



NAVIGATOR®

**For Serial Nos.
850,000 & Higher**
Part No. 4500-628 Rev. B

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: The engine in this product is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code (CPRC) Section 4442 to use or operate this engine on any forest-covered, brush-covered, or grass-covered land as defined in CPRC 4126. Other states or federal areas may have similar laws.

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. Exmark parts manuals are available online at <http://www.exmark.com/manuals.htm>.

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.

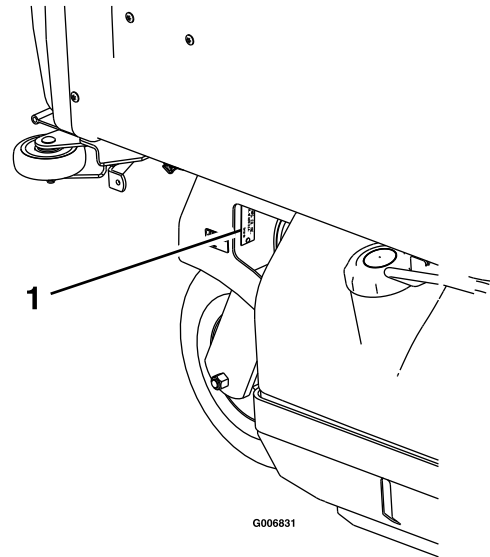


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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Safety

Safety Alert Symbol

This 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.
- Only adults and mature teenagers should operate a mower, and even mature teenagers should have adult supervision. Be sure a teenager:
 1. has read and understands the Operator's Manual and recognizes the risks involved;
 2. is sufficiently mature to use caution; and
 3. is of sufficient size and weight to operate the controls comfortably and to manage the mower without taking risks.
- 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 on level ground, 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. Fill the fuel tank to the bottom of the filler neck. The empty space in the tank allows gasoline to expand. Overfilling may result in fuel leakage or damage to the engine or emission system (if equipped).
- 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.

WARNING

Operating a Navigator tractor without an approved Exmark front mount attachment increases the possibility of operator entanglement in drive wheels or forward tip over. Entanglement or tip-over could cause serious injury or death.

When operating a Navigator tractor without an approved Exmark front mount attachment, observe the following:

- Keep feet and clothing away from tires.
- Limit operation to minimum required to install a different front mount attachment.
- Minimize speed and use extreme caution.
- Only operate on a flat level surface.
- Do not operate up or down a trailer ramp.
- Avoid sudden acceleration or deceleration.

- Operate only in daylight or good artificial light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine.
- 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 unless there is a grass collection system or mulch kit in place and working properly.
- Do Not change the engine governor setting or overspeed the engine.
- Stop engine, wait for all moving parts to stop, remove key and engage parking brake:
 - 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.

Safety

- Stop engine, wait for all moving parts to stop, and engage parking brake:
 - Before refueling.
 - Before dumping the grass catcher.

⚠ 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.
- **NEVER** carry passengers. **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.
- 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. Wheels dropping over edges, ditches, steep banks, or water can cause rollovers, which may result in serious injury, death or drowning.

- Do Not mow slopes when grass is wet.
 - Do Not mow near drop-offs or near water.
 - Do Not mow slopes greater than 15 degrees.
 - Reduce speed and use extreme caution on slopes.
 - Avoid sudden turns or rapid speed changes.
- See inside the back cover to determine the approximate slope angle of the area to be mowed.
 - Use a walk behind mower and/or a hand trimmer near drop-offs, ditches, steep banks or water. (Figure 3).

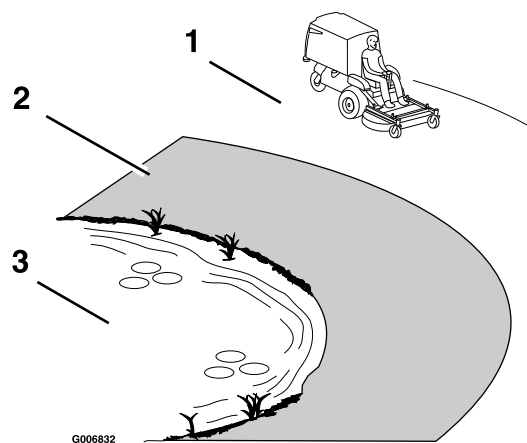


Figure 3

1. Safe Zone-Use the mower here on slopes less than 15 degrees
2. Danger Zone-Use a walk behind mower and/or hand trimmer on slopes greater than 15 degrees, near drop-offs and water.
3. Water

- 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.

- Avoid sudden starts when mowing downhill. Mower may tip forwards.
- Be aware that operating on wet grass, across steep slopes or downhill may cause the mower to lose traction. Loss of traction to the drive wheels may result in sliding and a loss of braking and steering.
- Always avoid sudden starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly off the slope.
- Follow the manufacturer's recommendations for wheel weights or counter weights to improve stability.
- Use extreme care with attachments. These can change the stability of the machine and cause loss of control.

Note: A 2-post foldable ROPS (Rollover Protection System) is available for the Navigator as an accessory. A ROPS is recommended if you will be mowing next to drop-offs, near water, or on steep banks which could result in a rollover. The model number for the ROPS attachment is FRPSNAV. Contact an Authorized Exmark Service Dealer for more details.

Maintenance and Storage

- Disengage drives, lower implement, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
- Keep engine, engine area, and pump drive belt compartment 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.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace damaged blades. Never straighten or weld them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.

DANGER

Charging or jump starting the battery may produce explosive gases. Battery gases can explode causing serious injury.

- Keep sparks, flames, or cigarettes away from battery.
- Ventilate when charging or using battery in an enclosed space.
- Make sure venting path of battery is always open once battery is filled with acid.
- Always shield eyes and face from battery.

DANGER

Battery electrolyte contains sulfuric acid, which is poisonous and can cause severe burns. Swallowing electrolyte can be fatal or if it touches skin can cause severe burns.

- Wear safety glasses to shield eyes, and rubber gloves to protect skin and clothing when handling electrolyte.
- Do Not swallow electrolyte.
- In the event of an accident, flush with water and call a doctor immediately.

⚠ CAUTION

If the ignition is in the “ON” position there is potential for sparks and engagement of components. Sparks could cause an explosion or moving parts could accidentally engage causing personal injury

Be sure ignition switch is in the “OFF” position before charging the battery.

- 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.

⚠ WARNING

Removing standard original equipment parts, or using non-Exmark replacement parts and accessories may alter the warranty, traction, and safety of the machine. Failure to use original Exmark parts could cause serious injury or death.

Replace all parts including, but not limited to, tires, belts, and blades with original Exmark parts.

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid accidentally injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

- Make sure all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to hydraulic system.
- Keep body and hands away from pinhole leaks or nozzles that eject high pressure hydraulic fluid.
- Use cardboard or paper, not your hands, to find hydraulic leaks.
- Safely relieve all pressure in the hydraulic system by placing the motion control levers in neutral and shutting off the engine before performing any work on the hydraulic system.

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.



1-513747



65-2690



98-4361



98-5954



103-8425



103-8444



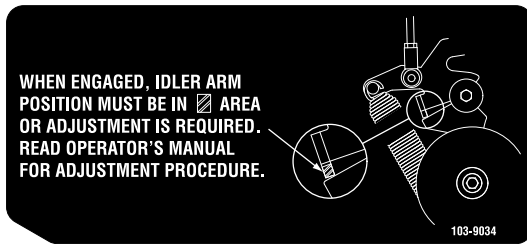
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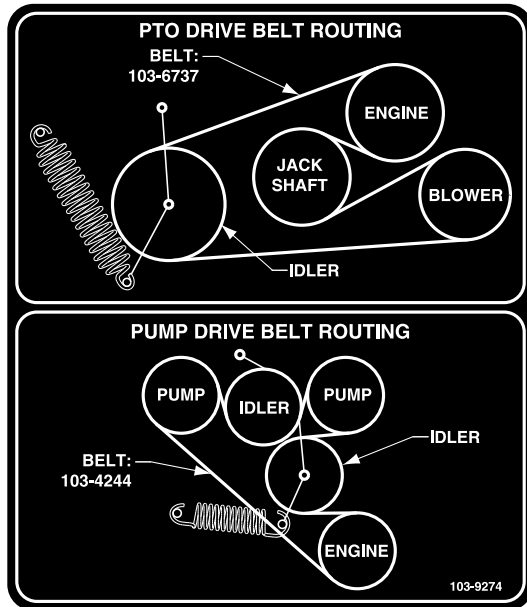
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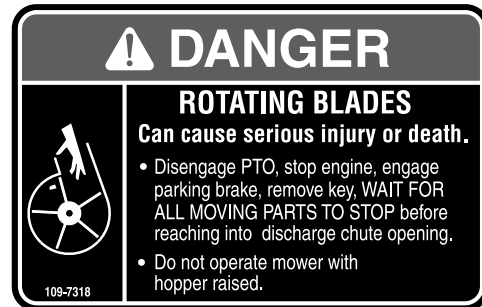
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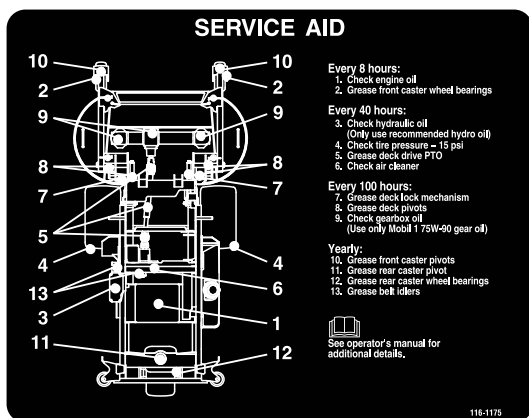
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116-0404

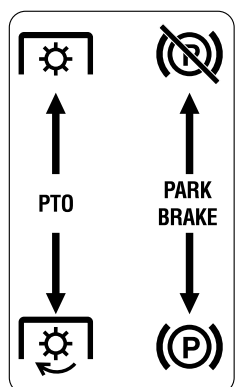


116-1175

CALIFORNIA SPARK ARRESTER WARNING

Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117-2718



Molded in LH Console

⚠ DANGER




- Operating on wet grass or steep slopes can cause sliding and loss of control.
- Wheels dropping over edges can cause rollovers, which may result in serious injury, death or drowning.
- To avoid loss of control and possibility of rollover:
 - Do NOT operate near drop-offs or near water.
 - Do NOT operate on slopes greater than 15°.
 - Reduce speed and use extreme caution on slopes.
 - Avoid sudden turns or rapid speed changes.
- A rollbar is available and its use is recommended for areas where there are slopes, drop-offs or water.




- To avoid serious injury or death:
 - Avoid blades unless engine and blades are stopped.

⚠ WARNING




- To avoid serious injury or death:
 - Read and understand the operator's manual before using this machine.
 - Do NOT operate unless trained to safely use this machine.
 - Pick up objects that could be thrown by the blades.
 - Do NOT mow when people and pets are in the area.
 - Do NOT carry passengers.
 - Do NOT operate under the influence of alcohol or drugs.
 - Do NOT operate without shields, guards, and safety devices in place and working.
 - Look behind and to the side before changing directions.
 - Before leaving operator's position:
 - Disengage PTO.
 - Move speed control lever to neutral position.
 - Engage park brake.
 - Stop engine.
 - Check the function of the operator presence controls (OPC) safety system daily. Do NOT defeat the OPC system.
 - Stop engine and remove key before adjusting, servicing, or cleaning machine and attachments.
 - Hearing protection is recommended.

Molded into Front of Hopper

Specifications

Model Numbers

Serial Nos: 850,000 and Higher

NAV20KC; NAV27KC

Systems

Engine

- Engine Specifications: See your Engine Owner's Manual
- RPM: Full Speed: 3600 \pm 50 RPM (No Load)
Idle: 1500 RPM

Fuel System

- Capacity: 7.5 gal. (28 L)
- Type of Fuel: Regular unleaded gasoline, 87 octane or higher; containing no more than 10% methanol or ethanol.
- Fuel Filter: In-line 30 Micron Kohler P/N 2405010.
- Fuel Shut-Off Valve: 1/4 turn increments in-line valve by fuel filter.

Electrical System

- Charging System: Flywheel Alternator
- Charging Capacity: 15 amps
- Battery Type: BCI Group U1
- Battery Voltage: 12 Volt
- Polarity: Negative Ground
- Fuses: Two 20 amp and one 30 amp blade type
- Safety Interlock System:
 - PTO must be disengaged, brake engaged, and speed control lever in neutral position to start engine. (It is not necessary for the operator to be in the seat to start the engine.)
 - Operator must be in seat when PTO is engaged, brake is disengaged, or speed control lever is moved out of neutral or engine will stop.
 - Engine will stop in the following conditions:
 - ◊ If the speed control lever is moved from neutral position while brake is engaged.

◊ If the PTO is engaged while the hopper is tilted up.

Operator Controls

- Steering and Motion Control:
 - Speed Control lever, located on RH console, sets maximum forward speed.
 - Steering levers, centered in front of the seat, control the speed and direction of travel of the respective drive wheels.
 - Moving speed control lever rearward to the neutral position places the drive system in neutral.
- **Note:** The unit may be moved in reverse while the speed control is in the neutral position by pulling back on the steering levers.
- PTO Engagement Lever: Engages drive to PTO (mower deck) and blower.
- Parking Brake Lever: Pull back to engage parking brake.

Seat

- Type: Standard seat with high back, foam padded (internal suspension).
- Mounting: Seat is hinged to tilt up for access to hydraulic pumps and other components. The seat is held in the tilted position with a link.
- Armrests: None.
- Seat Safety Switch: Internal to the bottom seat cushion, non serviceable. Time delay module incorporated into the Safety Interlock System eliminates rough ground cut-outs.

Hydrostatic Ground Drive System

- Hydrostatic Pumps: Two Hydro Gear variable displacement piston pumps.
- Wheel Motors: Hydro Gear planetary reduction motors.

- Hydraulic Oil Type: Use Exmark Premium Hydro oil.
- Hydraulic Oil Capacity: 4.0 qt. (3.8 L)
- Hydraulic Filter: Replaceable cartridge type.
 - Summer use above 32°F (0°C):
P/N 109-0071: 25 microns, 10 psi bypass
 - Winter use below 32°F (0°C):
P/N 1-523541: 40 microns, 18 psi bypass
- Speeds:
 - 0-7.0 mph (11.3 km/hr) forward.
 - 0-5.5 mph (8.6 km/hr) reverse.
- Drive wheel release valves allow machine to be moved when engine is not running.
- Clutching belt on horizontal engine shaft. Dual “A” section hexagon belt with spring tensioned idler to jackshaft and blower.
- Heavy-duty cast iron, spiral bevel gearbox is final drive to blades.
- Deck:
 - Full floating deck is attached to out-front support frame. Deck design allows for bagging or mulching.
- Deck Depth:
 - 42 inch Deck: 4 5/8 inches (11.7 cm)
 - 48 inch Deck: 4 5/8 inches (11.7 cm)

Tires & Wheels

	Drive	Front Caster	Rear Caster
	Pneumatic (Air-Filled)	Semi-Pneumatic	Semi-Pneumatic
Quantity	2	2	1
Tread	“Multi-Trac C/S”	Smooth	Smooth
Size	18 x 10.50-10	8 x 3.00-4	13 x 8.00-6
Ply Rating	4		
Pressure	15 psi (103 kPa)		

Cutting Deck

(Sold separately)

- Model Numbers:
 - CD42CD
 - CD48CD
- Cutting Width:
 - 42 inch Deck: 42 inch (106.7 cm)
 - 48 inch Deck: 48 inch (121.9 cm)
- Discharge: Center
- Blade Size: (2 ea.)
 - w/42 inch Deck: 22.00 inches (55.9 cm)
 - w/48 inch Deck: 25.00 inches (63.5 cm)
- Deck Drive:

Dimensions

Overall Width:

Without Deck	42 inch Deck	48 inch Deck
42.6 inches (108.2 cm)	43.2 inches (109.7 cm)	49.2 inches (125.0 cm)

Overall Length:

Without Deck	42 inch Deck	48 inch Deck
67.3 inches (170.9 cm)	91.8 inches (233.2 cm)	94.5 inches (240.0 cm)

Overall Height:

Without Deck	42 inch Deck	48 inch Deck
51.2 inches (130.0 cm)	51.2 inches (130.0 cm)	51.2 inches (130.0 cm)

Tread Width: (Center to Center of Tires, Widthwise)

	42 inch Deck	48 inch Deck
Drive Wheels	32.7 inches (83.1 cm)	32.7 inches (83.1 cm)

Wheel Base: (Center of Drive Wheel to Center of Rear Caster Wheel)

42 inch Deck	48 inch Deck
44.2 inches (112.3 cm)	44.2 inches (112.3 cm)

Product Overview

Curb Weight:

42 inch Deck	48 inch Deck
850 lb (386 kg)	1145 lb (519 kg)

Torque Requirements

Bolt Location	Torque
Blade Mounting Bolt	85-110 ft-lb (115-149 N-m)
Engine Mounting Bolts	30-35 ft-lb (41-47 N-m)
Wheel Lug Nuts	90-95 ft-lb (122-129 N-m)
Wheel Motor Mounting Bolts	72-77 ft-lb (98-104 N-m)
Wheel Hub Locknut	210-250 ft-lb (285-339 N-m)

Product Overview

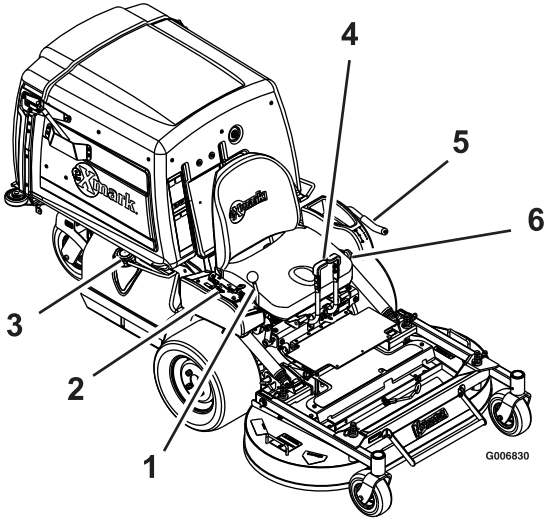


Figure 4

1. Speed Control Lever
2. Controls
3. Fuel Cap
4. Steering Levers
5. PTO Engagement Lever
6. Parking Brake Lever

Operation

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

Controls

Steering Levers

Located in the center in front of the seat.

Pulling back on the steering levers, progressively slows, then reverses the direction of travel of the respective drive wheels.

By moving both steering levers an equal amount back, the machine can be slowed down or travel backward in a straight line.

Steering is controlled by varying the position of the steering levers relative to each other.

Speed Control Lever

Located on right hand console.

The speed control lever sets maximum forward speed.

Moving speed control lever rearward to the neutral position places the drive system in neutral.

Choke Control

Located on right hand console.

The choke is used to aid in starting a cold engine. Moving the choke lever forward will put the choke in the “ON” position and moving the choke lever to the rear will put the choke in the “OFF” position. DO NOT run a warm engine with choke in the “ON” position.

Throttle Control

Located on right hand console.

The throttle is used to control engine speed. Moving throttle lever forward will increase engine speed and moving throttle lever to the rear will decrease engine speed.

Brake Lever

Located on left side of unit, between the seat and console.

The brake lever engages a parking brake on the drive wheels.

Pull the lever up and rearward to engage the brake.

Push the lever forward and down to disengage the brake.

The unit must be tied down and brake engaged when transporting.

Ignition Switch

Located on the right hand console.

The ignition switch is used to start and stop the engine. The switch has three positions “OFF”, “ON” and “START”. Insert key into switch and rotate clockwise to the “ON” position. Rotate clockwise to the next position to engage the starter (key must be held against spring pressure in this position).

Note: Brake must be engaged, speed control lever rearward (neutral position) and PTO disengaged to start engine. (It is not necessary for the operator to be in the seat to start the engine.)

Hour Meter

Located on the right hand console.

The hour meter is connected to a pressure switch installed in the engine block and it records the number of hours that the engine has run. If the ignition switch is left on without engine running, hour meter will not run.

Note: This switch is not a low oil sensor and will not alert the operator if the engine oil is low.

Fuel Shut-Off Valve

Located in fuel line by fuel tank and fuel filter (accessible by raising the hopper).

The fuel shut-off valve is used to shut off the fuel when the machine will not be used for a few days, during transport to and from the jobsite, and when parked inside a building.

Rotate the valve 1/4 turn clockwise to shut off the fuel. rotate the valve 1/4 turn counterclockwise to turn on the fuel.

Operation

Drive Wheel Release Valves

Located on the top left front corner of hydrostatic pumps.

Drive wheel release valves are used to release the hydrostatic drive system to allow the machine to be pushed without the engine running. Tilt seat up to gain access to pumps.

With a 7/16 wrench, turn both valves one turn counterclockwise to release drive system. Turn clockwise to reset system. **Do Not overtighten. Do Not tow machine.**

Tracking Adjustment Knob

Located under the seat on the left pump control link.

Rotating this knob allows fine tuning adjustments so that the machine tracks straight with the drive levers in the full forward position.

Run unit at 3/4 speed for at least 5 minutes to bring hydraulic oil up to operating temperature. Stop machine and wait for all moving parts to stop. Engage park brake. Tilt seat forward to gain access to the tracking knob. Rotate the knob towards the right to steer right and rotate towards the left to steer left. Adjust in 1/8 turn increments until the machine tracks straight. Check that the machine does not creep when in neutral with the park brakes disengaged.

Important: Do Not rotate the knob too far, as this may cause the machine to creep in neutral. Refer to the Motion Control Linkage Adjustment section in Maintenance.

PTO Engagement Lever

Located immediately left of the left console.

Lever must be moved up to the “ROTATE” position to engage the PTO and blower drives. Lever is moved down to the “STOP” position to stop the drives.

Engine Oil Temperature Light and Buzzer

Located on the right console.

The engine oil temperature light monitors the temperature of the engine oil. An illuminated engine oil temperature light and intermittent buzzing sound signals the engine is overheating.

Pre-Start

Fill fuel tanks. For best results use only clean, fresh regular grade unleaded gasoline with an octane rating of 87 or higher.

Important: Never use methanol, gasoline containing methanol, gasohol containing more than 10% ethanol, premium gasoline, or white gas because the fuel system could be damaged.

Do Not add oil to gasoline.

Do Not overfill fuel tank. Fill the fuel tank to the bottom of the filler neck. The empty space in the tank allows gasoline to expand. Overfilling may result in fuel leakage or damage to the engine or emission system (if equipped).

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

Open the Fuel Shut-Off Valve

The fuel shut-off valve is located on the right side of unit in fuel line next to the fuel filter. Raise the hopper to access. Rotate the valve 1/4 counterclockwise to turn on fuel.

Starting the Engine

1. Move the speed control lever to the neutral position.
2. Pull up and back on the parking brake lever to engage the parking brake.
3. Push the PTO engagement lever down to the “STOP” position.

Note: It is not necessary for the operator to be in the seat to start the engine.

4. Place the throttle midway between the “SLOW” and “FAST” positions.
5. On a cold engine, push the choke lever forward into the “ON” position.

On a warm engine, leave the choke in the “OFF” position.

6. Turn ignition switch to the “START” position. Release the switch as soon as the engine starts.

Important: Do Not crank the engine continuously for more than ten seconds at a time. If the engine does not start, allow a 60 second cool-down period between starting attempts. Failure to follow these guidelines can burn out the starter motor.

7. If the choke is in the “ON” position, gradually return choke to the “OFF” position as the engine warms up.

Engaging the PTO

⚠ DANGER

The rotating blades under the mower deck are dangerous. Blade contact can cause serious injury or kill you.

Do Not put hands or feet under the mower or mower deck when the blades are engaged.

⚠ DANGER

An uncovered discharge opening will allow objects to be thrown in an operator’s or bystander’s direction. Also, contact with the blower blades could occur. Thrown objects or blade contact can cause serious injury or death.

Never operate the mower with the hopper or hopper door raised, removed, or altered unless there is a mulch kit in place and working properly.

The PTO lever engages the PTO and blower. Be sure that the hopper is down, the hopper door is securely closed, and all persons are clear of the mower deck and discharge area before engaging PTO.

Important: Operator must be in seat before the PTO can be engaged.

1. Set the throttle to the “MIDWAY” position.
2. Pull the PTO lever upward until locked over center.
3. Place the throttle in the “FAST” position to begin mowing.

Disengaging the PTO

1. Set the throttle to the “MIDWAY” position.
2. Push PTO lever down to the “STOP” position stopping the PTO and blower.

Stopping the Engine

1. Bring the unit to a full stop.
2. Disengage the PTO.
3. Move speed control lever to the neutral position.
4. Engage the parking brake.
5. Place the throttle midway between the “SLOW” and “FAST” positions.
6. Allow the engine to run for a minimum of 15 seconds, then turn the ignition switch to the “OFF” position to stop the engine.
7. Remove the key to prevent children or other unauthorized persons from starting engine.
8. Close the fuel shut-off valve when the machine will not be in use for a few days, when transporting, or when the unit is parked inside a building.

Driving the Machine

⚠ CAUTION

Machine can spin very rapidly by positioning one lever too much ahead of the other. Operator may lose control of the machine, which may cause damage to the machine or injury.

- Use caution when making turns.
- Slow the machine down before making sharp turns.

Important: To begin movement (forward or backward) the operator must be in the seat, the brake lever must be disengaged (pushed down) before the speed control lever can be moved forward or the engine will stop.

Driving Forward

1. Start the engine.
2. Release the parking brake.
3. To move forward in a straight line move the speed control lever forward.

Operation

To turn left or right, pull one of the steering levers back toward neutral in the direction desired.

The machine will move faster the farther the speed control lever is moved away from neutral.

4. To stop, pull the speed control lever back to the neutral position.

Driving in Reverse

1. To move rearward in a straight line applying equal pressure pull both steering levers rearward.

To turn left or right, release pressure on the steering lever toward the direction desired.

2. To stop, release the steering levers to the neutral position.

Emptying Hopper

1. A full hopper is indicated by a buzzer located behind the operator in the hopper. Empty hopper when buzzer sounds to prevent clogging of the blower or deck.
2. Disengage PTO, move speed control to neutral, set park brake and dismount unit to dump hopper.
3. Make sure unit is on a dry level surface.
4. Lift the rear door up and allow it to rest on top of hopper.
5. Dump hopper by firmly grasping one of the hopper handles on either side of the unit and lifting the hopper.

Clearing Hopper Screen

Screen may be removed by firmly lifting screen handles (see Figure 5).

Pull screen towards the back to remove. Gently tap debris from the screen as needed.

Excessive build-up on the screen can cause the blower to plug.

Note: In conditions where the screen clogs quickly, the front removable screen panel can be turned and reinstalled under the primary screen to allow free air flow from the hopper.

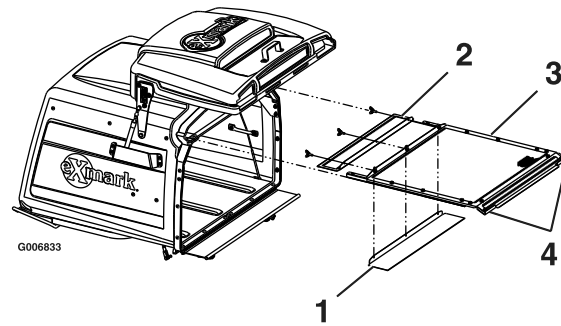


Figure 5

- | | |
|--|-------------------|
| 1. Front removable screen can be rotated and stored for wet conditions | 3. Primary screen |
| 2. Front removable screen | 4. Handles. |

Transporting

Transporting a Unit

Use a heavy-duty trailer or truck to transport the machine. Lock brake and block wheels. Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes. Be sure that the trailer or truck has all necessary lighting and marking as required by law. Secure a trailer with a safety chain.

⚠ CAUTION

This unit does not have proper turn signals, lights, reflective markings, or a slow moving vehicle emblem. Driving on a street or roadway without such equipment is dangerous and can lead to accidents causing personal injury. Driving on a street or roadway without such equipment may also be a violation of State laws and the operator may be subject to traffic tickets and/or fines.

Do Not drive a unit on a public street or roadway.

WARNING

Loading a unit on a trailer or truck increases the possibility of tip-over. Tip-over could cause serious injury or death.

- Use extreme caution when operating a unit on a ramp.
- Use only a single, full width ramp; Do Not use individual ramps for each side of the unit.
- If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the unit.
- Do Not exceed a 15° angle between ramp and ground or between ramp and trailer or truck.
- Avoid sudden acceleration while driving unit on a ramp.

Loading a Unit

Use extreme caution when loading units on trailers or trucks. One full width ramp is required. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

Ramp should be long enough so that the angles between the ramp and the ground and the ramp and the trailer or truck do not exceed 15°. A steeper angle may cause mower deck components to get caught as the unit moves from ramp to trailer or truck. Steeper angles may also cause the unit to tip. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramp extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: Do Not attempt to turn the unit while on the ramp, you may lose control and drive off the side.

Avoid sudden acceleration when driving on a ramp.

Maintenance

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

⚠ WARNING

While maintenance or adjustments are being made, someone could start the engine. Accidental starting of the engine could seriously injure you or other bystanders.

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

⚠ 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.
After the first 100 hours	<ul style="list-style-type: none">• Check the wheel hub locknuts torque specification.• Check the wheel lug nut torque specification.
After the first 250 hours	<ul style="list-style-type: none">• Change the hydraulic filter.
Before each use or daily	<ul style="list-style-type: none">• Check the engine oil level.• Check the safety interlock system.• Check for loose hardware.• Remove accumulated debris from engine (see Cleaning section.)• Clean the grass and debris build-up from the machine.
Every 40 hours	<ul style="list-style-type: none">• Check the hydraulic oil level.• Check the tire pressures.• Check the condition of the belts.
Every 50 hours	<ul style="list-style-type: none">• Service the air cleaner. (May need more often under severe conditions. See the Engine Owner's Manual for additional information.)
Every 80 hours	<ul style="list-style-type: none">• Remove engine shrouds and clean cooling fins (see Cleaning section.)
Every 100 hours	<ul style="list-style-type: none">• Change the engine oil. (May need more often under severe conditions.)
Every 160 hours	<ul style="list-style-type: none">• Lubricate the brake handle pivot.• Lubricate the brake rod bushings.• Lubricate the steering linkage rod ends.• Lubricate hopper actuator• Check the spark plugs.
Every 500 hours	<ul style="list-style-type: none">• Change the hydraulic filter (Every 250 hours/yearly if using Mobil 1 15W50)• Check the wheel hub locknuts torque specification.• Check the wheel lug nut torque specification.

Maintenance Service Interval	Maintenance Procedure
Monthly	<ul style="list-style-type: none"> Check the battery charge.
Yearly	<ul style="list-style-type: none"> Lubricate grease fittings. Lubricate the caster wheel hubs.

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. Raise hopper.
4. Clean area around dipstick. Remove dipstick and wipe oil off. Reinsert the dipstick and push it all the way down into the tube. Remove the dipstick and read the oil level.
5. 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.

Check Battery Charge

Service Interval: Monthly

⚠ WARNING

CALIFORNIA Proposition 65 Warning

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

Allowing batteries to stand for an extended period of time without recharging them will result in reduced performance and service life. To preserve optimum battery performance and life, recharge batteries in storage when the open circuit voltage drops to 12.4 volts.

Note: To prevent damage due to freezing, battery should be fully charged before putting away for winter storage.

Check the voltage of the battery with a digital voltmeter. Locate the voltage reading of the battery in the table and charge the battery for the recommended time interval to bring the charge up to a full charge of 12.6 volts or greater.

Important: Make sure the negative battery cables are disconnected and the battery charger used for charging the battery has an output of 16 volts and 7 amps or less to avoid damaging the battery (see chart for recommended charger settings).

Voltage Reading	Percent Charge	Maximum Charger Settings	Charging Interval
12.6 or greater	100%	16 volts/7 amps	No Charging Required
12.4 – 12.6	75–100%	16 volts/7 amps	30 Minutes
12.2 – 12.4	50–75%	16 volts/7 amps	1 Hour
12.0–12.2	25–50%	14.4 volts/4 amps	2 Hours
11.7–12.0	0–25%	14.4 volts/4 amps	3 Hours
11.7 or less	0%	14.4 volts/2 amps	6 Hours or More

Recommended Jump Starting Procedure

Service Interval: As required

1. Check the weak battery for terminal corrosion (white, green, or blue “snow”), it must be cleaned off prior to jump starting. Clean and tighten connections as necessary.

⚠ CAUTION

Corrosion or loose connections can cause unwanted electrical voltage spikes at anytime during the jump starting procedure.

Do Not attempt to jump start with loose or corroded battery terminals or damage to the engine may occur.

⚠ DANGER

Jump starting a weak battery that is cracked, frozen, has low electrolyte level, or an open/shorted battery cell, can cause an explosion resulting in serious personal injury.

Do Not jump start a weak battery if these conditions exist.

2. Make sure the booster is a good and fully charged lead acid battery at 12.6 volts or greater. Use properly sized jumper cables (4 to 6 AWG) with short lengths to reduce voltage drop between systems. Make sure the cables are color coded or labeled for the correct polarity.

⚠ CAUTION

Connecting the jumper cables incorrectly (wrong polarity) can immediately damage the electrical system.

Be certain of battery terminal polarity and jumper cable polarity when hooking up batteries.

Note: The following instructions are adapted from the SAE J1494 Rev. Dec. 2001 – Battery Booster Cables – Surface Vehicle Recommended Practice (SAE – Society of Automotive Engineers).

⚠ WARNING

Batteries contain acid and produce explosive gases.

- Shield the eyes and face from the batteries at all times.
- Do Not lean over the batteries.

Note: Be sure the vent caps are tight and level. Place a damp cloth, if available, over any vent caps on both batteries. Be sure the vehicles do not touch and that both electrical systems are off and at the same rated system voltage. These instructions are for negative ground systems only.

3. Connect the positive (+) cable to the positive (+) terminal of the discharged battery that is wired to the starter or solenoid as shown in Figure 6.

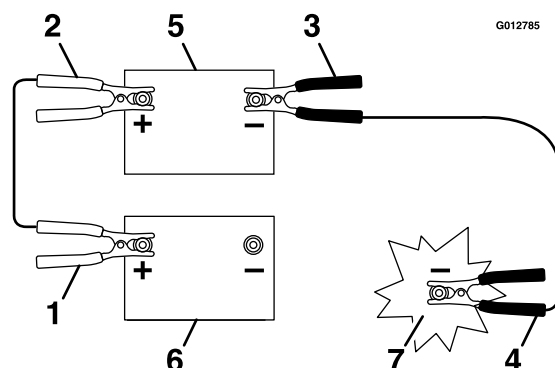


Figure 6

1. Positive (+) cable on discharged battery
 2. Positive (+) cable on booster battery
 3. Negative (-) cable on the booster battery
 4. Negative (-) cable on the engine block
 5. Booster battery
 6. Discharged battery
 7. Engine block
4. Connect the other end of the positive cable to the positive terminal of the booster battery.
 5. Connect the black negative (-) cable to the other terminal (negative) of the booster battery.
 6. MAKE THE FINAL CONNECTION ON THE ENGINE BLOCK OF THE STALLED VEHICLE (NOT TO THE NEGATIVE POST) AWAY FROM THE BATTERY. STAND BACK.
 7. Start the vehicle and remove the cables in the reverse order of connection (the engine block (black) connection is the first to disconnect).

Check Safety Interlock System

Service Interval: Before each use or daily

Note: To prevent engine cut-outs on rough terrain the seat kill switch has a 1/2 second delay.

1. Check starting circuit. Starter **should** crank with, parking brake **engaged**, PTO **disengaged** and

speed control lever in the **neutral** position. The operator does not need to be in the seat to start the engine.

Try to start with **operator in seat**, parking brake **disengaged**, PTO **disengaged** and speed control lever in the **neutral** position - starter **must not crank**.

Try to start with **operator in seat**, parking brake **engaged**, PTO **engaged** and speed control lever in the **neutral** position - **starter must not crank**.

Try to start with **operator in seat**, parking brake **engaged**, PTO **disengaged**, and the **speed control lever forward** (out of neutral), starter **must not crank**.

2. Check the kill circuits. Run engine at one-third throttle, **disengage** parking brake and **raise off** of seat (but do not get off of machine) engine **must initiate shutdown** after approximately 1/2 second has elapsed (seat has time delay kill switch to prevent cut-outs on rough terrain).

Run engine at one-third throttle, **engage PTO** and **raise off** of seat (but do not get off of machine) engine **must initiate shutdown** after 1/2 second has elapsed.

Note: If machine does not pass any of these tests, do not operate. Contact your authorized **EXMARK SERVICE DEALER**.

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

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 Cleaner

Service Interval: Every 50 hours—Service the air cleaner. (May need more often under severe conditions. See the Engine Owner's

Manual for additional information.)

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Tilt hopper up to gain access to the air cleaner.
3. Loosen retaining clips and remove air cleaner compartment cover.
4. Remove paper element. Check the condition of the paper element. Replace if dirty, bent or damaged.
5. Check the condition of the inner element. Replace whenever it appears dirty, typically every other time the paper element is replaced. Clean the base around the inner element before removing, so dirt does not get into the engine.
6. **Do Not** wash or use pressurized air to clean paper element or inner element.
7. Reinstall elements. Position the cover so that the rubber dust ejector is pointing downward and secure with retaining clips.

Change Engine Oil

Service Interval: After the first 5 hours

Every 100 hours (May need more often under severe conditions.)

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Drain oil while engine is warm from operation.
3. Tilt hopper up to gain access to the engine area.
4. The oil drain valve is located on right hand side of engine at the back of the unit. Remove two nuts near right hand drive tire and swing out the fuel tank. Install oil drain hose, supplied in the literature pack, onto oil drain valve. Place pan under machine to catch oil. Open valve to allow oil to drain and then close valve.
5. Replace the oil filter every other oil change. Clean around oil filter and unscrew filter to remove. Before reinstalling new filter, apply a thin coating of oil on the surface of the rubber seal. Turn filter clockwise until rubber seal contacts the filter adapter then tighten filter an additional 1/2 to 3/4 turn.

Maintenance

6. Clean around oil fill cap and remove cap. Fill to specified capacity and replace cap.
7. Remove drain hose, close fuel tank, and lower hopper.
8. Use oil recommended in engine owner's manual. **Do Not** overfill. Start the engine and check for leaks.
9. Wipe up any spilled oil from engine deck mounting surfaces.

Check Hydraulic Oil Level

Service Interval: Every 40 hours

⚠ WARNING

Oil spilled or vented from an overfilled hydraulic reservoir onto the PTO brake band will cause a longer stopping time for the deck and blower rotating components. The deck and blower rotating components can cause serious injury.

- Wait for all moving parts to come to a complete stop before servicing.
- **Do Not** overfill the hydraulic reservoir. Carefully fill only to the recommended level.
- Replace the brake band if it becomes contaminated with oil.

1. Stop engine and wait for all moving parts to stop. Engage parking brake.
2. Tilt hopper up.
3. Clean area around hydraulic reservoir cap and remove cap. Oil level should be to the top of the baffle inside the tank. If not, add oil. Use only Exmark Premium Hydro oil. Replace hydraulic reservoir cap and tighten until snug. **Do Not** overtighten. **Do Not** overfill.

Note: The baffle is labeled “HOT” and “COLD”. The oil level varies with the temperature of the oil. The “HOT” level shows the level of oil when it is at 225°F (107°C). The “COLD” level shows the level of the oil when it is at 75°F (24°C). Fill to the appropriate level depending upon the temperature of the oil. For example: If the oil is about 150°F (65°C), fill to

halfway between the “HOT” and “COLD” levels. If the oil is at room temperature (about 75°F (24°C)), fill only to the “COLD” level. **Do Not** overfill.

Check Tire Pressures

Service Interval: Every 40 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Check tire pressure in drive tires.
3. Inflate drive tires to 15 psi (103 kPa).
4. The rear caster tire is semi-pneumatic and does not need to be inflated.

Note: **Do Not** add any type of tire liner or foam fill material to the tires. Excessive loads created by foam filled tires may cause failures to the hydro drive system, frame, and other components. Foam filling tires will void the warranty.

Check Condition Of Belts

Service Interval: Every 40 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Tilt hopper up and check pump and PTO drive belts for wear, cracking, or contamination.
3. Belts are spring tensioned and no adjustment is necessary unless belts are replaced. See **PTO Belt Replacement** and **Pump Drive Belt Replacement** sections for belt replacement.

Lubricate Grease Fittings

Note: See chart for service intervals.

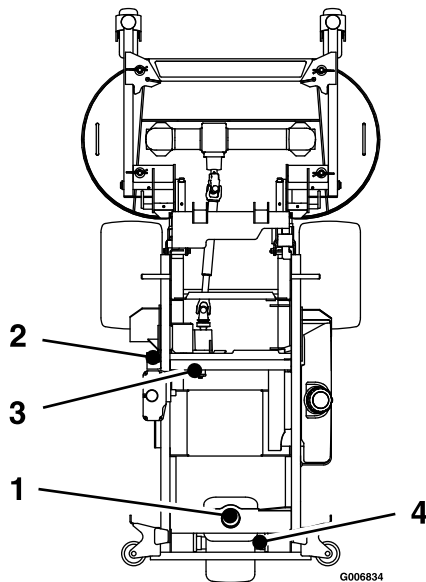
1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Lubricate fittings with one to two pumps of NGLI grade #2 multi-purpose gun grease.

Refer to the Lubrication Chart for fitting locations and lubrication schedule.

Lubrication Chart

Fitting Locations	Initial Pumps	Number of Places	Service Interval
1. Caster Pivot	*0	3	*Yearly
2. PTO Idler	1	1	Yearly
3. Pump Idler	1	1	Yearly
4. Rear Caster Hub	*0	1	*Yearly

* See step 3 for special lubrication instructions on the front and rear caster pivots and the **Lubricate Rear Caster Wheel Hubs** section for special lubrication instructions on the rear caster wheel hubs.



Deck shown for reference only. See attachment manual for lubrication schedule.

- Lubricate caster pivots once a year. Remove hex plug and cap. Thread grease zerk in hole and pump with grease until it oozes out around top bearing. Remove grease zerk and thread plug back in. Place cap back on.

Lubricate Rear Caster Wheel Hubs

Service Interval: Yearly

- Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.

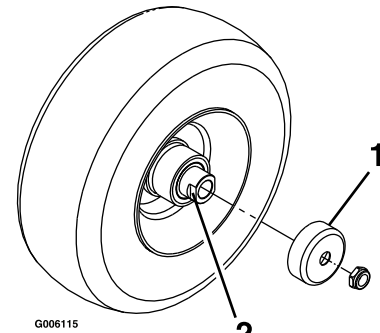


Figure 7

- Seal guard
 - Spacer nut with wrench flats
- Remove caster wheel from caster forks.
 - Remove seal guards from the wheel hub.
 - Remove one of the spacer nuts from the axle assembly in the caster wheel. Note that thread locking adhesive has been applied to lock the spacer nuts to the axle. Remove the axle (with the other spacer nut still assembled to it) from the wheel assembly.
 - Pry out seals, and inspect bearings for wear or damage and replace if necessary.
 - Pack the bearings with a NGLI grade #1 multi-purpose grease.
 - Insert one bearing, one new seal into the wheel.
- Note:** Seals (Exmark PN 103-0063) must be replaced.
- If the axle assembly has had both spacer nuts removed (or broken loose), apply a thread locking adhesive to one spacer nut and thread onto the axle with the wrench flats facing outward. Do Not thread spacer nut all of the way onto the end of the axle. Leave approximately 1/8 inch (3 mm) from the outer surface of the spacer nut to the end of the axle inside the nut.
 - Insert the assembled nut and axle into the wheel on the side of the wheel with the new seal and bearing.
 - With the open end of the wheel facing up, fill the area inside the wheel around the axle full of NGLI grade #1 multi-purpose grease.

Maintenance

11. Insert the second bearing and new seal into the wheel.
12. Apply a thread locking adhesive to the 2nd spacer nut and thread onto the axle with the wrench flats facing outward.
13. Torque the nut to 75-80 in-lb (8-9 N-m), loosen, then re-torque to 20-25 in-lb (2-3 N-m). Make sure axle does not extend beyond either nut.
14. Reinstall the seal guards over the wheel hub and insert wheel into caster fork. Reinstall caster bolt and tighten nut fully.

Important: To prevent seal and bearing damage, check the bearing adjustment often. Spin the caster tire. The tire should not spin freely (more than 1 or 2 revolutions) or have any side play. If the wheel spins freely, adjust torque on spacer nut until there is a slight amount of drag. Reapply thread locking adhesive.

Lubricate Brake Handle Pivot

Service Interval: Every 160 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Lubricate bronze bushings on brake handle pivot with a spray type lubricant or light oil (see Figure 8).

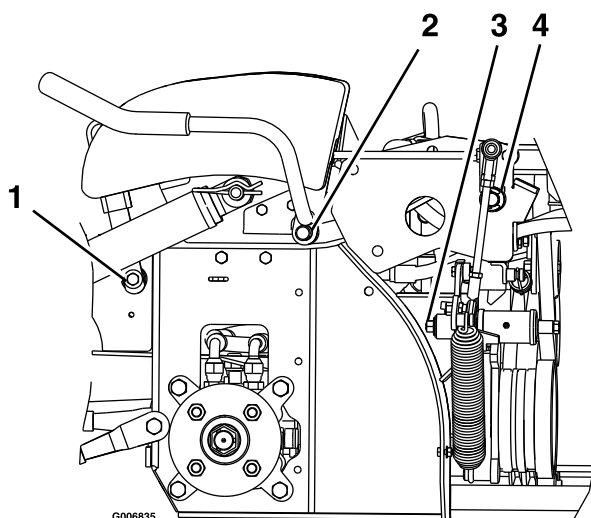


Figure 8

Left Side of Unit Shown

- | | |
|-----------------------|---------------------|
| 1. Brake Handle Pivot | 3. Spring Arm Pivot |
| 2. PTO Handle Pivot | 4. Toggle Pivot |

Lubricate Brake Rod Bushings

Service Interval: Every 160 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Unhook seat latch and tilt seat up.
3. Lubricate bronze bushings on each end of brake rod shaft with a spray type lubricant or a light oil (bushings are located to the inside of the flange bearings).

Lubricate Steering Linkage Rod Ends

Service Interval: Every 160 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Unhook seat latch and tilt seat up.
3. Lubricate each end of both steering linkage rods with a spray lubricant or a light oil.

Lubricate Hopper Actuator

Service Interval: Every 160 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Raise hopper and locate actuator on right hand side of mainframe.
3. Lubricate switch actuator rod with a spray lubricant or a light oil.

Check Spark Plugs

Service Interval: Every 160 hours

Remove spark plugs, check condition and reset gaps, or replace with new plugs. See Engine Owner's Manual.

Change Fuel Filter

Service Interval: As required

A fuel filter is installed between the fuel tank and the engine. Replace when necessary.

Replacement Filters	
Kohler	Kohler P/N 2405010

Change Hydraulic System Filter

Service Interval: After the first 250 hours

**Every 500 hours/Yearly
(whichever comes
first) thereafter
(Every 250 hours/Yearly if
using Mobil 1 15W50)**

Note: Use only Exmark Part No. 109-0071 for Summer use above 32°F (0°C) or P/N 1-523541 for Winter use below 32°F (0°C). (Refer to the **Hydrostatic Ground Drive System** section in Specifications for filter specifications.)

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Carefully clean area around filter. It is important that no dirt or contamination enter hydraulic system.
3. Unscrew filter to remove and allow oil to drain from reservoir.

Important: Before reinstalling new filter, fill it with Exmark Premium Hydro oil and apply a thin coat of oil on the surface of the rubber seal.

Turn filter clockwise until rubber seal contacts the filter adapter, then tighten the filter an additional 2/3 to 3/4 turn.

4. Fill reservoir as stated in **Check Hydraulic Oil Level** section.

Exmark Premium Hydro Oil is recommended. Refer to the chart for an acceptable alternative:

Hydro Oil	Change Interval
Exmark Premium Hydro Oil (Preferred)	500 Hours
Mobil 1 15W50	250 Hours

5. Raise the rear of machine up and support with jack stands (or equivalent support) just high enough to allow drive wheels to turn freely.
6. Start engine and move throttle control ahead to full throttle position. Move the speed control levers to the full speed and run for several minutes. Shut down machine and recheck oil level.

Note: Do Not change hydraulic system oil (except for what can be drained when changing filter), unless it is felt the oil has been contaminated or been extremely hot.

Changing oil unnecessarily could damage hydraulic system by introducing contaminants into the system.

Check Wheel Hub Locknuts

Service Interval: After the first 100 hours

Every 500 hours thereafter

Torque to 210–250 ft-lb (285–339 N-m).

Check Wheel Lug Nuts

Service Interval: After the first 100 hours

Every 500 hours thereafter

Torque to 90–95 ft-lb (122–129 N-m) cross pattern.

Fuel Tank — Mounting Hardware Specifications

Service Interval: As required

When installing the nuts on the fuel tank studs, fully tighten the nyloc nut and back off 1/2 turn. This allows for normal fuel tank expansion and contraction with changes in temperature and fuel levels.

Thread Locking Adhesives

Thread locking adhesives such as “Loctite 242” or “Fel-Pro, Pro-Lock Nut Type” are used on the following fasteners:

- Pump drive sheave set screws.
- Square head setscrews on Hydro pump control arms.
- Sheave retaining bolt in the end of engine crankshaft, blower shaft and jackshaft.
- Caster wheel spacer nuts.
- Fuel tank bulkhead fitting nuts.

Adhesives such as “Loctite RC/609 or RC/680” or “Fel-Pro Pro-Lock Retaining I or Retaining II” are used on the following:

Maintenance

Fuel tank studs, where studs are inserted into tank.

Dielectric Grease

Dielectric grease is used on all blade type electrical connections to prevent corrosion and loss of contact.

Adjustments

Note: Disengage PTO, shut off engine, wait for all moving parts to stop, engage parking brake, and remove key before servicing, cleaning, or making any adjustments to the unit.

PTO Drive Belt Tension

Self-tensioning - No adjustment necessary.

Pump Drive Belt Tension

Self-tensioning - No adjustment necessary.

PTO Belt Replacement

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. With engine “off”, engage PTO lever, then remove the hairpin and clevis pin at the bottom of the PTO brake band.
3. Rotate the brake band upwards out of the way of the belts keeping clear of the belt drive.
4. Disengage PTO lever.
5. Loosen belt guides “A” and “B” (See Figure 9).
6. Remove current belts
7. Route new belts onto sheaves as shown in the decal located on the back of the left drive shield (see Figure 9).

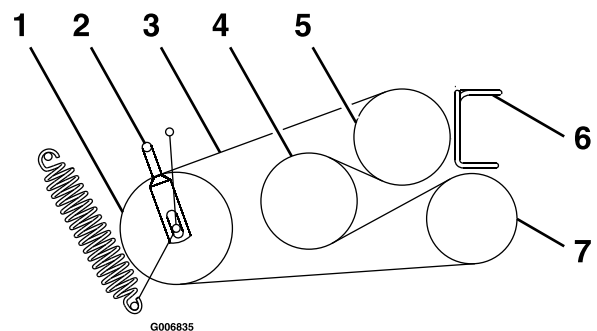


Figure 9

- | | |
|-------------------|-------------------|
| 1. Idler | 5. Engine |
| 2. Belt Guide “B” | 6. Belt Guide “A” |
| 3. PTO Belt | 7. Blower |
| 4. Jackshaft | |

-
8. Engage the PTO lever
 9. Rotate brake band back down into original position

10. Re-install clevis pin and hairpin to secure brake band.
11. Engage the PTO lever.
12. Loosen the jam nuts and adjust linkage until the top of the idler arm is aligned with the bottom of notch on tension arm as shown in Figure 10.

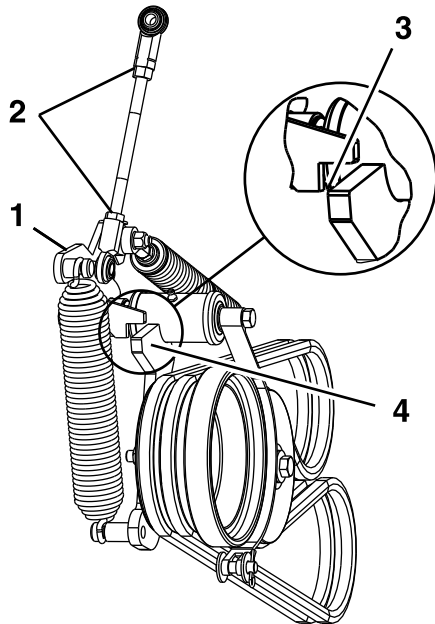


Figure 10

1. Tension Arm
2. Loosen jam nuts
3. When PTO is engaged, align top of idler arm with bottom of notch on tension arm, as shown.
4. Idler Arm

13. Tighten jam nuts and disengage PTO lever. Re-engage PTO lever and check alignment.
14. Check and adjust belt guides as stated in **Belt Guide Adjustment** section.

Pump Drive Belt Replacement

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Remove PTO Belts. See **PTO Belt Replacement** section for removal instructions.
3. Pull spring idler or remove spring to relieve pump drive belt tension. Remove old belt.
4. Route new belt onto sheaves as shown in the decal located on the back of the left drive shield (see Figure 11).

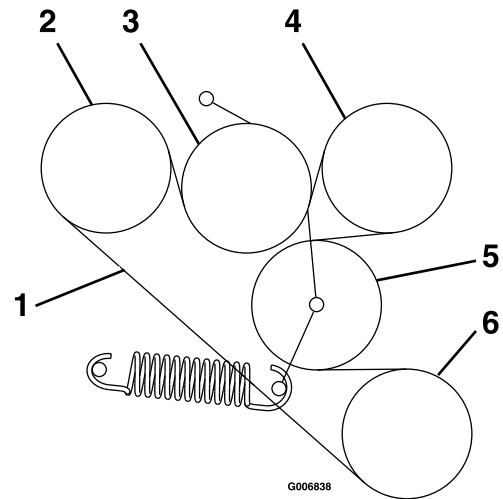


Figure 11

- | | |
|--------------------|-----------|
| 1. Pump Drive Belt | 4. Pump |
| 2. Pump | 5. Idler |
| 3. Idler | 6. Engine |

5. Reinstall PTO Belts as stated in the **PTO Belt Replacement** section

Belt Guide Adjustment

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Engage PTO lever.
3. Adjust belt guides as shown in Figure 12.

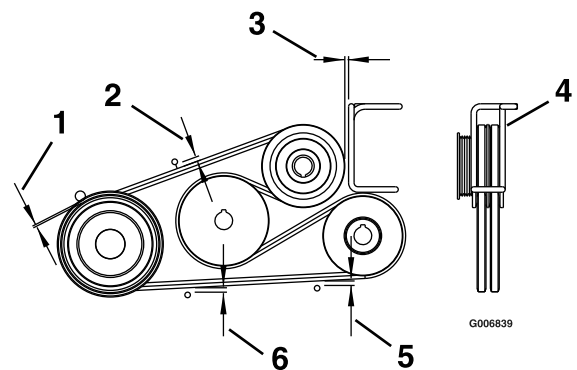


Figure 12

- | | |
|------------------------------|--|
| 1. 1/8 inch (3 mm) | 4. Rotate wireform guide to center belts in guide. |
| 2. 7/16 inch (11 mm) | 5. 1/4 inch (6 mm) |
| 3. 1/8 inch (3 mm) Clearance | 6. 5/16 inch (8 mm) |

Adjust Safety Switch

Adjust all safety switches so plunger extends 3/16 inch to 1/4 inch (4.8 mm-6.4 mm) from switch body when plunger is compressed (see Figure 13).

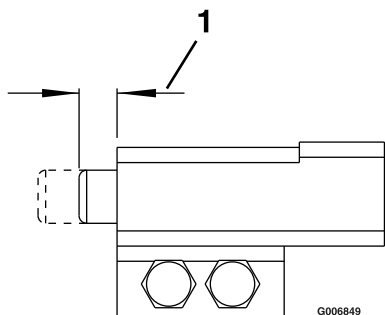


Figure 13

1. 3/16 inch to 1/4 inch (4.8 mm-6.4 mm)

Brake Adjustment

Check to make sure each brake is adjusted properly.

1. Pull the brake lever up and back to the engaged position.
2. A gap must exist between the bottom of the brake bolt head and the top surface of the brake swivel as shown in Figure 14. If a gap does not exist, adjust the linkage to a maximum gap of 1/2 inch $\pm 1/8$ inch (1.3 cm ± 0.33 cm) as shown.

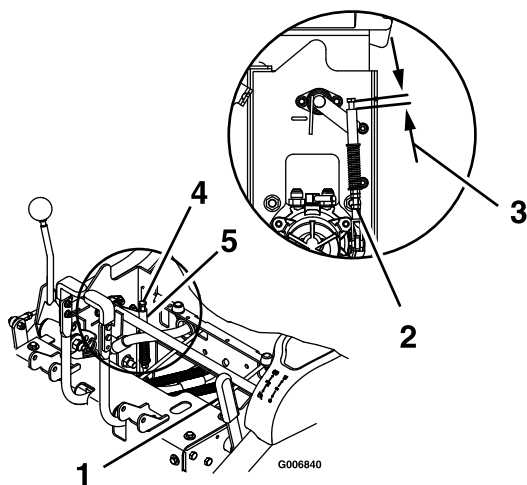


Figure 14

Brake Adjustment for Each Side (Separately)

1. Brake Lever in engaged position
2. Loosen nut here
3. 1/2 inch $\pm 1/8$ inch (1.3 cm ± 0.33 cm)
4. Brake Bolt
5. Brake Swivel

3. The brakes on both sides can be simultaneously adjusted by lengthening or shortening the linkage shown in Figure 15.

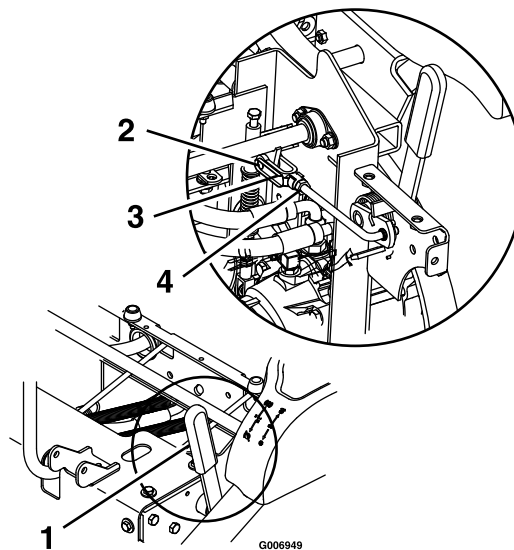


Figure 15

Brake Adjustment for Both Sides
(At the same time)

1. Brake Lever in engaged position
 2. Remove clevis pin
 3. Rotate yoke
 4. Loosen nut here
4. If individual adjustment is necessary, loosen the jam nut on the brake bolt that is against the clevis connected to the brake arm on the wheel motor. Turn the brake bolt to achieve proper adjustment.
 5. Tighten the jam nut against the clevis.
 6. Repeat for other side of unit.
 7. Engage and disengage the brakes to check for proper engagement and disengagement. Readjust if necessary. When the brakes are disengaged, there should be free play in the brake linkage with no dragging in the brakes.

Adjust Speed Control Lever Tension

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Tension in speed control lever can be adjusted by adjusting the tightness of the lever pivot bolt, which is located under the seat near the speed control lever (see Figure 16).
3. Set the tension high enough that the speed control lever position is maintained during operation and

loose enough to be moved comfortably by the operator.

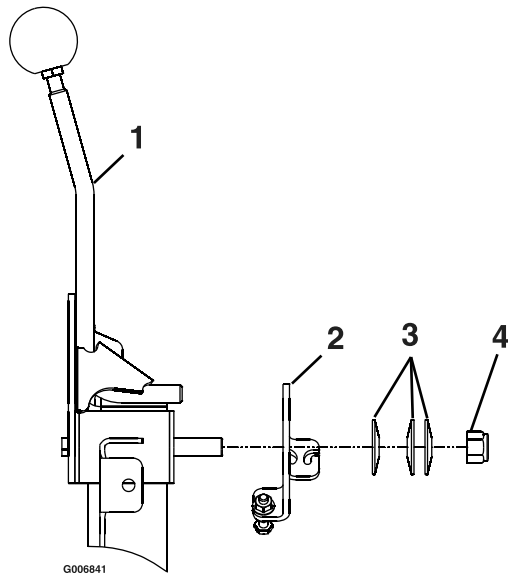


Figure 16

- | | |
|------------------------|------------------------|
| 1. Speed Control Lever | 3. Spring disc washers |
| 2. Friction Plate | 4. Hex locknut |

Speed Control Linkage Adjustment

⚠ WARNING

Engine must be running and drive wheels must be turning so motion control adjustment can be performed. Contact with moving parts or hot surfaces may cause personal injury.

Keep fingers, hands, and clothing clear of rotating components and hot surfaces.

⚠ CAUTION

Raising the mower deck for service or maintenance relying solely on mechanical or hydraulic jacks could be dangerous. The mechanical or hydraulic jacks may not be enough support or may malfunction allowing the unit to fall, which could cause injury.

Do Not rely solely on mechanical or hydraulic jacks for support. Use adequate jack stands or equivalent support.

- Adjust steering levers
 - Stop engine and wait for all moving parts to stop.
 - Pull the speed control lever completely back to the neutral position. The two steering levers should be straight up and down (vertical). If necessary, adjust steering levers by changing the length of the link between the speed control lever and the control arm on the end of the steering control shaft (see Figure 17).

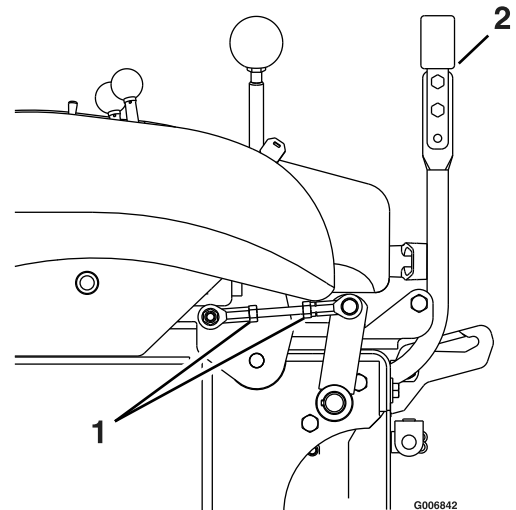


Figure 17

- | | |
|---|---------------------------------------|
| 1. Loosen jam nuts here to adjust linkage | 2. Steering levers should be vertical |
|---|---------------------------------------|

- Set neutral:
 - Remove the electrical connection from the seat safety switch, located directly in front of the seat switch assembly.
 - The neutral adjustment must be made with the drive wheels turning. Raise the frame and place on jack stands so that drive wheels can rotate freely. Temporarily install a jumper wire

across the terminals in the connector of the wiring harness.

3. Start the engine.
4. Run the unit at least 5 minutes with the speed control lever at full forward speed to bring hydraulic system oil up to operating temperature. Return speed control lever to neutral (full rear) position.
5. To obtain the neutral position, adjust the left and right pump control rod linkages that connect the steering control to the pump control arms until the wheels stop, or creep slightly in reverse.
6. Adjust the left pump linkage by rotating the tracking adjustment knob.
7. Adjust the right pump linkage by using a wrench to turn the double nuts on the assembly (see Figure 18)

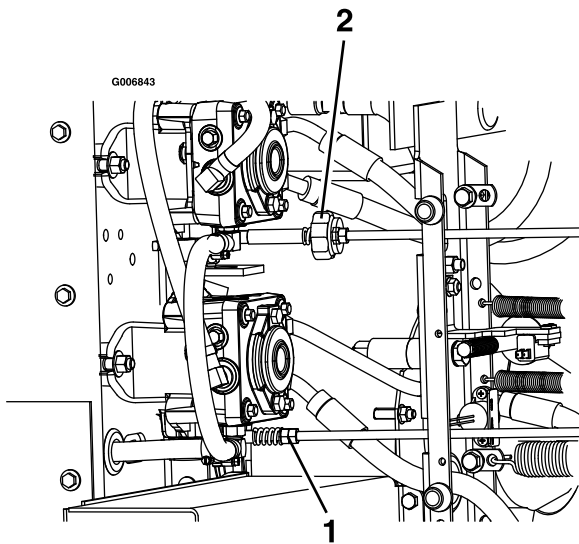


Figure 18

1. Rotate tracking knob on left side
2. Rotate double nuts on right side

8. Move the steering levers to the reverse position. While applying slight pressure to the levers, allow the steering levers to return to neutral. The wheels must stop turning (or slightly creep in reverse).
9. Stop engine and wait for all moving parts to stop. Remove jumper wire from wire harness connector and plug connector into seat switch.
10. Lower from jackstands.

Set forward stop bolt:

1. Remove seat deck (with seat attached) to obtain a clear view of the steering control shaft to complete this adjustment.
2. Push the speed control lever forward to full forward speed position.
3. If either steering control lever surface does not contact the stop bar at the full forward speed position, adjust the stop bolt until contact occurs (see Figure 19). Once contact occurs, turn the stop bolt one more full turn to prevent bottoming of the hydraulic pump internal stops.

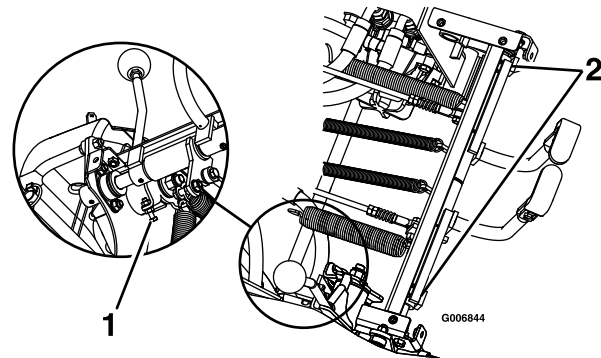


Figure 19

1. Speed control Lever forward stop bolt
2. Contact must be maintained between these components at full forward speed condition

Steering Control Lever Response Adjustment

1. Stop engine, wait for all moving parts to stop and remove key. Engage parking brake.
2. Move the speed control lever to the full forward position.
3. Lift the seat and locate the pump control springs. To increase responsiveness, increase spring tension by hooking the rear spring anchor directly to the anchor bolt. To decrease responsiveness, hook the rear spring anchor to the anchor tab.

Note: Be sure both springs maintain the same adjustment.

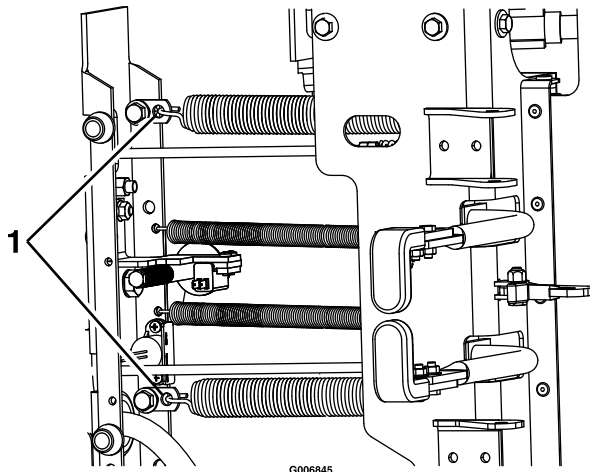


Figure 20

1. To increase steering responsiveness hook pump control springs directly on anchor bolt. To decrease steering responsiveness hook pump control springs on anchor tabs as shown.

inch to 1/16 inch (0.8-1.6 mm). Use a straight edge to align all three surfaces (see Figure 21).

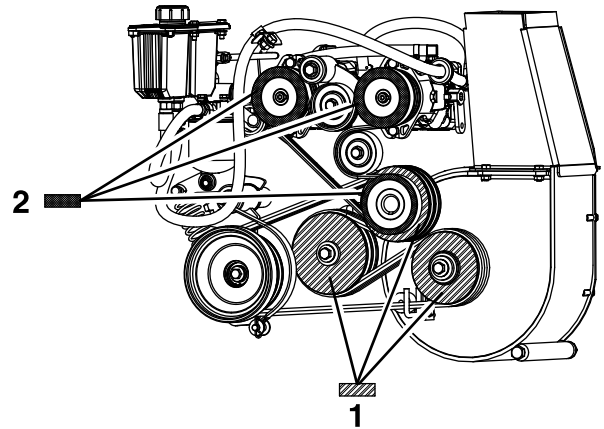


Figure 21

1. Align three pump drive pulley surfaces shown with this pattern within 1/32 inch to 1/16 inch (0.8-1.6 mm).
2. Align three PTO drive pulley surfaces shown with this pattern within 1/32 inch to 1/16 inch (0.8-1.6 mm).

Tracking Adjustment

See **Motion Control Linkage Adjustment** section

PTO Drive Pulley Alignment

PTO drive pulley alignment is necessary for any of the following conditions:

- The blower has been removed or replaced.
 - The engine mounting bolts have been loosened or the engine has been moved or replaced.
 - The jackshaft mounting bolts have been loosened or the jackshaft has been moved or replaced.
1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
 2. Move the speed control lever to the neutral position.
 3. Disengage the PTO lever.
 4. Remove fuel tank mounting nuts and swing out fuel tank.
 5. Verify that the blower is installed and secured tightly.
 6. Loosen the 4 engine mounting bolts.
 7. Unhook the pump belt tension spring.
 8. Loosen the 4 jackshaft mounting bolts.
 9. Measuring from the blower pulley as a baseline, move the engine and jackshaft until the rear surface of all 3 pulleys are aligned within 1/32

10. Tighten the four engine mounting bolts and four jackshaft mounting bolts. Check alignment after tightening.
11. Re-install pump belt tension spring.
12. Swing fuel tank in and re-install tank mounting nuts.
13. Complete the **Pump Drive Pulley Alignment** section.

Pump Drive Pulley Alignment

Pump drive pulley alignment is necessary for any of the following conditions:

- The engine mounting bolts have been loosened or the engine has been moved or replaced.
 - The pump pulleys have been loosened, moved, or replaced.
 - The PTO pulley alignment has been performed (see **PTO Drive Pulley Alignment** section).
1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
 2. Loosen set screws on both pump pulleys.
 3. Using a straight edge, align each pump pulley with the engine pulley by sliding along the pump shaft (see Figure 21).
 4. Re-tighten pulley set screws and recheck alignment.

Rear Caster Pivot Bearings Pre-Load Adjustment

Remove dust cap from caster and tighten nyloc nut until washers are flat. Back off 1/4 of a turn to properly set the pre-load on the bearings. If disassembled, make sure the spring disc washers are reinstalled as shown in Figure 22.

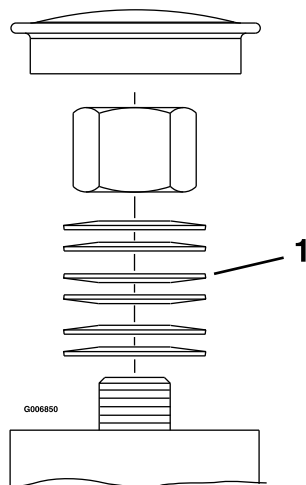


Figure 22

1. Spring disc washers

Hopper Door Adjustment

Door Closing:

Loosen six door hinge nuts (see Figure 23).

Open door and place a 3/8 inch rubber strip or 3/8 inch diameter hose between the hopper and hopper door (see Figure 23).

Close door and push tight against hopper.

Tighten hinge hardware. Open hopper door and remove rubber strip.

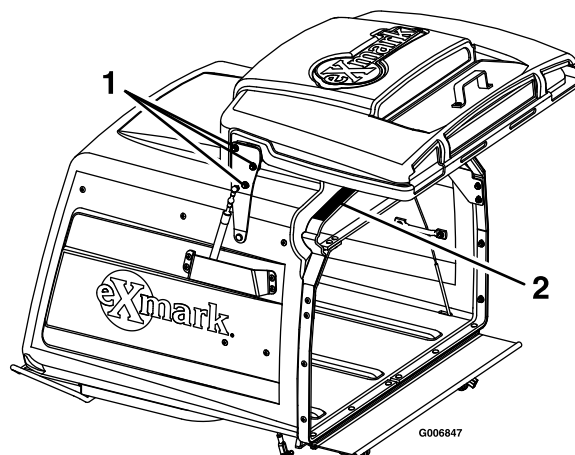


Figure 23

1. Loosen door hinge nuts-three per side
2. Place a piece of 3/8 inch (9.5 mm) rubber on this surface

PTO Brake Spring Adjustment

PTO brake spring adjustment is only necessary if the blower has been removed or replaced or if the PTO drive idler arm has been disassembled.

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Locate the brake spring and thread the two jam nuts out to the end of the brake spring rod (see Figure 24).
3. Tighten jam nuts together at end of brake spring rod.

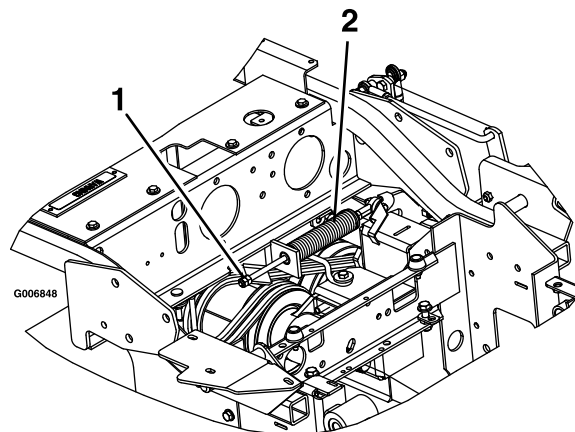


Figure 24

1. Tighten jam nuts here
2. PTO Brake spring assembly

Cleaning

Clean Engine and Exhaust System Area

Service Interval: Before each use or daily
(May be required more often in dry or dirty conditions.)

⚠ CAUTION

Excessive debris around the engine cooling air intake and inside of the pump drive belt compartment and damaged or missing rubber baffles can cause the engine and hydraulic system to overheat which can create a fire hazard.

Clean all debris from inside of pump drive belt compartment daily.

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Clean all debris from rotating engine air intake screen and from around engine shrouding and exhaust system area.
3. Clean all debris from around engine, drive belts, and exhaust system area.

Remove Engine Shrouds and Clean Cooling Fins

Service Interval: Every 80 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Remove cooling shroud clean-out covers from engine and clean cooling fins. Also clean dust, dirt, and oil from external surfaces of engine, which can cause improper cooling.
3. Make sure cooling shroud clean-out covers are reinstalled. Operating the engine without cooling shroud clean-out covers will cause engine damage due to overheating.
4. For 27HP Kohler units: Swing out the fuel tank and remove debris from around the oil cooler positioned at right front corner of engine.

Important: Do Not use water to clean engine. Use low pressure compressed air. See Engine Owner's Manual.

Clean Debris From Machine

Service Interval: Before each use or daily

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Clean off any oil, debris, or grass build-up on the machine, especially around the fuel tank, around engine and exhaust area.

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.

Battery Disposal

⚠ DANGER

Battery electrolyte contains sulfuric acid, which is poisonous and can cause severe burns. Swallowing electrolyte can be fatal or if it touches skin can cause severe burns.

- Wear safety glasses to shield eyes, and rubber gloves to protect skin and clothing when handling electrolyte.
- Do Not swallow electrolyte.
- In the event of an accident, flush with water and call a doctor immediately.

Federal law states that batteries should not be placed in the garbage. Management and disposal practices must be within relevant federal, state, or local laws.

If a battery is being replaced or if the unit containing the battery is no longer operating and is being scrapped, take the battery to a local certified recycling center. If no local recycling is available return the battery to any certified battery reseller.

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. Do Not attempt to service or replace major items or any items that call for special timing or adjustments procedures (such as valves, governor, etc.). Have this work done by your **Engine Service Dealer**.

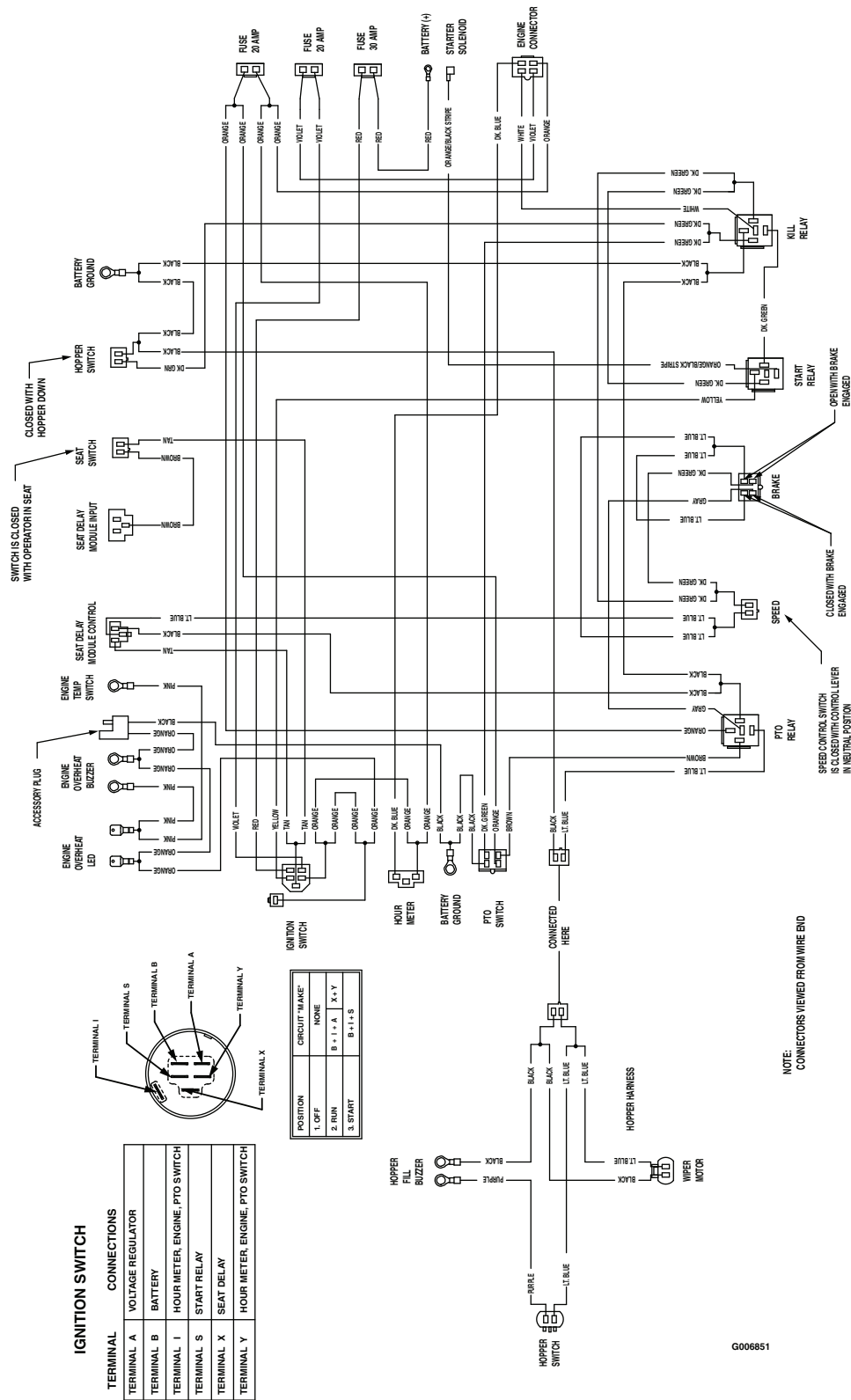
Note: When disconnecting electrical connectors Do Not pull on the wires to separate the connectors.

Problem	Possible Cause	Corrective Action
Starter does not crank.	<ol style="list-style-type: none">1. PTO is engaged.2. Parking brake is not set.3. Speed control lever is not in neutral position.4. Battery does not have a full charge.5. Electrical connections are corroded, loose or faulty.6. Fuse is blown.7. Relay or switch is defective.	<ol style="list-style-type: none">1. Disengage the PTO.2. Set the parking brake.3. Ensure the speed control lever is in the neutral position.4. Charge the battery. See Check Battery Charge and Recommended Jump Starting Procedure sections in Maintenance.5. Check the electrical connections for good contact. Clean connector terminals thoroughly with electrical contact cleaner, apply dielectric grease and reconnect.6. Replace the blown fuse.7. Contact an Authorized Service Dealer.
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. Oil level in the crankcase is low.4. The throttle and choke are not in the correct position.5. Dirt in fuel filter.6. Dirt, water, or stale fuel is in the fuel system.7. Air cleaner is dirty.8. Electrical connections are corroded, loose or faulty.9. Relay or switch is defective.10. Faulty spark plug.11. Spark plug wire is not connected.	<ol style="list-style-type: none">1. Fill the fuel tank.2. Open the fuel shutoff valve.3. Add oil to the crankcase.4. Be sure the throttle control is midway between the "SLOW" and "FAST" positions, and the choke is in the "ON" position for a cold engine or the "OFF" position for a warm engine.5. Replace the fuel filter.6. Contact an Authorized Service Dealer.7. Clean or replace the air cleaner element.8. Check the electrical connections for good contact. Clean connector terminals thoroughly with electrical contact cleaner, apply dielectric grease and reconnect.9. Contact an Authorized Service Dealer.10. Clean, adjust or replace spark plug.11. Check the spark plug wire connection.
Engine loses power.	<ol style="list-style-type: none">1. Engine load is excessive.2. Air cleaner is dirty.3. Oil level in the crankcase is low.4. Cooling fins and air passages for the engine are plugged.5. Vent hole in the fuel cap is plugged.6. Dirt in fuel filter.7. Dirt, water, or stale fuel is in the fuel system.	<ol style="list-style-type: none">1. Reduce the ground speed.2. Clean or replace the air cleaner element.3. Add oil to the crankcase.4. Remove the obstructions from the cooling fins and air passages.5. Clean or replace the fuel cap.6. Replace the fuel filter.7. Contact an Authorized Service Dealer.

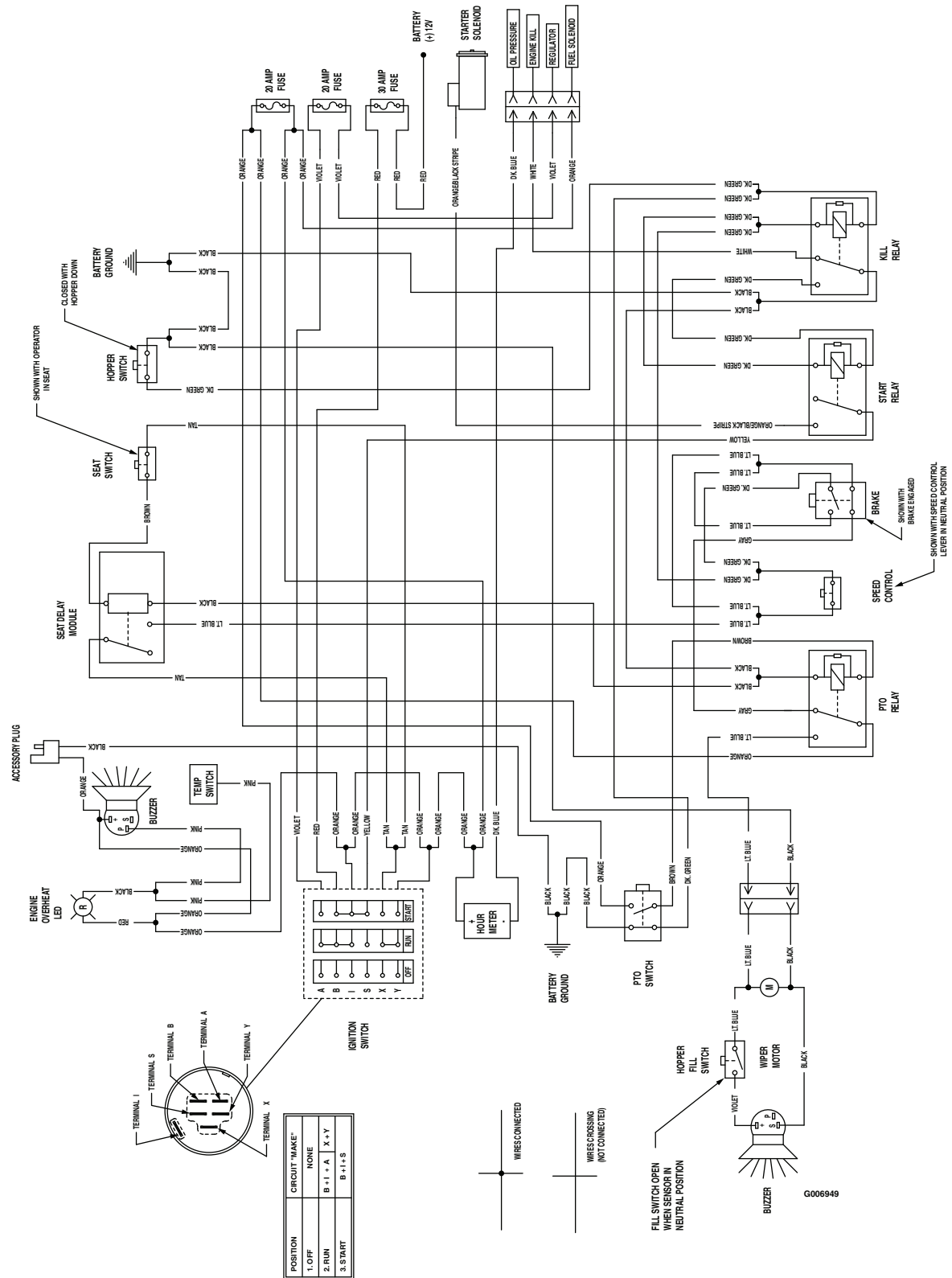
Problem	Possible Cause	Corrective Action
Engine overheats.	<ol style="list-style-type: none"> 1. Engine load is excessive. 2. Oil level in the crankcase is low. 3. Cooling fins and air passages for the engine are plugged. 	<ol style="list-style-type: none"> 1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstructions from the cooling fins and air passages.
Mower pulls left or right (with levers fully forward).	<ol style="list-style-type: none"> 1. Tracking needs adjustment. 2. Tire pressure in drive tires not correct. 3. Reverse indicator and speed control linkage need adjustment. 	<ol style="list-style-type: none"> 1. Adjust the tracking. 2. Adjust tire pressure in the drive tires. 3. Adjust the reverse indicator and the speed control linkage.
Machine does not drive.	<ol style="list-style-type: none"> 1. Bypass valve is not closed tight. 2. Drive or pump belt is worn, loose or broken. 3. Drive or pump belt is off a pulley. 4. Broken or missing idler spring. 5. Hydraulic fluid level is low or too hot. 	<ol style="list-style-type: none"> 1. Tighten the bypass valve. 2. Change the belt. 3. Change the belt. 4. Replace the spring. 5. Add hydraulic fluid to reservoir or let it cool down.
Abnormal vibration.	<ol style="list-style-type: none"> 1. Engine mounting bolts are loose. 2. Loose engine pulley, idler pulley, or blade pulley. 3. Engine pulley is damaged. 4. Belt is damaged. 	<ol style="list-style-type: none"> 1. Tighten the engine mounting bolts. 2. Tighten the appropriate pulley. 3. Contact an Authorized Service Dealer. 4. Install new belt.

Schematics

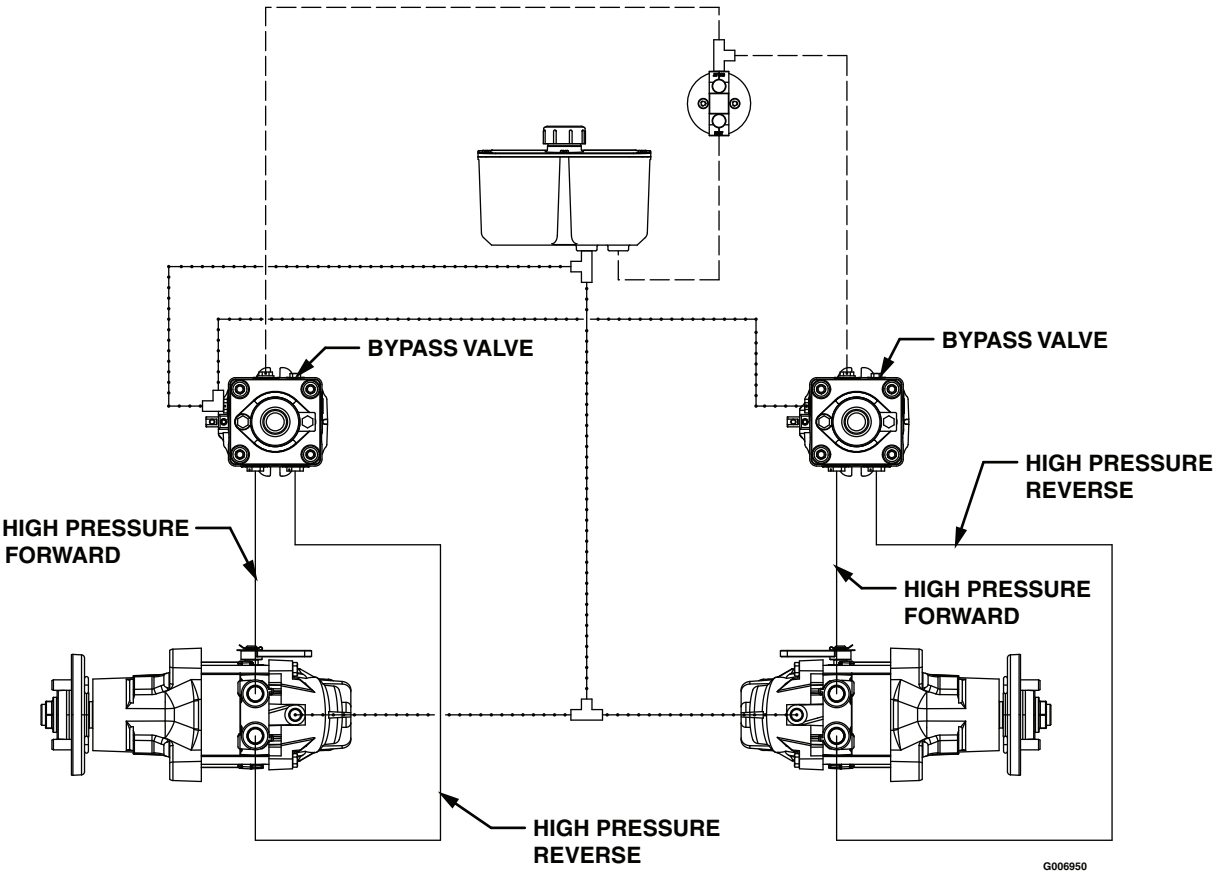
Electrical Diagram



Electrical Logic Schematic



Hydraulic Diagram



- HIGH PRESSURE
- - - - CHARGE PUMP
- - - - CASE DRAIN

Exmark Commercial Turf Equipment

2 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 two years.

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
- Battery
- Engine

Warranty Period

90 days

1 Year Prorated

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

If your product requires warranty service it 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.

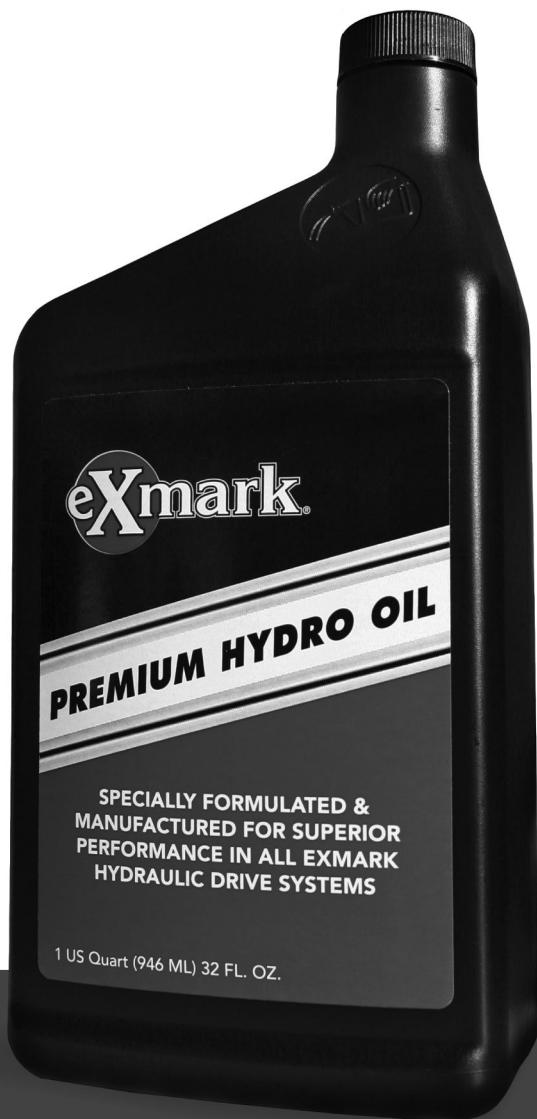
This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Notes:

Service Record

[illegible]

NEW EXMARK PREMIUM HYDRO OIL



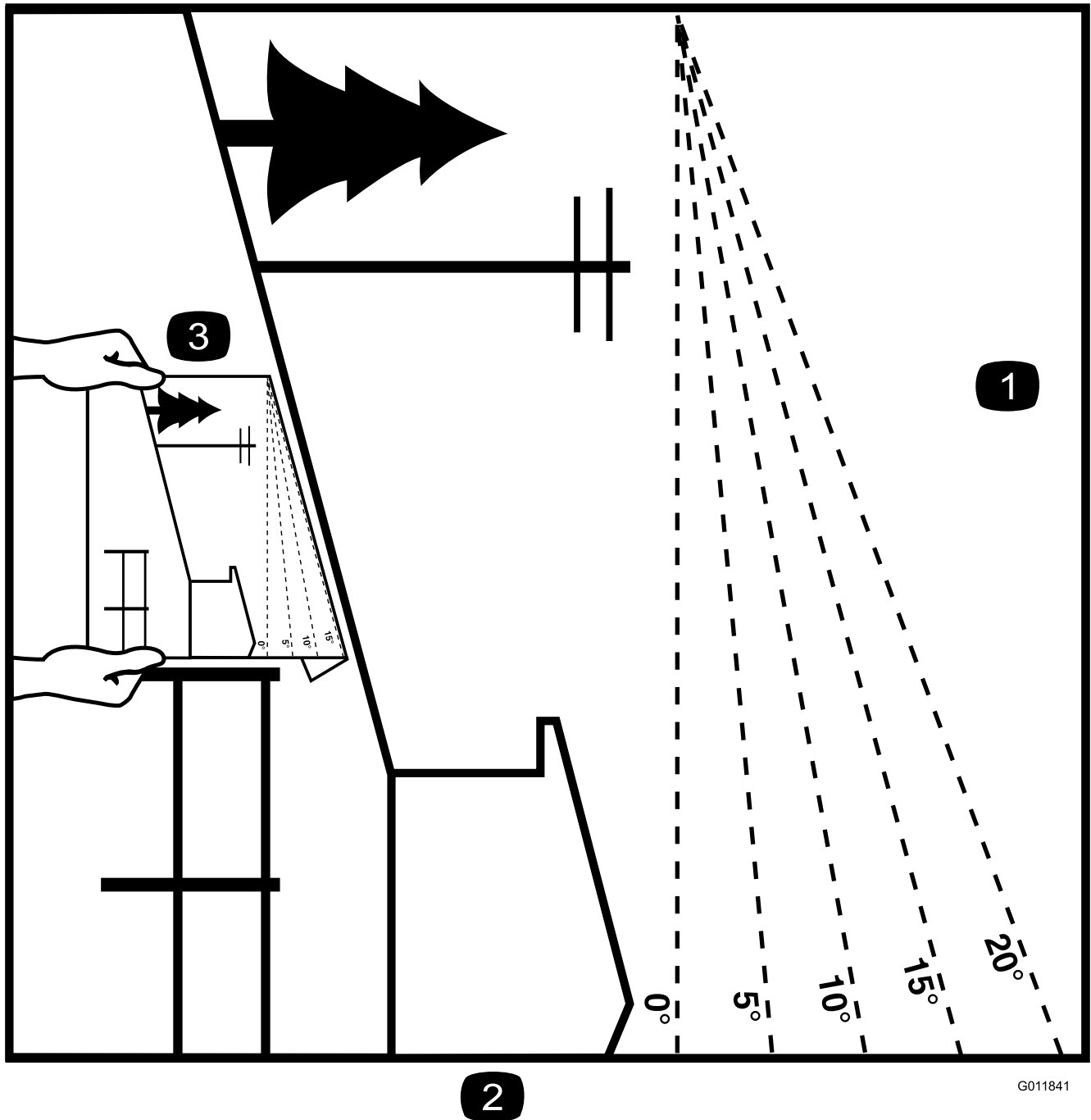
BENEFITS

- Designed & manufactured with superior anti-wear protection
- Superior thermal stability
- Consistent hydro performance
- Superior shear resistance under heavy loads
- Field tested & proven performance
- Twice the shear stability of competing oils
- Enhanced control performance
- Specially formulated for any Exmark hydraulic system

**NOW AVAILABLE
FOR PURCHASE**

Part No. 109-9828





G011841

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Figure 25

This page may be copied for personal use.

1. The maximum slope you can safely operate the machine on is **15 degrees**. Use the slope indicator to determine the degree of slope of hills before operating. **Do Not operate this machine on a slope greater than 15 degrees.** Fold along the appropriate line to match the recommended slope.
2. Align this edge with a vertical surface, a tree, building, fence pole, etc.
3. Example of how to compare slope with folded edge.

SEE EXMARK'S COMPLETE LINE OF ACCESSORIES AND OPTIONS

MID-MOUNT RIDING ACCESSORIES AND OPTIONS

CUSTOM RIDE SEAT SUSPENSION SYSTEM	OPERATOR CONTROLLED DISCHARGE
FULL SUSPENSION SEAT	ROLL OVER PROTECTION SYSTEM (ROPS)
DECK LIFT ASSIST KIT	SUN SHADE
HITCH KIT	TRASH CONTAINER
LIGHT KIT	TURF STRIPER
12V POWER PORT	ULTRA VAC COLLECTION SYSTEM
MICRO-MULCH SYSTEM	ULTRA VAC QUICK DISPOSAL SYSTEM

OUT-FRONT RIDING ACCESSORIES AND OPTIONS

CUSTOM RIDE SEAT SUSPENSION SYSTEM	SNOW BLADE
DUAL-TAIL WHEEL	SNOWBLOWER
FLOOR PAN EXTENDER	SUN SHADE
HITCH KIT	TRASH CONTAINER
LIGHT KIT	ULTRA VAC COLLECTION SYSTEM
MICRO-MULCH SYSTEM	ULTRA VAC QUICK DISPOSAL SYSTEM
ROLL OVER PROTECTION SYSTEM (ROPS)	WEATHER CAB

WALK-BEHIND ACCESSORIES AND OPTIONS

GRASS CATCHER	TURF STRIPER
MICRO-MULCH SYSTEM	STANDON

Place Model No. and Serial No.
Label Here (Included in the Literature
Pack) or Fill in Below

Model No. _____

Serial No. _____

Date Purchased _____

Engine Model No. and Spec. No. _____

Engine Serial No. (E/No) _____

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Part No. 4500-628 Rev. B
(402) 223-6300
Fax (402) 223-5489
Printed in the USA

