

EASTMAN INDUSTRIES

HOVER MOWER

Model HM16H-4



Operator's Manual

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WARNING!

This mower, when oriented in the front to back position, is capable of continuous operation on slopes reaching 45 degrees incline. The use of this mower on inclines steeper than 45 degrees will cause severe damage to the engine VOIDING ALL APPLICABLE WARRANTIES.

This lawn mower is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

General Operations

1. Read, understand and follow all instructions on the machine and in the Manual. Be thoroughly familiar with the controls and the proper use of the mower before starting.
2. Do not put hands or feet near or under rotating parts.
3. Only allow responsible individuals, who are familiar with the instructions, to operate the mower.
4. Clear the area of objects such as rocks, toys, wire, bones, sticks etc., which could be picked up and thrown by the blade.
5. Be sure the area is clear of other people before mowing. Stop the mower if anyone enters the area.
6. Do not operate the mower when barefoot, wearing open sandal or regular shoes. Always wear heavy boots or substantial footwear.
7. Do not pull mower backwards unless absolutely necessary. Look down and behind before and while moving backwards.
8. Do not operate the mower without proper inspection of the safety and protective devices.
9. Read the Operator's Manual for proper operation and installation of accessories. Only use accessories approved by Eastman Industries.
10. Shut the engine off when crossing gravel drives, walks or roads.
11. Shut the engine off whenever you leave the equipment.
12. Shut the engine off and wait until the blade comes to complete stop before cleaning the mower or unclogging grass and debris.
13. Mow only in daylight or good artificial light.
14. Do not operate the mower while under the influence of alcohol or drugs.
15. Never operate the mower in wet grass. Always be sure of your footing; keep a firm hold on the handle and walk; never run.
16. If the equipment should start to vibrate abnormally, stop the engine and check immediately for the cause. Vibration is generally a warning of trouble.
17. Always wear safety goggles or safety glasses with side shields when operating mower.

Slope Operations

Slopes are a major factor related to slip and fall accidents, which can result in severe injury. All slopes require extra caution. If you feel uneasy on a slope, do not mow it.

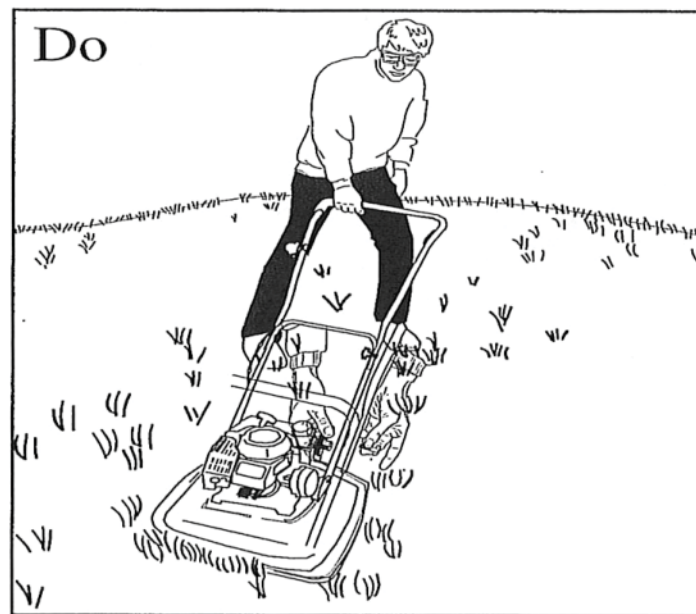
DO:

Mow across the face of slopes; not up and down. Exercise extreme caution when changing directions on slopes.

Always keep the mower below you when mowing on the slope.

Remove objects such as rocks, tree limbs, etc.

Watch for holes, ruts or bumps. Tall grass can hide obstacles.



(Figure 1)

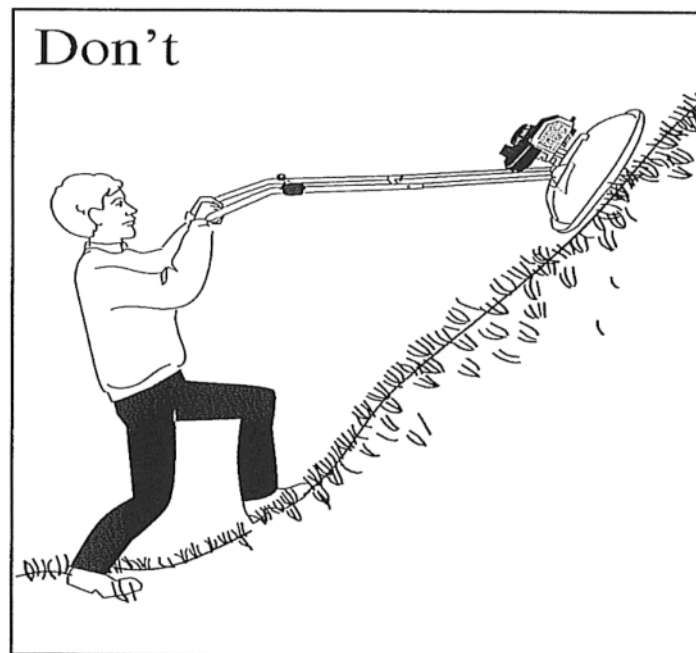
DO NOT:

Do not mow near drop-offs, ditches or embankments. The operator could lose footing or balance.

Do not push the mower up the slope.

Do not mow slopes that are steeper than 45° incline.

Do not mow on wet grass. Reduced footing could cause slipping.



(Figure 2)

Children

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the mower. *Never* assume that children will remain where you last saw them.

1. Keep children out of the mowing area and under the watchful care of a responsible adult.
2. Be alert and turn mower off if children enter the area.
3. Before and while moving backwards, look behind and down for small children.

4. Never allow children to operate the mower.
5. Use extra care when approaching blind corners, shrubs, trees or other objects that may obscure vision.

Service

1. Use extra care in handling gasoline and other fuels. **Gasoline is highly flammable and vapors are explosive.**
 - a) Use only approved containers.
 - b) Never remove gas cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
 - c) Never refuel the mower indoors.
 - d) Never store the mower or fuel container inside where there is an open flame, such as a water heater.
 - e) Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
 - f) When practical, remove the mower from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
 - g) Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
 - h) If fuel is spilled on clothing, change clothing immediately.
2. Never run an engine inside a closed area.
3. Never make adjustments or repairs with the engine running. Disconnect the spark plug wire, and keep the wire away from the plug to prevent accidental starting.
4. Keep all nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
5. Never tamper with safety devices. Check their proper operation regularly.
6. Keep mower free of grass, leaves or other debris build-up. Clean oil or fuel spillage on the mower. Allow mower to cool before storing.

7. Stop and inspect the mower if you strike an object. Repair, if necessary, before restarting.
8. Never attempt to remove grass or debris from mower while the engine is running.
9. Cutter disc components are subject to wear, damage and deterioration, which could allow objects to be thrown. Frequently check components and, when necessary, replace with Eastman Industries' recommended parts.
10. Mower blade is sharp and can cut. Wrap the blade or wear gloves, and use extra caution when servicing it.
11. Do not change the engine governor setting or overspeed the engine.
12. Maintain or replace safety and instruction labels as necessary.

WARNING: In order to prevent accidental starting when setting up, transporting, adjusting or making repairs, always disconnect spark plug wire and place wire where it cannot contact spark plug.

CAUTION: Muffler and other engine parts become extremely hot during operation and remain hot after engine has stopped. To avoid severe burns on contact, stay away from these areas.

Consult the engine manual for more complete instructions regarding engine maintenance and operation.

Introduction

Read this Manual carefully to learn how to operate and maintain your product properly. The information in this Manual can help you and others avoid injury and product damage. Although Eastman Industries designs and produces safe products, you are responsible for operating the product properly and safely.

When you need service, genuine Eastman parts, or additional information, contact an Authorized Eastman Dealer or Eastman's Customer Service and have the model and serial number of your mower ready. For the Model and Serial numbers refer to the silver tag attached to the rear of the mower housing.

Eastman Industries

70 Ingersoll Drive
Portland, Maine 04103

USA

Tel: (207) 878-5353

Fax: (207) 878-9109

www.eastmanmowers.com

Write the Engine model and serial numbers in the space below.

Model # _____

Serial # _____

Assembly

Installing the Handle

1. Mount the lower handle on the handle brackets with two (2) clevis and cotter pins. (Fig 3).

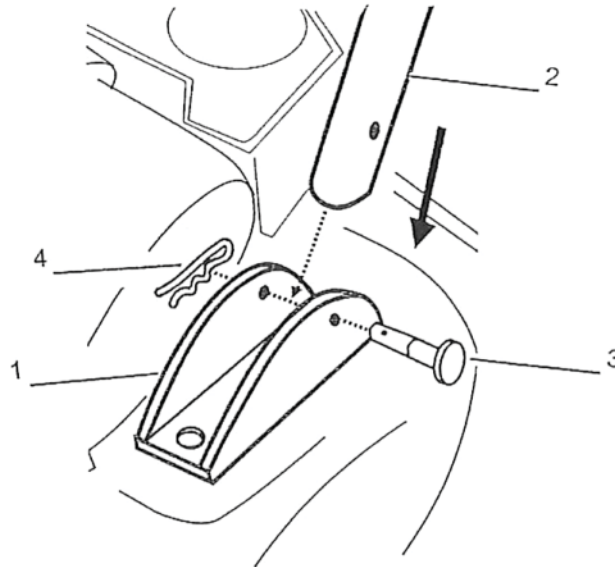


Figure 3

- | | |
|-------------------|-----------------|
| 1. Handle Bracket | 2. Lower Handle |
| 3. Clevis Pin | 4. Cotter Pin |

2. Attach the upper handle to the lower handle, with four (4) 5/16"-18 x 1 1/2" shoulder bolts and wing nuts (Fig 4)



Figure 4

3. Secure the throttle cable neatly behind the handles using black tie wraps. Use one tie wrap for the upper handle and one tie wrap for the lower handle.

Preparing the Engine

IMPORTANT: The Engine is shipped without oil.

Fill the engine with oil prior to startup in order to avoid serious damage to the engine.

Consult the engine manual for more complete instructions regarding engine maintenance and operation.



Filling the Crankcase with Oil

The crankcase holds 0.26 U.S. quarts (0.25 liters) of oil. Use only high-quality SAE 10W30 weight detergent oil that has the American Petroleum Institute (API) service classification SF, SG, or equivalent. SAE 30 W oil is recommended for ambient temperatures exceeding 80° F.

Before each use, ensure that the oil level is between the *Lower* and *Upper limit* marks on the dipstick. (Fig.5) **Do not screw in the dipstick to check the oil.**

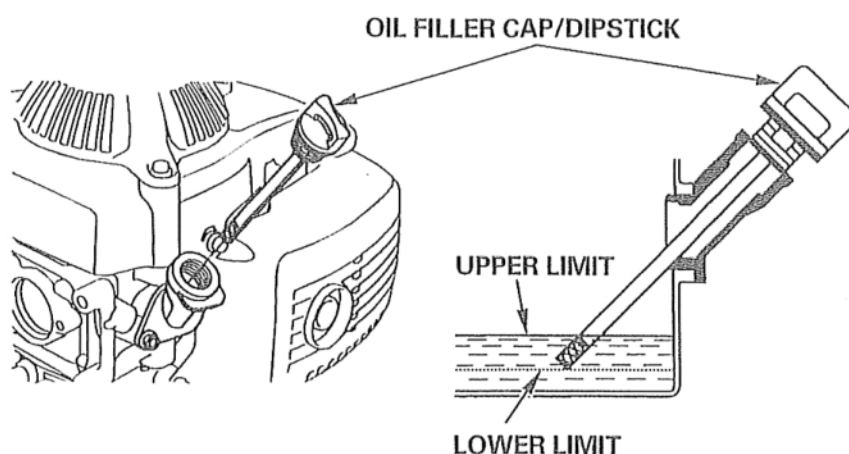


Figure 5

To add oil:

1. Move the lawn mower to a level surface.
2. Stop the engine and wait for the blade to stop.
3. Clean around the dipstick.
4. Remove the dipstick by rotating the cap.
5. Wipe the dipstick clean with a clean cloth.
6. Insert the dipstick into the filler neck BUT DO NOT SCREW IT IN. Then remove the dipstick and read the oil level. (Fig. 5)

7. If the oil level reading is below the *Lower Limit* mark on the dipstick, slowly pour only enough oil into the filler hole to raise the oil level to the *Upper Limit* mark on the dipstick. Do not overfill the crankcase with oil and run the engine; engine damage will result. Drain the excess oil until the oil level on the dipstick is within the limit.
8. Insert the dipstick into the filler neck and rotate the cap clockwise until it is tight.

Filling the Fuel Tank with Gasoline

- Use clean, fresh, lead-free gasoline with an octane rating of 86 or higher. Using unleaded gasoline results in fewer combustion deposits and longer engine life.
- Do not use gasoline containing more *than 5% methanol, 10% ethanol, or 15% MTBE*. Using fuels containing a higher percentage of these additives will damage the engine and void manufacturer's warranty.
- Do not use gasoline that is *stale or has been stored since the last mowing season or longer*.

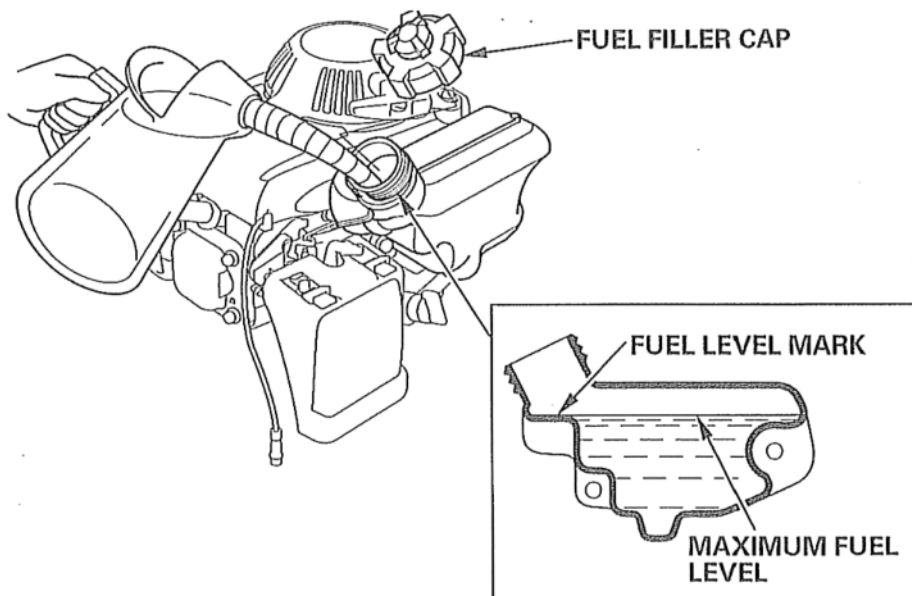


Figure 6

To Fill the Tank:

1. Stop the engine and wait for the blade to stop.
2. Clean around the fuel tank (Fig 6)
3. Remove the cap from the tank.
4. Fill the fuel tank to the bottom of the fuel level limit in the neck of the fuel tank. Do not over fill.
5. Install the cap and wipe up any spilled gasoline.

Operation

Before you start, make sure the mower is placed on grass devoid of rocks and loose branches:

WARNING: Never carry or tilt the mower with the carburetor leaning toward the ground. This will cause gasoline and engine oil to flow through the carburetor and soak the air filter. Replace the soaked air filter before attempting to start the engine.



Starting the Engine

1. Connect the wire to the spark plug.
2. Turn the fuel valve to the ON position (Fig. 7)

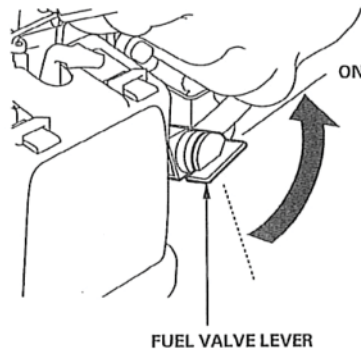


Figure 7

3. Open the fuel tank vent by turning the vent knob at least 2 or 3 turns counterclockwise.
(Fig. 8)

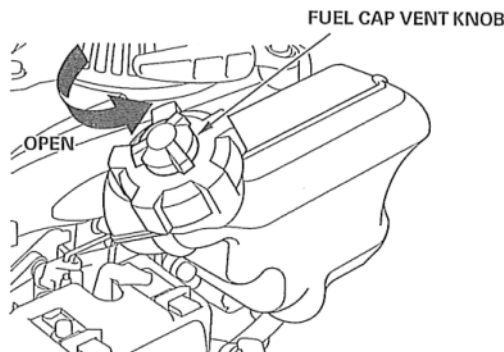


Figure 8

4. To start a cold engine, move the choke lever to the CLOSED position.

To restart a warm engine, leave the choke lever in the OPEN position. (Fig. 9)

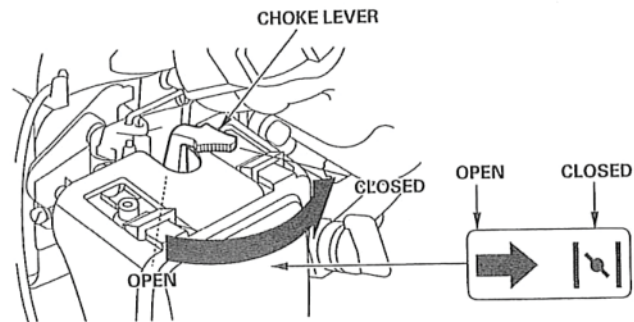


Figure 9

5. Pull the bail arm in toward the handle. (Fig 10)



Figure 10

6. Press in the red starter button on the handle. (Fig. 11)

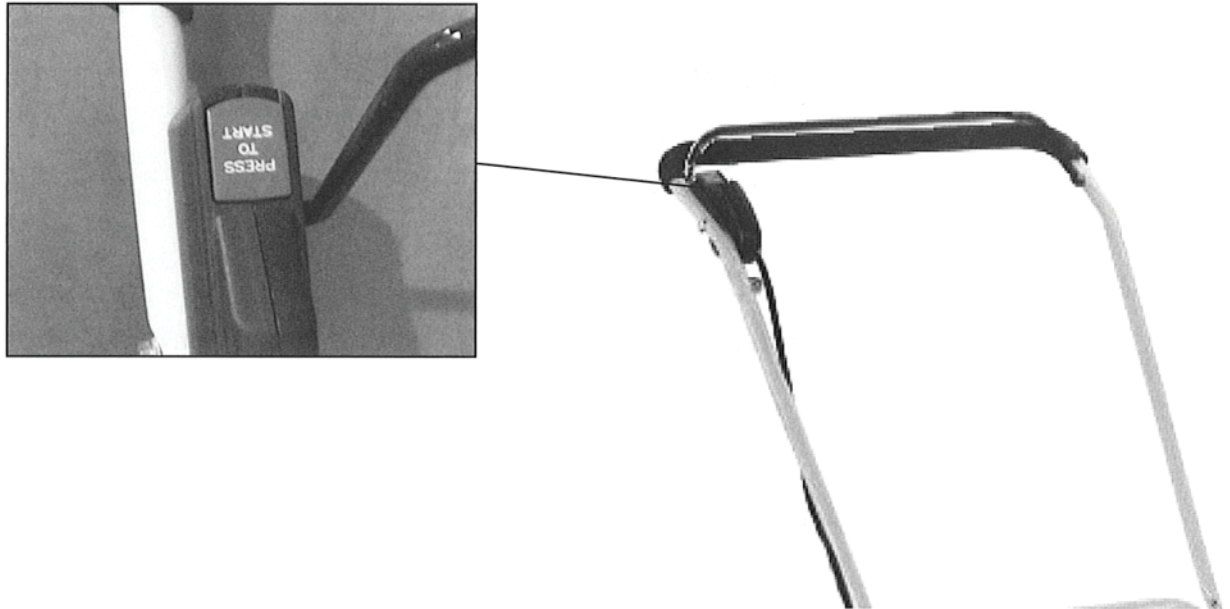


Figure 11

7. Pull the starter handle lightly until you feel resistance, then pull it sharply. (Fig. 12)



Figure 12

8. Move the choke lever to OPEN position gradually as the engine warms up. (Fig. 13)

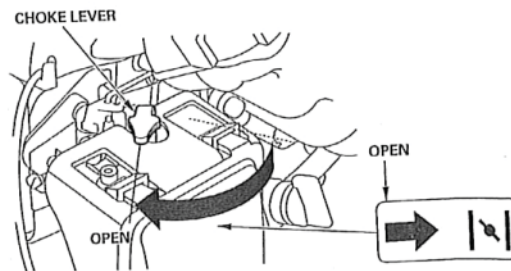


Figure 13



The engine operates at a **FIXED THROTTLE SPEED** for optimum performance.

Stopping the Engine

1. Release the bail arm to stop the engine. (Fig 14)



Figure 14

2. Disconnect the wire from the spark plug if you do not use the lawn mower or if you leave it unattended.
3. Shut the fuel valve.

Adjusting the Cutting Height

The cutting height can be adjusted from 1/2" – 3". The height is preset at approximately 2". The height can be raised or lowered in 1/4" or 1/2" increments.

1. Stop the engine and wait for the blade to stop before adjusting the cutting height.
2. Tilt the mower to its **left side** making sure the carburetor is on the upside of the mower and away from the ground. *Never tilt the mower with the carburetor pointing toward the ground.*
3. Remove the impeller retaining bolt, flat washer and cutter disc. (Fig. 15)

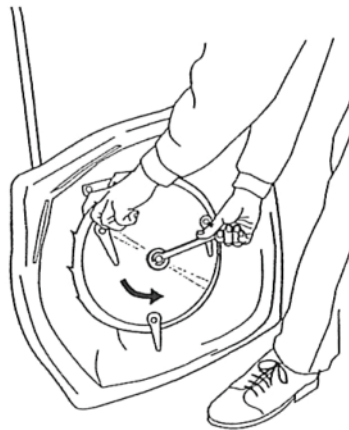


Figure 15

4. **To obtain a higher cut** remove the height adjustment spacer (s) from the impeller hub. Remount the cutter disc to obtain the highest cut - do not use any spacers. Install the flat washer and the Impeller retaining bolt. Tighten the bolt securely. (Fig 16)
 - a. Remove the height adjustment spacer (s) from the impeller hub. (Fig 16)
 - b. Remount the cutter disc.
 - c. Install the flat washer and the impeller retaining bolt.
 - d. Tighten the bolt securely.
 - e. To obtain the maximum cut height, do not use any spacers.
 - f. Use a 2 3/4" long Impeller retaining bolt when no adjustment spacers are used.

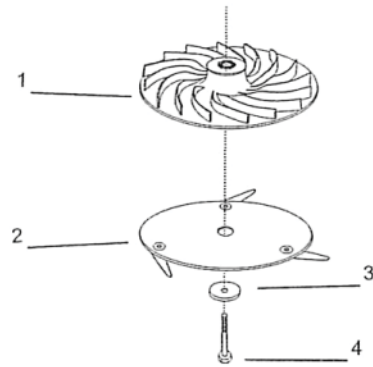


Figure 16

- | | |
|----------------|----------------------------|
| 1. Impeller | 3. Impeller Flat Washer |
| 2. Cutter Disc | 4. Impeller Retaining bolt |

5. **To obtain a lower cut** add height adjustment spacer (s) between the impeller hub and the cutter disc. Remount the cutter disc. Install the flat washer and the impeller retaining bolt. Tighten the bolt securely. (Fig. 17)
 - a. Add height adjustment spacer (s).
 - b. Remount the cutter disc.
 - c. Install the flat washer and the impeller retaining bolt.
 - d. Tighten the bolt securely.
 - e. Use a 3 ¼" long impeller retaining bolt when one ½" spacer is used.
 - f. Use a 3 ¾" long impeller retaining bolt when two ½" spacers are used.

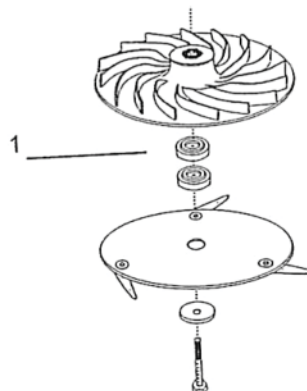


Figure 17

1. Height Adjustment spacer

Operating Tips

- Review the safety instructions and read this Manual carefully before operating the lawn mower.
- Never mow on slopes with inclines exceeding 45°.
- Never attempt to mow by pushing the lawn mower up the slope.
- Keep the mower pointing down when mowing slopes.
- Always stay above the mower when mowing slopes.
- Walk across the slopes not up and down.
- Clear the area of sticks, stones, wire, branches and other debris that the blade could hit or throw.
- Keep everyone, especially children and pets, away from the area of operation.
- Avoid striking trees, walls, curbs or other solid objects. Never deliberately mow over any object.
- If the lawn mower strikes an object or starts to vibrate, immediately stop the engine, disconnect the wire from the spark plug and examine the lawn mower for damage.
- Maintain sharp blades throughout the cutting season.
- Replace the blades when necessary with original Eastman Industries replacement blades.
- Mow only dry grass or leaves. Wet grass and leaves tend to clump on the yard and can cause the lawn mower to plug or the engine to stall.
- Wet grass or leaves can cause serious injury if you slip and come in contact with the blades.
- Clean the underside of the lawn mower deck after each mowing. Keep the engine in good running condition.
- Clean the air filter frequently. Mulching stirs up more clippings and dust which clogs the air filter and reduces engine performance.
- **Consult the Engine Operator's Manual for more complete instructions regarding engine maintenance and operation.**

Recommended Maintenance Schedule

Note: Determine the left and right sides of the machine from the normal operating position.

Service Interval	Maintenance Procedure
Each Use	<p>Check the engine oil level.</p> <p>Check the blades and blade attachment bolts. Tighten if they are loose.</p> <p>Check the air cleaner.</p> <p>Remove grass clippings from the impeller fins.</p> <p>Remove the grass clippings and dirt from under the housing.</p> <p>Clean the air intake area around the engine.</p>
5 Hours	<p>Check the blades and the blade attachment bolts. Tighten them if they are loose.</p> <p>Replace the blade mounting bolts if they are worn or damaged.</p> <p>Inspect the cutter disc. Change if the cutter disc is bent or the pem inserts are lose or worn.</p>
25 Hours	Clean the air cleaner. (1)
50 Hours	<p>Change the engine oil. (2) (3)</p> <p>Clean – replace the air cleaner. (1)</p> <p>Sharpen or replace the blade; maintain it more frequently if the edge dulls quickly in rough or in sandy conditions.</p> <p>Clean the fuel filter.</p> <p>Check for leaks in the fuel system and/or a deteriorating fuel hose. Replace parts if necessary.</p>
100 Hours	<p>Inspect the spark plug and replace it if necessary.</p> <p>Clean – replace the air cleaner.</p> <p>Clean the cooling system; remove grass clippings, debris, or dirt from the engine air cooling fins and starter. Clean the system more frequently in dirty or high-chaff conditions.</p>
150 Hours	<p>Replace the air filter. Replace it more frequently in dusty conditions.</p> <p>Replace the spark plug.</p>
Storage	Empty the fuel tank before repairs or before storage.

(1) Service more frequently when used in dusty conditions.

(2) Change the engine oil after the first 5 operating hours (first oil change only).

(3) Change the engine oil every 25 hours when used under heavy load or high ambient temperature.

Checking the Engine Oil Level

Before you use the lawn mower, make sure that the oil level is between the *Upper* and the *Lower Limit* marks as shown on the dipstick. If the oil level is below the *Lower Limit* mark, add oil.

Cleaning the Underside of the Lawn Mower Housing

To ensure the best performance, keep the underside of the lawn mower housing clean.

1. Disconnect the spark plug wire and drain the fuel tank.
2. Tip the lawn mower onto its **left side** with the **carburetor and air cleaner on the upside of the mower and away from the ground**. Remove the grass thoroughly and return the mower to up-right position.

Servicing the Air Cleaner

Clean the filter element every 25 operating hours. Replace the filter element every season or every 150 operating hours - clean and replace the filter element more frequently in dusty conditions.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug.
3. Press the latch tabs on the top of the filter cover and remove the cover. (Fig. 18)

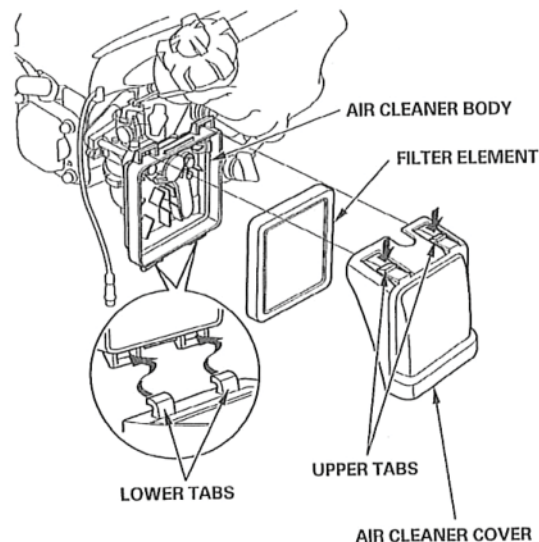


Figure 18

4. Clean the filter element in warm, soapy water. Rinse and allow to dry thoroughly. Or clean in nonflammable solvent and allow to dry.

5. Dip the filter element in clean engine oil, then squeeze out all excess oil. The engine will smoke when started if too much oil is left in the filter element.
6. Wipe dirt from the air cleaner body and cover, using a moist rag. Be careful to prevent dirt from entering the carburetor.
7. Install the filter element and cover.

Changing the Engine Oil

Change the oil after the first month or after **5** operating hours and then after every 6 months or every 50 operating hours.

1. Run the engine to warm the engine oil.
2. Stop the engine and wait for all moving parts to stop.
3. Disconnect the wire from the spark plug.
4. Turn the fuel valve to off position.
5. Remove the dipstick and drain the oil into a pan by removing the drain plug. (Fig 19)

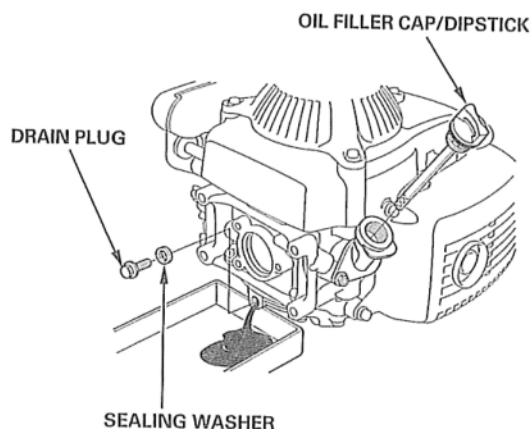


Figure 19

6. Recycle the used oil according to local codes.
7. Reinstall the oil drain plug and new washer, and tighten the oil drain plug securely.
8. Fill the crankcase to the *Upper Limit* line on the dipstick with fresh oil. **Do not screw in the dipstick to check the oil.**
9. Wipe up any spilled oil.

Maintaining the Cutter Disc

Always mow with a balanced cutter disc making sure that the pem inserts, the blade attachment bolts and blades are securely fastened to the disc.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug.
3. Turn the fuel valve to off position.
4. Tip the lawn mower onto its **left side** with the **carburetor and air cleaner on the upside of the mower and away from the ground**.
5. Remove the blade attachment bolts and the blades.
6. Check the cutter disc for flatness by placing a straight edge against the disc. Replace the disc if it is bent, warped or damaged. Never operate the mower with a bent disc. A bent or damaged disc will cause excessive vibration and hazardous operating conditions. Loose components can be thrown causing serious injury or death.
7. Inspect the pem inserts embedded in the disc for looseness or wear. Replace the disc if the pems are loose or damaged. Do not try to tighten the pems if they are loose. Loose pems can be thrown into the operator's path causing serious injury or death.
8. Inspect the blade attachment bolts for looseness or excessive wear. Tighten, if necessary. Replace worn or damaged bolts. Loose or damaged blades and bolts can be thrown into the operator area causing serious injury or death.
9. Inspect the blades for wear or damage. Replace worn and damaged blades. Worn or damaged blades can be thrown into operator area causing serious injury or death.

Removing the Blade

Grasp the cutter disc firmly using a rag or a glove. Remove the blade mounting bolts using a ¼" Allen wrench.

Installing the Blade

Make certain the blades are mated to the correct blade attachment bolts.

1. Mount the blades on the blade attachment bolts.
2. Screw the blade attachment bolts into the pem fasteners on the cutter disc.
3. The blades should fit snugly into the blade attachment bolts.
4. Tighten the bolts.

Draining the Fuel Tank and Carburetor

Clean the fuel filter element every 50 operating hours.

1. Stop the engine and wait for it to cool down.
2. Disconnect the wire from the spark plug.
3. Open the fuel valve by turning the lever to the open position.
4. Remove the carburetor bowl drain bolt and gasket, then drain the fuel into an approved gasoline container (Fig 20).
5. Do not force the carburetor bowl off the carburetor body.

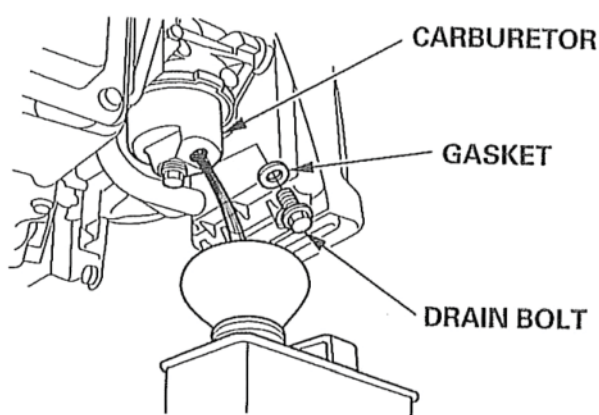


Figure 20

6. Install the drain bolt and tighten securely.

Servicing the Spark Plug

Check the spark plug after every 150 operating hours.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug.
3. Clean around the spark plug.
4. Remove the spark plug from the cylinder head, with a 5/8 inch spark plug wrench.
5. Set the gap on the plug to 0.024 – 0.028 In (0.60 – 0.70 mm)
6. Install the spark plug and the gasket seal.
7. Connect the wire to the spark plug.

Storage

To prepare the lawn mower for storage, perform the recommended maintenance procedures. Refer to *Maintenance* on page 19.

Store the lawn mower in a dry place. Empty the fuel tank after mowing the last time before storing the lawn mower.

1. Run the lawn mower until the engine stops from running out of fuel.
2. When you can no longer start the engine, it is sufficiently dry.

Preparing the Engine

1. While the engine is still warm, change the oil from the crankcase.
2. Remove the spark plug.
3. Using an oil can, add about one tablespoon of oil to the crankcase through the spark plug hole.
4. Slowly rotate the engine several times, using the starter rope, to distribute the oil.
5. Install the spark plug. **Do Not** connect the wire to the spark plug.

General Information

1. Clean the lawn mower housing.
2. Check the condition of the blade.
3. Service the air filter.
4. Tighten all nuts, bolts and screws.

Removing the Lawn Mower from Storage

1. Check and tighten all fasteners.
2. Remove the spark plug and spin the engine rapidly using the starter to blow excess oil from the cylinder.
3. Clean the spark plug or replace it if it is cracked, broken or if the electrodes are worn.
4. Install the spark plug.
5. Fill the fuel tank with fresh gasoline.
6. Check the engine oil level.
7. Connect the wire to the spark plug.

Troubleshooting

Problem	Possible Cause	Corrective Action
Engine does not start	<ol style="list-style-type: none"> 1. The fuel tank is empty or the fuel system contains stale fuel. 2. The air filter is soaked with oil or gasoline. 3. The engine is not in <i>Choke</i> position. 4. The wire is not connected to the spark plug. 5. The spark plug is pitted, fouled or the gap is incorrect. 6. Starter switch malfunctions or is worn. 7. Starter switch wires worn or not connected. 	<ol style="list-style-type: none"> 1. Drain and/or fill the fuel tank with fresh gasoline. If the problem persists, contact an Authorized Service Dealer. 2. Replace the filter. 3. Move the throttle lever to the <i>Choke</i> position. 4. Connect the wire to the spark plug. 5. Check the spark plug and adjust the gap if necessary. Replace the spark plug if it is pitted, fouled or cracked. 6. Replace starter switch. 7. Repair and connect wire.
Engine starts hard or loses power	<ol style="list-style-type: none"> 1. The fuel tank contains stale fuel. 2. The fuel cap vent hole is plugged. 3. The air filter element is dirty and is restricting the air flow. 4. The underside of the lawn mower is clogged with clippings and debris. 5. The spark plug is pitted, fouled or the gap is incorrect. 6. The engine oil level is low or the oil is dirty. 	<ol style="list-style-type: none"> 1. Drain and fill the fuel tank with fresh gasoline. 2. Clean the fuel cap vent hole or replace the fuel cap. 3. Clean the air filter pre-cleaner and/or replace the air filter. 4. Clean the underside of the lawn mower deck, the air intakes and impeller fins. 5. Check the spark plug and adjust the gap if necessary. Replace the spark plug if it is pitted, fouled or cracked. 6. Check the engine oil. Change the oil if it is dirty or add oil if it is low.

Troubleshooting

Problem	Possible Cause	Corrective Action
The mower does not hover	<ol style="list-style-type: none"> 1. The engine does not run at the correct speed. 2. Air vents are clogged with grass clippings and debris. 3. Impeller fins and underside of the deck are clogged with grass and debris. 	<ol style="list-style-type: none"> 1. Correct the engine speed. 2. Clean and unclog. 3. Remove the impeller. Thoroughly clean the impeller and the deck.
Engine runs rough	<ol style="list-style-type: none"> 1. The wire is not connected to the spark plug. 2. The spark plug is pitted, fouled or the gap is incorrect. 3. The throttle lever is not in the <i>Run</i> position. 4. The air filter element is dirty and is restricting the air flow. 	<ol style="list-style-type: none"> 1. Connect the wire to the spark plug. 2. Check the spark plug and adjust the gap if necessary. Replace the spark plug if it is pitted, fouled or cracked. 3. Move the throttle lever to the <i>Run</i> position. 4. Clean the air filter element or replace the air filter.
Mower or engine vibrates excessively	<ol style="list-style-type: none"> 1. The cutter disc is bent or warped. 2. The blade attachment bolts are loose or missing. 3. The underside of the lawn mower deck contains clippings and debris. 4. Cut Height Adjustment spacers are not properly mounted. 5. The engine mounting bolts are loose. 	<ol style="list-style-type: none"> 1. Replace the cutter disc. 2. Tighten the blade attachment bolts. 3. Clean the underside of the lawn mower deck. 4. Remount and tighten properly. 5. Tighten the engine mounting bolts.



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PO Box 603, REDCLIFFE QLD 4020
Ph: 1300 363 027 Fax: 1800 33 22 13
Email: powerup@rgs.com.au
www.plpgolfandturf.com.au

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