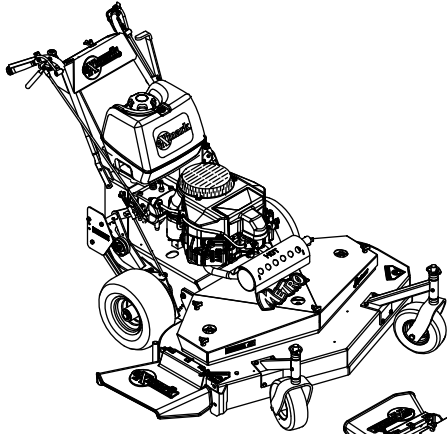
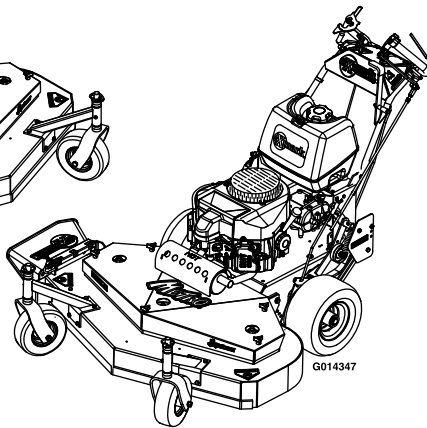


**eXmark**®



Metro with Pistol Grip Handles



Metro with ECS Handles

**METRO**®

**For Serial Nos.  
920,000 & Higher**  
Part No. 4500-689 Rev. A

**Operator's Manual**

**⚠ WARNING**

**CALIFORNIA  
Proposition 65 Warning**

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

**Important:** 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.

To acquire a spark arrester for your unit, see your Engine Service Dealer.

This spark ignition system complies with the Canadian standard 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.

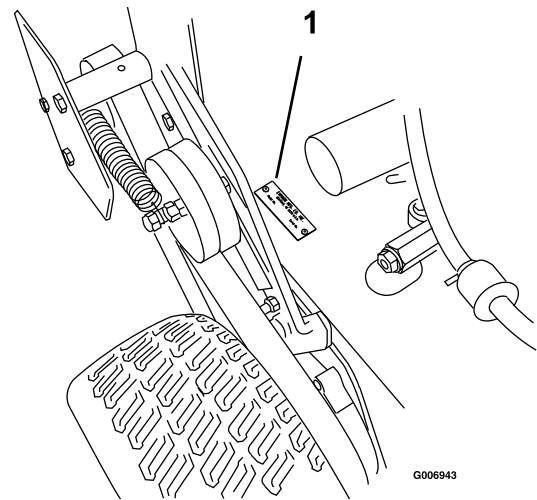
If additional information is needed, or should you require trained mechanic service, contact your authorized Exmark equipment dealer or distributor. Exmark parts manuals are available online at <http://www.exmark.com/manuals.htm>

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 lawn mower meets or exceeds the B71.4 specifications of the American National Standards Institute in effect at the time of production.

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

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

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



Figure 2

1. Safety alert symbol

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

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

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

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

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

## Safe Operating Practices

### Training

- 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.
- Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by spark.
- Store gasoline in an approved container and keep it out of the reach of children.
- Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel when engine is running or when the engine is hot.
- If fuel is spilled, Do Not attempt to start the engine. Move away from the area of the spill and avoid creating any source of ignition until fuel vapors have dissipated.
- Do Not operate without entire exhaust system in place and in proper working condition.

## **⚠ DANGER**

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

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

## **⚠ WARNING**

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

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

## Operation

### ⚠ WARNING

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

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

### ⚠ WARNING

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

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

- Operate only in daylight or good artificial light, keeping away from holes and hidden hazards.
- 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 with the discharge deflector raised, removed or altered 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.
- Park machine on level ground. 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.
- Stop engine, wait for all moving parts to stop, and engage parking brake:
  - Before refueling.
  - Before dumping the grass catcher.
  - Before making height adjustments.

### ⚠ WARNING

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

- Do Not operate the machine without guards, shields, and safety devices in place and working properly.
- Keep hands, feet, hair, jewelry, or clothing away from rotating parts.
- **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.

# Safety

---

## **▲ DANGER**

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

- **Mow across slopes, never up and down.**
- **Do Not mow slopes when grass is wet.**
- **Do Not mow near drop-offs or near water.**
- **Do Not mow slopes greater than 20 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.
- 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 uphill because the mower may tip backwards.
- 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 grass catchers or attachments. These can change the stability of the machine and cause loss of control.

## **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 and engine area free from accumulation of grass, leaves, excessive grease or oil, and other debris which can accumulate in these areas. These materials can become combustible and may result in a fire.
- Let engine cool before storing and Do Not store near flame or any enclosed area where open pilot lights or heat appliances are present.
- Shut off fuel while storing or transporting. Do Not store fuel near flames or drain indoors.
- Park machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- 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.
- 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.**

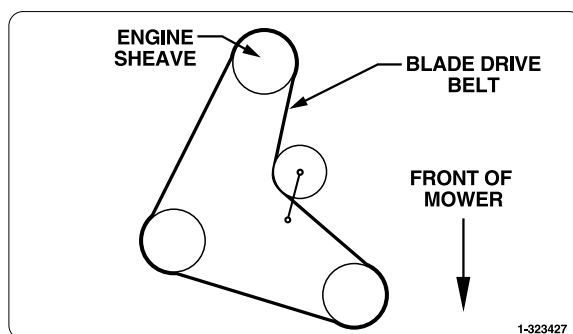


## Safety and Instructional Decals

- 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.

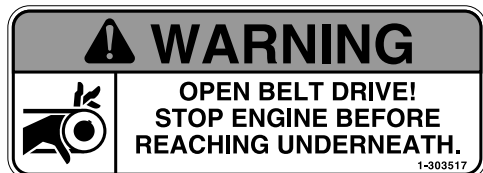


1-303508

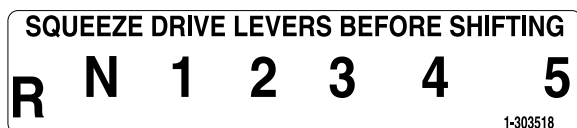


1-323427

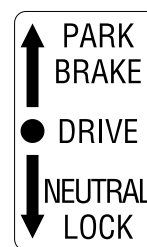
32 inch and 36 inch Units Only



1-303517



1-303518



1-323550

Pistol Grip Handle Units Only



1-403005

# Safety



1-403143



103-2076



98-5954



103-1623

ECS Units Only

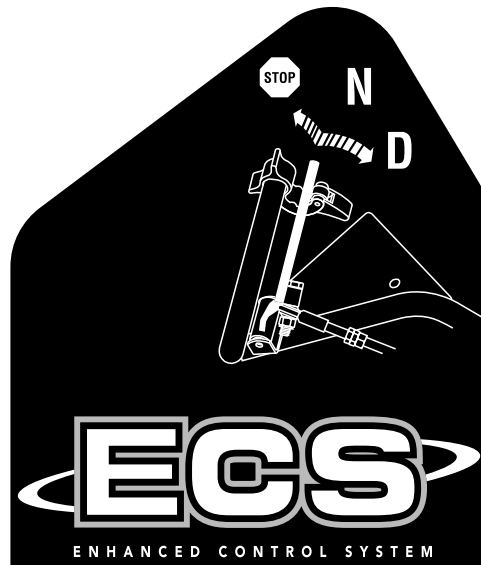


103-2244

ECS Units Only

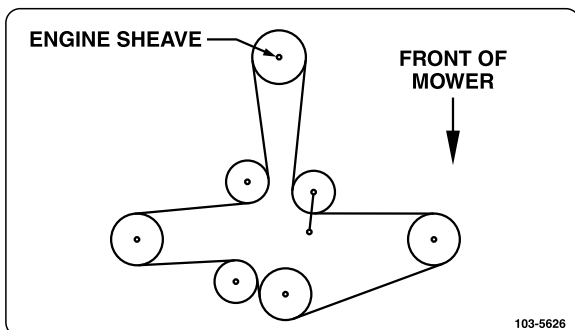


103-1798



103-2245

ECS Units Only



103-5626

48 inch Deck Units Only

## 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

↑ ROTATE PTO  
↓ STOP

**⚠ DANGER**

- Thrown objects or blade contact can cause serious injury or death.
- Keep all people and pets out of area when mowing.
- Avoid blades unless blades and engine are stopped.

**⚠ WARNING**

- Read operator's manual before operating.
- Do NOT operate unless trained to safely operate this machine.
- Do NOT operate without shields, guards, and safety devices in place and working.
- Do NOT carry passengers.
- Clear area of debris before mowing.
- Before leaving operator's position:
  - Disengage PTO.
  - Shift speed control lever to neutral.
  - Engage park brakes.
- Shut off engine and remove key before adjusting, servicing, or cleaning.
- Use extreme caution when operating on slopes.
- Mow across slope - NOT up and down.
- Do NOT operate on slopes greater than 20°.
- Do NOT mow wet slopes.

**⚠ CAUTION**

- Hearing protection recommended.

STOP OFF ON

MAX 20°

103-1967

103-1967

Pistol Grip Units Only

## Specifications

### Model Numbers

Serial Nos: 920,000 and Higher

MG16KA322P; MG16KA322PCA; MG16KA362; MG16KA362CA; MG16KA362P; MG16KA483;  
MG16KA483CA; MG16KA483P

### Systems

#### Engine

- Engine Specifications: See your Engine Owner's Manual
- Engine Oil Type: Exmark 4-Cycle Premium Engine Oil
- RPM: Full Speed: 3600 (No Load)  
Idle: 1550 RPM

#### Fuel System

- Capacity: 5.0 gal. (18.9 L)
- Type of Fuel: Regular unleaded gasoline, 87 octane or higher; containing no more than 10% methanol or ethanol.
- Fuel Filter: Replaceable In-line
- Fuel Shut-Off Valve: 1/4 turn increments

#### Safety Interlock System

Operator must have the transmission in neutral and PTO disengaged to start engine. Release of Operator Presence Control (OPC) levers will cause engine to stop if transmission is not in neutral and/or PTO is engaged.

#### Steering/Brake Controls

Fingertip drive control levers provide independent control of traction, braking, and neutral to each drive wheel for moving, stopping, and power turning. Parking brakes are engaged by locking drive control levers in the "brake" position.

#### Transmission

- Peerless 700-070A, five speeds forward and one reverse.
- Speed range:
  - 1st: 2.0 mph (3.22 km/hr)
  - 2nd: 2.7 mph (4.35 km/hr)
  - 3rd: 3.5 mph (5.63 km/hr)
  - 4th: 4.1 mph (6.60 km/hr)
  - 5th: 6.2 mph (9.98 km/hr)
  - Reverse: 3.1 mph (4.99 km/hr)

#### Wheel Drive System

Banded double A-Section V-belts, single top-side idlers and replaceable bolt-on drive sheaves and brake drums. (Single B-Section V-belts for the 32 inch Model)

#### Tires & Wheels

	Drive		Front Caster
	Pneumatic (Air-Filled)		Semi-Pneumatic
	32	36 & 48	All Decks
Quantity	2	2	2
Tread	Turf Saver	Turf Master	Smooth
Size	13 x 5.00-6	13 x 6.50-6	9 x 3.50-4
Ply Rating	4	4	
Pressure	14 psi (97 kPa)	14 psi (97 kPa)	
Bearings	Replaceable Ball	Replaceable Ball	Replaceable Roller

## Cutting Deck

- Cutting Width:
  - 32 inch Deck: 31.75 inches (80.7 cm)
  - 36 inch Deck: 35.38 inches (89.9 cm)
  - 48 inch Deck: 47.25 inches (120.0 cm)
- Discharge: Side
- Blade Size:
  - 32 inch Deck: 16.25 inches (41.3 cm) — Quantity: 2
  - 36 inch Deck: 18.00 inches (45.7 cm)— Quantity: 2
  - 48 inch Deck: 16.25 inches (41.3 cm)— Quantity: 3
- Deck Drive: Manual engagement of belt with over-center lock. Blade belt tension is adjustable via turnbuckle.
- Blade Brake: When the blade engagement control is moved to the disengaged position a friction brake pad stops the rotation of the blades.
- Deck Mounting: Bolted directly to engine deck.
- Deck Depth:
  - 32 inch Deck: 5.0 inches (12.7 cm)
  - 36 inch Deck: 5.0 inches (12.7 cm)
  - 48 inch Deck: 5.0 inches (12.7 cm)
- Cutting Height Adjustment:
 

Adjusts from 1 inch (2.5 cm) to 4 1/4 inches (10.8 cm) in 1/4 inch (6.4 mm) or smaller increments by various adjustments of caster spacers, blade spacers, and axle height.

## Dimensions

### Overall Width:

	32 inch Deck	36 inch Deck	48 inch Deck
Deflector Up	32.7 inches (83.1 cm)	36.4 inches (92.5 cm)	48.1 inches (122.2 cm)
Deflector Down	43.3 inches (110.0 cm)	47.0 inches (119.4 cm)	57.9 inches (147.1 cm)

### Overall Length:

	32 inch Deck	36 inch Deck	48 inch Deck
Standard Pistol Grip Handles	78.0 inches (198.1 cm)	78.0 inches (198.1 cm)	73.0 inches (185.4 cm)
ECS Handles	77.3 inches (196.3 cm)	77.3 inches (196.3 cm)	72.3 inches (183.6 cm)

### Overall Height:

Standard Pistol Grip Handles	40.0 inches (101.6 cm)
ECS Handles	42.1 inches (106.9 cm)

### Tread Width: (Outside to Outside of Tires, Widthwise)

	32 inch Deck	36 inch Deck	48 inch Deck
Standard Pistol Grip & ECS Handles	32.1 inches (81.4 cm)	35.6 inches (90.4 cm)	35.6 inches (90.4 cm)

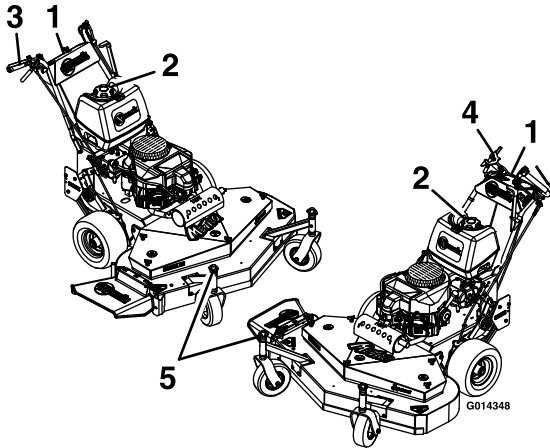
### Curb Weight:

	32 inch Deck	36 inch Deck	48 inch Deck
Standard Pistol Grip Handles	477 lb (215 kg)	495 lb (223 kg)	536 lb (241 kg)
ECS Handles	507 lb (228 kg)	507 lb (228 kg)	554 lb (249 kg)

## Torque Requirements

Bolt Location	Torque
Blade/Cutter Housing Spindle Bolt	75-80 ft-lb (102-109 N-m)
Caster Bracket Mounts	30-35 ft-lb (41-48 N-m)
Mower Deck/Engine Deck Mount	30-35 ft-lb (41-48 N-m)
Engine Mounting Bolts	17-23 ft-lb (23-31 N-m)
Transmission Shifter Lever Nut	30-35 ft-lb (41-48 N-m)

## Product Overview



**Figure 3**

- |                        |                  |
|------------------------|------------------|
| 1. Controls            | 4. ECS Handles   |
| 2. Fuel Cap            | 5. Blade Spacers |
| 3. Pistol Grip Handles |                  |

## Operation

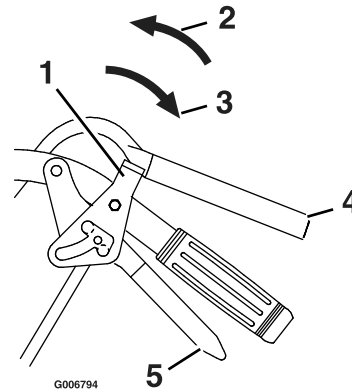
**Note:** Determine the left and right sides of the machine from the normal operating position.

### Controls

#### Operator Presence Control (OPC) Levers

Located on the upper handle assembly directly above the handle grips.

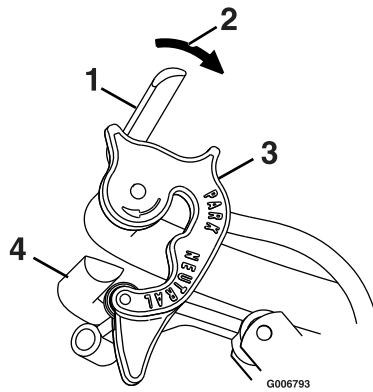
When these levers are depressed, the OPC system senses that the operator is in the normal operator's position. When the levers are released, the OPC system senses that the operator has moved from the normal operating position and will kill the engine if either the transmission shift lever is not in the neutral position or the PTO is engaged (see Figure 4 and Figure 5).



**Figure 4**

Pistol Grip Handle

1. Neutral Lock/Park Brake Latch
2. Rotate latch forward for park brake position
3. Rotate latch back for neutral lock position
4. OPC Lever
5. Drive Lever



**Figure 5**  
ECS Handle

1. OPC Lever
2. Rotate latch for neutral lock and park brake positions
3. Neutral Lock Latch/Park Brake Latch
4. Drive Lever

## Drive Levers

Located on each side of the upper handle assembly ahead of and below the handle grips (see Figure 4 and Figure 5).

These levers individually control clutching action of the wheel drive belts and brakes. When the drive levers are all the way down, the brakes disengage and the wheel drive belts engage

Gradually squeezing the left or right hand drive lever disengages the wheel drive belts, causing the left hand or right hand wheel to slow down until they reach neutral or stop. This makes the machine turn to the left or right respectively. Squeezing further engages the park brakes. The sharpness of the turn varies by how much the lever is squeezed. For straight ahead motion, smoothly release both drive levers to engage both drive wheels simultaneously.

## Neutral Lock/Park Brake Latches

- **For Pistol Grip Handles:** Located on handles ahead of the grips.
- **For ECS Handles:** Located on the upper handle assembly on the ends of the handle grips.

The latches allow the operator to lock the drive levers in a “neutral” position where neither the wheel drive belts nor the brakes engage or in a “park brake” position where the wheel drive belts are not engaged and the park brake is engaged (see Figure 4 and Figure 5).

## Choke Control

Located on the front left corner of the fuel tank support.

Choke is used to aid in starting a cold engine. The choke control is pulled out to be in the “ON” position and pushed in to be in the “OFF” position. Do Not run a warm engine with choke in the “ON” position.

## Throttle Control

Located on the on the control console right side.

The throttle is used to control engine speed. Moving the throttle control forward will increase engine speed and moving it to the rear will decrease engine speed. Moving the throttle forward into the detent is full position.

## Transmission Shift Lever

Located under the control console and behind the fuel tank.

It shifts the 5-speed transmission into five forward gears, neutral and reverse. Shift transmission only when drive levers are in the neutral position. Shifting without drive levers in neutral may cause damage to the transmission.

**Note:** Reverse is “reverse assist” only, meaning when the transmission is in reverse, the operator has to pull the unit backward to “assist” with the movement of the unit.

## “Off-Run” Switch

Located on the control console.

Turn the key to the “Run” position to allow the engine to be started. Turn the key to the “Off” position to shut engine off.

## Fuel Shut-Off Valve

Located in the fuel line midway between the tank and engine.

The fuel shut-off valve is used to shut off the flow of fuel when parking inside a building, during transportation to and from the job sites, and when the machine will not be used for a few days.

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

# Operation

---

## Pre-Start

Fill fuel tank on level ground. 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.

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

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

### Starting the Engine

**Note:** Always engage the left and right neutral lock/park brake latches in the “park brake” position when starting the engine

1. On a cold engine, place the throttle midway between the “Slow” and “Fast” positions and place the choke in the “On” position. On a warm engine, place the throttle lever midway between “Slow” and “Fast” positions and leave the choke in the “Off” position.
2. Turn ignition switch to “Run” position. Pull the recoil rope to start engine.
3. On a cold engine, gradually return choke to the “Off” position after engine starts and warms up.

**Note:** Kawasaki engines generally need to be “choked” even when warm.

## PTO Engagement

### **▲ 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 blade could occur. Thrown objects or blade contact can cause serious injury or death.

**Never operate the mower with the discharge deflector raised, removed, or altered unless there is a grass collection system or mulch kit in place and working properly.**

The PTO switch engages the cutting blades. Be sure that all persons are clear of mower deck and discharge area before engaging the PTO.

1. Set throttle to “MIDWAY” position.
2. Push the PTO lever forward to engage blades.
3. Place the throttle in the “FAST” position to begin mowing.

### Disengaging the PTO

1. Set throttle to “MIDWAY” position.
2. Pull the blade engagement lever to the full rearward position to disengage the blades

### Stopping the Engine

1. Bring the unit to a full stop.
2. Lock drive levers in “park brake” position.
3. Disengage the PTO.
4. Move transmission shift lever to “neutral”.
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

### Drive Lever/Neutral Lock/Park Brake Latch Operation

- **For Pistol Grip Handles**

To lock the drive levers in “neutral”, squeeze the drive levers back to the neutral position. Place thumbs on the upper portion of the neutral lock/park brake latches and move them to the rear. Release the drive levers.

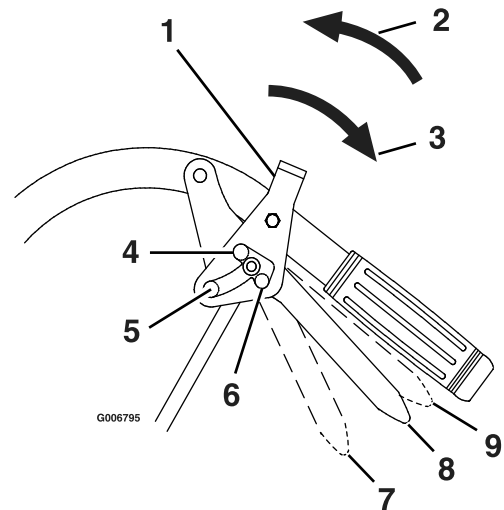
To lock the levers in “park brake”, squeeze the drive levers back to the brake position. Place thumbs on the upper portion of the neutral lock/park brake latches and move them to the front. Release the drive levers (see Figure 6)

### **▲ CAUTION**

**If the neutral lock/park brake latches are not completely engaged the drive levers could unexpectedly slip into the forward drive position. If the drive levers slip into the drive position, the unit could lurch forward and cause injury or property damage.**

**Be sure the pins protruding through the slots of each neutral lock latch are completely engaged in the rear slot of each latch.**

To place the drive levers in the drive position, firmly hold the drive levers, place thumbs on the upper portion of the neutral lock/park brake latches and move them out of the “neutral” or the “park brake” position. Slowly and smoothly release the drive levers.



**Figure 6**

- |                                           |                                    |
|-------------------------------------------|------------------------------------|
| 1. Latch is in the drive position         | 6. Neutral lock                    |
| 2. Rotate forward for park brake position | 7. Forward — release drive lever   |
| 3. Rotate back for neutral lock position  | 8. Neutral — hold in this position |
| 4. Park brake                             | 9. Reverse—squeeze drive lever     |
| 5. Full speed forward                     |                                    |

- **For ECS Handles**

To lock the drive levers in “neutral lock”, squeeze the drive levers to the “neutral” position. See Figure 7 position 2. Place thumbs on the inner thumb lobe of the neutral lock /park brake latches and rotate them to the “neutral” position. See Figure 7 position 3. Release the drive levers.

To lock the drive levers in “park brake”, squeeze the drive levers farther to the “brake” position. Place thumbs on the inner thumb lobe of the neutral lock/park brake latches and rotate them to the “park” position. See Figure 7 position 4. Release drive levers.

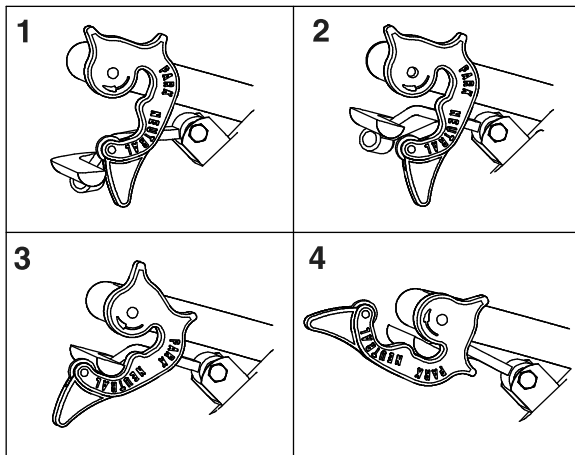
### **▲ CAUTION**

**If the neutral lock/park brake latches are not completely engaged the drive levers could unexpectedly slip into the forward drive position. If the drive levers slip into the drive position, the unit could lurch forward and cause injury or property damage.**

**Be sure the drive levers are securely seated at the bottom of the “neutral” or “park” areas of the neutral lock latches.**

# Operation

To place the drive levers in the “drive” position, slightly squeeze the drive levers while placing thumbs on the outer thumb lobe of the neutral lock/park brake latches (or the index finger on the front lobe) and rotate them from under the drive levers. Slowly and carefully release the drive levers. See Figure 7 position 1.



G006796

Figure 7

1. Drive Lever in drive position
2. Drive Lever in neutral position
3. Drive Lever locked in neutral position
4. Drive Lever locked in park position

## Driving Forward

1. With drive levers in the “neutral” or “park brake” position, shift transmission into desired gear.
2. Squeeze both drive levers and move both neutral lock/park brake latches from the “neutral” or “park brake” position to the “drive” position.
3. To move forward in a straight line, smoothly release both drive levers to engage drive wheels.

To turn left or right, squeeze the right hand drive lever to turn right and the left hand drive lever to turn left.

Squeeze drive levers all the way back to engage brakes. Move neutral lock/park brake latches into the “park brake” position and release drive levers. Shift transmission into neutral.

## Driving in Reverse

**Note:** Reverse gear is reverse assist only, the operator must pull the unit backwards.

To move rearward, squeeze the drive levers to neutral position and move the shifter to the “R”.

Smoothly release both drive levers to engage drive wheels.

Pull the unit backward to “assist” with the movement of the unit.

To stop, squeeze drive levers all the way back to engage the brakes. Move the neutral lock latches into the “park brake” position and release drive levers. Move the speed control lever to the neutral position.

## Changing Gears

When changing gears, always squeeze drive levers to the neutral position. The shift lever may be moved with a knee or by hand (engage the neutral lock latches if shifting by hand).

**Note:** Reverse gear is “reverse assist” only, the operator must pull the unit backwards.

## Transporting

### Transporting a Unit

#### ⚠ WARNING

Loading the mower onto a trailer without strong enough or properly supported ramps could be dangerous. The ramps could collapse causing the unit to fall, which could cause injury.

- Use proper ramps that are secured to the truck or trailer.
- Keep feet and legs out from under the unit when loading and unloading.
- If necessary, use assistance when loading.

Be sure the fuel shut-off valve is closed.

Use a heavy duty trailer to transport the machine. Engage neutral lock latches and park brake, then block wheels.

Securely fasten the machine to the trailer with straps, chains, cables, or ropes.

Do Not rely solely on the parking brake to hold the machine on the trailer.

Be sure that the trailer has all necessary lighting and marking as required by law and use a safety chain.

# 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"> <li>Change the engine oil.</li> </ul>
Before each use or daily	<ul style="list-style-type: none"> <li>Check the engine oil level.</li> <li>Check the mower blades.</li> <li>Check the safety interlock system.</li> <li>Check for loose hardware.</li> <li>Grease the front caster wheel bearings.</li> <li>Grease front caster pivots.</li> <li>Grease the drive wheels.</li> <li>Grease the drive wheel idler arm.</li> <li>Clean the engine and exhaust system area.</li> <li>Clean the grass and debris build-up from the machine and cutting deck.</li> <li>Clean the grass build-up from under the deck.</li> </ul>
Every 25 hours	<ul style="list-style-type: none"> <li>Service the foam element. (May need more often under severe conditions. See the Engine Owner's manual for additional information.)</li> </ul>
Every 40 hours	<ul style="list-style-type: none"> <li>Check the tire pressures.</li> <li>Check the condition of the belts.</li> <li>Grease the brake arm.</li> <li>Grease the transmission output shaft coupler</li> <li>Grease the mower deck idler pivots</li> </ul>
Every 100 hours	<ul style="list-style-type: none"> <li>Service the paper element. (May need more often under severe conditions. See the Engine Owner's manual for additional information.)</li> <li>Change the engine oil. (May need more often under severe conditions.)</li> <li>Remove engine shrouds and clean cooling fins.</li> </ul>
Every 160 hours	<ul style="list-style-type: none"> <li>Check the spark plugs.</li> <li>Check grease level, input and output shaft bearing wear on Peerless Transmission.</li> </ul>
Every 200 hours	<ul style="list-style-type: none"> <li>Replace the paper element.</li> </ul>
Every 500 hours	<ul style="list-style-type: none"> <li>Replace the emissions air intake filter.</li> </ul>
Yearly	<ul style="list-style-type: none"> <li>Replace gearbox grease.</li> </ul>

## Periodic Maintenance

### Check Engine Oil Level

#### Service Interval: Before each use or daily

1. Stop engine and wait for all moving parts to stop. Make sure unit is on a level surface.
2. Check with engine cold.
3. Clean area around dipstick. Remove dipstick and wipe oil off. Reinsert the dipstick and push it all the way down into the tube. **Do Not** screw into place. Remove the dipstick and read the oil level.
4. If the oil level is low, wipe off the area around the oil fill cap, remove cap and fill to the “FULL” mark on the dipstick. Exmark 4-Cycle Premium Engine Oil is recommended; refer to the Engine Owner’s manual for an acceptable alternative. **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 Mower Blades

#### Service Interval: Before each use or daily

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Lift deck and secure in raised position as stated in the **Clean Grass Build-Up Under Deck** procedure.
3. Inspect blades and sharpen or replace as required.
4. Re-install the blades (if they were removed) and torque blade bolts to 75-80 ft-lb (102-109 N-m). Be sure the spring disc washer cone is installed toward the bolt head (see Figure 8).

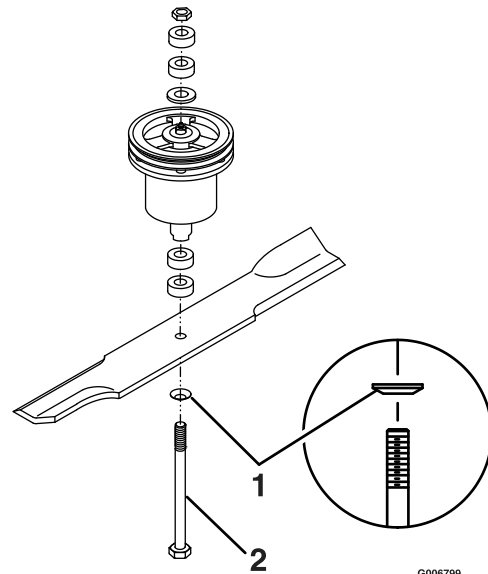


Figure 8

1. Spring disc washer (cone towards bolt head)
2. Blade bolt torque to 75-80 ft-lb (102-109 N-m).

### Replacing the Discharge Deflector

#### Service Interval: As required

#### **⚠ DANGER**

An uncovered discharge opening could allow the lawn mower to throw objects in the operator’s or bystander’s direction and result in serious injury. Also, contact with the blade could occur.

Never operate the lawn mower unless you install a mulch plate, discharge deflector, or grass collection system.

1. To remove a damaged or worn discharge deflector, lift the leg of the spring with the loop out of the notch in the discharge deflector and slide the rod out of the discharge deflector brackets, and discharge deflector.
2. To install new discharge deflector, orient the spring on the rod as shown in Figure 9. Slide the rod through the front discharge deflector bracket, discharge deflector, and rear deflector bracket.

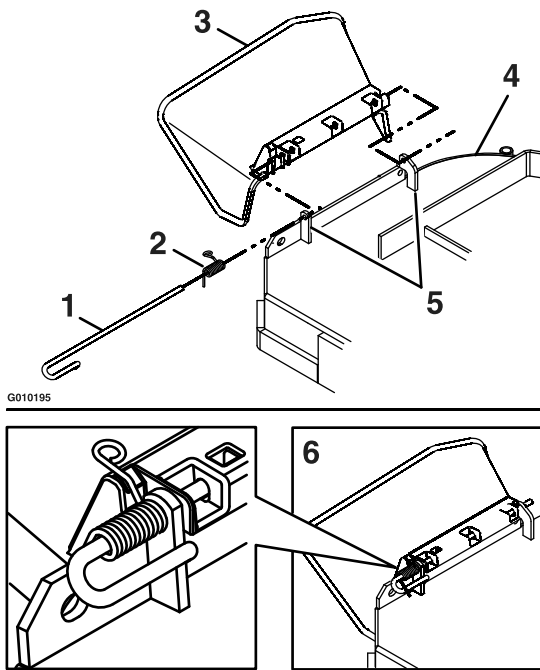


Figure 9

- |                        |                                |
|------------------------|--------------------------------|
| 1. Rod                 | 4. Mower deck                  |
| 2. Spring              | 5. Discharge deflector bracket |
| 3. Discharge deflector | 6. Assembled view              |

- Hook the bent end of the rod around the front discharge deflector bracket to retain it from sliding out. Place the leg of the spring with the loop in the notch in the discharge deflector to hold the discharge deflector in the down position (see Figure 9).

**Important:** The discharge deflector must be spring loaded in the down position. Lift the deflector up to test that it snaps to the full down position.

## Check Safety Interlock System

**Service Interval: Before each use or daily**

- For your safety, your Exmark mower is equipped with Operator Presence Controls, referred to as (OPC). When either the PTO is **engaged**, or the transmission shifter lever is not in **neutral** and the operator removes both hands from the handles, the mower **engine must stop**.
- To determine if the OPC is in operating condition, clear area of bystanders. Run the engine at one-third throttle, then with the drive levers and neutral lock latches in the “park brake” position,

shift the transmission into gear and release the OPC levers—the **engine must stop**.

- Again, run the engine at on-third throttle, move the transmission shifter lever to neutral, engage the PTO and release the OPC levers—the **engine must stop**.

**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**

- Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- 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 25 hours—Service the foam element. (May need more often under severe conditions. See the Engine Owner’s manual for additional information.)**

**Every 100 hours—Service the paper element. (May need more often under severe conditions. See the Engine Owner’s manual for additional information.)**

**Every 200 hours/Yearly (whichever comes first)—Replace the paper element.**

- Stop engine, wait for all moving parts to stop, and remove key or spark plug wire(s). Engage parking brake.
- See the Engine Owner’s Manual for maintenance instructions.

# Maintenance

## 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. Remove the oil drain plug from the right hand side of the engine. Allow oil to drain, replace drain plug.
4. Replace the oil filter per the engine owner's manual. Clean around oil filter and unscrew filter to remove. Before the new filter is installed, apply a thin coating of Exmark 4-Cycle Premium Engine Oil on the surface of the rubber seal. Turn filter clockwise until rubber seal contacts the filter adapter, then tighten filter an additional 2/3 to 3/4 turn.
5. Clean around oil fill cap and remove cap. Fill to specified capacity and replace cap.
6. Use oil recommended in the **Check Engine Oil Level** section. **Do Not** overfill. Start the engine and check for leaks. Stop engine and recheck oil level.
7. Wipe up any spilled oil from engine deck mounting surfaces.

## 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 12–16 psi (83–110 kPa).
4. Inflate tires to pressures stated above. Measure the circumference of each drive tire. Adjust tire pressures within the above range to try to make tire circumferences match as closely as possible.
5. Semi-pneumatic caster tires Do Not need to be inflated.

**Note:** A more uniform cutting height may be obtained with higher tire pressure on rough terrain. A lower tire pressure provides more flotation.

## 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. Remove the mower deck belt shield to check mower blade drive belt condition.
3. Look under engine deck to check the transmission drive belt condition.
4. Inspect wheel drive belt conditions.
5. Check all idler arms to be sure they pivot freely. Disassemble, clean and grease pivot bushings if necessary.

## 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 NGLI grade #2 multi-purpose gun grease.

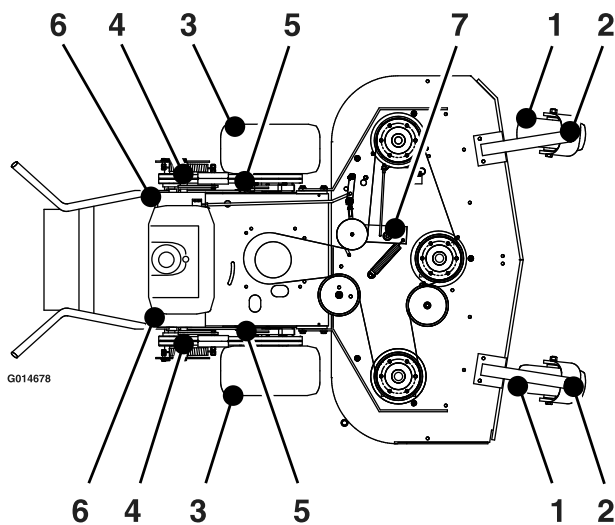
Refer to the following chart for fitting locations and lubrication schedule.

**Lubrication Chart**

Fitting Locations	Initial Pumps	Number of Places			Service Interval
		32 inch Deck	36 inch Deck	48 inch Deck	
1. Front Caster Wheel Bearings	12	2	2	2	Daily
2. Front Caster Pivots	2	2	2	2	Daily
3. Drive Wheels	18	2	2	2	Daily
4. Drive Wheel Idler Arm	2	2	2	2	Daily
5. Brake Arm	2	2	2	2	40 hours

## Lubrication Chart (cont'd.)

Fitting Locations	Initial Pumps	Number of Places			Service Interval
		32 inch Deck	36 inch Deck	48 inch Deck	
6. Transmission Output Shaft Coupler	2	2	2	2	40 hours
7. Mower Deck Idler Pivots	2	1	1	1	40 hours



48 inch Deck Shown for Reference Only

Number 4 and 7 (Idler Arm Pivots) Disassemble and grease once a month under a "No Load" condition

Number 6 (Transmission Coupler) Located below fuel tank support

- Replace 5-speed gearbox grease yearly. Use 18 oz. of Peerless grease (Part No. 788067). See **Check Grease Level, Input and Output Shaft Bearing Wear on Peerless Transmission** section for special lubrication instructions.
- Lubricate pivot points with a spray penetrating lubricant as shown in the **Spray Lubricant Chart**.

### Spray Lubricant Chart

	Number of Places			Service Interval
	32 inch Deck	36 inch Deck	48 inch Deck	
1. Blade Engagement Bellcrank	1	1	1	40 hours

## 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 in the fuel line between the fuel tank and the engine. Replace when necessary.

## Replace Emissions Air Intake Filter

**Service Interval: Every 500 hours**

- Stop engine, wait for all moving parts to stop, and remove key or spark plug wire(s). Engage parking brake.
- Remove the filter from the vent hose.
- Insert a new filter into the end of the vent hose.

## Check Grease Level, Input and Output Shaft Bearing Wear on Peerless Transmission

**Service Interval: Every 160 hours—Check grease level, input and output shaft bearing wear on Peerless Transmission.**

**Yearly—Replace gearbox grease.**

- Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake. Remove key or spark plug wire(s).
- Place drive levers and neutral lock/park brake latches in neutral lock position
- Remove shifter lever from top of transmission.
- Remove shifter plate from top of transmission and the two leads from the neutral start switch.
- Release the tension on the transmission belt.

## Maintenance

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6. Check for side play caused by bearing wear on the input and output shafts of the transmission. Replace bearings if necessary.
7. Remove the six bolts that fasten the upper case to the lower case and carefully remove the upper case half
8. Check the grease level in the lower case. The grease level should be approximately 1 1/2 inch to 1 3/4 inch (3.8 to 4.4 cm) from the gearbox bottom. If necessary, fill to proper level with Peerless grease (Part No. 788067).
9. Reinstall upper case half and fasten in place with six bolts previously removed.
10. Reinstall all parts removed in steps 3 and 4. Install drive belt and adjust tension as stated in the **Transmission Belt Adjustment** section.

## Thread Locking Adhesives

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

- All belt drive pulley setscrews.
- OPC lever setscrews.
- Pulley retaining bolt in end of engine crankshaft.
- Fuel tank bulkhead fitting threads

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

- OPC lever hubs and cross-shaft
  - Note:** Care must be used not to bond the bearing, next to each OPC hub, to the cross-shaft which could cause binding of the OPC levers and erratic operation.
- Fuel tank studs, where studs are inserted into tank.

## Mobil HTS Grease (Or Food-Grade Anti-seize)

Mobil HTS grease (or food-grade anti-seize) is used in the following locations:

- Between the cutter housing spindle and bearings.
- Between the cutter housing spindle and sheave.

## Copper-Based Anti-seize

Copper-based anti-seize is used in the following locations:

- Between the blade drive and transmission drive pulleys and engine crankshaft.
- Between the transmission drive pulley and transmission drive shaft.
- Between the bearings and sheaves and transmission output shafts.

## 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.

## Adjusting the Cutting Height

The cutting height of the mower deck is adjusted from 1 inch to 4 1/4 inches (2.54 cm to 11.4 cm) in 1/4 inch (.64 cm) increments by adjusting the axle position, number of spacers below the caster hub, and number of spacers between blade and spindle.

Refer to the Cutting Height Adjustment table and select a cutting height range in the left hand column which corresponds to the range of cutting heights you will most often be using. Adjustments within this range can then be made by adjusting the number of blade spacers between the blade and the bottom of the spindle (this is a much easier adjustment to make

than adjusting axle position and number of spacers below caster support hub).

Note that:

- For the best cut and discharge, place a minimum of two spacers between the blade and the spindle.
- For highest quality cut, place all four spacers between the blade and the spindle.
- If mulching kit is installed, the highest quality cut can be obtained with 3 spacers between the blade and the spindle (minimum is 1 for a good cut).
- When mulching leaves it is best to have fewer spacers between blade and spindle.

Refer to the table and select desired cutting height range. Refer to **Adjusting the Axle Position**, **Adjusting the Number of Spacers below Caster Support Hub**, and **Adjusting the Cutting Height with Blade Spacers** and sections to make adjustments make adjustment to obtain specific cutting height.

**Cutting Height Adjustment Table (1 inch to 4 1/4 inches (2.5 cm-10.8 cm))**

Cutting Height Range	Axle Position (Figure 10)	Number Of Spacers Below Caster Support Hub		Number of 1/4 inch (.64 cm) Blade Spacers Below Spindle				
		1/2 inch (1.2 cm)	3/16 inch (.48 cm)	4	3	2	1	0
1–2 inches (2.5–5.0 cm)	A	0	0	1 inch (2.5 cm)	1 1/4 inch (3.2 cm)	1 1/2 inch (3.5 cm)	1 3/4 inch (4.4 cm)	2 inch (5.0 cm)
1 1/8–2 1/8 inches (2.9–5.4 cm)	A	0	1	1 1/8 inch (2.9 cm)	1 3/8 inch (3.5 cm)	1 5/8 inch (4.1 cm)	1 7/8 inch (4.8 cm)	2 1/8 inch (5.4 cm)
1 3/8–2 3/8 inches (3.5–6.0 cm)	A	1	0	1 3/8 inch (3.5 cm)	1 5/8 inch (4.1 cm)	1 7/8 inch (4.8 cm)	2 1/8 inch (5.4 cm)	2 3/8 inch (6.0 cm)
1 3/8–2 3/8 inches (3.5–6.0 cm)	B	0	1	1 3/8 inch (3.5 cm)	1 5/8 inch (4.1 cm)	1 7/8 inch (4.8 cm)	2 1/8 inch (5.4 cm)	2 3/8 inch (6.0 cm)
1 5/8–2 5/8 inches (4.1–6.7 cm)	B	1	0	1 5/8 inch (4.1 cm)	1 7/8 inch (4.8 cm)	2 1/8 inch (5.4 cm)	2 3/8 inch (6.0 cm)	2 5/8 inch (6.7 cm)
1 3/4–2 3/4 inches (4.4–7.0 cm)	B	1	1	1 3/4 inch (4.4 cm)	2 inch (5.0 cm)	2 1/4 inch (5.7 cm)	2 1/2 inch (6.4 cm)	2 3/4 inch (7.0 cm)
2–3 inches (5.0–7.6 cm)	B	2	0	2 inch (5.0 cm)	2 1/4 inch (5.7 cm)	2 1/2 inch (6.4 cm)	2 3/4 inch (7.0 cm)	3 inch (7.6 cm)
1 7/8–2 7/8 inches (4.8–7.3 cm)	C	1	1	1 7/8 inch (4.8 cm)	2 1/8 inch (5.4 cm)	2 3/8 inch (6.0 cm)	2 5/8 inch (6.7 cm)	2 7/8 inch (7.3 cm)

# Maintenance

**Cutting Height Adjustment Table (1 inch to 4 1/4 inches (2.5 cm-10.8 cm)) (cont'd.)**

Cutting Height Range	Axle Position (Figure 10)	Number Of Spacers Below Caster Support Hub		Number of 1/4 inch (.64 cm) Blade Spacers Below Spindle				
		1/2 inch (1.2 cm)	3/16 inch (.48 cm)	4	3	2	1	0
2 1/8– 3 1/8 inches (5.4–7.9 cm)	C	2	0	2 1/8 inch (5.4 cm)	2 3/8 inch (6.0 cm)	2 5/8 inch (6.7 cm)	2 7/8 inch (7.3 cm)	3 1/8 inch (7.9 cm)
2 1/4– 3 1/4 inches (5.7–8.3 cm)	C	2	1	2 1/4 inch (5.7 cm)	2 1/2 inch (6.4 cm)	2 3/4 inch (7.0 cm)	3 inch (7.6 cm)	3 1/4 inch (8.3 cm)
2 1/2– 3 1/2 inches (6.4–8.9 cm)	C	3	0	2 1/2 inch (6.4 cm)	2 3/4 inch (7.0 cm)	3 inch (7.6 cm)	3 1/4 inch (8.3 cm)	3 1/2 inch (8.9 cm)
2 3/8– 3 3/8 inches (6.0–8.6 cm)	D	2	1	2 3/8 inch (6.0 cm)	2 5/8 inch (6.7 cm)	2 7/8 inch (7.3 cm)	3 1/8 inch (7.9 cm)	3 3/8 inch (8.6 cm)
2 1/2– 3 1/2 inches (6.4–8.9 cm)	D	3	0	2 1/2 inch (6.4 cm)	2 3/4 inch (7.0 cm)	3 inch (7.6 cm)	3 1/4 inch (8.3 cm)	3 1/2 inch (8.9 cm)
2 3/4– 3 3/4 inches (7.0–9.5 cm)	D	3	1	2 3/4 inch (7.0 cm)	3 inch (7.6 cm)	3 1/4 inch (8.3 cm)	3 1/2 inch (8.9 cm)	3 3/4 inch (9.5 cm)
3–4 inches (7.6–10.1 cm)	D	4	0	3 inch (7.6 cm)	3 1/4 inch (8.3 cm)	3 1/2 inch (8.9 cm)	3 3/4 inch (9.5 cm)	4 inch (10.1 cm)
2 7/8– 3 7/8 inches (7.3–9.8 cm)	E	3	1	2 7/8 inch (7.3 cm)	3 1/8 inch (7.9 cm)	3 3/8 inch (8.6 cm)	3 5/8 inch (9.2 cm)	3 7/8 inch (9.8 cm)
3 1/8– 4 1/8 inches (7.9–10.5 cm)	E	4	0	3 1/8 inch (7.9 cm)	3 3/8 inch (8.6 cm)	3 5/8 inch (9.2 cm)	3 7/8 inch (9.8 cm)	4 1/8 inch (10.5 cm)
3 1/4– 4 1/4 inches (8.3–10.8 cm)	E	4	1	3 1/4 inch (8.3 cm)	3 1/2 inch (8.9 cm)	3 3/4 inch (9.5 cm)	4 inch (10.1 cm)	4 1/4 inch (10.8 cm)

**Important:** Always adjust the Number of Spacers below Caster Hub to correspond to the Axle Position as shown in table to obtain proper “rake” (blades should always be level to the ground or tipped slightly down at the front).

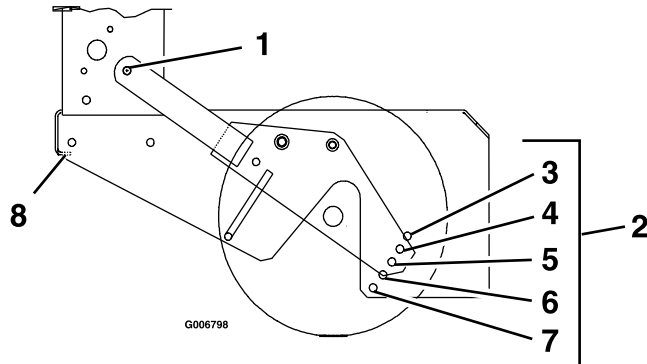
## Adjusting the Axle Position

Desired cutting height range can be obtained by adjusting the rear axle and placing caster spacers above or below the caster arm (See Figure 10 and Figure 11 along with the Cutting Height Adjustment Chart). It may be necessary to readjust wheel drive and brake linkages.

To adjust rear axle:

1. Stop the machine and move the drive levers to the neutral lock position.
2. Disengage the PTO.
3. Place the drive levers in the neutral lock position.
4. Remove mower deck belt shield for access to axle adjustment bolts.
5. Loosen but do not remove the two axle pivot bolts and the two axle adjustment bolts (see Figure 10).
6. Place a jack under the rear center of the engine deck.
7. Raise the back end of the engine deck up enough to remove the two axle adjustment bolts.

8. With the jack, raise or lower the back end of the engine deck so that two axle adjustment bolts can be reinstalled in desired hole location. A tapered punch can be used to help align the holes.
9. Retighten all four bolts, lower unit and remove jack.
10. Install mower deck belt shield.
11. Adjust wheel drive and brake linkages as required (see **Brake and Wheel Drive Linkage Adjustment** section).



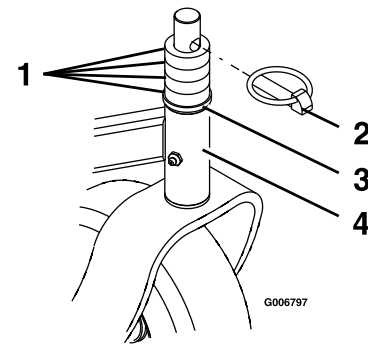
**Figure 10**

- |                                                                        |                    |
|------------------------------------------------------------------------|--------------------|
| 1. Axle Pivot Bolt                                                     | 5. Position C      |
| 2. Axle Adjustment Holes<br>(Located in the side of<br>the rear deck.) | 6. Position D      |
| 3. Position A                                                          | 7. Position E      |
| 4. Position B                                                          | 8. Place jack here |

**Note:** The axle positions are in 1/2 inch (1.3 cm) increments and the large caster spacers are 1/2 inch (1.3 cm) thick. Therefore, by adjusting the same number of 1/2 inch (1.3 cm) caster spacers as axle hole positions the blades will retain the same front-to-back tip (rake).

## Adjusting the Number of Spacers below Caster Support Hub

1. Stop the machine and move the drive levers to the neutral lock position.
2. Disengage the PTO.
3. Place the drive levers in the “park brake” position.
4. Push down on handles to lift front casters off the ground.
5. Support with jackstands.
6. Remove “quick pin” from one caster and remove caster from hub (see Figure 11).



**Figure 11**

- |                                      |                                 |
|--------------------------------------|---------------------------------|
| 1. Four 1/2 inch (127 mm)<br>spacers | 3. 3/16 inch (4.8 mm)<br>spacer |
| 2. Quick Pin                         | 4. Caster support               |

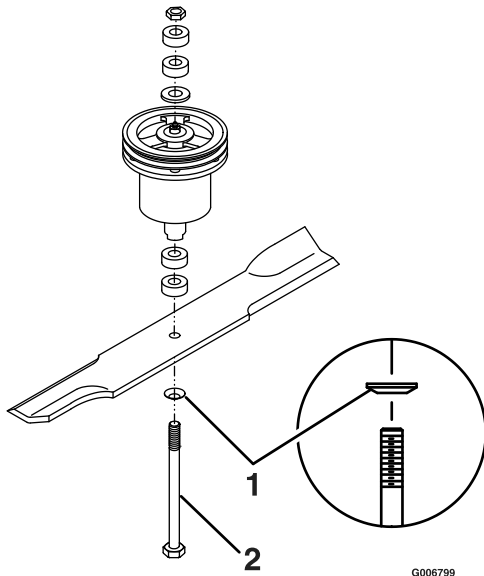
7. Adjust the number of 1/2 inch spacers between bottom of hub and caster yoke to obtain the desired cutting height from the Cutting Height Adjustment Table in the **Adjusting the Cutting Height** section.
8. Install remaining spacers on top of hub.
9. Install “quick pin”.
10. Repeat for other caster.

## Adjusting the Cutting Height with Blade Spacers

1. Stop the machine and move the drive levers to the neutral locked position.
2. Disengage the PTO.
3. Engage the park brake.
4. Stop the engine, remove the key and wait for all moving parts to stop.
5. Blades may be adjusted for cutting height by using the four 1/4 inch (.64 cm) spacers found on the blade spindle bolts (factory setting is two above and two below). This allows a 1 inch (2.5 cm) range in 1/4 inch (.64 cm) increments of cutting height in any axle position. The same number of blade spacers must be used on all blades to achieve a level cut (two above and two below, one above and three below, etc.).
6. Raise front of deck and support with jack stands.
7. Hold blade bolt on bottom and loosen spindle nut on top.
8. Adjust number of spacers between bottom of spindle and blade as indicated in the Cutting

Height Adjustment Table and notes in the **Adjusting the Cutting Height** section.

9. Install unused spacers between top of spindle and spindle nut.
10. Torque bolt to 75–80 ft-lb (102–109 N-m) (see Figure 12).



**Figure 12**

1. Spring disc washer (cone towards bolt head)
2. Blade bolt torque to 75–80 ft-lb (102–109 N-m)

## Transmission Belt Adjustment

1. Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
2. To tighten transmission belt, loosen the 3/8 inch nyloc nut on transmission belt idler pulley. Slide bolt inward in slot and retighten nyloc nut.
3. When properly adjusted, the belt should have 1/2 inch (1.3 cm) of deflection with three pounds of pressure on the belt midway between the transmission and engine pulley.

## Wheel Drive Belt Pulley Scrapers

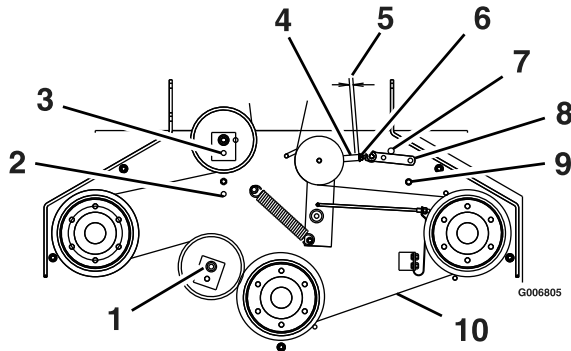
1. Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
2. Be sure mud and grass scraper, on each side, is adjusted properly and centered in the pulley grooves. The pointed part of the scraper should be centered and as deep in the pulley groove as possible without rubbing at any point.

## Engine to Mower Deck Belt

1. Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
2. Check the adjustment of the lower blade drive linkage located between the bellcrank on the engine deck and assist arm on the mower deck. Lengthen or shorten the linkage. When properly adjusted, there should be 1/16 inch to 1/8 inch (2–3 mm) of clearance between bell-crank and transmission output shaft when belt is engaged. Make sure the assist arm is against the rear assist arm stop on the deck (see Figure 13). Push the lever down to the disengaged position. The assist arm should contact the front assist arm stop on the deck. If it does not contact, readjust so that the bellcrank is closer to the transmission output shaft.
3. Belt must be tight enough to not slip during heavy loads while cutting grass. Over-tensioning will reduce belt and spindle bearing life. To adjust belt tension, loosen the 5/16 inch whizlock nut on turnbuckle and rotate the turnbuckle; rotate turnbuckle toward rear of mower to tighten, and toward front of mower to loosen belt tension (see Figure 13). Leave a minimum of 5/16 inch (.79 cm) of the eyebolt threads engaged on both ends of the turnbuckle.

For 48" Decks: If there is no adjustment left in the turnbuckle and the belt is still loose, the rear idler pulley can be repositioned in the front hole (See Figure 12). The belt guide located next to the pulley must also be repositioned in the front hole when the pulley is moved. The turnbuckle will need to be readjusted.

Check belt tension after the first hour of operation and at least twice during the first 24 hours of operation. Adjust as necessary.



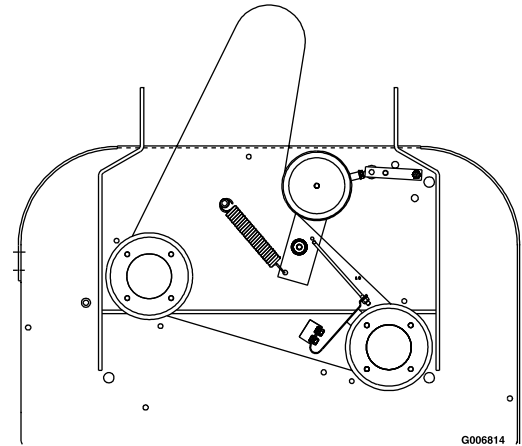
**Figure 13**

48 inch Deck Shown for Reference Only

1. Pulley location for Metro
2. Pulley can be moved to the front position to tighten the belt when there is no adjustment left in the turnbuckle (48 inch deck only)
3. Belt guide must be moved to the front position if the pulley is moved. (48 inch deck only)
4. Turnbuckle
5. 5/16 inch (.79 cm) minimum engagement
6. 5/16 inch whizlock nut
7. Rear Assist Arm Stop
8. Assist Arm
9. Front Assist Arm Stop
10. Point "A"

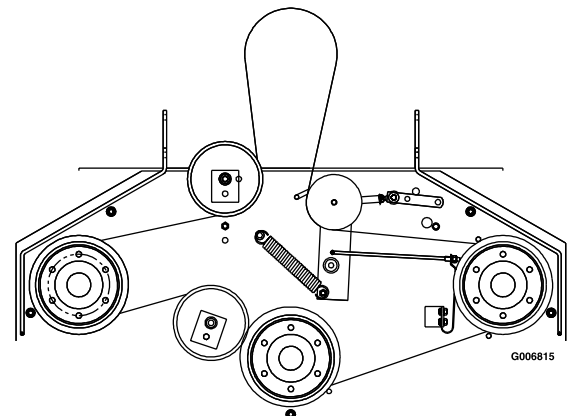
4. Proper belt tension will require about 10 lb (4.5 kg) side pull on belt, halfway between pulleys (see Figure 13, item 10–Point A) to deflect belt 1/2 inch (12 mm).
5. Check belt guide under the engine deck to see that it is properly set (see **Belt Guide Adjustment** section). Also check the blade brake adjustment (see **Blade Brake Adjustment** section).

Mower Deck Belt Routings:



**Figure 14**

32 inch and 36 inch Mower Deck



**Figure 15**

48 inch Mower Deck

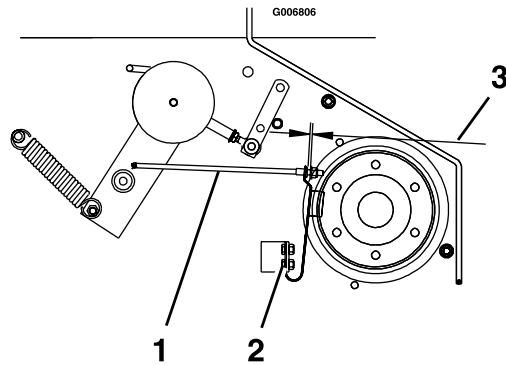
## Blade Brake Adjustment

1. Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
2. Disengage blades.
3. Make sure the blade brake pad rests against the sheave. Adjust the spring mounting bolts to properly align the pad on the sheave (see Figure 16).
4. Check the distance between the spacer and the nut at the end of the blade brake rod. The

# Maintenance

distance should be between 1/8 inch and 3/16 inch (3–5 mm) (see Figure 16).

- Engage the blade control and check to make sure the blade brake pad clears the sheave.



**Figure 16**

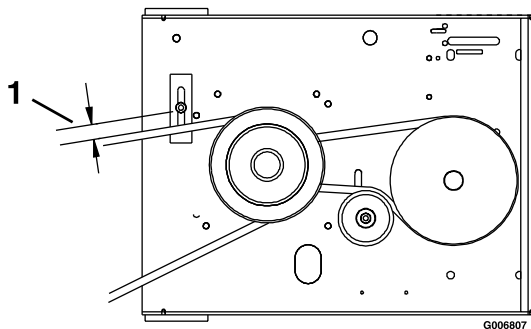
Shown with Blades Disengaged

- Blade Brake Rod
- Spring Mounting Bolts
- 1/8 inch to 3/16 inch (3–5 mm)

## Belt Guide Adjustment

- Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
- Engage the blade drive belt.
- Check belt guide under the engine deck for proper adjustment (See Figure 17 and Figure 18). Adjust as necessary.

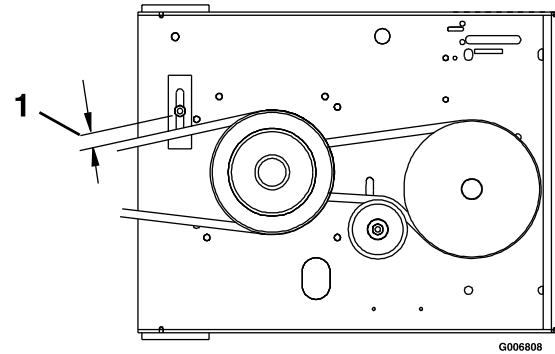
The disengaged belt should not drag or fall off pulley when guides are properly adjusted.



**Figure 17**

32 inch and 36 inch Belt Guide Location  
(Viewed from underneath the deck)

- 1 1/4 inch (3.1 cm)



**Figure 18**

48 inch Belt Guide Location  
(Viewed from underneath the deck)

- 1 3/8 inch (3.5 cm)

## Brake and Wheel Drive Linkage Adjustment

- Check for correct brake adjustment:

Place the drive levers in the “park brake” position. The mower should not move forward or backward. If it does, tighten the wingnuts.

Place the drive levers in the “neutral lock” position. The mower should move forward and backward freely. If it does not, brake adjustment is necessary.

- Adjust brakes by adjusting wingnut on the upper end of each brake rod. Tighten the wingnut until the brakes engage when the drive levers are squeezed enough to allow the neutral lock/park brake latches to be placed into the “park brake” position.

See Figure 6 for Standard Pistol Grip handles and Figure 7 for ECS handles.

**Note:** The neutral lock/park brake latches must be able to be moved into the park brake position, if not, the brake linkages must be adjusted again.

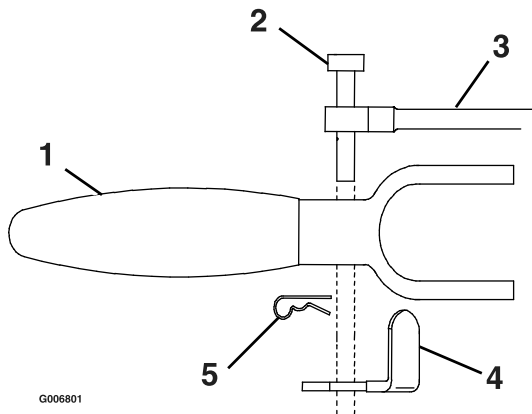
- Check for correct wheel drive linkage adjustment.

### • For Pistol Grip Handles

Allow drive levers to drop into the full forward position: The clevis pin should rest in the neutral lock latch with approximately 3/16 inch to 1/4 inch (4.7–6.4 mm) clearance from the bottom of the slot (see Figure 19). Adjust if necessary.

To adjust the wheel drive linkage:

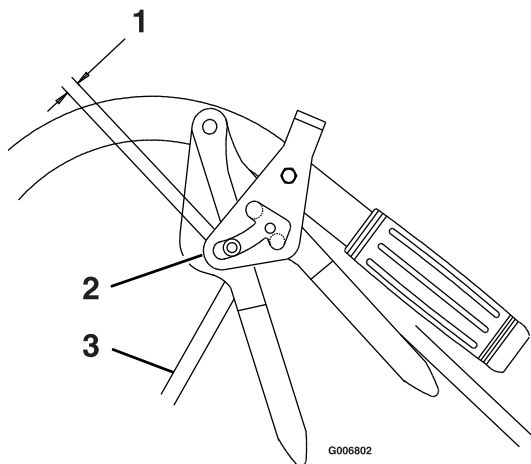
- A. For wheel drive linkage adjustment, remove the hairpin between the neutral lock latch and drive lever (Figure 19).



**Figure 19**  
Left Side Shown

- |                  |                                  |
|------------------|----------------------------------|
| 1. Drive Lever   | 4. Neutral Lock/Park Brake Latch |
| 2. Clevis Pin    | 5. Hairpin                       |
| 3. Drive Linkage |                                  |

- B. Adjust drive linkage length by threading into or out of the swivel until there is a 3/16 inch to 1/4 inch (.47-.64 cm) clearance between the linkage assembly and the bottom of the slot in the neutral lock/park brake latch (see Figure 20).



**Figure 20**

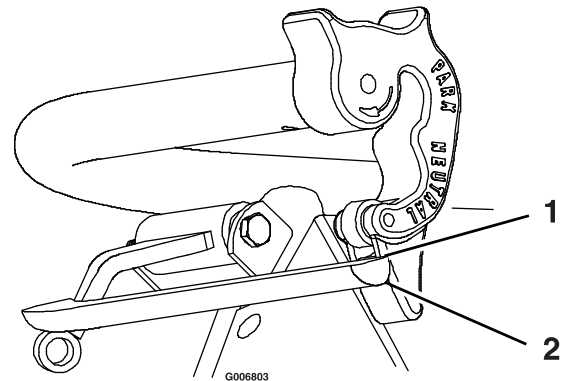
- |                                          |
|------------------------------------------|
| 1. 3/16 inch to 1/4 inch (.47 cm-.64 cm) |
| 2. Neutral Lock/Park Brake Latch         |
| 3. Drive Linkage                         |

a slight upward force placed on the drive levers to remove any "slack" in the linkage.

- C. Re-install hairpin into hole on the clevis pin between the neutral lock/park brake latch and drive lever (See Figure 19). Repeat procedure on opposite side of unit.

• **For ECS Handles:**

Allow drive levers to drop into the full forward position: the flat edge of the drive lever should align with the bottom roller notch (See Figure 21). Adjust if necessary



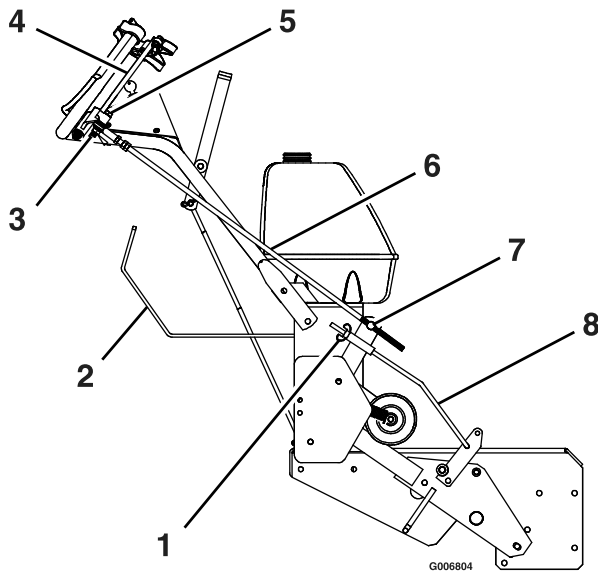
**Figure 21**

- |                                           |                |
|-------------------------------------------|----------------|
| 1. Notch in Neutral Lock/Park Brake Latch | 2. Drive Lever |
|-------------------------------------------|----------------|

To adjust the wheel drive linkage:

- A. Locate a drive lever linkage on one side of the unit and remove the 5/16-18 x 1 3/4 inch hex cap screw and 5/16-18 inch nyloc nut (see Figure 22).
- B. Thread drive lever linkage into or out of the swivel located on the wheel drive idler arm until the flat edge of the drive lever aligns with bottom of the roller notch in the neutral lock/park brake latch (see Figure 22).
- C. Re-install the 5/16-18 x 1 3/4 inch hex cap screw and secure with the 5/16-18 inch nyloc nut. Repeat for the other side (see Figure 22).

**Note:** Neutral lock/park brake latch clearance should be checked when there is

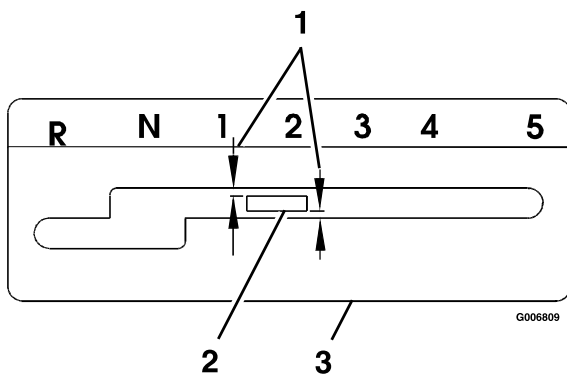


**Figure 22**  
Right Side of Unit Shown

- |                                  |                                      |
|----------------------------------|--------------------------------------|
| 1. Wingnut                       | 5. 5/16-18 x 1 3/4 inch hex capscrew |
| 2. Transmission Lever in neutral | 6. Drive Lever Linkage               |
| 3. 5/16-18 inch nyloc nut        | 7. Swivel                            |
| 4. Drive Levers in neutral       | 8. Brake Rod                         |

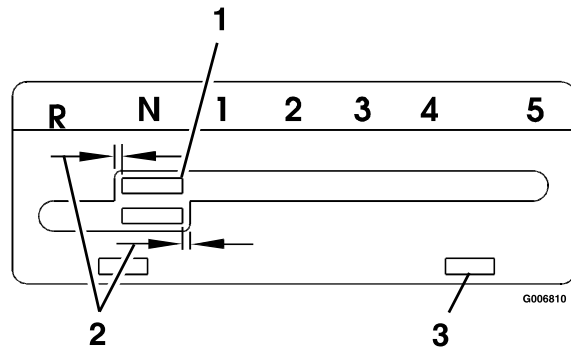
## Shifter Lever Adjustment

The shifter lever in neutral should not contact the upper or lower edge of the slot or the left edge of the upper slot or the right edge of the bottom slot (See Figure 23 and Figure 24). The clearance should be equal. Adjust the shifter lever and shifter plate if necessary.



**Figure 23**

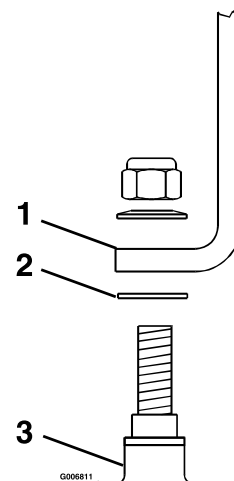
- |                   |                  |
|-------------------|------------------|
| 1. Equal distance | 3. Shifter Plate |
| 2. Shifter Lever  |                  |



**Figure 24**

- |                   |                    |
|-------------------|--------------------|
| 1. Shifter Lever  | 3. Adjustment slot |
| 2. Equal distance |                    |

- To adjust the shifter lever:
  - Remove the 3/8 inch nyloc nut and spring disc washer from the stud on top of the transmission (See Figure 25).



**Figure 25**

- |                        |                 |
|------------------------|-----------------|
| 1. Shifter Lever       | 3. Transmission |
| 2. Square Holed Washer |                 |

- Remove the shifter lever and bend it slightly. Do Not bend the lever while it is attached to the transmission.
  - Re-install lever and torque the 3/8 inch nyloc nut to 35 ft-lb (47 N-m).
- To adjust shifter plate:

**Note:** The square-hole washer must be between the lever and the transmission.

Place shifter lever in the neutral position. Loosen the two bolts securing the shifter plate to the shifter lever legs. Adjust shifter plate and retighten bolts.



## Shifter Detent Adjustment

Transmission shifter detent can be adjusted by adjusting the setscrew on the back side of transmission located just behind the neutral start switch. Turn setscrew in (clockwise) to hold the transmission shifter more positively in each gear and to increase the force on the lever required to shift gears.

Turn setscrew out (counterclockwise) to decrease force on lever required to shift gears. Factory setting is to turn setscrew all the way in then back out 1 1/2 turns.

**Important:** Screwing setscrew in too far will prevent the transmission from shifting.

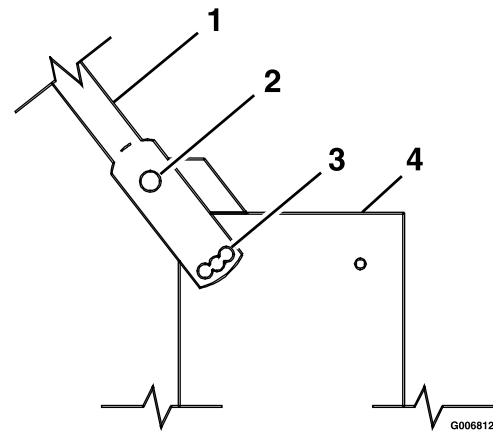


Figure 26

- |                 |                      |
|-----------------|----------------------|
| 1. Upper Handle | 3. Adjustment Holes  |
| 2. Upper Hole   | 4. Fuel Tank Support |

**Note:** Adjustment Holes are actually in the side of the fuel tank support.

## PTO Safety Switch Adjustment

1. Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
2. With the blades disengaged and the bellcrank touching the engine deck, adjust the blade safety switch (if needed) until the bellcrank depresses the plunger by 1/4 inch (.64 cm).
3. Be sure the bellcrank does not contact the switch body to prevent damage to the switch.
4. Retighten switch mounting hardware.

## Handle Height Adjustment

The handle can be pivoted to allow positioning in one of the three holes allowing various adjustments for operator comfort (see Figure 26).

To adjust the handle height:

1. Remove the bottom mounting hardware on each side of the handle.
2. Pivot the handle to one of the three positions.
3. Re-install hardware and tighten.

**Important:** If the handle height position is changed, it will be necessary to readjust the drive and brake linkage (see Check Brake and Wheel Drive Linkage Adjustment section in Operation.)

## Wheel Drive Spring Tension Adjustment

It may be necessary to increase wheel drive belt tension under certain operating conditions such as, wet grass, hilly terrain, or while pulling a sully.

1. Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
2. Disengage neutral lock/park brake latches and release drive levers to lower spring force.
3. Remove the 5/16-18 inch whizlock nut securing the adjustment bolt to the drive wheel shield. Locate bolt assembly in the desired position as follows:
  - Position A-Normal Conditions
  - Position B-More Severe
  - Position C-Most Severe

**Note:** Lever force is lowest with bolt assembly in Position A and will increase in Positions B and C (see Figure 27).

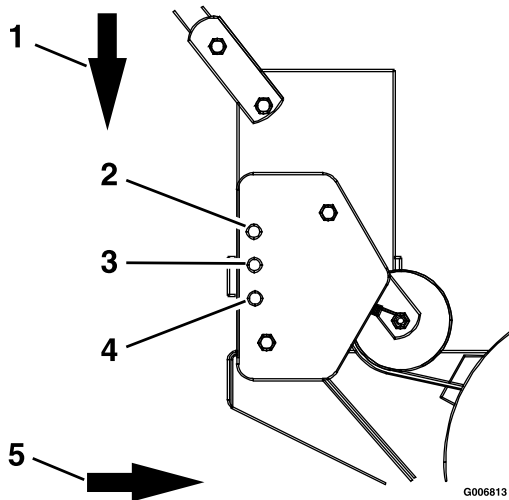


Figure 27

- |                                             |                           |
|---------------------------------------------|---------------------------|
| 1. More traction applied as bolt moves down | 4. Position C—Most Severe |
| 2. Position A—Normal Conditions             | 5. Front of Unit          |
| 3. Position B—More Severe                   |                           |

## 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 engine cooling air intake and exhaust system area can cause engine and exhaust system area to overheat which can create a fire hazard.

Clean all debris from engine and exhaust system area.

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, around engine shrouding, and exhaust system area.
3. Wipe up any excessive grease or oil around the engine and exhaust system area

### Remove Engine Shrouds and Clean Cooling Fins

**Service Interval:** Every 100 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Remove cooling shrouds 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 shrouds are properly reinstalled. Operating the engine without cooling shrouds will cause engine damage due to overheating.

## 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 and cutting deck, especially under deck belt shields, around the fuel tank, around engine and exhaust area.

## Clean Grass Build-Up Under Deck

### Service Interval: Before each use or daily

1. Disengage PTO.
2. Stop engine and wait for all moving parts to stop. Engage parking brake. Remove key or spark plug wire(s).
3. Raise deck and support unit using jack stands or equivalent support.

### **▲ CAUTION**

**Raising the mower 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.**

4. Clean out any grass build-up from underside of deck and in discharge chute.

## 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.

## 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.

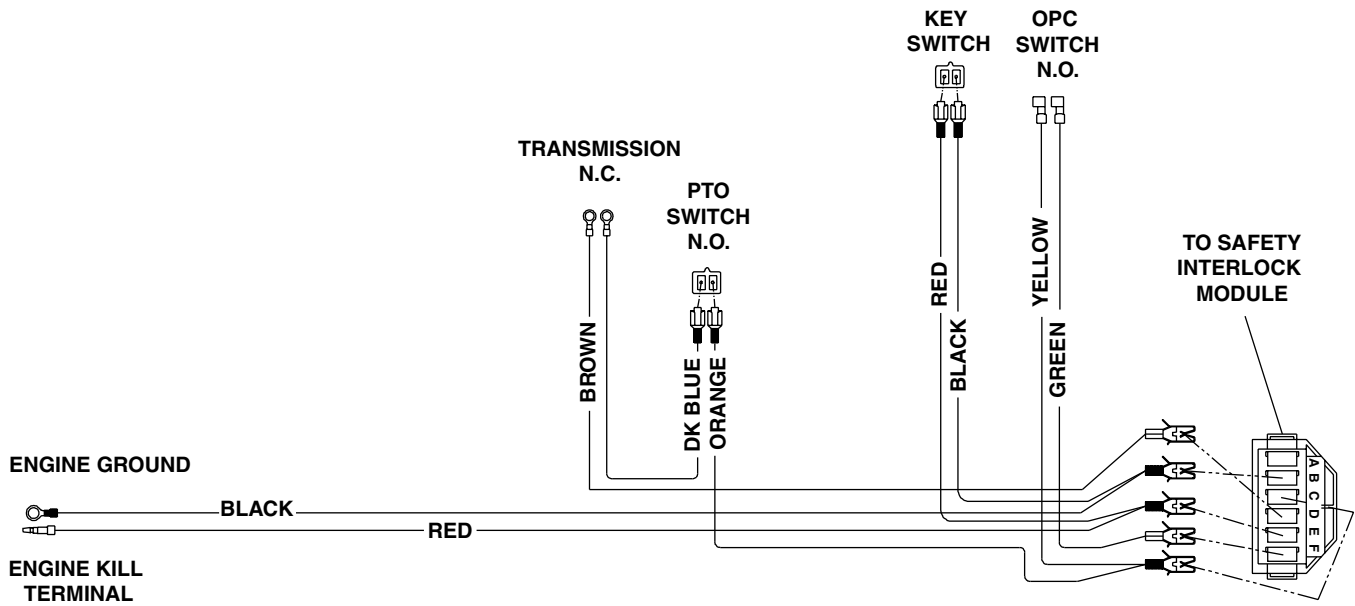
The following table lists some of the common causes of trouble. Do Not attempt to service or replace major items or any items that call for special timing of adjustments procedures (such as valves, governor, etc.). Have this work done by your **Engine Service Dealer**.

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

Problem	Possible Cause	Corrective Action
Engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> <li>1. Fuel tank is empty.</li> <li>2. Fuel shutoff valve is closed.</li> <li>3. The throttle and choke are not in the correct position.</li> <li>4. Dirt in fuel filter.</li> <li>5. Dirt, water, or stale fuel is in the fuel system.</li> <li>6. Air cleaner is dirty.</li> <li>7. Electrical connections are corroded, loose or faulty.</li> <li>8. Relay or switch is defective.</li> <li>9. Faulty spark plug.</li> <li>10. Spark plug wire is not connected.</li> <li>11. PTO is engaged.</li> <li>12. Transmission is not in true neutral position.</li> <li>13. OPC levers are released.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill the fuel tank.</li> <li>2. Open the fuel shutoff valve.</li> <li>3. 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.</li> <li>4. Replace the fuel filter.</li> <li>5. Contact an Authorized Service Dealer.</li> <li>6. Clean or replace the air cleaner element.</li> <li>7. Check the electrical connections for good contact. Clean connector terminals thoroughly with electrical contact cleaner, apply dielectric grease and reconnect.</li> <li>8. Contact an Authorized Service Dealer.</li> <li>9. Clean, adjust or replace spark plug.</li> <li>10. Check the spark plug wire connection.</li> <li>11. Disengage the PTO.</li> <li>12. Ensure the shifter lever is in the neutral position.</li> <li>13. Depress OPC levers.</li> </ol>
Engine loses power	<ol style="list-style-type: none"> <li>1. Engine load is excessive</li> <li>2. Air cleaner is dirty.</li> <li>3. Oil level in the crankcase is low.</li> <li>4. Cooling fins and air passages for the engine are plugged.</li> <li>5. Vent hole in the fuel cap is plugged.</li> <li>6. Dirt in fuel filter.</li> <li>7. Dirt, water, or stale fuel is in the fuel system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the ground speed.</li> <li>2. Clean or replace the air cleaner element.</li> <li>3. Add oil to the crankcase.</li> <li>4. Remove the obstructions from the cooling fins and air passages.</li> <li>5. Clean or replace the fuel cap.</li> <li>6. Replace the fuel filter.</li> <li>7. Contact an Authorized Service Dealer.</li> </ol>
Engine overheats	<ol style="list-style-type: none"> <li>1. Engine load is excessive</li> <li>2. Oil level in the crankcase is low.</li> <li>3. Cooling fins and air passages for the engine are plugged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the ground speed.</li> <li>2. Add oil to the crankcase.</li> <li>3. Remove the obstructions from the cooling fins and air passages.</li> </ol>

Problem	Possible Cause	Corrective Action
Mower pulls left or right (with levers fully forward).	<ol style="list-style-type: none"> <li>1. Idler arm pulleys and drive sheaves are dirty.</li> <li>2. Wheel drive belt pulley scrapers adjustment is not correct</li> <li>3. Idler pivot arms cannot pivot freely</li> <li>4. Drive belts are worn.</li> <li>5. Drive linkage adjustment is not correct.</li> <li>6. Tire pressure in drive tires not correct.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove mud and/or grass buildup.</li> <li>2. Correct adjustment.</li> <li>3. Lubricate idler pivots.</li> <li>4. Replace drive belts as a set. (Do Not mix a new belt with a worn drive belt.)</li> <li>5. Correct adjustment.</li> <li>6. Adjust tire pressure in the drive tires.</li> </ol>
Machine does not drive.	<ol style="list-style-type: none"> <li>1. Transmission drive belt is worn, loose or broken.</li> <li>2. Transmission drive belt is off a pulley.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change the belt.</li> <li>2. Change the belt.</li> </ol>
Uneven cutting height.	<ol style="list-style-type: none"> <li>1. Blade(s) not sharp.</li> <li>2. Cutting blade(s) is/are bent.</li> <li>3. Mower deck is not level.</li> <li>4. Underside of mower is dirty.</li> <li>5. Tire pressure in drive tires not correct.</li> <li>6. Blade spindle bent.</li> <li>7. Tips of adjacent blades are at an uneven cutting height. Blades tips should be even within 3/16 inch which is approximately one blade thickness.</li> <li>8. Caster mounting brackets are loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sharpen the blade(s).</li> <li>2. Install new cutting blade(s).</li> <li>3. Level mower deck from side-to-side and front-to-rear.</li> <li>4. Clean the underside of the mower.</li> <li>5. Adjust tire pressure in the drive tires.</li> <li>6. Contact an Authorized Service Dealer.</li> <li>7. Replace blades, spindles and (or) check for damage to mower deck.</li> <li>8. Tighten hardware.</li> </ol>
Abnormal vibration	<ol style="list-style-type: none"> <li>1. Cutting blade(s) is/are bent or unbalanced.</li> <li>2. Blade mounting bolt is loose.</li> <li>3. Engine mounting bolts are loose.</li> <li>4. Loose engine pulley, idler pulley, or blade pulley.</li> <li>5. Engine pulley is damaged.</li> <li>6. Blade spindle is bent.</li> <li>7. Belt is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install new cutting blade(s).</li> <li>2. Tighten the blade mounting bolt.</li> <li>3. Tighten the engine mounting bolts.</li> <li>4. Tighten the appropriate pulley.</li> <li>5. Contact an Authorized Service Dealer.</li> <li>6. Contact an Authorized Service Dealer.</li> <li>7. Install new belt.</li> </ol>
Blades do not rotate.	<ol style="list-style-type: none"> <li>1. Deck belt is worn, loose or broken.</li> <li>2. Deck belt is off pulley.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install new deck belt.</li> <li>2. Install deck pulley and check the idler pulley, idler arm and spring for correct position and function.</li> </ol>
Blades do not stop when disengaged.	<ol style="list-style-type: none"> <li>1. Blade brake is not adjusted properly.</li> <li>2. Belt guide is not properly set</li> <li>3. PTO engagement is not properly set.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust blade brake.</li> <li>2. Adjust belt guide to proper position.</li> <li>3. Check the PTO engagement position.</li> </ol>

# Schematics



CONNECTORS ARE VIEWED FROM WIRE END  
N.C. = NORMALLY CLOSED  
N.O. = NORMALLY OPEN

G006816

# 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 \*

\* 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](http://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](mailto: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.

G4500-589\_C

## Notes:





## MAXIMIZE THE PERFORMANCE OF YOUR EXMARK.

### 4-CYCLE PREMIUM ENGINE OIL

Part No. 116-3373

Both SAE 30 and SAE 10W-30 in one bottle.

Contains increased levels of zinc and phosphorus for better lubricity.

No Viscosity Index Improvers that tend to shear down in high heat.

Synthetic formulation.

Gas & Diesel compatible.

Anti-corrosion additives.

API 'SL' and JASO rated with wet clutch compatibility for other machines.

### PREMIUM HYDRO OIL

Part No. 109-9828

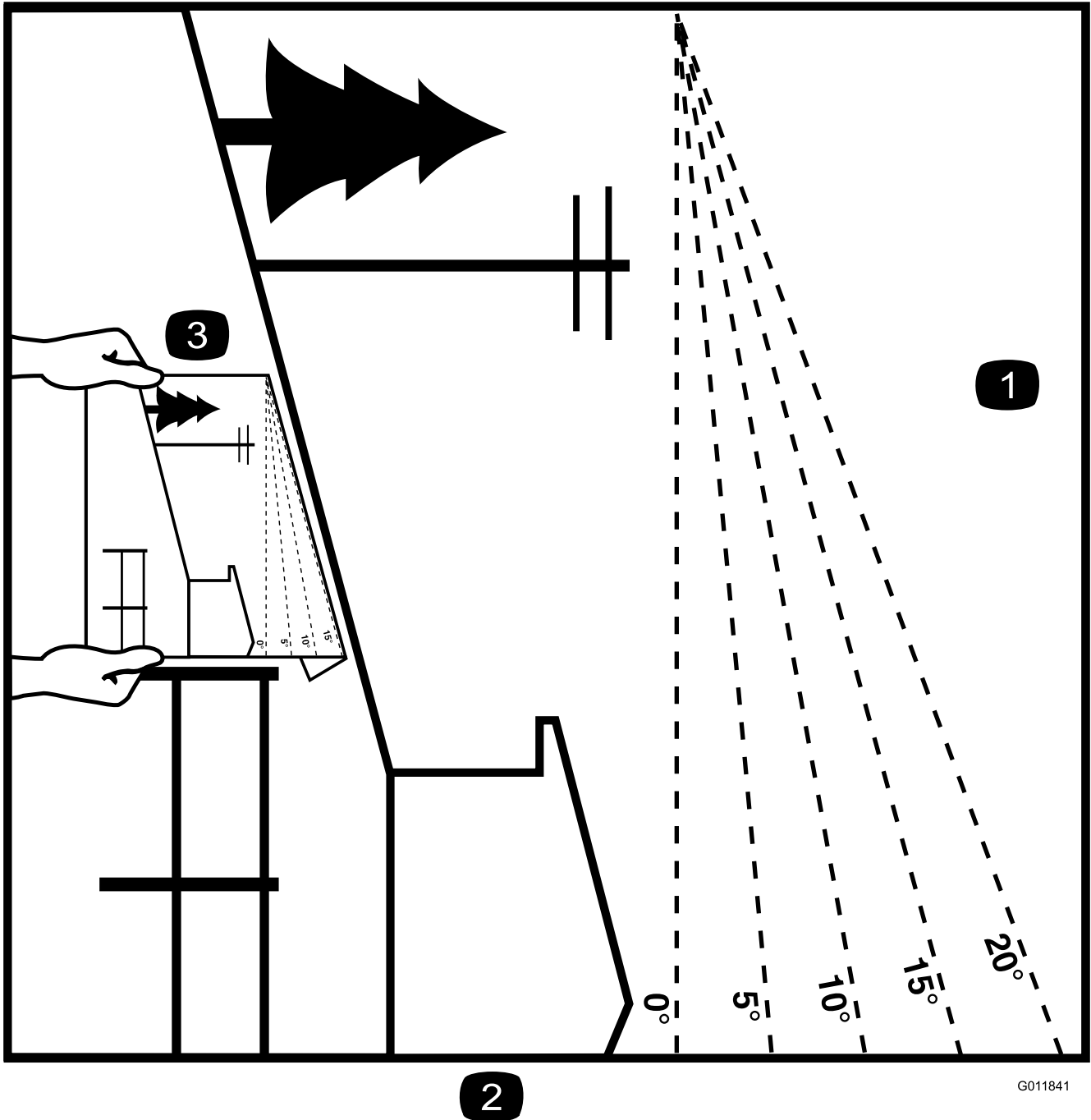
Commercial quality for tough, high-heat conditions.

Designed specifically for zero-turn mower hydraulic systems.

Superior shear resistance under heavy loads.



Available from your local Exmark dealer. Find your closest dealer at [exmark.com](http://exmark.com)



G011841

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Figure 28

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1. The maximum slope you can safely operate the machine on is **20 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 20 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

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Serial No. \_\_\_\_\_

Date Purchased \_\_\_\_\_

Engine Model No. and Spec. No. \_\_\_\_\_

Engine Serial No. (E/No) \_\_\_\_\_

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Part No. 4500-689 Rev. A  
(402) 223-6300  
Fax (402) 223-5489  
Printed in the USA



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