

# Hustler® X-RIDE™ General Service Manual



**HUSTLER®**  
ENGINEERING PERFORMANCE™

200 South Ridge Road  
Hesston, Kansas  
67062

## **WARNING**

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

### NOTICE OF REQUIREMENT OF SPARK ARRESTER MUFFLER

This equipment may create sparks that can start fires around dry vegetation. California Public Resources Code Section 4442.6 provides that it is unlawful to use or operate an internal combustion engine on any forest-covered, brush-covered, or grass-covered land unless the engine is equipped with a spark arrester maintained in effective working order. A spark arrester is a device constructed of nonflammable materials specifically for the purpose of removing and retaining carbon and other flammable particles over 0.0232 of an inch in size from the exhaust flow of an internal combustion engine that uses hydrocarbon fuels or which is qualified and rated by the United States Forest Service. Other states or federal areas may have similar laws. The Operator Should Contact Local Fire Agencies For Laws or Regulations Relating to Fire Prevention Requirements. THIS EQUIPMENT DOES NOT HAVE A SPARK ARRESTER AND YOU SHOULD CONTACT YOUR AUTHORIZED DEALER FOR THE PURCHASE OF A SPARK ARRESTER.

**Inspect spark arrester daily; replace every 500 hours or as needed.**

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

**Keep Engine Owner's Manual with your unit. Should the Engine Owner's Manual become damaged or illegible, replace immediately. Replacements may be ordered per the information found in the Product Information section of the owner's manual.**

**Federal law and California State law prohibit the following acts or the causing thereof:**

- 1. The removal or rendering inoperative by any person other than for purposes of maintenance, repair, replacement, of any device or element of design incorporated into any equipment for the purposes of emissions control prior to or after its sales or delivery to the ultimate purchaser or while it is in use, or**
- 2. The use of the equipment after such device or element of design has been removed or rendered inoperative by any person.**

# Table of Contents

General Information . . . . .	1-1
Service Program . . . . .	1-1
Maintenance Introduction . . . . .	1-1
Warranty . . . . .	1-1
Safety . . . . .	2-1
Training . . . . .	2-1
General Operation . . . . .	2-1
Slope Operation . . . . .	2-2
Slope gauge (back cover) . . . . .	2-3
Children . . . . .	2-3
Towing . . . . .	2-3
Transporting Machines . . . . .	2-4
Operator Protective System (OPS) . . . . .	2-4
Hydraulic Devices and Systems . . . . .	2-4
Service . . . . .	2-5
General Service . . . . .	2-5
Do Not Modify Engine . . . . .	2-6
Torque . . . . .	3-1
Standard Torques . . . . .	3-1
Special Torques . . . . .	3-1
Power Unit Maintenance . . . . .	4-1
Steering Adjustments . . . . .	4-1
Park Brake Spring Adjustment . . . . .	4-4
Belts . . . . .	4-5
Hydraulic Pump Belt Adjustment . . . . .	4-5
Hydraulic System . . . . .	4-5
Warner Clutch Re-gap Adjustment Procedures . . . . .	4-7
Tires . . . . .	4-8
Caster Fork Tapered Bearing Replacement . . . . .	4-8
Tapered Wheel Bearing Replacement . . . . .	4-10
Engine Maintenance . . . . .	5-1
General Engine Maintenance . . . . .	5-1
Engine Air Filter . . . . .	5-1

Fuel Evaporation System Filter .....	5-3
Fuel & Evaporative System Line Routings.....	5-3
Deck Adjustments .....	6-1
Deck Leveling .....	6-1
Blades .....	6-2
Belts.....	6-3
Deck Belt Adjustment .....	6-3
Electrical .....	7-1
Electrical Schematic – Kawasaki.....	7-1
Maintenance Locator Chart .....	8-2
Troubleshooting .....	9-1

# GENERAL INFORMATION

## Service Program

---

This manual is part of a service package for the Hustler® X-RIDE mowers. Use of this manual in conjunction with other Hustler® mower and component manuals will provide the information necessary to service and maintain Hustler® X-RIDE mowers.

This General Service Manual is a service guide for use by Service Technicians. It provides the necessary information needed to perform normal maintenance requirements on these units.

The Parts Manual provides a complete parts listing for the unit. Use this manual when ordering parts.

The Operator's Manual provides fundamental operational information and operational safety that is needed when operating the mower.

The component manuals are furnished by the various manufacturers to be used for the troubleshooting and servicing of their components.

## Maintenance Introduction

---

Regular maintenance is the best prevention for downtime or premature failure. The following pages contain suggested maintenance information and schedules which the operator/mechanic should follow on a routine basis.

Remain alert for unusual noises, they could be signaling a problem. Visually inspect the machine for any abnormal wear or damage. A good time to detect potential problems is while performing scheduled maintenance service. Correcting the problem as quickly as possible is the best insurance.

Clear away heavy build-up of grease, oil and dirt, especially in the engine compartment and under the seat platform areas; minute dust particles are abrasive to close-tolerance engine and hydraulic assemblies.

**Inspect mower daily** for grass clippings and wire and string tangles. The underside of the mower deck will collect a build-up of grass clippings and dirt, especially when grass is wet or has high moisture content. This build-up will harden, restricting blade and air movement and will probably show a lesser quality of cut. Therefore it should be removed routinely.

To do this it will be necessary to raise and block the deck, using jack stands or blocks, in the full up position and scrape the build-up from underneath.

Some repairs require the assistance of a trained service mechanic and should not be attempted by unskilled personnel. Consult your Hustler® Turf Equipment service center when assistance is needed.

Information included in this manual was current at the time of printing, but subsequent production changes may cause your machine to vary slightly in detail. Hustler® Turf Equipment reserves the right to redesign and change the machine as deemed necessary, without notification. If a change has been made to your machine which is not reflected in this service manual contact the Customer Service Department at Hustler® Turf Equipment for additional information.

## Warranty

---

Warranty repair must be performed by a Hustler® Turf Equipment Authorized Dealer before warranty credit can be allowed.



# SAFETY

## WARNING

This symbol points out important safety instructions which, if not followed, could endanger the personal safety and/or property of yourself and others. Read and follow all instructions in this manual before attempting to operate this machine. Failure to comply with these instructions may result in personal injury. When you see this symbol, HEED ITS WARNING!

## DANGER

This machine was built to be operated according to the safe operation practices in this manual. As with any type of power equipment, carelessness, or error on the part of the operator can result in serious injury. This machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

### Training

#### WARNING

Particular attention must be given to tightening the drive wheel lug nuts and blade spindle bolts. Failure to correctly torque these items may result in the loss of a wheel or blade, which can cause serious damage or personal injury

Read the Operator's Manual and other training material. If the operator(s) or mechanic(s) cannot read English it is the owner's responsibility to explain this material to them.

Become familiar with the safe operation of the machine, operator controls, and safety signs.

All operators and mechanics should be trained to operate or service the equipment. The owner is responsible for training them.

Never let children under the age of 16 or untrained people operate or service the equipment. Local regulations may further restrict the age of the operator.

The owner/operator can prevent, and is responsible for, accidents or injuries occurring to them, other people, or property.

### General Operation

1. Read, understand, and follow all instructions on the machine and in the manual(s) before attempting to assemble and operate. Keep this manual in a safe place for future and regular reference by each operator and for ordering replacement parts.
2. Be familiar with all controls and their proper operation. Know how to stop the machine and disengage the controls quickly.
3. Do not allow anyone to operate or maintain this machine who has not read the manual. Never permit children under the age of 16 to operate this machine.
4. Do not remove any shields, guards, labels, or safety devices. If a shield, guard, label, or safety device is

damaged or does not function, repair or replace it before operating the machine.

5. To help avoid blade contact or a thrown object injury, keep bystanders, helpers, children, and pets at least 75 feet (23 meters) from the machine while it is in operation. Stop machine if anyone enters the area.
6. Thoroughly inspect the area where the equipment is to be used. Remove all stones, sticks, wire, bones, toys, and other foreign objects that could be picked up and thrown by the blade(s). Thrown objects can cause serious personal injury.
7. 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 the machine manufacturer.
8. Plan your mowing pattern to avoid discharge of material toward roads, sidewalks, bystanders, and the like. Also, avoid discharging material against a wall or obstruction which may cause discharged material to ricochet back toward the operator.
9. Always wear appropriate clothing and personal protective equipment (e.g. safety glasses, long pants, gloves, hearing protection, safety shoes, hard hat) when operating or maintaining this machine. Long hair, loose fitting clothing, or jewelry may get entangled in moving parts. Follow all federal, state, and local guidelines regarding the use of personal protective equipment.
10. For extended use of this product, hearing protection is recommended.
11. Be aware of the mower and attachment discharge direction and do not point it at anyone. Do not operate the mower without the discharge cover or entire grass catcher in its proper place.
12. Do not put hands or feet near rotating parts or under the cutting deck. Contact with the blade(s) can amputate hands and feet.
13. A missing or damaged discharge cover can cause blade contact or thrown object injuries.

14. Stop the blade(s) when crossing gravel drives, walks, or roads and while not cutting grass.
15. Watch for traffic when operating near or crossing roadways. This machine is not intended for use on any public roadway.
16. Do not operate the machine while under the influence of alcohol or drugs.
17. Mow only in daylight or good artificial light.
18. Never carry passengers.
19. Back up slowly. Always look down and behind before and while backing to avoid a back-over accident.
20. Slow down before turning. Operate the machine smoothly. Avoid erratic operation and excessive speed. Be aware of your direction of travel to avoid accidents.
21. Disengage blade(s), set parking brake, stop engine, and wait until the blade(s) come to a complete stop before removing grass catcher, emptying grass, unclogging chute, removing any grass or debris, or making any adjustments.
22. Never leave a running machine unattended. Always stop on level ground, turn off blade(s), place drive control levers in neutral, set parking brake, stop engine, and remove key before leaving the operator position.
23. Use extra care when loading or unloading the machine on a trailer or truck. The machine should not be driven on unstable, unsecured, or inadequate ramps because the machine could tip over causing serious personal injury.
24. Check overhead clearances carefully before driving under low hanging tree branches, wires, door openings, etc., where the operator and/or ROPS may be struck which could result in serious injury and/or machine tip over.
25. Muffler and engine become hot and can cause a burn. Do not touch.
26. Disengage the blades, set the parking brake to the 'on' position, and make sure the drive control levers are in the neutral position before attempting to start the engine. Only start the engine from the operator's position.
27. Do not attempt to mow unusually tall, dry grass (e.g., pasture) or piles of dry leaves. Dry grass or leaves may contact the engine exhaust and/or build up on the mower deck presenting a potential fire hazard.
28. Do not stop or park the machine over dry leaves, grass, debris, or other combustible material.
29. Never attempt to operate the machine without the mowing deck attached; the machine could tip over.
30. Keep the machine and especially the engine exhaust system and hydraulic components clean and free of grease, grass, and leaves to reduce the potential for overheating and fire.
31. Allow the machine to cool at least 5 minutes before storing.
32. Use only accessories and attachments approved for this machine by the machine manufacturer. Read, understand, and follow all instructions provided with the approved accessory or attachment.
33. Data indicates that operators, age 65 years and above, are involved in a large percentage of mower-related injuries. Operators should evaluate their ability to operate this machine safely enough to protect themselves and others from serious injury.
34. Do not operate or start machine if there are fuel or oil leaks; repair immediately.
35. When looking for oil leaks, never run your hand over hydraulic hoses, lines, or fittings. Never tighten or adjust hydraulic hoses, lines, or fittings while the system is under pressure. If high-pressure oil penetrates the skin seek immediate medical attention or gangrene and permanent damage may result. Do not check for hydraulic leaks with your hands, use paper or cardboard instead. Wear gloves and safety glasses when checking for leaks.
36. Do not operate machines that have been damaged or have not been properly maintained. If the machine has been damaged, have it repaired.
37. When operating this machine in the forward direction, do not allow the drive control levers to return to the neutral position on their own. Always operate them smoothly and avoid any sudden movements of the levers when starting or stopping.
38. If situations occur which are not covered in this manual use care and good judgement. Contact your customer service representative for assistance.

## Slope Operation

---

Slopes are a major factor related to loss of control and tip-over accidents that can result in severe injury or death. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not mow it or drive on the slope.

For your safety, use the slope gauge included as part of this manual to measure slopes before operating this machine on a sloped or hilly area. If the slope is greater than 15° (26%) as shown on the slope gauge, do not operate this machine on that area or serious injury could result.

### Do:

1. Mow across slopes, not up and down. Exercise extreme caution when changing direction on slopes.
2. Watch for holes, ruts, bumps, rocks, or other hidden objects. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
3. Use slow speed. Choose a low enough speed so that you will not have to stop while on the slope. Avoid starting or stopping on a slope. If the tires are unable to maintain traction, disengage the blades and proceed slowly and carefully straight down the slope.
4. Keep all movements on slopes slow and gradual. Do not make sudden changes in speed or direction. Rapid



acceleration could cause the front of the machine to lift and rapidly flip over backwards, which could cause serious injury or death.

5. Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.
6. Use extra care with grass catchers or other attachments. These can change the stability of the machine.

#### Do Not:

1. Do not turn on slopes unless necessary; then turn slowly uphill and use extra care while turning.
2. Do not mow near drop-offs, ditches, or embankments. The machine could suddenly turn over if a wheel is over the edge of a cliff, ditch, or if an edge caves in.
3. Do not operate on slopes or near the edge of water such as a lake, pond, river, or stream where the machine could slip, tip, or roll-over into the water.
4. Do not try to stabilize the machine by putting your foot on the ground.
5. Use extra care while operating mower with grass catcher or other attachment(s). They can affect the stability of the mower. Do not use grass catcher on slopes greater than 10° (17%).
6. Do not mow on wet grass. Reduced traction could cause sliding and/or loss of control.
7. Do not tow heavy pull behind attachments (e.g. loaded dump cart, lawn roller, etc.) on slopes greater than 5° (9%). When going downhill, the extra weight tends to push the machine and may cause loss of traction and loss of control (e.g. machine may speed up, braking and steering ability are reduced, attachment may jack-knife and cause machine to overturn).

#### Slope gauge (back cover)

### **WARNING**

Slopes are a major factor related to slip and fall accidents which can result in severe injury or death. All slopes require extra caution. If you feel uneasy on the slope, do not mow it. Do not mow on slopes greater than 15° (26%). Do not mow up and down slopes, only mow across slopes

USE THE SLOPE GAUGE ON THE BACK COVER AS SHOWN TO DETERMINE IF A SLOPE IS TOO STEEP FOR SAFE OPERATION!

To check the slope, proceed as follows:

1. Open manual to the back cover and fold along the dashed line.
2. Locate a vertical object on or behind the slope (e.g., a pole, building, fence, tree, etc.).
3. Align either side of the slope gauge with the object.

4. Adjust gauge up or down until the left corner touches the slope.
5. If there is a gap below the gauge, the slope is too steep for safe operation.

#### Children

1. Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the mowing activity. They do not understand the dangers. Never assume that children will remain where you last saw them.
  - Keep children out of the mowing area and in watchful care of a responsible adult other than the operator.
  - Be alert and turn machine off if a child enters the area.
  - Always look behind and down for small children. Use slow speed.
  - Never carry children, even with the blade(s) shut off. They may fall off or interfere with safe mower operation, causing serious injury or death.
  - Use extreme care when approaching blind corners, doorways, shrubs, trees, or other objects that may block your vision of a child who may run into the path of the machine.
  - To avoid back-over accidents, always disengage blades before traveling in reverse.
  - Keep children away from hot or running engines. They can suffer burns from a hot muffler.
  - Remove key when machine is unattended to prevent unauthorized operation.
2. Never allow children under 16 years of age to operate this machine. Children 16 and over should read and understand the instructions and safe operation practices in this manual and on the machine and should be trained and supervised by an adult

#### Towing

1. Do not tow heavy tow-behind attachments (e.g. loaded dump cart, lawn roller, etc.) on slopes greater than 5° (9%).
2. Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.
3. Follow the manufacturer's recommendation for weight limits for towed equipment and towing on slopes.
4. Never allow children or others in or on towed equipment.
5. On slopes, the weight of the towed equipment may cause loss of traction and loss of control.
6. Travel slowly and allow extra distance to stop.
7. Make wide turns to avoid jack knifing.

## Transporting Machines

---

1. This machine is not intended for use on public roads. Machines operated on public roads must comply with state and local ordinances, SAE J137, and ANSI/ASABE S279 (lighting and marking requirements).
2. Use care when loading or unloading machines onto trailers and trucks.
3. If ramps are used, they must be full width, stable, have an adequate capacity rating, and be secured to the trailer or truck. Ramp angle should not exceed 15° (26%) and trailer or truck should be parked on level terrain.
4. Machines must be secured onto trailers and trucks with straps, chains, cables, ropes, or other means deemed adequate for that purpose. The front and rear of the machines must be secured to the trailer or truck in both the lateral and vertical directions.

## Operator Protective System (OPS)

---

1. This machine is equipped with an Operator Protective System (OPS), which includes:
  - A Roll Over Protective Structure (ROPS) of the fixed or folding configuration.
  - Seat belt assembly with retractable function.
2. ROPS are structures designed to provide a crush-resistant space for the operator when properly seat-belted within the designated seating area of the machine in the event of a machine tip-over or roll-over. Folding ROPS shall be used in their fully upright and locked configurations except in those circumstances whereby they need to be momentarily folded-down to avoid contact with items such as tree limbs, clothes lines, guy wires, utility poles, buildings, etc. At other times and conditions, ROPS shall be in their fully upright and locked configurations.

### DANGER

Damaged ROPS must be replaced prior to operator use.

3. Seat belts shall be used and shall be properly fastened about the operator's waist at all times, except when the ROPS are:
  - Not properly installed and/or not properly secured onto the machine.
  - Damaged in such manner that their structural integrity has been compromised.
  - Not in their fully upright and locked position.
4. Seat belts are attached to the movable portion of the seat when suspension seats are utilized, and therefore the seat-mounting base must be secured to its pivot means and the pivot means latched to the frame of the machine. Seat belts are attached to the seat or the

frame of the machine when non-suspension (standard) seats are provided, however, if a suspension kit is added to a seat, the seat belt must be attached to the movable portion of the seat or suspension mechanism, the seat-mounting base must be secured to its pivot means, and the pivot means be latched to the frame of the machine.

### DANGER

If ROPS are folded down or missing, seat belts shall not be fastened. Worn or damaged seat belt assemblies must be replaced prior to operator use.

5. A brush guard or canopy may deflect tree limbs, clothes lines, and other obstacles that otherwise could come in contact with the ROPS. Contact of ROPS and/or canopies by items such as tree limbs, clothes lines, guy wires, and buildings, could create hazardous conditions whereby the machine could experience a tip-over or roll-over. A canopy may provide protection for the operator from some environmental exposure (sunlight, rain, etc.).
6. The ROPS and seat belt are integral parts of this machine and should not be tampered with, modified in any manner, or removed.
7. Inspect the ROPS and seat belt assemblies on a regular basis for damage and improper operation. Replace all components that are damaged or are not functioning properly with authorized replacement parts.
8. The ROPS extends above and behind the operator position, and therefore the operator must be aware of potential contact of the ROPS with items such as trees, buildings, doorways, clothes lines, utility wires, etc., that could cause the machine to tip-over or rollover. Use caution in (or avoid) areas where the ROPS could come in contact with any structures, trees, etc.
9. Inspect the ROPS and seat belt assemblies on a regular basis for damage and improper operation. Replace all components that are damaged or are not functioning properly with authorized replacement parts.
10. Failure to use the seat belt properly could result in serious injury or death if an accidental overturn occurs. In order for the ROPS to be effective, the seat belt must be securely fastened around the operator at all times when the operator is on the machine. Contact with the ROPS during an overturn could cause serious injury or death.
11. The ROPS will not prevent machine from tip-overs or roll-overs.
12. Do not assume ROPS will protect you in a tip-over or roll-over. Injuries may still occur.

## Hydraulic Devices and Systems

---

Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign

fluid is injected into the skin or eyes, seek immediate medical attention or gangrene and permanent damage may result.

## **WARNING**

Keep body and hands away from pinholes or nozzles that could inject hydraulic fluid under high pressure. Use paper or cardboard, not your hands, to search for leaks! Wear gloves and safety glasses.

Safely relieve all pressure in the system before performing any work on the system, and make sure that:

- The ignition switch is OFF.
- The key is removed.
- The engine spark plug wire(s) is removed.
- All connections to the negative terminal of the battery are removed.
- The park brake is set.
- All by-pass valves, if so equipped, are open.
- Hydraulic controls are actuated to release pressure on pumps, cylinders, etc. If “float” positions are available, they should be used.

After the above operations are completed, it should be safe to begin disconnecting the lines or components. It is still a good idea to cover the connection with a cloth shield and then gently loosen connections.

## **WARNING**

Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.

## **Service**

### **Safe Handling of Fuel**

To avoid personal injury or property damage use extreme care in handling fuel. Fuel is extremely flammable and the vapors are explosive. Serious personal injury can occur when fuel is spilled on yourself or your clothes, which can ignite. Wash your skin and change your clothes immediately.

- Use only approved containers.
- Never fill containers inside a vehicle or a truck or trailer bed with a carpeted or plastic liner. Always place containers on the ground away from your vehicle before fueling.
- When practical, remove machine from the truck or trailer and refuel it on the ground. If this is not possible, then refuel equipment on a trailer with a portable container rather than from a fuel dispenser nozzle.
- Keep nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.

- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Never fuel machine indoors or near ignition sources.
- Never remove fuel cap or add fuel while the engine is hot or running. Allow engine to cool at least 5 minutes before refueling.
- Never over fill fuel tank. Fill tank to no more than 1/2” below bottom of filler neck to allow space for expansion.
- If necessary, use a funnel to avoid spillage.
- Replace fuel cap and tighten securely.
- If fuel is spilled, wipe off the engine and equipment. Wait 5 minutes before starting the engine.
- To reduce fire hazards, keep machine free of grass, leaves, or other debris build-up. Clean up oil and fuel spillage and remove any fuel-soaked debris.
- Never store the machine or fuel container inside where there is an open flame, spark, or pilot light as on a water heater, space heater, furnace, clothes dryer, or other gas appliance

## **General Service**

1. Never run an engine indoors or in a poorly ventilated area. Engine exhaust contains carbon monoxide, an odorless and deadly gas.
2. Before cleaning, repairing, or inspecting, make certain the blade(s) and all moving parts have stopped. Disconnect the spark plug wires and remove the key from the ignition to prevent unintended starting.
3. Periodically check to make sure the blades come to a complete stop within approximately 7 seconds after operating the blade disengagement control. If the blades do not stop within this time frame, your machine should be serviced.
4. Never tamper with the safety interlock system or other safety devices.
5. Regularly check the safety interlock system for proper function, as described later in this manual. If the safety interlock system does not function properly, have your machine serviced.
6. Check brake operation frequently as it is subjected to wear during normal operation. Adjust and service as required.
7. Check the blade(s) and engine mounting bolts at frequent intervals for proper tightness. Also, visually inspect blade(s) for damage (e.g., excessive wear, bent, cracked). Replace the blade(s) with the original equipment manufacturer’s (O.E.M.) blade(s) only, listed in this manual. Use of parts which do not meet the original equipment specifications may lead to improper performance and compromise safety!

8. Mower blades are sharp. Wrap the blade or wear gloves, and use extra caution when servicing them.
9. Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
10. After striking a foreign object (or if abnormal vibration occurs), stop the blades and engine and thoroughly inspect the machine for any damage. Make necessary repairs before resuming operation.
11. Never attempt to make adjustments or repairs to the machine while the engine is running.
12. Grass catcher components and the discharge cover are subject to wear and damage which could expose moving parts or allow objects to be thrown. For safety protection, frequently check components and replace immediately with original equipment manufacturer's (O.E.M.) parts only, listed in this manual. Use of parts

which do not meet the original equipment specifications may lead to improper performance and compromise safety!

13. Do not change the engine governor settings or over-speed the engine. The governor controls the maximum safe operating speed of the engine.
14. Maintain or replace safety and instruction labels, as necessary.
15. Observe proper disposal laws and regulations for gas, oil, etc., to protect the environment.

### **Do Not Modify Engine**

---

To avoid serious injury or death, do not modify engine in any way. Tampering with the governor setting can lead to a runaway engine and cause it to operate at unsafe speeds.

# TORQUE

## Standard Torques

The following chart lists the standard torque values for the threaded grade 5 fasteners found in this manual. Torque all cap screws, nuts and set screws to these values unless a different torque is shown in the *Special Torques* section.

Size	ft-lbs	N·m	Size	ft-lbs	N·m
#10	32.4 IN.-LBS.	3.6	M3	12 IN.-LBS.	1.3
.250	98.4 IN.-LBS.	11.1	M4	26.4 IN.-LBS.	3
.312	204 IN.-LBS.	23	M5	54 IN.-LBS.	6.1
.375	30	40	M6	92.4 IN.-LBS.	10.4
.438	48	65	M8	222 IN.-LBS.	25
.500	73	99	M10	37	50
.562	105	143	M12	64	87
.625	145	200	M14	103	140
.750	260	350	M16	160	215
.875	420	565	M20	320	435

## Special Torques

Description	ft-lbs	N·m
Wheel (lug) nuts <sup>1</sup>	70	95
Blade spindle bolt top	70	95
Blade spindle bolt bottom	118	160
Electric clutch mounting bolt <sup>3</sup>	47	63
Wheel motor hub nut	230	312
Transmission case to frame fastener	95-115	128-155

- Lug nuts only** – It is recommended that these be checked after the first 2 hours of operation and every 50 hours and following removal for repair or replacement.
- Engine torque values** – Refer to the respective engine owner's manual.
- If clutch mounting bolt is loosened or removed, **do not re-use**. Replace with a new bolt. Use only hand tools to install this fastener

### WARNING

Particular attention must be given to tightening the drive wheel lug nuts and blade spindle bolts. Failure to correctly torque these items may result in the loss of a wheel or blade, which can cause serious damage or personal injury



# POWER UNIT MAINTENANCE

## Steering Adjustments

### Steering Control Lever Neutral Adjustment

The mower's steering has been factory adjusted to eliminate creeping when the steering control levers are in the neutral position. However, should the mower begin to creep, the steering control lever linkage can be adjusted.

Before considering any adjustment, check the tire air pressure. Unequal tire pressure will cause the mower to drift to one side. Refer to tire pressure information in the *Tires* section for detailed information.

**NOTE:** Proper park brake adjustment must be completed before the steering control lever neutral adjustment can be done. Refer to the *Park Brake Adjustment* section for detailed information.

Fine adjustment to the unit's steering is made with the transmission's control rod.

Neutral is properly adjusted when the steering control levers are in the park brake position and the transmissions do not "whine".

If the transmissions "whine", the steering control linkage may be adjusted as follows

### **! WARNING**

Never work under the machine or attachment unless it is safely supported with jack stands.

- Make certain machine is secure when it is raised and placed on the jack stands.
- **Use only certified jack stands.** Use only appropriate jack stands, with a minimum weight rating of 2000 pounds (907 kg) to block the unit up.
- Use in pairs only.
- Follow the instructions supplied with the jack stands.
- The jack stands should not allow the machine to move when the engine is running and the drive wheels are rotating.
- Do not allow the wheels to come in contact with the floor or any object that would permit the unit to propel itself.
- To prevent injury stay clear and exercise caution when rotating the wheels.

### **! WARNING**

Keep hands, hair, clothing, etc., clear of the cooling fans on top of the transmissions. Exercise extreme caution.

### **! WARNING**

Untrained maintenance personnel should never attempt to make any adjustments or repairs to the mower's drive system while the engine is running. **The following procedures should be performed by trained maintenance personnel only.**

1. Raise the rear of the mower and block with certified jack stands. The rear wheels need to be able to rotate freely and clear of all obstructions.
2. Block the front tires.
3. Raise the seat platform and disconnect the mower harness from the seat switch. Bypass the seat switch by connecting the two mower harness female spade connectors together. Figure 4-1

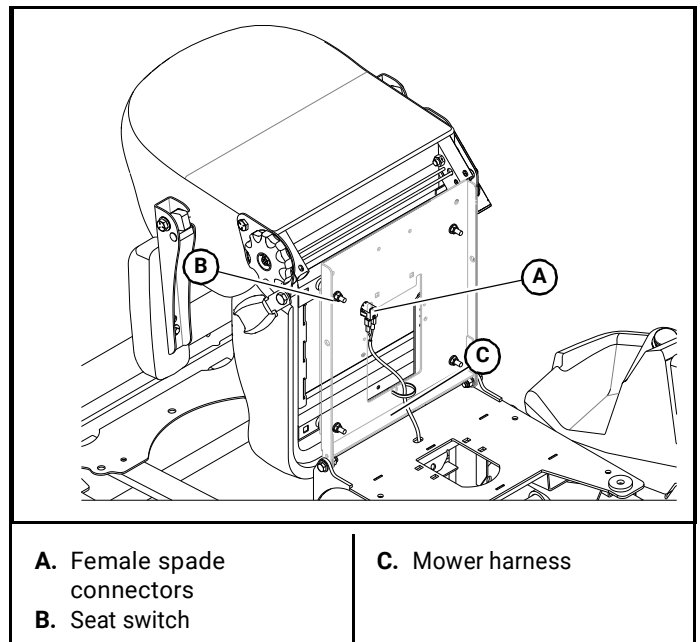


Figure 4-1

4. Start the engine.
  5. Position the steering control lever in the neutral position and observe which way the wheels are rotating. Figure 4-2
  6. If wheel(s) are rotating forward, loosen the jam nuts on the pump linkage rods and rotate the rod to shorten the steering control linkage until the wheel(s) come to a stop. Figure 4-3
  7. Repeat for the opposite side if necessary.
  8. If wheel(s) are rotating in reverse, then loosen the jam nuts on the pump linkage rods and rotate the rod to lengthen the steering control linkage until the wheel(s) come to a stop. Figure 4-3
- Repeat for the opposite side if necessary.

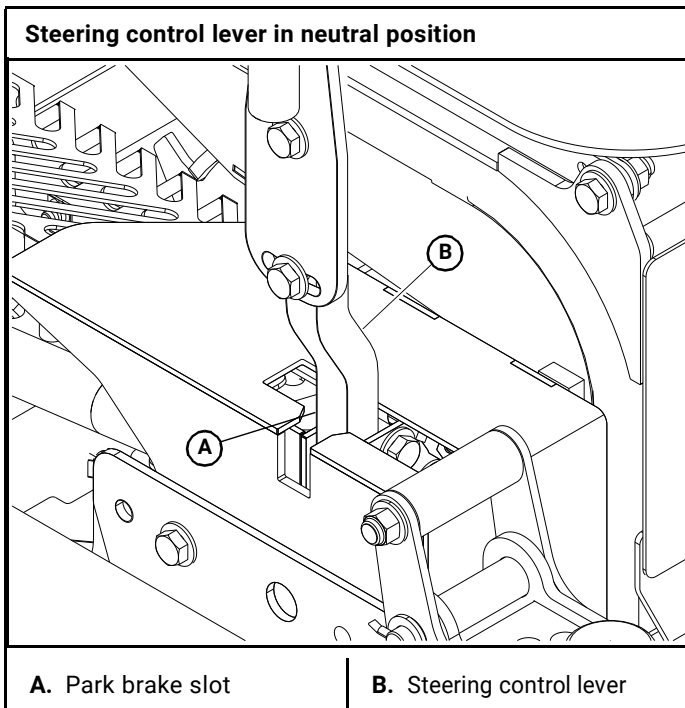


Figure 4-2

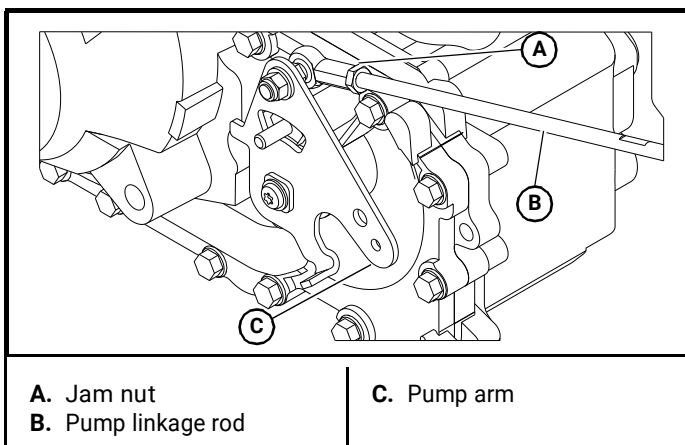


Figure 4-3

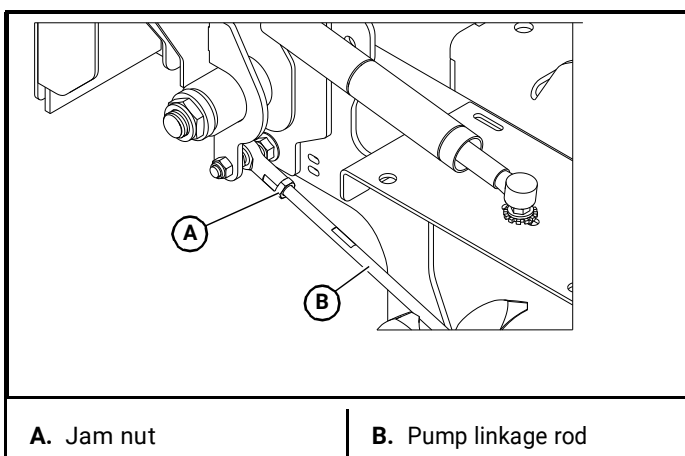


Figure 4-4

- When both wheels remain stopped, tighten the jam nuts to lock the turnbuckle in place. Figure 4-4

- Test again by moving the steering control levers forward and backward before returning them to the neutral position. If the tires do not rotate, the unit is ready for operation.
- After adjusting for neutral it may be necessary to re-adjust the control lever stop and/or damper.
- IMPORTANT:** With the engine off, disconnect the two female spade connectors from each other (from step #3) and reconnect them to the seat switch. This must be completed so that the safety circuit is functioning properly. Figure 4-1

**! WARNING**

Do not operate the mower without plugging the mower's wiring harness into the seat switch. This switch is an important part of the safety start interlock system. Serious injury can result if the seat switch is not plugged into the mower's wiring harness.

**! WARNING**

**Never operate the mower with a non-functioning seat switch. Always reconnect the seat switch to the mower harness.**

- Check to make sure all tools or obstructions are removed from under the mower.
- Raise the rear of the mower and remove the jack stands. Lower the mower.
- Remove the front wheel blocks.
- Lower and secure the seat platform.

**Control Lever Stops**

The steering control lever stops (see Figure 4-5 & Figure 4-6) are designed to do two things: first, and most important, they must keep the pumps from bottoming out internally. Secondly, the stops may be adjusted to help drive straight when the steering control levers are pushed forward against the stops.

**To keep the pumps from bottoming out internally use the following procedure:**

**NOTE:** This adjustment normally is only required if the hydraulic pump(s) have been replaced.

**! WARNING**

**Pump damage will occur if these stops are set incorrectly.**

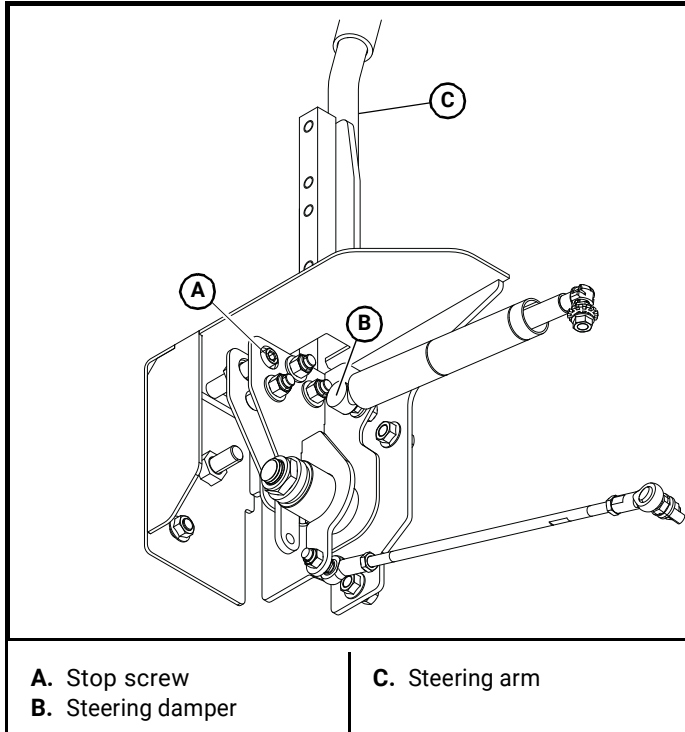
- To make the first adjustment the mower engine must **not** be running.
- Check to make sure the steering control levers are against the stops before the pumps are bottomed out internally.



To do this, gently and slowly move the steering control levers forward and feel if there is some resistance on the pump lever before the control lever hits the stops.

**NOTE:** Check one side at a time.

3. If the pump arm is stopping the forward motion of the control arm, adjust the stop (set screw) inward to stop the steering control levers slightly before the pump bottoms out. After applying a threadlock (e.g., Loctite 290), turn the stop screw inward until contact is made with the inside of the steering cover, then turn the stop screw an additional 1/4–1/2 turn. Figure 4-5
4. Do this for each side, then after the adjustment, fill the sockets of the set screws with a tamper-proof sealant.

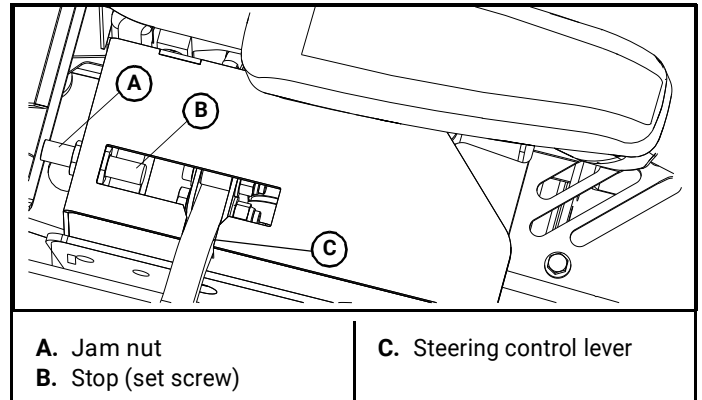


**Figure 4-5**

**To adjust the stops for driving straight when steering control levers are against the stops during operation:**

1. Determine which drive tire is rotating too fast when both steering control levers are against the stops in the control panel. Figure 4-6
2. Stop the engine. Loosen the lock nut on the side which is rotating too fast and turn the stop (set screw) inward to stop the steering control lever sooner. Figure 4-6
3. Tighten the lock nut on the stop and test again.
4. Repeat this procedure until both drive wheels rotate at the same speed and the unit drives straight.

**NOTE:** Because this is a hydrostatic drive, variables such as temperature of oil, efficiency of pumps and motors, tire pressure, etc., may require the operator to make minor steering adjustments with the control arms rather than rely on just the stops to drive straight.



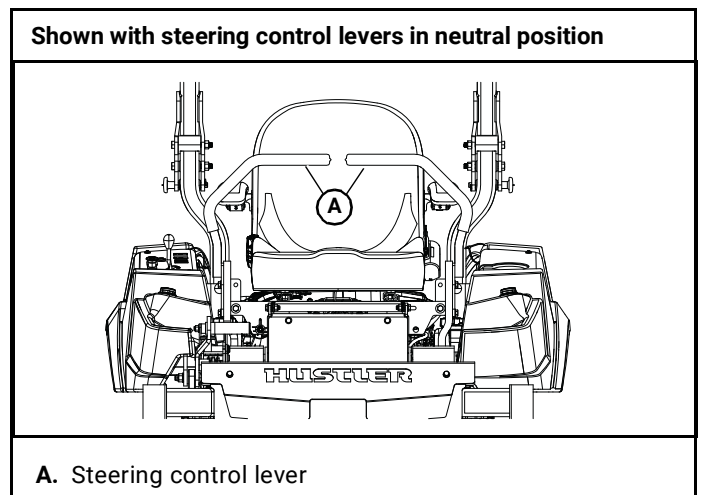
**Figure 4-6**

**Steering Damper**

The steering dampers are spring loaded to return the control levers to the neutral position from the reverse position. This gives the operator a sense of neutral during operation.

To set the steering dampers in the correct operating position, follow these steps:

1. Shut the engine off, place steering control levers in the park brake position, disengage deck clutch, remove ignition switch key and disconnect negative battery cable before doing any adjustments.
2. Place the steering control lever in the neutral position. Figure 4-7



**Figure 4-7**

- Loosen the nut on the steering damper rear ball stud enough to allow the stud to move freely within the slot. Figure 4-8

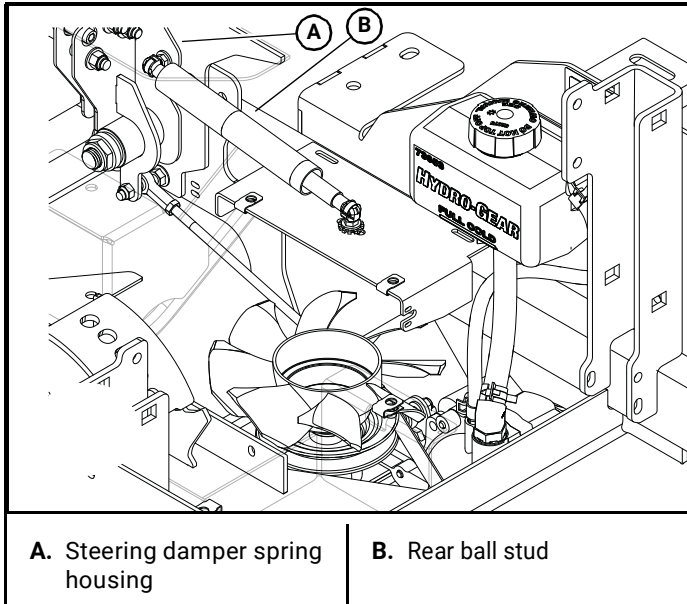


Figure 4-8

- Pull the damper rod end toward the back of the slot, past the point that the internal spring is engaged. Figure 4-8
- Release the rod end and allow the internal spring to bring the rod end and ball stud back to the neutral position.
- Tighten the nut on the steering damper's rear ball stud to secure the final position.
 

**NOTE:** The damper must not bottom out when the pump lever is fully stroked in either direction.
- Reconnect the negative battery cable.
- Lower and secure the seat platform.
- To check, move the steering control lever to the reverse position and release. The steering control lever should return to the neutral position. If not, repeat steps 1 through 6.

### Steering Control Lever Adjustment

The steering control levers can be adjusted for operator comfort.

- Loosen the cap screws that attach the upper control lever to the lower lever, then pivot the upper control lever to fit the operator's personal preference. Figure 4-9
- Adjust the steering control levers so that they align with each other when in the neutral position. Figure 4-10

### Park Brake Spring Adjustment

Occasionally check the park brake spring adjustment using the following method:

- This procedure does not require engine power, therefore:

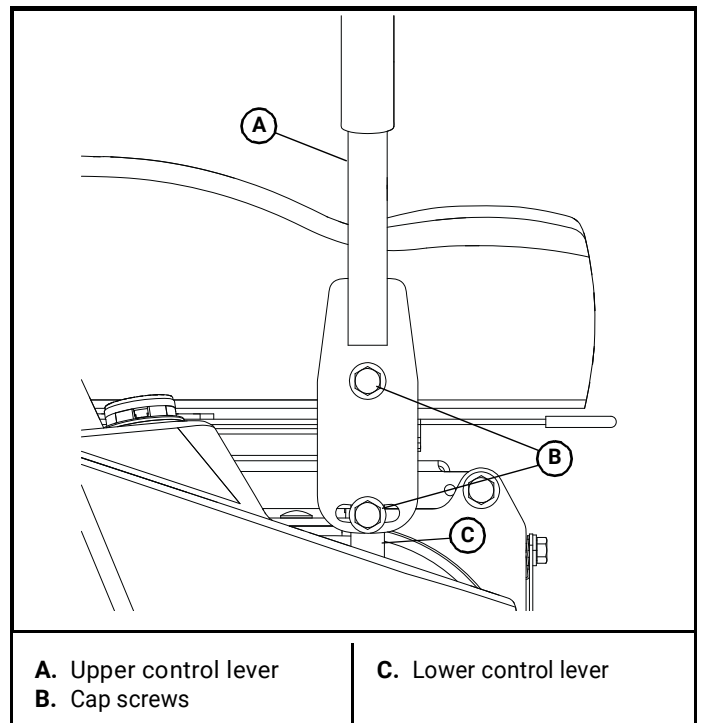


Figure 4-9

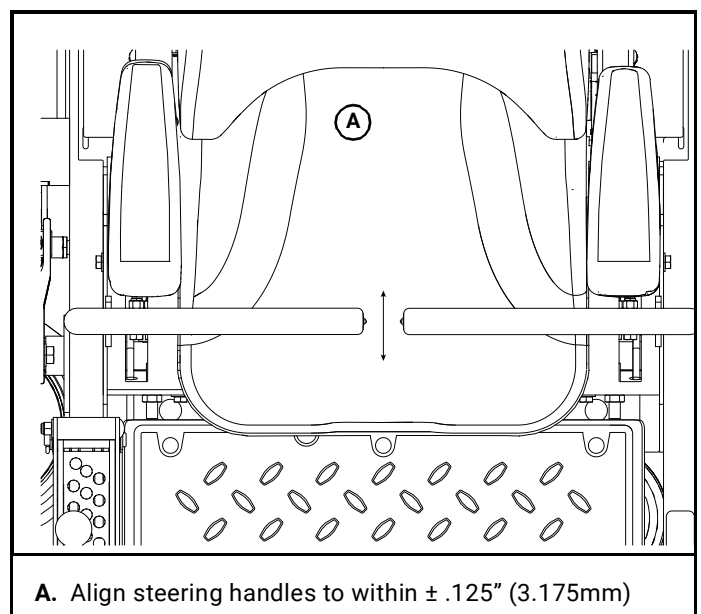


Figure 4-10

- Park the mower on level ground
  - Disengage the deck clutch.
  - Place the steering control levers in the park brake position.
  - Stop the engine.
  - Remove the ignition key.
  - Disconnect the negative battery cable.
- On one side measure the park brake spring. It should be compressed to  $1.50" \pm 0.03$ . If it is not, adjust the nylock nut until the proper spring compression is achieved. Figure 4-11

3. With the spring adjusted and brake engaged, position the lock collar  $0.18" \pm 0.03$  from the pivot block and tighten the set screw. Figure 4-11
4. Repeat for other side.
5. Reconnect the negative battery cable.

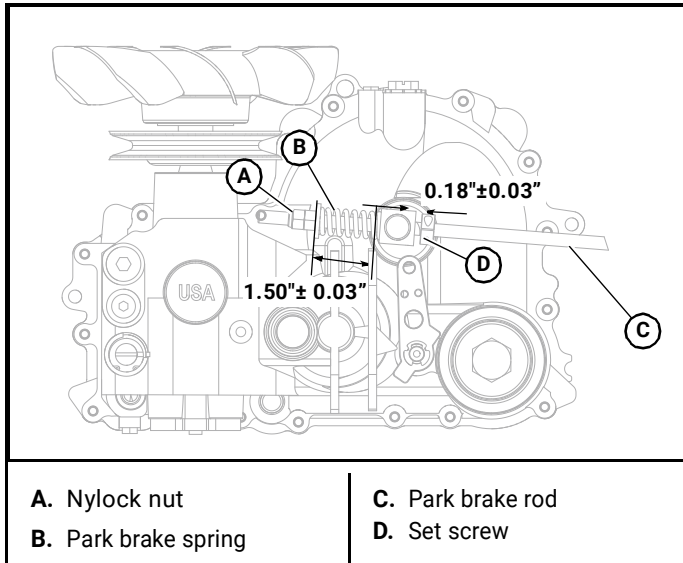


Figure 4-11

## Belts

Inspect belts frequently for wear and serviceability. Replace a belt that shows signs of:

- severe cuts
- tears
- separation
- weather checking
- cracking
- burns caused by slipping.

Slight raveling of belt covering does not indicate failure, trim ravelings with a sharp knife.

Inspect the belt pulley grooves and flanges for wear. A new belt, or one in good condition, should never run against the bottom of the groove. Replace the pulley when this is the case, otherwise, the belt will lose power and slip excessively.

Never pry a belt to get it on a pulley as this will cut or damage the fibers of the belt covering.

Keep oil and grease away from belts, and never use belt dressings. Any of these will destroy the belt composition in a very short time.

## Hydraulic Pump Belt Adjustment

The transmission drive belt tension remains constant by means of a tension idler and spring. The spring tension should be such that the belt does not slip under normal operating load conditions, assuming the belt is not excessively worn or damaged. As the belt stretches and wears in, adjustment may become necessary.

The proper belt tension is achieved when the tension spring is stretched to a dimension of 8.75"–9.25" (222–234mm) when measured from the inside of the hook to the inside of the other hook. Figure 4-12

To increase belt tension, loosen the jam nut on the eyebolt. Then, tighten the nut on the eyebolt until the proper dimension is attained. Lock the eyebolt in place by tightening the jam nut. Figure 4-12

**IMPORTANT:** Do not over tension the spring to compensate for a badly worn belt or pulley.

Inspect the belt every 100 hours and replace as needed. Replace the belt every 400 hours or every two (2) years whichever comes first.

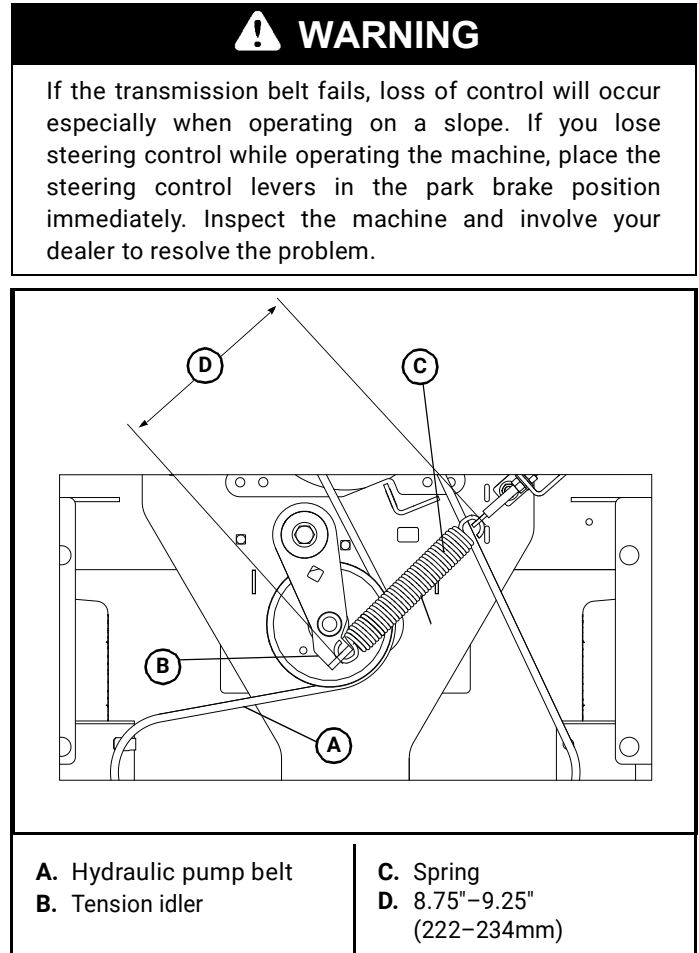


Figure 4-12

## Hydraulic System

**IMPORTANT:** Never use hydraulic or automatic transmission fluid in this system; use only motor oil as

specified. Remember, dirt is the primary enemy of any hydraulic system.

## **⚠ WARNING**

Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. Foreign fluid 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.

Before applying pressure to hydraulic system, make sure all connections are tight and all hoses and lines are in good condition. To find a leak under pressure, use a piece of cardboard or wood – never use your hands. Relieve all pressure in the system before disconnecting or working on hydraulic lines. To relieve pressure, lower all attachments and shut off engine.

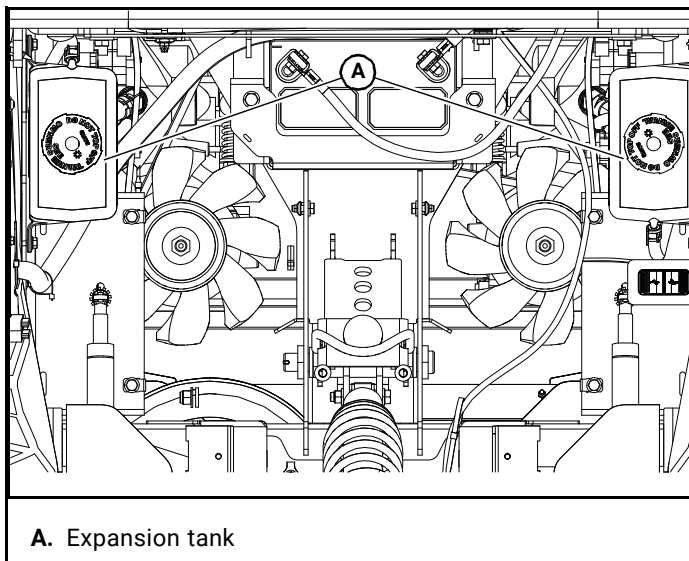
Check oil level in hydraulic system after every 50 hours of operation or weekly, whichever occurs first. Check more often if system appears to be leaking or otherwise malfunctioning.

The mower ships from the factory with SAE 20W50 oil in the system. Use **SAE 20W50 oil, 15W50 synthetic oil, or 20W50 synthetic oil** when changing the system oil and filter. **Hustler® Full Synthetic 20W50 Hydrostatic Transmission Oil is recommended.**

When Checking the hydraulic system's oil level:

1. Always check oil level with the mower on level ground.
2. Always check oil level when the oil is cold (mower has not run for at least 1.5 hours)
3. Always check oil level on side of expansion tank.

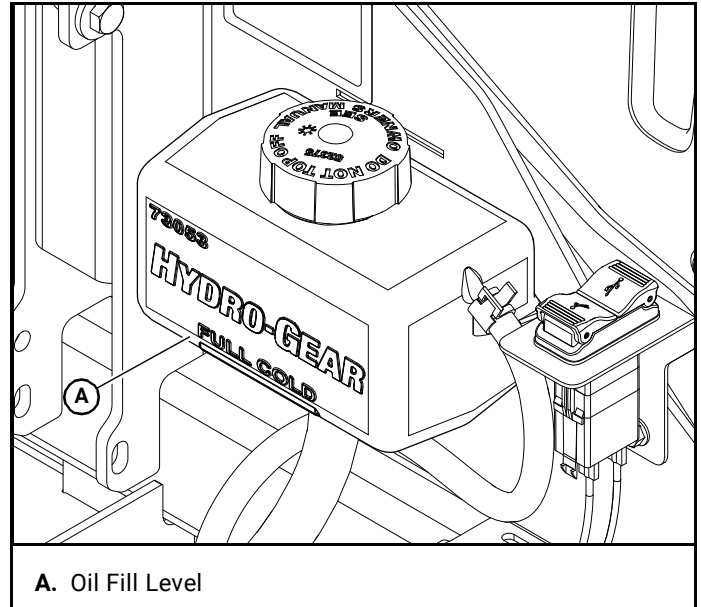
Figure 4-13, Figure 4-14.



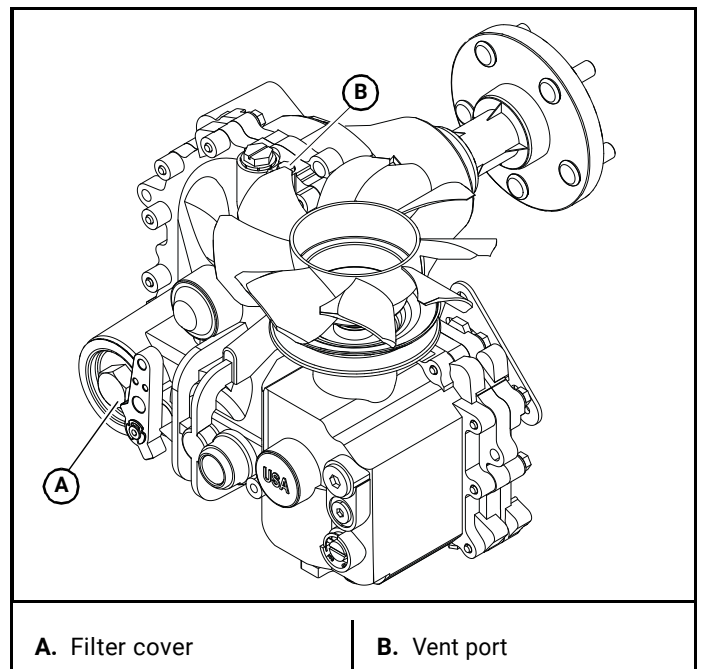
**Figure 4-13**

Initial system oil and filter change **must** be after the first 100 hours of mower operation. Thereafter, replace filter and oil in reservoir **annually or every 400 hours, whichever comes first.**

The system filter is located inside the transmission underneath the expansion tank. **Use a Hustler® approved filter element only.** When changing the filter use a 29 mm socket. The threads are right hand. Figure 4-15



**Figure 4-14**



**Figure 4-15**

## Warner Clutch Re-gap Adjustment Procedures

The air gap is only adjustable on clutches that have a removable shim (see Figure 4-19).

### When to remove shim:

When a clutch has worn to the extent that the existing air gap is too large to allow for complete clutch engagement (clutch may engage easily when cold but has problems engaging when hot), the brake shim can be removed to reduce air gap and allow the clutch to continue to function.

After verifying that proper voltage and current are supplied to the clutch, follow the procedure outlined below.

**NOTE:** Before proceeding, the clutch must be installed on the engine crankshaft and the retaining bolt torqued to 45–48 ft-lbs (61–65 N•m).

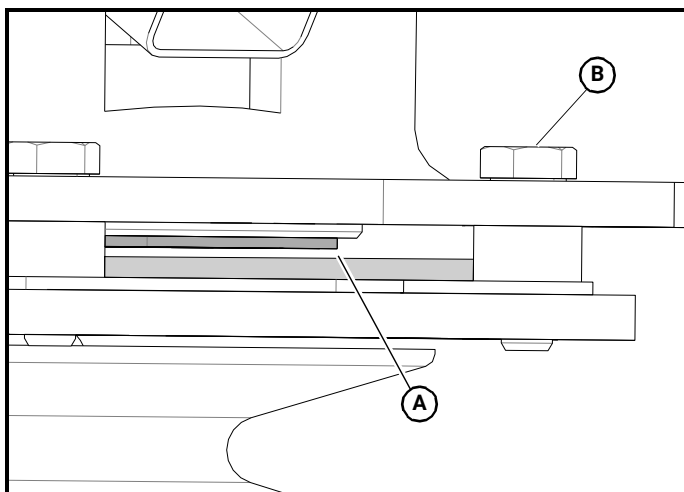
### Procedure:

#### **⚠ WARNING**

Always wear adequate eye protection when servicing the mower.

With engine off, key removed and clutch disengaged, use a pneumatic line to blow out any debris from under the brake pole and around the aluminum spacers.

Check the air gap between the rotor and armature with a feeler gauge (Figure 4-17 or Figure 4-20). If the gap is less than .070", then follow the troubleshooting procedure outlined in Warner Electric P-1177 installation troubleshooting guide available on Warner Electric's web site—[www.WarnerElectric.com](http://www.WarnerElectric.com). If the air gap is over .070", follow the procedure outlined below.



- A. Gap between the rotor and armature face must be greater than .070" prior to shim removal
- B. M6 x 1 bolt

Figure 4-17

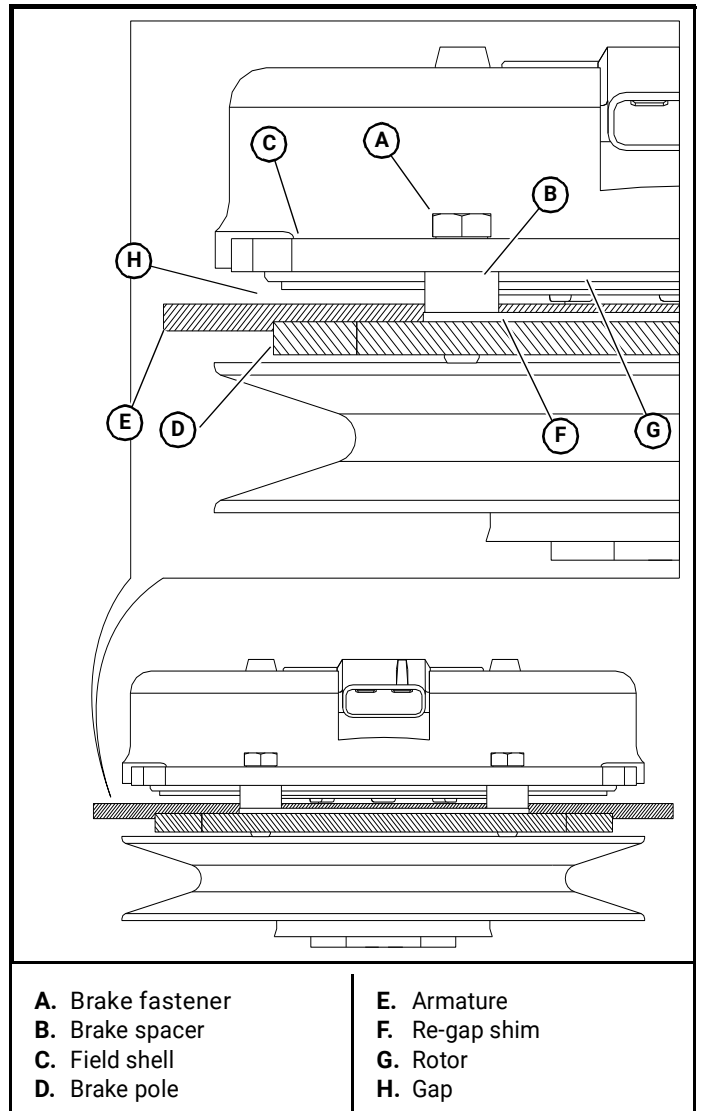
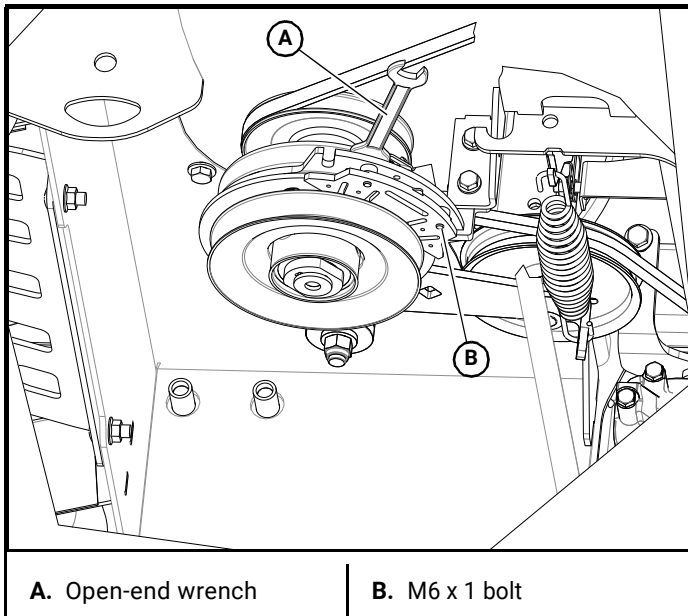


Figure 4-16

1. Loosen both brake mounting bolts (M6 x 1) 1/2 to 1 full turn as shown in Figure 4-18 .

#### **⚠ WARNING**

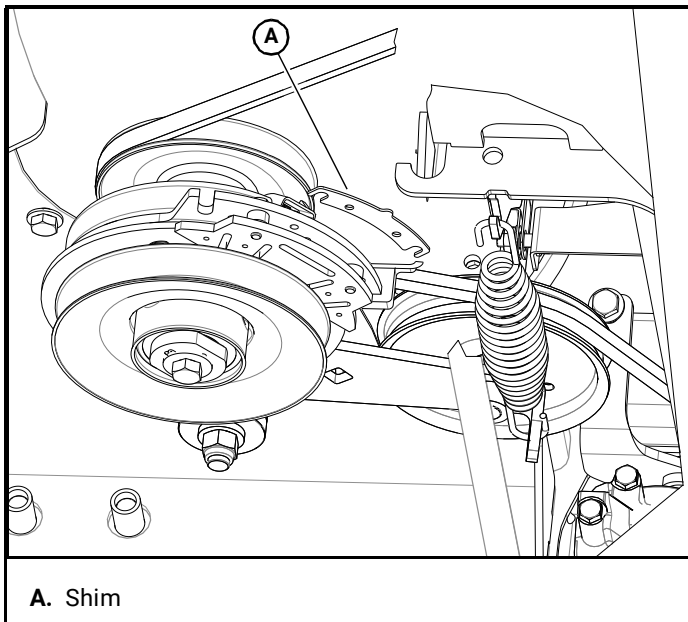
Do not remove brake pole from field shell/armature. The brake pole tracks match with the clutch brake and need to continue to match after shim is removed to ensure proper brake torque. Figure 4-16



A. Open-end wrench      B. M6 x 1 bolt

**Figure 4-18**

- Using needle-nose pliers, or by hand, take hold of the tab and remove the shim (do not discard the shim until proper clutch function has been confirmed).  
Figure 4-19

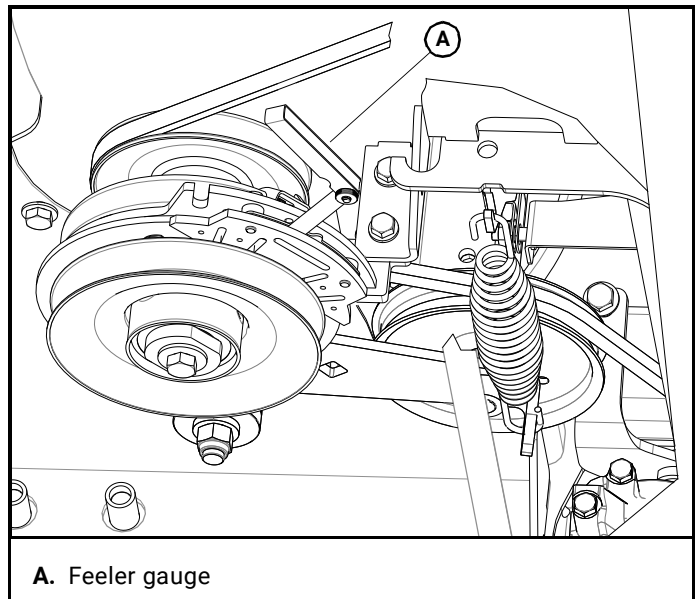


A. Shim

**Figure 4-19**

- Use an air hose to blow out any debris from under the brake pole and around the aluminum spacers.
- Re-torque each bolt (M6 x 1) to 120 in-lbs.
- Use a .015" thick feeler gauge to verify that a gap is present between the rotor and armature face on both ends of the brake pole as shown. Figure 4-20
- If the gap is less than .015" the clutch must be replaced.

If sufficient gap is present, then proceed to *Perform Safety Check* outlined below.



A. Feeler gauge

**Figure 4-20**

**Perform Safety Check:**

**⚠ WARNING**

Observe deck operation from the operator's seat.

- Start the engine and the deck should not be engaged with the PTO switch "off" and clutch de-energized. Engage and disengage the PTO switch to ensure the proper function of the clutch.
- If clutch still does not engage, then follow the troubleshooting procedure outlined in Warner Electric P-1177 installation troubleshooting guide available on Warner Electric's web site-[www.Warnerelectric.com](http://www.Warnerelectric.com).

**Tires**

It is important for level mowing that the tires have the same amount of air pressure. The recommended pressures are:

- Drive wheels . . . . . 8–12 psi (55–83 KPa)
- Front wheels . . . . . 8–12 psi (55–83 KPa)

If you wish to use non-pneumatic tires on your Hustler® mower, the tire must be a Hustler® approved tire. Warranty claims will be denied on any mower equipped with unapproved non-pneumatic tires.

**Caster Fork Tapered Bearing Replacement**

**NOTE:** A 1/4"-28 straight thread grease fitting (not provided) is required for replacing the grease.

**Disassembly:**

- Raise the front of the mower enough to remove the caster wheel assembly.

- Place mower securely on jack stands and do not allow mower to move. Chock the drive wheels.

## ! WARNING

- Use only certified jack stands.
- Use only appropriate jack stands, with a minimum weight rating of 2000 pounds (907 kg) to block the unit up.
- Use in pairs only.

Follow the instructions supplied with the jack stands.

- Remove the top cap and the top lock nut. Figure 4-21
- Remove the caster fork from the machine.
- Remove and retain the cup washers.
- Remove and discard the seal.
- Remove and discard the tapered roller bearings and outer races.
- Remove and retain the grease port plug.

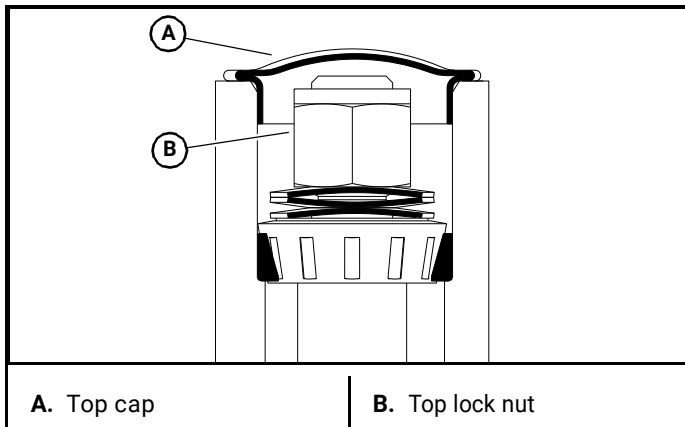


Figure 4-21

### Assembly:

- Insert the 1/4"-28 straight thread grease fitting into the grease port and tighten.
- Apply a light coating of grease to the caster pocket before installing the outer bearing races.
- Use the Hustler® Bearing Race Installation Kit (p/n 124351) to install the outer races into the caster pocket bore.
- Insert the Bearing Race Installation tool through the backing plate and the caster arm housing.
- Align a bearing outer race over the Bearing Race Installation tool and into the caster arm housing. Make sure that the race's thick edge is the leading edge going into the caster arm housing.

**IMPORTANT:** Do not use the bearings to press the races into place.

- Install the pressing tool, washers and the nut, then slowly start to draw the race into the caster arm housing.
- Make sure the bearings outer race is correctly aligned before pressing the outer race into the fully-seated position against the caster pocket shoulder. Figure 4-22

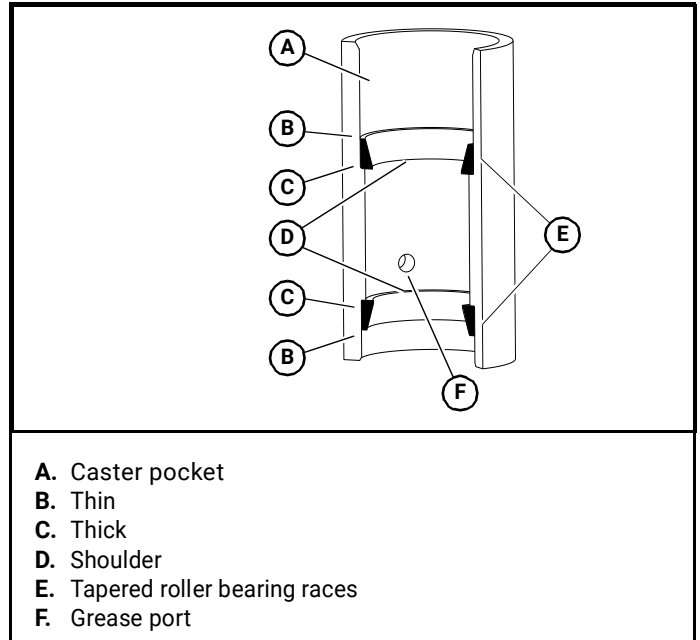


Figure 4-22

- Disassemble and invert the Bearing Race Installation tool to install the other outer race.
- Install the bottom bearing and lower seal. Make sure that the lower seal lip is facing out and driven flush with the caster pocket. Figure 4-23

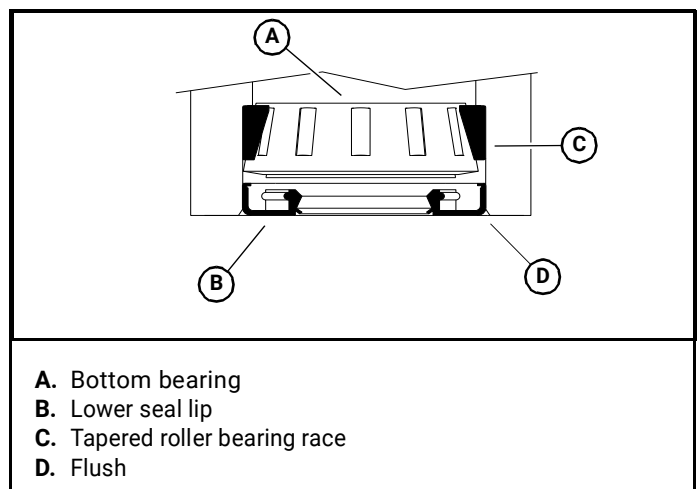


Figure 4-23

10. Install the upper bearing. Figure 4-24

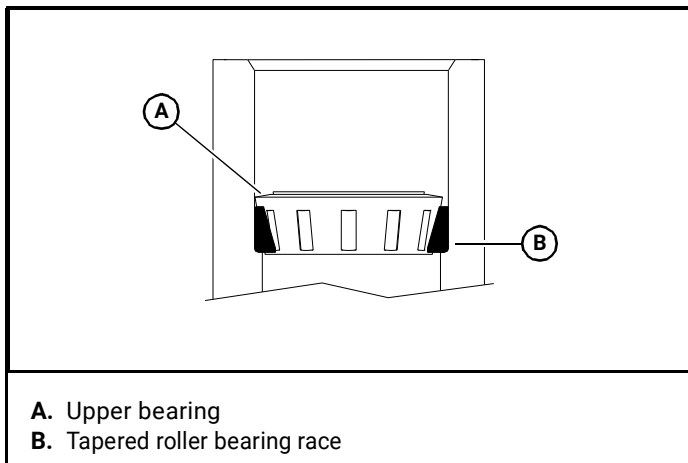


Figure 4-24

11. Install the caster fork assembly, taking care not to damage the lower seal lip. Figure 4-23

**IMPORTANT:** Stack the cup washers as shown in Figure 4-25.

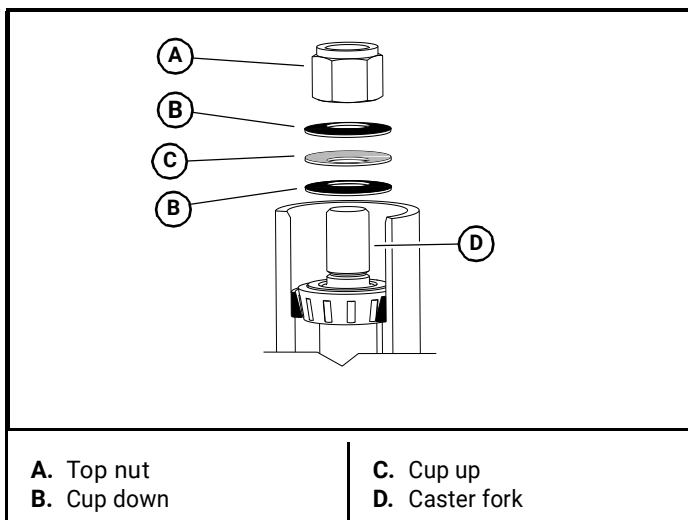


Figure 4-25

12. Torque the top nut to 40 ft-lbs (55 N•m), then back off ¼ turn. Figure 4-25
13. Apply grease to the grease fitting until it is visible at the top bearing. Fill the top cavity with grease.
14. Make sure that the caster fork is free to rotate by spinning the fork one full revolution.
15. Remove the grease fitting, insert the plug into the grease port and tighten.
16. Install the top cap.
17. Remove the jack stands and wheel chocks.

### Tapered Wheel Bearing Replacement

#### Disassembly:

1. Raise the front of the mower enough to remove the wheel assembly.

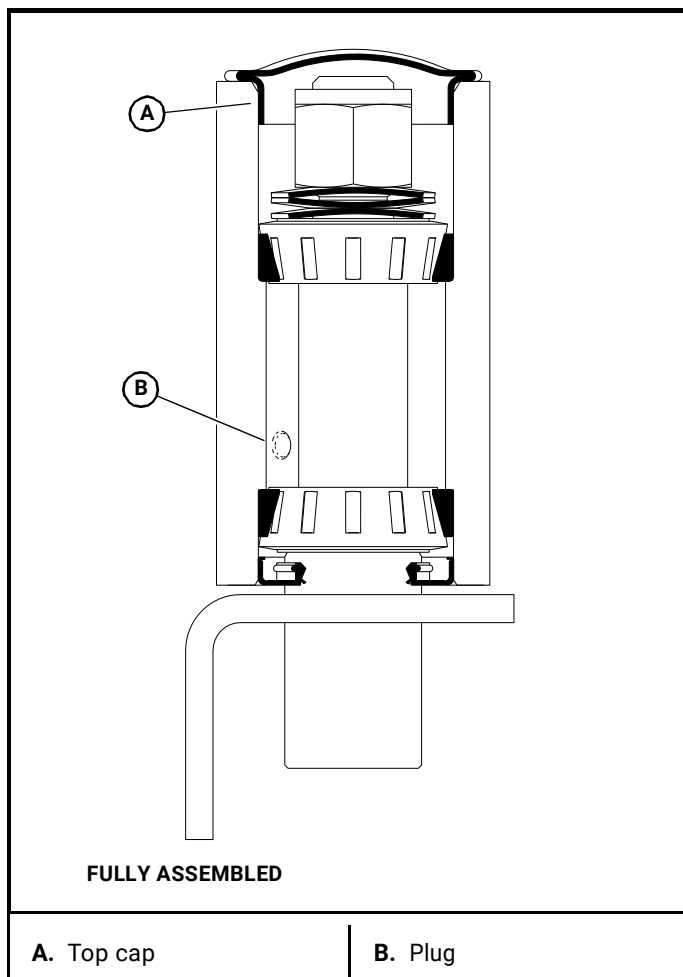


Figure 4-26

2. Place mower securely on jack stands and do not allow the mower to move. Chock the drive wheels.

### **! WARNING**

- **Use only certified jack stands.** Use only appropriate jack stands, with a minimum weight rating of 2000 pounds (907 kg) to block the unit up.
- Use in pairs only.
- Follow the instructions supplied with the jack stands.

3. Remove the wheel from the fork by removing the axle bolt, flat washers, and lock nut. Figure 4-27
4. Remove the dust caps and bushings from the wheel housing. Retain these parts. Figure 4-28
5. Remove and discard the seals. Figure 4-28
6. Remove and discard the tapered roller bearings and outer bearing races. Figure 4-28
7. To prevent contamination of the new tapered roller bearings remove the existing grease from the wheel housing.



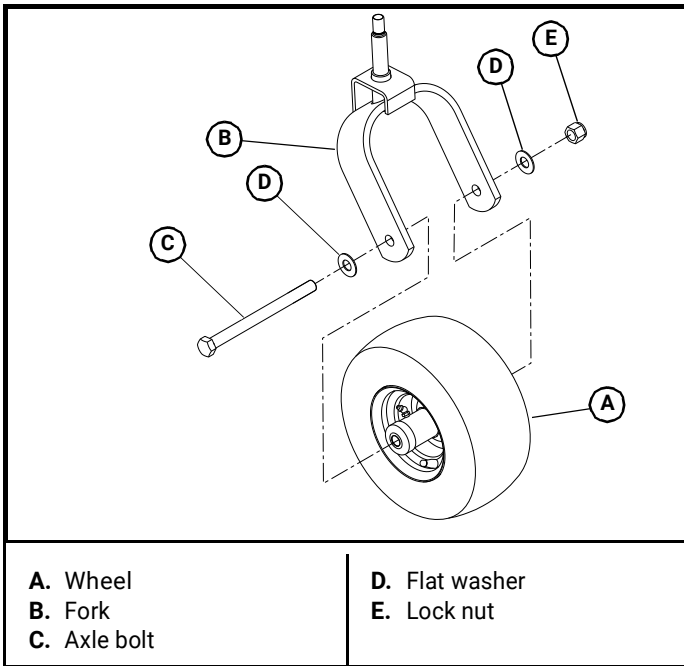


Figure 4-27

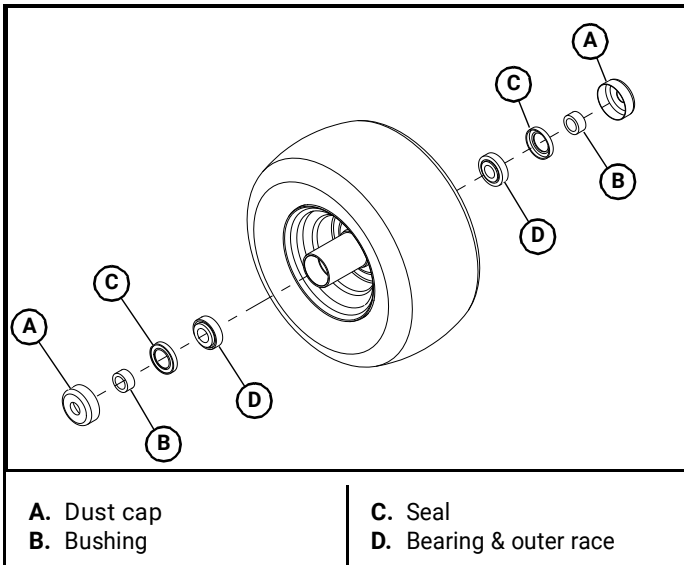


Figure 4-28

**Assembly**

1. Press the new outer bearing races into the wheel housing until they are fully seated against the housing shoulder. Figure 4-29

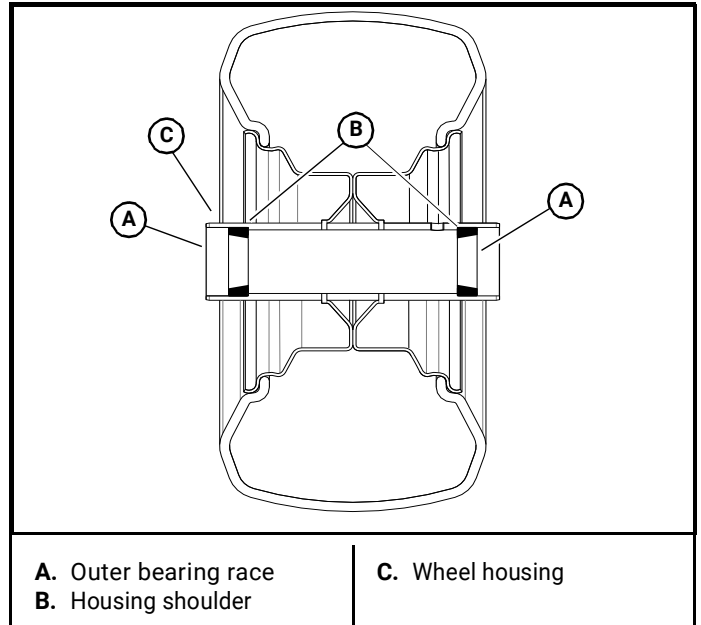


Figure 4-29

2. Thoroughly pack the tapered roller bearings with multi-purpose grease.
3. Insert the new tapered roller bearings into the outer bearing race. Figure 4-30
4. Insert the new seals into the wheel housing. Make sure that the flat side of the seal is flush with the outside edge of the wheel housing. Figure 4-30

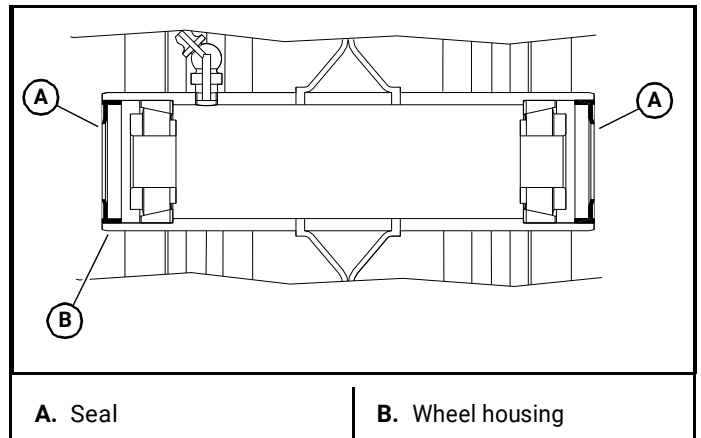


Figure 4-30

5. Insert the bushings through the seal openings and push them in until they contact the tapered roller bearings. Figure 4-31
6. Push the dust caps onto the wheel housing. Figure 4-31
7. Slide the wheel assembly between the caster fork legs and assemble to the fork using the axle bolt, flat washers, and lock nut. Figure 4-32

**NOTE:** Make sure the head of the axle bolt is on the same side as the valve stem.

8. Screw the lock nut onto the axle bolt and tighten. Then, back the nut off until the wheel rotates freely.
9. Using a grease gun, insert multi-purpose grease into the wheel housing until grease begins to seep from the dust caps.

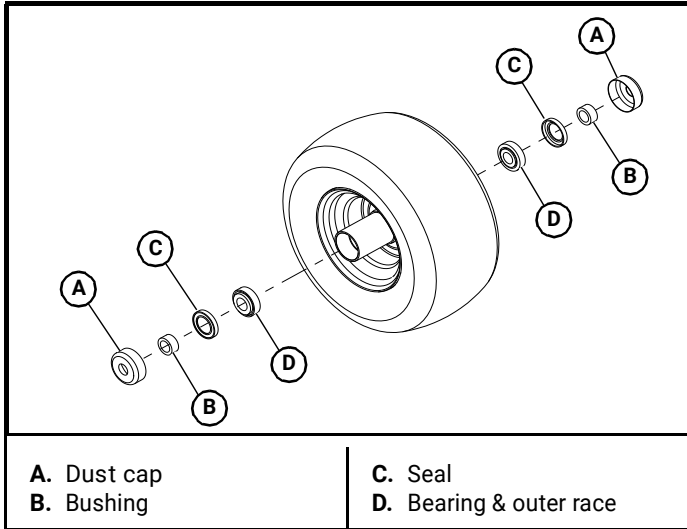


Figure 4-31

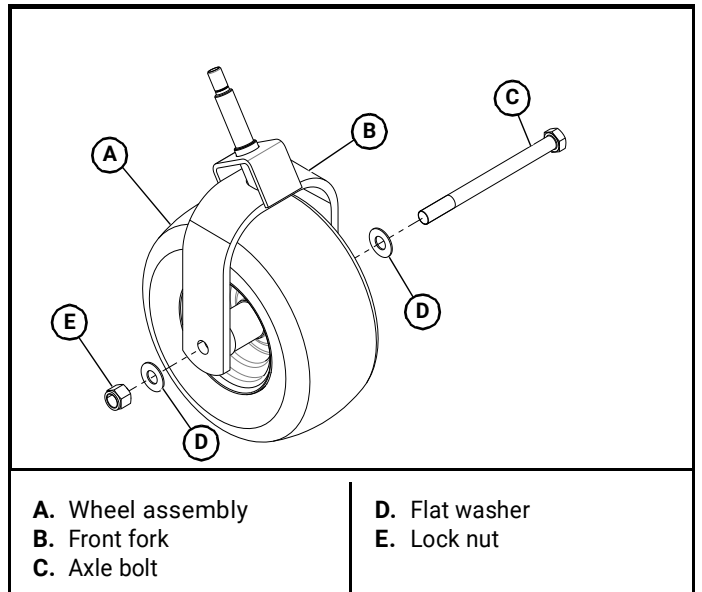


Figure 4-32

# ENGINE MAINTENANCE

## General Engine Maintenance

Detailed instructions and recommendations for break-in and regular maintenance are specified in the *Engine Owner's Manual*. Please refer to the *Engine Owner's Manual* for engine servicing, lubricating oil levels with quality and viscosity recommendations, bolt torques, etc.

### Engine Oil and Filter

#### WARNING

Allow the engine to cool before changing the engine oil. If the engine has been running, use caution when changing the engine oil as it will be very hot. You should wear the appropriate protective gear to avoid being burned or exposed to engine oil.

Check engine oil daily and after every 4 hours of operation. Machine must be sitting level when checking oil. Refer to engine manual and maintenance schedule for oil recommendation and capacities. Hustler® 15W-50 Engine Oil is recommended.

Change the engine oil and filter per the engine manufacturer's recommendations. If mower is being operated in extremely dirty conditions, then it is recommended oil and filter be changed more frequently.

**Kawasaki engine** – Change the engine oil and filter after the first 100 hours of operation and per the engine manufacturer's recommendations after that. Refer to the engine owner's manual for detailed information. If mower is being operated in extremely dirty conditions, then it is recommended oil be changed more frequently.

**IMPORTANT:** After the new oil filter has been installed, clean up any oil which may have spilled onto the engine plate, engine exhaust system, and muffler guard.

### Draining the engine oil (Kawasaki):

1. Locate the oil drain valve on the engine or at the bottom of the oil reservoir. Figure 5-1
2. Use a piece of 1/2" hose to drain oil into oil drain pan.
3. Attach one end of the hose onto the oil drain valve nipple. Make sure the hose is pushed all the way onto the valve. Figure 5-1
4. Position the loose end of the hose so that it can drain into a suitable oil drain container.

**IMPORTANT:** Make sure the oil does not come in contact with the belts or clutch.

5. Position a suitable oil drain container under the machine below the end of the hose.
6. Use a 10 mm wrench or socket and open the valve approximately 4 turns in the counterclockwise direction. Allow 10 minutes for engine oil to adequately drain.
7. After the oil is drained, close the valve by twisting clockwise.
8. Once the valve is closed, carefully remove the oil drain hose and clean up any spilled oil.

**IMPORTANT:** All oil drips or spills **must** be cleaned off of the engine plate, engine exhaust system, and muffler guard before operating the machine.

**IMPORTANT:** Clean the oil drain hose and store it appropriately before operating the machine.

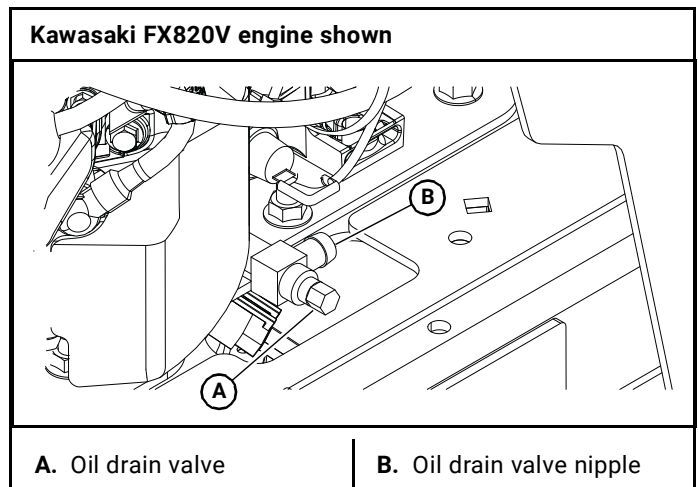


Figure 5-1

### Engine Air Filter

Perform engine air filter maintenance per the *Maintenance Schedule* shown elsewhere in this manual.

A specially designed dry filter is standard equipment on these mowers and supplies clean combustion air to the engine. Figure 5-2, Figure 5-3

These mowers are equipped with a safety filter. The filter element slides over the safety filter. Figure 5-3

The safety element does not require servicing unless it becomes contaminated with dirt or moisture.

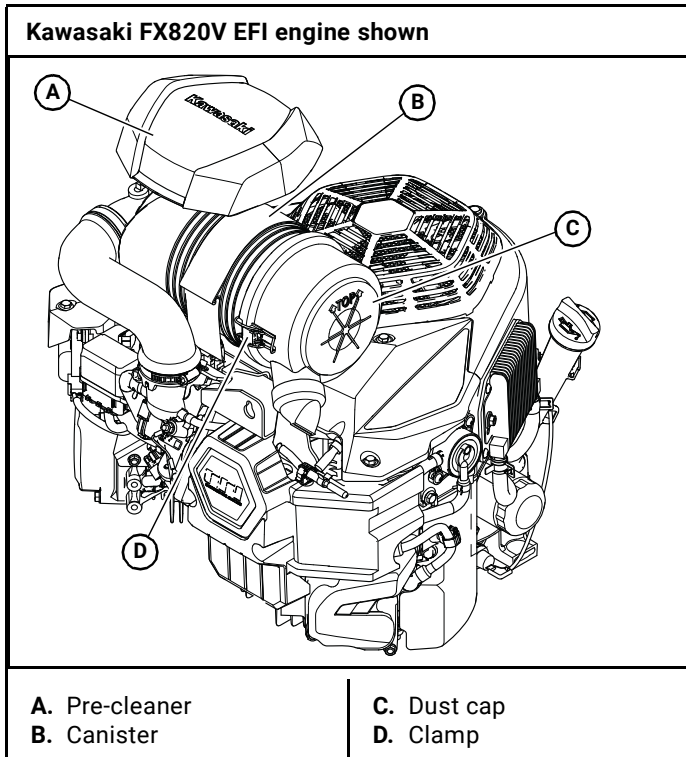


Figure 5-2

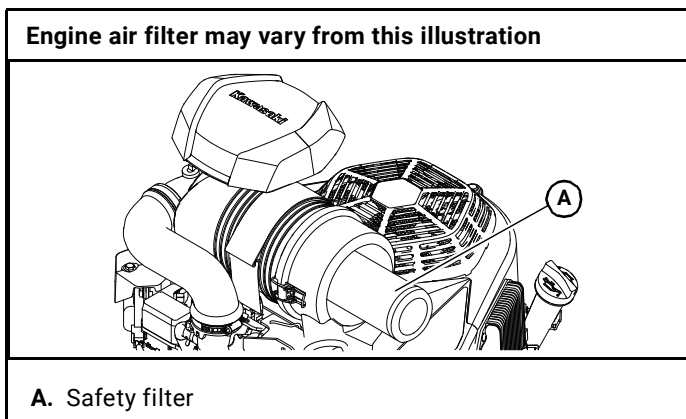


Figure 5-3

### Recommended Service Procedure

1. Release clamps and remove element. Clean the air cleaner canister with a damp cloth.
2. Before installing a new element, inspect it by placing a bright light inside and rotating the element slowly, looking for any holes or tears in the paper. Also check gaskets for cuts or tears. Do not attempt to use a damaged element which will allow abrasive particles to enter the engine.

3. Reinstall the dust cap. Make sure it seals all the way around the air cleaner canister, then tighten the clamps.
4. Check all fittings and clamps periodically for tightness and inspect hoses for holes or cracks.
5. Periodically check the intake hose for signs of ingested dust. Locate and repair the source of ingested dirt.
6. Never operate the machine without an air filter installed.

### Overservicing

Overservicing occurs when an air filter element is removed for cleaning or replacement before it is necessary. Each time the filter is removed a small amount of dirt and dust could fall in the intake system. This accumulated dirt can cause a dusted engine. It only takes a few grams of ingested dirt over the normal service life of an engine to cause a dusted engine.

**Do not clean the element, but replace with a new element only.** Cleaning used air filter elements, through improper cleaning procedures, can get dust on the inside of the filter causing dirt ingestion and engine failure.

It is important to note that whenever an air filter element is cleaned by **any method**, the person or company performing the cleaning assumes responsibility for the integrity of the filter from then on. **The warranty for air filters expires upon cleaning or servicing in any manner because the condition of the filter after servicing is completely out of the filter manufacturer's control. Therefore, on a dust ingested engine failure, there will be no warranty consideration if the air filter element has been cleaned or serviced in any manner.**

A partially dirty air filter element works better than a new element. Therefore, a dirty filter element is not bad for the engine unless it is excessively restricting the air flow and engine performance is affected. The media in the filter must be porous to allow air to pass through it. When dirty air passes through the filter, the dirt plugs some of the holes in the media and actually acts as part of the filter media. When the next round of dirt enters, the first dirt helps filter out even smaller particles making the filter more efficient at stopping dirt from entering the engine. This is referred to as barrier filtration.

At some point the filter media becomes too clogged to allow air to pass.

The mowing conditions will determine the frequency of air filter element changing.

## Air Restriction Indicator

Some mowers have engines with an air restriction indicator installed in the air cleaner. Figure 5-4

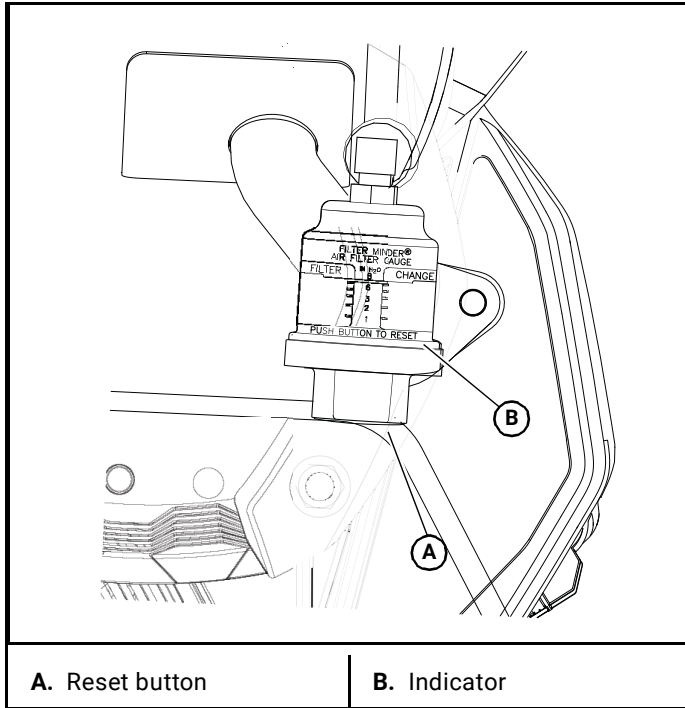


Figure 5-4

Replace the element when the restriction indicator reaches the change filter red line. Check the indicator daily and replace element as needed or annually whichever occurs first.

Reset the indicator by pushing in on the yellow button after each element change. Figure 5-4

## Fuel Evaporation System Filter

These mowers have a fuel evaporation system filter. This filter must be checked and replaced every 500 hours or annually, whichever comes first. Figure 5-5

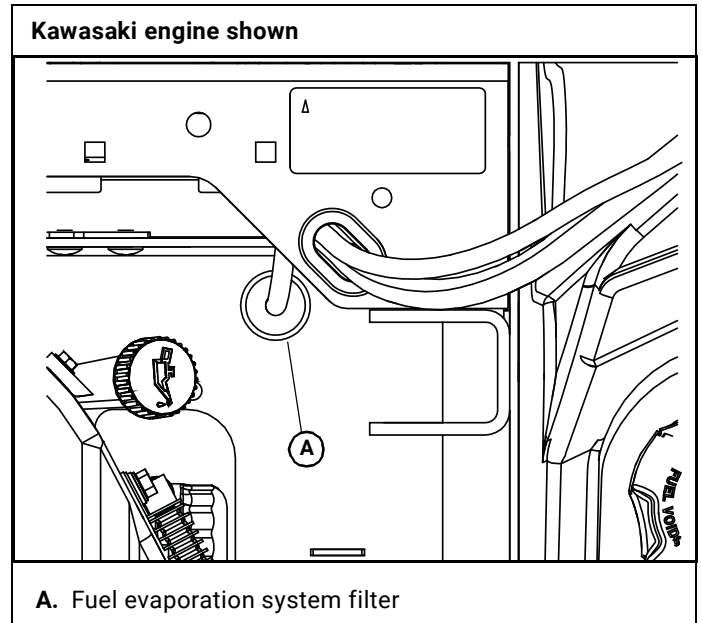


Figure 5-5

## Fuel & Evaporative System Line Routings

There are two rubber hoses that are connected to the fuel tanks. One is the fuel hose that is part of the fuel system. The other is the vapor line that is part of the fuel evaporative system.

The fuel hose is connected to the port on the fuel tank as shown. It connects the fuel tank to the fuel shutoff valve. Figure 5-6

The vapor line is connected to the port on the fuel tank as shown. It connects the fuel tank to the engine's vapor port. Figure 5-6

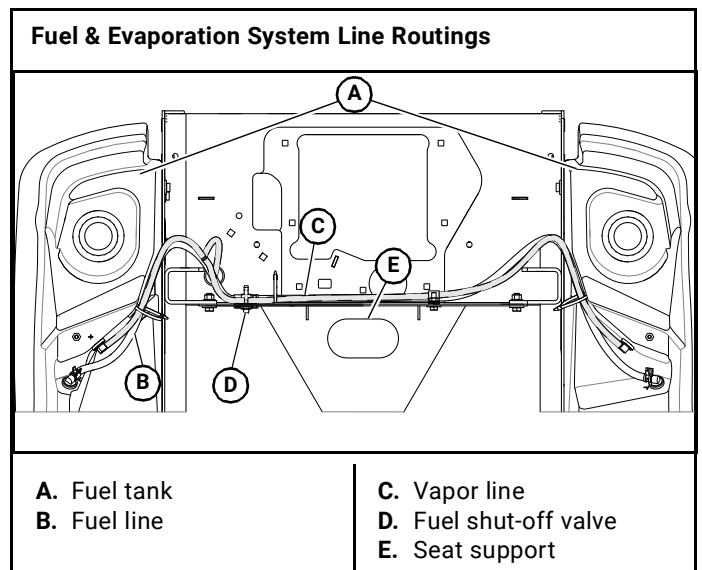


Figure 5-6

## Engine RPM Settings

---

The engine rpm's are set at the factory for maximum mowing efficiency. Occasionally it may be necessary to check and adjust the settings. Run engine for 15 minutes before setting rpm. The high idle speeds, with no load, should be set as follows:

Kawasaki FX820V EFI	
ENGINE SPEED	
MODEL NO. ENDING WITH:	HIGH IDLE
Model NO. without extension Model NO. <b>EX</b> extension Model NO. <b>US</b> extension	3600 RPM maximum
Model NO. <b>CE</b> extension	Refer to mower's serial number plate

**NOTE:** Model numbers may or may not end with an extension after the number. There are several different extensions that may be shown; i.e. EX or CE.

**Example:** 922222 (no extension)

922222 EX

922222 CE

922222 US

# DECK ADJUSTMENTS

## Deck Leveling

Leveling the deck must be done in the following manner and order:

1. Check tire pressures to make certain they are properly inflated before starting to level deck. The recommended pressures are as follows:  
 Drive wheels ..... 8-12 psi (55-83 KPa)  
 Front wheels ..... 8-12 psi (55-83 KPa)

**! WARNING**

Stop engine. Make sure deck clutch switch is **in the down (OFF) position**. Place control levers in the brake position before leaving machine.

2. Park the unit on a flat surface.
3. **Note: North America mowers – Side Discharge Decks –** Place 3" (76.2 mm) high deck support blocks (two stacked 2" x 4" blocks can be used to create a 3" [76.2 mm] high support) at the three points of the deck as shown. Figure 6-1  
 Back of deck will automatically be set 1/4" (6.35 mm) higher. Figure 6-1
4. Place the deck height pin in the 3.25" position.

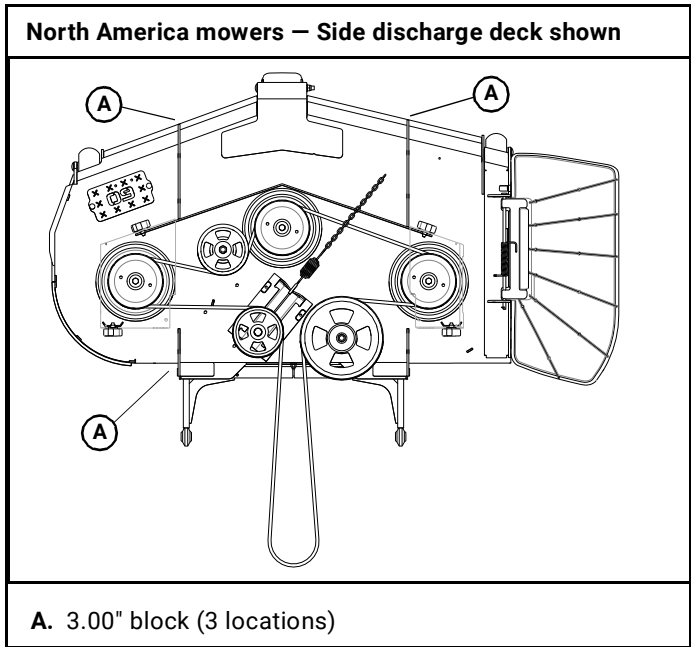


Figure 6-1

5. Lower the deck onto the blocks.
6. Adjust the nut on each deck level rod end over the three blocks so that the deck is sitting on the block and the nut is on the deck level spacer. Figure 6-2

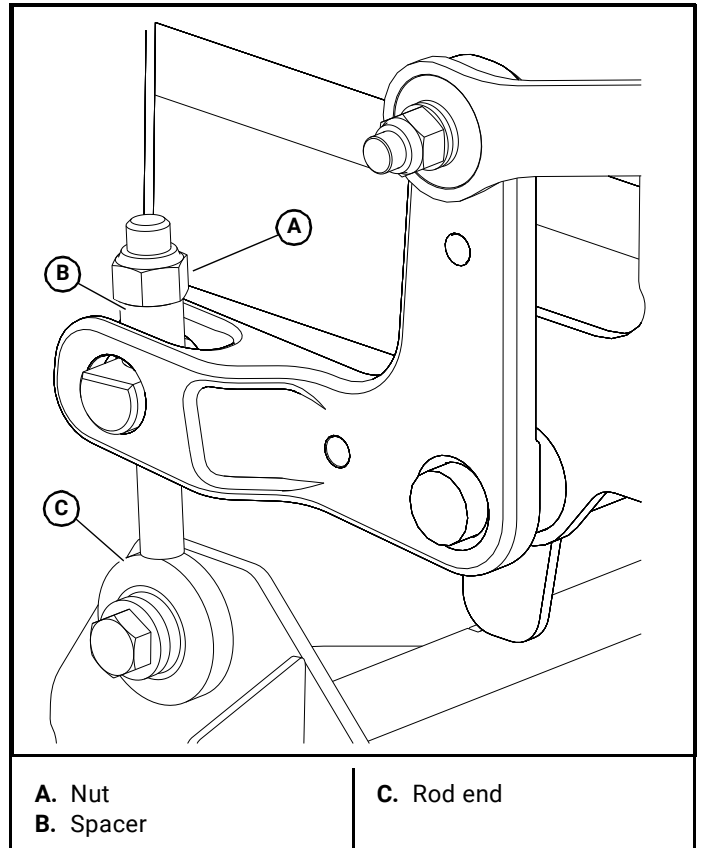


Figure 6-2

7. Adjust the last nut of the right rear corner rod so that the deck level rod end is not loose.

8. Adjust the deck lift assist spring tension by turning the nut until the spring length from the inside of one hook to the inside of the other hook matches the length indicated in the table. Tighten the jam nut once the distance is set. Figure 6-3

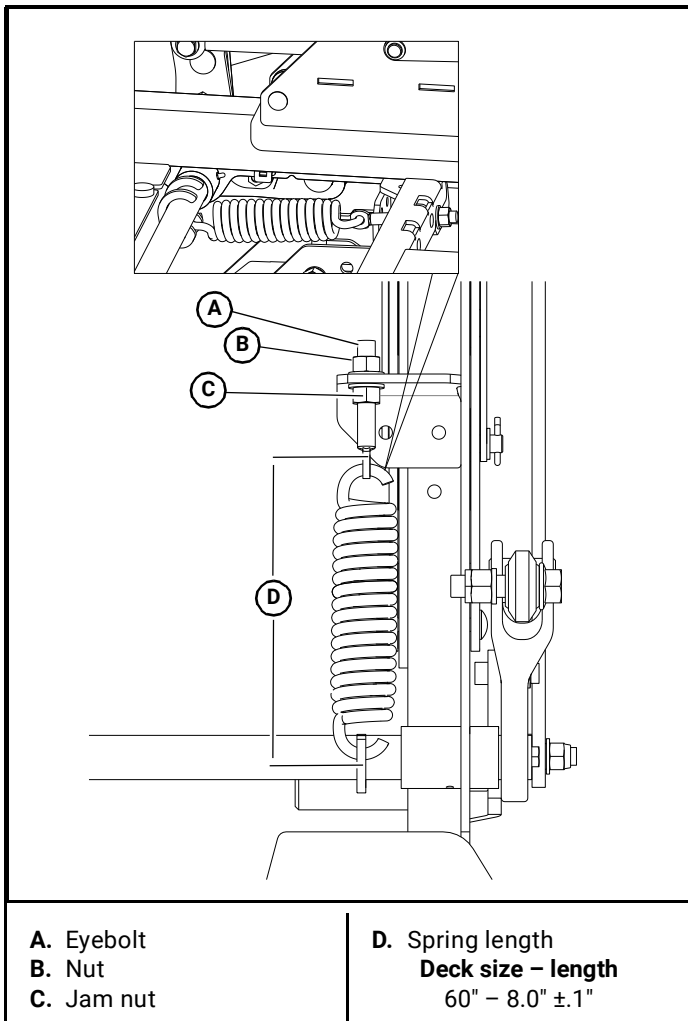


Figure 6-3

## Blades

### Mower Blade Maintenance

**IMPORTANT:** Refer to the *Safety* section of this manual for blade handling safety information.

Refer to the *Mower Blade Replacement* section for blade removal and installation. Check the mower blades daily, they

## ⚠ WARNING

Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves and use extra caution when servicing them.

are the key to power efficiency and well groomed turf. Keep the blades sharp. A dull blade will tear rather than cut the grass, leaving a brown ragged top on the grass within a few hours. A dull blade also requires more power from the engine.

Replace any blade which is bent, cracked or broken.

## ⚠ WARNING

### Always check for blade damage:

- if mower strikes a rock, branch or other foreign object during mowing!
- or if an abnormal vibration occurs while operating.

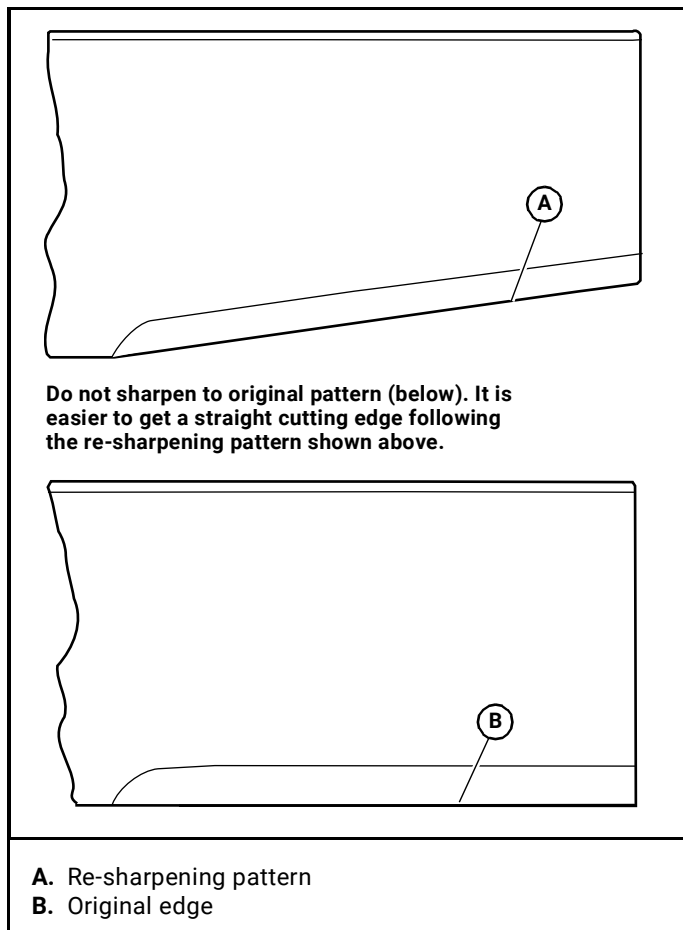
Make all necessary repairs before resuming operation..

Sharpen the blades following the pattern shown. Touch-up sharpening can be done with a file. Figure 6-4

After grinding the blades, check for balance. Blade balancing can be done by placing the blade on an inverted line punch or 5/8" (16 mm) bolt. A commercial balancing tool is also available through most hardware supply stores.

The blade should not lean or tilt. When spinning the blade slowly it should not wobble. Balance the blade before reinstalling.

Lay the blade on a flat surface and check for distortion. Replace any distorted blade. Figure 6-5 & Figure 6-6



- A. Re-sharpening pattern  
B. Original edge

Figure 6-4



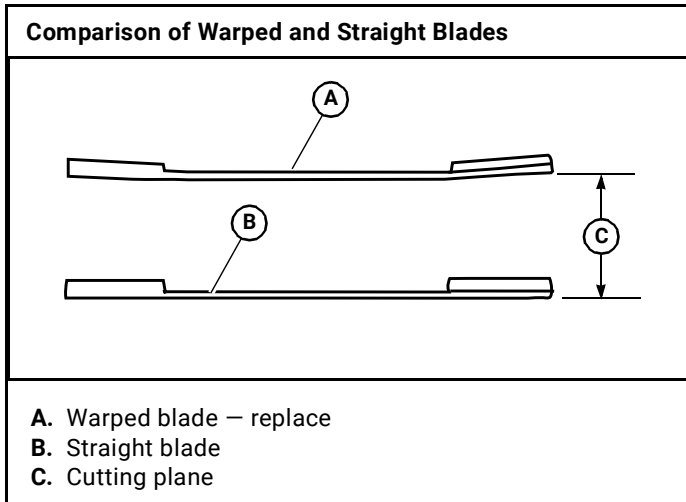


Figure 6-5

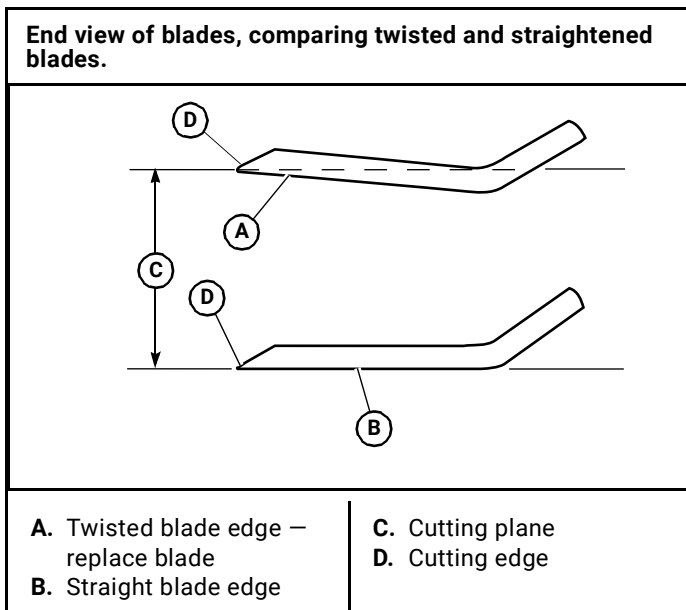


Figure 6-6

**Mower Blade Removal**

**IMPORTANT:** Refer to the *Safety* section of this manual for blade handling safety information.

**! WARNING**

Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves and use extra caution when servicing them.

**IMPORTANT:** A 15/16" (24 mm) wrench is required to remove the 5/8" (16 mm) cap screw holding the blade to the spindle shaft. **NOTE:** A blade holding tool (P/N 381442) is available from Hustler® Turf Equipment. It is designed to prevent the blades from rotating when they are being removed

or installed on the spindle. Contact your Hustler® Dealer for more information.

Do not re-use spindle bolts which have stripped, worn or undercut threads. Torque bolts on spindles to 118 ft-lbs (160.0 N•m) when reinstalling blades.

**! WARNING**

Failure to correctly torque the bolt may result in the loss of the blade which can cause serious injury.

Properly compressed cup washers maintain the correct compression load on the blades. Replace the cup washers if they are cracked or flattened.

**IMPORTANT:** The blade sail (curved part) must be pointing upward toward the inside of the deck to ensure proper cutting.

When mounting blades, rotate them after installation to make sure blade tips do not touch each other or sides of the mower.

**Belts**

Inspect belts frequently for wear and serviceability. Replace a belt that shows signs of:

- severe cuts
- tears
- separation
- weather checking
- cracking
- burns caused by slipping.

Slight raveling of belt covering does not indicate failure, trim ravelings with a sharp knife.

Inspect the belt pulley grooves and flanges for wear. A new belt, or one in good condition, should never run against the bottom of the groove. Replace the pulley when this is the case, otherwise, the belt will lose power and slip excessively.

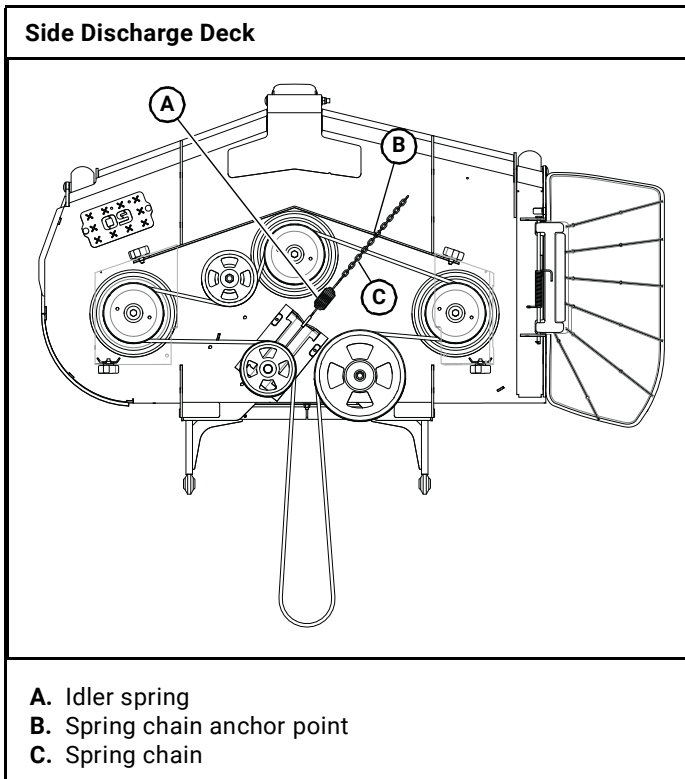
Never pry a belt to get it on a pulley as this will cut or damage the fibers of the belt covering.

Keep oil and grease away from belts, and never use belt dressings. Any of these will destroy the belt composition in a very short time.

**Deck Belt Adjustment**

The spindle belt tension remains constant by means of a tension idler and spring. The spring tension should be such that the belt does not slip under normal operating load conditions, assuming the belt is not excessively worn or damaged. As the belt stretches and wears in, adjustment may become necessary. To increase belt tension, move the spring chain one (or more) link(s) at the anchor point on the deck frame. Figure 6-7 & Figure 6-8

**IMPORTANT:** Do not over tension the spring to compensate for a badly worn belt or pulley.



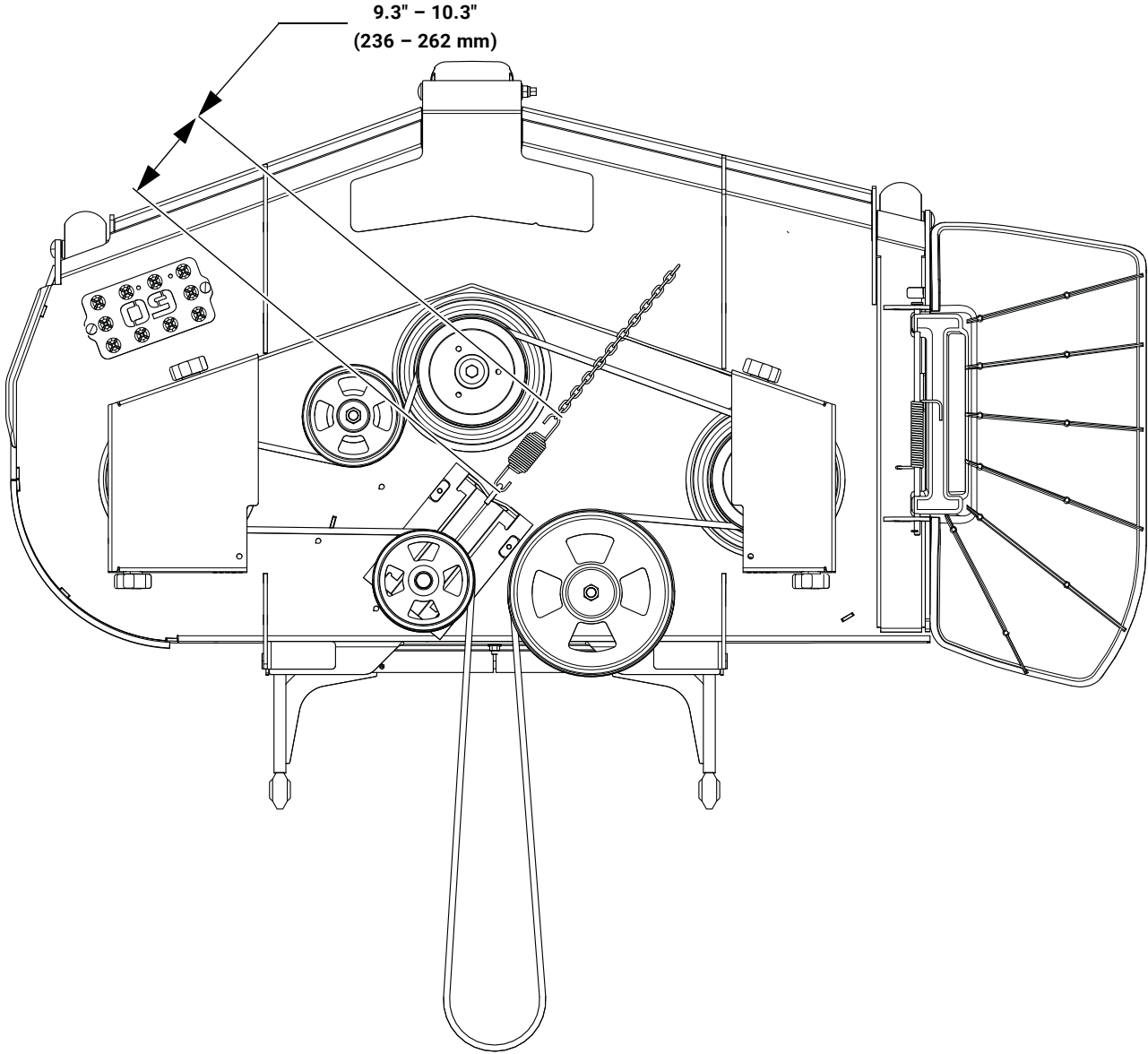
**Figure 6-7**

**NOTE:** The following notes are the same for the different decks shown.

- 1. Spring length after tensioning new belt. Measured from outside of hook to outside of hook with deck set at 3.25" (82.6 mm) cut height. Route belt as shown.

**Side Discharge Deck Belt Routing & Tensioning**

60"

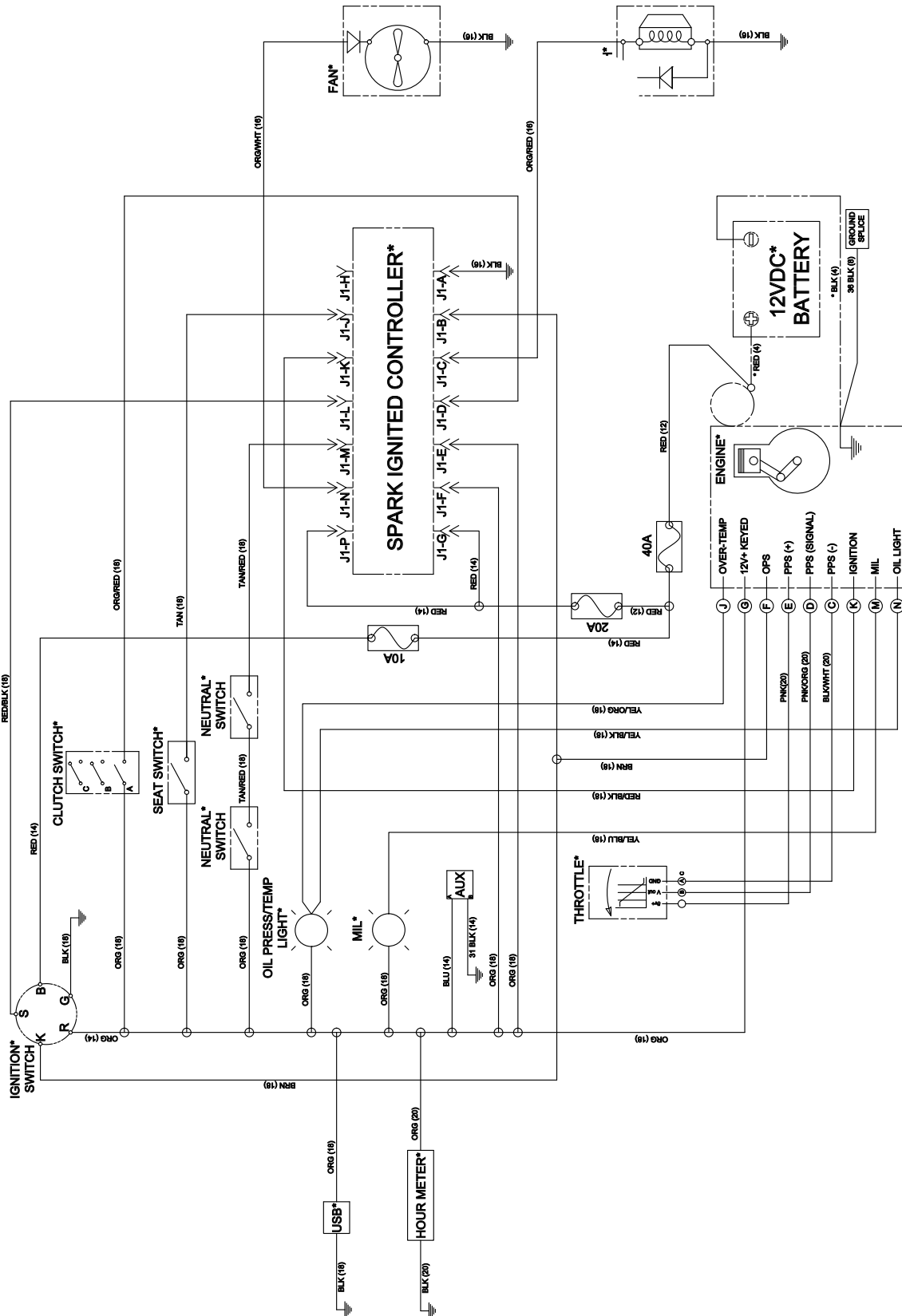


**Figure 6-8**



# ELECTRICAL

## Electrical Schematic – Kawasaki





# MAINTENANCE

<b>Maintenance Schedule</b>		
Refer to Figure 8-1, Figure 8-2 & Figure 8-3		
<b>SERVICE AT INTERVALS INDICATED</b>		
Verify safety start interlock system	Prior to each use	
Visually inspect unit for loose hardware &/or damaged parts	Prior to each use	
Visually inspect tires	Prior to each use	
Clean air intake screen	Prior to each use	Service more often under dusty or dirty conditions and during hot weather. Refer to Engine Owner's Manual
Check fuel level	Prior to each use	
Blades - sharpen & fastened securely	Prior to each use	
Discharge chute - securely in place & in lowest position	Prior to each use	
Check tire pressure with a gauge	Prior to each use	
Rear discharge deck flaps and/or power unit deflector securely in place	Prior to each use	
Clean engine and pump/transaxle/transmission compartment (as equipped)	After each use	
Check air cleaner service indicator	After each use	
Caster fork tapered bearings	Regular maintenance not required	
Tighten lug nuts/axle bolts on wheels	Weekly or 40 hours	Torque initially and after first 2 hours of operation.
Check battery connections	Weekly or 50 hours	Any maintenance operation that requires the removal of safety covers must be performed by a trained service technician. Refer to the General Service Manual.
Check hydraulic oil level	Weekly or 50 hours	Any maintenance operation that requires the removal of safety covers must be performed by a trained service technician. Refer to the General Service Manual.
Check pump and deck belt tension and condition	Monthly or 100 hours	Pump drive belt only - Inspect every month and replace if worn or cracking is noticed. Otherwise, replace every 2 years. Pump drive belt only - Inspect every 6 months or 100 hours and replace if worn or cracking is noticed. Otherwise, replace every 200 hours or 2 years whichever comes first. Refer to Cold weather pump clutch section for tensioning information. Service more often under dusty or dirty conditions and during hot weather.
Check fuel tank grommets	Monthly or 100 hours	
Grease deck height pivots	Monthly or 100 hours	Service more often under dusty or dirty conditions and during hot weather. Refer to General Service Manual.
Grease front wheel bearings	Monthly or 100 hours	Refer to General Service Manual.
Check fuel valve	Monthly or 100 hours	
Grease deck pusher arms	Monthly or 100 hours	
Grease pump belt idler pivot	Monthly or 100 hours	
Check ROPS mounting hardware	Annually or 300 hours	
Change hydraulic filter & oil	Annually or 500 hours	
Grease deck spindle housings	As needed or annually, depending on usage	
Replace fuel evaporation system filter (if equipped)		Refer to Engine Owner's Manual
Check engine oil level		Refer to Engine Owner's Manual
Replace engine air cleaner element		Refer to Engine Owner's Manual
Change engine oil & filter		Refer to Engine Owner's Manual
Clean cylinder & head fins (as equipped)		Refer to Engine Owner's Manual
Clean engine exterior		Refer to Engine Owner's Manual
Clean & gap spark plugs		Refer to Engine Owner's Manual
Check fuel system		Refer to Engine Owner's Manual
Change fuel filter		Refer to Engine Owner's Manual
Replace spark plugs		Refer to Engine Owner's Manual

# Maintenance Locator Chart

## Units with Kawasaki Engines

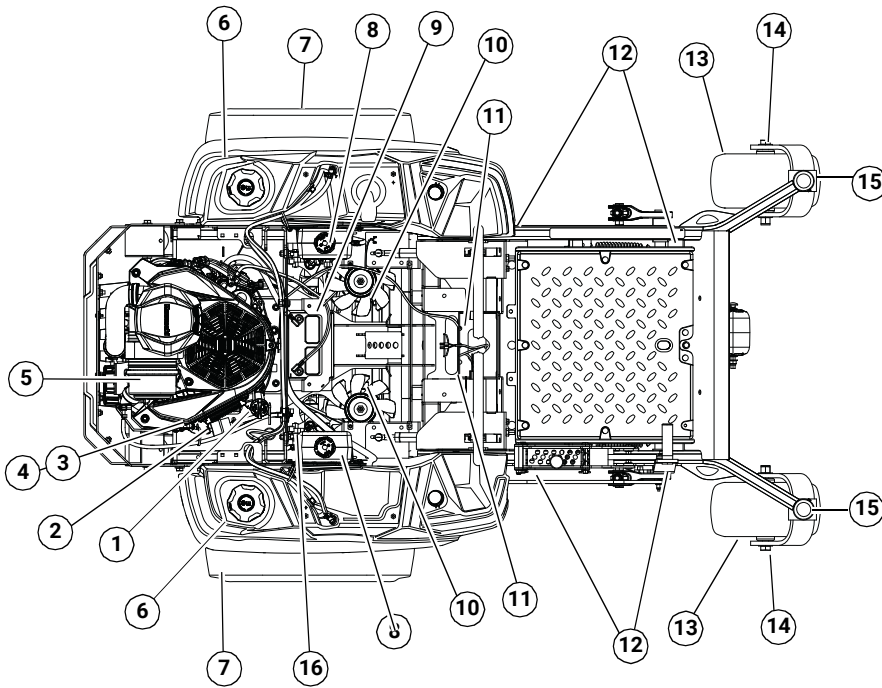


Figure 8-1

1. Engine Oil Fill & Dipstick
2. Fuel Filter
3. Engine Oil Drain Valve
4. Engine Oil Filter
5. Engine Air Cleaner
6. Fuel Tanks
7. Drive Tires
8. Hydraulic Oil Reservoir
9. Battery
10. Hydraulic Oil Filter
11. Park Brake Switch
12. Deck Height Pivot Grease Fitting (4)
13. Front Wheel Tires
14. Front Wheel Bearing Grease fitting (2)
15. Caster Fork Tapered Grease fitting
16. Fuel Evaporation System Filter
17. Pump Idle Grease Fitting
18. Pump Belt
19. Deck Pusher Arm Grease fitting (2)
20. Deck Belt
21. Spindle Housing Grease fitting (3)
22. Blades

## Pump Belt Routing

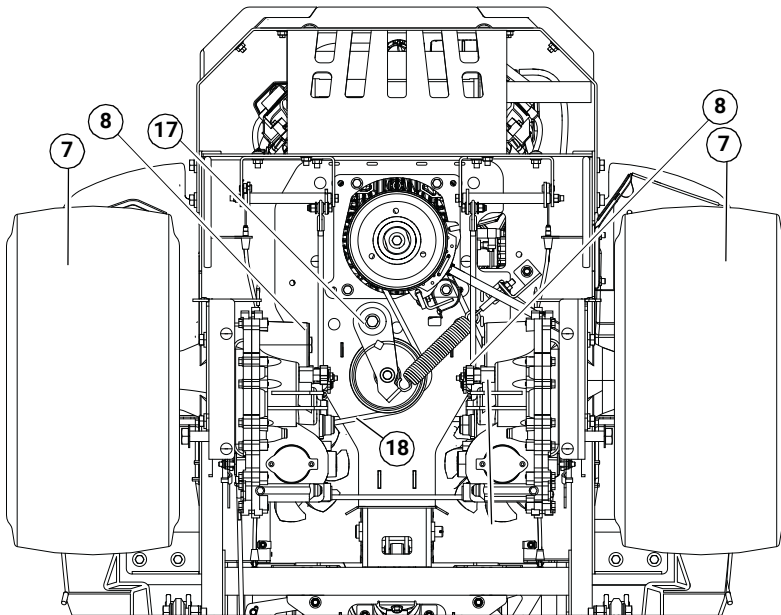
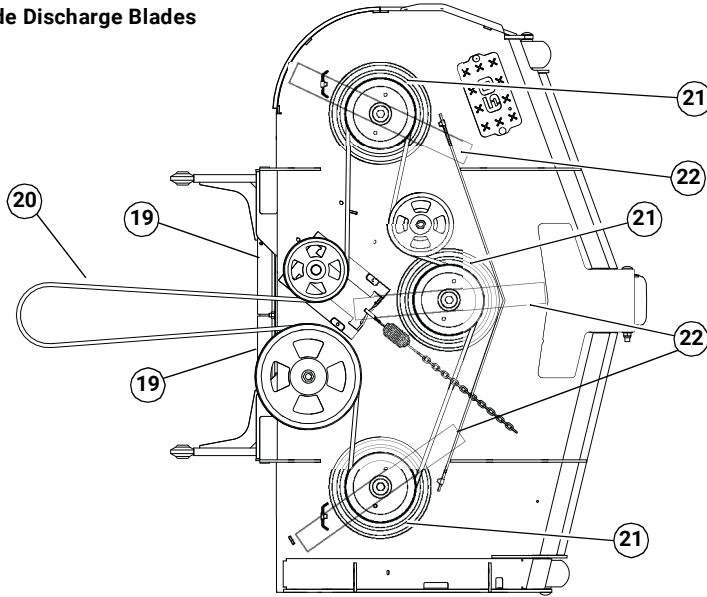


Figure 8-2



**Side Discharge Blades**



**Figure 8-3**

1. Engine Oil Fill & Dipstick
2. Fuel Filter
3. Engine Oil Drain Valve
4. Engine Oil Filter
5. Engine Air Cleaner
6. Fuel Tanks
7. Drive Tires
8. Hydraulic Oil Reservoir
9. Battery
10. Hydraulic Oil Filter
11. Park Brake Switch
12. Deck Height Pivot Grease Fitting (4)
13. Front Wheel Tires
14. Front Wheel Bearing Grease fitting (2)
15. Caster Fork Tapered Grease fitting
16. Fuel Evaporation System Filter
17. Pump Idle Grease Fitting
18. Pump Belt
19. Deck Pusher Arm Grease fitting (2)
20. Deck Belt
21. Spindle Housing Grease fitting (3)
22. Blades



# TROUBLESHOOTING

SYMPTOMS	PROBABLE CAUSES	SUGGESTED REMEDIES
Starting motor does not crank	Steering control levers not in park brake position or switch not adjusted	Place steering control levers in park brake position or re-adjust switch
	Deck clutch switch engaged	Disengage clutch switch
	Weak or dead battery	Recharge or replace
	Electrical connections are corroded or loose	Check the electrical connections
	Fuse is blown	Check fuses – replace blown fuse
	For additional causes	See engine manual
The engine will not start, starts hard or fails to keep running	No fuel or line plugged	Fill tank or replace line (See <i>Fuel System</i> section for more details)
	Fuel valve is turned off	Open the fuel valve
	There is incorrect fuel in the fuel system	Drain the tank and replace the fuel with the proper type
	There is dirt in the fuel filter	Replace the fuel filter
	Dirt, water or stale fuel in the fuel system	Contact your dealer
	The choke (if equipped) is not on	Move the choke lever to ON
	Numerous	See engine manual
Engine: Runs with continuous misfiring or engine runs unevenly or erratically	Numerous	See engine manual
Loss of power or system will not operate in either direction	Restrictions in air cleaner	Service air cleaner
	Internal interference or leakage in transaxle	See your dealer
	Poor compression	See your dealer
	Steering linkage needs adjustment	Adjust linkage
	Tow valve open	Close tow valve
	The traction drive belt is worn, loose or broken	Install a new traction drive belt
	Air in system	Check filter and fittings
	For additional causes	See engine manual
Low engine oil pressure	Low oil level	Add oil
	Oil diluted or too light	Change oil and check for source of contamination
	Failed oil pump	Contact your dealer
High oil consumption	Numerous	Contact your dealer
Mower jerky when starting or operates in one direction only	Steering control linkage needs adjustment	Adjust linkage
	Transaxle component faulty	Contact your dealer
	Tow valves not closed completely	Close tow valves
	Loose steering linkage	Tighten linkage

SYMPTOMS	PROBABLE CAUSES	SUGGESTED REMEDIES
Mower creeps when steering control levers are in neutral	Steering linkage needs adjustment	Adjust linkage
Mower circles or veers in one direction	Steering linkage needs adjustment	Adjust linkage
	Loose steering linkage	Tighten linkage
	Tires improperly inflated	Adjust air pressure to 8–12 psi (55–83 KPa)
	Transaxle component faulty	Contact your dealer
Mower creeps when parking brake engaged	Steering linkage out of adjustment	Adjust steering linkage
	Brakes need adjustment	Adjust parking brakes
There is abnormal vibration	The engine mounting bolts are loose	Tighten the engine mounting bolts
	The engine pulley, idler pulley or blade pulley is loose	Tighten the appropriate pulley
	The engine pulley is damaged	Contact your dealer
	The cutting blade(s) is/are bent or unbalanced	Install new cutting blade(s)
	A blade mounting bolt is loose	Tighten the blade mounting bolt
	Spindle bearing is worn or loose	Replace or tighten spindle bearing
	A blade spindle is bent	Contact your dealer
	Blades do not rotate	The deck drive belt is worn, loose or broken
The deck drive belt is off the pulley		Install the deck drive belt and check for a reason
Electric clutch is not engaging		Check and/or replace 10 amp fuse. Contact your dealer
Uneven cutting height	The blade(s) are not sharp	Sharpen the blades
	A cutting blade(s) is/are bent	Install new cutting blade(s)
	The deck is not level	Level the deck per the <i>Deck leveling and height adjustment</i> section of the General Service Manual
	An anti-scalp wheel is not set correctly	Adjust the height of the anti-scalp wheel
	The underside of the deck is dirty	Clean the underside of the deck
	Tires improperly inflated	Adjust air pressure to 8–12 psi (55–83 KPa)
	A blade spindle is bent	Contact your dealer
	Flex Forks® are installed	After initial break-in period, level the deck per the <i>Deck Leveling</i> section of the General Service Manual.



# INDEX

	<b>PAGE</b>		<b>PAGE</b>
Air Restriction Indicator .....	5-3	Hydraulic System .....	4-5
Belts .....	6-3	Maintenance Introduction .....	1-1
Blades .....	6-2	Mower Blade Maintenance .....	6-2
Carbon Canister .....	5-3	Mower Blade Removal .....	6-3
Clutch Re-gap Adjustment .....	4-7	Overservicing .....	5-2
Control Lever Stops .....	4-2	Rear Discharge Deck Belt Routing & Tensioning .....	6-5
Deck Belt Adjustment .....	6-3	Service Program .....	1-1
Deck Leveling .....	6-1	Side Discharge Deck Belt Routing & Tensioning .....	6-5
Draining the engine oil (Kawasaki) .....	5-1	Special Torques .....	3-1
Electrical Schematic – Kawasaki .....	7-1	Standard Torques .....	3-1
Engine Air Filter .....	5-1	Steering Adjustments .....	4-1
Engine Oil and Filter .....	5-1	Steering Control Lever Adjustment .....	4-4
Engine RPM Settings .....	5-4	Steering Control Lever Neutral Adjustment .....	4-1
Fuel & Evaporative System Line Routings .....	5-3	Steering Damper .....	4-3
Fuel Evaporation System Filter .....	5-3	Tires .....	4-8
General Engine Maintenance .....	5-1	Warner Clutch Re-gap Adjustment Procedures .....	4-7
Hydraulic Pump Belt Adjustment .....	4-5	Warranty .....	1-1

**INDEX**

**PAGE**

**PAGE**