

eXmark[®]



METRO[®] 21

**For Serial Nos.
790,000 & Higher**
Part No. 4500-400 Rev. A

Operator's Manual

⚠ WARNING

CALIFORNIA Proposition 65 Warning

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Important: When the mower is used or operated on any California forest, brush or grass covered land, a working spark arrester must be attached to the muffler. If not, the operator is violating state law, Section 4442 Public Resource Code. To acquire a spark arrester for your unit, see your Engine Service Dealer.

This spark ignition system complies with Canadian ICES-002 Ce système d'allumage par étincelle de véhicule est conforme à la norme NMB-002 du Canada

The enclosed Engine Owner's Manual is supplied for information regarding The U.S. Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance and warranty.

Keep this engine Owner's Manual with your unit. Should this engine Owner's Manual become damaged or illegible, replace immediately. Replacements may be ordered through the engine manufacturer.

Exmark reserves the right to make changes or add improvements to its products at any time without incurring any obligation to make such changes to products manufactured previously. Exmark, or its distributors and dealers, accept no responsibility for variations which may be evident in the actual specifications of its products and the statements and descriptions contained in this publication.



If your Exmark dealer does not have the Exmark part in stock, Exmark will get the parts to the dealer the next business day or the part will be FREE Guaranteed!! (Some restrictions apply. See your participating Exmark Dealer for details.)

Introduction

CONGRATULATIONS on the purchase of your Exmark Mower. This product has been carefully designed and manufactured to give you a maximum amount of dependability and years of trouble-free operation.

This manual contains operating, maintenance, adjustment, and safety instructions for your Exmark mower.

BEFORE OPERATING YOUR MOWER, CAREFULLY READ THIS MANUAL IN ITS ENTIRETY.

By following the operating, maintenance, and safety instructions, you will prolong the life of your mower, maintain its maximum efficiency, and promote safe operation.

If additional information is needed, or should you require trained mechanic service, contact your authorized Exmark equipment dealer or distributor.

All Exmark equipment dealers and distributors are kept informed of the latest methods of servicing and are equipped to provide prompt and efficient service in the field or at their service stations. They carry ample stock of service parts or can secure them promptly for you from the factory.

All Exmark parts are thoroughly tested and inspected before leaving the factory, however, attention is required on your part if you are to obtain the fullest measure of satisfaction and performance.

Whenever you need service, genuine Exmark parts, or additional information, contact an Authorized Service Dealer or Exmark Customer Service and have the model and serial numbers of your product ready.

Figure 1 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.

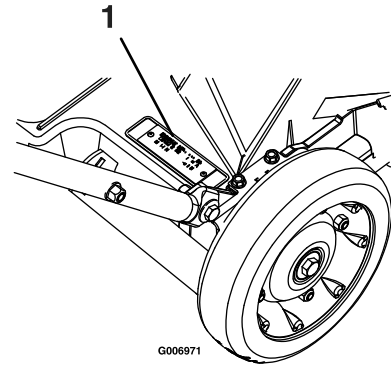


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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Safety

Safety Alert Symbol

This lawn mower meets or exceeds the CPSC blade safety requirements for walk-behind rotary mowers and the B71.4 specifications of the American National Standards Institute in effect at the time of production

Exmark designed and tested this lawn mower to offer reasonably safe service; however, failure to comply with the following instructions may result in personal injury.

This Safety Alert Symbol (Figure 2) is used both in this manual and on the machine to identify important safety messages which must be followed to avoid accidents

This symbol means: **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



Figure 2

1. Safety alert symbol

The safety alert symbol appears above information which alerts you to unsafe actions or situations and will be followed by the word **DANGER**, **WARNING**, or **CAUTION**.

DANGER: White lettering / Red background. Indicates an imminently hazardous situation which, if not avoided, **Will** result in death or serious injury.

WARNING: Black lettering / Orange background. Indicates a potentially hazardous situation which, if not avoided, **Could** result in death or serious injury.

CAUTION: Black lettering / Yellow background. Indicates a potentially hazardous situation which, if not avoided, **May** result in minor or moderate injury.

This manual uses two other words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

Safe Operating Practices

Training

- Read the Operator's Manual and other training material. If the operator(s) or mechanic(s) can not read English it is the owner's responsibility to explain this material to them.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people or property.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by Exmark.
- Wear appropriate clothing including safety glasses, substantial footwear, long trousers, and hearing protection. Do Not operate when barefoot or when wearing open sandals. Long hair, loose clothing or jewelry may get tangled in moving parts.

CAUTION

This machine produces sound levels in excess of 85 dBA at the operator's ear and can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

- Inspect the area where the equipment is to be used and remove all rocks, toys, sticks, wires, bones, and other foreign objects which can be thrown by the machine and may cause personal injury to the operator or bystanders.

⚠ DANGER

In certain conditions gasoline is extremely flammable and vapors are explosive.

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

- Fill the fuel tank outdoors in an open area, when the engine is cold. Wipe up any gasoline that spills.
- Never refill the fuel tank or drain the machine indoors or inside an enclosed trailer.
- Do Not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1/4 to 1/2 inch (6–13 mm) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.
- Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by spark.
- Store gasoline in an approved container and keep it out of the reach of children.
- Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel when engine is running or when the engine is hot.
- If fuel is spilled, Do Not attempt to start the engine. Move away from the area of the spill and avoid creating any source of ignition until fuel vapors have dissipated.
- Do Not operate without entire exhaust system in place and in proper working condition.

⚠ DANGER

In certain conditions during fueling, static electricity can be released causing a spark which can ignite gasoline vapors. A fire or explosion from gasoline can burn you and others and cause property damage.

- Always place gasoline containers on the ground away from your vehicle before filling.
- Do Not fill gasoline containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.
- When practical, remove gas-powered equipment from the truck or trailer and refuel the equipment with its wheels on the ground.
- If this is not possible, then refuel such equipment on a truck or trailer from a portable container, rather than from a gasoline dispenser nozzle.
- If a gasoline dispenser nozzle must be used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.

⚠ WARNING

Gasoline is harmful or fatal if swallowed. Long-term exposure to vapors has caused cancer in laboratory animals. Failure to use caution may cause serious injury or illness.

- Avoid prolonged breathing of vapors.
 - Keep face away from nozzle and gas tank/container opening.
 - Keep away from eyes and skin.
 - Never siphon by mouth.
- Check that the operator's presence controls, safety switches, and shields are attached and functioning properly. Do Not operate unless they are functioning properly.

Operation

WARNING

Operating engine parts, especially the muffler, become extremely hot. Severe burns can occur on contact and debris, such as leaves, grass, brush, etc. can catch fire.

- Allow engine parts, especially the muffler, to cool before touching.
- Remove accumulated debris from muffler and engine area.
- Install and maintain in working order a spark arrester before using equipment on forest-covered, grass-covered, or brush-covered unimproved land.

WARNING

Engine exhaust contains carbon monoxide, which is an odorless deadly poison that can kill you.

Do Not run engine indoors or in a small confined area where dangerous carbon monoxide fumes can collect.

- Operate only in daylight or good artificial light, keeping away from holes and hidden hazards.
- Start the engine carefully according to instructions with feet well away from the blades.
- Never raise deck with blades running.
- Never operate the mower with damaged guards, shields, or covers. Always have safety shields, guards, switches and other devices in place and in proper working condition.
- Never mow with the discharge deflector raised, removed or altered unless there is a grass collection system or mulch kit in place and working properly.
- Grass catcher components are subject to wear, damage and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check the components and replace them with the manufacturer's recommended parts when necessary.
- Do Not change the engine governor setting or overspeed the engine.

- Never attempt to make wheel height adjustments while the engine is running.
- Stop engine, wait for all moving parts to stop, remove the spark plug wire(s) and/or remove key.
 - Before checking, cleaning or working on the mower.
 - After striking a foreign object or abnormal vibration occurs (inspect the mower for damage and make repairs before restarting and operating the mower).
 - Before clearing blockages.
 - Whenever you leave the mower.
- Stop engine, wait for all moving parts to stop:
 - Before refueling.
 - Before dumping the grass catcher.
 - Before making height adjustments.

WARNING

Hands, feet, hair, clothing, or accessories can become entangled in rotating parts. Contact with the rotating parts can cause traumatic amputation or severe lacerations.

- **Do Not operate the machine without guards, shields, and safety devices in place and working properly.**
- **Keep hands, feet, hair, jewelry, or clothing away from rotating parts.**
- Keep clear of the discharge opening at all times.
- To extend the life the engine brake, place the throttle control in the "slow" position; then stop the engine.
- This mower was designed for one operator only. Keep all others away from mower during operation.
- **DO NOT** operate the mower when people, especially children, or pets are in the area.
- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions.
- Stop the blades, slow down, and use caution when crossing surfaces other than grass and when transporting the mower to and from the area to be mowed.

Safety

- Be aware of the mower discharge path and direct discharge away from others.
- Do Not operate the mower under the influence of alcohol or drugs.
- Use extreme care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Slope Operation

Use **Extreme** caution when mowing and/or turning on slopes as loss of traction and/or tip-over could occur. The operator is responsible for safe operation on slopes.

⚠ DANGER

Operating on wet grass or steep slopes can cause sliding and loss of control. Loss of control and/or loss of operator's footing could result in a fall with an arm or leg getting under the mower or engine deck which may result in serious injury, death or drowning.

- **Mow across slopes, never up and down.**
 - **Do Not mow slopes when grass is wet.**
 - **Do Not mow near drop-offs or near water.**
 - **Do Not mow excessively steep slopes.**
 - **Reduce speed and use extreme caution on slopes.**
 - **Avoid sudden turns or rapid speed changes.**
- When feasible, avoid operating the equipment in wet grass.
 - Progressively greater care is needed as the slope increases.
 - Remove or mark obstacles such as rocks, tree limbs, etc. from the mowing area. Tall grass can hide obstacles.
 - Watch for ditches, holes, rocks, dips and rises that change the operating angle, as rough terrain could overturn the machine.
 - Use extreme care with grass catchers or attachments. These can change the stability of the machine and cause loss of control.

Maintenance and Storage

- Stop the engine and remove the spark plug wire(s) and/or remove key. Wait for all movement to stop before adjusting, cleaning or repairing.
- Keep engine and engine area free from accumulation of grass, leaves, excessive grease or oil, and other debris which can accumulate in these areas. These materials can become combustible and may result in a fire.
- Let engine cool before storing and Do Not store near flame or any enclosed area where open pilot lights or heat appliances are present.
- Shut off fuel while storing or transporting. Do Not store fuel near flames or drain indoors.
- Park machine on level ground. Never allow untrained personnel to service machine.
- Remove spark plug wire before making any repairs.
- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
- Keep hands and feet away from moving parts. If possible, Do Not make adjustments with the engine running.
- Keep all guards, shields and all safety devices in place and in safe working condition.
- Check all bolts frequently to maintain proper tightness.
- Frequently check for worn or deteriorating components that could create a hazard.
- All replacement parts must be the same as or equivalent to the parts supplied as original equipment.

Safety and Instructional Decals

- Keep all safety signs legible. Remove all grease, dirt and debris from safety signs and instructional labels.
- Replace all worn, damaged, or missing safety signs.
- When replacement components are installed, be sure that current safety signs are affixed to the replaced components.
- If an attachment or accessory has been installed, make sure current safety signs are visible.
- New safety signs may be obtained from your authorized Exmark equipment dealer or distributor or from Exmark Mfg. Co. Inc.
- Safety signs may be affixed by peeling off the backing to expose the adhesive surface. Apply only to a clean, dry surface. Smooth to remove any air bubbles.
- Familiarize yourself with the following safety signs and instruction labels. They are critical to the safe operation of your Exmark commercial mower.



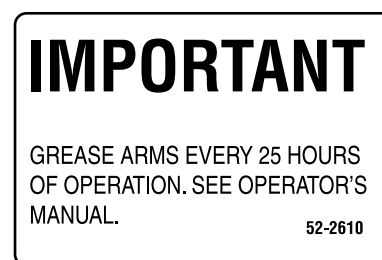
39-5770

For Units without a Blade Brake Clutch
(MPKA21, MPKA21CA, MSKA21, MSKA21CA,
and MSHN21)



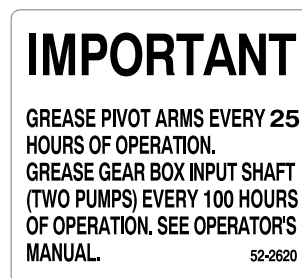
43-8480

For Units with a Blade Brake Clutch
(MSKA21B, MSHN21B, and MSKA21BCA)



52-2610

For Push Units
(MPKA21 and MPKA21CA)



52-2620

For Self-Propelled Units
(MSKA21, MSKA21CA, MSKA21B, MSKA21BCA,
MSHN21, and MSHN21B)



68-7410

Common to All Units

Safety



74-1970

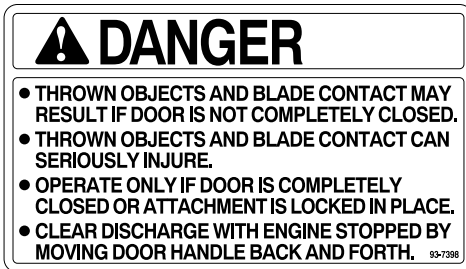
For Self-Propelled Units
(MSKA21, MSKA21CA, MSKA21B, MSKA21BCA,
MSHN21, and MSHN21B)

1. Transmission speeds
2. Neutral



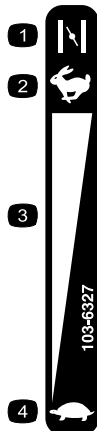
77-0500

Common to All Units



93-7398

Common to All Units



103-6327

For MPKA21, MSKA21, and MSHN21 Units Only

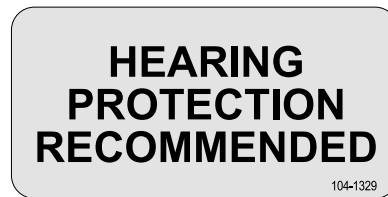
1. Choke
2. Fast
3. Continuous variable setting
4. Slow



103-6328

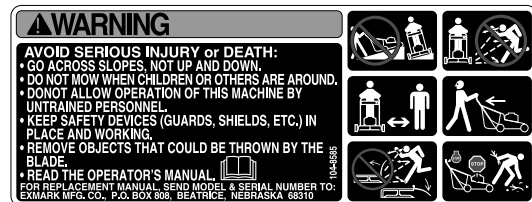
For MSKA21B and MSHN21B Units Only

1. Choke
2. Fast
3. Continuous variable setting
4. Slow
5. Engine—stop



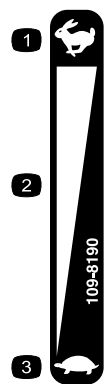
104-1329

Common to All Units



104-8585

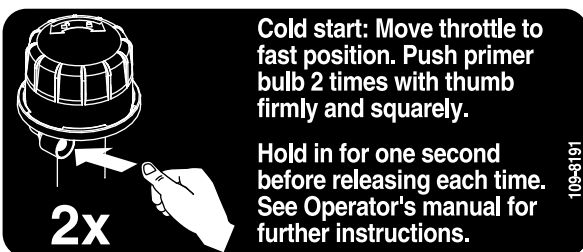
Common to All Units



109-8190

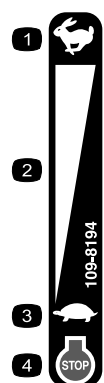
On MPKA21CA and MSKA21CA Units Only

1. Fast
2. Continuous variable setting
3. Slow



109-8191

On MPKA21CA, MSKA21CA,
and MSKA21BCA Units Only



109-8194

On MSKA21BCA Units Only

1. Fast
2. Continuous variable setting
3. Slow
4. Engine—stop

Specifications

Model Numbers

Serial Nos: 790,000 and Higher

MPKA21; MPKA21CA; MSKA21; MSKA21CA; MSKA21B; MSKA21BCA; MSHN21; MSHN21B

Systems

Engine

- Engine Specifications: See your Engine Owner's Manual
- RPM: 3300 (No Load)

Fuel System

- Capacity:
MPKA21, MSKA21, and MSKA21B Units:
4.0 qt (3.8 L)
MPKA21CA, MSKA21CA, and MSKA21BCA
Units: 2.1 qt (2.0 L)
Honda Units: 2.1 qt (2.0 L)
- Type of Fuel: Regular unleaded gasoline, 87 octane or higher.
- Fuel Filter: Non-replaceable, in tank
- Fuel Shut-Off Valve: MPKA21, MSKA21, and MSKA21B and Honda Units: In-line 1/4 turn increments.
MPKA21CA, MSKA21CA, and MSKA21BCA Units Do Not have a shut-off valve.

Safety Interlock System

For units without a Blade Brake Clutch: Operator must have the blade control bail depressed to start the engine. Releasing the blade control bail will cause the engine to stop.

Transmission (Self Propelled Units)

3 speeds forward

Speed Range:

- 1st–2.0 mph (3.2 km/hr)
- 2nd–2.9 mph (4.6 km/hr)
- 3rd–4.1 mph (6.6 km/hr)

Cutting Deck

- Cutting Width: 21 inches (53.3 cm)
- Blade Brake: When the blade engagement control is moved to the disengaged position a friction brake pad stops the rotation of the blades.
- Blade Size: (1 ea.): 20.88 inches (53.0 cm)
- Deck: 21 inches rigid. Deck design allows for bagging, mulching or side discharge.
- Cutting Height Adjustment:
Adjusts from 3/4 inches (1.9 cm) to 3 1/4 inches (8.3 cm) in 1/2 inch (1.3 cm) increments.
- Mulching Kit: Standard
- Side Discharge Kit: Optional

Dimensions

Curb Weight:

122 lb (55 kg) Weights may vary slightly depending on engine option.

Overall Width:

22.25 inches (56.5 cm)

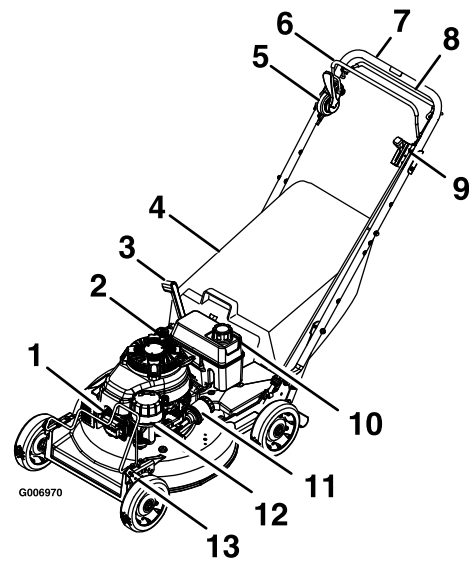
Overall Length and Height at 2 1/4 inch Cutting Height:

Handle Setting	Length	Height
High	60.50 inches (153.7 cm)	42.75 inches (108.6 cm)
Medium	64.25 inches (163.2 cm)	40.38 inches (102.6 cm)
Low	67.00 inches (170.2 cm)	37.88 inches (96.2 cm)

Overall Length and Height at Alternate Handle Mounting Position:

Handle Setting	Length	Height
High	62.63 inches (159.1 cm)	37.50 inches (95.3 cm)
Medium	64.38 inches (163.5 cm)	35.50 inches (90.2 cm)
Low	66.25 inches (168.3 cm)	33.63 inches (85.4 cm)

Product Overview



- Figure 3**
- | | |
|--|--|
| 1. Spark plug | 8. Drive Bail
(Self-Propelled Units Only) |
| 2. Oil fill/dipstick | 9. Throttle/Choke control |
| 3. Discharge door handle | 10. Fuel tank |
| 4. Grass bag | 11. Oil filter |
| 5. Blade Control Lever
(Blade Brake Units Only) | 12. Air filter |
| 6. Blade Control Bail | 13. Cutting height lever |
| 7. Handle | |

Operation

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

Controls

Blade Control Bail

Located on the upper handle as shown in Figure 4.

When the blade control bail is depressed, the system senses that the operator is in the normal operator's position.

- **For Units with a Blade Brake Clutch:** When the blade control bail is released, the system senses that the operator has moved from the normal operating position and will stop the blade.
- **For Units without a Blade Brake Clutch:** When the blade control bail is released, the system senses that the operator has moved from the normal operating position and will kill the engine.

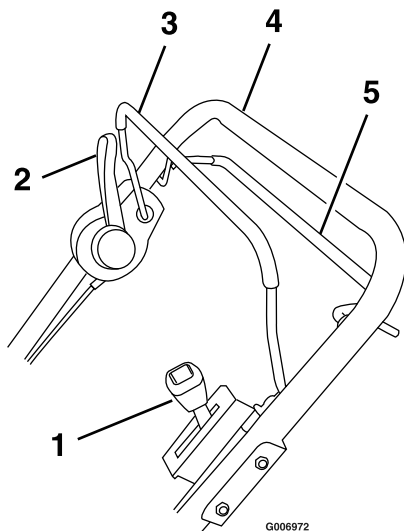


Figure 4

- | | |
|--|---|
| 1. Throttle-Choke Control | 4. Handle |
| 2. Blade Control Lever
(Blade Brake Units Only) | 5. Drive Bail
(Self-Propelled Units
Only) |
| 3. Blade Control Bail | |

control lever. When this bail is released the unit will stop moving.

Throttle-Choke Control

The throttle-choke control is located on the left side of the handles as shown in Figure 4.

The lever is used to control engine speed. Moving the lever to the full forward (Choke) position will place the lever in the choke position. The choke aids in starting a cold engine. Moving the throttle control forward will increase engine speed and moving it to the rear will decrease engine speed.

For units with a Blade Brake Control: The throttle-choke control also includes an engine kill position. Moving the lever into the full rearward (Off) position will kill the engine.

Note: MPKA21CA, MSKA21CA, and MSKA21BCA Units Do Not have a choke.

Blade Control Lever (Blade Brake Clutch Units Only):

The blade control lever is located on the right side of the handle next to the Blade Control Bail as shown in Figure 4.

Moving the blade control lever into the full forward position while depressing the blade control bail engages the blade. Releasing the blade control bail automatically disengages the blades.

Ground Speed (Shifter) Control (Self-Propelled Units Only):

The ground speed control is located at the rear of the belt cover as shown in Figure 5.

The ground speed control has three settings which control the ground speed of the mower: 1 is slow, 2 is medium, and 3 is fast.

Self-Propel Drive Bail (For Self-Propelled Units Only)

Located on the upper handle as shown in Figure 4.

When the self-propel drive bail is squeezed, the unit will move forward at the speed set on the speed

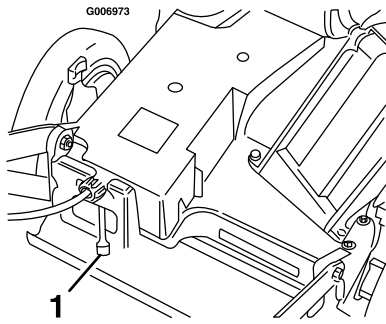


Figure 5

1. Ground speed control

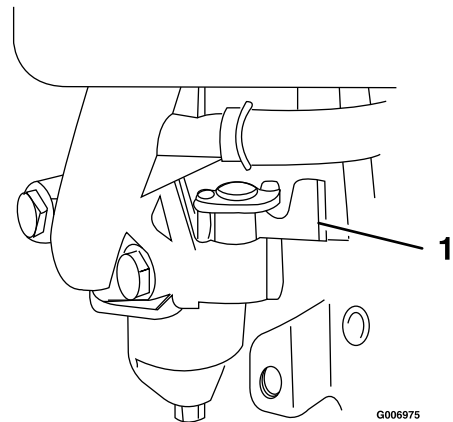


Figure 7

MSHN21 and MSHN21B Units

1. Fuel valve

Fuel Shut-Off Valve

For MPKA21, MSKA21, and MSKA21B Units:
The fuel shut off valve is installed on the fuel line midway between the fuel tank and the engine as shown in Figure 6.

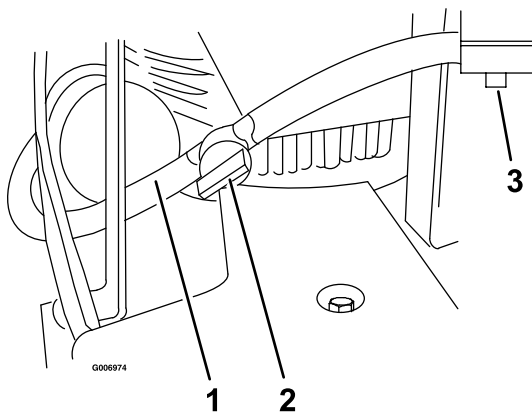


Figure 6

MPKA21, MSKA21, and MSKA21B Units

1. Fuel line
2. Fuel valve
3. Elbow fitting

For MSHN21 and MSHN21B Units: The fuel shut off valve is located on the engine as shown in Figure 7.

For MPKA21CA, MSKA21CA, and MSKA21BCA Units: Do not have a fuel shut off valve.

The fuel shut off valve shuts off the flow of fuel when the machine will not be used for a few days, when parking inside a building, and during transport to and from the job. Rotate the valve 1/4 turn clockwise to shut off fuel. Rotate the valve 1/4 turn counterclockwise to turn on fuel.

Pre-Start

Fill fuel tank. For best results use only clean, fresh regular grade unleaded gasoline with an octane rating of 87 or higher. To ensure freshness, purchase only the quantity of gasoline that you expect to use in 30 days. Using unleaded gasoline results in fewer combustion deposits and longer engine life. See Engine Owner's Manual.

Do Not add oil to gasoline.

Do Not use methanol, gasoline containing methanol, gasohol containing more than 10% ethanol, premium gasoline or white gas. Using these fuels can damage the engine's fuel system.

Do Not use gasoline that has been stored since the last mowing season or longer.

Do Not overfill fuel tank. Never fill the fuel tank so that the fuel level rises above a level that is 1/2 inch below the bottom of the filler neck to allow for fuel expansion and prevent fuel spillage.

Operation

Make sure you understand the controls, their locations, their functions, and their safety requirements.

Refer to the Maintenance section and perform all the necessary inspection and maintenance steps.

Operating Instructions

Handle Adjustment

The handle may be adjusted to different heights for comfortable operation. Stand behind the handle to determine the height. To adjust the handle height, position the capscrews and the locknuts that secure the handle latches to the handle into the other mounting holes in the latches.

See Figure 8A for the highest possible handle heights.

See Figure 8B for the lowest possible handle heights.

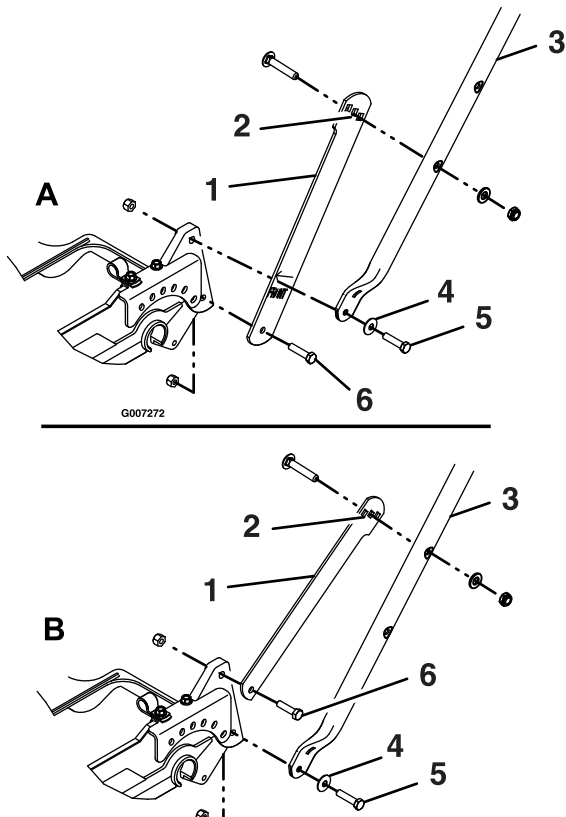


Figure 8

- | | |
|--|--------------------------------------|
| 1. Handle latch | 4. Spring disc washer |
| 2. Adjustment holes in upper end of handle latch | 5. 5/16-18 x 1 3/8 inch hex capscrew |
| 3. Handle | 6. 5/16-18 x 1 1/4 inch hex capscrew |

1. Install the hardware in the lower holes in the handle and latches as shown in Figure 8.
2. Install hardware in one of the three adjustment holes in the upper ends of each of the handle latches to obtain the desired handle height within the selected range.
3. Slide the bag support rod through into the upper, middle, or lower mounting holes in the handle and secure each end with a cap locknut. The bag support rod mounting hole location corresponds with the mounting hole location for the handle latches as shown in the table.

Bag Support Rod Mounting Hole Location	Handle Latch Mounting Hole Location
Lower	Lower
Middle	Middle
Upper	Upper

Open the Fuel Shut-Off Valve

Rotate the valve 1/4 turn counterclockwise to turn the fuel on.

Starting the Engine

1. Connect the wire to the spark plug.

For MSHN21 and MSHN21B Units: see Figure 9.

For MPKA21, MSKA21, MSKA21B, MPKA21CA, MSKA21CA, and MSKA21BCA Units: see Figure 10.

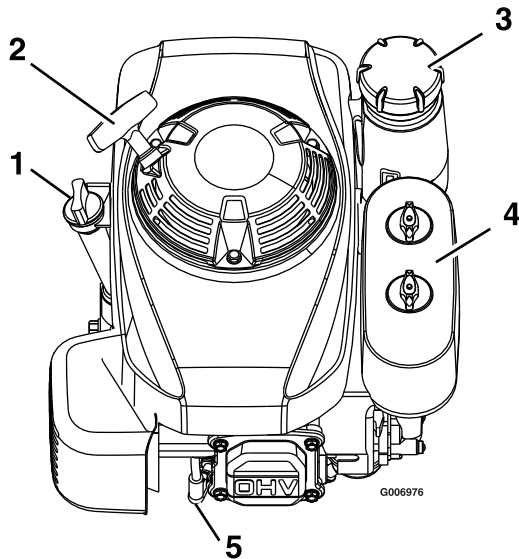


Figure 9
All Honda Units

- | | |
|--------------------------|----------------|
| 1. Oil fill/dipstick | 4. Air cleaner |
| 2. Recoil starter handle | 5. Spark plug |
| 3. Fuel tank cap | |

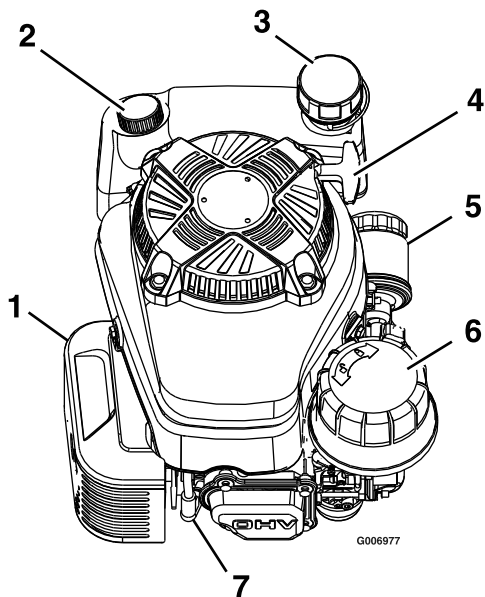


Figure 10
All Kawasaki Units

- | | |
|--------------------------|----------------|
| 1. Muffler | 5. Oil filter |
| 2. Oil fill/dipstick | 6. Air cleaner |
| 3. Fuel tank cap | 7. Spark plug |
| 4. Recoil starter handle | |

- Open the fuel valve.

For MPKA21, MSKA21, and MSKA21B Units: see Figure 6.

For MSHN21 and MSHN21B Units: see Figure 7.

MPKA21CA, MSKA21CA, and MSKA21BCA Units: Do Not have a fuel valve.

- For MSHN21 MSHN21B, MPKA21, MSKA21, and MSKA21B Units:** Move the throttle-choke control to the Choke position.

Note: Do Not use the choke when the engine is warm up.

For MPKA21CA, MSKA21CA, and MSKA21BCA Units: Move the throttle control to the Fast position. Press the primer bulb two times (see Figure 11).

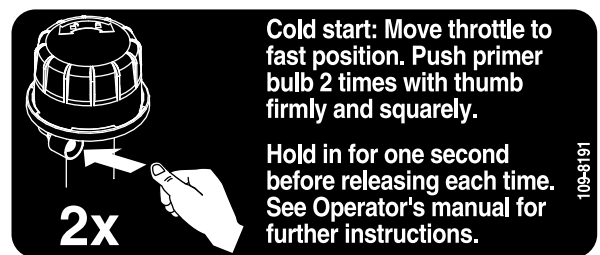


Figure 11

- For units without a Blade Brake Clutch:** Hold the blade control bail to the handle.
- Pull the starter handle lightly until you feel resistance, then pull it sharply. Allow the rope to return slowly.
- When the engine starts, move the throttle control to the Fast position, and set the ground speed control as desired.

Note: If the engine fails to start after three pulls, repeat steps 3 through 6).

Stopping the Engine

- Bring the unit to a full stop.
 - For units without a Blade Brake Clutch:** Release the blade control bail. Both the engine and the blade should stop within three seconds.
 - For units with a Blade Brake Clutch:** Release the blade control bail. The blade should stop within three seconds. Move the throttle to the (Off) position to kill the engine.

Operation

Note: If the blade does not stop within 3 seconds after releasing the blade control bail, contact an Authorized Service Dealer.

2. Close the fuel shut-off valve, if equipped with, when the machine will not be in use for a few days, when transporting, or when the unit is parked inside a building.

Using the Self-Propel Drive (Self-Propelled Units Only)

The lawn mower has three ground speeds: 1 is slow, 2 is medium, and 3 is fast.

1. Start the engine.
2. Using the ground speed control, select the desired ground speed.
3. Squeeze the drive bail against the handle (see Figure 4).

Note: Do Not shift speeds while squeezing the ground speed control against the handle. This can damage the transmission. Release the ground speed control before changing speeds.

Note: You can vary the ground speed by increasing or decreasing the distance between the ground speed control and the handle. Lower the control bar to decrease the ground speed when you are making a turn or if the lawn mower is moving too fast for you. If you lower the control bar too far the lawn mower stops self-propelling. Squeeze the ground speed control closer to the handle to increase the ground speed. When you hold the ground speed control tight against the handle, the lawn mower self-propels at the maximum ground speed. Move the ground speed control to the **Neutral** position when you use the lawn mower for trimming or whenever you leave the lawn mower.

Operating the Blade Control Lever (Blade Brake Clutch Units Only)

1. Start the engine.
2. Squeeze the blade control bail against the handle (Figure 4).
3. Move the blade control lever to the full forward Latch position. Blades should engage.
4. Release the blade control bail to disengage the blades.

Note: The blade control lever will release rapidly when the blade control bail is released. To avoid minor injury, keep hands clear of the blade control lever when the blade control bail is released.

Using the Discharge Tunnel

1. Stop the engine and wait for all moving parts to stop.
2. Insert the plug. (Refer to **Installing the Discharge Plug** section).
3. To remove the plug, move the discharge door handle rearward and lift up the spring clip on the bottom of the plug. When the plug is unlocked, pull it out of the discharge tunnel.

Note: When grass is thick and lush, clippings may collect on and around the discharge tunnel plug. This may make removing the plug difficult. Clean the plug thoroughly after each use.

Checking the Blade Brake Clutch (Blade Brake Clutch Units Only)

Check the Blade Brake Clutch (BBC) system before each use to ensure that it is operating properly.

Normal Test:

1. Stop the engine and wait for all moving parts to stop.
2. Move the lawn mower onto a paved surface in a non-windy area.
3. Set all four wheels in to the 2 1/2 inches (6.4 cm) cutting height (see Figure 13).
4. Set the ground speed selector to the **N (Neutral)** position.
5. Take a half sheet of newspaper and crumple it into ball small enough to go under the deck (about 3 inches or 7.6 cm in diameter) as shown in Figure 12.

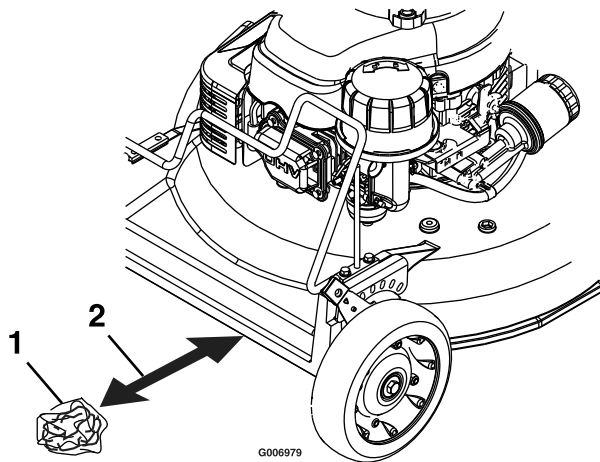


Figure 12

1. Crumpled newspaper 2. 5 inches (12.7 cm)

6. Place the ball of newspaper 5 inches (12.7 cm) in front of the lawn mower.
7. Start the engine.
8. Squeeze the blade control bail against the handle.
9. Move the blade control lever to the full forward Latch position. Blades should engage.
10. Release the blade control bail. You should hear a “bang.” The blade should stop in three seconds.
11. Immediately push the lawn mower over the newspaper ball.
12. Stop the engine and wait for all moving parts to stop.
13. Walk around the lawn mower to check for the newspaper ball. If the ball did not go under the deck, repeat steps 7 through 12.
14. Pull the lawn mower away from the newspaper. If the newspaper ball unravels or is shredded, the blade has not properly stopped, resulting in an unsafe operating condition. Contact an Authorized Service Dealer.

⚠ DANGER

If the blade brake clutch system is inoperative, the blade will continue to rotate when you release the blade control bail. Contact with the blade could occur, causing serious injury.

- Check the BBC operation before each use.
- Never use the BBC-equipped lawn mower with an inoperative safety system.
- Take your lawn mower to an Authorized Service Dealer for repair if the safety system fails to operate properly.

Test Using the Grass Bag

1. Install the empty grass bag on the discharge tunnel.
2. Start the engine.
3. Squeeze the blade control bail against the handle.
4. Move the blade control lever to the full forward Latch position. The bag should begin to inflate, indicating that the blade is engaged and rotating.
5. Release the blade control bail. If the bag does not immediately deflate, it indicates that the blade is still rotating. The blade brake clutch mechanism may deteriorating, and, if ignored could result in an unsafe operating condition. Have the lawn mower inspected and serviced by an Authorized Service Dealer.

Adjusting the Cutting Height

Each wheel is adjusted individually with a wheel height adjustment lever. The cutting heights are listed in the following table.

Cutting Heights	
3/4 inch (19 mm)	2 1/4 inches (57 mm)
1 1/4 inches (32 mm)	2 3/4 inches (70 mm)
1 3/4 inches (44 mm)	3 1/4 inches (83 mm)

Operation

⚠ WARNING

Adjusting the cutting height levers could bring your hands into contact with a moving blade. A moving blade can cause serious injury.

- Stop the engine and wait for all movement to stop before adjusting the cutting height.
- Do Not put your fingers under the housing when adjusting the cutting height.

1. Pull the wheel height adjustment lever toward the wheel (Figure 13) and move it to the desired setting.

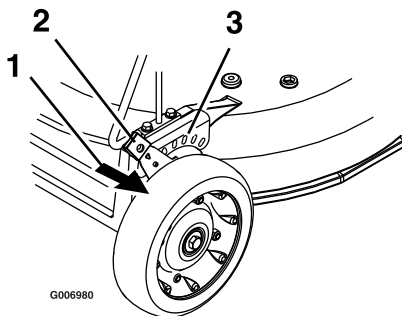


Figure 13

1. Pull towards wheel
2. Wheel Height Adjustment Lever
3. Notches

2. Release the wheel height adjustment lever and set it securely in the notch.
3. Adjust all the wheels to the same cutting height setting.

Using the Grass Bag

Occasionally, you may wish to use the grass bag for bagging extra long grass, lush grass, or leaves.

- Installing the Grass Bag
 1. Stop the engine and wait for all moving parts to stop.
 2. Ensure that the discharge door handle is fully forward and that the pin is engaged in the catch (Figure 14).

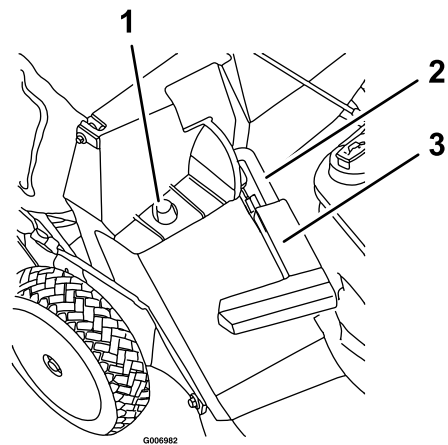


Figure 14

1. Bag Frame on retaining post.
2. Pin engaged in catch.
3. Handle fully forward—discharge door closed.

3. Slide the hole in the bag frame onto the retaining post on the discharge tunnel.
4. Set the rear of the bag frame onto the bag support rod.
5. Pull the discharge door handle forward until the pin clears the catch, and move the handle rearward until the pin locks in the bag notch (Figure 15).

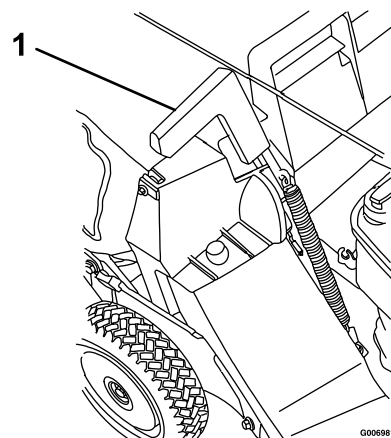


Figure 15

1. Pin locked in bag notch.

Note: The discharge door in the lawn mower housing is now open.

- Mowing with the Grass Bag

WARNING

A worn grass bag could allow small stones and other similar debris to be thrown in the operator's or bystander's direction. Thrown objects can result serious personal injury or death to the operator or bystanders.

Check the grass bag frequently. If it is damaged, install a new Exmark replacement bag.

Cut the grass until the bag is full.

Note: Do Not overfill the bag.

- Removing the Grass Bag
 1. Stop the engine and wait for all moving parts to stop.
 2. Raise the discharge door handle and move it forward to engage the pin with the catch (Figure 14).
 3. Grasp the handles at the front and the rear of the bag and lift the bag off the lawn mower.
 4. Gradually tip the bag forward to empty the clippings.
 5. To install the bag, refer to the Installing the Grass Bag section.

DANGER

If the discharge door does not close completely, the lawn mower could throw objects. Thrown objects can result serious personal injury or death to the operator or bystanders.

- Never open the door to the discharge opening when the engine is running.
- If you cannot close the door because the grass clippings clog the discharge area, stop the engine and gently move the discharge door handle back and forth until you can close the door completely. If you still cannot close the door, remove the obstruction with a stick, not your hand.

DANGER

If the discharge door does not close completely, the lawn mower could throw objects. Thrown objects can result serious personal injury or death to the operator or bystanders.

Never open the door on the discharge tunnel when the engine is running.

Operating Tips

- Review the Safety section and read this manual carefully before operating the lawn mower.
- Set the engine speed to the fastest position for the best cutting results.
- Maintain a sharp blade throughout the cutting season. Periodically file down nicks on the blade. Replace the blade when necessary with an original Exmark replacement blade.
- Clean the air filter frequently. Mulching stirs up more clippings and dust which clogs the air filter and reduces engine performance.

Cutting Grass

- Grass grows at different rates at different times of the year. In the summer heat, it is best to cut grass at the 2 1/4 inch (57 mm), 2 3/4 inch (70 mm), or 3 1/4 inch (83 mm) cutting height settings. Cut only about a third of the grass blade at a time. Do Not cut below the 2 1/4 inch (57 mm) setting unless the grass is sparse or it is late fall when grass growth begins to slow down.
- When cutting grass over 6 inches (15 cm) tall, first mow at the highest cutting height setting and walk slower; then mow again at a lower setting for the best lawn appearance. If the grass is too long and the leaves clump on top of the lawn, the lawn mower may plug and cause the engine to stall.
- Alternate the mowing direction. This helps disperse the clippings over the lawn for even fertilization.

If the finished lawn appearance is unsatisfactory, try one or more of the following:

- Sharpen the blade.
- Walk at a slower pace while mowing.
- Cut the grass more frequently.

Operation

- Overlap cutting swaths instead of cutting a full swath with each pass.
- Set the cutting height on the front wheels one notch lower than the rear wheels. For example, set the front wheels at 2 1/4 inches (57 mm) and the rear wheels at the 2 3/4 inches (70 mm).

Cutting Leaves

- After cutting the lawn, ensure that half of the lawn shows through the cut leaf cover. You may need to make more than one pass over the leaves.
- For light leaf coverage, set all the wheels at the same cutting height setting.
- If there are more than 5 inches (12.7 cm) of leaves on the lawn, set the front cutting height 1 or 2 notches higher than the rear cutting height. This makes it easier to feed the leaves under the lawn mower deck.
- Slow down your mowing speed if the lawn mower does not cut the leaf finely enough.
- If you mow over oak leaves, you can add lime to the grass in the spring to reduce the acidity of the oak leaves.

Maintenance

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

⚠ WARNING

If you leave the wire on the spark plug, someone could accidentally start the engine. Accidental starting of the engine could seriously injure you or other bystanders.

Disconnect the wire from the spark plug before you do any maintenance. Set the wire aside so that it does not accidentally contact the spark plug.

⚠ WARNING

The engine can become very hot. Touching a hot engine can cause severe burns.

Allow the engine to cool completely before service or making repairs around the engine area.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 5 hours	<ul style="list-style-type: none"> Change the engine oil.
Before each use or daily	<ul style="list-style-type: none"> Check the engine oil level. Check the stopping time of the blade brake. The blade must stop within 3 seconds of releasing the bail; if it does not, contact an Authorized Service Dealer for repair. Check the mower blades and the engine mounting fasteners. Check for loose hardware. Clean the grass build-up from under the deck. Clean the discharge tunnel and plug.
Every 25 hours	<ul style="list-style-type: none"> Clean the foam pre-cleaner (Kawasaki Units). Clean the cover, base, foam and paper elements (Honda Units).
Every 40 hours	<ul style="list-style-type: none"> Check the condition of the belt(s).
Every 50 hours	<ul style="list-style-type: none"> Change the engine oil. (May need more often under severe conditions.) Grease the pivot arms. Clean under the belt cover (self-propelled models only). Clean the blade brake clutch shield. Check for leaks in the fuel systems and /or deteriorating fuel hose.
Every 100 hours	<ul style="list-style-type: none"> Change the oil filter (Kawasaki Units Only). Service the wheels. Grease the gear case (self-propelled units only). Check the spark plugs. For Blade Brake Clutch Units: Adjust the blade brake cable. Clean the fuel filter element (Kawasaki Units Only).
Every 250 hours	<ul style="list-style-type: none"> Replace the air filter elements (Honda Units). (May need more often if they are damaged or excessively dirty.)
Every 300 hours	<ul style="list-style-type: none"> Replace the paper air filter (Kawasaki Units). (May need more often in dusty conditions. See the Engine manual for additional information.)
Yearly	<ul style="list-style-type: none"> Lubricate the gear case (self-propelled units only)
Yearly or before storage	<ul style="list-style-type: none"> Empty the fuel tank before repairs as directed or before storage.

Periodic Maintenance

Check Engine Oil Level

Service Interval: Before each use or daily

1. Stop engine and wait for all moving parts to stop. Make sure unit is on a level surface.
2. Check with engine cold.
3. Clean area around dipstick. Remove dipstick and wipe oil off. Reinsert the dipstick and push it all the way down into the tube. **Do Not** screw into place. Remove the dipstick and read the oil level.

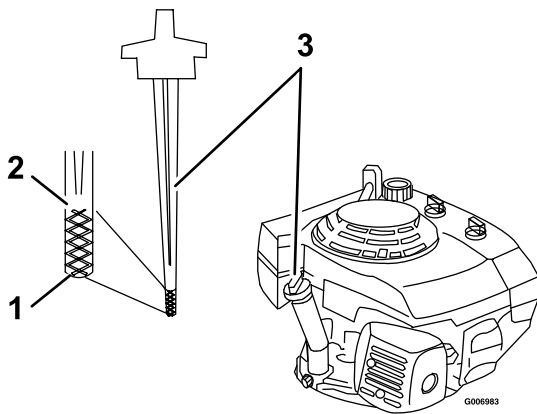


Figure 16
Honda Engine

1. Lower limit mark
2. Upper limit mark
3. Dipstick

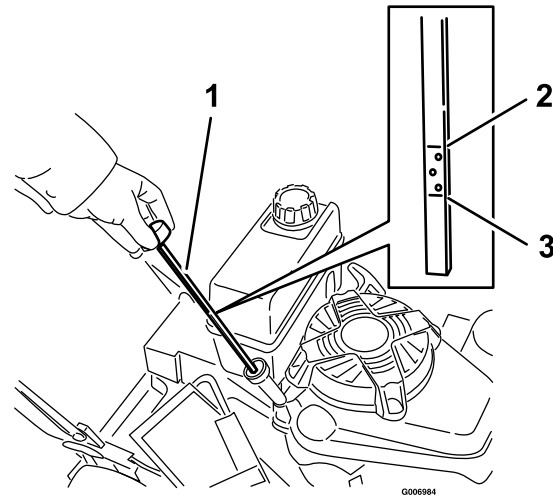


Figure 17
Kawasaki Engine

1. Dipstick
2. Full
3. Add

4. If the oil level is low, wipe off the area around the oil fill cap, remove cap and fill to the “FULL” mark on the dipstick. Use oil as specified in Engine Owner’s Manual. **Do Not** overfill.

Important: Do Not operate the engine with the oil level below the “LOW” (or “ADD”) mark on the dipstick, or over the “FULL” mark.

Checking the Blade Brake Clutch (For Units with a Blade Brake Clutch Only)

Service Interval: Before each use or daily

Refer to **Checking the Blade Brake Clutch** in the Operating Instructions section.

Check the Mower Blade

Service Interval: Before each use or daily

Always mow with a sharp blade. A sharp blade cuts cleanly and without tearing or shredding the grass blades.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug (Figure 9 and Figure 10).
3. Drain the gasoline from the fuel tank.

4. Tip the lawn mower onto its right side (see Figure 18 and Figure 19).

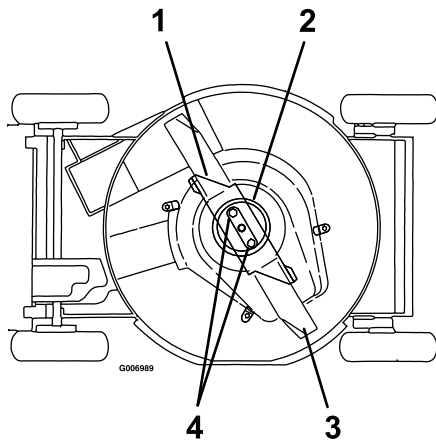


Figure 18

Blade Brake Clutch Units Only

- | | |
|-------------------|---------------|
| 1. Accelerator | 3. Blade |
| 2. Anti-Scalp Cup | 4. Blade Nuts |

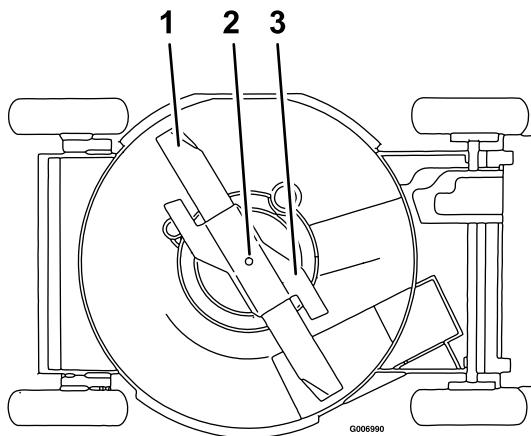


Figure 19

Units Without a Blade Brake Clutch Only

- | | |
|---------------|----------------|
| 1. Blade | 3. Accelerator |
| 2. Blade Bolt | |

5. Inspect the blade for sharpness and wear, especially where the flat and the curved parts meet (see Figure 20A). Because 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 lawn mower. If you notice a slot or wear (Figure 20B and Figure 20C), replace the blade.

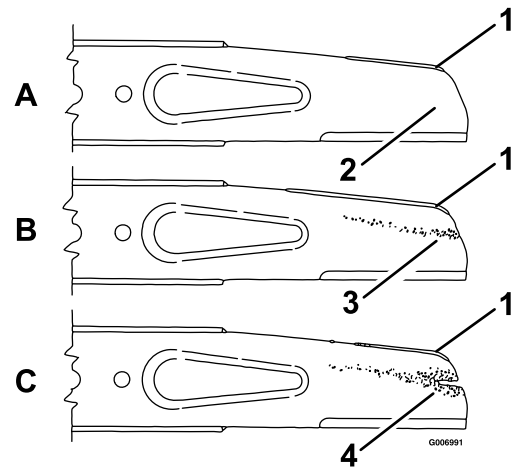


Figure 20

- | | |
|---------|---------|
| 1. Sail | 3. Wear |
| 2. Flat | 4. Slot |

Note: For the best performance, install a new blade before the cutting season begins. During the year, file down any small nicks to maintain the cutting edge.

⚠ DANGER

A worn or damaged blade can break. A piece of the blade could be thrown into the operator's or bystander's area, resulting in serious personal injury or death.

- Inspect the blade periodically for wear or damage.
- Replace a worn or damaged blade.

If it is necessary to remove the blade for replacement or sharpening, complete the following steps:

6. Remove the blade. Make sure to grasp the end of the blade using a rag or a thickly padded glove.
- For Blade Brake Clutch Units: Remove the blade nuts, anti-scalp cup, accelerator, and the blade (Figure 18).
 - For Units without a Blade Brake Clutch: Remove the blade bolt, accelerator, and blade (Figure 19).
7. For Sharpening: File the top side of the blade to maintain its original cutting angle (Figure 21A) and inner cutting edge radius (Figure 21B). The blade will remain balanced if you remove the same amount of material from both cutting edges.

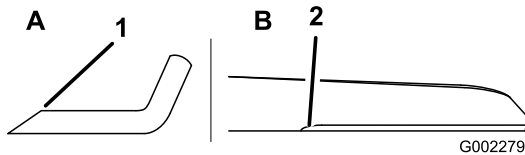


Figure 21

1. Cutting angle
2. Cutting edge radius

8. Check the balance of the blade by placing the center hole of the blade over a nail or screwdriver shank clamped horizontally in a vise (Figure 22). If either end of the blade rotates downward, file that end (not the cutting edge). The blade is properly balanced when neither end drops.

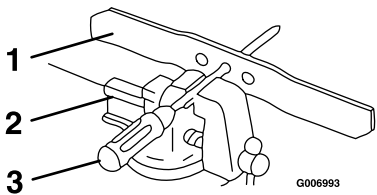


Figure 22

1. Blade
2. Vise
3. Screwdriver

9. For Installation: Make sure to grasp the end of the blade using a rag or a thickly padded glove.

For Blade Brake Clutch Units: Install a sharp, balanced Exmark blade, the accelerator, the anti-scalp cup, and the blade nuts. The sail of the blade must point toward the top of the lawn mower housing for proper installation. Torque the blade nuts to 15-27 ft-lb (20-37 N m).

For Units without a Blade Brake Clutch: Install a sharp, balanced Exmark blade, the accelerator, and blade bolt. The sail of the blade must point toward the top of the lawn mower housing for proper installation. Torque the blade nuts to 50 ft-lb (68 N m).

⚠ DANGER

Operating the lawn mower without the accelerator in place can cause the blade to flex, bend, or break. Thrown objects from a broken blade can result in serious injury or death to the operator or bystanders.

Do Not operate the lawn mower without the accelerator.

10. Return the lawn mower to its upright position.
11. Connect the wire to the spark plug.

Check for Loose Hardware

Service Interval: Before each use or daily

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Visually inspect machine for any loose hardware or any other possible problem. Tighten hardware or correct the problem before operating.

Service Air Filter (Kawasaki Units)

Service Interval: Every 25 hours—Clean the foam pre-cleaner (Kawasaki Units).

Every 300 hours—Replace the paper air filter (Kawasaki Units). (May need more often in dusty conditions. See the Engine manual for additional information.)

Note: Do Not operate the engine without the air filter assembly; extreme engine damage will occur.

1. Stop engine, wait for all moving parts to stop.
2. Disconnect the wire from the spark plug (Figure 10).
3. Remove the cover and clean it thoroughly.

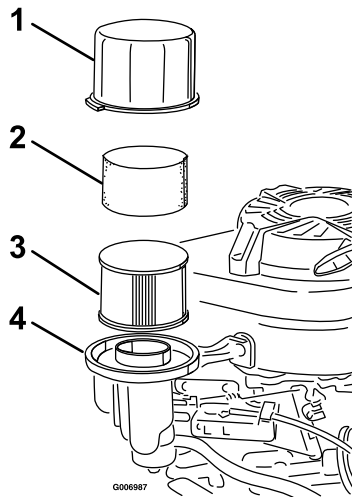


Figure 23

- | | |
|---------------------|---------------------|
| 1. Cover | 3. Paper air filter |
| 2. Foam pre-cleaner | 4. Air filter base |

- Remove the paper air filter and discard it as required.

Note: Do Not try to clean a paper air filter.

- Remove the foam pre-cleaner and wash it with a mild detergent and water, then blot it dry.
- Saturate the pre-cleaner with clean engine oil, then squeeze it (Do Not twist) to remove the excess oil.
- Install the foam pre-cleaner.
- Install the new paper air filter.
- Install the cover.

Service Air Filter (Honda Units)

Service Interval: Every 25 hours—Clean the cover, base, foam and paper elements (Honda Units).

Every 250 hours—Replace the air filter elements (Honda Units). (May need more often if they are damaged or excessively dirty.)

Note: Do Not operate the engine without the air cleaner assembly; extreme engine damage will occur.

- Stop the engine and wait for all moving parts to stop.

- Disconnect the wire from the spark plug (Figure 9).
- Remove the two wing nuts that secure the cover (Figure 24).

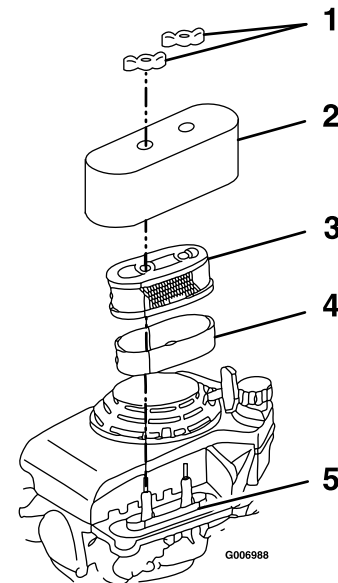


Figure 24

- | | |
|------------------|-----------------|
| 1. Wing nuts | 4. Foam element |
| 2. Cover | 5. Base |
| 3. Paper element | |

- Remove the cover.

Note: Be careful to prevent dirt and debris from falling into the base.

- Remove the foam and paper elements from the base.
- Remove the foam element from the paper element.
- Inspect the foam and paper elements, and replace them if they are damaged or excessively dirty.
- Tap the paper element on a hard surface several times or use compressed air not exceeding 30 psi (207 kPa) through the filter from the wire screen side to remove any excess dirt. If the paper element is excessively dirty, replace it.

Note: Never try to brush dirt off the paper element; brushing forces the dirt into the fibers.

- Clean the foam element in warm, soapy water or in a **nonflammable** solvent.
- Rinse and dry the foam element thoroughly.

Maintenance

11. Dip the foam element in clean engine oil, then squeeze out the excess oil.

Note: Excess oil in the foam element restricts the air flow through the element and may reach the paper filter and clog it.

12. Wipe dirt from the base and the cover with a moist rag.

Note: Be careful to prevent dirt and debris from entering the air duct leading to the carburetor.

13. Install the air cleaner elements and ensure that they are properly positioned.
14. Securely install the cover with the two wing nuts.

Change Engine Oil

**Service Interval: After the first 5 hours
Every 50 hours (May need
more often under severe
conditions.)**

1. Run the engine to warm the engine oil.

Note: Warm oil flows better and carries more contaminants.

⚠ WARNING

Oil may be hot after engine has been run. Contact with hot oil can cause severe personal injury.

Avoid contacting the hot engine oil when you drain it.

2. Stop engine, wait for all moving parts to stop.
3. Disconnect the wire from the spark plug.
4. Place a suitable drain pan under the dipstick/oil drain.
5. Clean around the dipstick.
6. Remove the dipstick by rotating the cap counterclockwise and pulling it out.
7. Raise the left side of the lawn mower to drain the oil from the dipstick fill tube into the drain pan.
8. After draining the oil, return the lawn mower to the operating position.
9. Fill the crankcase with fresh oil to the upper limit mark on the dipstick.
10. Insert the dipstick into the filler neck and rotate the cap clockwise until it is tight.

11. Wipe up any spilled oil.
12. Connect the wire to the spark plug.
13. Recycle the used oil according to local codes.

Changing the Oil Filter (Kawasaki Units Only):

Service Interval: Every 100 hours

1. Run the engine to warm the oil.
2. Stop the engine and wait for all moving parts to stop.
3. Disconnect the wire from the spark plug.
4. Drain the engine oil.
5. Place a rag under the oil filter to catch any oil that may leak out as you remove the filter.
6. Remove the oil filter.
7. Use your finger to coat the gasket on the new filter with clean engine oil (see Figure 25).

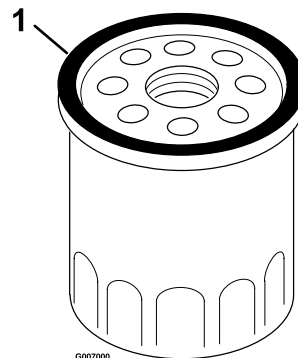


Figure 25

1. Gasket

8. Install the new filter and hand tighten it 2/3 turn only.
9. Fill the crankcase to the Full line on the dipstick with fresh oil.
10. Connect the wire to the spark plug.
11. Run the engine for about 3 minutes.
12. Stop the engine, wait for all moving parts to stop, and check for oil leakage around the filter.
13. Add oil to compensate for the oil in the oil filter.
14. Recycle the used oil filter according to local codes.

Servicing the Wheels

Service Interval: Every 100 hours

Removing the Wheels

1. Stop engine, wait for all moving parts to stop.
2. Disconnect the wire from the spark plug.
3. Remove the bolt, the wheel spacer, and the locknut mounting the wheel to the pivot arm (Figure 26).

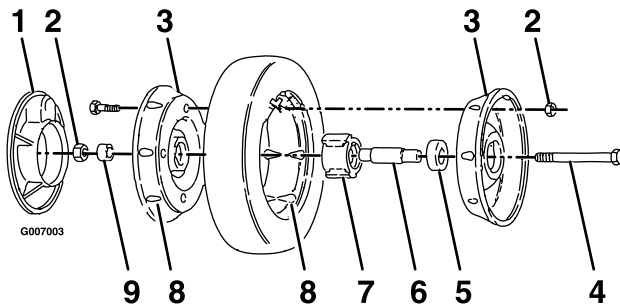


Figure 26

- | | |
|------------------|-------------------------|
| 1. Plastic Cover | 6. Bearing Spacer |
| 2. Locknut | 7. Bearing/Hub Assembly |
| 3. Wheel half | 8. Lug |
| 4. Bolt | 9. Wheel Spacer |
| 5. Bearing | |

4. Separate the wheel halves from the tire by removing four bolts and four locknuts.

Note: If you remove the bearings from the bearing/hub assembly, remove them by pressing on the bearing spacer.

Assembling the Wheels

1. Position the tire onto one wheel half, aligning the lugs on each.
2. Place the bearing/hub assembly into the center hole of the wheel half. Ensure that the legs of the hub are positioned over the flange of the hole.
3. Place the other wheel half onto the bearing/hub assembly, aligning the wheel and the tire lugs and the mounting holes.
4. Using two fully threaded screws or bolts and non-locking nuts, loosely secure the wheel halves together. Mount the screws or bolts in the opposing holes.
5. Check the alignment of all parts and tighten the screws, alternating from side to side for a uniform fit until the wheel halves are drawn together.
6. Install the two cap screws and two locknuts previously removed in the remaining holes in the

wheel halves and tighten. Remove the two long screws or bolts and replace them with two cap screws and two locknuts.

7. Install the wheel to the pivot arm with the cap screws, a spacer, and a locknut. Ensure that the spacer is positioned between the wheel hub and the pivot arm.
8. Connect the wire to the spark plug.

Check Condition Of Belt (Self-Propelled Units Only)

Service Interval: Every 40 hours

1. Stop engine, wait for all moving parts to stop.
2. Remove the bolts that secure the belt cover to the lawn mower housing.
3. Check the belt for cracks, frayed edges, burn marks or any other damage.
4. Replace the damaged belt.

Lubricate the Pivot Arms

1. Move the rear wheel cutting height levers to the center setting.
2. Wipe the grease fittings with a clean rag (Figure 27).

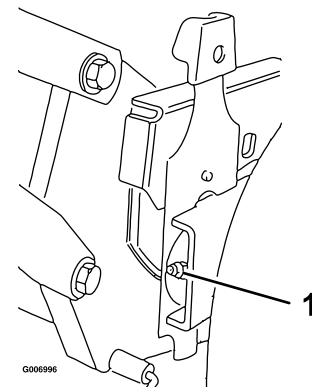


Figure 27

1. Grease fitting
-
3. Install a grease gun onto the fitting and gently apply 2 or 3 pumps of #2 multi-purpose lithium base grease.
- Note:** Excessive grease pressure may damage the seals.

Maintenance

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Lubricate fittings with one to two pumps of NGLI grade #2 multi-purpose gun grease.

Refer to the following chart for fitting locations and lubrication schedule.

Lubrication Chart			
Fitting Locations	Initial Pumps	Number of Places	Service Interval
1. Pivot Arms	2	2	50 Hours
2. Gear Case	1	1	100 Hours

Lubricate the Gear Case (Self-Propelled Units Only)

Service Interval: Yearly

1. Stop engine, wait for all moving parts to stop.
2. Remove the grass bag.
3. Install a grease gun onto the fitting through the belt cover opening

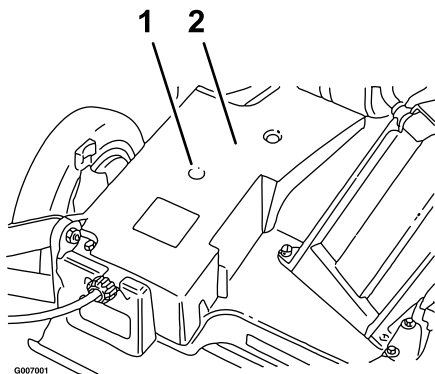


Figure 28

1. Grease fitting
2. Belt cover

4. Gently apply one to two pumps of #2 multi-purpose lithium-base grease.
5. Install the grass bag.

Check Spark Plugs

Service Interval: Every 100 hours

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug (Figure 9 and Figure 10).
3. Clean around the spark plug.
4. Remove the spark plug from the cylinder head.

Note: Replace a cracked, fouled, or dirty spark plug. Do Not clean the electrodes because grit entering the cylinder can damage the engine.

5. Set the gap on the plug to 0.030 inch (0.76 mm) (Figure 29).

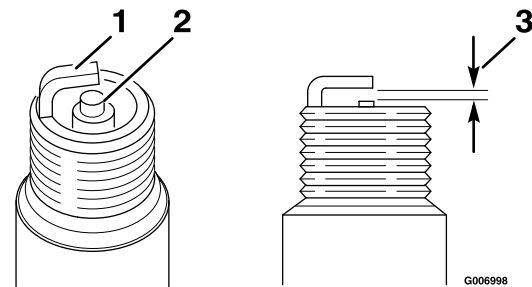


Figure 29

1. Side electrode
2. Center electrode insulator
3. Air gap—0.030 inch (0.76 mm)

6. Install the spark plug and the gasket seal.
7. Torque the plug to 17 ft-lb (23 N-m).
8. Connect the wire to the spark plug.

Adjustments

Note: Wait for all moving parts to stop and remove spark plug wire before servicing, cleaning, or making any adjustments to the unit.

Adjusting the Self-Propel Drive (Self-Propelled Units Only)

If the lawn mower does not self-propel or has a tendency to creep forward when the control bar is released, adjust the wheel drive control knob on the rear of the gear box.

1. Close the door in the lawn mower housing and remove the grass bag.
2. If the lawn mower does not self-propel, rotate the control knob clockwise 1/2 turn to tighten the belt.

If the lawn mower creeps forward, rotate the knob 1/2 turn counterclockwise to loosen the belt.

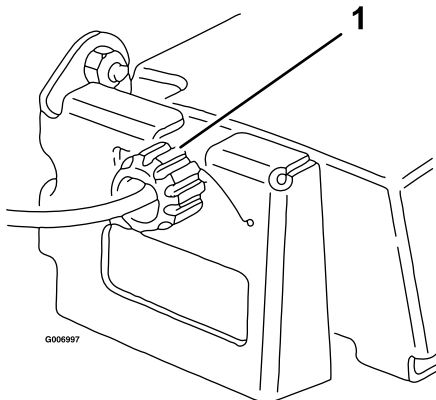


Figure 30

1. Control knob

Adjusting the Blade Brake Cable

Service Interval: Every 100 hours

Adjust whenever a new blade brake cable assembly is installed.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug.

- **For Blade Brake Clutch Units:**

1. Loosen the cable clamp screw until the cable conduit slides (see Figure 31).

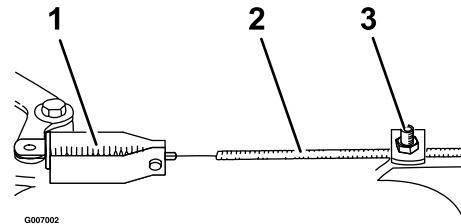


Figure 31

1. Spring
2. Cable conduit
3. Cable clamp screw

2. Pull the cable to remove the slack, but Do Not put tension on the spring.
3. Tighten the screw to lock the adjustment in place.
4. Connect the wire to the spark plug.

- **For Self-Propelled Units without a Blade Brake Clutch:**

1. Loosen the nut on the cable bracket (see Figure 31).
2. Insert a 3/16 to 1/4 inch (5 to 6 mm) object between the brake control lever and the handle.
3. Turn the cable adjuster on the brake cable until you remove the slack.
4. Tighten the jam nut.
5. Connect the wire to the spark plug.

- **For Hand-Push Units:**

1. Loosen the jam nut on the blade brake cable clamp (see Figure 31).
2. Insert a 3/16 to 1/4 inch. (5 to 6 mm) object between the brake control lever and the handle. Pull down on the cable conduit until you remove the slack from the wire.
3. Tighten the nut.
4. Connect the wire to the spark plug.

Cleaning

Clean Grass Build-Up Under Deck

Service Interval: Before each use or daily

1. Stop engine, wait for all moving parts to stop, and remove spark plug wire.
2. To ensure the best performance, keep the underside of the lawn mower housing clean (Figure 32).

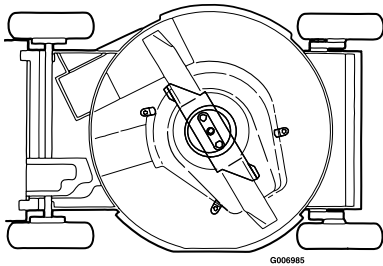


Figure 32

Blade Brake Unit Shown for Reference Only

Washing Method

1. Position the lawn mower on a flat concrete or asphalt surface near a garden hose.
2. Start the engine.
3. Hold the running garden hose at handle level and direct the water to flow on the ground just in front of the right rear tire (Figure 33).

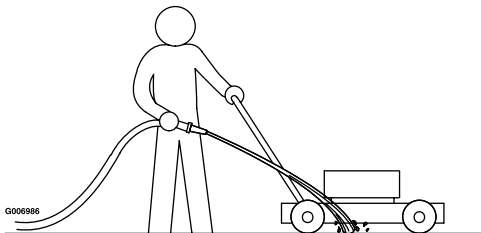


Figure 33

4. Engage the blade.

Note: The blade will draw in water and wash out clippings. Let the water run until you no longer see clippings being washed out from under the housing.

5. Disengage the blade, stop the engine and wait for all moving parts to stop.

6. Turn off the water.
7. Start the lawn mower, engage the blade, and let the lawn mower run for a few minutes to dry out its components.

Scraping Method

If washing does not remove all debris from under the lawn mower, scrape it clean.

1. Disconnect the wire from the spark plug.
2. Drain the fuel from the fuel tank. Refer to **Emptying the Fuel Tank and Cleaning the Fuel Filter** section.

⚠ WARNING

Tipping the lawn mower may cause the fuel to leak from the carburetor or the fuel tank. Gasoline is extremely flammable, highly explosive, and under certain conditions, can cause personal injury or property damage.

Avoid fuel spills by running the engine dry or by removing the gasoline with a hand pump; never siphon.

3. Tip the lawn mower onto its right side.
4. Remove the dirt and grass clippings with a hardwood scraper. Avoid burrs and sharp edges.
5. Turn the lawn mower upright.
6. Fill the fuel tank.
7. Connect the wire to the spark plug.

Cleaning the Discharge Tunnel and Plug

Service Interval: Before each use or daily

Always be sure that the discharge tunnel door closes securely when you release the handle. If the debris prevents the discharge door from closing securely, clean the inside of the discharge tunnel and the door thoroughly.

⚠ WARNING

Grass clippings and other objects can be thrown from an open discharge tunnel. Thrown objects can cause serious injury or kill the operator or bystanders.

Never start or operate the lawn mower unless one of the following is true:

- The discharge tunnel plug is locked securely in the discharge tunnel.
- The grass bag is locked in place.
- The optional side discharge chute is locked in place.
- The discharge tunnel door is locked in place.

Cleaning Under the Belt Cover (Self-Propelled Models Only)

Service Interval: Every 50 hours

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug (see Figure 9 and Figure 10).
3. Remove the bolts that secure the belt cover to the lawn mower housing (Figure 34).

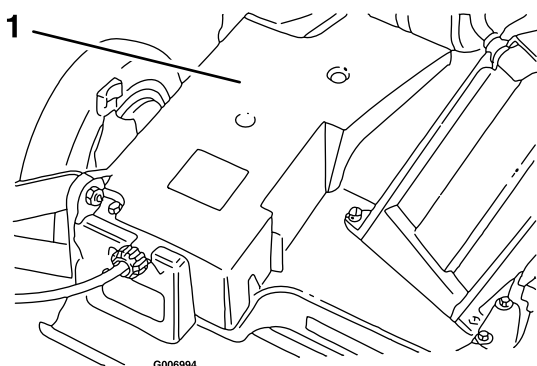


Figure 34

1. Belt cover

4. Lift off the cover and brush out all the debris around the belt area.

5. Install the belt cover.
6. Connect the wire to the spark plug.

Cleaning the Blade Brake Clutch Shield

Service Interval: Every 50 hours

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug (see Figure 9 and Figure 10).
3. Drain the gasoline from the fuel tank.
4. Tip the lawn mower onto its right side (air filter up).

⚠ WARNING

Tipping the lawn mower may cause the fuel to leak from the carburetor or the fuel tank. Gasoline is extremely flammable, highly explosive, and under certain conditions, can cause personal injury or property damage.

Avoid fuel spills by running the engine dry or by removing the gasoline with a hand pump; never siphon.

5. Remove the blade nuts, the anti-scalp cup, the accelerator, and the blade (see Figure 35).

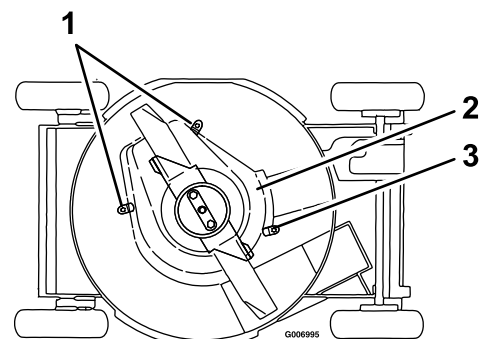


Figure 35

1. Tabs and nuts
2. BBC Shield
3. Tab and bolt.

6. Loosen the tabs that secure the BBC shield to the deck by loosening the nuts or the bolts on the tabs (Figure 35). Rotate the tabs 180° to move them out of the way.

Maintenance

7. Remove the BBC shield and brush or blow all the debris from under the shield and around the BBC system.
8. Install the BBC shield. Rotate the tabs 180° back into position. Tighten the nuts to the bolts on tabs to secure the BBC shield to the deck.
9. Install the blade, the accelerator, the anti-scalp cup, and the two blade nuts.
10. Turn the lawn mower upright.
11. Connect the wire to the spark plug.

Emptying the Fuel Tank and Cleaning the Fuel Filter (Kawasaki Units Only)

Service Interval: Every 100 hours

The fuel filter (screen) element is located inside the fuel tank.

1. Stop the engine and wait for it to cool down.
Note: Drain gasoline for a cold engine only.
2. Disconnect the wire from the spark plug (Figure 10).
3. Close the fuel valve (Figure 7).
4. Disconnect the fuel line by loosening the tube clamp at the carburetor.
5. Open the fuel valve by turning the lever to the open position.
6. Drain the gasoline completely from the tank and fuel line into an approved fuel container.
7. Remove the fuel tank from the mower.
8. Close the fuel valve.
9. Pour a small amount of fuel in the fuel tank, move the fuel around in the tank, and pour it out into an approved fuel container.
10. Install the fuel tank and fuel line.

Waste Disposal

Motor Oil Disposal

Engine oil and hydraulic oil are both pollutants to the environment. Dispose of used oil at a certified recycling center or according to your state and local regulations.

Storage

Preparing the Fuel System

To prepare the lawn mower for off season storage, perform the recommended maintenance procedures.

Store the lawn mower in a cool, clean, dry place. Cover the lawn mower to keep it clean and protected.

WARNING

Gasoline can vaporize if you store it over long periods of time. Gasoline vapors can explode if they come into contact with an open flame.

- Do Not store gasoline over long periods of time.
- Do Not store the lawn mower with gasoline in the fuel tank or the carburetor in an enclosure with an open flame. (For example, a furnace or a water heater pilot light.)
- Allow the engine to cool before storing it in any enclosure.

Empty the fuel tank when mowing the last time before storing the lawn mower.

1. Run the lawn mower until the engine stops from running out of fuel.
2. Prime the engine and start it again.
3. Allow the engine to run until it stops. 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. Refer to **Changing the Engine Oil** section in Maintenance.
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 but **Do Not** connect the wire to the spark plug.

General Storage Information

1. Clean the lawn mower housing. Refer to **Cleaning the Underside of the Lawn Mower Housing** section in Cleaning.
2. Clean any dirt and chaff from the cylinder, cylinder head fins, and blower housing.
3. Remove grass clippings, dirt, and grime from the external parts of the engine, the shrouding, and the top of the lawn mower housing.
4. Clean the BBC shield. Refer to **Cleaning the Blade Brake Clutch Shield** section in Cleaning.
5. Check the condition of the blade. Refer to **Maintaining the Blade** section in the Maintenance.
6. Service the air filter. Refer to **Servicing the Air Filter** in Maintenance.
7. Lubricate the pivot arms. Refer to **Lubricating the Pivot Arms** section in Maintenance.
8. Tighten all nuts, bolts, and screws.
9. Touch up all rusted or chipped paint surfaces with paint available from an Authorized Service Dealer.

Removing the Lawn Mower from Storage

1. Check and tighten all fasteners.
2. Remove the spark plug and spin the engine rapidly by pulling the starter rope 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 and torque it to 17 ft-lb (23 N-m).
5. Perform any needed maintenance procedures.
6. Fill the fuel in the fuel tank with fresh gasoline.
7. Check the engine oil level.
8. Connect the wire to the spark plug.

Troubleshooting

Troubleshooting

Important: It is essential that all operator safety mechanisms be connected and in proper operating condition prior to mower use.

When a problem occurs, Do Not overlook the simple causes. For example: starting problems could be caused by an empty fuel tank.

The following table lists some of the common causes of trouble. If a problem continues, contact an Authorized Service Dealer.

Problem	Possible Cause	Corrective Action
Engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> 1. Fuel tank is empty. 2. Fuel shutoff valve is closed. 3. The throttle lever is not in the correct position. 4. Dirt, water, or stale fuel is in the fuel system. 5. Faulty spark plug. 6. Spark plug wire is not connected. 	<ol style="list-style-type: none"> 1. Fill the fuel tank. 2. Open the fuel shutoff valve. 3. Move the throttle lever to the Choke position. 4. Contact an Authorized Service Dealer. 5. Clean, adjust or replace spark plug. 6. Check the spark plug wire connection.
Engine loses power.	<ol style="list-style-type: none"> 1. Air cleaner is dirty. 2. Oil level in the crankcase is low. 3. Vent hole in the fuel cap is plugged. 4. Dirt in fuel filter. 5. Dirt, water, or stale fuel is in the fuel system. 6. The underside of the lawn mower deck contains clippings and debris 	<ol style="list-style-type: none"> 1. Clean or replace the air cleaner element. 2. Add oil to the crankcase. 3. Clean or replace the fuel cap. 4. Replace the fuel filter. 5. Contact an Authorized Service Dealer. 6. Clean the underside of the lawn mower deck.
Engine runs rough.	<ol style="list-style-type: none"> 1. The wire is not connected to the spark plug. 2. Faulty spark plug. 3. The throttle lever is not in the Fast 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. Clean, adjust or replace spark plug. 3. Move the throttle lever to the Fast position. 4. Clean the air filter pre-cleaner and/or replace the paper air filter.
Lawn mower or engine vibrates excessively.	<ol style="list-style-type: none"> 1. The blade is bent or is out of balance. 2. The blade mounting bolt is loose. 3. The underside of the lawn mower deck contains clippings and debris. 4. The engine mounting bolts are loose. 	<ol style="list-style-type: none"> 1. Balance the blade. If the blade is bent, replace it. 2. Tighten the blade mounting bolt. 3. Clean the underside of the lawn mower deck. 4. Tighten the engine mounting bolts.
Uneven cutting pattern.	<ol style="list-style-type: none"> 1. All four wheels are not at the same height. 2. The blade is dull. 3. Mowing in the same pattern repeatedly. 4. The underside of the lawn mower deck contains clippings and debris. 	<ol style="list-style-type: none"> 1. Place all four wheels at the same height. 2. Sharpen and balance the blade. 3. Change the mowing pattern. 4. Clean the underside of the lawn mower deck.
Discharge chute plugs	<ol style="list-style-type: none"> 1. The throttle lever is not in the Fast position. 2. The cutting height is too low. 3. Mowing too fast. 4. The grass is wet. 5. The underside of the lawn mower deck contains clippings and debris. 	<ol style="list-style-type: none"> 1. Move the throttle lever to the Fast position. 2. Raise the cutting height. 3. Slow down. 4. Allow the grass to dry before mowing. 5. Clean the underside of the lawn mower deck.

Problem	Possible Cause	Corrective Action
Lawn mower does not self-propel (Self-Propelled Models Only)	<ol style="list-style-type: none"><li data-bbox="634 218 1057 268">1. The self-propel drive cable is out of adjustment or is damaged.<li data-bbox="634 281 1057 331">2. There is debris under the belt cover.	<ol style="list-style-type: none"><li data-bbox="1089 218 1511 268">1. Adjust the self-propel drive cable. Replace the cable if necessary.<li data-bbox="1089 281 1511 331">2. Clean the debris from under the belt cover.

Exmark Commercial Turf Equipment

1 Year Limited Warranty

Conditions and Products Covered

Exmark Mfg. Co. Inc. and its affiliate, Exmark Warranty Company, pursuant to an agreement between them, jointly warrant on the terms and conditions herein, that we will repair, replace or adjust any part on these products and found by us (in the exercise of our reasonable discretion) to be defective in factory materials or workmanship for a period of one year.

This warranty applies to Exmark commercial turf equipment sold in the U.S. or Canada. This warranty may only be assigned or transferred to a second (or third) owner by an authorized Exmark dealer. The warranty period commences upon the date of the original retail purchase.

Warranty Exceptions

- Bags, Belts and Tires
- Engine

Warranty Period

90 days
2 years*

* The Engine warranty is covered by the engine manufacturer. Please refer to the engine manufacturer's warranty statement that is included in the literature packet.

This warranty only includes the cost of parts and labor.

Items and Conditions Not Covered

This warranty does not cover the following:

- Pickup and delivery charges to and from any authorized Exmark Service Dealer.
- Any damage or deterioration due to normal use, wear and tear, or exposure.
- Cost of regular maintenance service or parts, such as filters, fuel, lubricants, tune-up parts, and adjustments.
- Any product or part which has been altered or misused or required replacement or repair due to normal wear, accidents, or lack of proper maintenance.
- Any repairs necessary due to use of parts, accessories or supplies, including gasoline, oil or lubricants, incompatible with the turf equipment or other than as recommended in the operator's manual or other operational instructions provided by Exmark.

There are no other express warranties except for engine and special emission system coverage.

All warranty work must be performed by an authorized Exmark Service Dealer using Exmark approved replacement parts.

Instructions for Obtaining Warranty Service

The product must be registered with original proof of purchase by an Exmark Service Dealer before obtaining any warranty service.

Contact any Exmark Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, access our website at www.exmark.com. U.S. or Canada customers may also call 402-223-6375.

If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, contact us at:

Exmark Customer Service Department
The Exmark Warranty Company
2101 Ashland Avenue
Beatrice, NE 68310
402-223-6375 or
service@exmark.com

Owner's Responsibilities

The Exmark turf equipment, including any defective part, must be returned to an authorized Exmark service dealer within the warranty period. This warranty extends only to turf equipment operated under normal conditions. You must read the operator's manual. You must also properly service and maintain your Exmark product as described in the operator's manual. Such routine maintenance, whether performed by a dealer or by you, is at your expense.

General Conditions

The sole liability of Exmark and Exmark Warranty Company with respect to this warranty shall be repair or replacement of defective components as set forth herein. **Neither Exmark nor Exmark Warranty Company shall be liable for any incidental or consequential loss or damage.**

Such damages include but are not limited to:

- Expenses related to gasoline, oil or lubricants.
- Travel time, overtime, after hours time or other extraordinary repair charges or charges relating to repairs or replacements outside of normal business hours at the place of business of the authorized Exmark Service Dealer.
- Rental of like or similar replacement equipment during the period of any warranty, repair or replacement work.
- Any telephone or telegram charges or travel charges.
- Loss or damage to person or property other than that covered by the terms of this warranty.
- Any claims for lost revenue, lost profit or additional cost as a result of a claim of breach of warranty.
- Attorney's fees.

No Claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any Exmark mower.

All implied warranties of merchantability (that the product is fit for ordinary use) and fitness for use (that the product is fit for a particular purpose) are limited to the duration of the express warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations 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.

G4500-426

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LIGHT KIT	TURF STRIPER
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