FORM NO. 3311-473 Rev. C

TORO®

21" H.P. MODEL 16880-0000001 & UP
21" S.P. MODEL 16890-0000001 & UP

OPERATOR'S MANUAL

21" (0.53 m) HAND PROPELLED REAR BAGGER
21" (0.53 m) SELF PROPELLED REAR BAGGER

The REAR BAGGER meets or exceeds the Outdoor Power Equipment Institutes safety standards for rotary mowers; thus, Toro proudly displays the OPEI safety seal.

MODEL CERTIFIED BY INDEPENDENT LABORATORY
OPEI
ANSI B71.1b-1977 SAFETY STANDARD

To assure maximum safety, optimum performance, and to gain knowledge of the mower, it is essential that you or any other operator of the mower read and understand the contents of this manual before the engine is started. Pay particular attension to the instructions highlighted by the safety alert symbol. Failure to comply with the safety instructions may result in personal injury.

BEST COPY AVAILABLE



FOREWORD

The REAR BAGGER with vacuum action housing provides a new degree of mowing efficiency and convenience. If the mower is set up, operated and maintained properly, it will give long, dependable service.

To familiarize yourself with safety, set-up, operating and maintenance instructions, read this manual thoroughly. The major sections of this manual are:

1. Safety Instructions
2. Set-up Instructions
3. Before Operating
4. Controls
5. Operating Instructions
6. Maintenance

Safety, mechanical, and some general information in this manual is emphasized. DANGER, WARNING, and CAUTION identify the safety messages. Whenever the safety alert symbol appears, it is followed by a safety message that must be read and understood. IMPORTANT identifies special mechanical information and NOTE identifies general information worthy of special attention.

OPTIONAL SPARK ARRESTER

In some areas there are local, state or federal regulations requiring that a spark arrester be used on the engine of this mower. If a spark arrester is required, order the following parts from your local Authorized Briggs & Stratton Service Dealer:

1 - 392188 Spark Arrester Assembly

These parts are approved by the United States Department of Agriculture and forestry. The approval number for the exhaust system is 391911.

When mower is used or operated on any California forest, brush or grass covered land, a working order spark arrester must be attached to muffler. If not, the operator is violating state law, Section 4442 Public Resources Code.

If help – concerning safety, set-up, operation and maintenance – is ever needed, contact the local Authorized TORO Service Dealer or Distributor. Refer to the "YELLOW PAGES" for assistance. In addition to skilled service technicians, the dealer and distributor have other TORO Products, as well as factory approved accessories and replacement parts. Keep your TORO all TORO. Buy genuine TORO replacement parts and accessories.

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The Toro Company – 1979, Rev. 1981
MINNEAPOLIS, MN 55420 – U.S.A.

SAFETY INSTRUCTIONS

The REAR BAGGER was tested and certified by an independent laboratory for compliance with the B71.1b 1977 specifications of the American National Standards Institute. However, improper use or maintenance by the operator or owner of the mower can still result in injury. To reduce the potential for any injury, comply with the following safety instructions.

BEFORE OPERATING

1. Operate the mower only after reading this manual. A replacement manual is available by sending complete model and serial number to: The Toro Company, 8111 Lyndale Avenue South, Minneapolis, Minnesota 55420; Attn: Publications.

2. Never allow children to operate the mower or adults to operate it without proper instructions.

3. Become familiar with the controls and know how to stop the engine quickly.

4. Keep everyone, especially children and pets, away from the area of operation. Remove sticks, stones, wire and any other debris that might be picked up and thrown by the blade.

5. Keep all shields and safety devices in place. Before operating mower, check it for damage and abnormal wear. If a shield, safety device or decal is defective or damaged, repair or replace it before operation is commenced.

6. Wear long pants and substantial shoes. Do not operate mower while wearing sandals, tennis shoes, sneakers or shorts. Do not wear loose fitting clothing that could get caught in moving parts.

7. If long grass will be cut, set height-of-cut in highest position. After mowing, reinspect the area and remove all debris. Then lower the height-of-cut and mow grass again.

8. Gasoline is highly flammable; handle it carefully.

   A. Use an approved gasoline container.

   B. Do not fill fuel tank when engine is hot or running.

   C. Do not smoke while handling gasoline.

   D. Fill fuel tank outdoors and up to about one-half inch (13 mm) from the top of the tank, not the filler neck.

   E. Wipe up any spilled gasoline.

WHILE OPERATING

9. Cutting grass with a rotary mower demands attention. Always maintain secure footing, balance and control.

10. Cut grass during the daytime or when there is adequate artificial light. Cut grass slopes from side to side. Avoid slopes when grass is wet. If possible, mow when grass is dry for best results.

11. Keep face, hands and feet away from the mower housing and cutter blade when the engine is running. Stay behind the handle until the engine stops.

12. When operating mower, the complete bag assembly must be installed. Whenever the bag assembly is removed the engine must be shut off.

13. If the discharge opening is clogged, shut engine off and wait for all moving parts to stop. Disconnect high tension wire from the spark plug and clear the obstruction with a stick.

14. If a solid object is hit by the blade or if mower vibrates abnormally, stop the engine and disconnect high tension wire from the spark plug. Slide end of wire into V-shaped notch to prevent possibility of accidental starting. Then check mower for possible damage, bent blade, an obstruction or loose parts. Repair the mower before using it again.

15. Stop the engine before adjusting the height-of-cut.

16. If a gravel driveway, road or side walk must be crossed, stop the engine so loose sand and rocks are not thrown.

17. Before leaving the operator's position — behind the handle — stop the engine and wait for all moving parts to stop. Do not walk in front of the mower while the engine is running. Disconnect high tension wire from spark plug if mower will be unattended.

18. Do not touch any part of the engine while it is running or shortly after it has been stopped because the engine will be hot enough to cause a burn.

19. Before the mower is serviced or adjusted, stop the engine and disconnect high tension wire from spark plug. Slide end of high tension wire onto V-shaped notch above spark plug to prevent the possibility of accidental starting.

SAFETY INSTRUCTIONS

MAINTENANCE

20. To assure the mower is in safe operating condition, frequently check, and keep all nuts, bolts and screws tight. Assure blade bolt is tightened to 50 ft-lb (68 N·m) and engine mounting bolts are tightened to 20 ft-lb (27.2 N·m).

21. Perform only those maintenance instructions described in this manual. If major repairs are ever needed or if assistance is desired, contact an Authorized TORO Service Dealer.

22. If mower must be tipped when it is serviced or adjusted, drain gasoline from the fuel tank.

23. If a guard, safety device or safety decal is damaged, replace the defective part(s) before operating the mower.

24. To reduce potential fire hazards, assure mower is free of excessive grease, grass, leaves and accumulations of dirt.

25. The grass bag must always be in good condition; therefore, check it before each use to assure the bag is not torn or deteriorated. Replace a defective grass bag with a genuine TORO bag.

26. Allow engine to cool before storing mower in any enclosure such as a garage or storage shed. Do not store mower near any open flame or where gasoline fumes may be ignited by a spark.

27. Do not overspeed the engine by changing governor settings. Recommended speed of the engine is 2800 rpm. To assure safety and accuracy, have an Authorized TORO Service Dealer check engine speed, 2800 rpm, with a tachometer.

28. At the time of manufacture the mower conformed to the safety standards in effect for rotary mowers. To assure optimum performance and continued safety certification of the mower, use genuine TORO replacement parts and accessories. Replacement parts and accessories made by other manufacturers may result in non-conformance with the safety standards, and that could be dangerous.

SAFETY DECALS

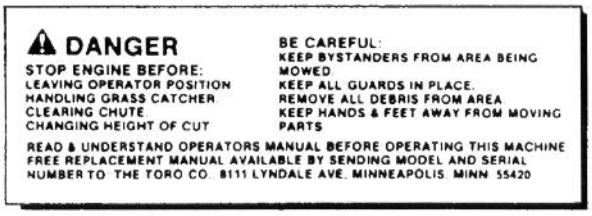
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged.

ON REAR DOOR

⚠ CAUTION BAG MUST BE IN PLACE WHEN OPERATING. STOP ENGINE BEFORE RAISING THIS DOOR OR CHANGING BAG ASSEMBLY.

(Part No. 39-9090)

ON HANDLE



(Part No. 29-6290)

ON REAR DOOR



(Part No. 39-5770)

ON HOUSING



(Part No. 36-2820)

SPECIFICATIONS

Briggs & Stratton Engine: Recoil equipped, four cycle engine, model 92908, type 1964-01 is used. The air cooled engine has an output of 3.5 hp (2.6 kw) @ 3600 rpm and 5.0 ft-lb (6.8 N·m) of torque @ 2800 rpm. Displacement of engine is 9.02 cubic inches (148 cc). Crankcase capacity is approximately 20 ounces (0.59 l) of oil.

Fuel Tank: Capacity of fuel tank is 1 quart (0.946 l).

Mower Housing: 14 gauge stamped steel housing with vacuum action, rear discharge, and symmetrical wheel locations.

Cutter Blade: Blade is 21" (0.53 m) long and heat treated for hardness.

Blade Tip Speed: The 21" (0.53 m) REAR BAGGER has tip speed of 16,493 ft/min (83 784 m/s) @ 3,000 rpm.

Throttle Control: Control is mounted on top left side of upper handle. Hand operated control connects to and operates the carburetor. Control has two positions: STOP and RUN.

Traction Control (Model 16890 Only): Hand operated, squeeze-grip lever on upper handle connects to and rotates gear case on drive shaft to tighten belt. Control has two positions: ENGAGE and DISENGAGE. The rear wheel drive has special 3L section V-belt that connects gear box to an output shaft on the engine. Engine to gear box reduction is 1.12:1.

Gear Case (Model 16890 Only): Case is die cast aluminum.

Wheels: Wheels are made of high density, linear polyethylene with oil impregnated, powdered metal bushings.

Tires: 8" x 1.75" (203 x 44 mm) semi-pneumatic front and rear tires with diamond tread.

Handles: Two handles are 7/8 inch (22 mm) diameter welded steel tubing with chrome plating. Handle is adjustable to one of two operating positions.

Height-of-Cut: Height-of-cut is adjustable to one of six approximate settings: 1 inch, 1-1/2 inches, 2 inches, 2-1/2 inches, 3 inches and 3-1/2 inches (25, 38, 51, 64, 76 and 89 mm).

Approximate Dimensions:

Overall width is 21-7/8 inches (0.56 m).

Overall length w/o handle and wheels set at 2 inches (51 mm) is 35-1/2 inches (0.902 m).

Height w/o handle is 14-1/2 inches (0.368 m).

Approximate Weight: Dry weight of model 16880 is 75 lb (334 N). Model 16890 is 82 lb (365 N).

LOOSE PARTS

PART	QTY.	WHERE USED
Operator's Manual	1	Read manual before operating mower.
Registration Card	1	Fill out card and send it to The Toro Company.
Lower Handle	1	Install lower handle, page 6.
Carriage Bolts	2	
Handle Knobs	2	
Cable Clip	1	
Upper Handle	1	Install upper handle, page 6.
Curved Head Bolt	2	
Locknuts 5/16 NC	2	
Control Rod Assembly	1	Install control rod assembly, page 6 (Model 16890 only).
Washers 5/16	1	
Cotter Pin 1/2" Large	2	
Stud-Handle	1	Assemble bag, page 7.
Locknuts 5/16 NC	2	
Capscrew	1	
Washers #10	2	
Bag Frame	1	
Baffle	1	
Grass Bag	1	
Cotter Pin 3/4" Large	2	
Bag Handle	1	
Retainer - Bag	1	
Hex Machine Screw #10	4	
Locknut #10	4	

SET-UP INSTRUCTIONS

ASSEMBLE AND ADJUST HANDLE

1. Remove from carton.

2. Spread lower handle and slide handle pins into mounting holes in sideplates (Fig. 1).

3. Secure handle to sideplates with carriage bolts and handle knobs. Knobs must be installed on outside of handle (Fig. 1).

Note: Handle height may be adjusted by moving handle pin to upper or lower mounting hole.

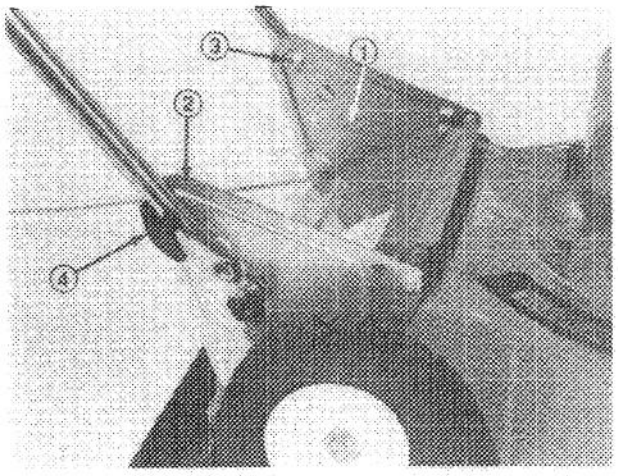


Figure 1

1. *Handle pins in mounting hole*
2. *Side plate*
3. *Carriage bolt*
4. *Handle knob*

4. Slide upper handle onto lower handle, line up mounting holes and secure with curved-head handle bolts and nuts. Nuts must be installed on outside of handle (Fig. 2).

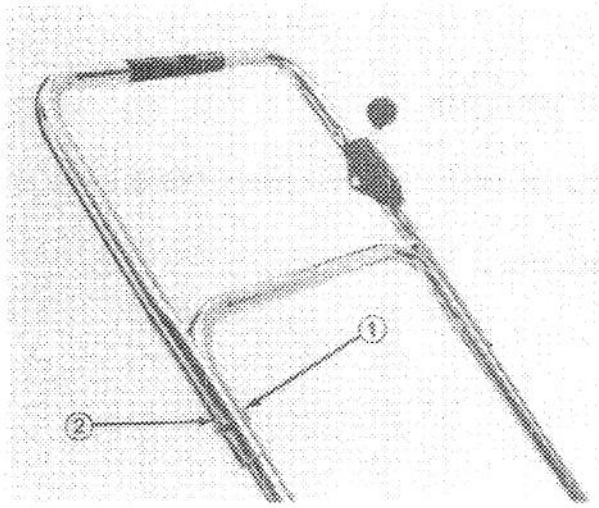


Figure 2

1. *Curved Head bolt*
2. *Nut*

INSTALL CONTROL ROD ASSEMBLY – (MODEL 16890)

1. Install long rod end of control rod to control pivot on mower and secure with 5/16 washer and 1/2" lg. cotter pin (Fig. 3).

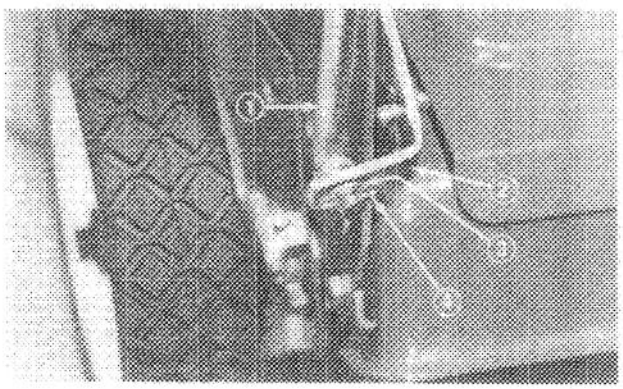


Figure 3

1. *Long rod*
2. *Control pivot*
3. *Washer*
4. *Cotter pin*

2. Insert end of short control rod into lower hole in traction control lever and secure with 1/2" lg. cotter pin (Fig. 4).

3. Activate traction control lever by squeezing toward handle. The control should be adjusted to touch the handle when activated and to provide enough traction.

4. If adjustment is necessary; refer to Adjusting Drive Belt, page 18.

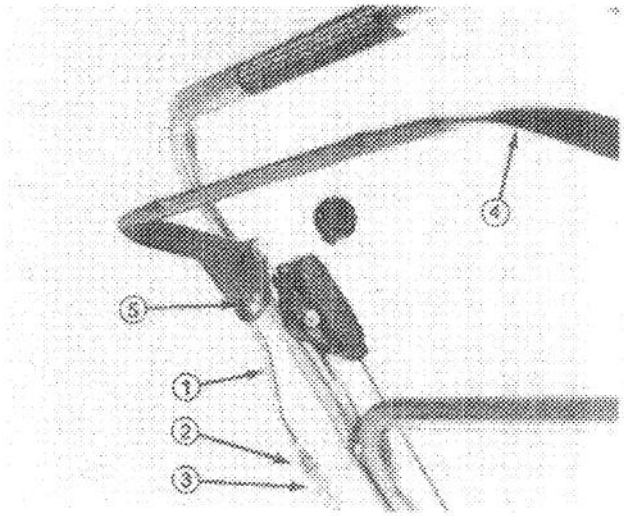


Figure 4

1. *Short rod*
2. *Locknut*
3. *Sleeve*
4. *Traction control*
5. *Cotter pin*

SET-UP INSTRUCTIONS

ASSEMBLE BAG

1. Mount baffle and bag handle to bag shell (Fig. 5).

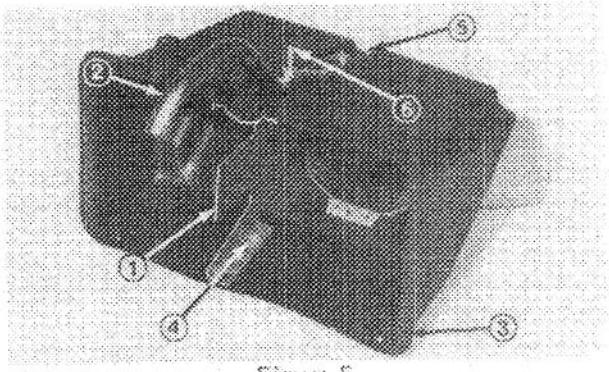


Figure 5

1. *Baffle*
2. *Bag handle*
3. *Bag shell*
4. *#10 hex-machine screw and locknut*
5. *Capscrew and locknut (locknut inside)*
6. *Handle stud and locknut*

2. Slide left end of bag frame through right side of bag seam (Fig. 6). Bag cover must be above frame and bends in frame must be up.

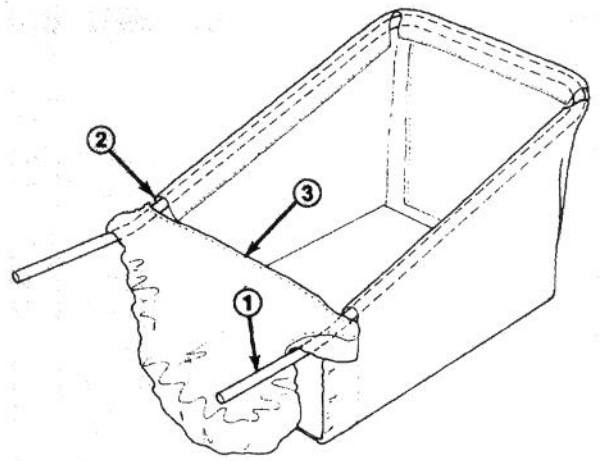


Figure 6

1. *Left end of bag frame*
2. *Right side of bag seam*
3. *Bag cover*

3. Secure bag frame and bag to bag shell with (2) 3/4" lg. cotter pins (Fig. 7).

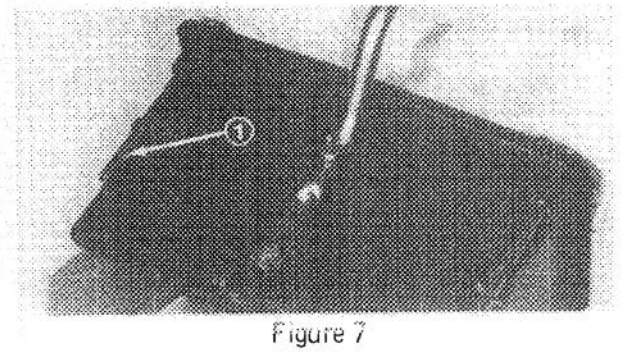


Figure 7

1. *Cotter pin*

4. Wrap front of bag around bag shell and secure bottom with bag retainer (Fig. 8).

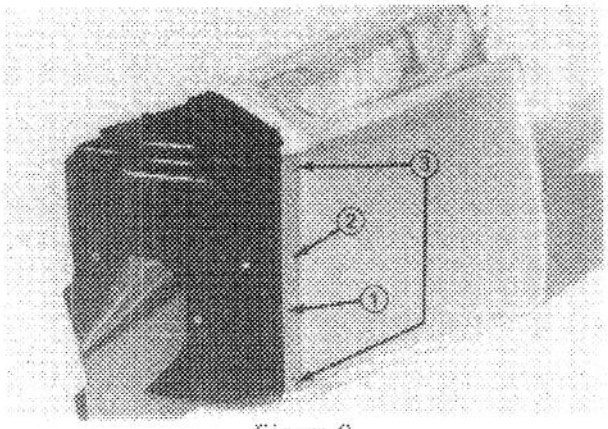


Figure 8

1. *Bag retainer*
2. *#10 hex machine screw and #10 locknut*
3. *#10 hex machine screw, #10 washer and #10 locknut (washer inside)*

5. Pull bag cover over bag frame for operation (Fig. 9).

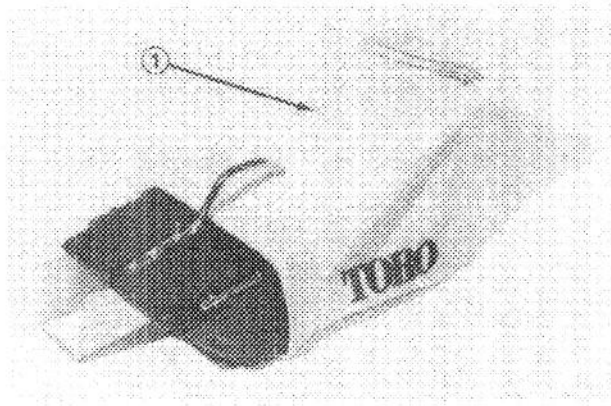


Figure 9

1. *Bag Cover*

6. To install bag to mower, raise rear door, slide bag assembly into housing opening, and lower rear door guiding handle stud through hole in door (Fig. 10).

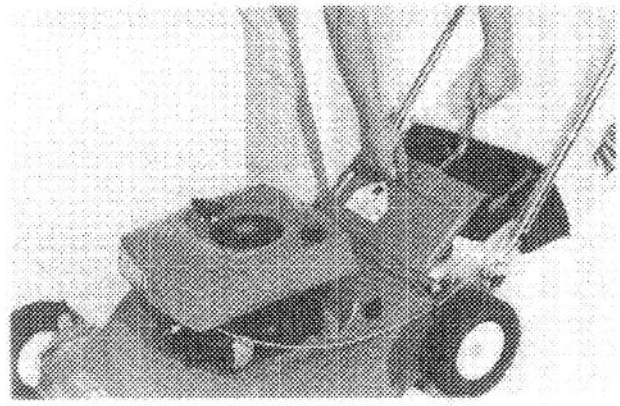


Figure 10

BEFORE OPERATING

FILL CRANKCASE WITH OIL

The engine does not have oil in the crankcase when it is shipped from the factory. If engine is started before oil is added to the crankcase, engine damage will result. Therefore, before engine is started for the first time:

1. Position mower on level surface.

2. Clean area around dipstick to prevent foreign matter from entering filler hole when dipstick is removed.

3. Remove dipstick from crankcase (Fig. 11).

4. Slowly pour approximately 20 ounces (0.59 l) of oil into the filler hole until oil is up to FULL mark on dipstick (Fig. 11).

Note: Dipstick must be fully installed to assure accurate gauging of oil level. DO NOT OVERFILL.

The engine uses any high quality detergent oil having the American Petroleum Institute – API – "Service classification" MS, SC, SD or SE. The recommended weight oil to use is:

A. Above +40F (4°C) – Use SAE 10W-30 or 10W-40 oil.

B. Below +40F (4°C) – Use SAE 5W-20 or 5W-30 oil.

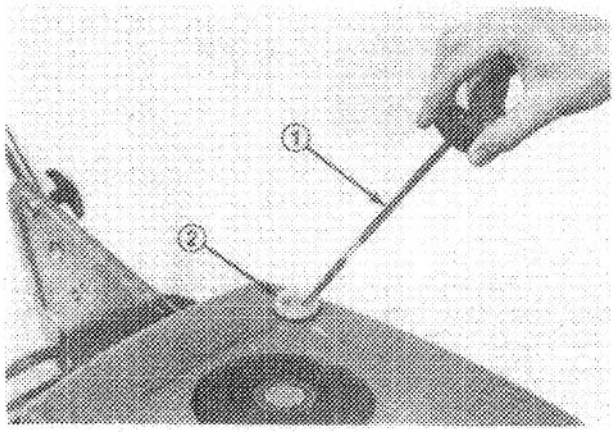


Figure 11

1. Dipstick
2. Fill hole

5. Install the dipstick, turn clockwise to secure and wipe up any oil that may have spilled.

Note: Check level of oil after every 5 operating hours or each time the mower is used. Initially, change oil after the first 2 hours of operation; thereafter, when conditions are normal, change oil after every 25 hours of operation. However, change oil more frequently when mower is operated in dusty or dirty conditions.

FILL FUEL TANK WITH GASOLINE

1. Clean area around fuel tank cap and remove cap from tank (Fig. 12).

2. Fill fuel tank to within 1/2 inch (13 mm) from top of the tank with leaded gasoline. Install fuel tank cap securely.

3. Wipe up spilled gasoline.

IMPORTANT: Leaded regular gasoline is recommended. If leaded regular gasoline is not available, low lead regular gasoline can be used. Do not mix any oil with the gasoline, and never use premium gasoline, gasoline additives or white gas because engine damage could result.

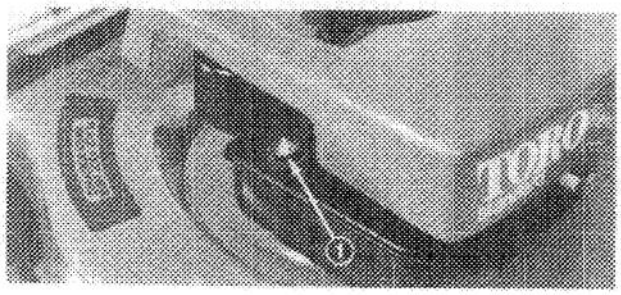


Figure 12

1. Fuel tank cap

DANGER

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

CONTROLS

Throttle Control (Fig. 13) – The throttle control is used to stop the engine. The speed of the blade is also controlled by the movement of the throttle. Moving throttle forward increases engine speed and moving it backward decreases engine speed. When control is in RUN position, engine will run at maximum rpm.

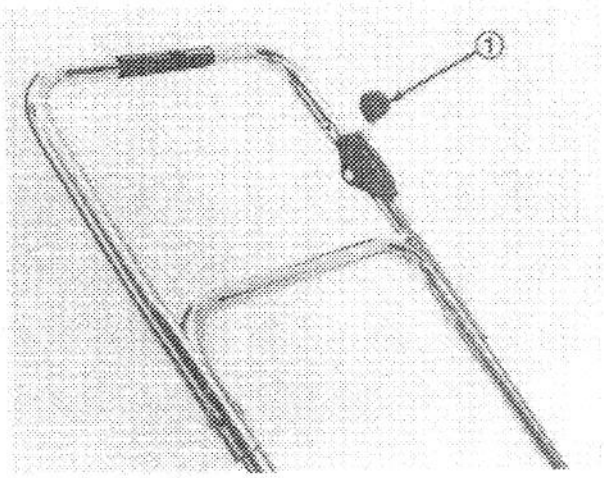


Figure 13

1. Throttle control

Traction Control (Fig. 14) – (Model 16890 Only) The traction control has two positions: ENGAGE and DISENGAGE. Squeeze control lever to engage rear wheel drive. Release control to disengage rear wheel drive. The traction control must be disengaged before engine is started.

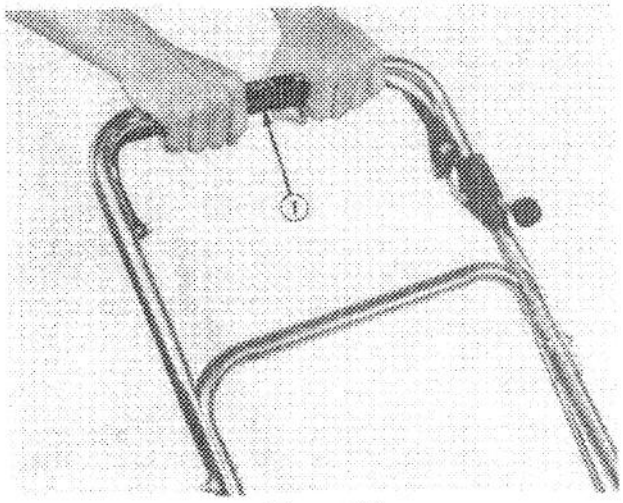


Figure 14

1. Traction control engaged

Recoil Starter (Fig. 15) – Pull fingertip starter to start the engine.

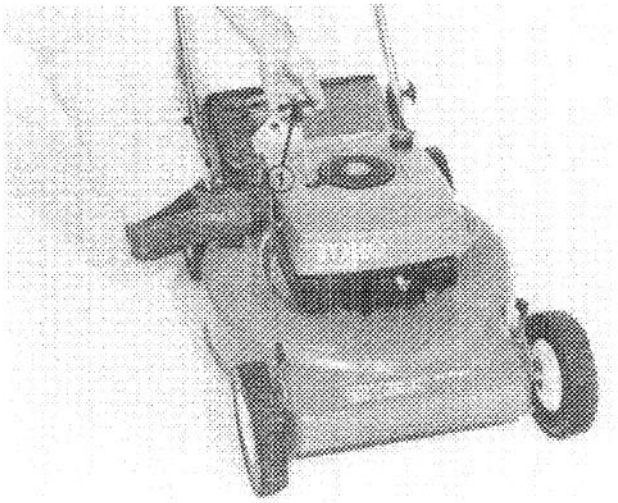


Figure 15

1. Recoil starter

Height-of-Cut Adjuster (Fig. 16) – Height-of-cut is adjustable to one of six approximate settings: 1 inch, 1-1/2 inches, 2 inches, 2-1/2 inches, 3 inches, or 3-1/2 inches (25, 38, 51, 64, 76 or 89 mm). When cutting thatch or heavy, thick grass, raise rear wheel one setting above the front wheel setting to assure optimum power to the blade.

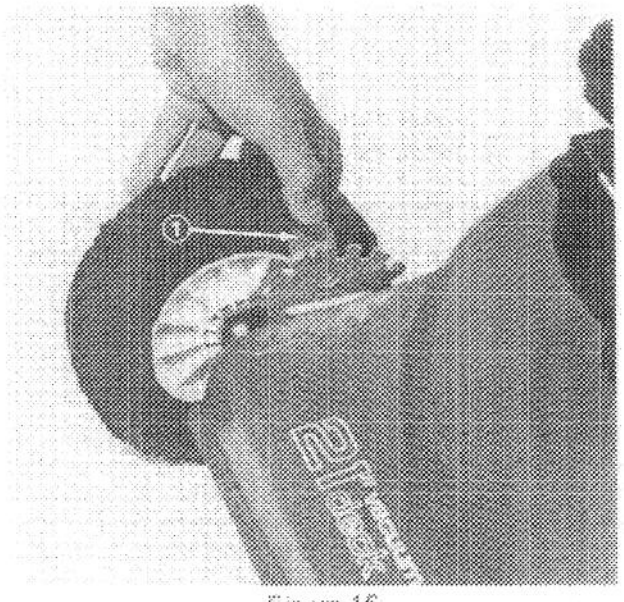


Figure 16

1. Height-of-cut adjuster

OPERATING INSTRUCTIONS

ADJUST HEIGHT-OF-CUT

The height-of-cut is adjustable from approximately 1 to 3-1/2 inches (25 to 89 mm), in 1/2 inch (13 mm) increments, and notches in quadrants represent each graduated increment.

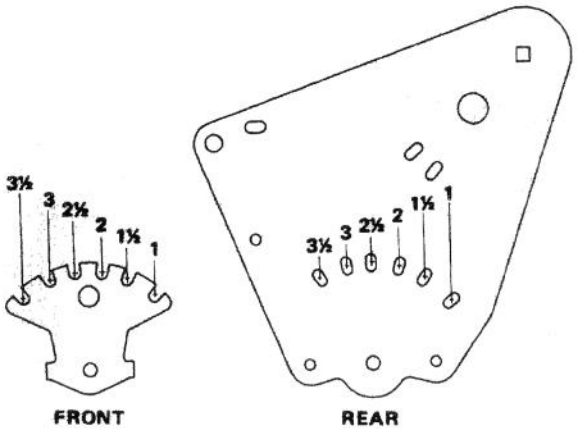


Figure 17

1. ⚠ Assure engine is not running before adjusting height-of-cut because contact with the blade will cause personal injury.

2. Place thumb against height-of-cut adjuster and fingers on outside of wheel (Fig. 16).

3. Raise mower housing until wheel is off the ground. Squeeze height-of-cut adjuster toward wheel so its locating pin disengages notch in mower quadrant. Then pivot the wheel and adjuster to the desired height-of-cut and release adjuster so locating pin engages notch in quadrant.

Note: For normal cutting, set all wheels in same height-of-cut position.

OPERATING CHARACTERISTICS AND TIPS

The REAR BAGGER has a 9.02 cubic inch engine that runs at a low, 2800 rpm, yet delivers the blade turning force necessary to produce a good quality-of-cut. The reduced engine speed should result in less engine wear, less noise when compared with other rotary mowers, and better gasoline economy.

To use the mower, install the bag, and start the engine. Notice that the grass bag expands at the sides and top. This expansion by the bag is caused by the air currents generated by the blade, flowing through the bag. As grass is cut and discharged into the bag, the air currents through the bag decrease gradually as it is being filled. While the bag is expanded, grass can be cut. Stop the engine and empty the bag when it is no longer expanded.

If operating position of handle is changed and loss of traction or constant traction occurs, traction control will have to be adjusted.

The mower is equipped with a rear shield (Fig. 18), which helps protect from objects that might be thrown rearward and from possible contact with the blade. Because of its flexible design, maneuverability of the mower is unaffected.

⚠ CAUTION

Never remove the rear shield because it is a safety device designed for your protection. If the shield is ever damaged, replace it before operating the mower.

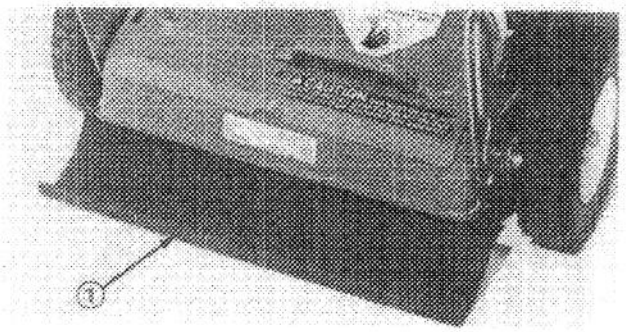


Figure 18

1. Rear shield

After the mower is used, it must be cleaned and maintained so it is ready for the next cutting. Use the wash-out port to clean the underside of the mower housing. However, avoid getting water directly onto the engine or electrical connections because damage could result. Periodically, check the blade, and assure the blade bolt is tightened to 50 ft-lb (68 N·m). The oil in the crankcase must be changed after the first 2 hours of operation and every 25 hours thereafter. Assure level of oil is always in the SAFE range, as shown on the dipstick; however, never fill oil over the FULL mark because engine damage could result. After every 25 hours of engine operation the air cleaner must be cleaned. If mower is used in dirty or dusty conditions, check air cleaner more frequently.

Whenever the mower is being operated, adjusted or maintained, the safety instructions at the front of this manual must be kept in mind. Safe operation is your responsibility.

BAGGING

The Rear Bagger discharges grass clippings into a large, 2 bushel bag, and because of the rear bagging feature, both sides of the mower can be used for trimming. Bagging is most effective when engine is running at maximum speed and only about 1/3 of grass blade is being cut. If an excessive amount of grass is being cut off, the mower can plug and cause the engine to stall. If long grass must be cut, adjust mower to the highest height-of-cut; then cut the grass. Follow this by lowering the height-of-cut and cutting the grass again.

OPERATING INSTRUCTIONS

WARNING

The grass bag material will catch and contain the majority of foreign objects, such as small stones and other similar debris. The bag material, however, is subject to normal wear and deterioration. So check the bag frequently, and if it is defective, install a new, genuine TORO replacement bag that has this warning or a similar one.

To bag the grass with the mower:

1. ⚠ Assure engine is not running and cutter blade is not moving.

2. Raise rear door, slide bag assembly into housing opening and lower rear door, guiding handle stud through hole in door (Fig. 19).

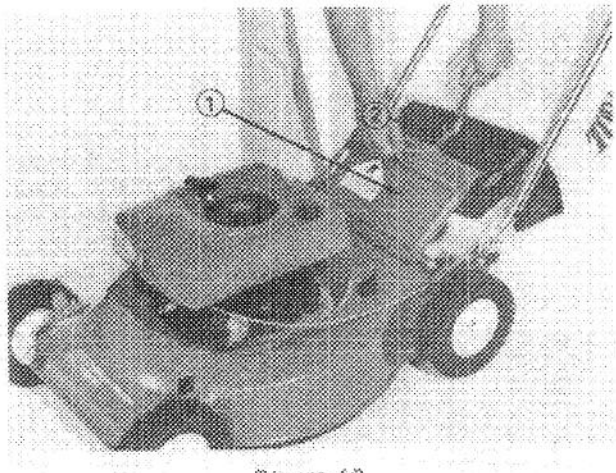


Figure 19

1. Rear door
2. Handle stud

CAUTION

Do not operate mower without entire grass catcher properly installed. Never open rear bag door while engine is running.

3. ⚠ When bag must be emptied, stop the engine and wait for all parts to stop moving. Raise rear bag door and slide bag out of housing. Then lift bag straight up so clippings stay in the bag rather than falling out the opening (Fig. 19).

CAUTION

Never open the bag cover when engine is running. Grass clippings and other debris will be discharged with enough force to cause personal injury.

4. To dump grass out of bag, open cover on top of bag, grasp handle on bottom of bag, and flip bag over. (Fig. 20).

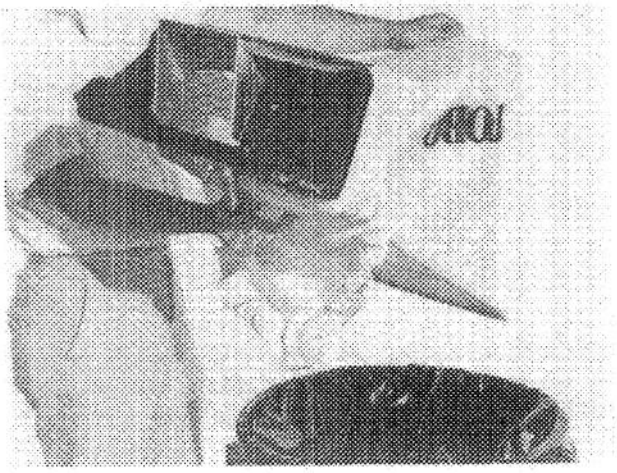


Figure 20

5. Reinstall bag by repeating step 2.

STARTING/STOPPING THE ENGINE

To Start Engine

1. Push high tension wire onto spark plug.

2. Move throttle control forward to START position.

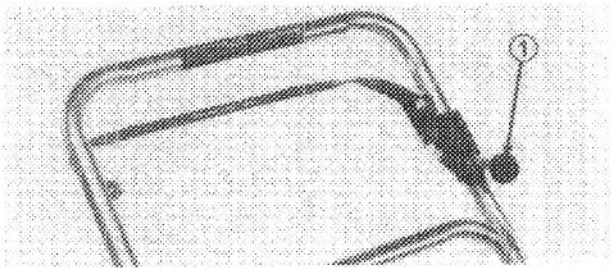


Figure 21

1. Throttle control lever in start position

CAUTION

Since blade rotates when starter rope is pulled, keep hands and feet away from mower housing. Contact with a moving part will likely cause personal injury.

3. Put one foot on STEP at right side of mower housing and keep other foot away from beneath the housing. Pull fingertip starter up until positive engagement results; then pull vigorously to start engine. Retract starter rope slowly.

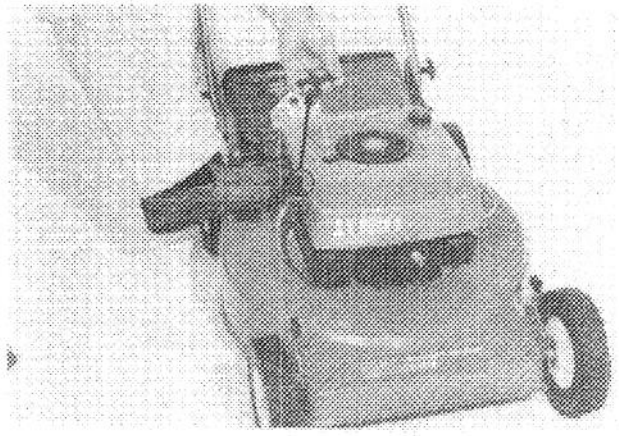


Figure 22

1. Recoil starter

IMPORTANT: Do not pull recoil rope to its limit or let go of fingertip starter when rope is pulled out, because starter mechanism or rope may break.

4. After engine starts and is running smoothly, move throttle control to desired speed.

To Stop Engine

1. To stop engine, release traction control (Model 16890 Only), and move throttle control to STOP position.

2. ⚠ Stay behind the handle until all parts stop moving.

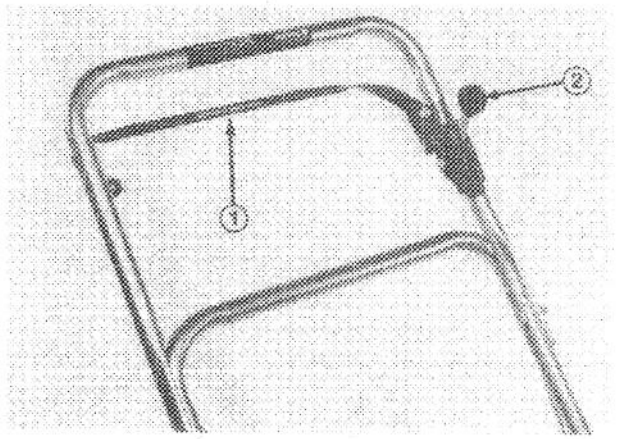


Figure 23

1. Traction control
2. Throttle control in STOP position

3. Pull high tension wire off spark plug and install end of wire onto V-notch, to prevent possibility of accidental starting when mower is unattended or not used.

USING WASH-OUT PORT

After mower is used, underside of mower housing should be cleaned to prevent grass clippings from adhering to the housing. To clean underside of mower housing, use the wash-out port.

1. ⚠ Stop the engine and wait for all moving parts to stop. Remove bag assembly and close rear door to prevent discharge of water when wash-out port is used.

⚠ CAUTION

Be careful while working around muffler as it will be hot and could cause injury.

2. Set height-of-cut in the 1 inch position and open the wash-out port.

3. Start the engine. Insert end of hose, without nozzle, into wash-out port opening (Fig. 24). Using moderate water pressure, allow water and engine to run for approximately two minutes. The action created by the rotating blade and water flushes accumulations of grass clippings from underside of mower housing. When grass is no longer discharged and color of discharged water is clear again, stop the engine. Pull high tension wire off spark plug after all parts stop moving.

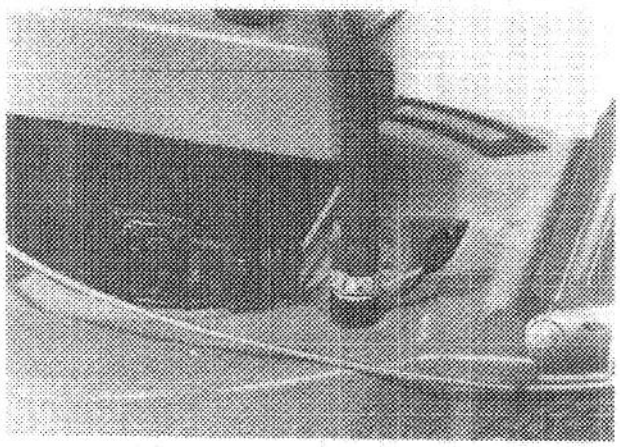


Figure 24

Note: Dry bulky accumulations of grass clippings must be cleaned with a scraper: refer to Cleaning Mower Housing, page 17.

4. Wipe the mower with a clean rag to remove excess water.

MAINTENANCE

CAUTION

To reduce potential accidents, never perform an adjustment or maintenance procedure while the engine is running. Pull high tension wire (Fig. 25) off spark plug and install end in notch above spark plug to prevent an accidental start.

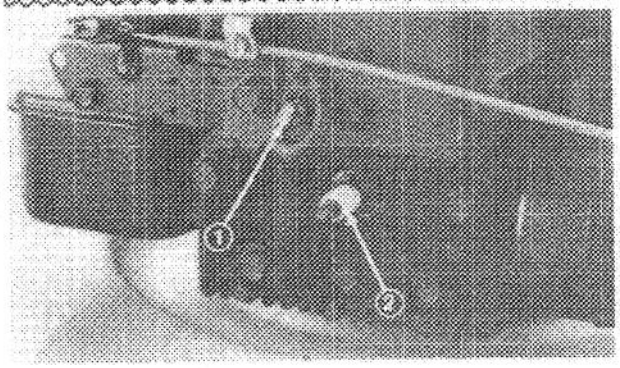


Figure 25

1. High tension wire on V-notch
2. Spark plug

LUBRICATION

Wheels, Controls And Cables:

1. After every 25 hours of operation or at the end of the mowing season, whichever comes first, apply 2 or 3 drops of light oil on the inside of all the wheel bolts (Fig. 26). Spin the wheel to distribute oil into the wheel bushings. Wipe up any excess oil.

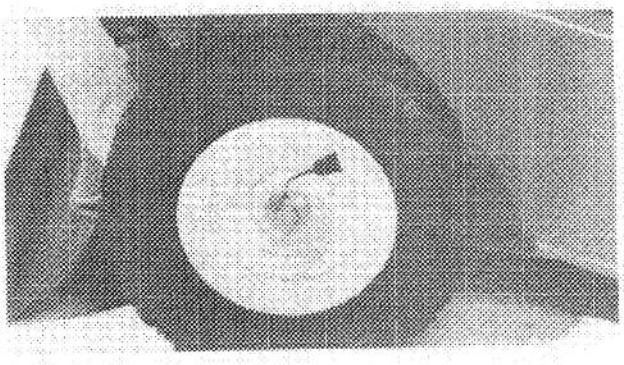


Figure 26

2. The throttle control cable must be lubricated after every 25 hours of operation or at the end of the mowing season, whichever comes first. Apply light oil onto the cable (Fig. 27), especially where it bends. Also, squirt oil onto the cable where it enters the throttle control housing. Operate the control to distribute the oil. Wipe up excess oil.

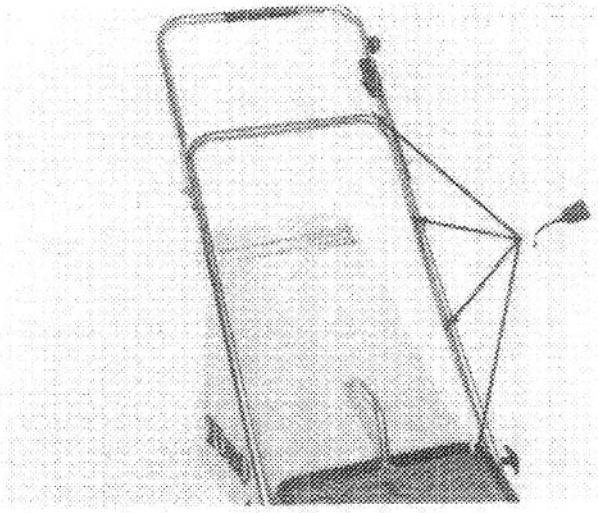


Figure 27

LUBRICATING AXLE PIVOTS

After every 25 operating hours, to prevent premature bearing failure, grease the rear axle pivots with No. 2 Multi Purpose Lithium Base Grease.

1. ⚠ Assure engine is not running, pull high tension wire off spark plug and install on V notch.

2. Set height of cut to center height setting.

3. Wipe grease fitting with clean rag to prevent dirt from entering bearing area (Fig. 28).

4. Install grease gun onto fitting and apply grease (Fig. 28). (Approximately 2-3 pumps).

5. Wipe excess grease away and reset height of cut to normal setting.

6. Repeat steps 1-5 on rear pivot on opposite side.

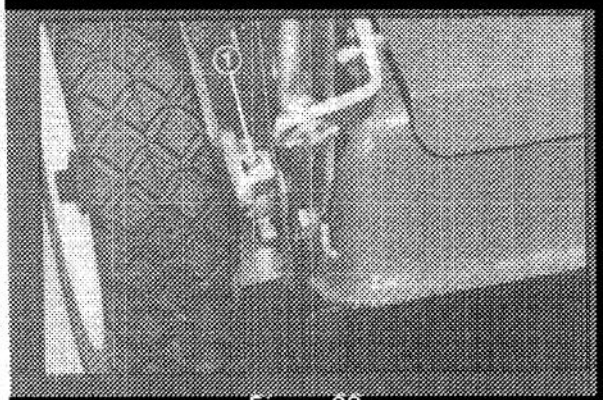


Figure 28

1. Grease fitting

MAINTENANCE

SERVICING AIR CLEANER

The air cleaner element must be cleaned after every 25 hours of engine operation if the engine is operated in clean air conditions. The element must be cleaned more frequently, however, when mower is operated in dusty or dirty conditions.

1. ⚠ Assure engine is not running, pull high tension wire off spark plug, and install end on V-notch.

2. Remove oil dipstick and (4) screws securing engine shroud to engine (Fig. 29).

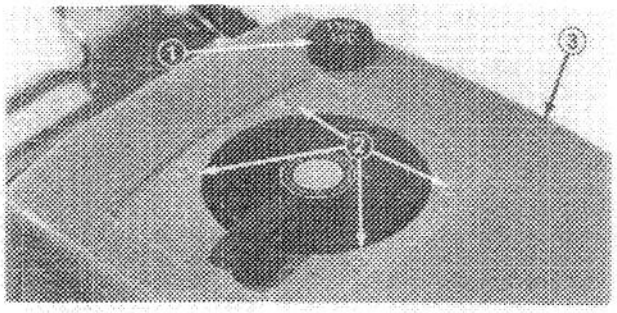


Figure 29

1. Oil dipstick 2. Screws 3. Engine shroud

3. Remove shroud and reinstall dipstick.

4. Remove screw and cover to expose air cleaner. Remove cover (Fig. 29) and clean dirt from inside and outside surfaces.

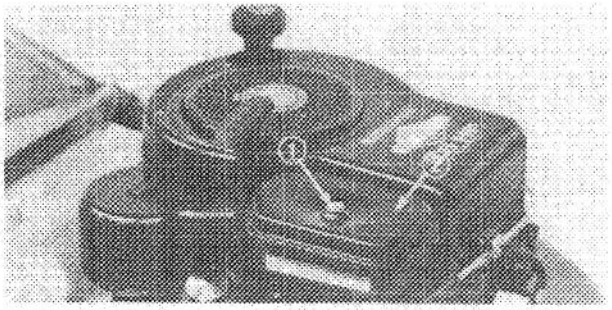


Figure 30

1. Air cleaner screw 2. Air cleaner cover

5. Look at top of air cleaner element (Fig. 30). If it is dirty, the element must be removed from air cleaner body (Fig. 31) and cleaned.

A. WASH element in a solution of liquid soap and warm water. Squeeze the element to remove dirt. Do not twist element because it may tear.

B. DRY the element by wrapping it in a clean rag. Squeeze the rag and element until element is dry.

C. SATURATE element with 5 teaspoons (25 ml) SAE 30 engine oil. Squeeze element to remove excess oil and to distribute the oil thoroughly. A damp element is desirable.

D. Place element and spacer into the air cleaner body (Fig. 31). Assure narrow edge of spacer is parallel with side of air cleaner body.

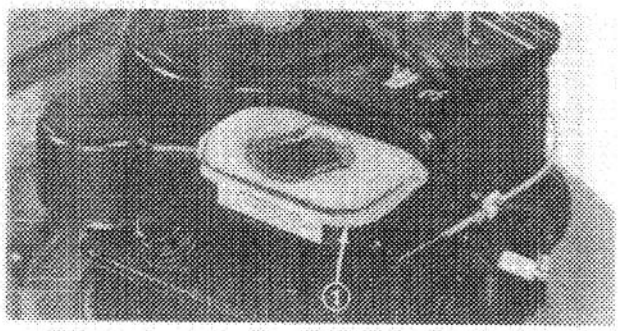


Figure 31

1. Air cleaner body

6. Install cover on air cleaner body and assure cover and element form a seal. Mount air cleaner assembly on top of carburetor with long screw (Fig. 30).

7. Reinstall engine shroud. (Fig. 29)

IMPORTANT: Do not operate engine without air cleaner element because extreme engine wear and damage will likely result.

REPLACING SPARK PLUG

Recommended spark plug to use is a Champion RJ-8 or equivalent, and correct air gap is 0.030 of an inch (0.76 mm). Since air gap between center and side electrodes of the spark plug increases gradually during normal engine operation, remove plug after every 25 hours of engine operation and check its condition.

1. ⚠ Assure engine is not running. Then pull high tension wire off spark plug.

2. Clean area around spark plug so foreign matter does not fall into cylinder when plug is removed. Remove plug from cylinder head (Fig. 32).

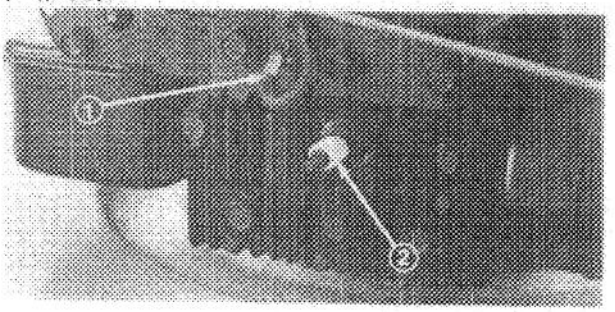


Figure 32

1. High tension wire on V-notch 2. Spark plug

IMPORTANT: A cracked, fouled or dirty spark plug must be replaced. Do not sand blast, scrape or clean electrodes, because grit may eventually release from the plug and fall into the cylinder. The result will likely be engine damage.

3. Set air gap between electrodes at 0.030 of an inch (0.76 mm) (Fig. 33). Install the correctly gapped spark plug with gasket and tighten plug to 15 ft-lb (20.4 N·m). If torque wrench is not used, tighten plug firmly.

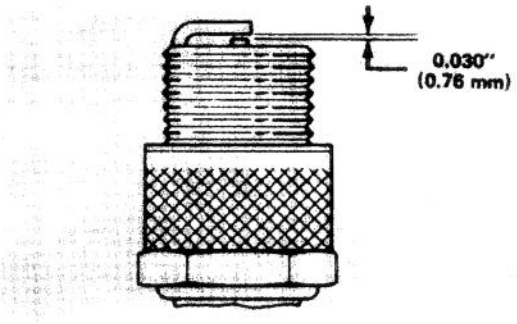


Figure 33
Air Gap Between Electrodes

DRAINING GASOLINE FROM FUEL TANK

CAUTION

Since gasoline is highly flammable, drain it outdoors and make sure engine is cool to prevent a potential fire hazard. Wipe up any gasoline that may have spilled. Do not drain gasoline near any open flame or where gasoline fumes may be ignited by a spark. Do not smoke a cigar, cigarette, or a pipe when handling gasoline.

1. ⚠ Assure engine is not running, pull high tension wire off spark plug, and install on V-notch.

2. Remove cap from fuel tank.

3. Using a pump-type syphon, drain gasoline into a clean gas can. This is the only recommended method of draining gasoline.

CHANGING CRANKCASE OIL

To prevent premature engine failure due to low oil level, check oil level after every 5 hours of operation or each time mower is used. Change oil after the first two hours of operation; thereafter, under normal conditions, change oil after every 25 hours of operation. However, change oil more frequently when engine is operated in dusty or sandy conditions or engine damage will occur. If possible, run engine just before changing oil because warm oil flows better and carries more contaminants than cold oil.

1. Pull high tension wire off spark plug, and install on V-notch. Assure that wire does not contact plug accidentally (Fig. 32).

2. ⚠ Using a pump-type syphon, drain gasoline from fuel tank to prevent a potential hazard.

3. Tip mower on its right side and remove oil drain plug (Fig. 34).

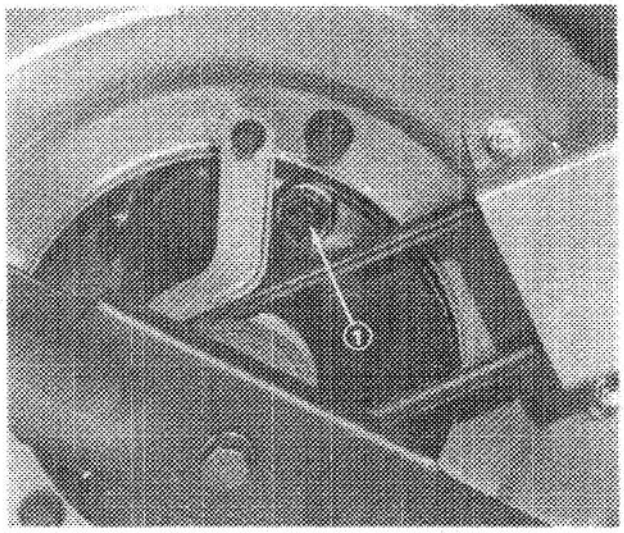


Figure 34
1. Oil drain plug

4. Tip mower upright over drain pan and allow oil to drain.

5. Tip mower on right side, install drain plug and tip mower upright.

6. Add engine oil: refer to Fill Crankcase With Oil, page 8.

INSPECTING CUTTER BLADE FOR DAMAGE

1. ⚠ Assure engine is not running, pull high tension wire off spark plug and install on V-notch.

2. ⚠ Drain gasoline from fuel tank: refer to Draining Gasoline, page 15.

3. Tip mower on its right side (Fig. 35), and allow it to remain tipped for a short time. Avoid rotating the blade when mower is tipped because starting problems may result.

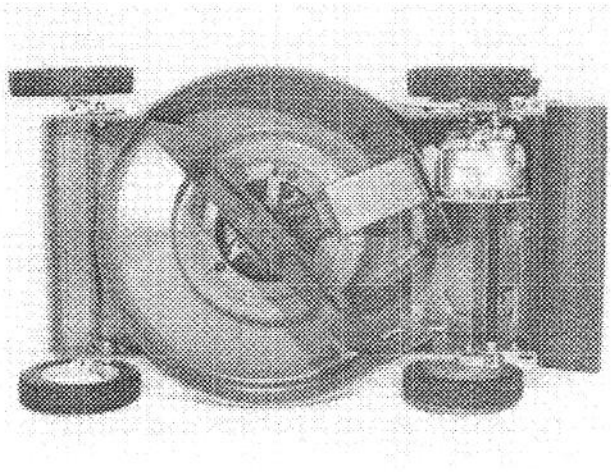


Figure 35

4. Examine cutting ends of the blade carefully, especially where the flat and curved parts of the blade meet (Fig. 36A). Since sand and abrasive material can wear away the metal that connects the flat and curved parts of the blade, check the blade before using the mower. If any wear is noticed (Fig. 36B), replace the blade: refer to Sharpening or Replacing Cutter Blade, page 16.

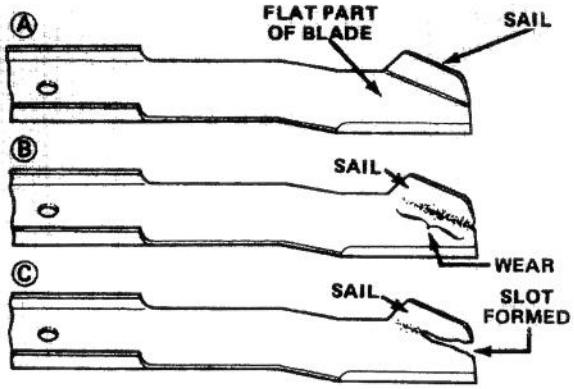


Figure 36
Examining Blade for Wear

CAUTION

If the blade is allowed to wear, a slot will form between the sail and flat part of the blade (Fig. 36C). Eventually, a piece of the blade may break off and be thrown from under the housing, possibly resulting in serious injury to yourself or bystander.

SHARPENING OR REPLACING CUTTER BLADE

1. ⚠ Assure engine is not running pull high tension wire off spark plug and install on V-notch.

2. ⚠ Drain gasoline from fuel tank: refer to Draining Gasoline, page 15.

3. Tip mower on its right side and allow it to remain tipped for a short time. Avoid rotating the blade when mower is tipped because starting problems may result.

4. Grasp end of blade using a rag or thickly padded glove. Remove blade bolt, lock washer and blade (Fig. 37).

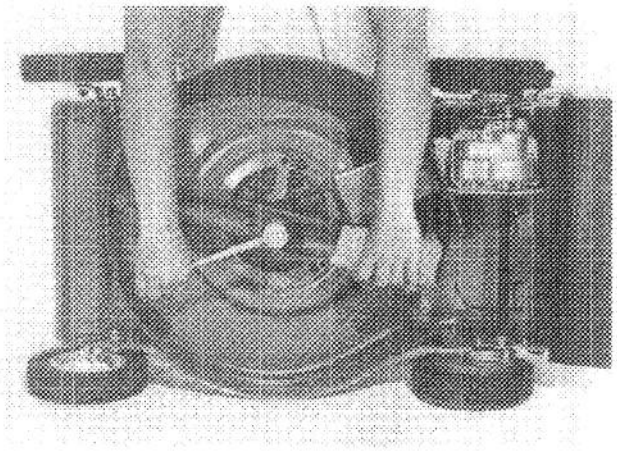


Figure 37

Note: To assure optimum cutting performance, install a new blade at the start of the cutting season. During the year, file down small nicks to maintain a fine cutting edge.

5. Using a file, sharpen cutting edge at both ends of the blade (Fig. 38).

IMPORTANT: Sharpen top side of blade and maintain original cutting angle to assure a sharp cutting edge (Fig. 38). The blade will remain balanced if same amount of material is removed from both cutting edges.

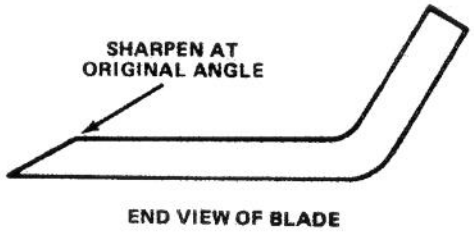


Figure 38

6. Check balance of blade by putting it on a blade balancer. A balanced blade will stay in a horizontal position on the balancer. By contrast, a blade that is not balanced will settle to the heavy side. If blade is not balanced, file more metal off cutting edge on heavy end of the blade. Then check the blade balance again.

Note: An inexpensive blade balancer can be purchased at a hardware store.

7. Install sharp, balanced blade with lock washer and blade bolt. Sail part of the blade must point toward the mower housing to assure correct installation. Tighten blade bolt to 50 ft-lb (68 N·m).

8. Set mower upright.

CLEANING MOWER HOUSING

To assure a good cut and efficient grass bagging, underside of mower housing and inside of discharge area must be kept clean.

1. ⚠ Assure engine is not running, pull high tension wire off the spark plug and install on V-notch.

2. ⚠ Drain gasoline from fuel tank: refer to Draining Gasoline, page 15.

3. Tip mower on its right side (Fig. 39), and allow it to remain tipped for only a short time. Avoid rotating the blade when mower is tipped, because starting problems may result.

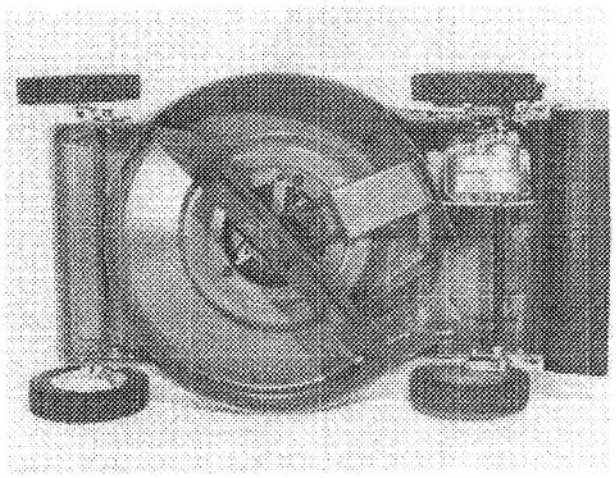


Figure 39

4. Remove grass clippings and dirt that sticks to the housing and gear box area by spraying it with a garden hose. Scrape out any grass that water does not remove from housing with a wooden scraper.

5. Set mower upright.

ADJUSTING CARBURETOR

The carburetor has been set at the factory, but an occasional adjustment may be required. However, do not make unnecessary carburetor adjustments, because factory settings are usually correct. An adjustment may be required to compensate for differences in fuel, temperature, and altitude.

IMPORTANT: Air cleaner must be installed on the engine whenever carburetor is being adjusted. The air cleaner mounting screw must also be installed when engine is run. Fuel tank must be half full of gasoline to get best carburetor adjustment.

Note: The cover over the engine can be removed to gain better access to carburetor, but dipstick must be installed.

1. Needle Valve – Close valve by gently rotating it clockwise (Fig. 40).

IMPORTANT: Do not close needle valve too tight, because valve and seat in carburetor will likely be damaged.

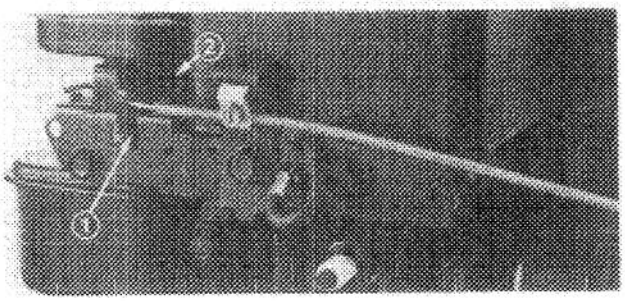


Figure 40

1. Needle valve
2. Idle adjusting screw

2. Open needle valve by rotating 1-1/2 turns counterclockwise.

Note: The needle valve setting is approximate; however, the setting will allow engine to be started so carburetor can be fine tuned.

3. Start engine and let it warm up for approximately two minutes. Next, move throttle control to RUN position.

⚠ WARNING

Engine must be running so final adjustment of the carburetor can be performed. To guard against possible personal injury, keep hands, feet, face, and other parts of the body away from the cutter blade, underside of the housing, and the discharge chute.

4. Rotate needle valve clockwise 1/8 turn at a time until engine starts to lose speed. Let engine react to each 1/8 turn setting.

5. Rotate needle valve counterclockwise (outward) 1/8 turn at a time until engine first starts to run rough. Let engine react to each 1/8 turn setting.

6. Rotate needle valve clockwise (inward) very slowly until engine starts to run smoothly. This setting, under no load, may be slightly rich; however, the slightly rich setting will assure proper operation when engine is under load.

7. Move throttle control backward so engine idles. Next rotate idle adjusting screw until engine speed is 1750 rpm.

Note: Rotate idle adjusting screw clockwise to increase idle rpm. By contrast, rotate idle adjusting screw counterclockwise to decrease idle rpm.

8. Check carburetor adjustment by quickly moving throttle control from idle speed to RUN position. Engine speed should increase without hesitation. If engine tends to stall or die out, rotate needle valve 1/8 turn counterclockwise until engine accelerates smoothly.

9. After carburetor is adjusted, shut engine off. If mower will not be used immediately, pull high tension wire off spark plug and install end in notched hole: Accidental starting will be prevented.

ADJUSTING THROTTLE CONTROL

If engine does not stop or start, or if throttle control is replaced, an adjustment may be required.

1. ⚠ Assure engine is not running, pull high tension wire off the spark plug, and install on V-notch.

2. Move throttle control lever to the STOP position.

Note: The cover over the engine can be removed to gain better access when adjusting throttle control.

3. Loosen cable clamp screw until throttle cable is free to slide (Fig. 41).

4. Move carburetor control arm to the right until it contacts grounding bracket (Fig. 41). Pull throttle cable slightly to remove any slack, and tighten the cable clamp screw to lock the adjustment in place.

5. If mower will be used immediately, push high tension wire onto spark plug. However, do not install high tension wire if mower will not be used: Accidental starting will be prevented.

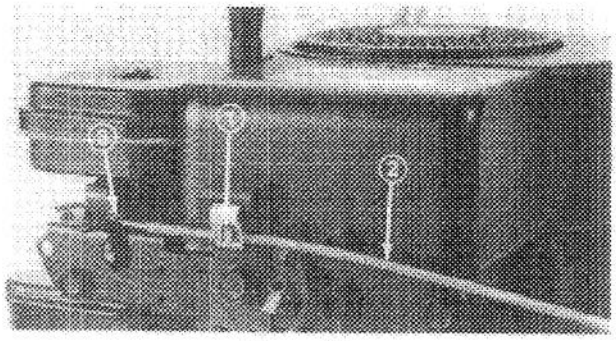


Figure 41

1. Cable clamp screw 2. Cable 3. Control arm

ADJUSTING DRIVE BELT

An adjustment of the drive belt may be required if the loss of traction occurs, or if handle operating position is changed.

1. ⚠ Assure engine is not running, pull high tension wire off spark plug and install on V-notch.

2. Remove cotter pin and short rod from traction control lever (Fig. 42).

3. Loosen top lock nut on control rod sleeve (Fig. 42).

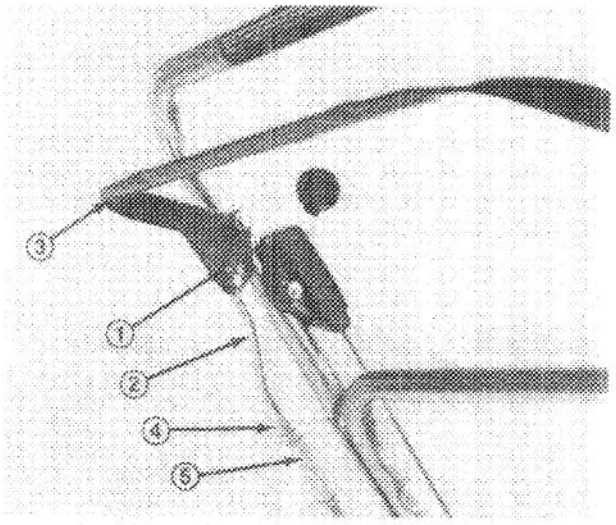


Figure 42

1. Cotter pin 2. Short rod 3. Traction control rod 4. Top lock nut 5. Control rod sleeve

4. Turn short rod clockwise for more traction or counterclockwise to move traction control lever toward handle.

⚠ CAUTION

Over-adjusting rod may cause mower to move without engaging traction drive.

5. Reinstall short rod to traction control lever with cotter pin and tighten both lock nuts (Fig. 42).

MAINTENANCE

PREPARING MOWER FOR STORAGE

1. Drain gasoline from fuel tank and fuel line: refer to Draining Gasoline, page 16. Start the engine and let it run at idle speed until it stops because all gasoline is used.

Note: All gasoline must be expended to prevent gum-like, varnish deposits from forming in the carburetor, fuel line and fuel tank. Such deposits, if allowed to form, will cause starting problems and poor engine operation.

2. Pull high tension wire off spark plug and clean area around the plug so foreign matter cannot fall into cylinder when plug is removed. Remove plug from cylinder head and pour two tablespoons of SAE 30 oil into spark plug hole. Pull recoil starter handle slowly to distribute oil on inside of cylinder. Then install spark plug and tighten it to 15 ft-lb (20.4 N·m). If torque wrench is not used, tighten plug firmly. DO NOT INSTALL HIGH TENSION WIRE ON SPARK PLUG.

3. Tip mower on its right side, remove drain plug from bottom of engine and allow oil to flow into drain pan. After all oil is drained, install drain plug but do not fill crankcase with oil at this time.

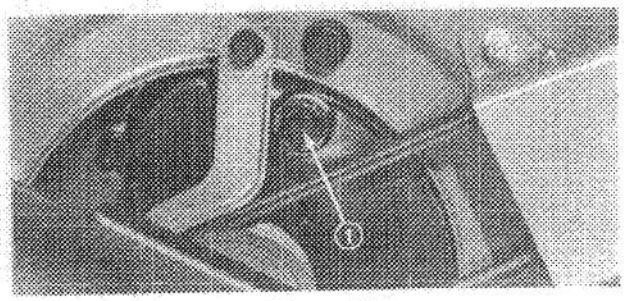


Figure 43
1. Oil drain plug

4. Clean dirt and chaff from outside of cylinder, cylinder head fins and blower housing. Also, remove grass clippings, dirt and grime from external parts of engine, shrouding and top of mower housing.

5. Clean underside of mower housing: refer to Cleaning Mower Housing, page 17.

6. Check condition of blade and blade bolt: refer to Inspecting Cutter Blade for Damage, page 15.

7. Check and tighten all capscrews, bolts, screws, nuts and mating parts. If any part is damaged, repair or replace it.

8. Lubricate wheel bushings and throttle cable with oil: refer to Lubrication, page 13. Lubricate rear axle pivots with grease.

9. Wash the air cleaner element in a liquid soap detergent and water: refer to Servicing Air Cleaner, page 14.

10. Fill crankcase with oil: refer to Fill Crankcase With Oil, page 8.

11. "Touch up" all rusted or chipped paint surfaces. Make sure to sand affected area before painting.

Note: TORO Re-Kote "touch-up" paint is available from any Authorized TORO Service Dealer. The spray paint dries in minutes to a glossy, factory-finish.

12. Store the mower in a clean, dry place. Cover the mower to protect it and keep it clean.

Note: Assure upper handle is in proper position and handle knobs securely tightened before resuming operation.

IDENTIFICATION AND ORDERING

MODEL AND SERIAL NUMBERS

The REAR BAGGER has two identification numbers: a model number and a serial number. The two numbers are stamped into a decal (Fig. 44) located on housing below rear door. In any correspondence concerning the mower, supply model and serial numbers to assure correct information and replacement parts are obtained.

To order replacement parts from an Authorized TORO Service Dealer, supply the following information:

1. Model and serial numbers of the mower.

2. Part number, description and quantity of part(s) desired.

Note: Do not order by reference number from parts catalog; use the PART NUMBER.

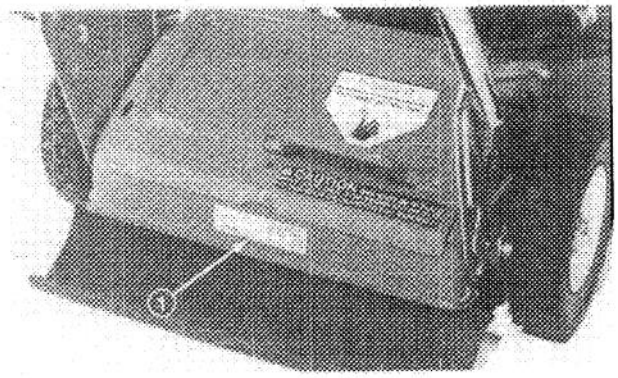


Figure 44
1. Model and serial number decal

TROUBLE SHOOTING

Problem	Possible Causes	Correction Action
Engine does not start.	1. Throttle not in start position.	1. Move throttle to start.
	2. Gas tank is empty.	2. Fill fuel tank with gasoline: refer to Fill Fuel Tank With Gasoline, page 8.
	3. Air cleaner element is dirty.	3. Clean air cleaner element: refer to Servicing Air Cleaner, page 14.
	4. Spark plug loose.	4. Tighten spark plug to 15 ft-lb (20.4 N·m).
	5. High tension wire loose or disconnected from spark plug.	5. Install high tension wire on plug.
	6. Spark plug gap is incorrect.	6. Set gap between electrodes at 0.030 of an inch (0.76 mm).
	7. Spark plug is defective.	7. Install new, correctly gapped plug: refer to Replacing Spark Plug, page 14.
	8. Carburetor is flooded with gasoline.	8. Remove air cleaner element and pull starter rope continuously until carburetor clears itself and engine starts. When engine starts, stop it and install air cleaner element.
	9. Blade bolt is loose.	9. Tighten blade bolt to 50 ft-lb (68 N·m).
	10. Faulty points or condenser.	10. Contact TORO Service Dealer.
Engine starts hard or loses power.	1. Dirt or water in gas tank.	1. Drain gas and clean fuel tank. Fill tank with clean, fresh gasoline: refer to Fill Fuel Tank With Gasoline, page 8.
	2. Vent hole in fuel tank cap is plugged.	2. Clean or replace fuel tank cap.
	3. Air cleaner is dirty.	3. Clean the air cleaner element: refer to Servicing Air Cleaner, page 14.
	4. Blade bolt is loose.	4. Tighten blade bolt to 50 ft-lb (68 N·m).
Engine operates erratically.	1. Spark plug is defective.	1. Install new, correctly gapped, plug: refer to Replacing Spark Plug, page 14.
	2. Spark plug gapped incorrectly.	2. Set gap between electrodes at 0.030 of an inch (0.76 mm).
	3. Air cleaner is dirty.	3. Clean the air cleaner element: refer to Servicing Air Cleaner, page 14.
	4. Carburetor maladjusted.	4. Adjust carburetor: refer to Adjusting Carburetor, page 17.
Engine idles poorly.	1. Air cleaner is dirty.	1. Clean the air cleaner element: refer to Cleaning Air Cleaner, page 14.
	2. Oil level in crankcase is low.	2. Add oil to crankcase: refer to Fill Crankcase With Oil, page 8.
	3. Cooling fins and air passages under engine blower housing are plugged.	3. Remove obstruction from cooling fins and air passages.

TROUBLE SHOOTING

Problem	Possible Causes	Corrective Action
Engine misfires at high speed.	1. Air gap between electrodes of spark plug is too close.	1. Set air gap at 0.030 of an inch (0.76 mm).
Engine overheats.	1. Cooling air flow is restricted. 2. Oil level in crankcase is low. 3. Incorrect spark plug.	1. Remove any obstruction from blower housing, air passages, and cooling fins on engine. 2. Add oil to crankcase: refer to Fill Crankcase With Oil, page 8. 3. Install Champion RJ-8 spark plug that is gapped at 0.030 of an inch (0.76 mm).
Mower vibrates abnormally.	1. Blade bolt is loose. 2. Cutter blade is unbalanced.	1. Tighten blade bolt to 50 ft-lb (68 N·m). 2. Sharpen cutter blade and check the balance: refer to Sharpening or Replacing Cutter Blade, page 17. Replace the blade if it cannot be balanced.

MAINTENANCE RECORD

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

MAINTENANCE RECORD

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

MAINTENANCE RECORD

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

The Toro Promise

A ONE YEAR LIMITED WARRANTY

The Toro Company promises to repair any TORO Product if defective in materials or workmanship. The following time periods from the date of purchase apply:

Residential Product	1 Year
Residential Products Used Commercially . . .	45 Days

The costs of parts and labor are included, but the customer pays the transportation costs. Just return any residential product to an Authorized TORO Service Dealer or TORO Distributor.

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

1. Contact any Authorized TORO Service Dealer, TORO Master Service Dealer, or TORO Distributor (the Yellow Pages of your telephone directory is a good reference source).
2. He will either instruct you to return the product to him or recommend another Authorized TORO Service outlet which might be more convenient.
3. Bring the product along with your original sales slip, or other evidence of purchase date, to the service dealer.
4. The servicing dealer will inspect the unit, advise you whether the product is defective and, if so, make all repairs necessary to correct the defect without extra charge to you.

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

Write:

TORO Consumer Service Department
8111 Lyndale Avenue South
Minneapolis, Minnesota 55420

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

THERE IS NO OTHER EXPRESS WARRANTY. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE ARE LIMITED TO THE DURATION OF THE EXPRESS WARRANTY.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

This warranty applies only to parts or components which are defective and does not cover repairs necessary due to normal wear, misuse, accidents, or lack of proper maintenance. Regular, routine maintenance of the unit to keep it in proper operating condition is the responsibility of the owner.

All warranty repairs reimbursable under The Toro Promise must be performed by an Authorized TORO Service Dealer using Toro approved replacement parts.

Repairs or attempted repairs by anyone other than an Authorized TORO Service Account are not reimbursable under The Toro Promise. In addition, these unauthorized repair attempts may result in additional malfunctions, the correction of which is not covered by warranty.

THE TORO COMPANY IS NOT LIABLE FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE USE OF THE PRODUCT INCLUDING ANY COST OR EXPENSE OF PROVIDING SUBSTITUTE EQUIPMENT OR SERVICE DURING PERIODS OF MALFUNCTION OR NON-USE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

COUNTRIES OTHER THAN THE UNITED STATES OR CANADA

Customers who have purchased TORO products exported from the United States or Canada should contact their TORO Distributor (Dealer) to obtain guarantee policies for your country, province or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the TORO importer. If all other remedies fail, you may contact us at The Toro Company.

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