquids, chemical burns to fingers or hand | Poisonous fumes or toxic gases, asphyxiation | Electrical shock, electrocution | High pressure fluid, injection into body | High pressure spray, erosion of flesh | High pressure spray, erosion of flesh | Crushing of fingers or hand, force applied from above | Crushing of toes or foot, force applied from above



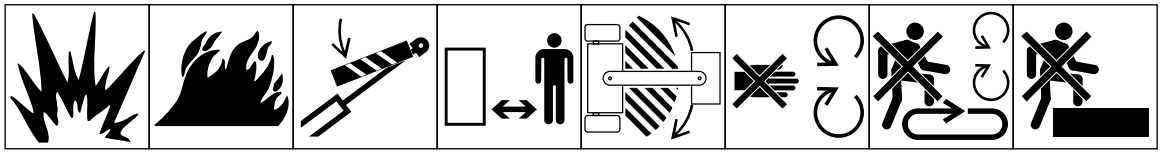
Crushing of whole body, applied from above | Crushing of torso, force applied from side | Crushing of fingers or hand/, force applied from side | Crushing of leg, force applied from side | Crushing of whole body | Crushing of head, torso and arms | Cutting of fingers or hand | Cutting of foot



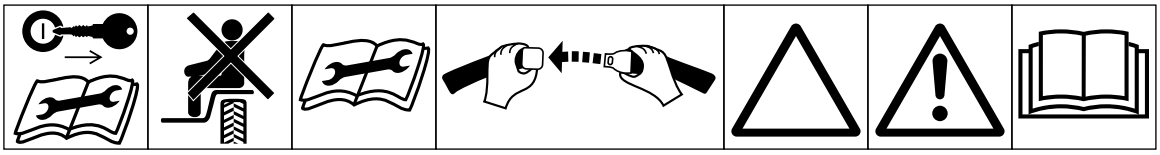
Cutting or entanglement of foot, rotating auger | Severing of foot, rotating knives | Severing of fingers or hand, impeller blade | Wait until all machine components have completely stopped before touching them | Severing of fingers or hand, engine fan | Whole body entanglement, implement input drive line | Fingers or hand entanglement, chain drive



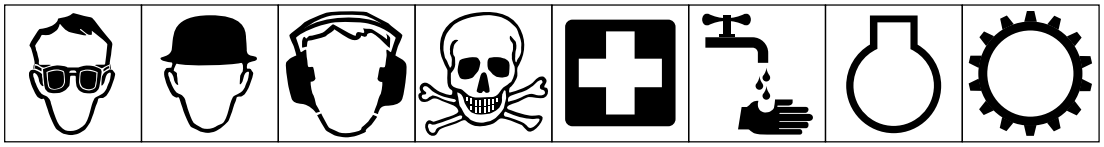
Hand & arm entanglement, belt drive | Thrown or flying objects, whole body exposure | Thrown or flying objects, face exposure | Runover/backover, (relevant machine to appear in dashed box) | Machine tipping, riding mower | Machine rollover, ROPS (relevant machine to appear in dashed box) | Stored energy hazard, kickback or upward motion | Hot surfaces, burns to fingers or hands



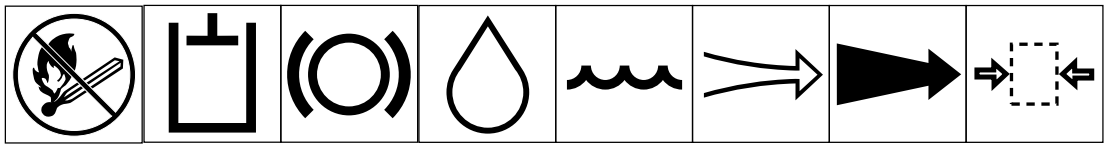
Explosion | Fire or open flame | Secure lifting cylinder with locking device before getting in hazardous area | Stay a safe distance from the machine | Stay clear of articulation area while engine is running | Do not open or remove safety shields while engine is running | Do not step on loading platform if PTO is connected to tractor & engine is running | Do not step



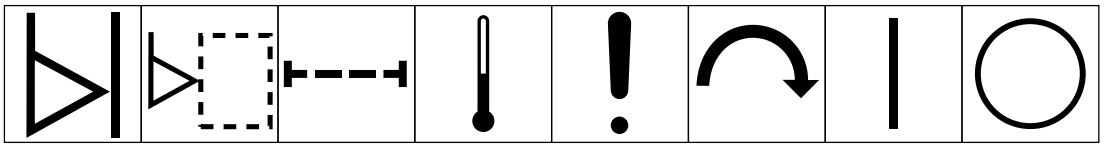
Shut off engine & remove key before performing maintenance or repair work | Riding on this machine is allowed only on a passenger seat & only if the driver's view is not hindered | Consult technical manual for proper service procedures | Fasten seat belts | Safety alert triangle | outline safety alert symbol | Read operator's manual



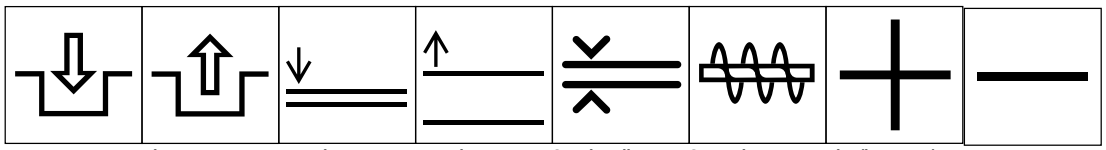
Eye protection must be worn | Head protection must be worn | Hearing protection must be worn | Caution, toxic risk | First aid | Flush with water | Engine | Transmission



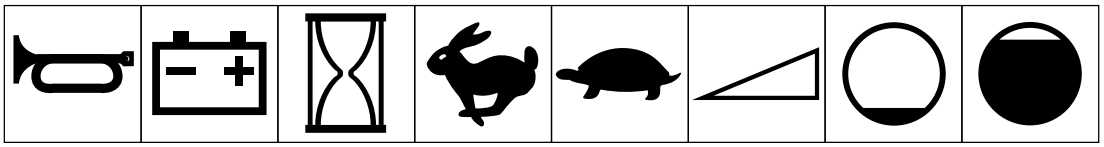
Fire, open light & smoking prohibited | Hydraulic system | Brake system | Oil | Coolant (water) | Intake air | Exhaust gas | Pressure



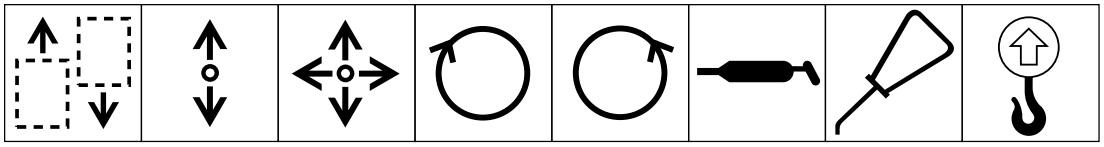
Level indicator | Liquid level | Filter | Temperature | Failure/ Malfunction | Start switch/ mechanism | On/start | Off/stop



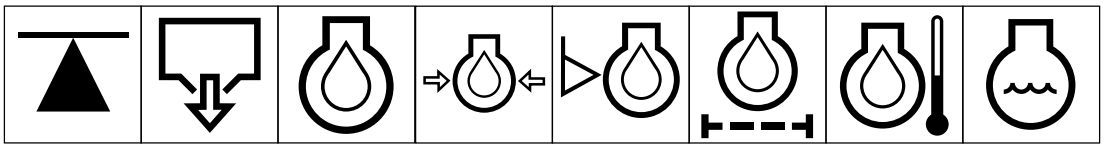
Engage | Disengage | Attachment lower | Attachment raise | Spacing distance | Snow thrower, collector auger | Plus/increase/ positive polarity | Minus/decrease/ negative polarity



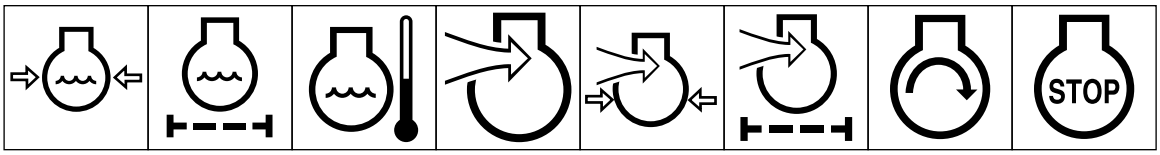
Horn | Battery charging condition | Hourmeter/elapsed operating hours | Fast | Slow | Continuous variable, linear | Volume empty | Volume full



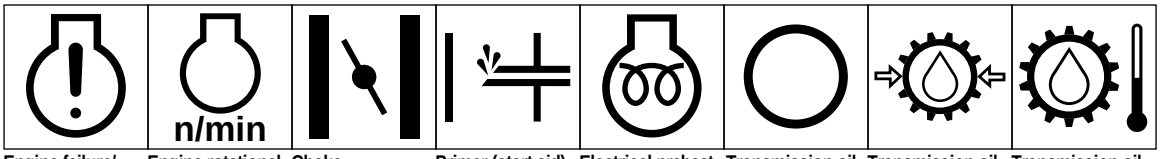
Machine travel direction, forward/rearward | Control lever operating direction, dual direction | Control lever operating direction, multiple direction | Clockwise rotation | Counter-clock-wise rotation | Grease lubrication point | Oil lubrication point | Lift point



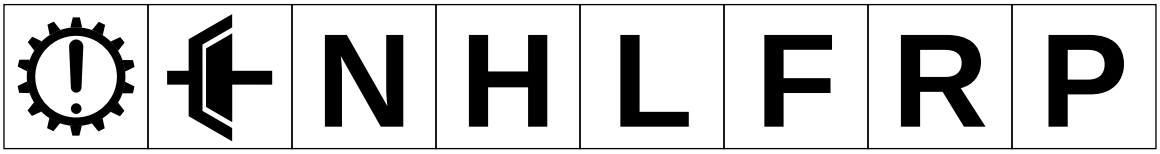
Jack or support point | Draining/ emptying | Engine lubricat-ing oil | Engine lubricating oil pressure | Engine lubricating oil level | Engine lubricating oil filter | Engine lubricating oil temperature | Engine coolant



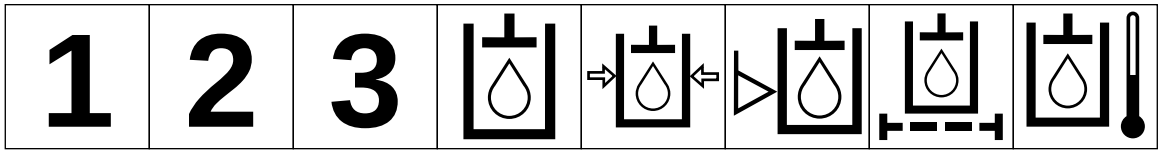
Engine coolant pressure | Engine coolant f ilter | Engine lubricating oil pressure | Engine intake/ combustion air | Engine intake/ combustion air pressure | Engine intake/ air filter | Engine start | Engine stop



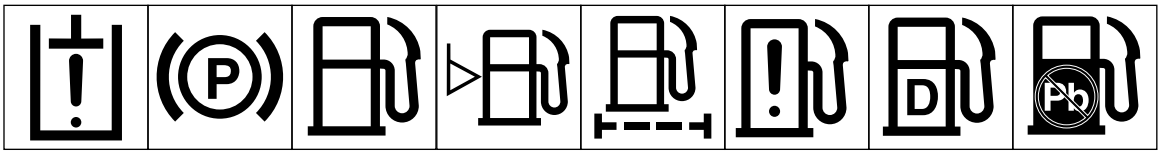
Engine failure/ malfunction | Engine rotational speed/frequency | Choke | Primer (start aid) | Electrical preheat (low temperature start aid) | Transmission oil | Transmission oil pressure | Transmission oil temperature



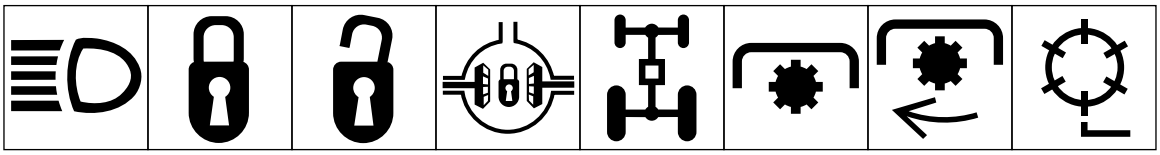
Transmission failure/malfunction | Clutch | Neutral | High | Low | Forward | Reverse | Park



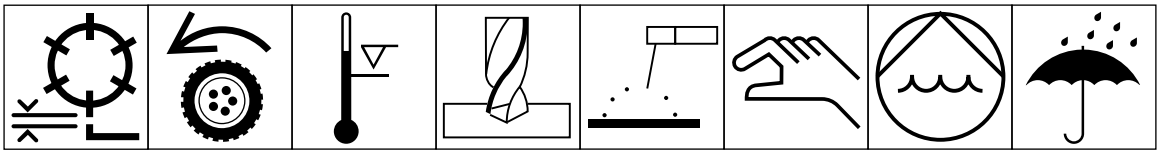
First gear | Second gear | Third gear (other #'s may be used until the maximum # of forward gears is reached.) | Hydraulic oil | Hydraulic oil pressure | Hydraulic oil level | Hydraulic oil filter | Hydraulic oil temperature



Hydraulic oil failure/malfunction | Parking brake | Fuel | Fuel level | Fuel filter | Fuel system failure/malfunction | Diesel fuel | Unleaded fuel



Headlights | Lock | Unlock | Differential lock | 4-Wheel drive | Power Take-Off | Power Take-Off, rotational speed | Reel cutting element



Reel cutting element, height adjustment | Traction | Above working temperature range | Drilling | Manual metal arc welding | Manual | 0356 Water pump | 0626 Keep dry



0430 weight | Do not dispose in the garbage | CE logo

Specifications

Engine: Mitsubishi, four-cycle, four-cylinder, 139 cu-in. displacement, water cooled diesel engine. Rated 40 hp @ 2,300 rpm, 21:1 compression ratio. Low idle—1,200 rpm, high idle—2,500 rpm. Injection Timing –20° BTDC. Oil capacity is 6.9 qt (6.5 L) with filter.

Cooling System: Capacity is 3.7 gal. (14 L) of 50/50 mixture of ethylene glycol anti-freeze.

Fuel System: Capacity is 10.5 gal. (40 L) of #2 diesel fuel.

Hydraulic System: Reservoir capacity is 9.3 gal. 35.2 L) and total system capacity is 18.2 gal. (69 L). Replaceable breather element. Replaceable spin-on filter element.

Traction System: Ground speed is 0–12.5 mph (0–20 km/h) Model 03700, 0–15 mph (0–23 km/h) Model 03701.

Cutting Unit Drive System: Adjustable reel speed to match the grass clip to the ground speed. Backlap reel speed is 385 rpm.

Seat: Adjusts 6 in. (15.2 cm) forward and backward. Adjustable backrest with three-positions for operator weight. Integral seat switch in the bottom of the seat cushion.

Diagnostic System: Test ports for the traction system, cutting unit drive system, lift/counterbalance, lift/relief, steering circuits and charge pressure.

Steering System: Automotive type, full power.

Brakes: The hand brake automatically locks the traction linkage in neutral. With the traction motor wheel locks engaged, twin disc brakes provide positive emergency braking.

Electrical System: 12-volt, 66-amp hour (DIN) battery and 35-amp alternator. Negative ground.

Interlock System: Designed to stop the engine if you get off the seat while the cutting unit drive lever is either in forward or reverse. Prevents the engine from starting unless the parking brake is engaged, the traction pedal is in neutral and the cutting units are disengaged. Low hydraulic oil level and high engine temperature protection systems stop the engine.

Warning Systems:

Water in fuel
Hydraulic oil filter
Engine coolant temperature
Engine oil pressure
Voltage Indicator
Air Cleaner Clogged
Hydraulic oil temperature
Hydraulic oil level

General Specifications:

Width-of-Cut:

5 Cutting Units	137 in. (348 cm)
4 Cutting Units	110 in. (279 cm)
3 Cutting Units	83 in. (211 cm)
1 Cutting Unit	29-1/2 in. (75 cm)

Overall Width:

Cutting Units Raised	91-1/2 in. (232 cm)
Cutting Units Down	147 in. (373 cm)
Overall Length:	110 in. (282 cm)

Height: 55-1/2 in. (141 cm)

Ground Clearance: approx. 7 in. (17.8 cm)

Recommended Height-of-Cut:

5-Blade Cutting Unit: 1–3 in. (25–76 mm)

7-Blade Cutting Unit: 3/8–1-3/4 in. (9.5–44 mm)

11-Blade Cutting Unit: 3/8–3/4 in. (9.5–19 mm)

Wheel Tread: 53 in. (135 cm)

Wheel Base: 57 in. (145 cm)

Operating Circle: 60 in. (152 cm)

Dry Weight: 3,786 lbs. (1,717 kg)

Reel Speed: 800–1,200 rpm, Model 03700
470–950 rpm, Model 03701

Clip (variable to match conditions):

5-Blade Cutting Unit: .176 in. per mph
(0.352 in. at 2 mph-1.32 in. at 7.5 mph)

7-Blade Cutting Unit: .126 in. per mph
(0.252 in. at 2 mph -945 in.at 7.5 mph)

11-Blade Cutting Unit: .080 in. per mph
(0.16 in. at 2 mph.600 in. at 7.5 mph)

Fluids

Engine Oil: SAE 10W30 SF, CD

Diesel Fuel: #2

Cooling System: 50/50 Water & Anti-Freeze

Hydraulic Oils (Interchangeable):Mobil DTE 26/

Shell	Tellus 68 Equivalent
Amoco	Rykon Oil #68
Conoco	Super Hydraulic Oil 68
Exxon	Nuto H 68
Kendall	Kenoil R & 0 AW 68
Pennzoil	Penreco 68
Phillips	Magnus A 68
Standard	Energol HLP 68
Sun	Sunvis 831 WR
Union	Unax AW 68

Before Operating

CHECK THE ENGINE OIL DAILY

1. Park the machine on a level surface. Release the engine cover latches (Fig. 1).

2. Open the engine cover and hold it upright

3. Remove the dipstick, wipe it clean, reinstall it into the fill tube and pull it out again; the oil level should be up to the FULL mark (Fig. 2).

4. If the oil is below the FULL mark, remove the fill cap (Fig. 3) and add SAE 10W-30 oil until the level reaches the FULL mark. DO NOT OVERFILL. Crankcase capacity is 6.9 qt. (6.5 l) with the filter.

5. Install the oil fill cap and dipstick.

6. Close the engine cover and secure it with the latches.

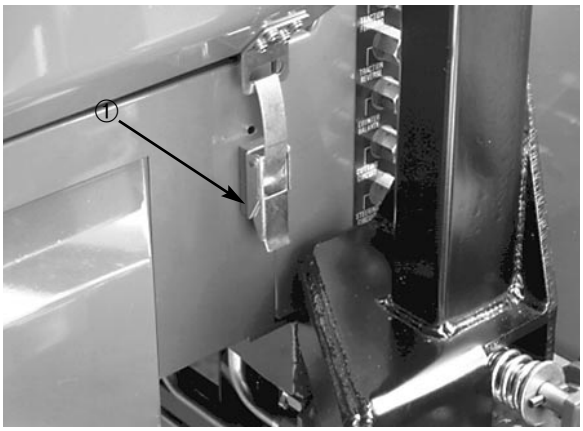


Figure 1

1. Engine Cover Latch

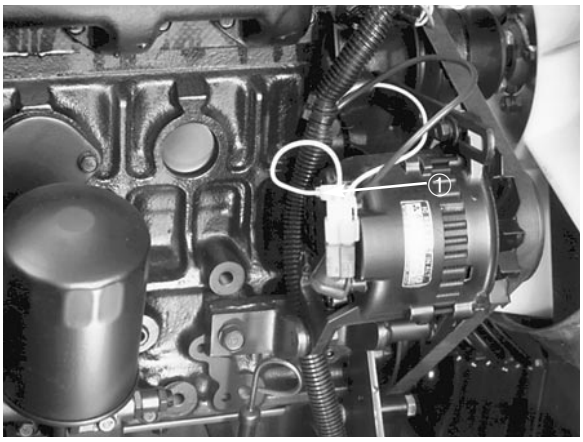


Figure 2

1. Dipstick

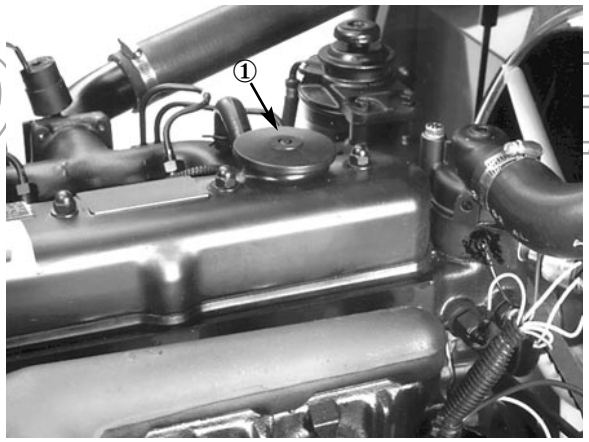


Figure 3

1. Oil Fill Cap

CHECK THE COOLING SYSTEM DAILY

Capacity of the system is 3.7 gal. (14 l).

1. Remove the radiator cap (Fig. 4). The coolant should be one inch from the bottom of the fill hole.

2. If the coolant is low, add a 50/50 mixture of water and ethylene glycol anti-freeze. DO NOT USE WATER ONLY OR ALCOHOL/METHANOL BASE COOLANTS.

3. Install the radiator cap.

⚠ CAUTION

The best time to check the coolant level is before the engine is started each day because it is not pressurized. When the engine is hot, pressurized coolant can escape and cause burns when the radiator cap is removed. Remove the radiator cap slowly and carefully if the engine coolant is hot.

FILL THE FUEL TANK

1. Remove the fuel tank cap (Fig. 4).

2. Fill the tank to about one inch (25 mm) below the bottom

of filler neck with No. 2 diesel fuel. Then install the cap.

⚠ DANGER

Because diesel fuel is flammable, use caution when storing or handling it. Do not smoke while filling the fuel tank. Do not fill the fuel tank while the engine is running, hot, or when the machine is in an enclosed area. Always fill the fuel tank outside and wipe up any spilled diesel fuel before starting the engine. Store fuel in a clean, safety-approved container and keep the cap in place. Use diesel fuel for the engine only; not for any other purpose.

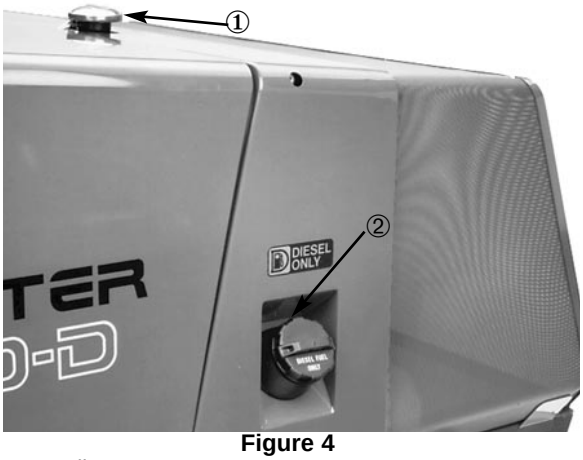


Figure 4

1. Radiator Cap
2. Fuel Tank Cap

CHECK THE HYDRAULIC SYSTEM DAILY

1. Look into the sight glass (Fig. 5). The oil level should be even with the arrows when checking warm oil. The oil will be 64-127 mm (1/4 to 1/2) inches below the arrows when cold.

2. If the oil level is low, add hydraulic oil to the reservoir. Refer to Hydraulic Oil Specifications.



Figure 5

1. Sight Glass Arrows

CHECK THE REEL-TO-BEDKNIFE CONTACT

Each day before operating, check the reel-to-bedknife contact, regardless of whether the quality of cut had previously been acceptable. There must be light contact across the full length of the reel and bedknife.

CHECK THE TIRE PRESSURE DAILY

For normal mowing conditions and a variety of turf grasses, use these tire pressures: 90 kPa (13 psi) front and 103 kPa (15 psi) rear. However, when the turf is either wetter or drier than normal, you may need to change the tire pressure. On hard turf, use high tire pressure 124kPa (18 psi) front and rear). When turf is soft, use low pressure 62kPa front and 83 kPa rear (9 psi front and 12 psi rear).

IMPORTANT: Maintain even pressure in the two front tires and both rear tires to assure excellent quality of cut. Do not exceed 16 kph (10 mph) transport speed (for extended periods) when the tire pressure is 83kPa (12 psi) or less because the tires may be damaged. Maximum transport speed can be used when the front tire pressure is higher than 90 kPa (13 psi).

Controls

Seat Adjustment (Fig. 6) The seat adjusting lever allows 15 cm (5.9 inches) fore and aft adjustment in 15 mm increments.

Arm Rest (Fig. 7) The arm rest pivots up and down.

Backrest Knob (Fig. 7)—The backrest knob adjusts the backrest angle from 5–20 degrees.

Suspension Lever (Fig. 7). The suspension lever adjusts the seat to the operator's weight. Use the up position for lightweight operators, the down position for heavy-weight operators. The backrest cushion and bottom seat cushion are removable.



Figure 6

1. Seat Adjusting Lever

⚠ CAUTION

To make sure the interlock switch operates correctly, the seat suspension must be set for the weight of each operator. If the suspension is not set correctly, the engine will run intermittently and tend to stall. To correct this, set the suspension lighter.

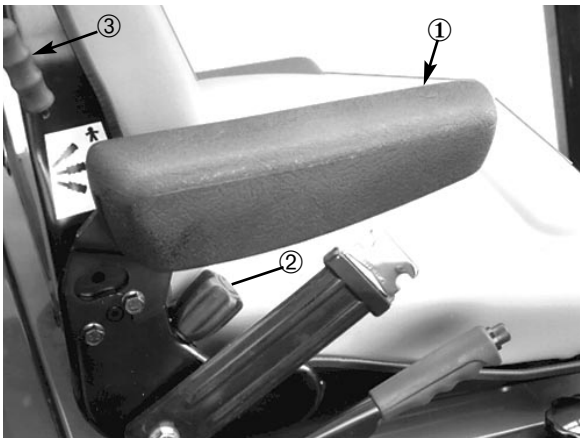


Figure 7

1. Arm Rest
2. Backrest knob
3. Suspension Lever

Warning Light Test Button (Fig. 8)—Before operating, press the test button. All lights on the steering tower should illuminate. Any light that does not come on indicates an electrical malfunction that should be repaired immediately. The oil pressure and no-charge indicator lights illuminate when turning the key switch "ON".

Hydraulic and Engine Indicator Lights (Fig. 8)—If these lights come on, stop the machine and make repairs immediately.

Engine Oil Pressure Warning (Fig. 8)—Dangerously low engine oil pressure is indicated by both a warning indicator light and an audible signal. When this occurs, stop the engine immediately and correct the problem.

Fuel System Warning (Fig. 8)—A warning indicator light and audible signal warn of excess water in the fuel system.

Coolant Temperature Warning (Fig. 8)—If the engine coolant temperature exceeds 203° F (95° C) a warning indicator light illuminates and audible signal sounds. The engine shuts down if the coolant's temperature exceeds 230° F (110° C). The switch resets automatically when system and engine cool down.

No Charge Warning (Fig. 8)—No charge to the batteries is indicated by a warning indicator light and audible signal.

Hydraulic Oil Temperature Warning (Fig. 8)—A warning

indicator light and audible signal warn of excessively high hydraulic temperature.

Hydraulic Oil Level Warning (Fig. 8)—A warning indicator light and audible signal warn of low hydraulic oil level. If the oil level drops further, the engine will automatically stop. The engine cannot be restarted until the oil supply is brought to a safe level.

Hydraulic Oil Filter Warning (Fig. 8)—A warning indicator light and audible signal warn of a clogged hydraulic filter.

Air Cleaner Warning (Fig. 8)-—A warning indicator light and audible signal warn that the filter is clogged and in need of service.

Alarm Silence Button (Fig. 8)—Pressing this button silences the alarm. The alarm system will disengage and automatically reset when the problem is corrected or the alarm silence button is pressed.

Speedometer (Fig. 11)—Indicates the machine's ground speed. Use it with the ground speed limiter and the reel speed control to get an appropriate rate of grass clip.

Horn—In the center of the steering wheel. Operates only when the key switch is ON.

Traction Pedal (Fig. 9)—Controls forward and reverse operation. Depress the top of the pedal to move forward and the bottom to move backward. The ground speed depends on how far the pedal is depressed.

- For no load, maximum ground speed, fully press the pedal while the throttle is in FAST.

- For maximum power under load or when going uphill, keep the engine rpm high by having the throttle in FAST and the traction pedal held stationary against the ground speed limiter. If the engine rpm begins to decrease due to load, gradually reduce the traction pedal pressure until the engine speed increases.

  To stop, reduce foot pressure on the traction pedal and allow it to return to the center position. On extreme downhill slopes, apply pressure to the REVERSE side of the pedal, or operate with your heel on REVERSE and your toe on FORWARD part of the pedal.

Ground Speed Limiter (Fig. 9) controls the traction pedal movement. Limiter lever helps control the rate of grass clip and eliminates sudden speed variations over rough terrain.

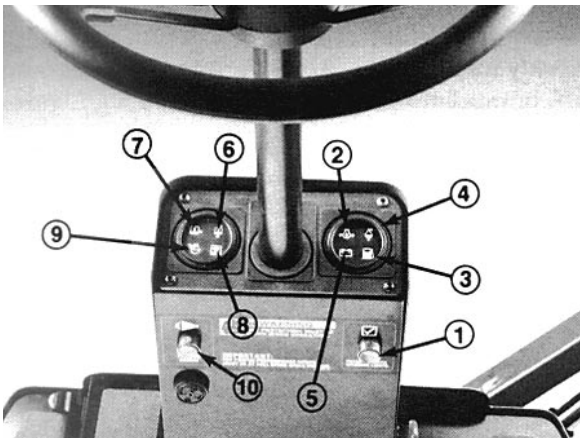


Figure 8

1. *Warning light check switch*
2. *Engine oil pressure warning*
3. *Fuel system warning*
4. *Coolant temperature warning*
5. *No charge warning*
6. *Hydraulic oil temperature warning*
7. *Hydraulic oil level warning*
8. *Hydraulic oil filter warning*
9. *Air cleaner warning*
10. *Alarm silence button*

IMPORTANT: The cam lever nut (Fig. 9 inset) can be tightened if the limiter stop will not hold traction pedal in desired position.

Transport Latches (Fig. 9 and 10)—Latches secure the cutting units in upright position for transport. The latch for the front cutting units is foot-operated (Fig. 9). Hand-operated latches control the center and outside cutting units (Fig. 10).

Adjust the nut for traction pedal resistance.

Cutting Unit Lift Controls (Fig. 11)—The two outside levers raise and lower the two outside cutting units. The center lever raises and lowers the two front and the center cutting units. The engine must be running to lower the cutting units. When the cutting units are lifted, the reels automatically stop. Do not allow the levers to snap-back to neutral, or the cutting units may not float freely.

Cross Cut Link (Fig. 11)—Used with the center cutting unit lift lever and the mow/Backlap lever when cross cutting the turf.

Coolant Temperature Gauge (Fig. 11)—Indicates temperature of system coolant.

Engine Override Button (Fig. 11)—When the button is depressed, the engine can be operated after it has overheated and automatically been stopped by the electrical safety system. Use only for short intervals.

Fuel Level Gauge (Fig. 11)—Indicates the amount of fuel in the tank.

Circuit Breakers (Fig. 11)—The main circuit breaker (40 amp) protects the main engine electrical circuits and options, such as headlights. The auxiliary breaker (10 amp) protects the wiring for the indicator lights and switches. Push the button to reset the breakers.

Hour Meter (Fig. 11)—Indicates total hours that the machine has been operated. **Note**: Lines circling in the small window at the left side of gauge indicate that the hour meter is operating.

Engine Preheat Indicator (Fig. 11)—Burns brightly when the glow plugs are heated sufficiently.

Engine Preheat Switch (Fig. 11)—For cold starts, push and hold the switch until the indicator glows brightly.

Key Switch (Fig. 11)—This switch has three positions: OFF, ON and START. Turn the key to START and release it when the engine begins running. To stop the engine, turn the key to

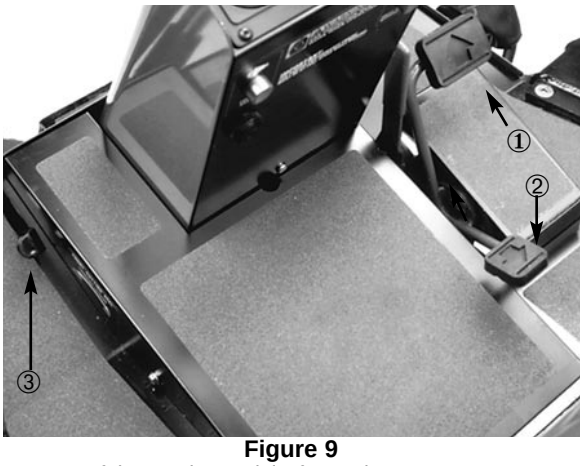


Figure 9

1. Top of the traction pedal—forward
2. Bottom of the traction pedal—reverse
3. Speed limiter
4. Transport latch—front cutting units

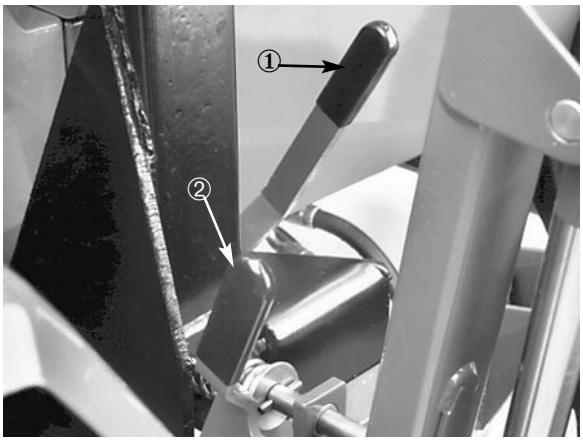


Figure 10

1. Center cutting unit latch
2. Outside cutting unit latch

OFF.

Parking Brake Lever (Fig. 11)—Pull the lever up to lock the brake. To release the brake, pull up on the lever, press the button and lower lever. The brake must be engaged to start the engine. Always engage the parking brake before getting off the seat.

Mow-Backlap Lever (Fig. 11)—Move the lever forward to engage the cutting units. Move the lever to the center to stop the cutting units. To backlap the cutting units, lift the lever over stop and hold in the rear position.

> **CAUTION**
>
> Do not move the lever directly between the MOW and BACKLAP positions. Pause briefly in the STOP position.

Reel Speed Control (Fig. 11)—Turn the knob clockwise to increase the reel speed, counter-clockwise to decrease reel speed. Use with the ground speed limiter to get an appropriate rate of grass clip.

Throttle Control (Fig. 11)—Move the control forward to increase the engine speed, backward to decrease speed.

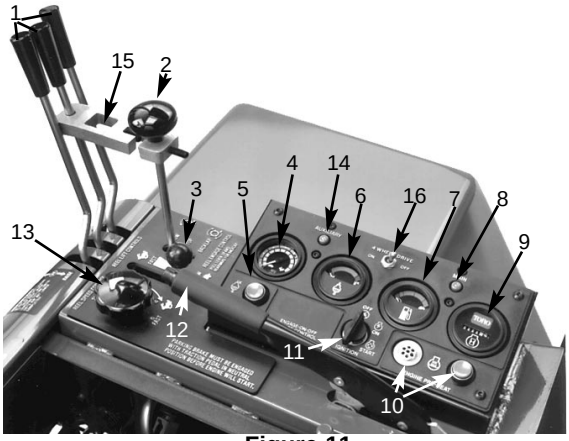


Figure 11

1. Cutting unit lift controls
2. Mow backlap lever
3. Throttle
4. Speedometer
5. Engine over ride button
6. Coolant temperature gauge
7. Fuel gauge
8. Main circuit breaker
9. Hour meter
10. Engine preheat button & indicator
11. Key switch
12. Hand brake
13. Reel speed control
14. Auxiliary circuit breaker
15. Cross cut link

Operating Instructions

STARTING AND STOPPING

1. Sit on the seat, keep your foot off the traction pedal. Make sure the parking brake is engaged (Fig. 11). The traction pedal and the mow/backlap lever must be in neutral.

2. If the engine or air temperature is below 45°–50° F (7–10° C), press and hold the engine preheat switch in until indicator burns brightly (Fig. 11). Then release the switch and go to step 3 to start the engine.

3. Move the throttle to SLOW and turn the ignition key to START (Fig. 11). Release the key when the engine starts.

4. To stop, disengage and move all controls to neutral and set the parking brake. Raise and latch all cutting units in transport position. Turn the key to OFF and remove it from the switch.

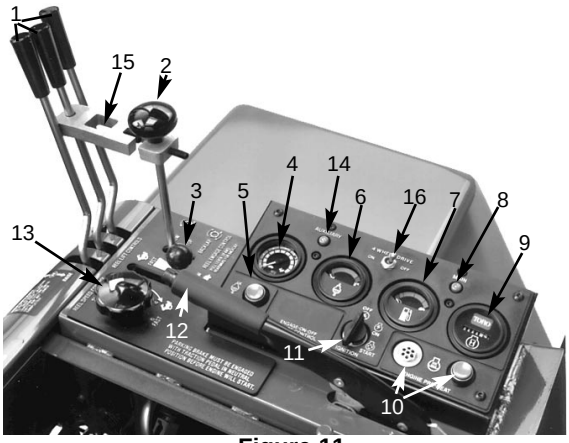


Figure 11

1. Cutting unit lift controls
2. Mow backlap lever
3. Throttle
4. Speedometer
5. Engine over ride button
6. Coolant temperature gauge
7. Fuel gauge
8. Main circuit breaker
9. Hour meter
10. Engine preheat button & indicator
11. Key switch
12. Hand brake
13. Reel speed control
14. Auxiliary circuit breaker
15. Cross cut link

PRIMING THE FUEL SYSTEM

IMPORTANT: The fuel system must be primed when a new engine is started for the first time, if it runs out of fuel or if maintenance is done on the fuel system.

1. Raise the engine cover.

2. Loosen the fuel filter bleed plug one turn (Fig. 12). Push the priming plunger (Fig. 12) until a steady stream of fuel runs out of the hole in the plug. When the fuel stops foaming, tighten the plug during the downstroke of the priming plunger. Wipe up any spilled fuel.

Note: lt may be necessary to bleed the air out of the fuel line between the fuel filter and the injection pump. To do this, loosen the fitting on the injection pump and repeat the bleeding procedure.

3. Normally the engine will now start. If the engine does not start, loosen each injector fitting at the engine and crank the engine until a steady stream of fuel runs out of the fitting. Tighten the fitting when fuel foaming stops.

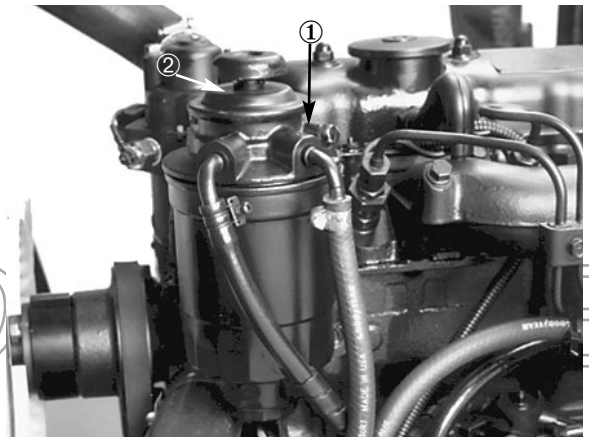


Figure 12

1. Bleed plug
2. Priming plunger

CHECKING THE WARNING INDICATOR LIGHTS

Each day before operating, make sure all warning lights are working.

1. Apply the parking brake, turn the ignition key ON. Push the warning indicator light button (Fig. 13). All lights should illuminate and the alarm will sound.

Note: The alarm will continue to sound until the problem is corrected or until the alarm silence button is pressed. If a second problem is encountered, the alarm will not sound but the indicator light will illuminate.

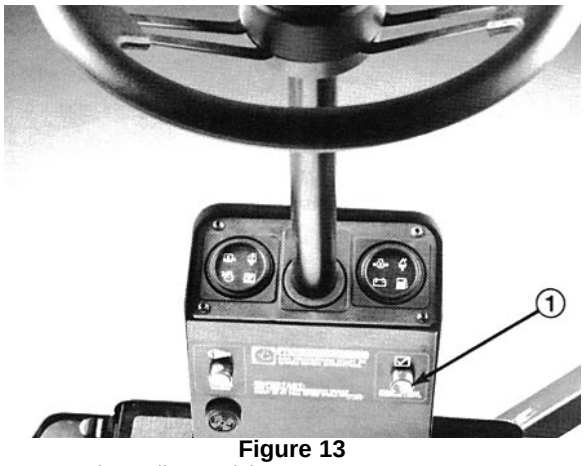


Figure 13
1. Warning Indicator Light Test Button

CHECKING THE INTERLOCK SYSTEM

⚠ CAUTION

THE INTERLOCK SWITCHES ARE FOR THE OPERATOR'S PROTECTION, SO DO NOT DISCONNECT THEM. CHECK SWITCH OPERATION DAILY TO MAKE SURE THE INTERLOCK SYSTEM IS OPERATING. IF A SWITCH IS DEFECTIVE, REPLACE IT BEFORE OPERATING. REGARDLESS OF WHETHER THE SWITCHES ARE OPERATING CORRECTLY, REPLACE THEM EVERY TWO YEARS TO ASSURE MAXIMUM SAFETY

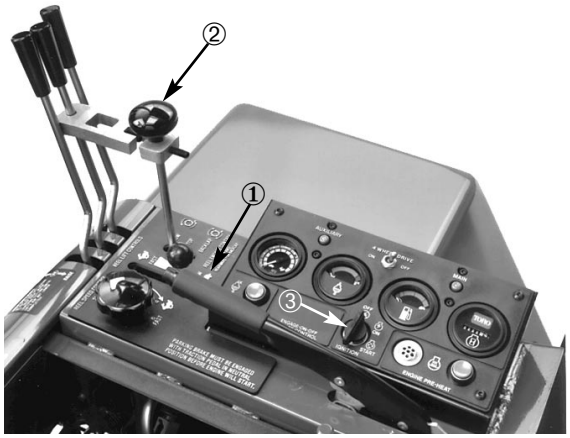


Figure 14
1. Parking Brake
2. Mow Backlap Lever
3. Key

1. In a wide open area free of debris and bystanders, lower the cutting units to the ground. Stop the engine.

2. Sit on the seat and engage the parking brake (Fig. 14). Turn the key and try to start the engine with the Mow Backlap lever (Fig. 14) in both the MOW and BACKLAP positions. If the engine cranks, there is a malfunction that must be repaired immediately. If the engine does not crank, the cutter drive switch is operating correctly.

3. Sit on the seat and disengage the parking brake (Fig. 14). Turn the key and try to start the engine with the Mow Backlap lever (Fig. 14) in STOP. If the engine cranks, there is a malfunction that must be repaired immediately. If the engine doesn't crank, the brake switch is operating correctly.

4. Engage the parking brake (Fig. 14), start the engine and lower the cutting units. Move the Mow-Backlap lever (Fig. 14) to MOW. Rise off the seat; the engine should stop within a few seconds, which indicates the interlock system is operating. Also rise off the seat with the lever in BACKLAP. The engine should stop, indicating the interlock system is operating. If the engine does not stop, there is a malfunction that must be repaired immediately.

Note: There is a 1–2 second delay between rising off the seat and the engine shuts off.

5. Engage the parking brake, move the Mow-Backlap lever to NEUTRAL, start the engine, disengage the hand brake and raise off the seat. If the engine stops, the interlock system is operating. If the engine does not stop, there is a malfunction that must be repaired immediately.

PUSHING OR TOWING THE TRACTION UNIT

In an emergency, the traction unit can be pushed or towed for a very short distance by using the traction pump by-pass valve.

IMPORTANT: Do not push or tow the traction unit faster than 2 to 3 mph (3 to 5 km/hr) because the hydraulic system may be damaged. If the traction unit must be moved a considerable distance, transport it on a truck or trailer.

1. Remove the retainer clip from the seat lock rod (Fig. 15)

2. Raise the seat and support it in an upright position with the seat support rod (Fig. 16)

3. Lift and remove the front panel (Fig 17)

4. Turn the by-pass valve 90 degrees (Fig. 18). Opening the valve opens an internal passage in the traction pump, bypassing hydraulic oil.. Because the oil is by-passed, the traction unit can be moved without damaging the hydraulic system.

IMPORTANT: Make sure that the hand brake is engaged before opening the by-pass valve.

⚠ CAUTION

The vehicle will roll with the front wheel motors disengaged. The vehicle must be on a level surface or the wheels must be blocked. There is no effective braking with the wheel motors disengaged.

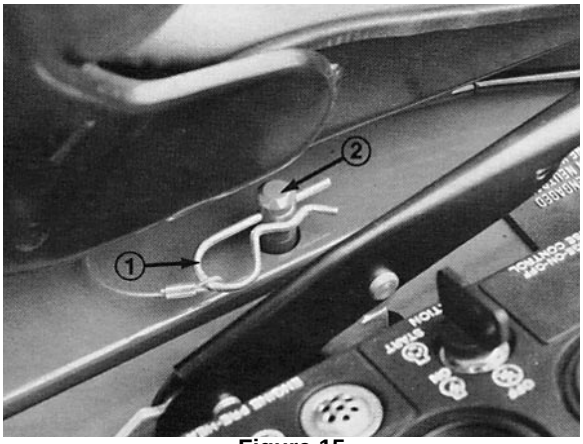


Figure 15

1. Retainer clip
2. Seat lock rod



Figure 16

1. Seat support rod

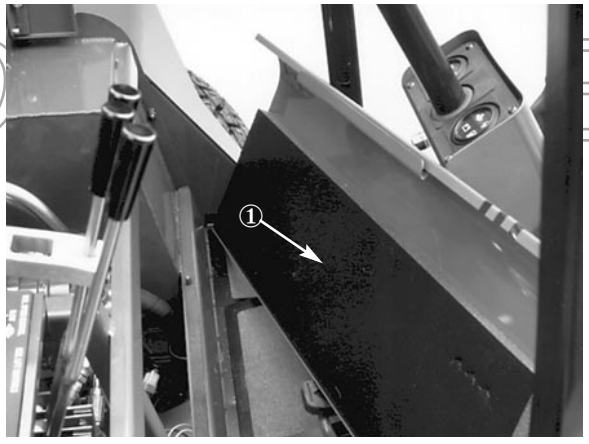


Figure 17

1. Front Panel

5. Before starting the engine, close the by-pass valve. Do not start the engine when the valve is open.

IMPORTANT: Running the machine with the bypass valve open will cause the hydraulic system to overheat.

If towing with the front wheel motors disengaged, the Tow Bar Assembly, Toro part no. 58-7020, must be used.

OPERATING CHARACTERISTICS

Familiarization—Before mowing grass, practice in an open area. Start and stop the engine. Operate the machine in forward and reverse. Lower and raise the cutting units simultaneously and individually. Engage and disengage the reels. Operate with all cutting units down, then with only an individual cutting unit. When you feel familiar with the machine, practice operating around trees and obstacles. Also drive up and down slopes using both mowing and transport speeds.

Warning System—If a warning light comes on during operation, stop the machine immediately and correct the problem before continuing operation. Serious damage could occur if you operate the machine when it has a malfunction. *For short intervals*, however, you can use the emergency engine override button (Fig. 11) to operate the engine if it stops because of overheating.

Mowing—When you are at the area to be mowed, release the front cutting unit transport latch, center latch and outside latches. Lower the cutting units, engage the hand brake and stop the engine.

Cutting Unit Grass Deflectors—Adjust the grass deflectors to the horizontal position (Fig. 19), so grass clippings disperse backward; out and away from the cutting units. This will prevent clumps of grass clippings—especially wet grass clippings—dropping off the machine or cutting units, which affects the turf's appearance.

Note: Generally you can adjust the deflectors down slightly in dry grass and up slightly in wet grass.

While checking the speedometer, match the ground speed limiter (Fig. 20) and the reel speed control knob (Fig. 21) to the desired height-of-cut: refer to the cutting Charts (Fig. 22). Use the decal at side of steering column as a guide only.

Cross Cut Link—When engaging/disengaging the center lift control lever, the cross-cut link will simultaneously engage/disengage the mow control lever to eliminate the need for two separate hand operations. If the mow control lever

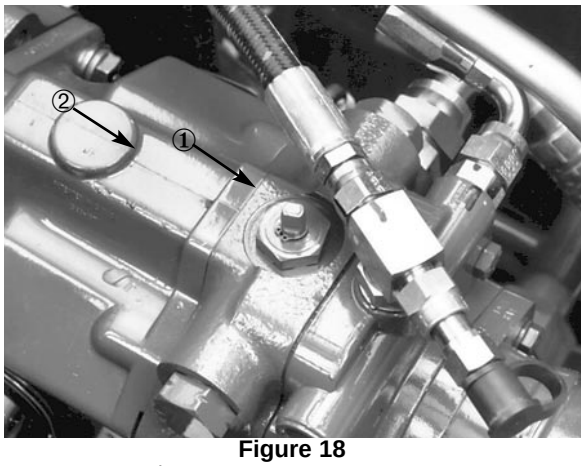


Figure 18

1. By-Pass Valve
2. Traction pump

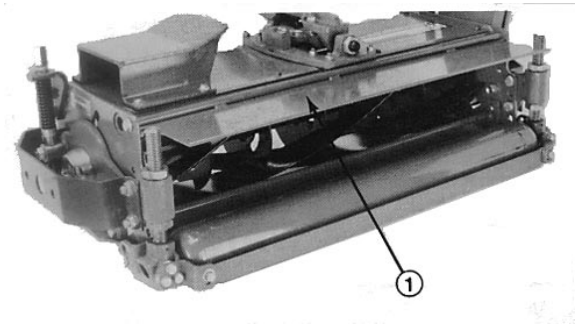


Figure 19

1. Grass deflector

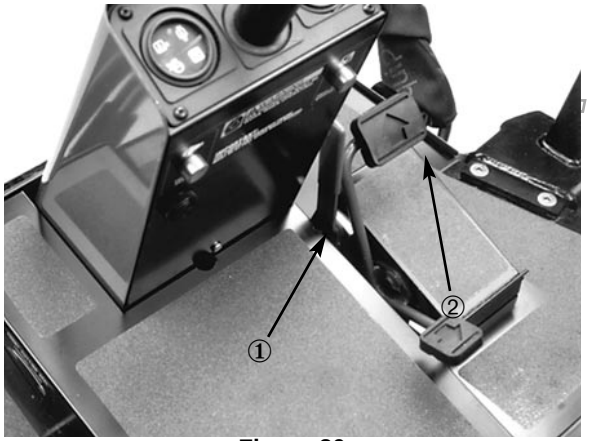


Figure 20

1. *Ground speed limiter*
2. *Traction pedal*

does not follow the motion of the lift control lever during operation, adjust the set screw(s) as required.

When permanent use of cross-cut link is not desired, you can remove it by unscrewing the lift control knob and loosening the set screw.

To temporarily disconnect the cross-cut link, stop the engine, pull back on the lift lever until the slot in the link aligns with the mow control lever and swing the link to the side.

Start the engine and move the throttle to FAST so the engine runs at maximum speed. Move the Mow/Backlap lever to MOW (Fig. 11). The reels are now spinning. Disengage the hand brake. To move forward and cut grass, press the traction pedal forward (Fig. 20). Maintain traction pedal contact with the ground speed limiter to assure consistent grass clip and quality-of-cut.

Transport—When mowing is complete, move THE MOW/BACKLAP lever to STOP. Raise the cutting units by pulling back on the lift control levers. Hold the levers back until the cutting units are raised fully (a squeal from the hydraulic system means the cutting units are fully raised). Lock the cutting units in place with the transport latches. When driving from one area to another, use a slower ground speed. Be careful when driving between objects so you do not accidentally damage the machine or the cutting units.

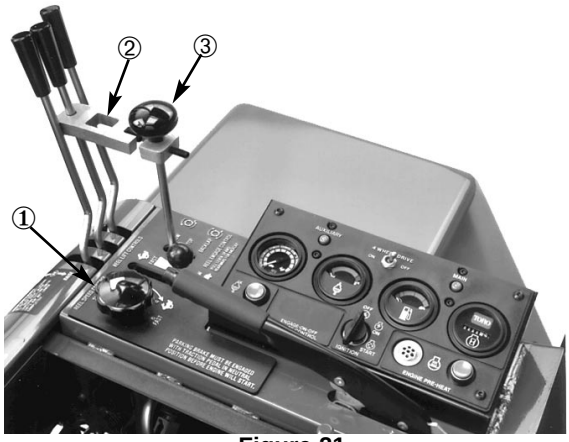


Figure 21

1. Reel speed control knob
2. Cross cut lever
3. Mow/Backlap lever

Matching Ground Speed and Reel Speed—Vary the reel speed (while maintaining constant ground speed) to establish the best quality of cut for the area being mowed. Reel speeds either too fast or too slow for conditions may affect the quality of cut. Use the following cutting chart (Fig. 22) and the decal on steering console as a guide for initial adjustment of the ground and reel speeds.

Recommended Reel Speed Settings

5-Blade Reel

Cut (mm) \ Speed km/h	5	6	8	10	11
25	1	3	5		
31		1	3	5	
38			2	3	3
50				1	2
63					1

7-Blade Reel

Cut (mm) \ Speed km/h	5	6	8	10	11
13	2	5			
16	1	3	5		
19		1	3	5	
25			1	2	3
31				1	2

11-Blade Reel

Cut (mm) \ Speed km/h	5	6	8	10	11
10	1	3	5		
13		1	3	4	
16			1	2	4
19				1	2

Relate Height of cut and the ground speed to required reel speed setting on a 1 through 5 scale on the reel speed knob. **Note:** 1 = 800 RPM; 2 = 900 RPM; 3 = 1000 RPM; 4 = 1,100 RPM and 5 = 1,200 RPM.

Figure 22

Maintenance

Service Intervals

Check Parking Brake Operation	Daily
Check Interlock Switch Operation	Daily
Check Engine Oil Level	Daily
Check Cooling System Fluid Level	Daily
Check Reel-to-bedknife Contact	Daily or as required
Check the hydraulic System Fluid Level	Daily
Check the tire Pressure	Daily or as required
Drain water from fuel separator	Daily or as required
Clean Debris From the radiator & Front Grill	Daily or as required
*Grease Five (5) Lift Arm Pivot Pins	Daily
*Grease Cutting Unit Rollers	Daily
*Grease Cutting Unit Reel Bearings	Daily
*Grease Rear Axle (3 fittings	Daily
Service Air Filter Bowl, Dust Cup & Baffle	Daily or as required
Grease Floatation or Fixed Head Pivots and Reel Control Valve	Weekly
Check Cooling System Hoses & Connections	100 hours
Check Condition & Tension of the engine Belts	**100 hours
Check Battery Fluid & Cable Connections	100 hours
Change Engine Oil or Filter	**100 hrs
Check the hydraulic Lines & Hoses	100 hrs
Drain Water From the hydraulic Reservoir	100 hrs
Tighten Wheel Nuts	**200 hrs
Clean Air Cleaner Filter Element	**200 hours or as required
Check the engine Valve Clearance	**Annually/500 hrs
Replace the fuel Filter	500 hours or as required
Change Planetary Gear Lube	**Annually/800 hrs
Change the hydraulic System Filter	**Annually/800 hrs
Check Rear Wheel Toe-In & Pack the Rear Wheel Bearings	Annually/800 hrs**
Drain & Flush the Cooling System	Annually/800 hrs
Change the hydraulic System Breather	Annually/800 hrs
Drain Water From the fuel Tank	Annually/800 hrs
Replace Air Cleaner Filter Element	Annually/800 hrs
Torque Cylinder Head Bolts	**Annually/1,000 hrs
Change the hydraulic Oil	2 years
Replace the seat Switch	2 years
Replace Hand Brake Switch	2 years
Replace the mow-Backlap Switch	2 years
Use #2 Lithium Base Grease.	Initial Service Interval—50 operating hours.

Service Specifications

Engine Oil: All temperatures use SAE 10W30 SF, CD.

Hydraulic System Fluid: Refer to Hydraulic Oil Specifications (Page 8). Do not use the engine oil in the hydraulic system.

Filters: Hydraulic Oil (Toro part no. 58-6610); Air (Toro part no. 27-7110); Fuel (Toro part no. 60-5420); Engine Oil (Toro part no. 49-2500); Hydraulic Reservoir Breather (Toro part no.68-6150.

*No 2 Lithium base grease ** Initial Service Interval—50 operating hours

LUBRICATION

Areas to lubricate are pictured in figures 23–25. Use No. 2 lithium-based grease. Also, grease the fitting on the Reel Control Valve (not shown), under the right console.

Note: Remove the plastic caps over the fittings on the floating- or fixed-head kit pivots and replace them after greasing (Fig. 24).

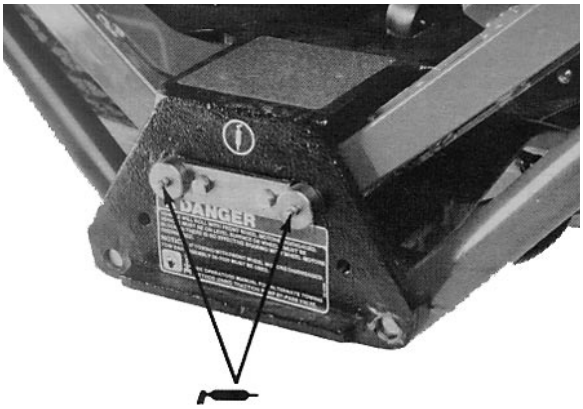


Figure 22
Lift Arms (5 fittings)

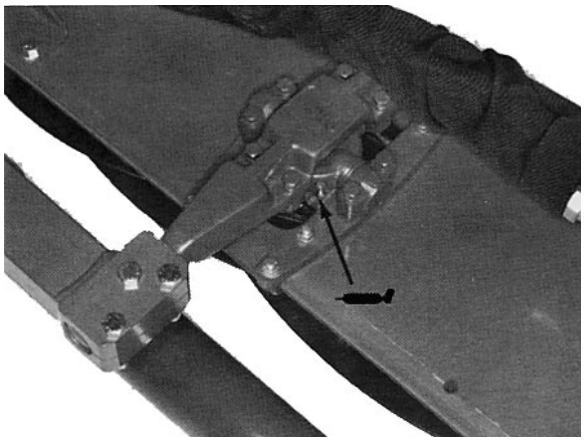


Figure 24
Floating or Fixed Head Kit Pivots
(Floating Head Kit Shown)

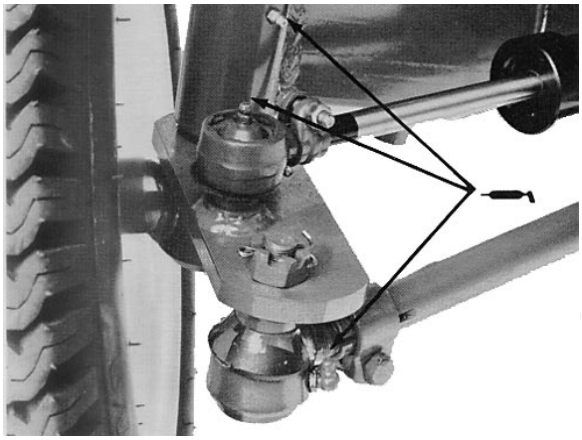


Figure 23
Rear Axle (3 fittings)

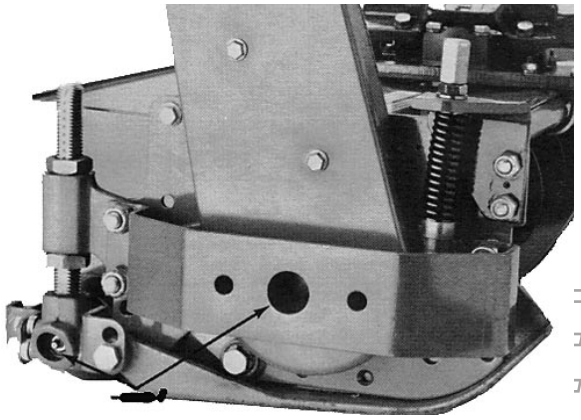


Figure 25
Reel & Roller Bearings

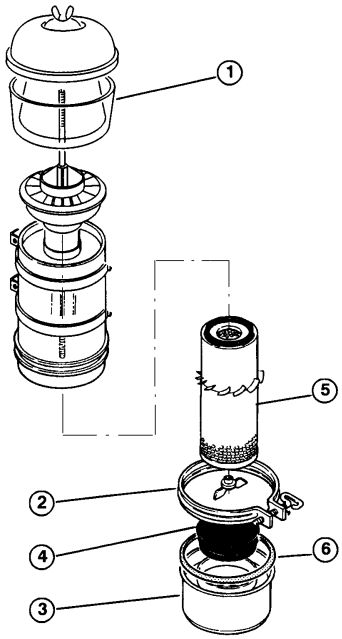


Figure 26

1. Precleaner bowl
2. Mounting band
3. Dust cup
4. Baffle
5. Filter
6. Gasket

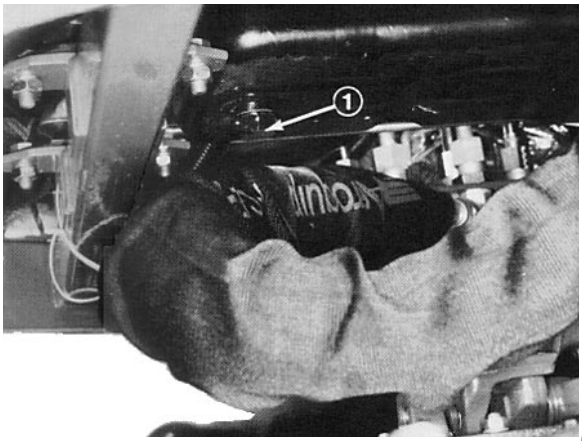


Figure 27

1. Drain plug

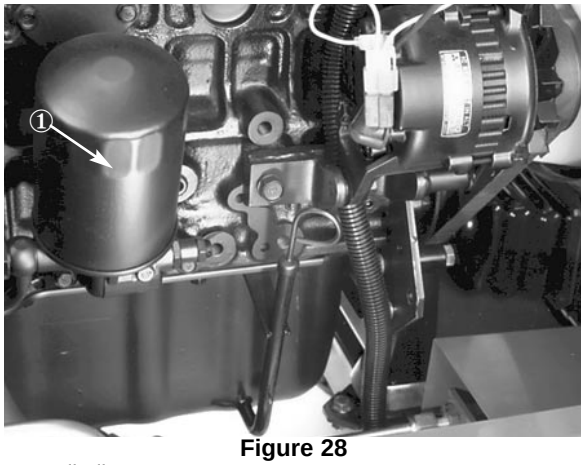


Figure 28

1. Oil Filter

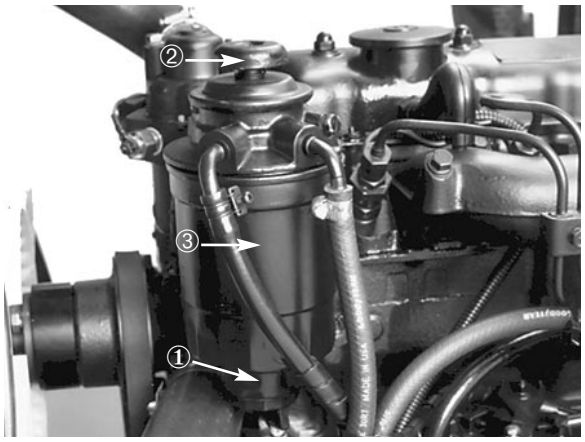


Figure 29

1. Drain Outlet
2. Plunger
3. Filter

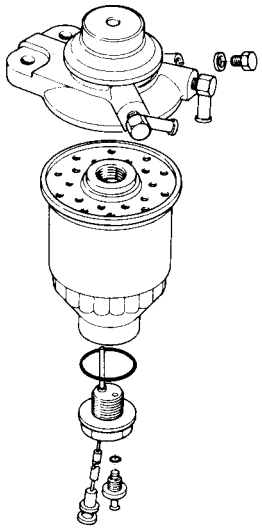


Figure 30

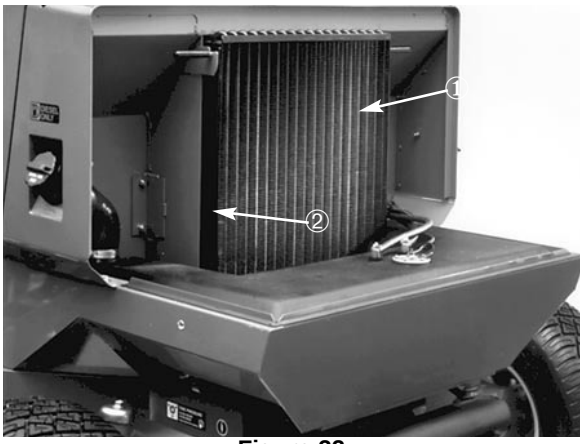


Figure 32

1. Oil cooler
2. Radiator



Figure 33

1. Hydraulic sight glass arrows

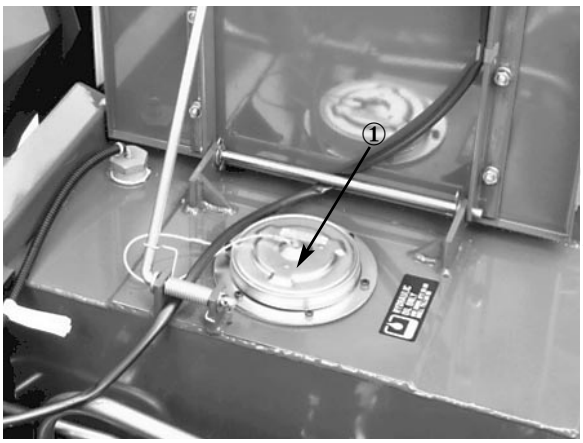


Figure 34

1. Hydraulic reservoir cover

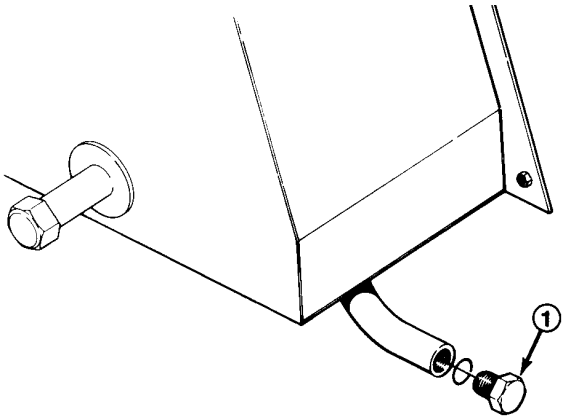


Figure 35

1. Hydraulic drain plug

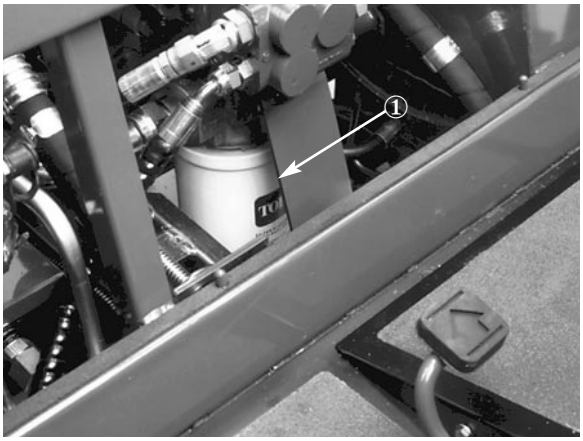


Figure 36

1. Hydraulic filter

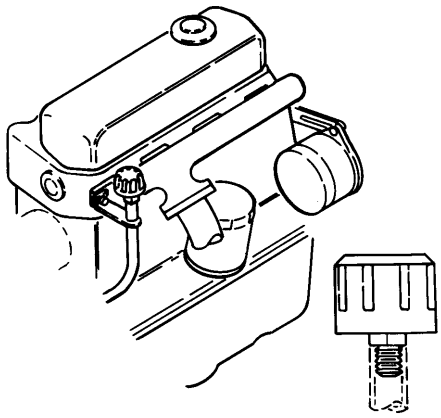


Figure 37

1. Hydraulic system breather

CHECKING PLANETARY GEAR DRIVE

Initially, check the oil level after 50 operating hours and check every 800 hours after that. The oil capacity is approximately 30 oz. (885 ml) high-quality 80–90 weight Gear Lube.

To check the oil level, the oil should be at the bottom of the check/drain plug hold (Fig. 40) when the hole is placed in the 3 o'clock or 9o'clock position. The traction unit must be on level ground when making this check.

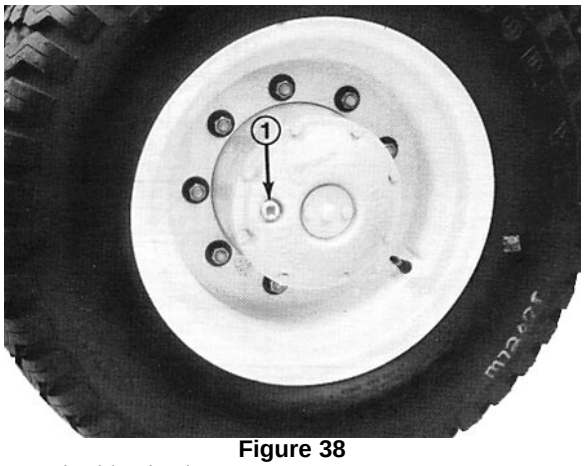


Figure 38

1. Check/Drain Plug

PROTOTYPE



PROTOTYPE