FORM NO. 3318–818GB

TORO®

Wheel Horse®

416–8E

Garden Tractor

Model No. 73441 – 7900001 & Up

Operator's Manual

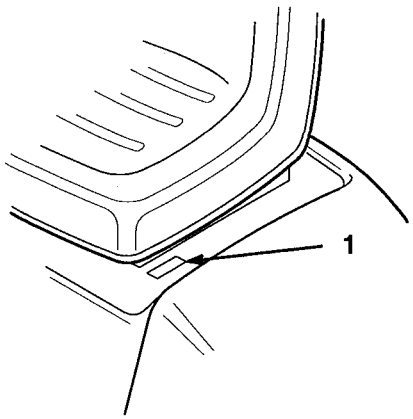
IMPORTANT: Read this manual carefully. It contains information about your safety and the safety of others. Also become familiar with the controls and their proper use before you operate the product.

Introduction

Thank you for purchasing a Toro product.

All of us at Toro want you to be completely satisfied with your new product, so feel free to contact your local Authorized Service Dealer for help with service, genuine replacement parts, or other information you may require.

Whenever you contact your Authorized Service Dealer or the factory, always know the model and serial numbers of your product. These numbers will help the Service Dealer or Service Representative provide exact information about your specific product. You will find the model and serial number plate located in a unique place on the product as shown below.



1. Model and Serial Number Plate

For your convenience, write the product model and serial numbers in the space below.

Model No: _____

Serial No. _____

Read this manual carefully to learn how to operate and maintain your product correctly. Reading this manual will help you and others avoid personal injury and damage to the product. Although we design, produce and market safe, state-of-the-art products, you are responsible for using the product properly and safely. You are also responsible for training persons, who you allow to use the product, about safe operation.

The warning system in this manual identifies potential hazards and has special safety messages that help you and others avoid personal injury, even death. DANGER, WARNING and CAUTION are signal words used to identify the level of hazard. However, regardless of the hazard, be extremely careful.

DANGER signals an extreme hazard that will cause serious injury or death if the recommended precautions are not followed.

WARNING signals a hazard that may cause serious injury or death if the recommended precautions are not followed.

CAUTION signals a hazard that may cause minor or moderate injury if the recommended precautions are not followed.

Two other words are also used to highlight information. "Important" calls attention to special mechanical information and "Note" emphasizes general information worthy of special attention.

The left and right side of the machine is determined by sitting on the seat in the normal operator's position.

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Safety

Safe Operation Practices for Ride-on (riding) Rotary Lawnmower Machines

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;

        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 refuelling.
    - 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°

   Note: Slope angle is calculated as in 5.4.2.3.2.

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 travelling 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 refuelling;
    - 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 shut-off 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.

Sound Pressure Level

This unit has an equivalent continuous A-weighted sound pressure at the operator ear of: 87.9 dB(A), based on measurements of identical machines per ANSI B71.5-1984 procedures.

Sound Power Level

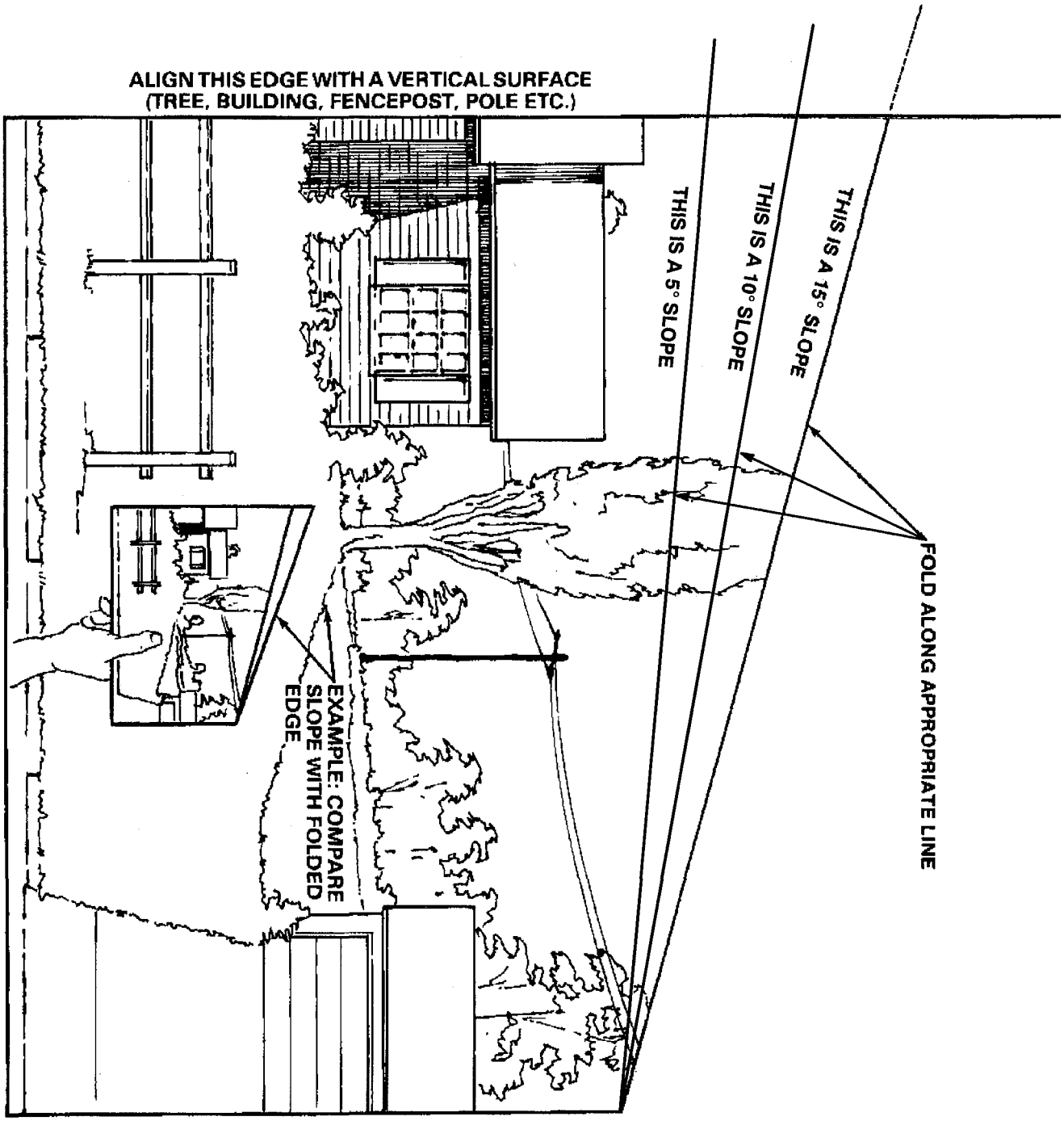
This unit has a sound power level of: 105 dB(A) / 1 pW, based on measurements of identical machines per procedures outlined in Directive 79/113/EEC and amendments. The test surface consisted of a surface of coconut mat surrounded by 2" grass.

Vibration Level

This unit has a maximum hand-arm vibration level of 3.71 m/s^2 and whole body vibration level of 0.13 m/s^2, based on measurements of identical machines per ISO 5349.

Slope Chart

Read all safety instructions on pages 2–9.



Symbols Glossary

Safety alert symbol



Safety alert symbol



Read operator's manual



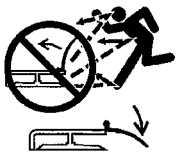
Consult Technical Manual for proper service procedures



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



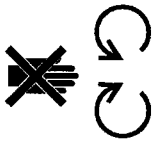
Severing fingers or hand– mower blade



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



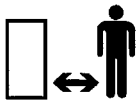
Do not open or remove safety shields while engine is running



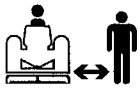
Dismemberment–Mower in rearward motion



Stay a safe distance from the machine



Stay a safe distance from the mower



Keep children a safe distance from machine



Machine rollover side hill



Machine rollover up hill



Machine rollover down hill



Machine rollover ROPS



Symbols Glossary

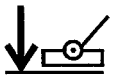
Cutting element–basic symbol



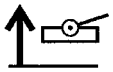
Cutting element–height adjustment



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 the snowthrower



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



Machine rollover ROPS snowthrower



Severing of hand–Rotating knives



Severing of foot–Rotating knives



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



Crushing of fingers or hands–Force applied from side



Kickback or upward motion–Stored energy



Shut off engine & 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 maximum # of forward gears **3**

Symbols Glossary

Fast 

Slow 

Decreasing/Increasing 

On/Run

Off/Stop 

Engine 

Engine start 

Engine stop 

Choke 

Engine temperature 

Engine lubricating oil pressure 

Engine lubricating oil level 

Fuel 

Fuel level 

Volume empty 

Volume full 

Battery charging conditin 

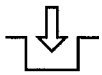
Head lights–
Main/high beam 

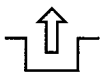
Brake system 

Parking brake 

Clutch 

PTO (Power Take Off) 

Engage 

Disengage 

Unlock 

Lock 

Gasoline and Oil

Recommended Gasoline

Use UNLEADED Regular Gasoline suitable for automotive use (85 pump octane minimum). Leaded regular gasoline may be used if unleaded regular is not available.

IMPORTANT: Never use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol because the fuel system could be damaged. Do not mix oil with gasoline.

⚠ DANGER

POTENTIAL HAZARD

- **In certain conditions gasoline is extremely flammable and highly explosive.**

WHAT CAN HAPPEN

- **A fire or explosion from gasoline can burn you, others, and cause property damage.**

HOW TO AVOID THE HAZARD

- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any gasoline that spills.**
- **Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1/4" to 1/2" (6 mm to 13 mm) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by a spark.**
- **Store gasoline in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of gasoline.**

Stabilizer/Conditioner

Add the correct amount of gas stabilizer/conditioner to the gas. Using a stabilizer/conditioner in the machine:

- Keeps gasoline fresh during storage
- Cleans the engine while it runs
- Eliminates gum-like buildup in the fuel system, which causes hard starting

IMPORTANT: Never use fuel additives containing methanol or ethanol.

Filling the Fuel Tank

1. Shut the engine off and raise the seat.
2. Clean around the fuel tank cap and remove the cap. Use a funnel and add unleaded regular gasoline to the fuel tank, until the level is 1/4 to 1/2 inch (6 mm to 13 mm) below the bottom of the filler neck. This space in the tank allows gasoline to expand. Do not fill the fuel tank completely full.
3. Install the fuel tank cap securely. Wipe up any gasoline that may have spilled.
4. Low fuel level is indicated on fuel gauge.

Check Engine Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking Oil Level, page 24.

Operation

Think Safety First

Please carefully read all the safety instructions on pages 2–8. Knowing this information could help you, your family, pets or bystanders avoid injury.

Controls

Become familiar with all the controls (Fig. 1) before you start the engine and operate the machine.

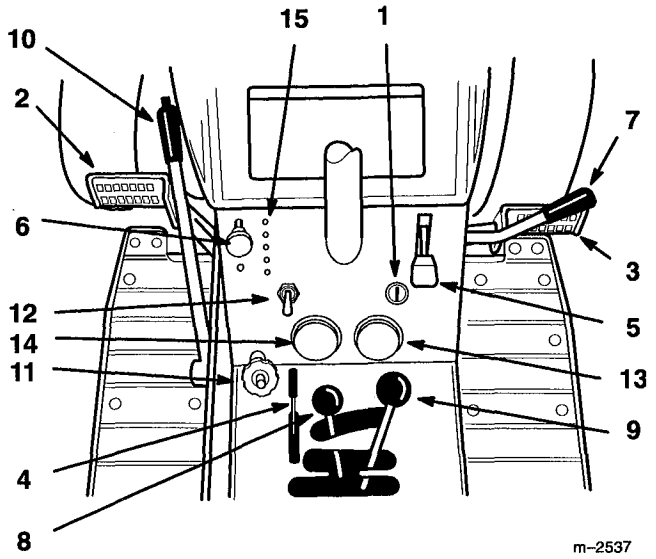


Figure 1

1. Ignition switch
2. Clutch pedal
3. Brake pedal
4. Parking brake lever
5. Throttle lever
6. Choke lever
7. Power take off (PTO)
8. Range selector
9. Gear shift
10. Attachment lift lever
11. Dial-A-Height knob
12. Light switch
13. Hour meter
14. Voltmeter
15. Indicator lights

Parking Brake

Always set the parking brake when you stop the machine or leave it unattended.

While the ignition key is in the "RUN" position and the Parking Brake is engaged, the light, in the Indicator Module, will be lit.

Setting the Parking Brake

1. Push the brake pedal (Fig. 2) down and hold it in the depressed position.
2. Move the parking brake lever (Fig. 2) back and gradually take your foot off the brake pedal. The brake pedal should stay in the depressed (locked) position.

Releasing the Parking Brake

1. Push down on the brake pedal (Fig. 2). The parking brake lever should release.
2. Gradually release the brake pedal.

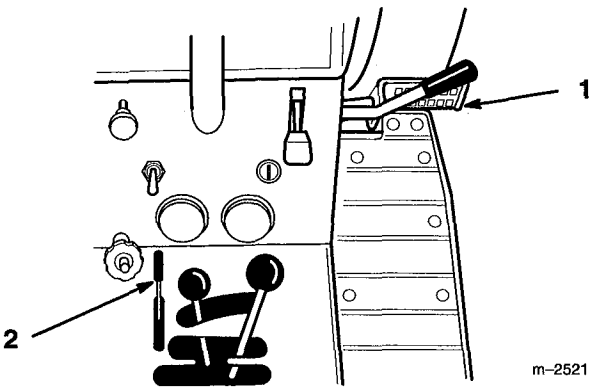


Figure 2

1. Brake pedal
2. Parking brake lever

Starting and Stopping the Engine

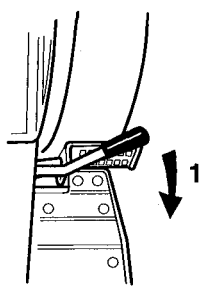
Starting

1. Sit down on the seat.
2. Set the parking brake; refer to Setting the Parking Brake, page 11.

   Note: The engine will not start unless you set the parking brake or fully depress the brake pedal.
3. Move the PTO (power take off) to disengage (Fig. 3).
4. Move the gear shift lever to "N" neutral; refer to Selecting Ground Speeds, page 16.
5. Move the choke lever to "ON" (Fig. 3).

   Note: An engine that has been running and is warm may not require step 5.
6. Move throttle lever to "FAST" (Fig. 4).
7. Turn the ignition key clockwise and hold it in the "START" position (Fig. 6). When the engine starts, release the key.

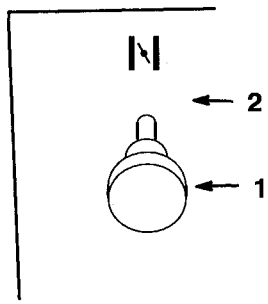
   IMPORTANT: If the engine does not start after 30 seconds of continuous cranking, turn the ignition key to "OFF" and let the starter motor cool; refer to Troubleshooting, page 42.
8. After the engine starts, move the choke lever to "OFF" (Fig. 4). If the engine stalls or hesitates, move the choke lever back to "ON" for a few seconds. Then move the throttle lever to desired setting. Repeat this as required.



m-2519

Figure 3

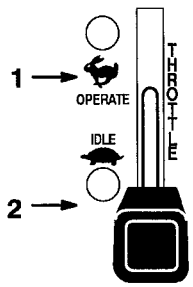
1. PTO—Disengaged



m-24

Figure 4

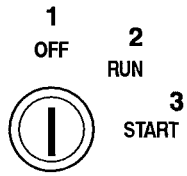
1. Choke–On
2. Choke–Off



m-2478

Figure 5

1. Fast
2. Slow



m-2477

Figure 6

1. Off
2. Run
3. Start

Stopping

1. Move the throttle lever to "SLOW" (Fig. 5).
2. Turn the ignition key to "OFF" (Fig. 6).

   Note: If the engine has been working hard or is hot, let it idle for a minute before turning the ignition key "OFF." This helps cool the engine before it is stopped. In an emergency, the engine may be stopped by turning the ignition key to "OFF."

Operating the Power Take Off (PTO)

The power take off (PTO) engages and disengages power to the clutch.

While the ignition key is in "RUN" position and the power take off (PTO) is engaged, the PTO light, in the Indicator Module, will be "ON". When this light is "ON" it is a reminder; the starter will not crank and to turn off the PTO before getting off.

Engaging the Power Take Off (PTO)

1. Depress the clutch and brake pedals to stop the machine.
2. Push the power take off (PTO) lever forward to engage (Fig. 7).

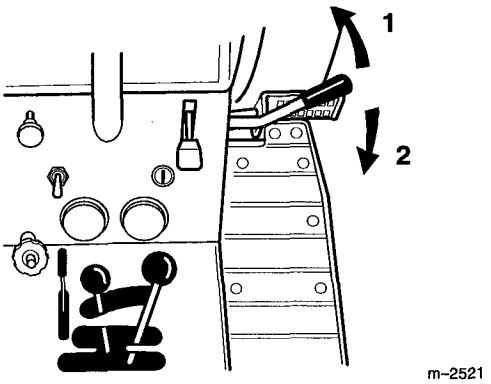


Figure 7

1. Engaged
2. Disengaged

Disengaging the Power Take Off (PTO)

1. Depress the clutch and brake pedals to stop the machine.
2. Pull the power take off (PTO) lever back to disengage (Fig. 7).

The Safety Interlock System

Understanding the Safety Interlock System

The safety interlock system is designed to prevent the engine from starting unless:

- The clutch pedal is depressed
- The power take off (PTO) is disengaged

The safety interlock system is designed to stop the engine if you rise from the seat when the power take off (PTO) is engaged.

Testing the Safety Interlock System

Test the safety interlock system before you use the machine each time. If the safety system does not operate as described below, have an Authorized Service Dealer repair the safety system immediately.

1. Depress the clutch. Move the power take off (PTO) to engaged. Now turn the ignition key to "START"; the engine should not crank.
2. Move the power take off (PTO) to disengaged and release the clutch. Now turn the ignition key to "START"; the engine should not crank.
3. Set the parking brake, depress the clutch and move the power take off (PTO) to disengaged Now start the engine. While the engine is running, move the power take off (PTO) to engaged and rise slightly from the seat; the engine should stop.

Indicator Lights

The indicator lights (Fig. 8) illuminate when certain controls are activated and when certain conditions occur that need immediate attention. Under normal operating conditions the lights should be off.

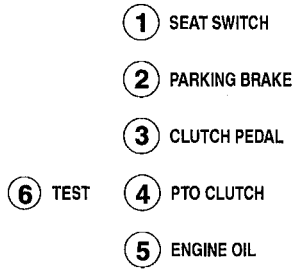


Figure 8

1. Seat switch
2. Parking brake
3. Clutch pedal
4. PTO (power take off)
5. Engine Oil
6. Test button

Seat Switch

When the seat switch light is "ON" it indicates the seat is not occupied.

Parking Brake

When the parking brake light is "ON" it indicates the parking brake is set. Do not drive with the parking brake on.

Clutch Pedal

When the clutch pedal light is "ON" it indicates the clutch pedal needs to be depressed before the engine will start.

PTO (Power Take Off) Clutch

When the PTO clutch light is "ON" it indicates the PTO clutch must be disengaged before the engine will start.

Engine Oil

When the oil light "BLINKS" it indicates the engine oil pressure is low. After the engine starts the light should go out. When the engine is running if the oil pressure drops below a safe operating level the light "BLINKS". **Stop engine immediately and correct the cause of low oil pressure.**

Test Button

When the test button is pressed all indicator lights come "ON" and the oil light "BLINKS", to check operation of the indicator lights.

Instruments

The gauges show conditions that need to be monitored during tractor operation. Read them to check operation immediately after starting the engine and regularly during use.

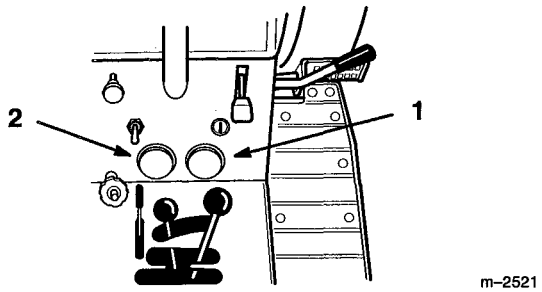


Figure 9

1. Hour meter
2. Voltmeter

Hour Meter

The hour meter records the number of hours the engine has operated (Fig. 9). It is turned on when the ignition switch is in the "RUN" position. Use these times for scheduling regular maintenance.

Voltmeter

The voltmeter shows the electrical system battery voltage (Fig. 9). When you turn the ignition key to "RUN", the gauge should read 12 volts or slightly higher. After the engine starts, the gauge should read between 12 and 15 volts. If the gauge reads less than 12 volts, the battery is discharging. If the gauge reads 15 volts for long periods of time, check the battery water more often.

Driving Forward or Backward

The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle control in the "FAST" position for best performance.

⚠ CAUTION

POTENTIAL HAZARD
- **If you release the clutch pedal too quickly when the ground speed selector is in gear, you could suddenly put the machine in motion.**

WHAT CAN HAPPEN
- **Sudden engagement of the machine's drive system could cause you to lose control.**

HOW TO AVOID THE HAZARD
- **Always release the clutch pedal slowly when starting the machine in motion (forward or reverse).**

To go forward or backward, depress the clutch and brake pedals. Move the range selector to the desired high–low location and select a forward or reverse gear. Release the brake pedal. As you slowly release the clutch pedal, the machine will begin to move. Steer the machine with the steering wheel.

IMPORTANT: Do not "Ride the Brakes," or use brakes to slow ground speed when in gear. On hills shift to a lower gear for slower ground speed.

Selecting Ground Speeds

IMPORTANT: To avoid transmission damage, always depress the clutch and brake pedals before shifting gears or high–low range.

Always start the machine and change gears by depressing the clutch pedal (Fig. 10). In most conditions, the machine is powerful enough to move out in any speed. If it will not move out in a selected speed (i.e., #5) due to a heavy load, us a lower speed (i.e., #2).

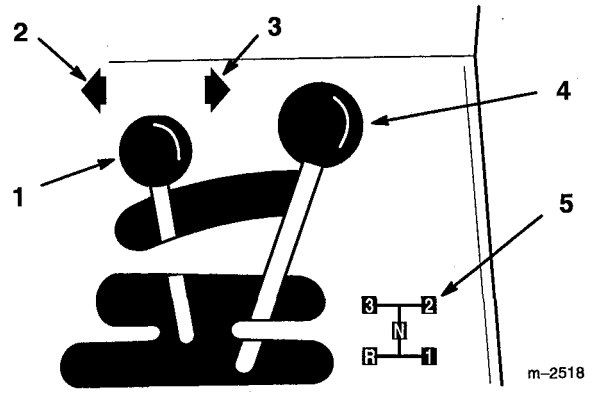


Figure 10

1. Range selector
2. Low range
3. High range
4. Ground speeds selector
5. Gear location 1-3, R

Stopping the Machine

To stop the machine, depress the clutch and brake pedals, disengage the power take off (PTO), and turn the ignition key to "OFF" to stop the engine. Also set the parking brake if you leave the machine unattended; refer to Setting the Parking Brake, page 11. Remember to remove the key from the ignition switch.

⚠ CAUTION

POTENTIAL HAZARD
- **Someone could move or attempt to operate the tractor while it is unattended.**

WHAT CAN HAPPEN
- **Children or bystanders may be injured if they use the tractor.**

HOW TO AVOID THE HAZARD
- **Always remove the ignition key and set the parking brake when leaving the machine unattended, even if just for a few minutes.**

Attachment Lift Lever

The attachment lift lever (Fig. 11) is used to raise and lower various attachments.

Raising Attachments

1. Depress the clutch and brake pedals to stop the machine.
2. Pull attachment lift lever rearward until latch locks. In this position the lift will hold the attachment in the up, or raised position.

Lowering Attachments

1. Depress the clutch and brake pedals to stop the machine.
2. Pull attachment lift lever rearward, to release lift pressure, and push the button on top to release the latch. Move lift lever forward to lower attachment.

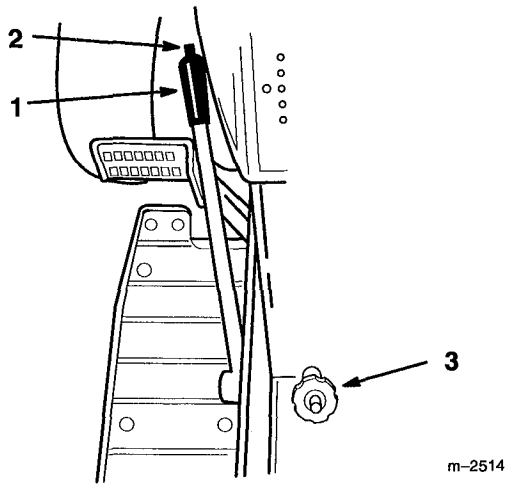


Figure 11

1. Lift lever
2. Button
3. Dial-A-Height

Adjusting Dial-A-Height

The Dial-A-Height control (Fig. 11) is used to limit the downward travel of the attachment. The knob is rotated to change the location of this stop, up or down.

1. Raise the attachment lift lever: Refer to Raising Attachments. In the raised position the Dial-A-Height knob (Fig. 11) can be rotated to change the stop location. Turn right to raise and left to lower the height of the attachment.

Positioning the Seat

The seat can move forward and backward. Position the seat where you have the best control of the machine and are most comfortable.

1. Raise the seat and loosen the adjustment knobs (Fig. 12).
2. Slide the seat to the desired position and tighten the knobs.

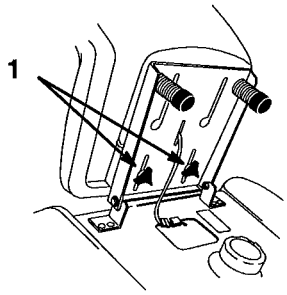


Figure 12

1. Adjustment knob

Lights

The lights are turned on with a switch in the control panel (Fig. 13). The lights are on while the ignition switch is in the "Run" position even with the engine off. Remove the key when the machine is left unattended so lights can not be turned on discharging the battery.

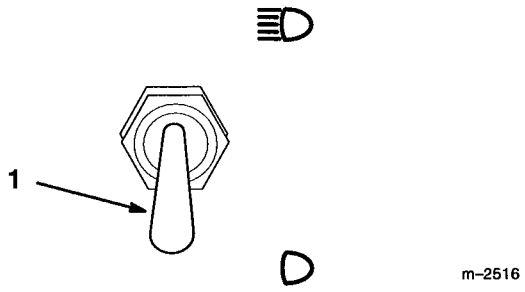


Figure 13

1. Light switch

Installing PTO Belt

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.

2. Remove the belt cover.

3. Remove hairpin cotter and trunnion from power take off PTO engagement plate (Fig. 14).

4. Unlatch and remove clevis pin that secures yoke assembly to clutch shaft and pivot forward to remove from engagement plate (Fig. 14).

5. Install belt from between clutch yoke and engagement plate (Fig. 14).

   Note: Install belt in inside pulley groove for mowers and outside pulley groove for tiller and snowthrower.

6. Assemble yoke and engagement plate and attach clevis pin, trunnion and hairpin cotter to secure (Fig. 14).

7. Install the belt cover.

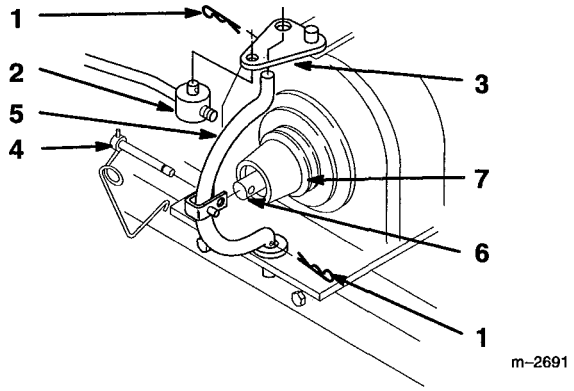


Figure 14

1. Hairpin cotter
2. Trunnion
3. Engagement plate
4. Clevis pin
5. Yoke
6. Clutch shaft
7. Belt groove

Maintenance

Service Interval Chart

Service Operation	Each Use	5 Hours	25 Hours	50 Hours	100 Hours	Storage Service	Spring Service
Oil—check level	X						
Oil—change*			Initial	X			
Oil Filter—change* (100 hours, every other oil change or yearly)			Initial		X	X	
Safety System—check	X						X
Brake—check	X					X	X
Foam Air Cleaner—service*			X			X	
Paper Air Cleaner—replace*					X		
Spark Plug(s)—check 200 hours						X	X
Crankcase Breather–clean					X	X	
Chassis—grease*				X		X	
Belts—check for wear/cracks				X		X	
Gasoline—drain						X	
Engine—clean outside	X		X			X	
Chipped Surfaces—paint						X	
Battery—check electrolyte		X				X	X
Battery—charge, disconnect cables						X	
Fuel Filter—replace					X	X	
PTO Brake–adjust					X	X	
Tires—check pressure			X			X	X
Front Wheels–check toe-in					X	X	
Transaxle Fluid–check level	X					X	X

* More often in dusty, dirty conditions

⚠ CAUTION

POTENTIAL HAZARD

- **If you leave the key in the ignition switch, someone could start the engine.**

WHAT CAN HAPPEN

- **Accidental starting of the engine could seriously injure you or other bystanders.**

HOW TO AVOID THE HAZARD

- **Remove the key from the ignition switch and pull the wire(s) off the spark plug(s) before you do any maintenance. Also push the wire(s) aside so it does not accidentally contact the spark plug(s).**

Air Cleaner

Service Interval/Specification

Foam Element: Clean and re-oil after every 50 operating hours, or once a year, whichever occurs first.

Paper Element: Replace after every 200 operating hours or yearly, whichever occurs first.

Note: Service the air cleaner more frequently (every few hours) if operating conditions are extremely dusty or sandy.

Removing the Foam and Paper Elements

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Open the hood.
3. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Remove the knob and air cleaner cover (Fig. 15).

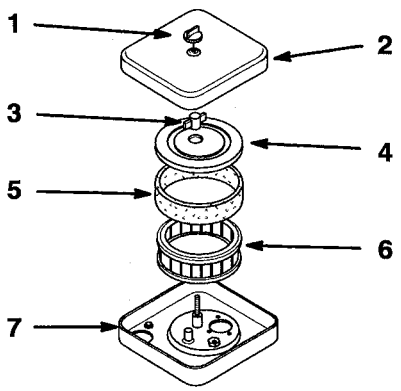


Figure 15

1. Knob
2. Air cleaner cover
3. Wing nut
4. Cover
5. Foam element
6. Paper element
7. Air cleaner base

4. Unscrew the nut and remove the cover, foam element and paper element (Fig. 15).
5. Carefully slide the foam element off the paper element (Fig. 15).

Cleaning the Foam and Paper Elements

1. Foam Element

   A. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.

   B. Dry the element by squeezing it in a clean cloth.

   C. Put one or two ounces of oil on the element (Fig. 16). Squeeze the element to distribute the oil.

IMPORTANT: Replace the foam element if it is torn or worn.

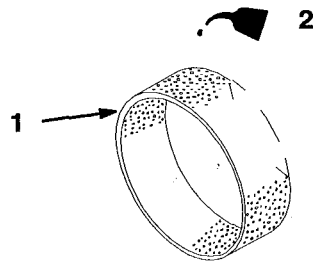


Figure 16

1. Foam element
2. Oil

2. Paper Element

   A. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 17).

   B. Inspect the element for tears, an oily film, and damage to the rubber seal.

IMPORTANT: Never clean the paper element with pressurized air or liquids, such as solvent, gas, or kerosene. Replace the paper element if it is damaged, defective, or cannot be cleaned thoroughly.

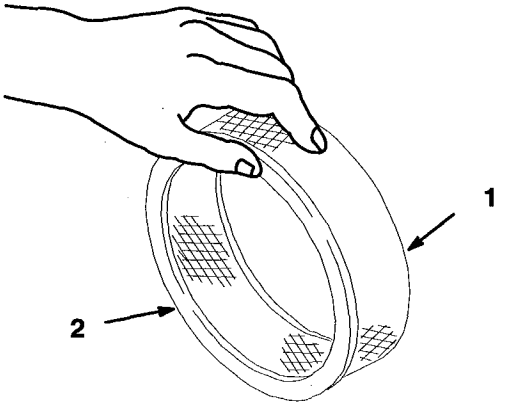


Figure 17

1. Paper element
2. Rubber seal

3. Installing the Foam and Paper Elements

IMPORTANT: To prevent engine damage, always operate the engine with the complete foam and paper air cleaner assembly installed.

1. Carefully slide the foam element onto the paper air cleaner element (Fig. 15).
2. Place the air cleaner assembly into air cleaner base. Slide cover onto rod and secure with nut (Fig. 15).
3. Install the air cleaner cover and secure with wing nut (Fig. 15).
4. Close the hood.

Engine Oil

Service Interval/Specification

Change oil:

- After the first 25 operating hours.
- After every 50 operating hours.

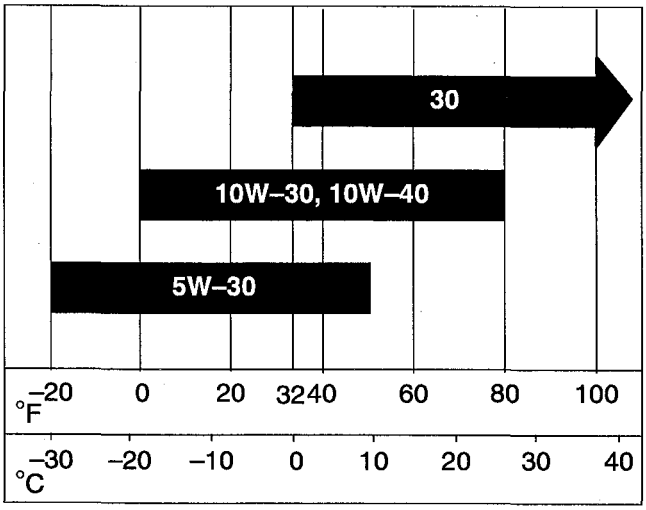
Note: Change oil more frequently when operating conditions are extremely dusty or sandy.

Oil Type: Detergent oil (API service SG, SH, SG/CD, SG/CE, SH/CD or SH/CE)

Crankcase Capacity: w\o filter, 1.5 quarts (1.4 l) with filter, 1.8 quarts (1.7 l)

Viscosity: See table below

USE THESE SAE VISCOSITY OILS



Checking Oil Level

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Open the hood.
3. Clean around the oil dipstick (Fig. 18) so dirt cannot fall into the filler hole and damage the engine.
4. Unscrew the oil dipstick and wipe the metal end clean (Fig. 18).
5. Slide the oil dipstick fully into the filler tube, do not thread onto tube (Fig. 18). Pull the dipstick out and look at the metal end. If oil level is low, slowly pour only enough oil into the filler tube to raise the level to the "FULL" mark.

IMPORTANT: Do not overfill the crankcase with oil because the engine may be damaged.

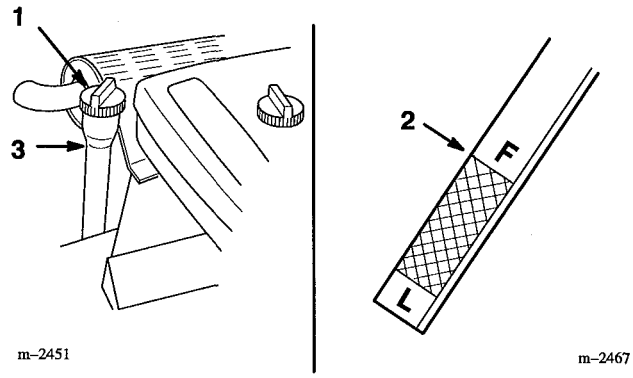


Figure 18

1. Oil dipstick
2. Metal end
3. Filler tube

Changing/Draining Oil

1. Start the engine and let it run five minutes. This warms the oil so it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to assure the oil drains completely. Then disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
3. Open the hood.
4. Place a pan below the oil drain. Open the drain by removing the cap (Fig. 19).
5. When oil has drained completely, close the drain by pushing in and turning clockwise, 1/8 turn.

   Note: Dispose of the used oil at a certified recycling center.

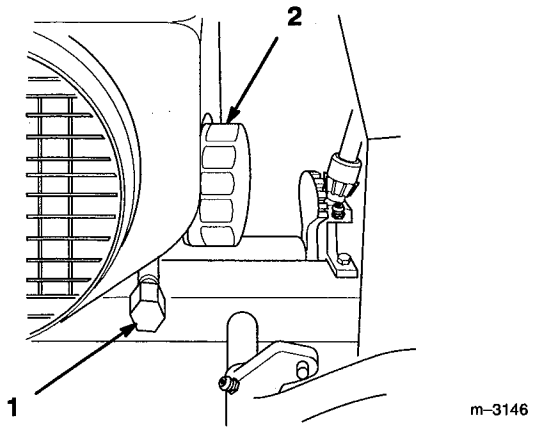


Figure 19

1. Oil drain cap
2. Oil filter

6. Slowly pour approximately 80% of the specified amount of oil into the filler tube (Fig. 18). Now check the oil level; refer to Checking Oil Level, page 24. Slowly add additional oil to bring to "FULL" mark on dipstick.

Change Oil Filter

Service Interval/Specification

Replace the oil filter after the first 25 operating hours then every 100 hours or every other oil change.

Note: Change oil filter more frequently when operating conditions are extremely dusty or sandy.

1. Drain the oil from the engine; refer to Changing/Draining Oil, page 25.
2. Remove the old filter and wipe the filter adapter (Fig. 20) gasket surface.
3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 20).

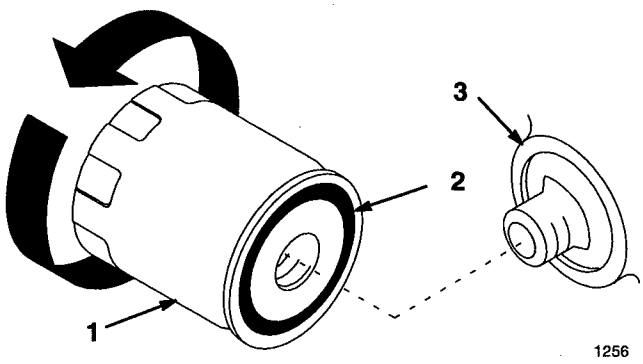


Figure 20

1. Oil filter
2. Gasket
3. Adapter

4. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Fig. 20).
5. Fill the crankcase with the proper type of new oil; refer to Changing/Draining Oil, page 25.

Spark Plug

Service Interval/Specification

Check the spark plug(s) after every 200 operating hours. Make sure the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug(s) and a gapping tool/feeler gauge to check and adjust the air gap.

Type: Champion RS17YX (or equivalent)
Air Gap: 0.025" (.635 mm)

Removing the Spark Plug(s)

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Open the hood.
3. Pull the wire(s) off the spark plug(s) (Fig. 21). Now clean around the spark plug(s) to prevent dirt from falling into the engine and potentially causing damage.
4. Remove the spark plug(s) and metal washer.

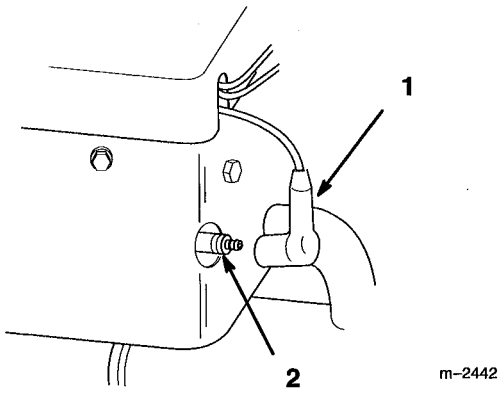


Figure 21

1. Spark plug wire
2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug(s) (Fig. 22). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

   IMPORTANT: Never clean the spark plug(s). Always replace the spark plug(s) when it has: a black coating, worn electrodes, an oily film, or cracks.

2. Check the gap between the center and side electrodes (Fig. 22). Bend the side electrode (Fig. 22) if the gap is not correct.

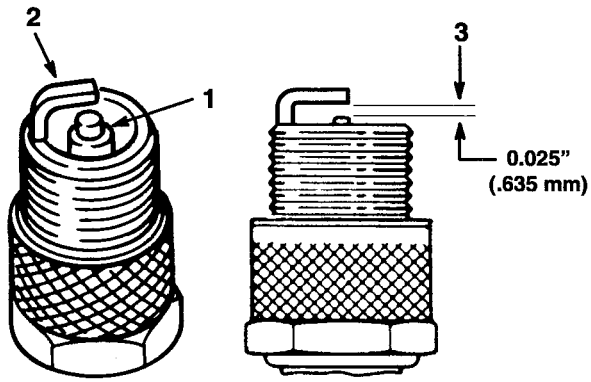


Figure 22

1. Center electrode insulator
2. Side electrode
3. Air gap (not to scale)

Installing the Spark Plug(s)

1. Install the spark plug(s) and metal washer. Make sure the air gap is set correctly.
2. Tighten the spark plug(s) to 11 ft-lb (14 Nm).
3. Push the wire(s) onto the spark plug(s) (Fig. 21).
4. Close the hood.

Engine Breather

Service Interval/Specification

Clean the engine breather after every 200 operating hours or yearly, whichever occurs first.

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Remove the air filter; refer to Remove the Foam and Paper elements page 22.
3. Remove the air filter base mounting bolts and screws. Slide base off breather tube (Fig. 23).

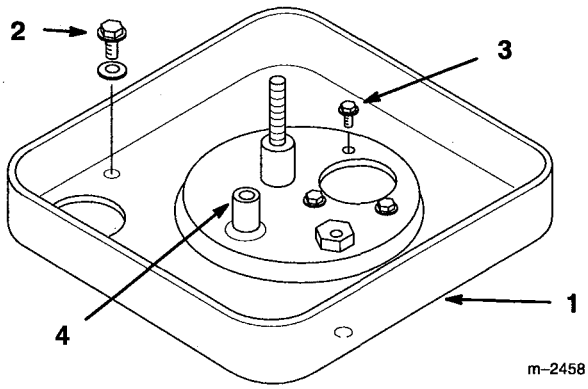


Figure 23

1. Air filter base
2. Bolt and washer
3. Screw
4. Breather tube

4. Open breather clamp and remove screen and element (Fig. 24).
5. Clean screen and element in an approved solvent and dry in a paper towel.
6. Install element and screen and secure breather with clamp (Fig. 24).
7. Install air filter base and assemble air filter (Fig. 23).

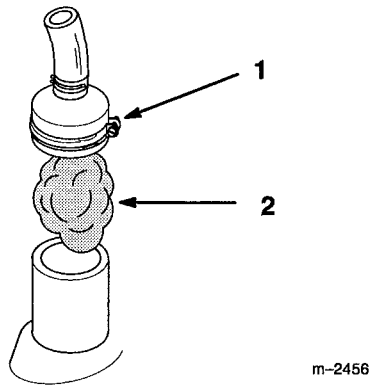


Figure 24

1. Clamp
2. Element

Greasing and Lubrication

Service Interval/Specification

Grease the machine after every 50 operating hours or yearly, whichever occurs first. Grease more frequently when operating conditions are extremely dusty or sandy.

Grease Type: General-purpose grease.

How to Grease

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Clean the grease fittings with a rag. Make sure to scrape any paint off the front of the fitting(s).
3. Connect a grease gun to the fitting. Pump grease into the fittings until grease begins to ooze out of the bearings.
4. Wipe up any excess grease.

Where to Add Grease

1. Lubricate the front wheels, spindles and tie-rod ends until grease begins to ooze out of the bearings (Fig. 25).
2. Lubricate the front axle pivot (Fig. 25).

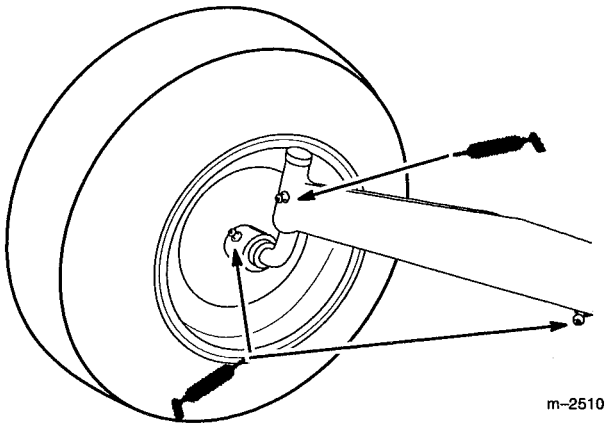


Figure 25

3. Lubricate the brake pedal where it pivots on mounting shaft, steering shaft and spread grease on steering sector teeth (Fig. 26).

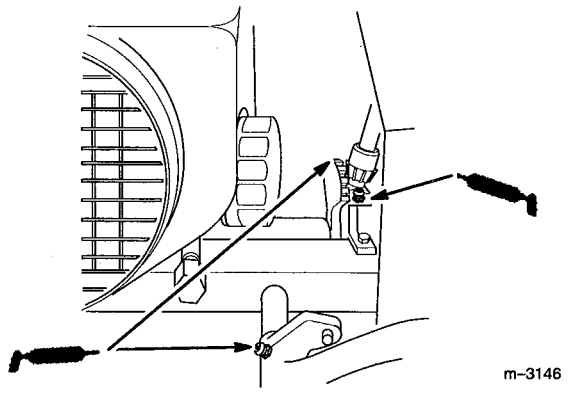


Figure 26

Tire Pressure

Service Interval/Specification

Maintain the air pressure in the front and rear tires as specified. Check the pressure at the valve stem after every 25 operating hours or monthly, whichever occurs first (Fig. 27). Check the tires when they are cold to get the most accurate pressure reading.

Pressure: 12 psi (.85 kPa) front and rear

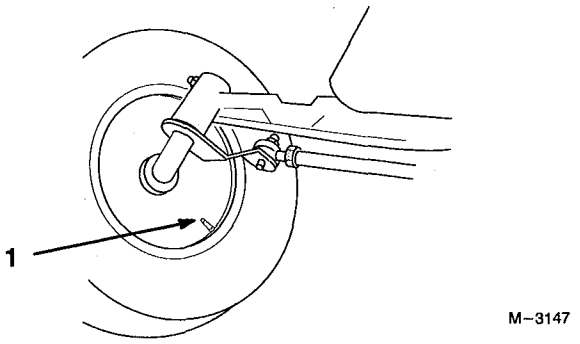


Figure 27

1. Valve stem

Brake

Always set the parking brake when you stop the machine or leave it unattended. If the parking brake does not hold securely, an adjustment is required.

Checking the Brake

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Rear wheels must lock and skid when you try to push the tractor forward. Adjustment is required if the wheels turn and do not lock; refer to Adjusting the Brake, page 30.
3. Release the parking brake and move the the gear shift lever to neutral. Wheels should rotate freely without brake drag.
4. If both conditions are met no adjustment is required.

Adjusting the Brake

The brake adjustment is behind the left side cover (Fig. 28). If the parking brake does not hold securely, an adjustment is required.

1. Check the brake before you adjust it; refer to Checking the Brake, page 29.
2. Set parking brake so latch is in second notch. To do this lift up on parking brake lever and slowly depress brake pedal and feel when latch is in second notch.
3. To adjust the brake tighten adjustment nut until rear wheels skid, then tighten an additional 1/2 turn (Fig. 28).
4. Check the brake operation again; refer to Checking the Brake, page 29.

IMPORTANT: With the parking brake released, the rear wheels must rotate freely when you push the tractor. If brake action and free wheel rotation cannot be achieved contact your service dealer immediately.

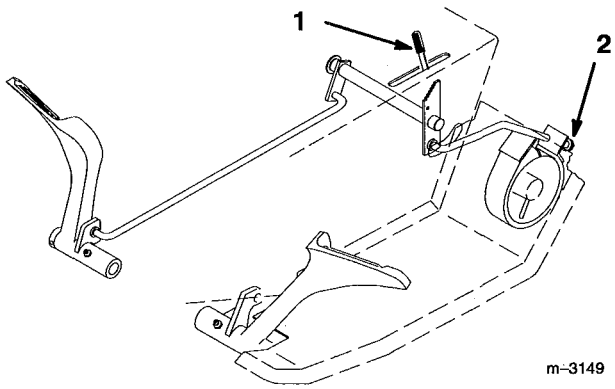


Figure 28

1. Parking brake lever
2. Adjustment nut

PTO (Power Take Off) Clutch and Brake

Service Interval/Specification

Check adjustment of PTO clutch and brake after every 100 operating hours or yearly, whichever occurs first. If attachment drive slippage or slow stopping is noticed adjust clutch and brake.

Adjusting PTO Clutch and Brake

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Remove the belt cover (not shown).
3. To adjust clutch, remove hairpin cotter and thread trunnion onto rod one turn at a time until there is moderate resistance as the clutch engages and clutch slippage is eliminated (Fig. 29).
4. To adjust brake, engage PTO clutch and loosen (2) adjustment nuts (Fig. 29).
5. Place a 0.012 (0.3 mm) feeler gauge between brake pad and clutch pulley. Holding brake pad against feeler gauge tighten adjusting nuts (Fig. 29).
6. Disengage PTO and check if brake pad engages properly to provide braking of PTO pulley.
7. Install the belt cover (not shown).

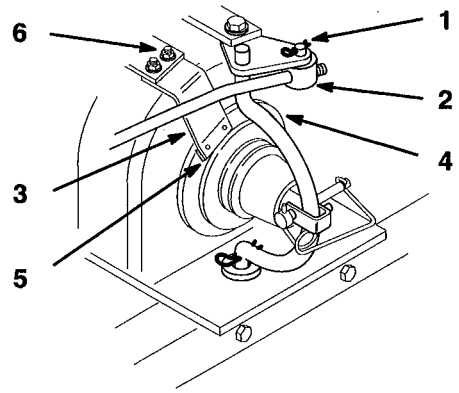


Figure 29

1. Hairpin cotter
2. Trunnion
3. Brake pad
4. Pulley
5. 0.012 (0.3mm) feeler gauge
6. Adjustment nut

Front Wheel Toe-In

Service Interval/Specification

Maintain toe-in of the front wheels as specified. If uneven tire wear, lawn scuffing or hard steering develop adjustment may be required. Check the toe-in after every 100 operating hours or yearly, whichever occurs first (Fig. 30).

Specification: 1/8–1/4 inch toe-in on front wheels.

Measuring Toe-in

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Push front tires out, at front, to remove normal looseness in the linkage.
3. Measure, between the rims, at spindle level, in the front and rear of the wheels (Fig. 30).
4. The front measurement should be less than the rear, as specified.

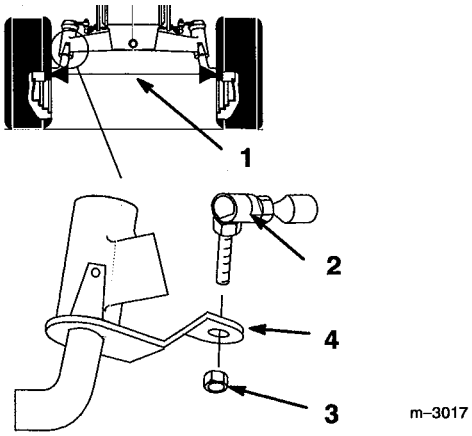


Figure 30

1. Measure here
2. Ball joint flats
3. Jam nut
4. Steering lever

Adjusting Toe-In

1. Check the toe-in before you adjust it; refer to Measuring Toe-In, Page 32.
2. Remove ball joint from one steering lever (Fig. 30).
3. Loosen jam nut securing ball joint to steering rod. Rotate ball joint one turn, clockwise to decrease or counter clockwise to increase toe-in.
4. Install ball joint to steering lever and check the toe-in; refer to Measuring Toe-In, Page 32.

IMPORTANT: If more than one turn is required to meet specifications, alternate between left and right steering rods to maintain steering wheel alignment.

Fuel Tank

Draining The Fuel Tank

⚠ DANGER

POTENTIAL HAZARD
- **In certain conditions gasoline is extremely flammable and highly explosive.**

WHAT CAN HAPPEN
- **A fire or explosion from gasoline can burn you, others, and cause property damage.**

HOW TO AVOID THE HAZARD
- **Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.**
- **Never drain gasoline near an open flame or where gasoline fumes may be ignited by a spark.**
- **Never smoke a cigarette, cigar or pipe.**

1. Park the machine on a level surface, to assure fuel tank drains completely. Then disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.

2. Close fuel shut–off valve at fuel tank (Fig. 31).

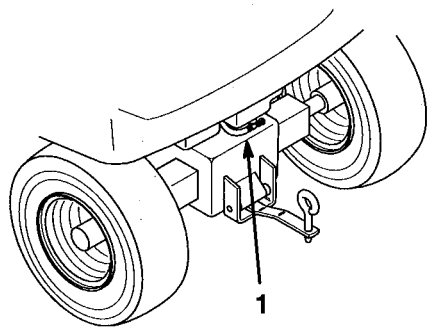


Figure 31

1. Fuel shut-off valve

3. Loosen the hose clamp and slide it up the fuel line away from the fuel shut-off valve (Fig. 32).

4. Pull the fuel line off fuel shut-off valve (Fig. 32). Open fuel shut-off valve and allow gasoline to drain into a gas can or drain pan.

   Note: Now is the best time to install a new fuel filter because the fuel tank is empty.

5. Install the fuel line onto the fuel shut-off valve. Slide the hose clamp close to the fuel shut-off valve to secure the fuel line (Fig. 32).

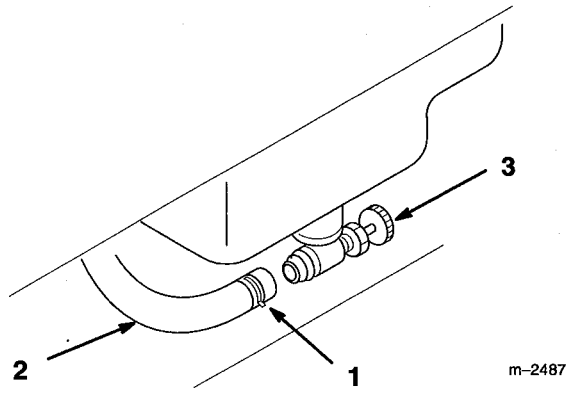


Figure 32

1. Hose clamp
2. Fuel line
3. Fuel shut-off valve

Fuel Filter

Service Interval/Specification

Replace the fuel filter after every 100 operating hours or yearly, whichever occurs first.

Replacing the Fuel Filter

Never install a dirty filter if it is removed from the fuel line.

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Close fuel shut–off valve at fuel tank (Fig. 31).
3. Open the hood.
4. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 33).
5. Remove the filter from the fuel lines.

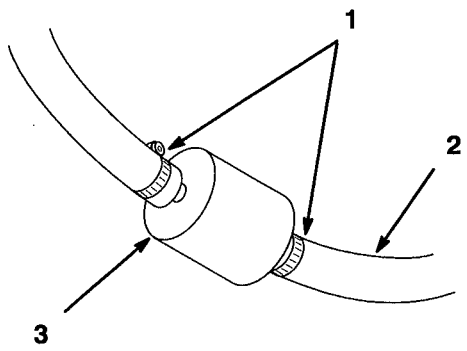


Figure 33

1. Hose clamp
2. Fuel line
3. Filter

6. Install a new filter and move the hose clamps close to the filter.
7. Open fuel shut-off valve at fuel tank (Fig. 31).
8. Close the hood.

Transaxle Fluid

Service Interval/Specification

Check fluid level before every use. Always keep the fluid level at the full level when the transaxle is cold.

Fluid Type: SAE 90 gear lube (API service QL-5)

Capacity: 2 quarts (1.9 l)

Checking Fluid Level

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Tilt the seat up.
3. Clean around the transaxle dipstick (Fig. 34) so dirt cannot fall into the filler hole and damage the transaxle.

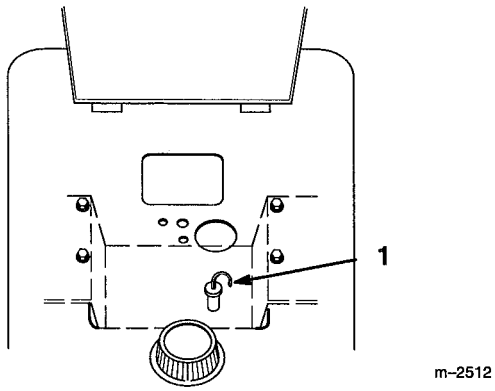


Figure 34

1. Transaxle dipstick

4. Pull out the dipstick and wipe the metal end clean (Fig. 34).

5. Slide the dipstick fully into the filler tube (Fig. 34). Pull the dipstick out and look at the metal end. When transaxle is cold oil should be at the "Full" line on the dipstick (Fig. 34).

6. If oil level is low, slowly pour only enough oil into the filler tube to raise the level to the "FULL" mark.

IMPORTANT: Do not fill above the "Full" line as fluid may overflow.

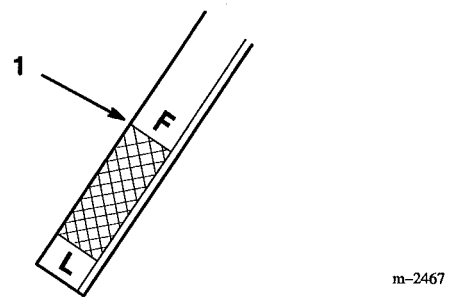


Figure 35

1. Full cold level

Headlights

Removing the Bulb

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.

2. Open the hood. Pull wire connectors off light terminals.

3. Remove screw securing retainer bracket (Fig. 36).

4. Lift and twist bulb out of pocket (Fig. 36).

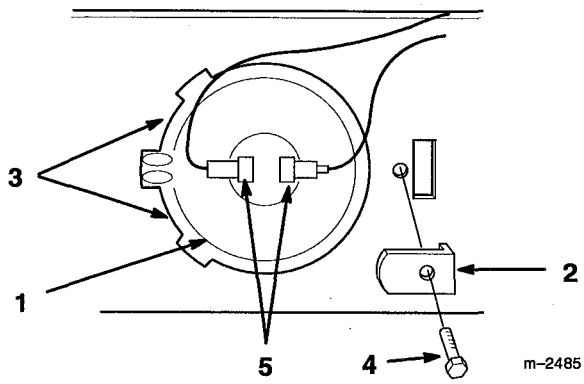


Figure 36

1. Bulb
2. Retainer bracket
3. Tabs
4. Screw
5. Terminals

Installing the Bulb

1. Locate index boss horizontal and twist bulb under tabs on left side of pocket (Fig. 36).

2. Hold bulb in socket with retainer bracket and secure with screw (Fig. 36).

3. Push wire connectors onto bulb terminals (Fig. 36).

Taillights

Removing the Bulb

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Inserting a screwdriver into slot and twist to remove lens (Fig. 37).
3. Pull bulb out of socket

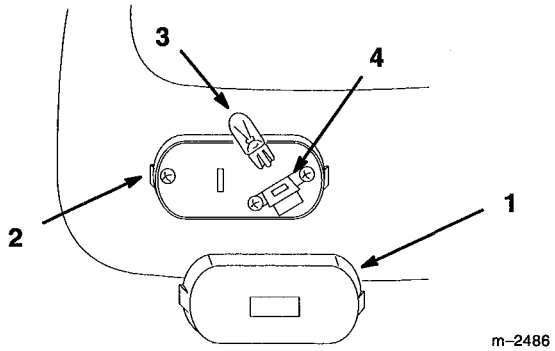


Figure 37

1. Lens
2. Slot
3. Bulb
4. Socket

Installing the Bulb

1. Align the bulb base with socket and push into position (Fig. 37).
2. Align and snap the lens onto the base (Fig. 37).

Battery

Service Interval/Specification

Check the electrolyte level in the battery every five hours. Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of four parts water and one part baking soda. Apply a light coating of grease to the battery terminals to prevent corrosion.

Voltage: 12 v, 380 Cold Cranking Amps

Removing the Battery

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Open the hood.
3. Disconnect the negative (black) ground cable from the battery post (Fig. 38).
4. Lift the rubber cover up on the positive cable. Disconnect the positive cable (red cover) from the battery post (Fig. 38).
5. Remove the battery hold down rods (Fig. 38). Lift battery from tractor

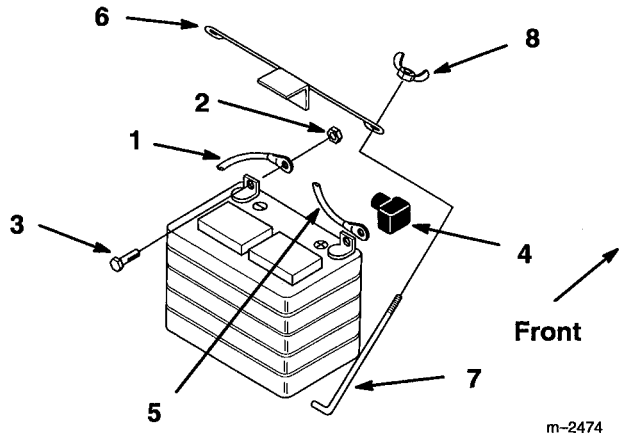


Figure 38

1. Negative cable (black)
2. Nut
3. Bolt
4. Rubber cover
5. Positive cable (red cover)
6. Battery clamp
7. Hold down rod
8. Wing nut

Installing the Battery

6. Install the battery into the chassis (Fig. 38).
7. Secure battery in chassis with hold down rods and wing nuts (Fig. 38).
8. Using the bolt and locknut, connect the positive (red cover) cable to the positive (+) battery post (Fig. 38). Slide the rubber cover over the battery post.
9. Using the bolt and nut, connect the negative (black) cable to the negative (–) battery post (Fig. 38).

Checking Electrolyte Level

1. With the engine off, open the hood to see the battery.
2. Open covers to see into the cells. The electrolyte must be up to the lower part of the tube (Fig. 39). Do not allow the electrolyte to get below the plates. (Fig. 39).
3. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery, page 38.

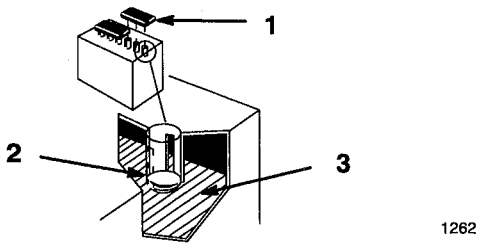


Figure 39

1. Filler caps
2. Lower part of tube
3. Plates

Adding Water to the Battery

The best time to add distilled water to the battery is just before you operate the machine. This lets the water mix thoroughly with the electrolyte solution.

1. Clean the top of the battery with a paper towel.
2. Lift off the filler caps (Fig. 39).
3. Slowly pour distilled water into each battery cell until the level is up to the lower part of the tube (Fig. 39).

   IMPORTANT: Do not overfill the battery because electrolyte (sulfuric acid) can cause severe corrosion and damage to the chassis.

4. Press the filler caps onto the battery.

Charging the Battery

IMPORTANT: Always keep the battery fully charged (1.260 specific gravity). This is especially important to prevent battery damage when the temperature is below 32°F (0°C).

1. Remove the battery from the chassis; refer to Removing the Battery, page 37.
2. Check the electrolyte level; refer to Checking Electrolyte Level, page 38, steps 2–3.
3. Remove the filler caps from the battery and connect a 3 to 4 amp battery charger to the battery posts. Charge the battery at a rate of 4 amperes or less for 4 hours (12 volts). Do not overcharge the battery. Install the filler caps after the battery is fully charged.

⚠ WARNING

POTENTIAL HAZARD
- **Charging the battery produces gasses.**

WHAT CAN HAPPEN
- **Battery gasses can explode.**

HOW TO AVOID THE HAZARD
- **Keep cigarettes, sparks and flames away from battery.**

4. Install the battery in the chassis; refer to Installing the Battery, page 37.

Fuse

Service Interval/Specification

The electrical system is protected by fuses. It requires no maintenance, however, if a fuse blows check component/circuit for malfunction or short. To replace fuses pull up on the fuse (Fig. 40) to remove or replace it.

Fuse: Charging circuit F3–30 amp, blade-type
Main F4–25 amp, blade-type
Lights F2–15 amp, blade-type

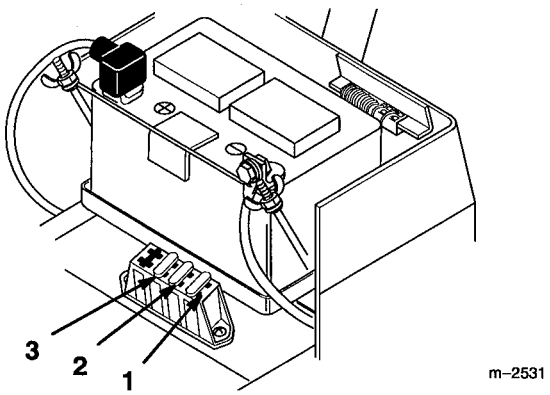
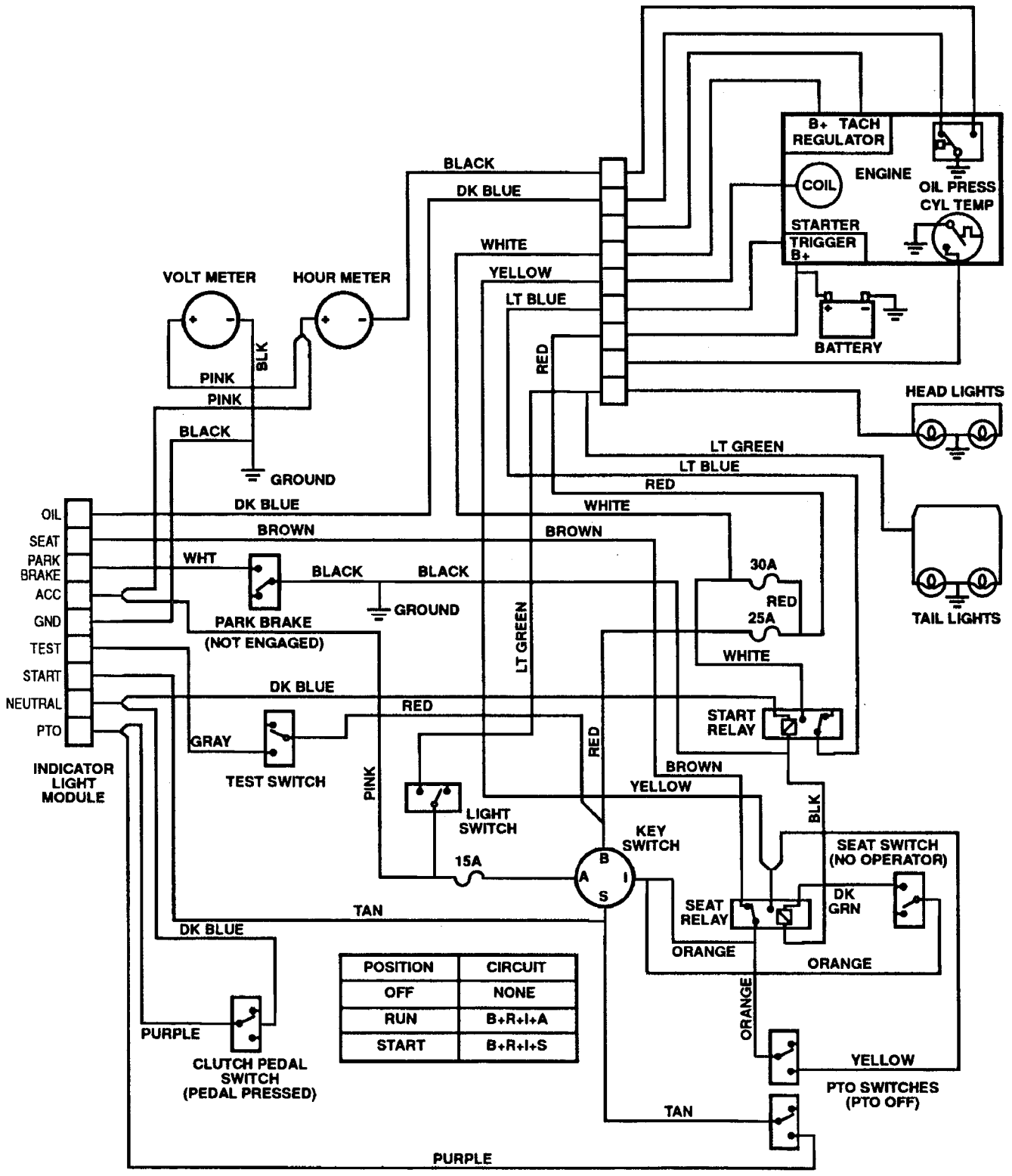


Figure 40

1. Charging circuit-30 amp
2. Main-25 amp
3. Lights-15 amp

Wiring Diagram



Cleaning and Storage

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.

2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine's cylinder head fins and blower housing.

   IMPORTANT: You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the control panel, lights, engine, and the battery.

3. Check the brake; refer to Brake, page 29.

4. Service the air cleaner; refer to Air Cleaner, page 22.

5. Grease the chassis; refer to Greasing and Lubrication, page 28.

6. Change the crankcase oil; refer to Engine Oil, page 25.

7. Remove the spark plug(s) and check its condition; refer to Spark Plug, page 26. With the spark plug(s) removed from the engine, pour two tablespoons of engine oil into the spark plug hole. Now use the electric starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug(s) and tighten it to 15 ft–lb (20.4 Nm). Do not install the wire on the spark plug(s).

8. Remove the battery from the chassis, check the electrolyte level, and charge it fully; refer to Battery, page 37. Do not connect the battery cables to the battery posts during storage.

   IMPORTANT: The battery must be fully charged to prevent it from freezing and being damaged at temperatures below 32°F (0°C). A fully charged battery maintains its charge for about 50 days at temperatures lower than 40°F (4°C). If the temperatures will be above 40°F (4°C), check the water level in the battery and charge it every 30 days.

9. Check the tire pressure; refer to Tire Pressure, page 29.

10. For long-term storage (more than 90 days) add stabilizer/conditioner additive to fuel in the tank (1 oz. per gallon).

    A. Run engine to distribute conditioned fuel through the fuel system (5 minutes).

    B. Stop engine, allow to cool and drain the fuel tank; refer to Fuel Tank, page 33, or operate engine until it stops.

    C. Restart engine and run until it stops. Repeat, on "CHOKE" until engine will not restart.

    D. Dispose of fuel properly. Recycle as per local codes.

    Note: Do not store stabilizer/conditioned gasoline over 90 days.

11. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.

12. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.

13. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it in a memorable place. Cover the machine to protect it and keep it clean.

Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Starter does not crank	1. Blade control (PTO) is ENGAGED.	1. Move blade control (PTO) to DISENGAGED.
	2. Parking brake is not on.	2. Set parking brake.
	3. Operator is not seated.	3. Sit on the seat.
	4. Speed selector not in "N" neutral.	4. Move speed selector to "N" neutral.
	5. Battery is dead.	5. Charge the battery.
	6. Electrical connections are corroded or loose.	6. Check electrical connections for good contact.
	7. Fuse is blown.	7. Replace fuse.
	8. Relay or switch is defective.	8. Contact Authorized Service Dealer.
Engine will not start, starts hard, or fails to keep running.	1. Fuel tank is empty.	1. Fill fuel tank with gasoline.
	2. Choke is not ON.	2. Move choke lever to ON.
	3. Air cleaner is dirty.	3. Clean or replace air cleaner element.
	4. Spark plug wire is loose or disconnected.	4. Install wire on spark plug.
	5. Spark plug is pitted, fouled, or gap is incorrect.	5. Install new, correctly gapped spark plug.
	6. Dirt in fuel filter.	6. Replace fuel filter.
	7. Dirt, water, or stale fuel is in fuel system.	7. Contact Authorized Service Dealer.
Engine loses power.	1. Engine load is excessive.	1. Shift into lower gear to reduce ground speed.
	2. Air cleaner is dirty.	2. Clean air cleaner element.
	3. Oil level in crankcase is low.	3. Add oil to crankcase.
	4. Cooling fins and air passages under engine blower housing are plugged.	4. Remove obstruction from cooling fins and air passages.
	5. Spark plug is pitted, fouled, or gap is incorrect.	5. Install new, correctly gapped spark plug.
	6. Vent hole in fuel cap is plugged.	6. Clean or replace the fuel cap.
	7. Dirt in fuel filter.	7. Replace fuel filter.
	8. Dirt, water, or stale fuel is in fuel system.	8. Contact Authorized Service Dealer.

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Engine overheats.	1. Engine load is excessive. 2. Oil level in crankcase is low. 3. Cooling fins and air passages under engine blower housing are plugged.	1. Shift into lower gear to reduce ground speed. 2. Add oil to crankcase. 3. Remove obstruction from cooling fins and air passages.
Abnormal vibration.	1. Engine mounting bolts are loose. 2. Loose engine pulley, idler pulley, or blade pulley. 3. Engine pulley is damaged.	1. Tighten engine mounting bolts. 2. Tighten the appropriate pulley. 3. Contact Authorized Service Dealer.
Machine does not drive.	1. Traction belt is worn, loose or broken. 2. Traction belt is off pulley. 3. Transmission does not shift.	1. Contact Authorized Service Dealer. 2. Contact Authorized Service Dealer. 3. Contact Authorized Service Dealer.

PROTOTYPE

PROTOTYPE



PROTOTYPE