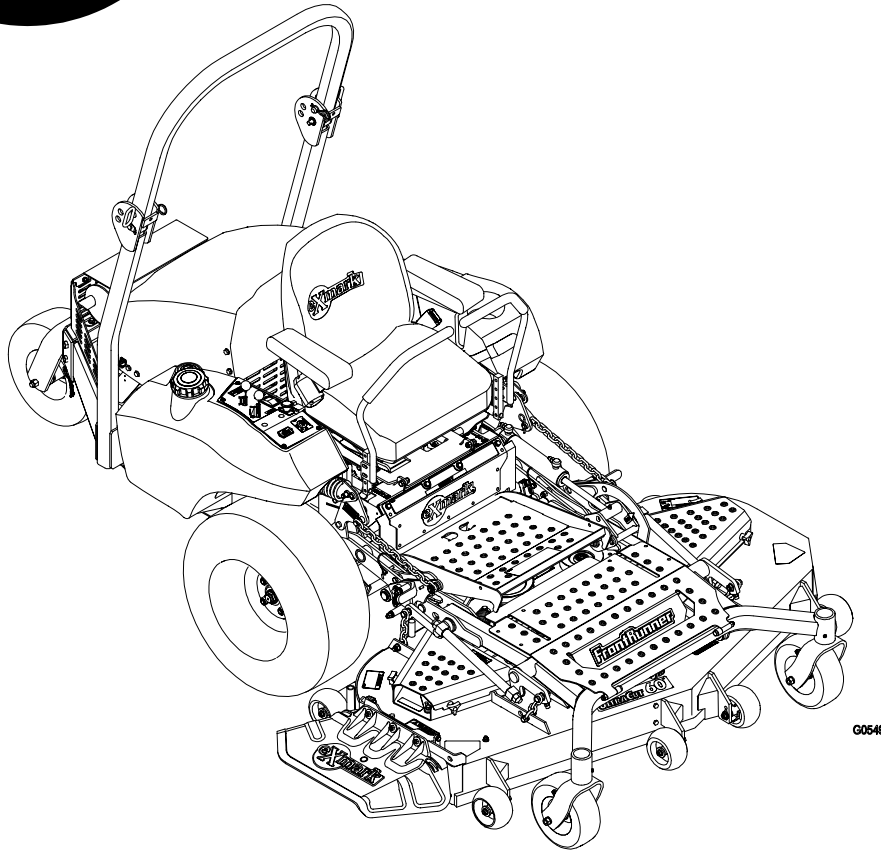


For Serial Nos.  
600,000 & Higher



# FRONTRUNNER

## AIR-COOLED MODELS

# OPERATOR'S MANUAL

**CONGRATULATIONS** on the purchase of your new Exmark mower. This product has been carefully designed and manufactured to give you a maximum amount of dependability and years of trouble-free operation. If additional information is needed, or should you require trained mechanic service, contact your authorized Exmark equipment dealer or distributor. If you need to order replacement parts from your dealer, always give the model number and serial number of your mower as well as the part number, description and quantity of the part needed.

The Serial No. Plate on the right side of the unit under the fuel tank. For ease of ordering and reference, we suggest that you record the information requested in the following identification table.



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

Engine Model No. and Spec. No. (Code) \_\_\_\_\_

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

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

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
◆ This product is a piece of power equipment.	
<b>WHAT CAN HAPPEN</b>	
◆ Failure to follow safe operating practices can result in serious operator injury or even death.	
<b>HOW TO AVOID THE HAZARD</b>	
◆ Keep all shields, guards, and safety devices (especially the grass discharge system) in place and in proper working condition.	
◆ Stop engine, wait for all moving parts to stop and engage parking brake. Remove spark plug wire(s) or remove key before adjusting, servicing, or performing maintenance.	
◆ If mower deck becomes clogged, stop engine, wait for all moving parts to stop and engage parking brake. Remove spark plug wire(s) or remove key before cleaning blockage.	
◆ Keep hands, feet, and clothing away from power driven parts.	
◆ Keep off mower unless seat platform is provided.	
◆ Keep others off mower.	

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
◆ Gasoline is harmful or fatal if swallowed. Long-term exposure to vapors has caused cancer in laboratory animals.	
<b>WHAT CAN HAPPEN</b>	
◆ Failure to use caution may cause serious injury or illness.	
<b>HOW TO AVOID THE HAZARD</b>	
◆ 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.	

### IMPORTANT

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

This spark ignition system complies with Canadian ICES-002

Ce système d'allumage par étincelle de véhicule est conforme à la norme NMB-002 du Canada

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

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

# EXMARK PARTS PLUS® PROGRAM

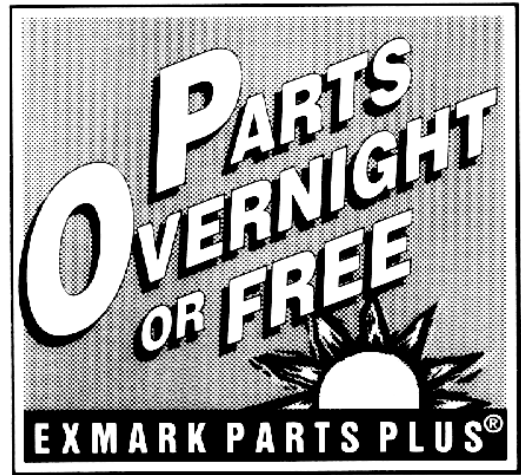
EFFECTIVE DATE: September 1, 1995

## Program

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!!

## *How the Program Works*

1. If dealer does not have part in stock for a "down" unit at the time of request by customer, the dealer contacts his distributor by 1:00 p.m., local time, and requests Exmark Parts Plus® shipment of six (6) line items or less.
2. Distributor ships part(s) to dealer or customer, as requested by dealer, same day, overnight UPS. Distributor bills dealer for part and freight charges where applicable.
3. If distributor does not have the part(s) in stock to satisfy Exmark Parts Plus® order, he contacts Exmark by 3:00 p.m., central time, with an Exmark Parts Plus® order of six (6) line items or less.
4. If order is received by 3:00 p.m. central time, Exmark ships part(s) direct to dealer or customer, as requested by distributor, same day, overnight UPS, Exmark bills the distributor for parts and shipping charges, where applicable.
5. The customer pays for the part and freight if it is shipped under the Exmark Parts Plus® and if it arrives in accordance to the program.
6. Who pays for the part and freight if it fails to arrive overnight in accordance to the program?
  - A. Under any circumstance the customer does not pay.
  - B. If the part does not arrive overnight due to:
    1. The dealer not submitting the Exmark Parts Plus® order to his Exmark distributor by 1:00 p.m., the dealer pays for the part and freight.
    2. The Distributor being unable to ship the part the same day or not submitting the Exmark Parts Plus® order to Exmark by 3:00 p.m., central time, the Distributor pays for the part and freight.
    3. Exmark being unable to ship the part and the Exmark parts order is received by 3:00 p.m., central time, Exmark pays for the part and freight.
    4. If the part does not arrive overnight due to the shipper (UPS), the shipper pays for the freight and Exmark pays for the part.



**The following restrictions apply** -- The Exmark Parts Plus® Program is available only through participating Exmark Dealers and applies only to orders submitted on this program Monday through Thursday. Parts Plus service is available only in the 48 contiguous United States. UPS has initiated a Saturday delivery program to many areas of the continental United States and can be requested for an overnight shipment on Friday to be delivered Saturday. The next day air charge, plus the Saturday delivery fee will be the responsibility of the purchaser. Exmark Mfg. will assume no responsibility for Saturday delivery shipments. To qualify, all Exmark Parts Plus® orders must be received by Exmark by 3:00 p.m., central time. Orders must be six (6) line items or less. Exclusions from the Exmark Parts Plus® Program are: Any wholegood or accessory in its entirety, engines and engine replacement parts, 5-speed Peerless transmissions and 5-speed transaxles, hydraulic or hydrostatic wheel motors, cutter decks and engine decks or any item exceeding United Parcel Service size and weight restrictions.

Due to UPS restrictions, aerosol spray paint is considered a hazardous material and cannot be shipped via UPS next day or Second Day Air.

Exmark Manufacturing stocks a limited supply of parts for transaxles, pumps and wheel motors. These parts can be ordered for Next Day Air shipment but will not be guaranteed per the Parts Plus Program.

**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.

## **OPERATOR'S MANUAL**

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

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

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

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

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


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

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# 1. SAFETY

## 1.1 SAFETY ALERT SYMBOL

This SAFETY ALERT SYMBOL  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!**

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.

## 1.2 TRAINING



- 1.2.1 Regard the Exmark mower as a piece of power equipment and teach this regard to all who operate this unit.
- 1.2.2 Read the instructions carefully. Familiarize yourself with the controls and the proper use of the equipment. If the operator(s) or mechanic(s) can not read English, it is the owner's responsibility to explain this material to them.
- 1.2.3 Do not allow operation of this machine by untrained personnel. Never allow children, teenagers, or people unfamiliar with these instructions to use the mower. Local regulations may restrict the age of the operator.
- 1.2.4 Avoid mowing while people, especially children, or pets, are nearby. Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.

## 1.3 PREPARATION

- 1.3.1 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.
- 1.3.2 The use of personal protective equipment, such as (but not limited to) protection for the eyes, ears, feet, and head is recommended.

 <b>CAUTION</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ This machine produces sound levels in excess of 85 dBA at the operator's ear when in operation.</li> </ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"> <li>◆ Exposure to sound levels of 85 dBA or above for extended periods of time can cause hearing loss.</li> </ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Wear hearing protection when operating this machine.</li> </ul>	

- 1.3.3 While mowing, always wear substantial footwear and long trousers. Do not operate equipment when barefoot or when wearing open sandals.
- 1.3.4 Thoroughly inspect the area where the equipment is to be used and remove all stones, sticks, wires, bones, and other foreign objects which may damage the equipment or cause personal injury to the operator or bystanders.

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Engine exhaust contains carbon monoxide, which is an odorless deadly poison.</li> </ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"> <li>◆ Carbon monoxide can kill you.</li> </ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Do not run engine indoors or in a small confined area where dangerous carbon monoxide fumes can collect.</li> </ul>	



## DANGER



### POTENTIAL HAZARD

- ◆ In certain conditions gasoline is extremely flammable and highly explosive.

### WHAT CAN HAPPEN

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

### HOW TO AVOID THE HAZARD

- ◆ *DO NOT* smoke while refueling, and stay away from an open flame or where gasoline fumes may be ignited by spark.
- ◆ Refuel only outdoors.
- ◆ 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.
- ◆ Never fill the fuel tank so that the gasoline level rises above a level that is 1/2" below the bottom of the filler neck to allow for gasoline expansion and prevent fuel spillage.
- ◆ 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



### POTENTIAL HAZARD



- ◆ In certain conditions gasoline is extremely flammable and highly explosive.

### WHAT CAN HAPPEN

- ◆ A static charge can ignite gasoline vapors. A fire or explosion from gasoline can burn you, others, and cause property damage.



### HOW TO AVOID THE HAZARD



- ◆ Purchase and store gasoline only in an approved container.
- ◆ 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.

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Gasoline vapor can collect inside enclosed trailers and may be ignited by electrical sparks or hot engine/exhaust components.</li> </ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"> <li>◆ Explosion and fire may occur, resulting in property damage, personal injury, and/or death.</li> </ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Provide adequate ventilation of any enclosed trailer to prevent build up of gasoline vapors, especially at floor level.</li> <li>◆ Refuel only outdoors, never inside an enclosed trailer.</li> <li>◆ Be sure all fuel tanks and gasoline storage containers have proper caps installed to prevent spillage and minimize vapor escaping into the trailer.</li> <li>◆ Do not place any equipment that is leaking gasoline in an enclosed trailer.</li> </ul>	



## 1.4 OPERATION

***Although hazard control and accident prevention are partially dependent upon the design and configuration of the equipment, these factors are also dependent upon the awareness, concern, prudence, and proper training of the personnel involved in the operation, transport, maintenance, and storage of the equipment. It is essential that all Operator Safety Mechanisms be connected and in operating condition prior to use for mowing.***



 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Operating engine parts, especially the muffler, become extremely hot.</li> </ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"> <li>◆ Severe burns can occur on contact.</li> <li>◆ Debris, such as leaves, grass, brush, etc. can catch fire.</li> </ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Allow engine parts, especially the muffler, to cool before touching.</li> <li>◆ Remove accumulated debris from muffler and engine area.</li> <li>◆ Install and maintain in working order a spark arrester before using equipment on forest-covered, grass-covered, or brush-covered unimproved land.</li> </ul>	

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Hands, feet, hair, clothing, or accessories can become entangled in rotating parts.</li> </ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"> <li>◆ Contact with rotating parts can cause traumatic amputation or severe lacerations.</li> </ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Do not operate the machine without guards, shields, and safety devices in place and working.</li> <li>◆ Keep hands, feet, hair, jewelry, or clothing away from rotating parts.</li> </ul>	

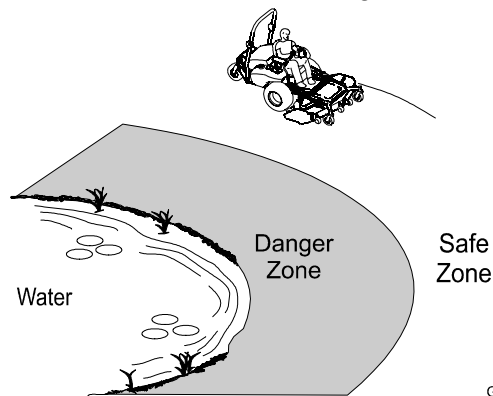
- 1.4.1 Give complete, undivided attention to the job at hand.
- 1.4.2 Mow only in daylight or good artificial light, keeping away from holes and hidden hazards. **NEVER** carry passengers.  
**DO NOT** operate the mower when children or others are in the area.
- 1.4.3 When feasible, avoid operating the equipment in wet grass.

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Operating a FrontRunner tractor without an approved Exmark front mount attachment increases the possibility of forward tip over.</li> </ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"> <li>◆ Tip-over could cause serious injury or death.</li> </ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ When operating a FrontRunner tractor without an approved Exmark front mount attachment, observe the following: <ul style="list-style-type: none"> <li>* Limit operation to minimum required to install a different front mount attachment.</li> <li>* Minimize speed and use extreme caution.</li> <li>* Only operate on a flat level surface.</li> <li>* Do not operate up or down a trailer ramp.</li> <li>* Avoid sudden acceleration or deceleration.</li> </ul> </li> </ul>	

- 1.4.4 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.

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
◆ Mowing on wet grass or steep slopes can cause sliding and loss of control.	
<b>WHAT CAN HAPPEN</b>	
◆ Wheels dropping over edges, ditches, steep banks, or water can cause rollovers, which may result in serious injury, death or drowning.	
<b>HOW TO AVOID THE HAZARD</b>	
◆ Do not mow slopes when grass is wet.	
◆ Do not mow near drop-offs or near water.	
◆ Do not mow slopes greater than 15 degrees.	
◆ Reduce speed and use extreme caution on slopes.	
◆ Avoid sudden turns or rapid speed changes.	

- See inside the back cover to determine the approximate slope angle of the area to be mowed.
- Use a walk behind mower and/or a hand trimmer near drop-offs, ditches, steep banks or water. This area can be dangerous, see Figure 1.



**FIGURE 1**

- Progressively greater care is needed as the slope increases.
- Always avoid sudden starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly off the slope.
- Avoid sudden stops when mowing downhill. Mower may tip forwards.
- Be aware that loss of traction may occur going uphill. Weight transfer to the rear wheel may cause drive wheels to slip and cause loss of braking and steering.
- Watch for ditches, holes, rocks, dips, and rises that change the operating angle, as rough terrain could overturn the machine.



- Remove or mark obstacles such as rocks, tree limbs, etc. from the mowing area. Tall grass can hide obstacles.
  - Use extreme care with attachments. These can change the stability of the machine and cause loss of control.
  - Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.
- 1.4.5 Use **EXTREME** caution when backing up. **LOOK BEHIND YOU!**
- 1.4.6 Stop the blades when crossing surfaces other than grass and when transporting the mower to and from the area to be mowed.
- 1.4.7 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.
- 1.4.8 **DO NOT** change the engine governor settings or overspeed the engine. Operating an engine at excessive speed may increase the hazard of personal injury.
- 1.4.9 Disengage PTO before starting engine.
- 1.4.10 Start the engine carefully with feet well away from the blades.
- 1.4.11 Keep hands, feet, and clothing away from rotating parts while the mower is being operated.
- 1.4.12 Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- Before checking, cleaning or working on the mower.
  - After striking a foreign object (inspect the mower for damage and make repairs before restarting and operating the mower).
  - Before clearing blockages.
  - Whenever you leave the mower.
- Stop the engine and wait for all moving parts to stop:
- Before refueling.
  - Before dumping the grass catcher.
- 1.4.13 Before stopping the engine, place the throttle control **midway** between the "slow" and "fast" positions. Allow the engine to run a minimum of 15 seconds; then stop the engine.
- 1.4.14 The fuel system is provided with a shut-off valve. Shut off the fuel:
- When the machine will not be used for a few days.
  - During transport to and from the job.
  - When parked inside a building.
- 1.4.15 This mower was designed for one operator only. Keep all others away from mower during operation.
- 1.4.16 **DO NOT** mow with the discharge deflector raised, removed or altered unless there is a grass collection system or mulch kit in place and working properly.
- 1.4.17 **DO NOT** operate mower under the influence of alcohol or drugs.
- 1.4.18 Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- 1.4.19 If jump starting is required:
- a) connect the positive (+) power cable from the positive post on the booster battery to the positive terminal post on the starter solenoid switch (this post has the positive battery cable attached to it).

- b) connect the negative or ground cable (-) from the negative post on the booster battery to the engine block as far away from the battery as possible.
- c) disconnect battery cables in the reverse order after starting.

## **1.5 MAINTENANCE AND STORAGE**

- 1.5.1 For engine maintenance, follow the engine manufacturer's recommendations precisely as stated in the engine manual.
- 1.5.2 Disconnect the battery cable from the negative battery post when the unit will be allowed to sit for more than 30 days without use.
- 1.5.3 Allowing batteries to stand for an extended period of time without recharging them will result in reduced performance and service life. To preserve optimum battery performance and life, recharge batteries in storage when the open circuit voltage drops to 12.4 volts.  

Note: To prevent damage due to freezing, battery should be fully charged before putting away for winter storage.
- 1.5.4 Keep engine, engine area, and pump drive belt compartment free from accumulation of grass, leaves, excessive grease or oil, and other debris which can accumulate in these areas. These materials can become combustible and may result in a fire.
- 1.5.5 Store fuel in a container specifically designed for this purpose in a cool, dry place.
- 1.5.6 Keep the mower and fuel container in locked storage to prevent children from playing or tampering with them.
- 1.5.7 Gasoline powered equipment or fuel containers should not be stored in a basement or any enclosed area where open pilot lights or heat appliances are present.
- 1.5.8 Maximum mowing results and safety can only be achieved if the mower is properly maintained and operated correctly.
- 1.5.9 Check all bolts frequently to maintain proper tightness.
- 1.5.10 Keep all guards, shields, and all safety devices in place and in safe working condition.
- 1.5.11 Frequently check for worn or deteriorating components that could create a hazard.
- 1.5.12 All replacement parts must be the same as or equivalent to the parts supplied as original equipment.

 <b>WARNING</b> 
<b>POTENTIAL HAZARD</b> <ul style="list-style-type: none"> <li>◆ Hydraulic fluid escaping under pressure can penetrate skin and cause injury.</li> </ul>
<b>WHAT CAN HAPPEN</b> <ul style="list-style-type: none"> <li>◆ Fluid accidentally injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.</li> </ul>
<b>HOW TO AVOID THE HAZARD</b> <ul style="list-style-type: none"> <li>◆ Make sure all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to hydraulic system.</li> <li>◆ The woven guards that protect the hydraulic hoses may deteriorate and wear over time. Check the guards frequently and replace if necessary.</li> <li>◆ Keep body and hands away from pinhole leaks or nozzles that eject high pressure hydraulic fluid.</li> <li>◆ Use cardboard or paper, not your hands, to find hydraulic leaks.</li> <li>◆ Safely relieve all pressure in the hydraulic system, by placing the motion control levers in neutral and shutting off the engine, before performing any work on the hydraulic system.</li> </ul>

## 1.6 SAFETY SIGNS

- 1.6.1 Keep all safety signs legible. Remove all grease, dirt and debris from safety signs and instructional labels.
- 1.6.2 Safety signs must be replaced if they are missing or illegible.
- 1.6.3 When new components are installed, be sure that current safety signs are affixed to the replaced components.
- 1.6.4 New safety signs may be obtained from Exmark Mfg. Co. Inc.
- 1.6.5 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.
- 1.6.6 Familiarize yourself with the following safety signs and instruction labels. They are critical to the safe operation of your Exmark commercial mower.



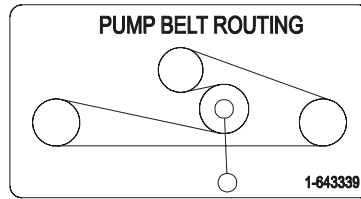
PART NO. 1-513746  
 LOCATION: Outside of Rear  
 Muffler Guard



PART NO. 1-513747  
 LOCATION: LH Side of Battery Holder



PART NO. 1-523552  
 LOCATION: Top Surface of Hydraulic Tank



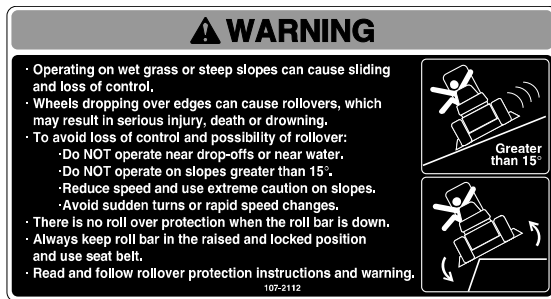
PART NO. 1-643339  
 LOCATION: Inside Hood Support, RH Side



PART NO. 103-5881  
 LOCATION: Inside Surface of Hood Support – Each Side



PART NO. 103-7218  
 LOCATION: On Seat Support Plate



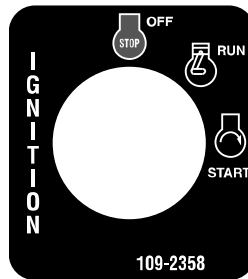
PART NO. 107-2112  
 LOCATION: Top of Floor Pan



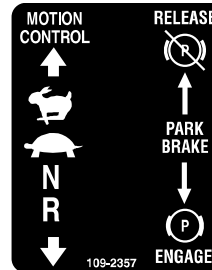
PART NO. 109-2355  
 LOCATION: Outside of each Bell Crank



PART NO. 109-2356  
 LOCATION: Top of Console, RH Side



PART NO. 109-2358  
 LOCATION: On Control Panel

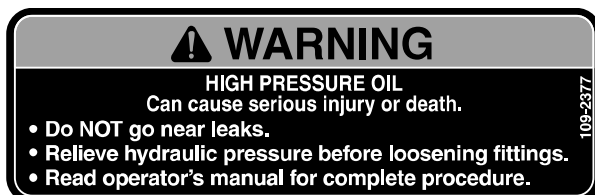


PART NO. 109-2357  
 LOCATION: Top of Console, LH Side

PART NO. 107-2102  
 LOCATION: Inside Surface of Upper Roll bar



PART NO. 109-2360  
 LOCATION: Front of Console



PART NO. 109-2377  
 LOCATION: On Hydraulic Cylinder



PART NO. 109-2396  
 LOCATION: Top of Seat Support Plate

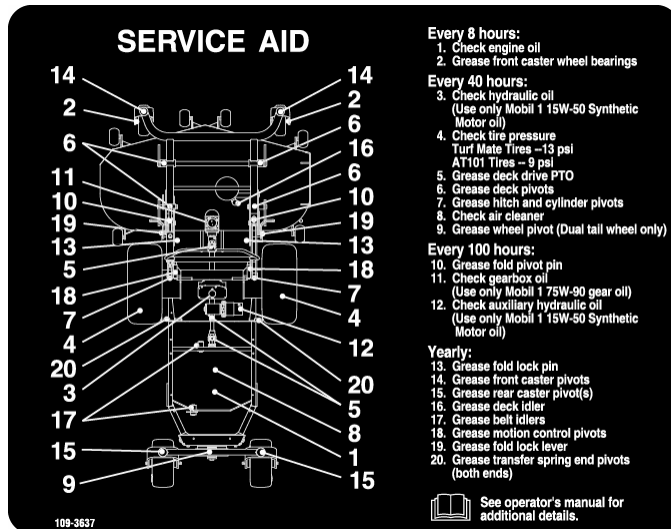


Engine RPM  
 3750 ± 50 (no load)  
 103-3270

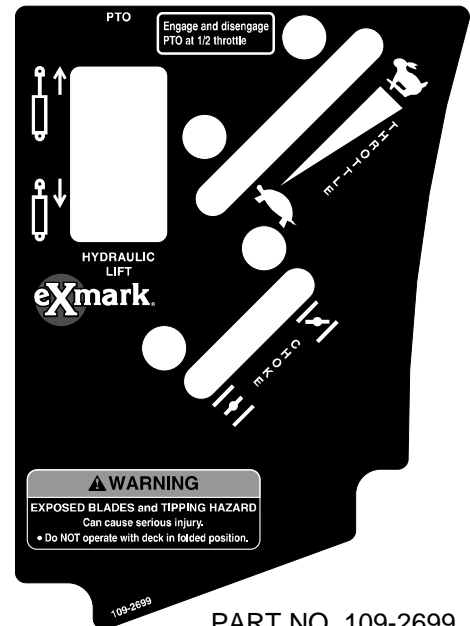
PART NO. 103-3270  
 LOCATION: Top Surface of Hood Support

**⚠ DANGER**  
 COVER IS MISSING. DO NOT OPERATE 98-5954  
 THIS UNIT WHEN COVER IS NOT IN PLACE.

PART NO. 98-5954  
 LOCATION: Top Surface of Hood Support



PART NO. 109-3637  
 LOCATION: Back of Seat



PART NO. 109-2699  
 LOCATION: On Control Panel



PART NO. 93-4361  
 LOCATION: On LH and RH Side, Near Back of Unit

## 2. SPECIFICATIONS

**2.1 MODEL NUMBER:** FR20KC; FR23KC; FR27KC

### 2.2 ENGINE

- 2.2.1 Engine Specifications: See your Engine Owner's Manual
- 2.2.2 RPM: Full Speed: 3750 RPM (No Load) Idle: 1500 RPM

### 2.3 FUEL SYSTEM

- 2.3.1 Capacity: 8.5 gal (32 L)
- 2.3.2 Type of Fuel: Regular **unleaded** gasoline, 87 octane or higher
- 2.3.3 Fuel Filter: In-line 15 Micron **Kohler** P/N 2405010.
- 2.3.4 Fuel Shut-Off Valve: 1/4 turn "in-line" valve by fuel filter.

### 2.4 ELECTRICAL SYSTEM

- 2.4.1 Charging System: Flywheel Alternator
- 2.4.2 Charging Capacity: 15 amps
- 2.4.3 Battery Type: BCI Group U1
- 2.4.4 Battery Voltage: 12 Volt
- 2.4.5 Polarity: Negative Ground

#### 2.4.6 Safety Interlock System:

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

Operator must be in seat **when PTO is engaged, brake is disengaged, or speed control lever is moved out of neutral** or engine will stop.

Engine will stop if the motion control levers are **moved from neutral position while brake is engaged.**

## 2.5 OPERATOR CONTROLS

### 2.5.1 Steering and Motion Control:

Separate levers, on each side of the console, control speed and direction of travel of the respective drive wheels.

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

Moving motion control levers outward (in slots) locks the drive system in neutral.

**NOTE:** Motion control levers are adjustable to three heights.

### 2.5.2 PTO Engagement Lever: Engages drive to PTO (mower deck).

### 2.5.3 Parking Brake Lever: Pull back to engage parking brake.

## 2.6 SEAT

### 2.6.1 Type: Standard seat with high back, foam padded (internal suspension).

### 2.6.2 Mounting: Hinged to tilt up for access to hydraulic pumps, battery and other components. The seat is held in the tilted position with a linkage. Adjustable fore and aft seat track.

### 2.6.3 Seat Safety Switch: Internal to the bottom seat cushion, non serviceable. Time delay module incorporated into the Safety Interlock System eliminates rough ground cut-outs.

### 2.6.4 Armrests: Standard seat: foam padded flip-up armrests. Optional suspension seat: molded adjustable flip-up armrests.

## 2.7 HYDROSTATIC GROUND DRIVE SYSTEM

### 2.7.1 Hydrostatic Pumps:

*27 HP Kohler Units:* Two Hydro Gear PR 16 cc variable displacement piston pumps.

*20 HP & 23 HP Kohler Units:* Two Hydro Gear PJ 12 cc variable displacement piston pumps.

### 2.7.2 Wheel Motors: Hydro Gear planetary reduction motors.

### 2.7.3 Hydraulic Oil Type: Use Mobil 1 15W-50 Synthetic Motor Oil.

### 2.7.4 Hydraulic Oil Capacity:

*For 27 HP Kohler Units:* 5.2 qt. (4.9 L.)

*For 20 HP & 23 HP Kohler Units:* 4.0 qt. (3.8 L.)

### 2.7.5 Hydraulic Filter: Replaceable cartridge type.

P/N 103-2146: 25 microns, No bypass

### 2.7.6 Speeds:

*27 HP Kohler Units:* 0-10.5 mph (16.9 km/hr) forward  
0-6.6mph (10.6 km/hr) reverse

*20 HP & 23 HP Kohler Units:* 0-8.7 mph (14.0 km/hr) forward  
0-5.7mph (9.2 km/hr) reverse

### 2.7.7 Drive wheel release valves allow machine to be moved when engine is not running.

## 2.8 TIRES

20 HP & 23 HP Kohler Units			
	Drive	Front Caster	Rear Caster (Single Tail Wheel)
	Pneumatic (Air-Filled)	Semi-Pneumatic	Semi-Pneumatic
Quantity	2	2	1
Tread	Turfmate	Smooth	Smooth
Size	23 x 10.50-10	9 x 3.50-4	13 x 6.5-6
Ply Rating	4		
Pressure	13 psi (90 kPa)		

27 HP Kohler Units			
	Drive	Front Caster	Rear Casters (Dual Tail Wheel)
	Pneumatic (Air-Filled)	Semi-Pneumatic	Semi-Pneumatic
Quantity	2	2	2
Tread	AT101	Smooth	Smooth
Size	24 x 12.00-12	9 x 3.50-4	13 x 6.5-6
Ply Rating	4		
Pressure	9 psi (62 kPa)		

## 2.9 MOWER DECK (Sold Separately)

2.9.1 Models	FR524	FR604
<i>Discharge</i>	Side Discharge	Side Discharge
<i>Cutting Width</i>	52 in. (132 cm)	60 in. (152 cm)

## 2.10 DIMENSIONS

2.10.1 Overall Width:	w/52" Deck	w/60" Deck
<i>without deck</i>	49.0 in. (124.5 cm)	49.0 in. (124 cm)
<i>deflector up</i>	53.3 in. (135.4 cm)	61.4 in. (156 cm)
<i>deflector down</i>	64.0 in. (163 cm)	72.0 in. (183 cm)

2.10.2 Overall Length:	20 & 23 HP Kohler	27 HP Kohler
<i>without deck &amp; floor pan folded</i>	80.4 in. (204.2 cm)	82.3 in. (209.0 cm)
<i>w/52" Deck</i>	112.4 in. (285.5 cm)	114.3 in. (290.3 cm)
<i>w/60" Deck</i>	112.4 in. (285.5 cm)	114.3 in. (290.3 cm)

2.10.3 Overall Height:	Roll Bar - Up	Roll Bar - Down
	69.2 in. (175.8 cm)	50.7 in. (128.8 cm)

2.10.4 Curb Weight:	without Deck	
		911 lbs. (413 kg)
	<i>w/52" Deck</i>	1303 lbs. (591 kg)
	<i>w/60" Deck</i>	1348 lbs. (611 kg)

2.10.5 Tread Width (Center to Center of Drive Wheels):

*For 27 HP Kohler Units:* 41.4 in. (105.2 cm)

*For 20 HP & 23 HP Kohler Units:* 38.9 in. (98.8 cm)

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

*For 27 HP Kohler Units:* 51.2 in. (130.0 cm)

*For 20 HP & 23 HP Kohler Units:* 54.1 in (137.4 cm)

2.10.7 Minimum Turning Radius:

*For 27 HP Kohler Units:* 55.25"

*For 20 HP & 23 HP Kohler Units:* 56.3"

## 2.11 TORQUE REQUIREMENTS

<u>Bolt Location</u>	<u>Torque</u>
Cutter Housing Spindle Nut (secured with threadlocker)	160-185 ft-lbs. (217-251 N-m)
Blade Mounting Bolt.....	55-60 ft-lbs. (75-81 N-m)
Sheave Mounting Nut .....	90-110 ft-lbs. (122-149 N-m)
Engine Deck/Front Frame Mount Bolts .....	30-35 ft-lbs. (41-47 N-m)
Anti-Scalp Roller (See Figure 7)	
Nyloc Nut .....	30-35 ft-lbs. (41-47 N-m)
Hex Capscrew.....	50-55 ft-lbs. (68-75 N-m)
Engine Mounting Bolts .....	30-35 ft-lbs. (41-47 N-m)
Wheel Lug Nuts.....	90-95 ft-lbs. (122-129 N-m)
Wheel Motor Mounting Bolts.....	72-77 ft-lbs. (98-104 N-m)
Wheel Hub Slotted Nut .....	minimum 125 ft-lbs. (169 N-m)
Rollover Protection System (Roll Bar) Mounting Bolts .....	30-35 ft-lbs. (41-47 N-m)
Clutch Retaining Bolt (secured with threadlocker).....	55-60 ft-lbs. (75-81 N-m)

## 3. OPERATION INSTRUCTIONS

### 3.1 CONTROLS

- 3.1.1 Familiarize yourself with all controls before operating the mower.
- 3.1.2 **Motion Control Levers:** Located on each side of the console. The left lever controls the flow of hydraulic oil from the left hydrostatic pump to the left drive wheel motor. The right lever controls the flow of hydraulic oil from the right hydrostatic pump to the right drive wheel motor.

**IMPORTANT: To begin movement (forward or backward) the operator must be in the seat, the brake lever must be disengaged (pushed down) before the motion control levers can be moved in or the engine will kill.**

When levers are centered in the T-slot the drive system is in the neutral position. With levers moved out in the T-slot the drive system is in the **neutral lock** position. See Figure 2.

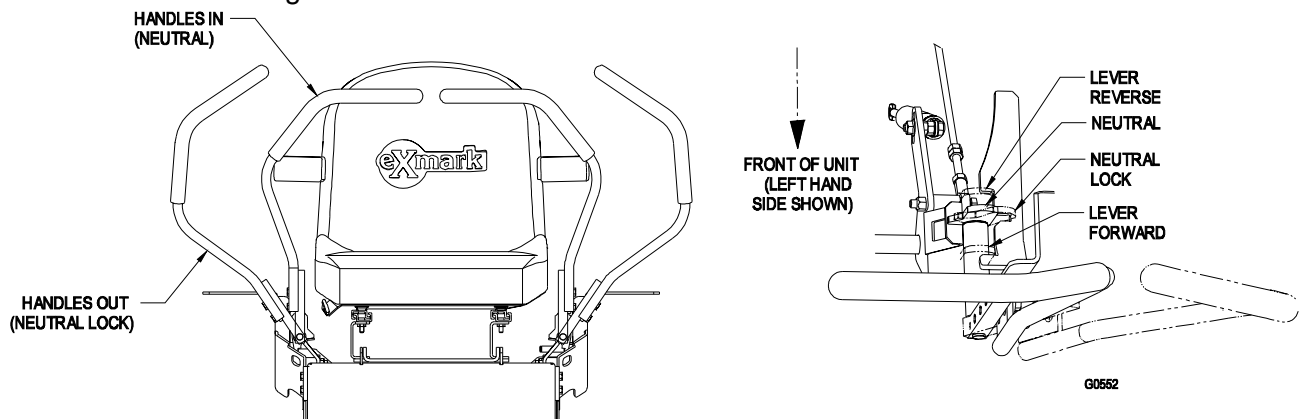


FIGURE 2

By moving both levers an **equal** amount forward or back from the neutral position the machine can be caused to move forward or backward in a straight line.

Movement of the **left lever forward** will cause the **left drive wheel** to rotate in a forward direction. Movement of the **right lever forward** will cause the **right drive wheel** to rotate in a forward direction. To **stop** forward travel, pull the levers back to the neutral position.

To **turn left** while moving forward, move the **left lever** back toward neutral to slow the left drive wheel.



To **turn right** while moving forward, move the **right lever** back toward neutral to slow the right drive wheel.

To make a **zero turn** to the **left**, pull the left lever back beyond neutral while holding the right lever slightly ahead of neutral.

To make a **zero turn** to the **right**, pull the right lever back beyond neutral while holding the left lever slightly ahead of neutral.

Pulling the **levers back** from the neutral position will cause the respective drive wheels to rotate in a **reverse** direction (spring tension can be felt when moving into reverse from neutral).

To turn to the left while backing, move the left lever forward toward neutral. To turn to the right while backing, move the right lever forward toward neutral.

 <b>CAUTION</b> 	
<b>POTENTIAL HAZARD</b>	
◆ Machine can spin very rapidly by positioning one lever too much ahead of the other.	
<b>WHAT CAN HAPPEN</b>	
◆ Operator may lose control of the machine, which may cause damage to the machine or injury.	
<b>HOW TO AVOID THE HAZARD</b>	
◆ Use caution when making turns.	
◆ Slow the machine down before making sharp turns.	

3.1.3 **PTO Engagement Switch:** Located on the right fuel tank console.

Switch must be **pulled out** to the “**ROTATE**” position to engage the PTO. The Switch is **pushed in** to the “**STOP**” position to stop the PTO.

3.1.4 **Choke Control:** Located on right fuel tank console.

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

3.1.5 **Throttle Control:** Located on right fuel tank console.

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

3.1.6 **Brake Lever:** Located on left side of unit, between the seat and the dummy tank. The brake lever engages a parking brake on the drive wheels.

**Pull** the lever **up** to **engage** the brake.

**Push** the lever **down** to **disengage** the brake.

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

3.1.7 **Ignition Switch:** Located on the right fuel tank console.

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

**Brake must be engaged, speed control lever in neutral and PTO switch “OFF” to start engine.** (It is not necessary for the operator to be in the seat to start the engine.)

- 3.1.8 **Hour Meter:** Located on the right fuel tank console. The hour meter is connected to a pressure switch installed in the engine block and it records the number of hours that the engine has run. If the ignition switch is left on without engine running, hour meter will not run.
- NOTE: This switch is not a low oil sensor and will not alert the operator if the engine oil is low.
- 3.1.9 **Hydraulic Lift Switch:** Located on the right fuel tank console. The hydraulic lift switch is used to raise and lower the mower deck.
- Push the **front** portion of the hydraulic lift switch down to **raise** the mower deck to the desired height.
- Push the **rear** portion of the hydraulic lift switch down to **lower** the mower deck to the desired height.
- 3.1.10 **Fuel Shut-Off Valve:** Located in fuel line by fuel tank and fuel filter. The fuel shut-off valve is used to shut off the fuel when the machine will not be used for a few days, during transport to and from the job site, and when parked inside a building.
- 3.1.11 **Fuel Gauge:** Located at the rear of the right fuel tank.
- The fuel gauge monitors the amount of fuel left in the right fuel tank only. The left tank does not hold fuel.
- 3.1.12 **Drive Wheel Release Valves:** Located on the top left front corner of hydrostatic pumps. Drive wheel release valves are used to release the hydrostatic drive system to allow the machine to be pushed without the engine running.
- With a wrench, turn both valves one turn counter-clockwise to release drive system. Turn clockwise to reset system. **DO NOT overtighten. DO NOT tow machine.**
- For 27 HP Kohler Units:* Use a 5/8 wrench to turn the valves.
- For 20 HP & 23 HP Kohler Units:* Use a 7/16 wrench to turn the valves.

## 3.2 PRE-START

- 3.2.1 Fill fuel tank. For best results use only clean, fresh regular grade **unleaded** gasoline with an octane rating of 87 or higher. Regular grade leaded gasoline may also be used; however, combustion chamber and cylinder head will require more frequent service. See Engine Owner's Manual.
- DO NOT** add oil to gasoline.
- DO NOT** overfill fuel tank. Never fill the fuel tank so that the fuel level rises above a level that is 1/2" below the bottom of the filler neck to allow for fuel expansion and prevent fuel spillage.
- 3.2.2 Make sure you understand the controls, their locations, their functions, and their safety requirements.
- 3.2.3 Refer to Maintenance, Section 4, and perform all the necessary inspection and maintenance steps.

## 3.3 OPERATING INSTRUCTIONS

- 3.3.1 **Raise roll bar:**
- Operate the unit with the roll bar in the raised and locked position and use seat belt. There is no rollover protection when the roll bar is down. If it is necessary to lower the roll bar, do not wear the seat belt. Raise the roll bar as soon as clearance permits.
- 3.3.2 **Open fuel shut-off valve:**
- The fuel shut-off valve is located on the right side of unit in fuel line next to the fuel filter. Raise the rear hood to access fuel shut-off valve.

### 3.3.3 Starting Engine:

**Brake must be engaged, speed control lever in neutral position and PTO switch “OFF” to start engine.** (It is not necessary for the operator to be in the seat to start the engine.)



On a **cold** engine, place the **throttle midway** between the “SLOW” and “FAST” positions and push **choke** lever forward into the “ON” position. Turn ignition switch to the “start” position. Release the switch as soon as the engine starts.



**IMPORTANT: DO NOT** crank the engine continuously for more than ten (10) seconds at a time. If the engine does not start, allow a 60 second cool-down period between starting attempts. Failure to follow these guidelines can burn out the starter motor.

After starting a cold engine, gradually return choke to the “OFF” position as the engine warms up.

On a **warm** engine, place the **throttle midway** between the “SLOW” and “FAST” positions and leave the **choke** in the “OFF” position.

### 3.3.4 Engaging PTO:

 <b>DANGER</b> 	
<b>POTENTIAL HAZARD</b>	<ul style="list-style-type: none"><li>◆ The rotating blades under the mower deck are dangerous.</li></ul>
<b>WHAT CAN HAPPEN</b>	<ul style="list-style-type: none"><li>◆ Blade contact can cause serious injury or kill you.</li></ul>
<b>HOW TO AVOID THE HAZARD</b>	<ul style="list-style-type: none"><li>◆ <i>DO NOT</i> put hands or feet under the mower or mower deck when the blades are engaged.</li></ul>

 <b>DANGER</b> 	
<b>POTENTIAL HAZARD</b>	<ul style="list-style-type: none"><li>◆ 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.</li></ul>
<b>WHAT CAN HAPPEN</b>	<ul style="list-style-type: none"><li>◆ Thrown objects or blade contact can cause serious injury or death.</li></ul>
<b>HOW TO AVOID THE HAZARD</b>	<ul style="list-style-type: none"><li>◆ 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.</li></ul>

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

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

Set throttle to "midway" position. Pull the switch out to the "ROTATE" position. Accelerate to full throttle to begin mowing.

3.3.5 Stopping PTO: Set throttle to the "midway" position. Push the switch in to the "STOP" position to stop the PTO.

3.3.6 Stopping Engine: Bring unit to a **full stop**. **Disengage** the PTO, **move motion control levers** to the **neutral** position and **set the parking brake**.

Before stopping the engine, place the throttle control **midway** between the "slow" and "fast" positions. Allow the engine to run a minimum of 15 seconds; then stop the engine.



Rotate ignition switch to "OFF" position. Remove the key to prevent children or other unauthorized persons from starting engine.

Close fuel shut-off valve when machine will not be used for a few days, when transporting, and when the unit is parked inside a building.



### 3.4 TRANSPORTING

**IMPORTANT:** Do not transport FrontRunner tractor without an approved Exmark front mount attachment.

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

 <b>CAUTION</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"><li>◆ This unit does not have proper turn signals, lights, reflective markings, or a slow moving vehicle emblem. These items are required to drive on a public street or roadway.</li></ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"><li>◆ Driving on a street or roadway without such equipment is dangerous and can lead to accidents causing personal injury.</li><li>◆ Driving on a street or roadway without such equipment may also be a violation of State laws and the operator may be subject to traffic tickets and/or fines.</li></ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"><li>◆ Do not drive a unit on a public street or roadway.</li></ul>	



 <b>WARNING</b> 
<b>POTENTIAL HAZARD</b> <ul style="list-style-type: none"> <li>◆ Loading a unit on a trailer or truck increases the possibility of tip-over.</li> </ul>
<b>WHAT CAN HAPPEN</b> <ul style="list-style-type: none"> <li>◆ Tip-over of the unit could cause serious injury or death.</li> </ul>
<b>HOW TO AVOID THE HAZARD</b> <ul style="list-style-type: none"> <li>◆ Use extreme caution when operating a unit on a ramp.</li> <li>◆ Use only a single, full width ramp; DO NOT use individual ramps for each side of the unit.</li> <li>◆ If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the unit.</li> <li>◆ DO NOT exceed a 15° angle between ramp and ground or between ramp and trailer or truck.</li> <li>◆ Avoid sudden acceleration while driving unit on a ramp.</li> </ul>



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



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

**DO NOT** attempt to turn the unit while on the ramp, you may lose control and drive off the side.

Avoid sudden acceleration when driving on a ramp.

## 4. MAINTENANCE & ADJUSTMENTS

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b> <ul style="list-style-type: none"><li>◆ While maintenance or adjustments are being made, someone could start the engine.</li></ul>	
<b>WHAT CAN HAPPEN</b> <ul style="list-style-type: none"><li>◆ Accidental starting of the engine could seriously injure you or other bystanders.</li></ul>	
<b>HOW TO AVOID THE HAZARD</b> <ul style="list-style-type: none"><li>◆ 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).</li></ul>	

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b> <ul style="list-style-type: none"><li>◆ The engine can become very hot.</li></ul>	
<b>WHAT CAN HAPPEN</b> <ul style="list-style-type: none"><li>◆ Touching a hot engine can cause severe burns.</li></ul>	
<b>HOW TO AVOID THE HAZARD</b> <ul style="list-style-type: none"><li>◆ Allow the engine to cool completely before service or making repairs around the engine area.</li></ul>	

### 4.1 PERIODIC MAINTENANCE

#### 4.1.1 Check engine oil level:

##### ***Service Interval: Daily***

- a) Stop engine and wait for all moving parts to stop. Make sure unit is on a level surface.
- b) Tilt seat forward and raise hood to gain access to access to engine area.
- c) Check with engine cold.
- d) Clean area around dipstick. Remove dipstick and wipe oil off. Reinsert the dipstick and push it all the way down into the tube. Remove the dipstick and read the oil level.
- e) If the oil level is low, wipe off the area around the oil fill cap, remove cap and fill to the "FULL" mark on the dipstick. Use oil as specified in Engine Owner's Manual. **DO NOT** overfill.

**IMPORTANT: DO NOT operate the engine with the oil level below the "LOW" (or "ADD") mark on the dipstick, or over the "FULL" mark.**

#### 4.1.2 Check battery charge:

##### **Service Interval: Monthly**

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

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



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

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

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

#### 4.1.3 Clean engine cooling system:

##### **Service Interval: Daily or more often in dry conditions**

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b> <ul style="list-style-type: none"><li>◆ Excessive debris can cause the engine and hydraulic system to overheat.</li></ul>	
<b>WHAT CAN HAPPEN</b> <ul style="list-style-type: none"><li>◆ Excessive debris around the engine cooling air intake and drive belts can create a fire hazard.</li></ul>	
<b>HOW TO AVOID THE HAZARD</b> <ul style="list-style-type: none"><li>◆ Clean all debris from around engine and drive belts daily.</li></ul>	

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Clean all debris from rotating engine air intake screen and from around engine shrouding.
- c) Clean all debris from around engine and drive belts.

#### 4.1.4 Check safety interlock system.

##### **Service Interval: Daily**

##### a) **Check starting circuit:**

Starter **should** crank with, parking brake **engaged**, PTO **disengaged** and motion control levers moved out in the **neutral lock** position. The operator does not need to be in the seat to start the engine.

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

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

Try to start with **operator in seat**, parking brake **engaged**, PTO **disengaged**, and the **left motion control lever in**, starter **must not crank**, repeat again with the **right lever in**, then with **both levers in** - starter **must not crank**.

##### b) **Check the kill circuits:**

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

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

Run engine at one-third throttle, with brake disengaged, move levers in and rise off seat (but do not get off of machine) engine **must stop** after 1/2 second has elapsed.

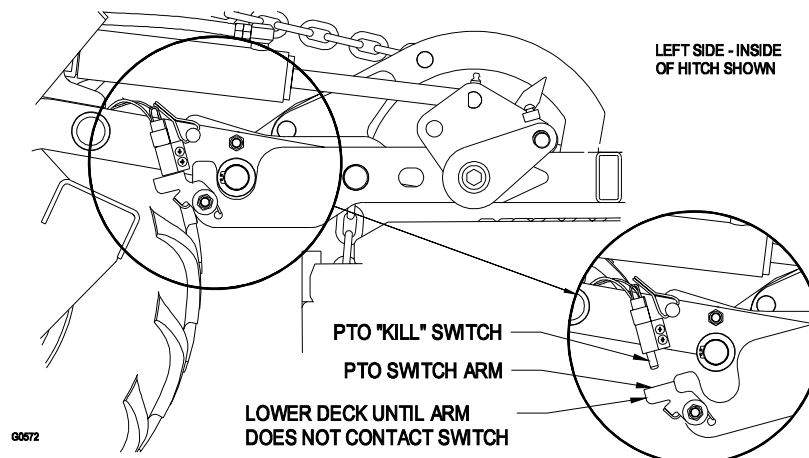
Again, run engine at one-third throttle, brake **engaged**, and move **left motion control lever in** - engine **must stop**.

Repeat again moving the **right lever in**, then moving **both levers in** - engine **must stop** whether operator is **on seat or not**.

##### c) **Check the PTO circuit:**

See the FR524 and FR604 Operator's manual to become familiar with the deck operation. Open the folding deck latches, **disengage** the park brake, move the motion control levers in to **neutral**, and **disengage** the PTO.

**Lower** the deck until the PTO switch arm is no longer depressing the PTO "kill" switch. See Figure 3.



**FIGURE 3**

Run the engine at half throttle and **pull** up on the PTO engagement switch.

The **PTO must not engage**.

**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.**

4.1.5 Check for loose hardware.

**Service Interval: Daily**

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

4.1.6 Service air cleaner.

**Service Interval: 50 hrs.**

**More often under severe conditions.**

**See Engine manual for additional information.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward and raise hood to gain access to the air cleaner.

**For 27 HP Kohler Units:**

- c) Loosen retaining clips and remove air cleaner compartment cover.
- d) Remove *paper element*. Check the condition of the paper element. Replace if dirty, bent or damaged.
- e) Check the condition of the *inner element*. Replace whenever it appears dirty, typically every other time the paper element is replaced. Clean the base around the inner element before removing, so dirt does not get into the engine.
- f) **DO NOT** wash or use pressurized air to clean paper element or inner element.
- g) Reinstall elements. Position the cover so that the rubber dust ejector is pointing downward and secure with retaining clips.

**For 20 HP and 23 HP Kohler Units:**

- h) Remove foam pre-cleaner element and wash in warm water with detergent. Rinse until all traces of detergent are eliminated and squeeze out excess water (**DO NOT wring**). Air dry. Saturate with engine oil and squeeze out excess oil.
- i) Check paper element. **DO NOT** wash or use pressurized air to clean paper element. Replace if dirty, bent or damaged.
- j) Reinstall foam pre-cleaner to paper element, then reinstall paper element and cover.

4.1.7 Change engine oil:

**Service Interval: 100 hrs.**

**NOTE:** Change oil and filter after first five (5) hrs. of operation.

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward and raise hood to gain access to the engine area.
- c) Drain oil while engine is warm from operation.
- d) Fit hose in literature pack over oil drain valve. Rotate the valve 1/4 counterclockwise and gently pull outward to open the valve. Allow the oil to

drain, then close the valve by pushing inward and rotating 1/4 turn clockwise. Remove and retain the hose for future use.

- e) Replace the oil filter **every other** oil change. Clean around oil filter and unscrew filter to remove. Before reinstalling new filter, apply a thin coating of oil on the surface of the rubber seal. Turn filter clockwise until rubber seal contacts the filter adapter then tighten filter an additional 2/3 to 3/4 turn.
- f) Clean around oil fill cap and remove cap. Fill to specified capacity and replace cap. Use oil recommended in engine owner's manual. **DO NOT** overfill.
- g) Lower the hood and seat.
- h) Start the engine and check for leaks.

#### 4.1.8 Check hydraulic oil level:

**Service Interval: 40 hr.**

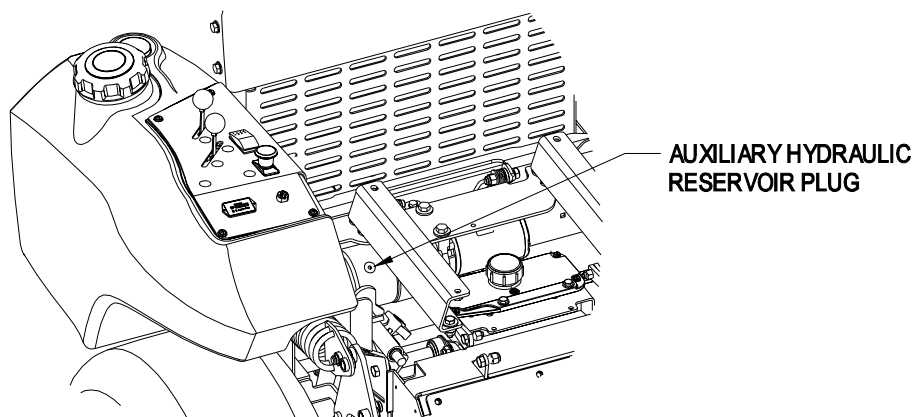
- a) Stop engine and wait for all moving parts to stop.
- b) Tilt seat up.
- c) Clean area around hydraulic reservoir cap and remove cap. Oil level should be to the top of the baffle inside the tank. If not, add oil. **Use only Mobil 1 15W-50 synthetic motor oil.** Replace hydraulic reservoir cap and tighten until snug. **Do not overtighten.**

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

#### 4.1.9 Check auxiliary hydraulic oil level:

**Service Interval: If there is evidence of a leak or the hydraulic cylinder does not perform normally.**

- a) Retract the hydraulic cylinder.
- b) Stop engine and wait for all moving parts to stop.
- c) Tilt the seat forward.
- d) Locate the auxiliary hydraulic power unit reservoir. See Figure 4.



**FIGURE 4**

- e) Clean area around the reservoir plug and remove. Oil level should be up to the reservoir plug hole. If not, add oil. **Use only Mobil 1 15W-50 synthetic motor oil.** Replace reservoir plug and tighten until snug. **Do not overtighten.**

4.1.10 Check tire pressures:

**Service Interval: 40 hrs.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Check tire pressure in drive tires.  
*For 20 and 23 HP Kohler Units:* The drive tires should be inflated to 13 psi (90 kpa).  
*For 27 HP Kohler Units:* The drive tires should be inflated to 9 psi (62 kpa)
- c) The rear caster tire(s) is semi-pneumatic and does not need to be inflated.

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

4.1.11 Check condition of belts:

**Service Interval: 40 hrs.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Check pump and PTO drive belts.
- c) Belts are spring tensioned and no adjustment is necessary. See section 4.2.2 and 4.2.3 for belt replacement.

4.1.12 Lubricate grease fittings:

**Service Interval: Refer to chart.**

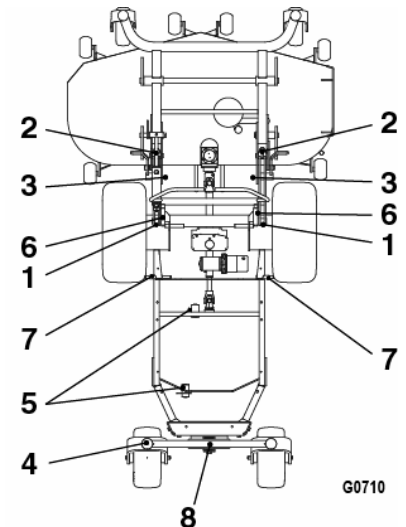
- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Lubricate fittings with one to two pumps of NGLI grade #2 multi-purpose gun grease.

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

**LUBRICATION CHART**

Fitting Locations	Initial Pumps	No. of Places	Service Interval
1. Hitch and Cylinder Pivots	2	4	40 hrs
2. Fold Pivot Pin	2	2	100 hrs
3. Fold Lock Pin	2	2	yearly
4. Rear Caster Pivot	*0	1	*yearly
5. Belt Idlers	1	2	yearly
6. Motion Control Pivots	1	2	yearly
7. Transfer Spring Ends	1	4	yearly
8. Dual Tail Wheel Pivot (if applicable)	2	1	40 hrs

\* See Section 4.1.12 c) for special lubrication instructions on the rear caster pivots and Section 4.1.13 for special lubrication instructions on the rear caster wheel hub.



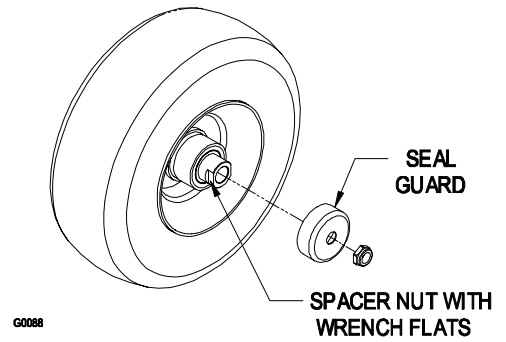
- c) Lubricate caster pivots once a year. Remove hex plug and cap. Thread grease zerk in hole and pump with grease until it oozes out around top bearing. Remove grease zerk and thread plug back in. Place cap back on.

#### 4.1.13 Lubricate rear caster wheel hub:

##### **Service Interval: Once Yearly**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
  - b) Remove caster wheel from caster forks.
  - c) Remove seal guards from the wheel hub.
  - d) Remove one of the spacer nuts from the axle assembly in the caster wheel. Note that thread locking adhesive has been applied to lock the spacer nuts to the axle. Remove the axle (with the other spacer nut still assembled to it) from the wheel assembly.
  - e) Pry out seals, and inspect bearings for wear or damage and replace if necessary.
  - f) Pack the bearings with a NGLI grade #1 multi-purpose grease.
  - g) Insert (1) bearing, (1) new seal into the wheel.

**NOTE:** Seals (Exmark PN 103-0063) must be replaced.
  - h) If the axle assembly has had both spacer nuts removed (or broken loose), apply a thread locking adhesive to (1) spacer nut and thread onto the axle with the wrench flats facing outward. Do not thread spacer nut all of the way onto the end of the axle. Leave approximately 1/8" (3 mm) from the outer surface of the spacer nut to the end of the axle inside the nut.
  - i) Insert the assembled nut and axle into the wheel on the side of the wheel with the new seal and bearing.
  - j) With the open end of the wheel facing up, fill the area inside the wheel around the axle full of NGLI grade #1 multi-purpose grease.
  - k) Insert the second bearing and new seal into the wheel.
  - l) Apply a thread locking adhesive to the 2<sup>nd</sup> spacer nut and thread onto the axle with the wrench flats facing outward.
  - m) Torque the nut to 75-80 in-lbs. (8-9 N-m), loosen, then re-torque to 20-25 in-lbs. (2-3 N-m). Make sure axle does not extend beyond either nut.
  - n) Re-install the seal guards over the wheel hub and insert wheel into caster fork. Re-install caster bolt and tighten nut fully.
- IMPORTANT:** To prevent seal and bearing damage, check the bearing adjustment often. Spin the caster tire. The tire should not spin freely (more than 1 or 2 revolutions) or have any side play. If the wheel spins freely, adjust torque on spacer nut until there is a slight amount of drag. Re-apply threadlocking adhesive.



**FIGURE 5**

#### 4.1.14 Lubricate the brake handle pivot:

##### **Service Interval: 160 hrs.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward.
- c) Lubricate bronze bushings on brake handle pivot with a spray type lubricant or light oil.



4.1.15 Lubricate the brake rod bushings:

**Service Interval: 160 hrs.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward and raise hood.
- c) Lubricate bronze bushings on each end of the brake rod shaft with a spray type lubricant or light oil (bushings are located to the inside of the flange bearings).

4.1.16 Lubricate the motion control bronze bushings:

**Service Interval: 160 hrs.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward.
- c) Lubricate bronze bushings on the flange bearings securing the motion control arm shafts with a light oil or a spray type lubricant.

4.1.17 Lubricate the motion control shaft:

**Service Interval: Yearly.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward.
- c) Remove tab at rear of motion control shaft.
- d) Pull motion control shaft out and lubricate with an NGLI grade #2 multi-purpose gun grease.
- e) Re-install shaft and tab.

4.1.18 Lubricate steering linkage rod ends:

**Service Interval: 160 hrs.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward.
- c) Lubricate each end of both steering linkage rods with a spray lubricant or light oil.

4.1.19 Remove engine shrouds and clean cooling fins:

**Service Interval: 80 hrs.**

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Remove cooling shroud clean-out covers from engine and clean cooling fins. Also clean dust, dirt, and oil from external surfaces of engine, which can cause improper cooling.
- c) Make sure cooling shroud clean-out covers are reinstalled. Operating the engine without cooling shroud clean-out covers will cause engine damage due to overheating.

4.1.20 Check spark plugs:

**Service Interval: 160 hrs.**

- a) Remove spark plugs, check condition and reset gaps, or replace with new plugs. See Engine Owners Manual.

4.1.21 Change fuel filter:

**Service Interval: As Required**

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

Replacement Filters	Kohler P/N 2405010
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4.1.22 Change hydraulic system filter:

**Service Interval: After First 250 hrs.  
Then yearly thereafter**



**NOTE:** Use only Exmark Part No.103-2146

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

**IMPORTANT:** Before reinstalling new filter, fill it with Mobil 1 15W-50 and apply a thin coat of oil on the surface of the rubber seal.

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

- d) Fill reservoir as stated in Section 4.1.8.

 <b>CAUTION</b> 
<b>POTENTIAL HAZARD</b> <ul style="list-style-type: none"><li>◆ Raising the mower deck for service or maintenance relying solely on mechanical or hydraulic jacks could be dangerous.</li></ul>
<b>WHAT CAN HAPPEN</b> <ul style="list-style-type: none"><li>◆ The mechanical or hydraulic jacks may not be enough support or may malfunction allowing the unit to fall, which could cause injury.</li></ul>
<b>HOW TO AVOID THE HAZARD</b> <ul style="list-style-type: none"><li>◆ DO NOT rely solely on mechanical or hydraulic jacks for support. Use adequate jack stands or equivalent support.</li></ul>

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

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

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

4.1.23 Wheel Hub – lock nut torque specification

**Service Interval: 500 hrs**

When tightening the lock nut on the wheel motor tapered shaft:

- a) Torque the lock nut to 125 ft-lbs (169 N-m).

NOTE: Do not use antisieze on wheel hub.

4.1.24 Fuel Tank – mounting hardware specification

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

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

- a) Pump drive sheave set screws.
- b) Line shaft sheave setscrews.
- c) Square head setscrews on Hydro pump control arms.
- d) Sheave retaining bolt in the end of engine crankshaft.
- e) Caster wheel spacer nuts.
- f) Fuel tank bulkhead fitting nuts.
- g) Motion control tab retaining bolt.

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

## 4.2 ADJUSTMENTS

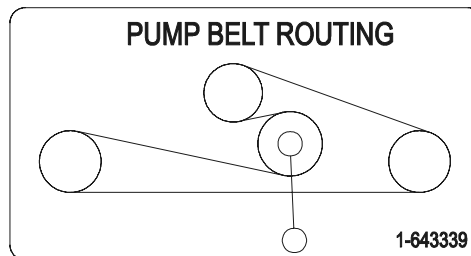
**IMPORTANT: Disengage PTO, shut off engine, wait for all moving parts to stop, engage parking brake, and remove key before servicing, cleaning, or making any adjustments to the unit.**

4.2.1 Pump Drive Belt Tension.

*Spring Tensioned - No adjustment necessary.*

4.2.2 Pump Drive Belt Replacement.

- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Remove pump drive belt.
- c) Route new belt onto sheaves as shown in the decal located on the right hand side of the left hood support. See Figure 6.



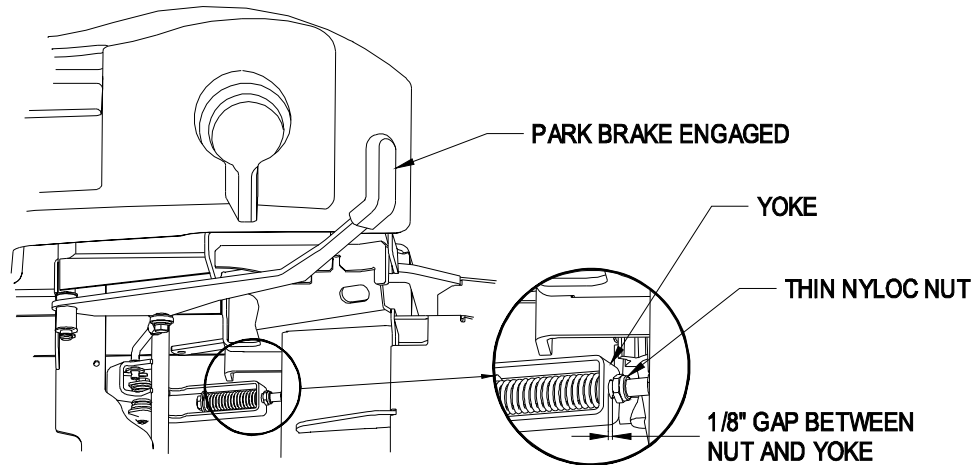
**FIGURE 6**

4.2.3 Park Brake Adjustment.

Check to make sure each brake is adjusted properly.

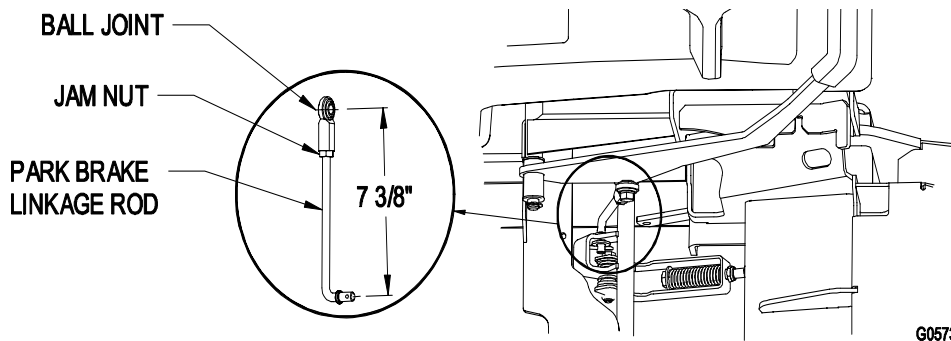
- a) Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- b) Tilt seat forward and raise hood.
- c) Pull the brake lever up into the engaged position.

- d) Locate the park brake spring assembly. See Figure 7. There should be a gap of 1/8" (3 mm) between the yoke and thin nyloc nut on the brake bolt. If necessary, rotate the thin nyloc nut to obtain the 1/8" gap.



**FIGURE 7**

- e) If park brake does not fully disengage when the lever is disengaged check the brake rod linkage assembly. The assembly should measure 7 3/8" (18.7 cm) from the center of the ball joint to the center of the lower end of the linkage rod. See Figure 8.

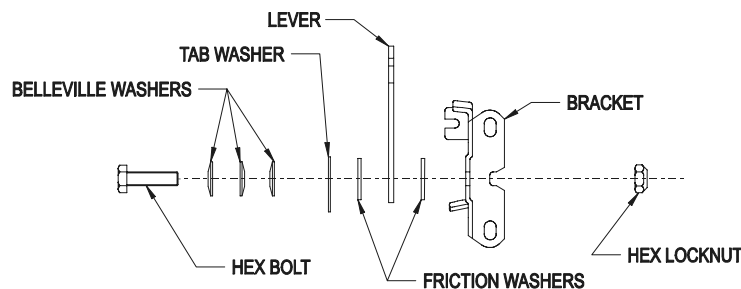


**FIGURE 8**

- f) If the linkage does not measure 7 3/8" (18.7 cm) or still does not disengage as desired, remove the bolt that secures the ball joint to the brake lever and loosen the jam nut next to the ball joint. Rotate the ball joint in half-turns counter-clockwise until desired disengagement is obtained.



#### 4.2.4 Adjust Throttle Lever Tension.



- Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
- Tension in throttle lever can be adjusted by adjusting the tightness of the lever pivot bolt, which is located under the console. See Figure 9.



**FIGURE 9**

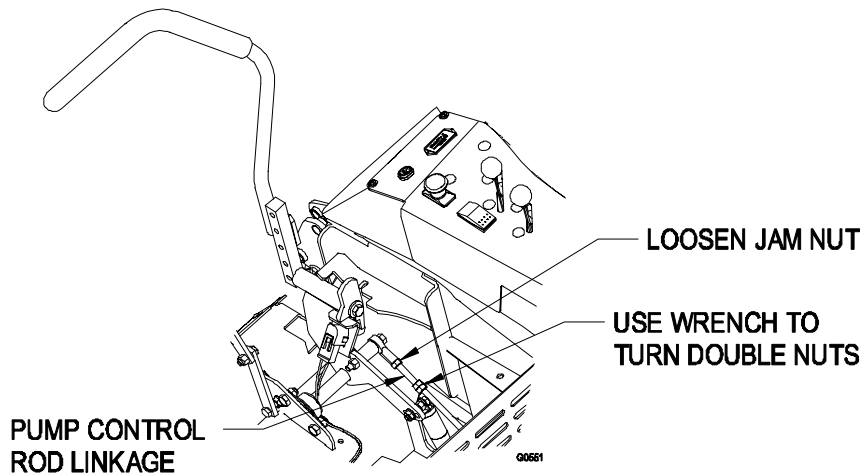
#### 4.2.5 Motion control linkage adjustment

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
◆ Engine must be running and drive wheels must be turning so motion control adjustment can be performed.	
<b>WHAT CAN HAPPEN</b>	
◆ Contact with moving parts or hot surfaces may cause personal injury.	
<b>HOW TO AVOID THE HAZARD</b>	
◆ Keep fingers, hands, and clothing clear of rotating components and hot surfaces.	

 <b>CAUTION</b> 	
<b>POTENTIAL HAZARD</b>	
◆ Raising the mower deck for service or maintenance relying solely on mechanical or hydraulic jacks could be dangerous.	
<b>WHAT CAN HAPPEN</b>	
◆ The mechanical or hydraulic jacks may not be enough support or may malfunction allowing the unit to fall, which could cause injury.	
<b>HOW TO AVOID THE HAZARD</b>	
◆ <b>DO NOT</b> rely solely on mechanical or hydraulic jacks for support. Use adequate jack stands or equivalent support.	

*Set neutral:*

- a) Remove the electrical connection from the seat safety switch, located directly in front of the seat switch assembly.
- b) The neutral adjustment must be made with the drive wheels turning. Raise the frame and place on jack stands so that drive wheels can rotate freely.  
**Temporarily** install a jumper wire across the terminals in the connector of the wiring harness.
- c) Start the engine.
- d) Run the unit at least 5 minutes with the drive levers at full forward speed to bring hydraulic system oil up to operating temperature.
- e) To obtain the neutral position, adjust the left and right pump control rod linkages that connect the steering control to the pump control arms until the wheels stop, or creep slightly in reverse.
- f) To adjust each linkage, loosen the jam nut next the ball joint at the upper end of the linkage rod assembly. Then rotate the assembly using a wrench to turn the double nuts on the assembly. See Figure 10.
- g) Re-tighten the jam nut against the ball joint on each side.



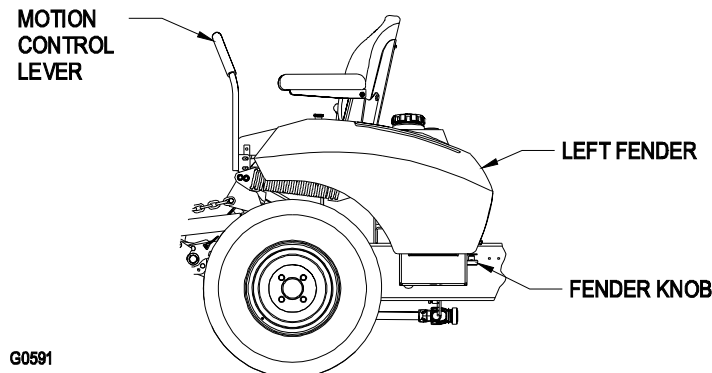
**FIGURE 10**

- h) Move the motion control levers to the reverse position. Return the motion control levers to neutral. The wheels must stop turning (or slightly creep in reverse).
- i) Stop engine and wait for all moving parts to stop. Remove jumper wire from wire harness connector and plug connector into seat switch.
- j) Lower from jackstands.

**4.2.6 Weight transfer spring adjustment:**



Weight transfer springs are assembled from the factory to apply the maximum amount of weight onto the drive wheels. This setting provides the greatest amount of traction. Some conditions may require the rear wheel lift to be reduced. This can be done by reducing the amount to weight transfer, which will increase the amount of weight on the front and rear castors.

- a) Rotate the left motion control arm up and into the operation position.
- b) Locate and loosen the knob under the rear of the left fender. See Figure 11.

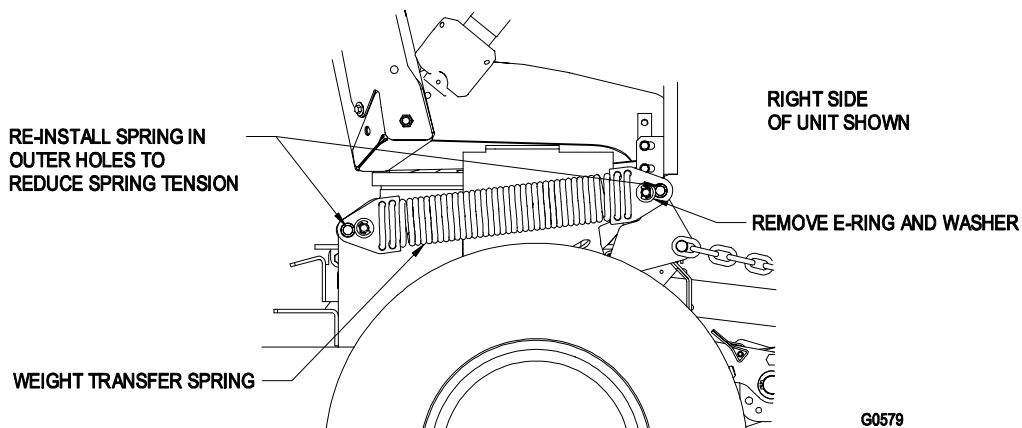


**FIGURE 11**

- c) Slide the fender forward and twist upward and outward to remove.
- d) To adjust the weight transfer springs, fold the mower deck and front frame and lock in service position. See Deck Manual for complete instructions.

 <b>WARNING</b> 	
<b>POTENTIAL HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Weight transfer springs may have stored energy.</li> </ul>	
<b>WHAT CAN HAPPEN</b>	
<ul style="list-style-type: none"> <li>◆ Removing the weight transfer springs without releasing the stored energy can cause serious injury</li> </ul>	
<b>HOW TO AVOID THE HAZARD</b>	
<ul style="list-style-type: none"> <li>◆ Fold mower deck and front frame and lock in service position to remove spring tension and release stored energy before performing any maintenance or adjustments on the weight transfer springs. (See Deck Manual for Deck Raising instructions)</li> </ul>	

- e) Remove the retaining ring and washer at either end of the weight transfer spring that retains it to the transfer bellcrank pins and/or weight transfer spring anchor pins. See Figure 12.
- f) Pull the spring off of front or rear pin and re-install in the outer hole, to reduce the spring force. Re-install the washer and retaining ring.



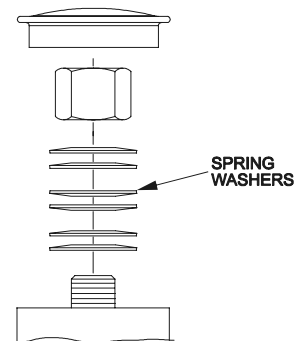
**FIGURE 12**

- g) Re-install the left fender.
- h) For additional weight transfer adjustment, repeat steps steps d) through g) on the right side of the unit.

#### 4.2.7 Rear caster pivot bearings pre-load adjustment.

- a) Remove dust cap from caster and tighten nyloc nut until washers are flat. Back the nyloc off 1/4 of a turn to properly set the pre-load on the bearings.

Note: If disassembled, make sure the spring washers are reinstalled as shown in Figure 13.





**FIGURE 13**

## 5. WASTE DISPOSAL

### 5.1 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.

### 5.2 BATTERY DISPOSAL

 <b>DANGER</b> 	
<b>POTENTIAL HAZARD</b>	
◆ Battery electrolyte contains sulfuric acid, which is poisonous and can cause severe burns	
<b>WHAT CAN HAPPEN</b>	
◆ Swallowing electrolyte can be fatal or if it touches skin can cause severe burns.	
<b>HOW TO AVOID THE HAZARD</b>	
◆ Wear safety glasses to shield eyes, and rubber gloves to protect skin and clothing when handling electrolyte.	
◆ Do not swallow electrolyte.	

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

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

## 6. TROUBLE SHOOTING

### 6.1 MOWER PULLS LEFT OR RIGHT (WITH LEVERS FULLY FORWARD).

- a) Refer to Tracking Adjustment Section 4.2.5
- b) Check air pressure in drive tires.

**For 20 and 23 HP Kohler Units:** The drive tires should be inflated to 13 psi (90 kpa).

**For 27 HP Kohler Units:** The drive tires should be inflated to 9 psi (62 kpa)

**For All Units:** Semi-pneumatic casters do not require inflation.

### 6.2 MOWER CUTS UNEVENLY.

- a) Check air pressure in drive tires.

**For 20 and 23 HP Kohler Units:** The drive tires should be inflated to 13 psi (90 kpa).

**For 27 HP Kohler Units:** The drive tires should be inflated to 9 psi (62 kpa)

**For All Units:** Semi-pneumatic casters do not require inflation.

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

- b) Check deck leveling (See Adjustments in Deck Manual).

Note: The front of the mower deck will be approximately 1/4" lower than the back of the mower deck. This is the "rake" of the deck.

- c) Check the distance from the bottom edge of the deck skirt to the tip of each blade. Measurement should be consistent between all blade tips.



### 6.3 ENGINE WILL NOT START.

- a) Make sure the battery has a full charge. See section 4.1.2 for charging instructions.
- b) 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.
- c) Make sure there is fuel in the fuel tank and that the fuel valve is open.
- d) Make sure the parking brake is set and motion control levers in the neutral position.
- e) Check that the PTO is disengaged, park brake is engaged and motion control is in “Neutral”.
- f) Check that the spark plug wires are properly connected.
- g) Check for loose or faulty wiring connections.
- h) Check for corrosion at all wiring connections. Even minor corrosion may cause a faulty connection. Clean connector terminals thoroughly with electrical contact cleaner, apply dielectric grease and reconnect.
- i) Check safety switch adjustment (See Section 4.2.5).

**NOTE: When disconnecting electrical connectors *DO NOT* pull on the wires to separate the connectors.**

**NOTE: After carefully checking the above steps, attempt to start the engine. If it does not start, contact your authorized Exmark service dealer.**

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

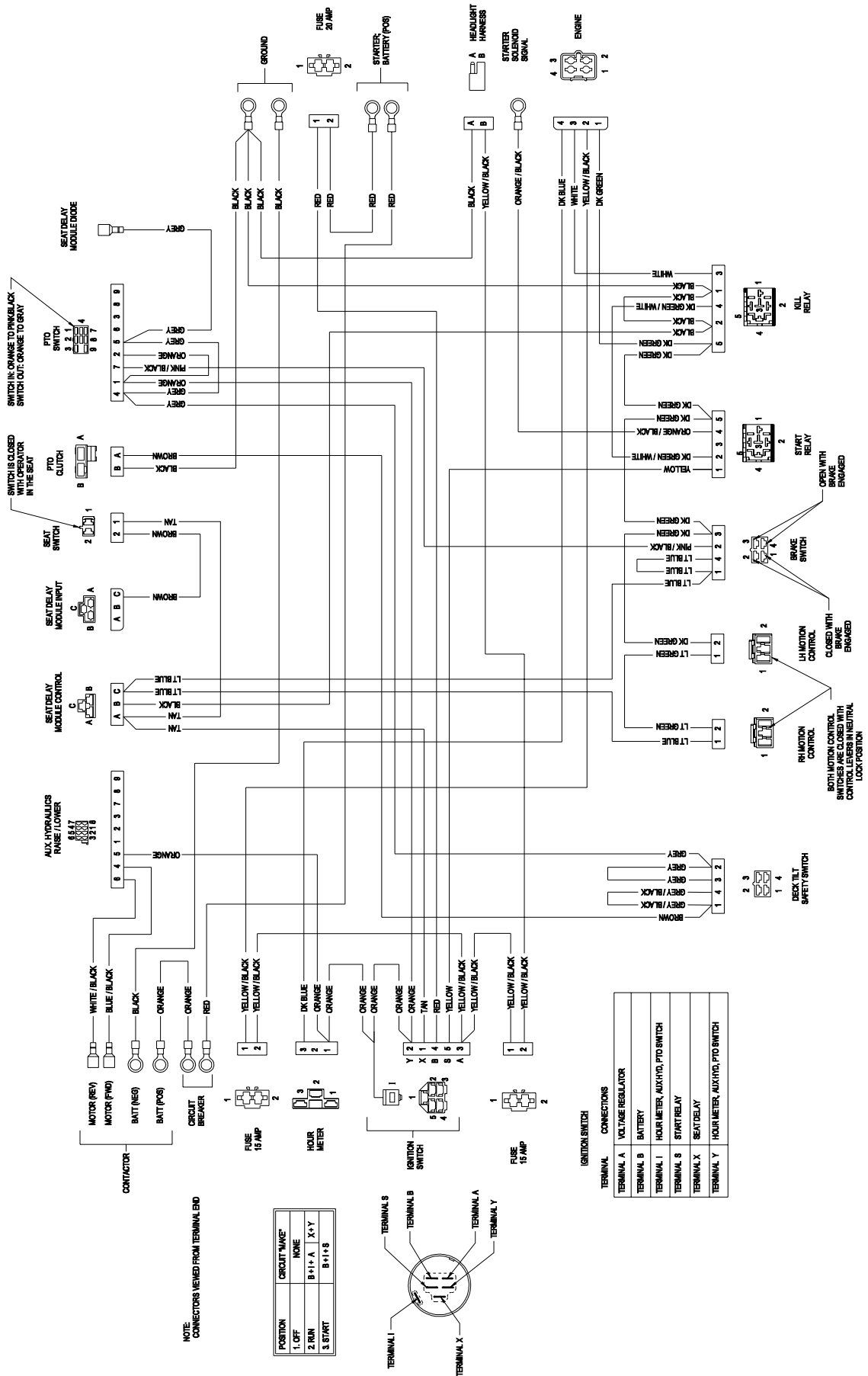
When a problem occurs, do not overlook the simple causes. For example: starting problems could be caused by an empty fuel tank.

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**.

**ENGINE TROUBLESHOOTING TABLE**

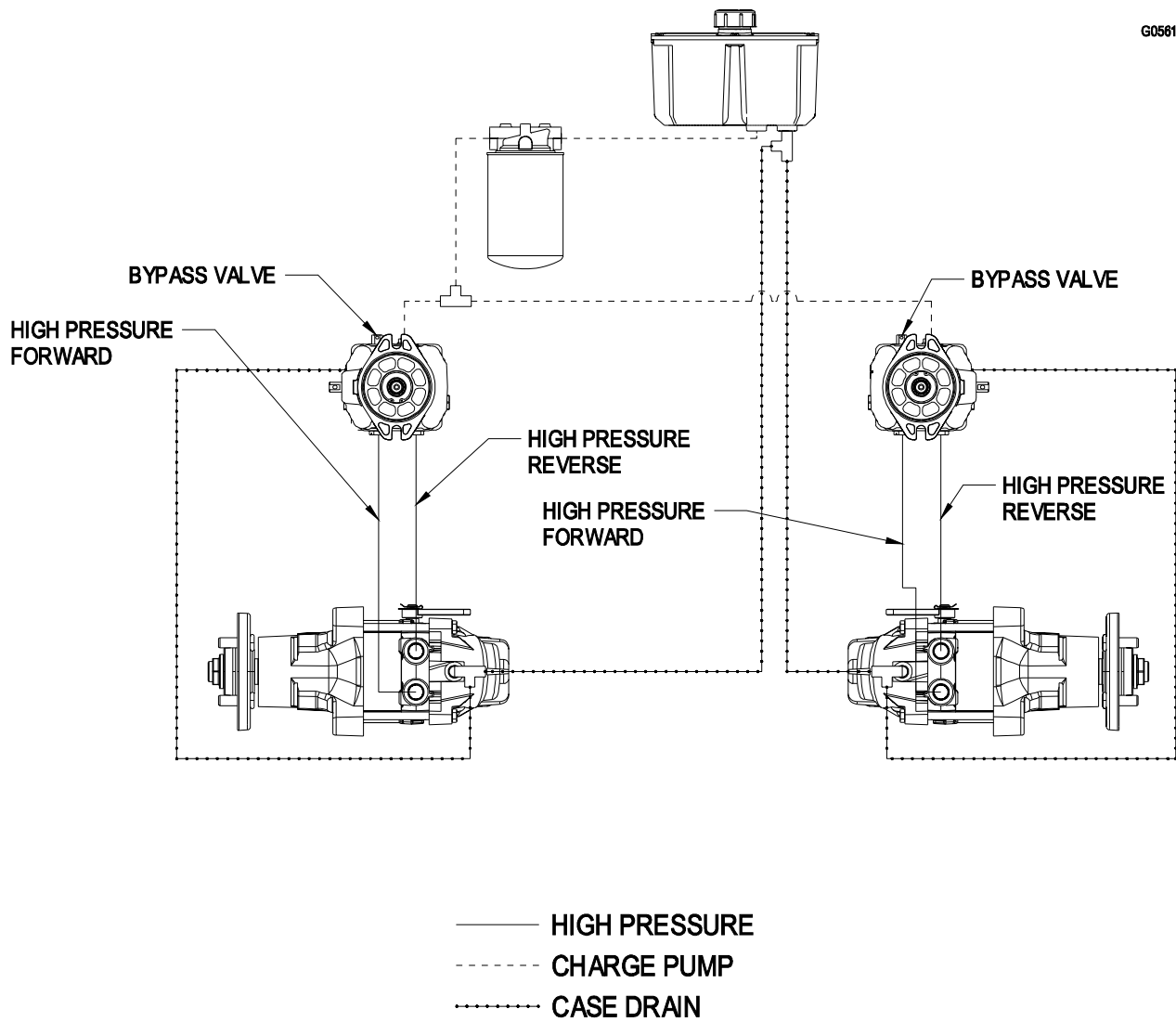
PROBLEM	NO FUEL	IMPROPER FUEL	DIRT IN FUEL LINE	DIRTY AIR FILTER	FAULTY SPARK PLUG	ENGINE OVERLOADED	BLOCKED FUEL FILTER	INCORRECT OIL LEVEL	DIRTY AIR SCREEN	INSUFFICIENT BATTERY CHARGE
Will not start	X		X	X	X	X	X			X
Hard starting	X	X	X	X	X	X	X			
Stops suddenly	X		X	X		X	X	X	X	
Lacks power		X	X	X	X	X	X	X	X	
Operates erratically		X	X	X	X	X	X		X	
Knocks or pings		X				X			X	
Skips or misfires		X	X	X	X				X	
Backfires			X	X	X	X			X	
Overheats			X	X		X		X	X	
High fuel consumption				X	X	X			X	

# 7. ELECTRICAL DIAGRAM



## 8. HYDRAULIC DIAGRAM

G0561



## 2-Year Limited Warranty Exmark Turf Equipment

(For units purchased on or after October 1, 2004)

### 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 manufactured by Exmark 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 turf equipment purchased on or after October 1, 2004 sold in the US 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.

<u>Products</u>	<u>Warranty Period</u>
• All Products (except as noted below)	2 years
• All Attachments and Accessories	1 year
• Metro 21 and Metro 26 Series	1 year
• Belts and Tires	90 days
• Battery	1 Year Prorated
• Engine*	Warranty is covered by engine manufacturer

\*Please refer to the engine manufacturer's warranty statement that is included in the literature packet. We are not authorized to handle warranty adjustments on engines.

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.

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

### Instructions for Obtaining Warranty Service

1. 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. Customers may also call 402-223-6375.
2. Bring the product and your proof of purchase (sales receipt) to the Exmark Service Dealer.

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

The Exmark turf equipment, including any defective part, must be returned to an authorized Exmark service dealer within the warranty period. This warranty extends only to turf equipment operated under normal conditions. You must 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.

As a condition to this warranty, customer shall have read the operator's manual and shall have completed and submitted to Exmark Warranty Company, within the prescribed time, the Exmark warranty registration.

### General Conditions

The sole liability of Exmark and Exmark Warranty Company with respect to this warranty shall be repair and replacement as set forth herein. **Neither Exmark nor Exmark Warranty Company shall have any liability for any other cost, loss or damage, including but not limited to, any incidental or consequential loss or damage.**

In particular, we shall have no liability or responsibility for:

- Expenses related to gasoline, oil or lubricants.
- Travel time, overtime, after hours time or other extraordinary repair charges or charge 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.

There are no understandings, agreements, representations, or warranties, express or implied, including but not limited to any regarding the merchantability (that product is fit for ordinary use) or fitness for use (that product is fit for a particular purpose), not specified herein, respecting the equipment which is the subject of this 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.

**Evaporative Emission Control Warranty Statement**  
 California Evaporative Emission Control Warranty Statement  
 Your Warranty Rights and Obligations

**Introduction**

The California Air Resources Board and Exmark Manufacturing Company are pleased to explain the evaporative emission control system's warranty on your 2006 model year equipment. In California, new equipment that uses small off-road engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. Exmark Manufacturing Company must warrant the evaporative emission control system on your equipment for two years provided there has been no abuse, neglect or improper maintenance of your equipment.

Your evaporative emission control system may include parts such as: fuel lines, fuel line fittings, and clamps.

**Manufacturer's Warranty Coverage:**

This evaporative emission control system is warranted for two years. If any evaporative emission-related part on your equipment is defective, the part will be repaired or replaced by Exmark Manufacturing Company.

**Owner's Warranty Responsibilities:**

- As the equipment owner, you are responsible for performance of the required maintenance listed in your Operator's Manual. Exmark Manufacturing Company recommends that you retain all receipts covering maintenance on your equipment, but Exmark Manufacturing Company cannot deny warranty solely for the lack of receipts.
- As the equipment owner, you should however be aware that Exmark Manufacturing Company may deny you warranty coverage if your emission warranty parts have failed due to abuse, neglect, or improper maintenance or unapproved modifications.
- You are responsible for presenting your equipment to an Authorized Service Dealer as soon as the problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. If you have a question regarding your warranty coverage, you should contact Exmark Manufacturing Company at 1-402-223-6375.

**Defects Warranty Requirements:**

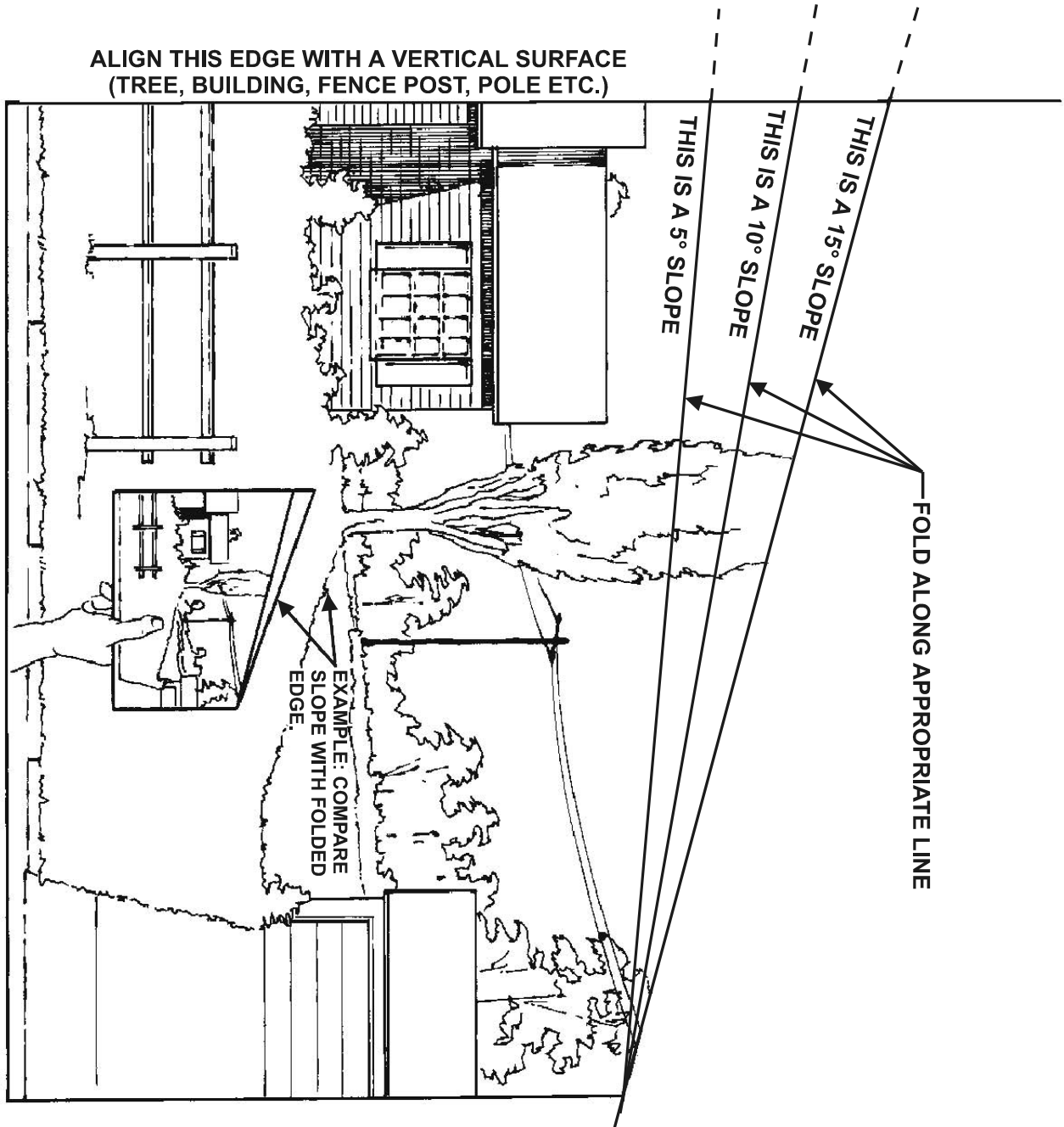
1. The warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser.
2. General Evaporative Emissions Warranty Coverage. The emission warranty parts must be warranted to the ultimate purchaser and any subsequent owner that the evaporative emission control system when installed was:
  - A. Designed, built, and equipped so as to conform with all applicable regulations; and
  - B. Free from defects in materials and workmanship that causes the failure of a warranted part for a period of two years.
3. The warranty on evaporative emissions-related parts will be interpreted as follows:
  - A. Any warranted part that is not scheduled for replacement as required maintenance in the written instructions must be warranted for the warranty period of two years. If any such part fails during the period of warranty coverage, it must be repaired or replaced by Exmark Manufacturing Company. Any such part repaired or replaced under the warranty must be warranted for a time not less than the remaining warranty period.
  - B. Any warranted part that is scheduled only for regular inspection in the written instructions must be warranted for the warranty period of two years. A statement in such written instructions to the effect of "repair or replace as necessary" will not reduce the period of warranty coverage. Any such part repaired or replaced under warranty must be warranted for a time not less than the remaining warranty period.
  - C. Any warranted part that is scheduled for replacement as required maintenance in the written instructions must be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part must be repaired or replaced by Exmark Manufacturing Company. Any such part repaired or replaced under warranty must be warranted for a time not less than the remainder of the period prior to the first scheduled replacement point for the part.
  - D. Repair or replacement of any warranted part under the warranty provisions of this article must be performed at no charge to the owner at an Authorized Service Dealer.
  - E. Notwithstanding the provisions of subsection (D) above, warranty services or repairs must be provided at an Authorized Service Dealer.
  - F. The owner must not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at an Authorized Service Dealer.
  - G. Throughout the evaporative emission control system's two year warranty period, Exmark Manufacturing Company must maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
  - H. Manufacturer approved replacement parts must be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of Exmark Manufacturing Company.
  - I. The use of any add-on or modified parts will be grounds for disallowing a warranty claim made in accordance with this article. Exmark Manufacturing Company will not be liable under this Article to warrant failures of warranted parts caused by the use of an add-on or modified part.
  - J. Exmark Manufacturing Company shall provide any documents that describe the warranty procedures or policies within five working days of request by the Air Resources Board.

**Emission Warranty Parts List:**

The following list includes the parts covered under this warranty:

- Fuel Lines
- Fuel Line Fittings
- Clamps

# NOTES



## SEE EXMARK'S COMPLETE LINE OF ACCESSORIES

### RIDING ACCESSORIES

CUSTOM RIDE SEAT SUSPENSION SYSTEM  
DECK LIFT ASSIST KIT  
HITCH KIT  
LIGHT KIT  
MICRO-MULCH SYSTEM  
ROLL OVER PROTECTION SYSTEM (ROPS)  
SNOW BLADE  
SUN SHADE  
TRASH CONTAINER  
TURF STRIPER  
ULTRA VAC COLLECTION SYSTEM  
ULTRA VAC QUICK DISPOSAL SYSTEM

### WALK BEHIND ACCESSORIES

GRASS CATCHER  
MICRO-MULCH SYSTEM  
STEERABLE SULKY  
SULKY HITCH KIT  
TURF STRIPER  
STANDON

Check us out on the Web:

**[www.exmark.com](http://www.exmark.com)**



#### WARNING



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

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BEATRICE, NE 68310  
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