

# Hustler® Surfer Pro™ 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.**

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# GENERAL INFORMATION

## Hustler® Service Program

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

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

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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.

**Daily inspect** mower 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

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



# SAFETY



This safety alert symbol is used to call attention to a message intended to provide a reasonable degree of PERSONAL SAFETY for operators and other persons during the normal operation and servicing of this equipment.

<b>⚠</b> <b>DANGER</b> <b>⚠</b>	<p>– denotes immediate hazards which <b>WILL</b> result in severe personal injury or death.</p>
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<b>⚠</b> <b>WARNING</b> <b>⚠</b>	<p>– denotes a hazard or unsafe practice which <b>COULD</b> result in severe personal injury or death.</p>
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## Safe Servicing Practices

Refer to the *Safety Precautions* section of this manual for more service safety information.

### Understand correct service

- ▲ Be sure you understand a service procedure before you work on the machine.
- ▲ Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.
- ▲ If it is necessary to make checks with the engine running, always use two people—with the operator at the controls, able to see the person doing the checking.

## Pre-Operation Precautions

### Fuel Handling

- ▲ **To avoid personal injury or property damage, use extreme care when handling gasoline. Gasoline is extremely flammable and the vapors are explosive.**
  - A fire or explosion from gasoline can burn you and others and can damage property.
- ▲ Observe the usual gasoline handling precautions:

- Do not smoke while refueling. Extinguish all cigarettes, cigars, pipes and other sources of ignition.
- **Do not remove fuel cap or fill tank with engine running or while engine is hot.** Clean up any gasoline spills.
- If gasoline is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until gasoline vapors have dissipated.
- Keep gasoline away from open flame or spark and store machine away from open flame or spark or pilot light such as on a water heater or appliances.
- Refuel outdoors. Never refuel or drain the gasoline from the machine indoors, or while in an enclosed trailer or other enclosed area.
- Never attempt to start the engine when there is a strong odor of gasoline fumes present. Locate and correct the cause.
- Store gasoline in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of gasoline.
- Do not fill fuel containers inside a vehicle or on a truck or trailer bed with interior carpets or plastic truck bed liners. Always place gasoline containers on the ground away from your vehicle before filling.
- When practical, remove the machine from the truck or trailer and refuel the machine with its wheels on the ground. If this is not possible, then refuel such machine on the truck or trailer using a portable container and not a fuel dispenser nozzle. If a fuel 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. Do not use a nozzle lock-open device.
- Never use gasoline for cleaning parts.
- Read and observe safety precautions elsewhere in this manual.
- ▲ Gasoline is harmful or fatal if swallowed.
- ▲ Avoid prolonged breathing of vapors.
  - Long-term exposure to vapors can cause serious injury and illness.
- ▲ Keep gasoline away from eyes and skin.
  - Keep face away from nozzle and fuel tank or fuel container opening.
  - If gasoline is spilled on clothing, change clothing immediately.

## Understand Machine Operation

- ▲ Only qualified and trained personnel should operate the equipment.
- ▲ Carefully read the operator's manual and all manuals furnished with the attachments. Learn the location and purpose of all controls, instruments, indicators and labels.

## Wear Protective Clothing

- ▲ Do not operate or service the equipment while wearing sandals, tennis shoes, sneakers, shorts or any type of loose fitting clothing. Long hair, loose clothing or jewelry may get tangled in moving parts. Always wear long pants, safety glasses, ear protection and safety shoes when operating or servicing this machine.
- ▲ Always wear adequate eye protection when servicing the hydraulic system and battery, or when grinding mower blades and removing accumulated debris.
- ▲ Prolonged exposure to loud noise can cause impairment or loss of hearing.
  - Always wear adequate ear protection, such as earplugs, when operating this equipment as prolonged exposure to uncomfortable or loud noises can cause impairment or loss of hearing.
  - Do not wear radios or music headphones while operating the machinery. Safe operation requires your full attention.

## Operation Precautions

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### Avoid Fire Hazards

- ▲ **Clean flammable material from machine. Prevent fires by keeping engine compartment, top of deck, exhaust area, battery, hydraulic lines, fuel line, fuel tank and operator's station clean of accumulated trash, grass clippings, and other debris. Always clean up spilled fuel and oil.**

### Start Engine Safely

- ▲ Avoid possible injury or death from machine runaway.
- ▲ Do not start engine by shorting across starter terminals.
- ▲ Before you start the engine:
  - Stand on the operator's platform.
  - Move the park brake lever to the engaged park brake position.
  - Move the steering control levers to the neutral position.
  - Place the deck clutch switch in the down (deck blades disengaged) position.

### Operate Machine Safely

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- ▲ Refer to the unit's operator's manual for complete safety information on safe machine operation.

- ▲ Always maintain a safe distance from people and pets when mowing.
- ▲ Always be aware of what is behind the machine before backing up.
- ▲ Never leave machine unattended with ignition key in switch, especially with children present.
- ▲ Follow daily and weekly checklists, making sure hoses are tightly secured and bolts are tightened.
- ▲ Always keep engine and machine clean, removing accumulated dirt, trash and other material from machine.
- ▲ Never put hands or feet under any part of the machine while it is running.
- ▲ Never attempt to start engine when there is a strong odor of gasoline fumes present. Locate and correct cause.
- ▲ Keep all safety shields and covers in place, except for servicing.
- ▲ Do not touch hot parts of the machine.

## General Maintenance Precautions

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- ▲ **Repairs or maintenance requiring engine power should be performed by trained maintenance personnel only.**
- ▲ Never run the engine in an enclosed area unless exhaust is vented to the outside. Exhaust gases contain carbon monoxide which is an odorless and deadly poison.
- ▲ Unless specifically required, **DO NOT** have the engine running when servicing or making adjustments to the mower.
  - Park the mower on level ground.
  - Disengage the deck clutch.
  - Place the steering control levers in the neutral position.
  - Place the park brake lever in the engaged park brake position.
  - Lower the deck.
  - Stop the engine.
  - Remove the ignition key.
  - Wait for all movement to stop before adjusting, cleaning or repairing.
  - Disconnect the negative battery cable.
  - Repairs or maintenance requiring engine power should be performed by trained maintenance personnel only.
  - To prevent carbon monoxide poisoning, operate the engine in a well ventilated area only.
  - Read and observe all safety warnings in this manual.
- ▲ Before working on or under the deck, make certain the engine cannot be accidentally started.



- ▲ **Always** keep belt covers on mower deck for safety as well as for cleanliness except when changing or checking the belt.
- ▲ Use a stick or similar instrument to clean under the mower making sure that no part of the body, especially arms and hands are under mower.
- ▲ Keep your machine clean and remove any deposits of trash and clippings, which can cause engine fires and hydraulic overheating as well as excessive belt wear. Clean up oil or fuel spillage. Allow machine to cool before storing.
- ▲ Always wear adequate eye protection when:
  - servicing the hydraulic system.
  - servicing the battery.
  - grinding mower blades and removing accumulated debris.
- ▲ Never attempt to make any adjustments or repairs to the mower drive system, mower deck or any attachment while the engine is running or deck clutch is engaged.
- ▲ Exercise caution when releasing spring tension from any of the belt idlers or when working with any of the deck lift components.
- ▲ 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.
  - The jack stands should not allow the machine to move when the engine is running and the drive wheels are rotating.
  - **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.
- ▲ Do not touch hot parts of machine. Keep nuts and bolts tight, especially the blade attachment bolts. Keep equipment in good working condition.
- ▲ Never tamper with safety devices. Check their proper operation regularly.
- ▲ Exercise caution when working under the deck as the mower blades are extremely sharp. Wrap the blade(s) or wear gloves and use extra caution when servicing them.
- ▲ Use original Hustler® replacement parts or parts that are equivalent in overall performance.
  - The mower may not comply with the appropriate safety standards if aftermarket parts, accessories, or attachments are used.

## Maintenance Precautions

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### Avoid Fire Hazards

- ▲ Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located and how to use them.
- ▲ Provide adequate ventilation when charging batteries.
- ▲ Do not smoke near battery.
- ▲ Never check fuel level with an open flame.
- ▲ Never use an open flame to look for leaks anywhere on the equipment.
- ▲ Never use an open flame as light anywhere on or around the equipment.
- ▲ When preparing engine for storage, remember that fuel stabilizer is volatile and therefore dangerous. Seal and tape openings after adding the inhibitor. Keep container tightly closed when not in use.
- ▲ Inspect electrical wiring for worn or frayed insulation. Install new wiring if wires are damaged.

### Prepare for Emergencies

- ▲ Be prepared if a fire starts.
- ▲ Keep a first aid kit and fire extinguishers available.
- ▲ Keep emergency numbers for doctor, ambulance service, hospital, and fire department near the telephone.

### Prevent Battery Explosions

- ▲ Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.
- ▲ Charge batteries in a well-ventilated open area, away from sparks and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
- ▲ Avoid skin and clothing contact with battery acid.
  - Always wear eye protection when checking the battery. Acid can cause serious injury to skin and eyes. If contact occurs, flush area with clean water and call a physician immediately. Acid will also damage clothing.
  - Do not drink the battery electrolyte.
  - Do not allow open flame near the battery when charging.
  - Hydrogen gas forms inside the battery. This gas is both toxic and flammable and may cause an explosion if exposed to flame. Always **disconnect** the negative (black) battery cable(s) before disconnecting the positive (red) cable(s). Always **connect** the positive (red) battery cable(s) before connecting the negative (black) cable(s).

- Do not overfill the battery.
  - Electrolyte may overflow and damage paint, wiring or structure. When cleaning the battery, use soap and water. Be careful not to get soap and water into the battery. Clean the battery terminals with a solution of four parts water and one part baking soda when they become corroded.
- ▲ Shorts caused by battery terminals or metal tools touching metal mower components can cause sparks. Sparks can cause a battery gas explosion which will result in personal injury.
- Prevent the battery terminals from touching any metal mower parts when removing or installing the battery.
  - Do not allow metal tools to short between the battery terminals and metal mower parts.
- ▲ Incorrect battery cable routing could cause damage to the mower and battery cables. This can cause sparks which can cause a battery gas explosion which will result in personal injury.
- Always **disconnect** the negative (black) battery cable(s) before disconnecting the positive (red) cable(s).
  - Always **connect** the positive (red) battery cable(s) before connecting the negative (black) cable(s).

## Avoid Acid Burns

- ▲ Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing and cause blindness if splashed in eyes.

### Avoid the hazard by:

- Filling batteries in a well-ventilated area.
- Wearing eye protection and rubber gloves.
- Avoiding breathing fumes when electrolyte is added.
- Avoiding spilling or contacting dripped electrolyte.

### If you spill acid on yourself:

- Flush your skin with water.
- Apply baking soda or lime to help neutralize the acid.
- Flush your eyes with water for 10–15 minutes. Get medical attention immediately.

### If acid is swallowed:

- Drink large amounts of water or milk.
- Then drink milk of magnesia, beaten eggs or vegetable oil.
- Get medical attention immediately.

# TORQUE

## Standard Torques

The following chart lists the standard torque values for the threaded 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

Size	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>	45 – 48	61 – 65
Engine pulley mounting bolt <sup>3</sup>	45 – 48	61 – 65
Front wheel axle bolt	Tighten the nut, then back it off until the wheel spins freely	
Wheel motor hub nut	230	312
Hydraulic pump pulley screw	14	19

### NOTES:

- 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 mounting bolt is loosened or removed, **do not re-use**. Replace with a new bolt. Use only hand tools to install this fastener.



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.

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 neutral position and the drive wheels do not rotate.

If this occurs, the steering control linkage may be adjusted as follows:

**WARNING** This procedure will require that the unit be raised and blocked up off of the ground. It is necessary for the wheels to rotate without coming in contact with the floor or any object that would permit the unit to propel itself. Stay clear and exercise caution when rotating wheels to prevent injury. Use only appropriate vehicle stands, with a minimum weight rating of 2000 pounds to block the unit up. Use in pairs only. Follow the instructions supplied with the vehicle stands.

**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. Chock the front tires.
3. Insert a 1/4" pin through the opening in the mower frame and into the steering control lever. This ensures that the steering control lever is in the neutral position. Figure 4-1
4. Start the engine and release the park brake.

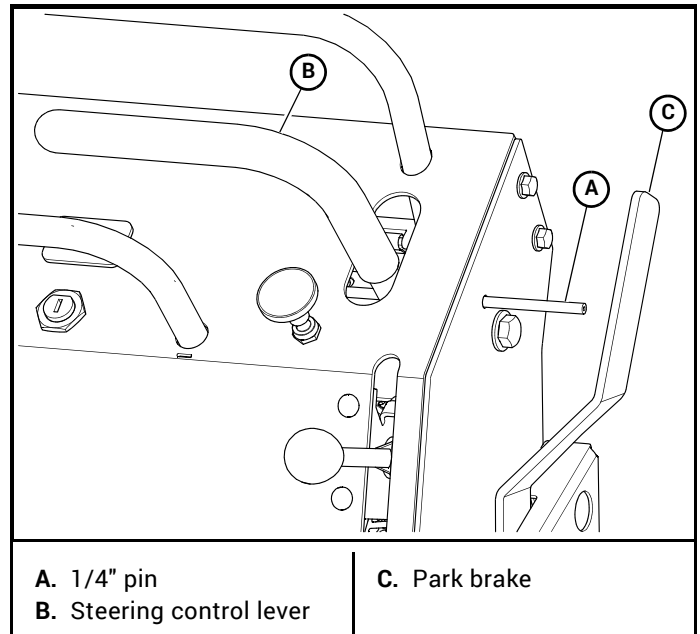


Figure 4-1

5. Observe which way the wheel(s) are rotating. If wheel(s) are rotating forward, adjust with the jam nuts on the upper bulkhead fitting of the cables. Adjust the cable to lengthen the steering control linkage until the wheel(s) come to a stop. Figure 4-2  
Repeat for the opposite side if necessary.
6. If wheel(s) are rotating in reverse adjust the cable to shorten the steering control linkage until the wheel(s) come to a stop. Figure 4-2  
Repeat for the opposite side if necessary.

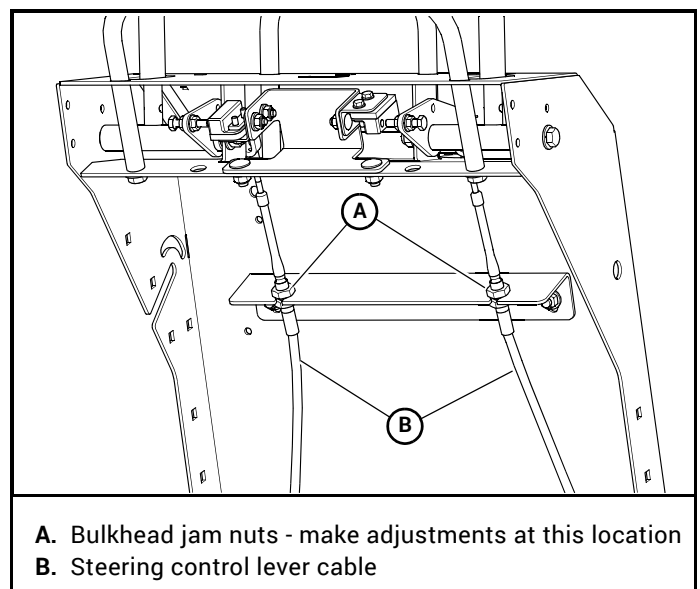


Figure 4-2

7. When both wheels remain in neutral, tighten the bulkhead jam nuts to lock the steering control lever in place.

8. Remove the 1/4" pin that is holding the steering control lever in the neutral position.
9. Check to make sure all tools or obstructions are removed from under the mower.
10. Raise the rear of the mower and remove the jack stands. Lower the mower.

### Steering Control Lever Stops

The steering control lever stops (see Figure 4-4) are designed to keep the pumps from bottoming out internally.

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

This adjustment is only required if the hydraulic pump(s) or pump linkage rod(s) have been replaced.

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

**NOTE:** To make this adjustment the mower engine must **not** be running.

**NOTE:** Neutral adjustment **must** be done before proceeding.

1. Slowly move the steering control levers forward and feel if there is some resistance on the pump control lever before the steering handle stop contacts the steering control lever stop screw.
2. Check one side at a time. If you sense that the pump control lever is stopping the forward motion of the steering control lever, then the steering control lever stop screw needs adjusted.
3. Move the steering control lever forward until the pump lever bottoms out.
4. Loosen the jam nut on the steering control lever stop screw. Figure 4-5
5. Turn the steering control lever stop screw until it makes contact with the steering handle stop. Then, turn it an additional 1/4 turn. Tighten the jam nut. Figure 4-5

6. Repeat for the other side.

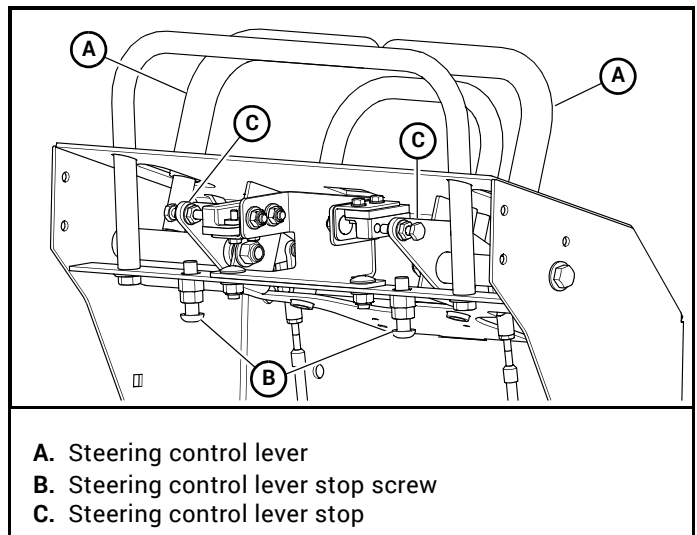


Figure 4-4

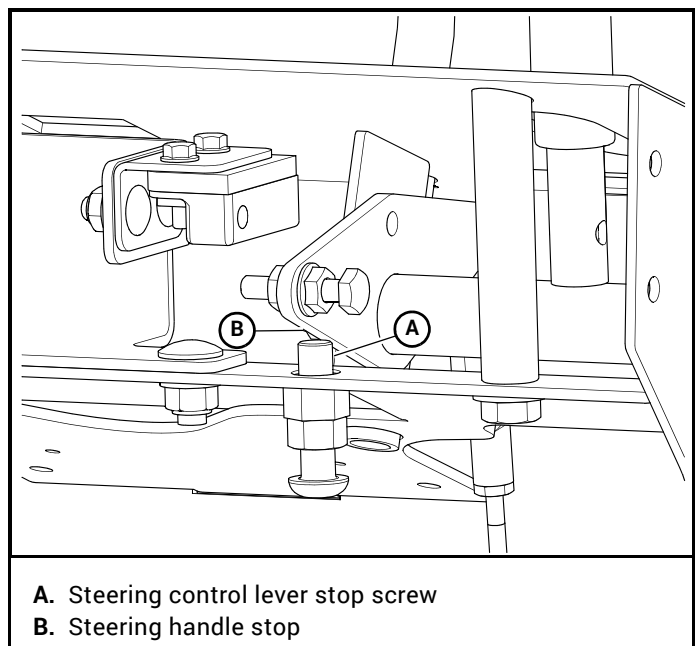


Figure 4-5

### Neutral Switch Adjustment

If the engine **does not** start unless one or both of the steering control levers is moved, then one or both of the neutral switches will need to be adjusted.

When the steering control lever is in the neutral position, the cap screw on the steering control lever should align with the target circle on the neutral switch. If it does not, then the neutral switch will need to be adjusted.

1. Place the steering control lever in the neutral position.

- Loosen the two cap screws that hold the switch. Slide the switch in the slot to move it. Figure 4-6,

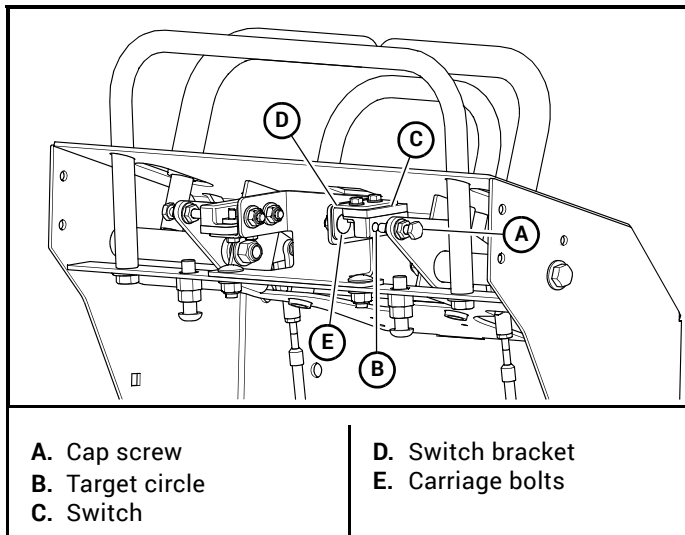


Figure 4-6

- Loosen the nuts on the steering control lever to change the gap as necessary. Tighten nuts.,

**NOTE:** The gap between the end of the cap screw and the target circle surface should be between .120" and .150". **The end of the cap screw and the target surface should not touch.**

- After the cap screw and target circle are aligned tighten all the hardware.
- Repeat the procedure, if necessary, for the opposite switch.

**NOTE:** If the neutral switch is replaced use the .20" spacer that is supplied with the switch.

### Operator Presence Switch Adjustment

The operator presence switch will need to be adjusted if the engine dies when the deck clutch is engaged and while the park brake is disengaged:

- Loosen the hardware holding the operator presence switch in place. Figure 4-7
- Adjust the operator presence switch forwards or backwards as necessary. Figure 4-7

- Tighten the operator presence switch hardware.

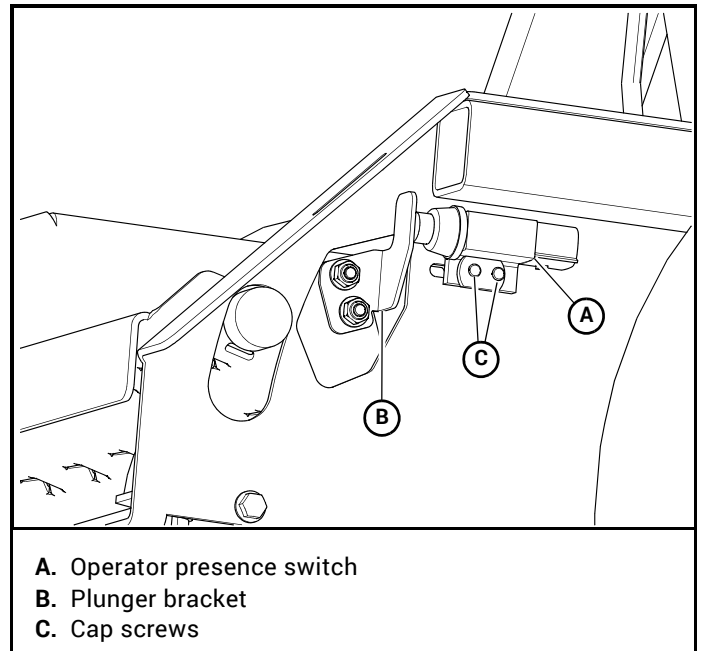


Figure 4-7

### Park Brake

- Release the park brake.
- Loosen the jam nuts to adjust the brake cable to keep the transmission brake levers in the run mode when the brake lever is not in the park position. Figure 4-8, Figure 4-9 & Figure 4-10

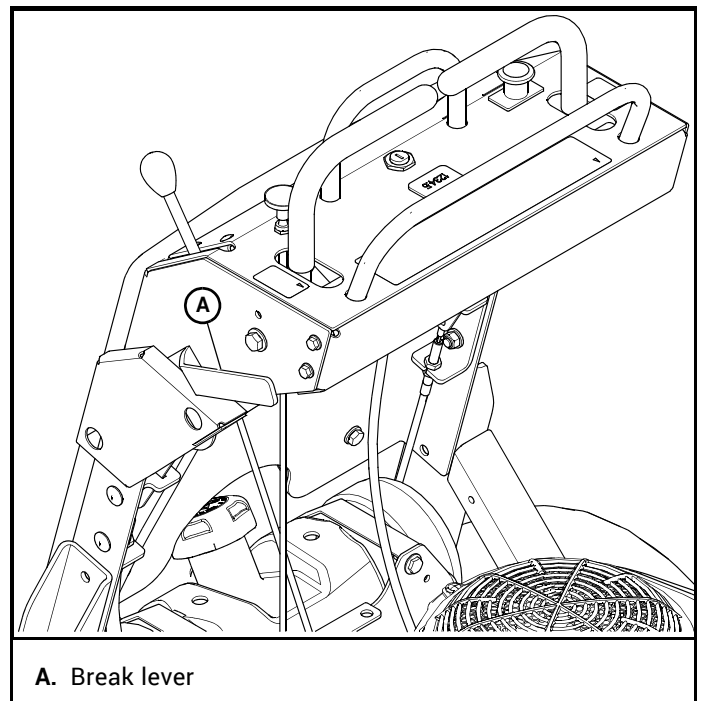


Figure 4-8

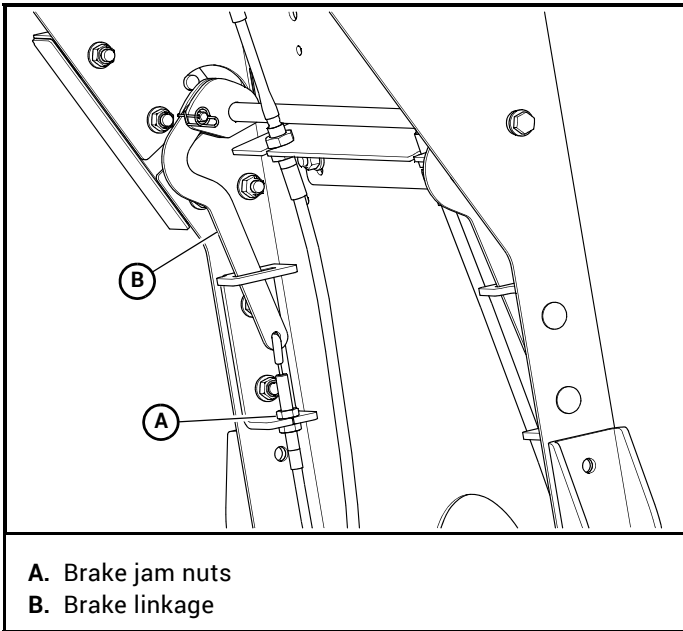


Figure 4-9

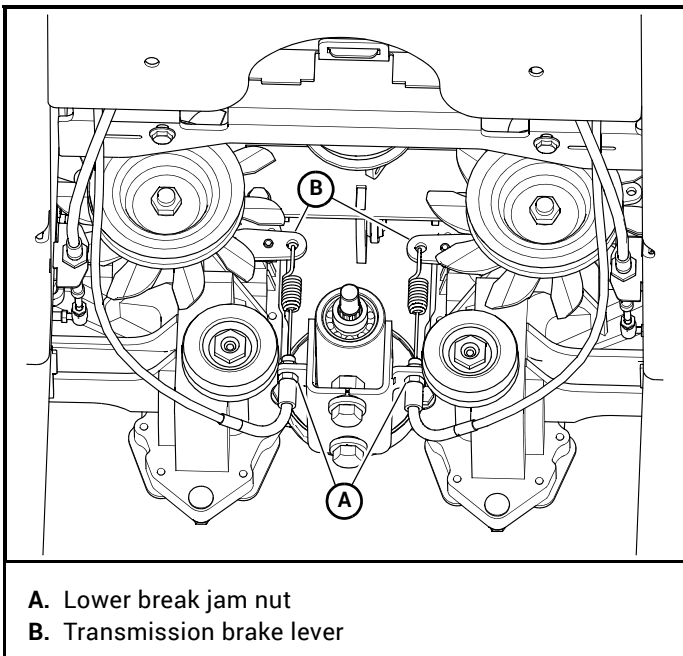


Figure 4-10

### Belts Replacement

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. Adjustment is unnecessary. Figure 4-11

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

**WARNING**

If the pump belt fails, loss of steering control will occur especially when operating on a slope. **If you lose steering control while operating the mower, turn the engine off and, if on a slope, step off of the operator's platform to the uphill side. Inspect the machine and involve your Hustler® Dealer to resolve the problem before continuing to operate.**

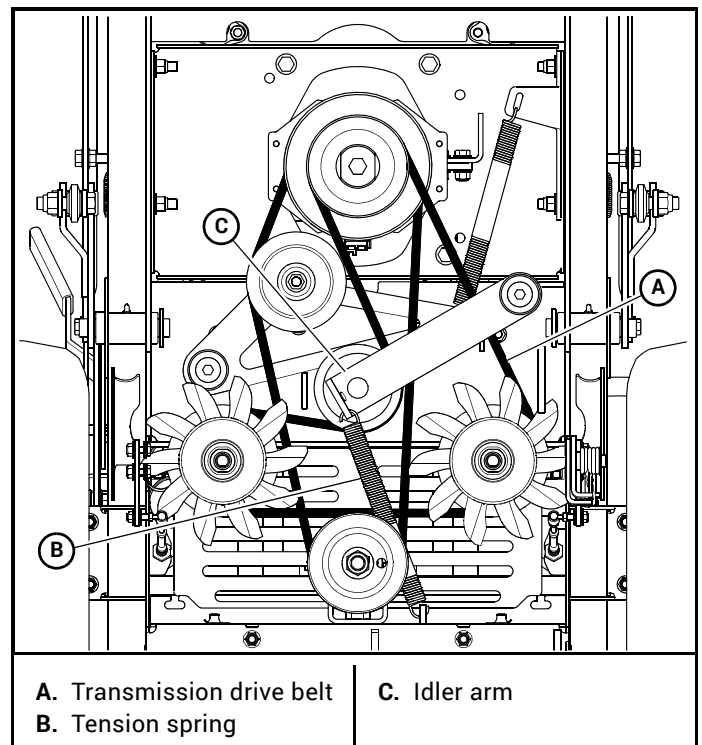
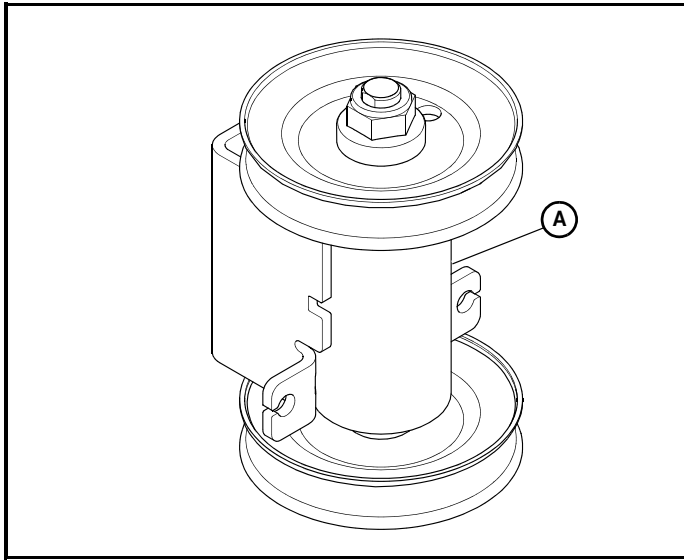


Figure 4-11



## Jackshaft

There is no adjustment to the jackshaft. Replace unit as necessary.



A. Jackshaft assembly

Figure 4-12

## 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)

**Only pneumatic tires are approved for the drive tires on this mower.** Warranty claims will be denied on any mower equipped with non-pneumatic tires.



# 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 this manual for engine servicing, lubricating oil levels with quality and viscosity recommendations, bolt torques, etc. The engine warranty is backed by the engine manufacturer. Special attention should be paid to applicable data which will not be duplicated here.

## Engine Oil and Filter



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 the engine oil daily and after every 4 hours of operation. The mower must be level when checking the oil. Refer to the *Engine Owner's Manual* and maintenance schedule for oil recommendation and capacities. Hustler® Engine Oil is recommended.

Change the engine oil and filter after the first 5 hours of operation and per the engine manufacturer's recommendations after that. Change the engine oil more frequently if operating in extremely dirty conditions.

**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:

1. Locate the oil drain valve on the lower right side of the engine. Figure 5-1
2. Locate the oil drain hose that was supplied with the machine. Be sure to clean and clear it of debris that might block the flow of the engine oil. Figure 5-1
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 forward and down in front of the right side transmission so that it can drain into a suitable oil drain container.
5. With the hose in position, 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.
6. After oil is drained, close the valve by turning it in the clockwise direction until it is fully closed.
7. 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, muffler, and exhaust system before operating the machine.

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

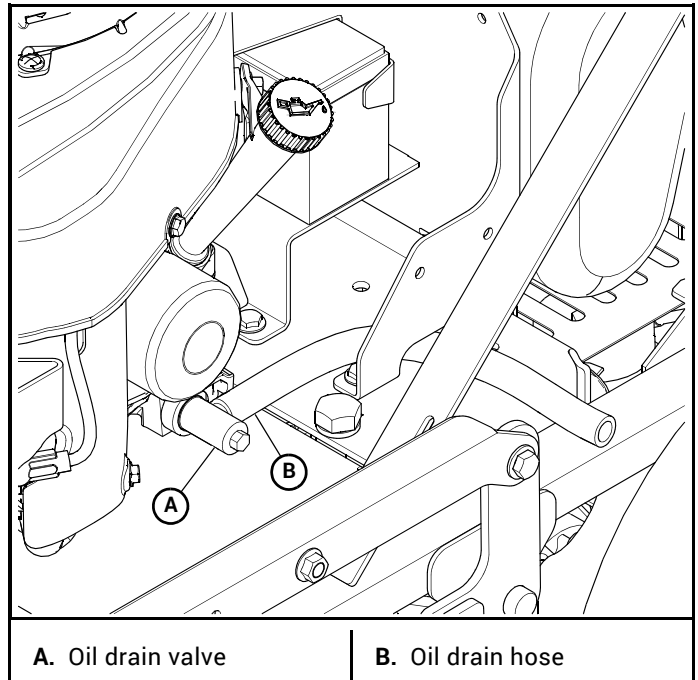


Figure 5-1

## Engine Air Filter

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

## 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. The high idle speeds should be set as follows:

Kawasaki FR541	
ENGINE SPEED	
MODEL NO.	HIGH IDLE
Model NO.	3200 ± 50 rpm

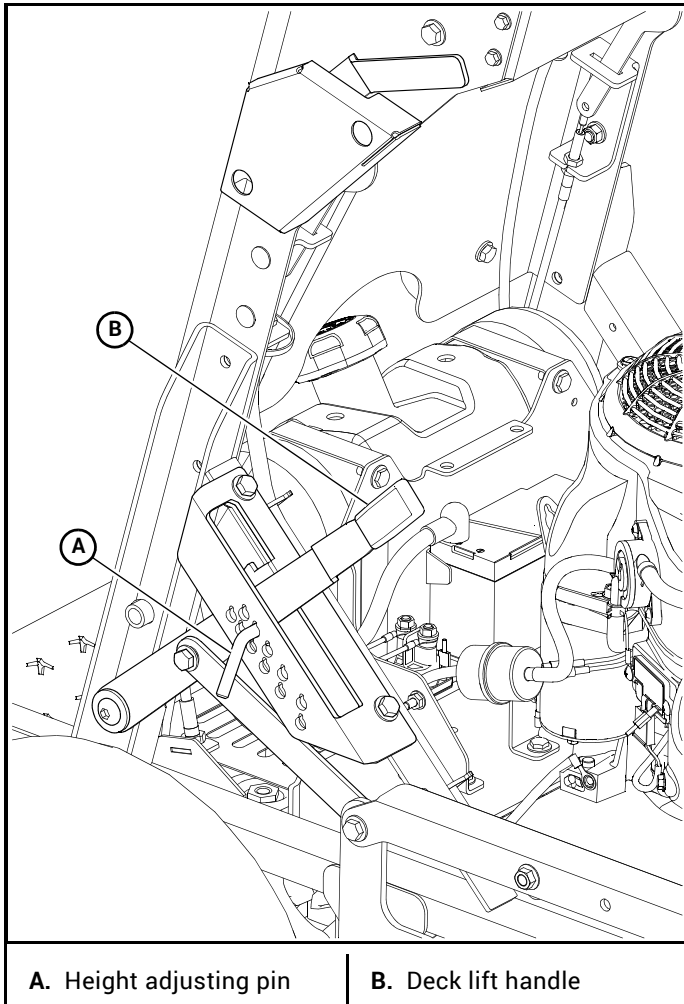
**NOTE:** Model numbers may or may not end with an extension after the number.

**Example:** 922222 (no extension)

# DECK ADJUSTMENTS

## Deck Leveling

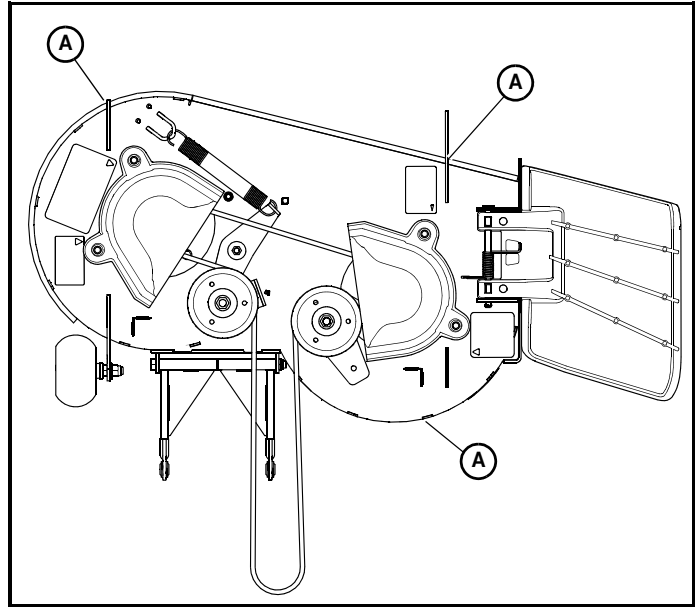
1. Before proceeding:
  - Park the mower on level ground
  - Disengage the deck clutch.
  - Place the steering control levers in the park brake position.
  - Stop the engine.
  - Remove the ignition key.
  - Make sure the blades are stopped before leaving seat.
  - Disconnect the negative battery cable.
2. Check tire pressures (8–12 psi) to make certain the tires are properly inflated before starting to level deck.
3. Raise and place the deck cutting height pin in the 3.25" position. Figure 6-1



**A.** Height adjusting pin      **B.** Deck lift handle

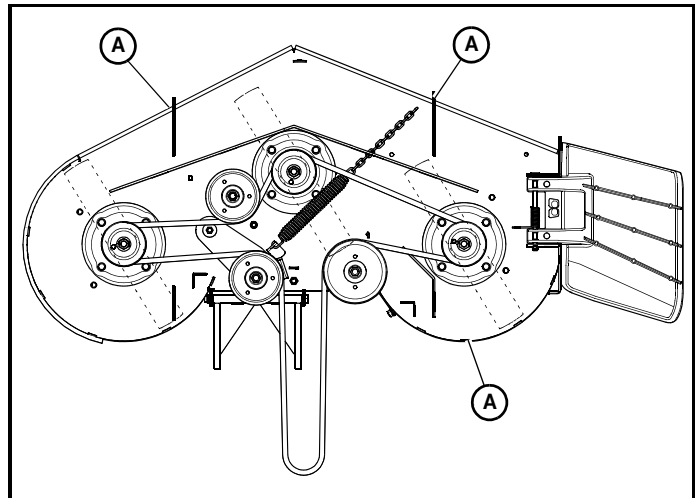
**Figure 6-1**

4. Insert the 3.00" deck leveling blocks in the 3 locations shown in Figure 6-2 or Figure 6-3.



**A.** Place 3" block here

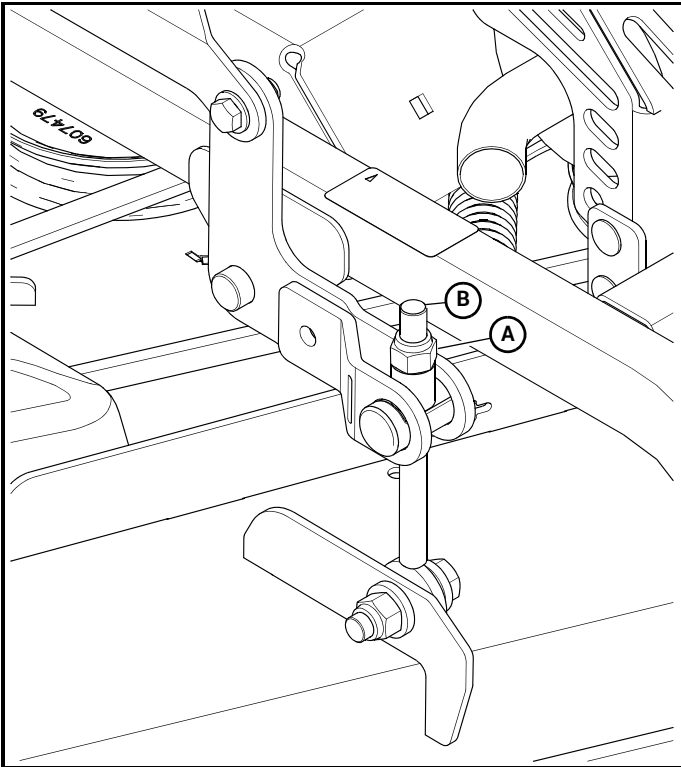
**Figure 6-2**



**A.** Place 3" block here

**Figure 6-3**

5. Lower the deck until it is sitting on the three deck leveling blocks. Make sure that all the deck lift hangers are loose.
6. Adjust the three (3) deck leveling nuts at the three (3) locations with the deck leveling blocks until the deck starts to lift off the blocks. Figure 6-4
7. Adjust the rear right side deck leveling nut until all the slack is removed in the deck lift hanger.
8. Raise the deck and remove the blocks.



A. Deck leveling nut

B. Rod end

Figure 6-4

## Blades

### Mower Blade Maintenance

Refer to the *Mower Blade Replacement* section for blade removal and installation.

Check the mower blades daily as they 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.



Never attempt to straighten a bent blade by heating, or weld a cracked or broken blade as the blade may break and cause serious injury. Replace worn or damaged blades.



Repairs or maintenance requiring engine power should be performed by trained maintenance personnel only.

Unless specifically required, **DO NOT** have the engine running when servicing or making adjustments to the mower.

- Park the mower on level ground
- Disengage the deck clutch.
- Place the steering control levers in the park brake position.
- Lower the deck.
- Stop the engine.
- Remove the ignition key.
- Disconnect the negative battery cable.
- Block up mower when you **must** work under it.

**Always check for blade damage** if mower strikes a rock, branch or other foreign object during mowing!



Always wear adequate eye protection when grinding mower blades.



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

Sharpen the blades on a grinder following pattern as shown (Figure 6-5). Touch-up sharpening can be done with a file.

After grinding the blades, check for balance. Blade balancing can be done by placing the blade on an inverted line punch or 5/8" 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 (Figure 6-6 & Figure 6-7). Replace any distorted blade.

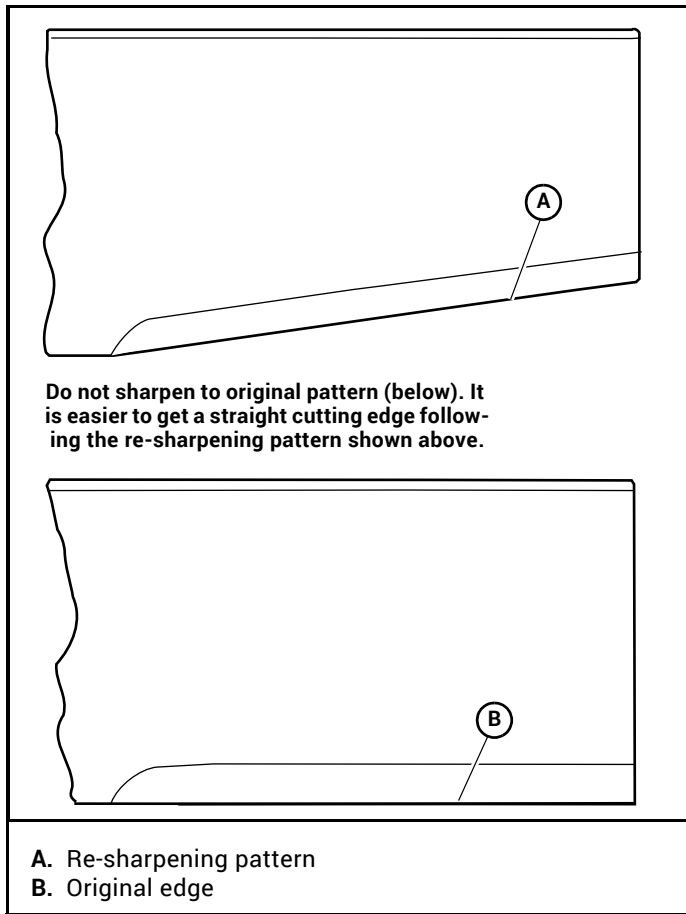


Figure 6-5

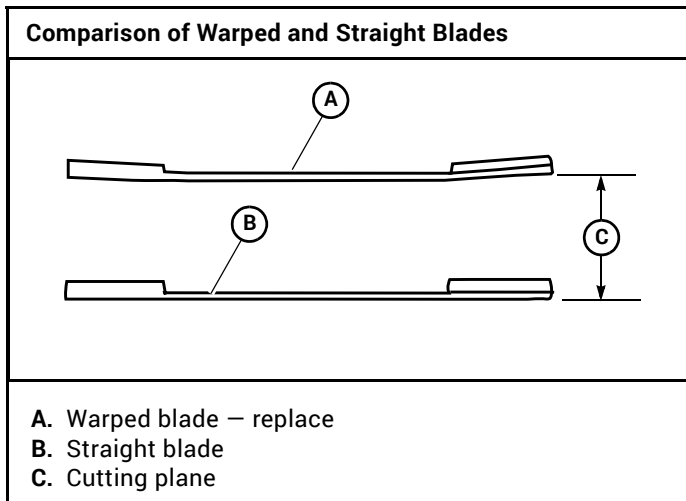


Figure 6-6

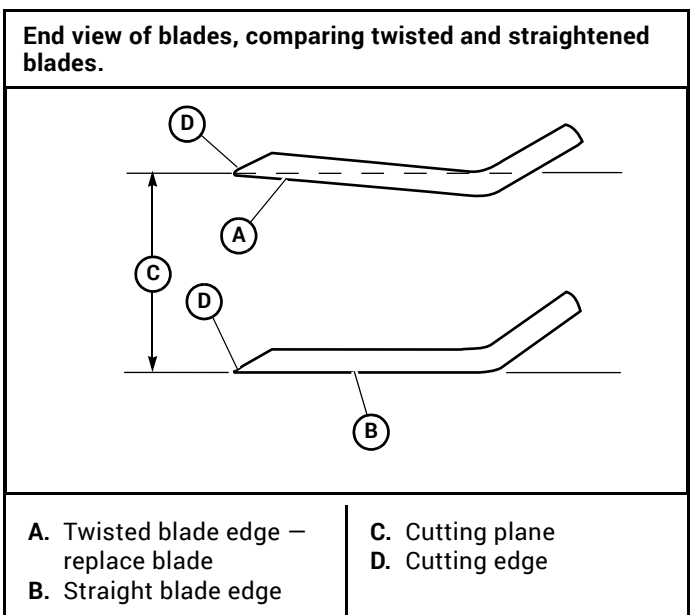


Figure 6-7

### Mower Blade Replacement

**WARNING** This procedure will require that the mower be raised and blocked up off of the ground. Never work under the machine or attachment unless it is safely supported with jack stands.

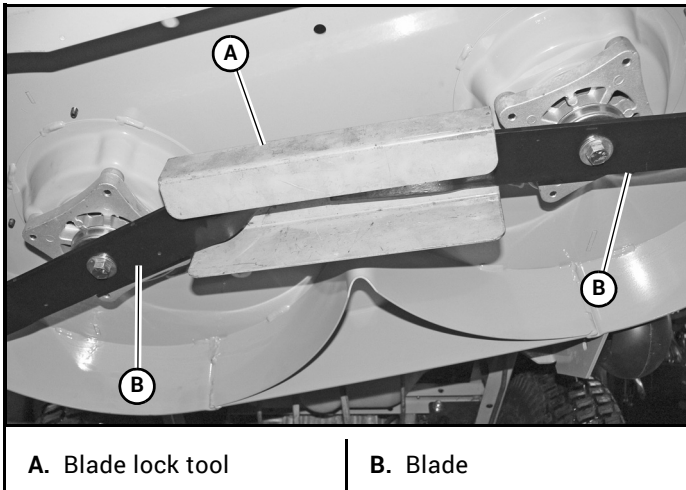
- Make certain machine is secure when it is raised and placed on the jack stands.
- **Use only certified jack stands.** Use only appropriate jack stands, with a minimum weight rating of 2000 pounds (907 kg) to block the unit up.
- Use in pairs only.
- Follow the instructions supplied with the jack stands.

1. Before proceeding:
  - Park the mower on level ground
  - Disengage the deck clutch.
  - Place the steering control levers in the park brake position.
  - Lower the deck.
  - Stop the engine.
  - Remove the ignition key.
  - Make sure the blades are stopped before leaving seat.
  - Disconnect the negative battery cable.
2. Raise the front of the unit and block with certified jack stands. This allows easier access to the blades under the deck.

3. Install a blade lock tool (Excel part number 381442) over the two blades to prevent them from rotating. Figure 6-8

**WARNING** ⚠ Never work with blades while engine is running or deck clutch is engaged. Always place deck clutch in the disengaged position, engage control levers in the park brake position and turn engine off. Block up mower when you must work under it. Wear gloves when handling blades. Always check for blade damage if mower strikes a rock, branch or other foreign

**WARNING** ⚠ Exercise caution when working under the deck as the mower blades are extremely sharp. Wearing gloves is advisable when working around or with the blades.



**Figure 6-8**

4. Use a 5/8" wrench to remove the 7/16" cap screw holding the blade to the spindle shaft. Figure 6-9

**NOTE:** Only remove and install one blade at a time when using the blade lock tool (381442) as it requires two blades to work properly.

5. Inspect the blade for damage. If the blade is damaged, replace it. If the blade is not damaged, either sharpen it or replace it with a new blade or another sharpened used blade.

**WARNING** ⚠ Never attempt to straighten a bent blade by heating, or weld a cracked or broken blade as the blade may break and cause serious injury.

6. If sharpening the blade, refer to the *Mower blade maintenance* section for proper sharpening procedures.
7. The spindles have a 5/8" diameter boss that centers the blades on the spindles. When re-installing blades, ensure that the blade is centered on the boss and seated flat against the spindle shaft face. Figure 6-9
8. When attaching the blade to the spindle shaft do not re-use spindle bolts which have stripped, worn or undercut threads. Torque bolts on spindles to 48 ft-lbs (65.14 N•m) when reinstalling blades.

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

**WARNING** ⚠ Rotate the blades after installation to ensure blade tips do not touch each other or sides of the mower.

9. Remove the blade lock.
10. Raise the front of the mower and remove the jack stands.
11. Lower the mower.
12. Reconnect the negative battery cable.



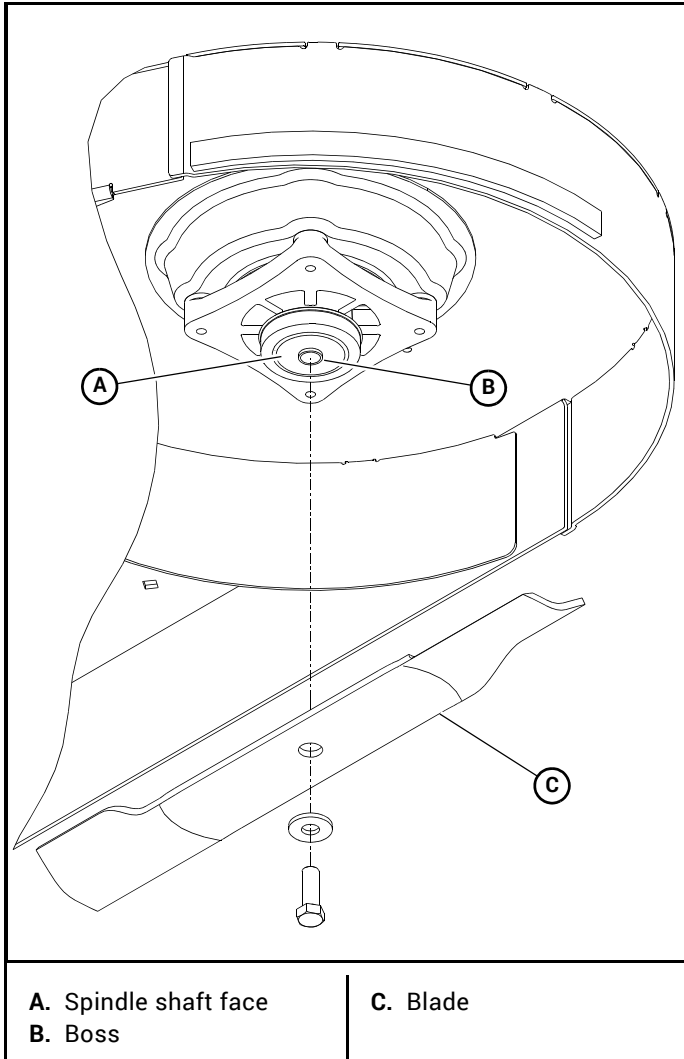


Figure 6-9

### Deck Belt

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. There is no tension adjustment of this belt. Figure 6-10

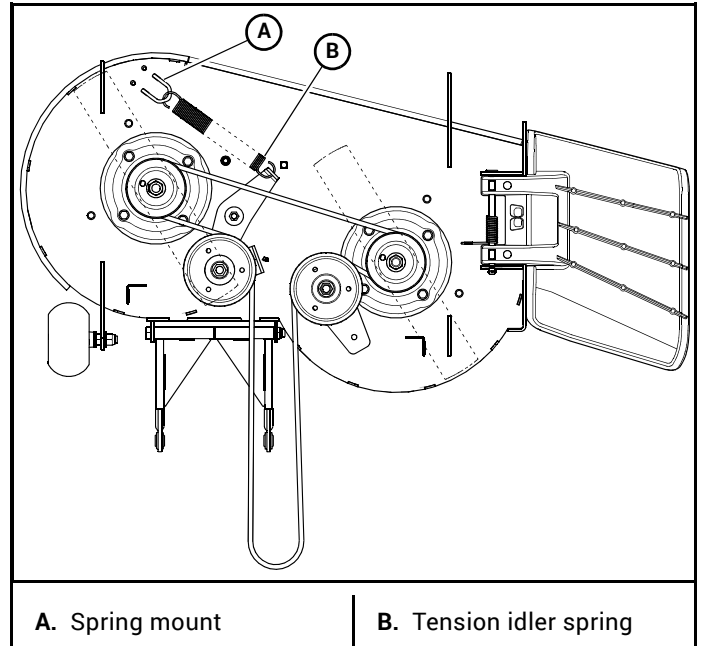


Figure 6-10

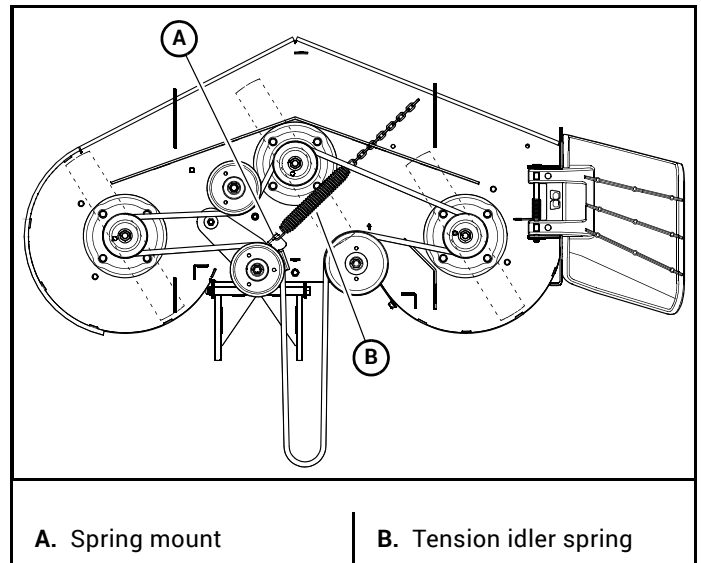


Figure 6-11

## Deck Belt Replacement

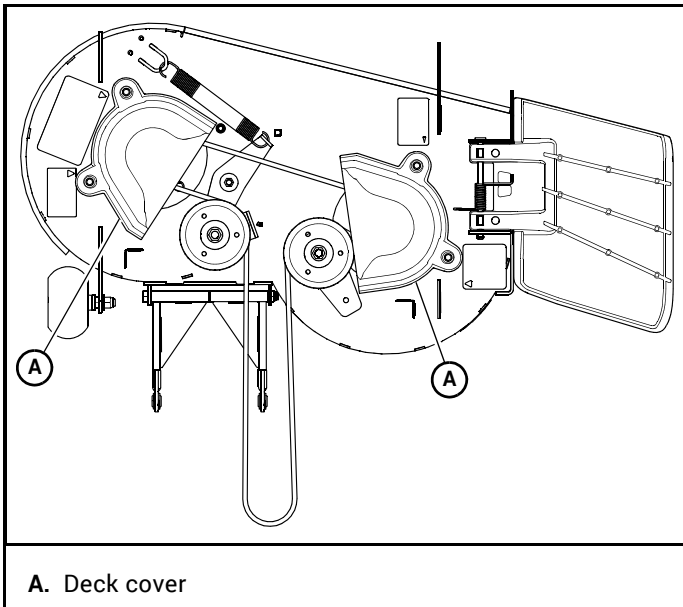
**WARNING** ⚠

Allow the engine and muffler to cool before proceeding with the following procedure.

**WARNING** ⚠

Exercise caution when releasing spring tension from the belt idler.

1. Before proceeding:
  - 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.
  - Make sure the blades are stopped before leaving seat.
  - Disconnect the negative battery cable.
2. Lower the deck to the lowest setting.
3. Remove the deck covers. Figure 6-12

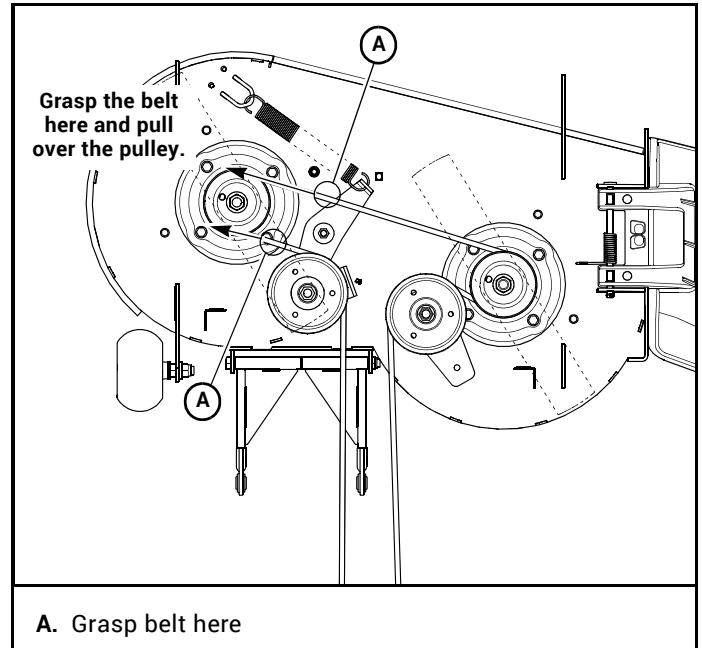


A. Deck cover

Figure 6-12

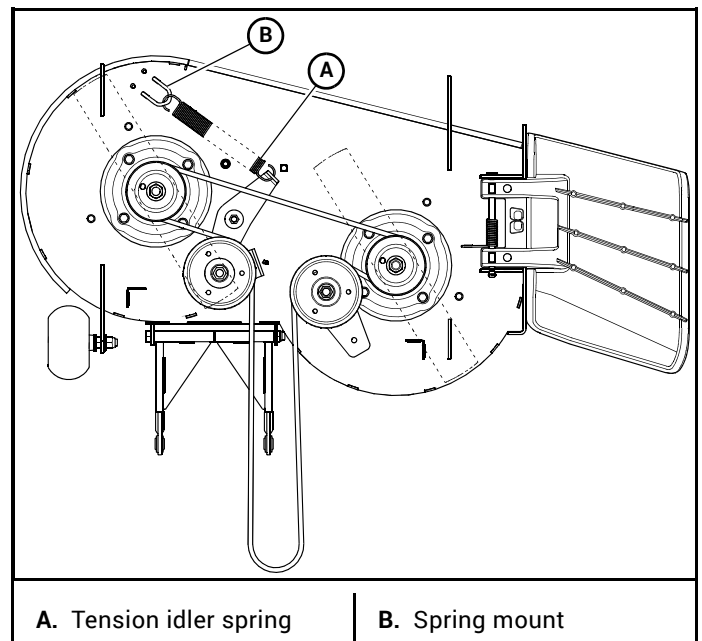
4. Release the tension from the deck drive belt by grasping the belt at the two locations shown and pulling the belt over the left spindle pulley. Figure 6-13

**NOTE:** The spring and spring mount will become loose and can become misplaced. Set these aside after removal for easier access upon re-assembly. Figure 6-14



A. Grasp belt here

Figure 6-13



A. Tension idler spring

B. Spring mount

Figure 6-14

5. Remove the deck drive belt from the deck spindle pulleys and idler pulley.
6. Remove the deck drive belt from the electric clutch pulley located on the engine shaft. Figure 6-15
7. Route the new deck drive belt around all the pulleys except the left deck spindle.
8. Grasp the belt at the two locations shown and pull the belt over the left spindle pulley. Figure 6-13

9. Release the belt.

**WARNING** ⚠

Keep hands clear when pulling belt over the pulley to prevent pinching. **Do not** get hand or fingers between pulley and belt.

10. Re-install the deck covers. Figure 6-12

11. Reconnect the negative battery cable.

**WARNING** ⚠

Never operate the mower without the deck covers in place.

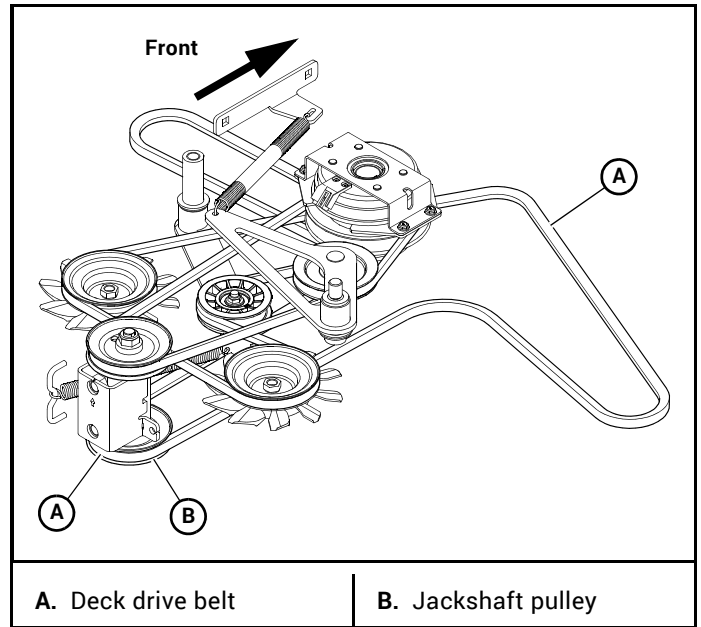


Figure 6-15

The following notes are the same for all decks.

1. There is no tension adjustment of this belt.
2. Route belt as shown.

### 34"/42" Deck Belt Routing

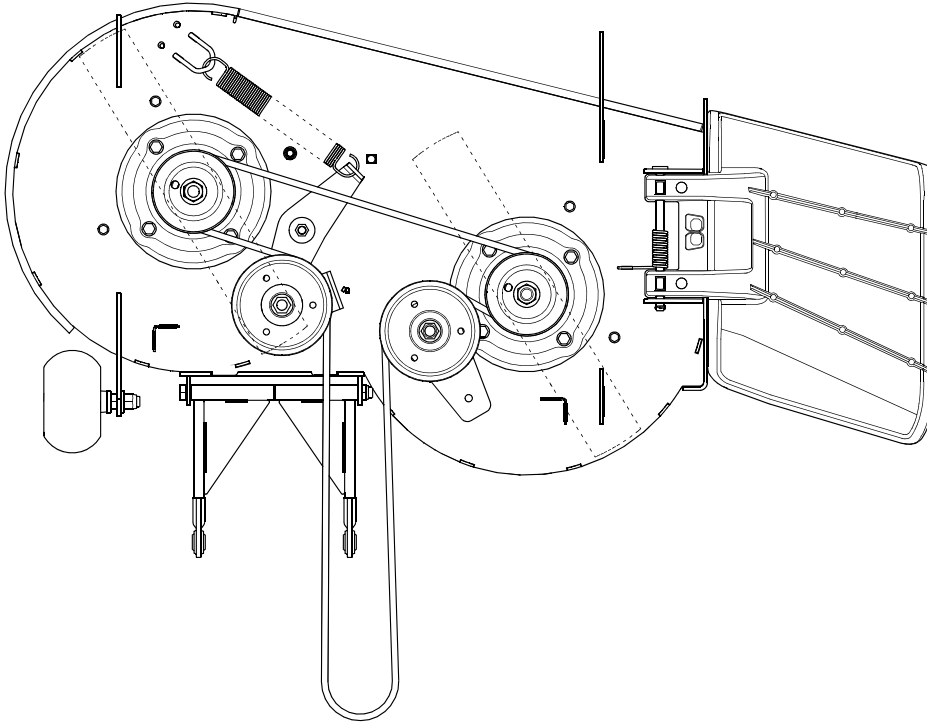


Figure 6-16

### 48" Deck Belt Routing

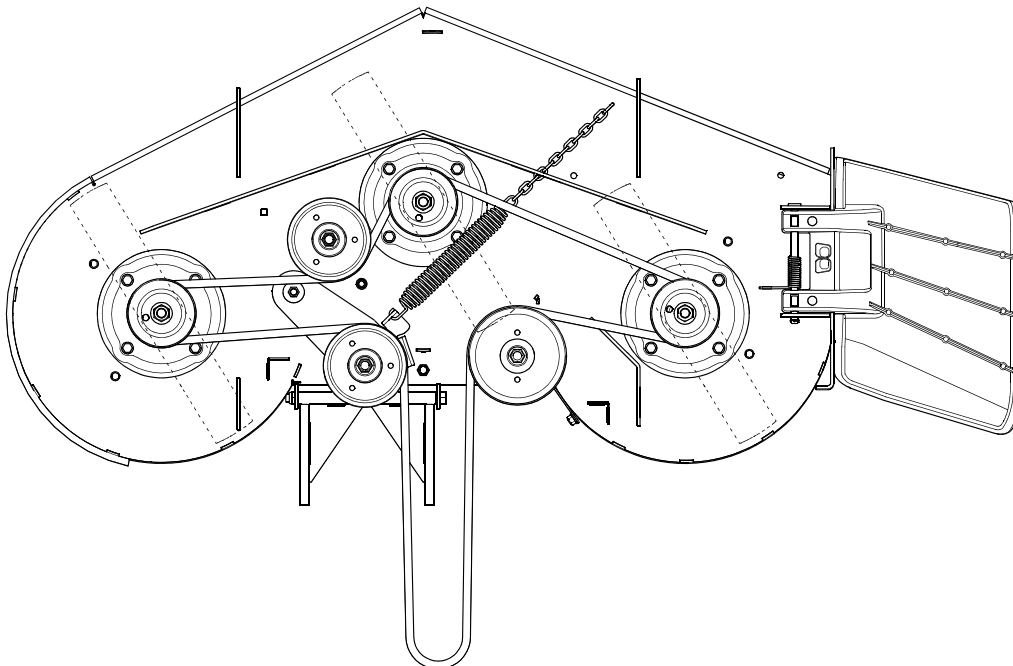
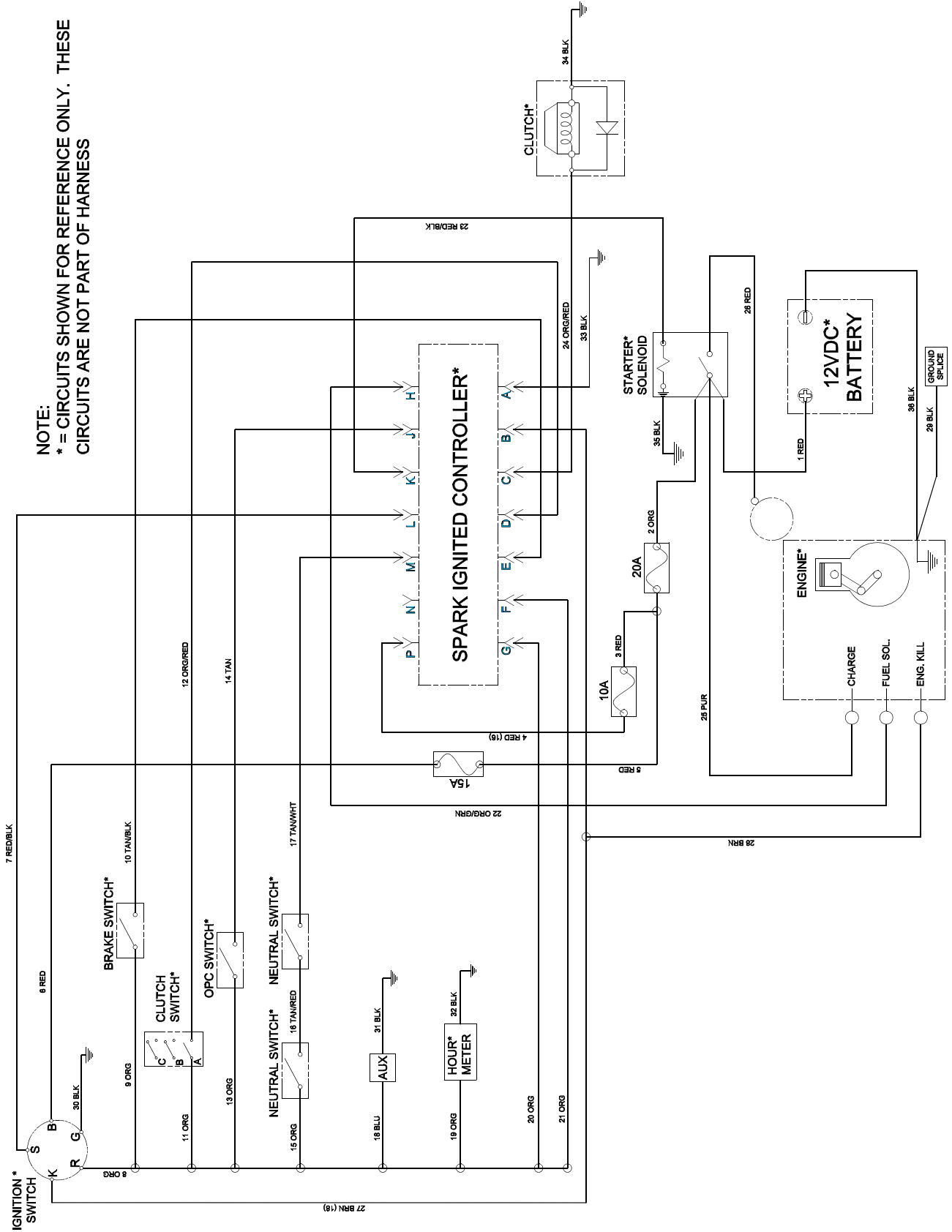


Figure 6-17

# ELECTRICAL

## Electrical Schematic





# MAINTENANCE

<b>Maintenance Schedule</b>		
<b>Refer to Figure 8-1, Figure 8-2, Figure 8-3, and Figure 8-4</b>		
SERVICE AT INTERVALS INDICATED	WEEKLY OR 40 HOURS	* ANNUALLY OR 100 HOURS
Verify safety start interlock system	Prior to each use	
Visually inspect unit for loose hardware and/or damaged parts	Prior to each use	
Visually inspect tires	Prior to each use	
Check oil level, engine (1)	Prior to each use or every 4 hours	
Clean air intake screen (7)	Prior to each use or every 4 hours	
Check fuel level	Prior to each use	
Blades - sharpen & securely fastened	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	
Clean engine and transmission compartment	After each use	
Replace engine air cleaner element (4) (7)	As needed	
Change engine oil & filter (1)	X	
Clean cylinder and head fins (7)	X	
Check battery connections	X	
Clean engine exterior (7)	X	
Tighten wheel axle bolts (2)	X	
Clean & gap spark plugs (8)		X
Check transmission & deck belt tension and condition (4)		X
Check fuel system (5)		X
Change fuel filter (6)		X
Replace spark plugs (7)		X

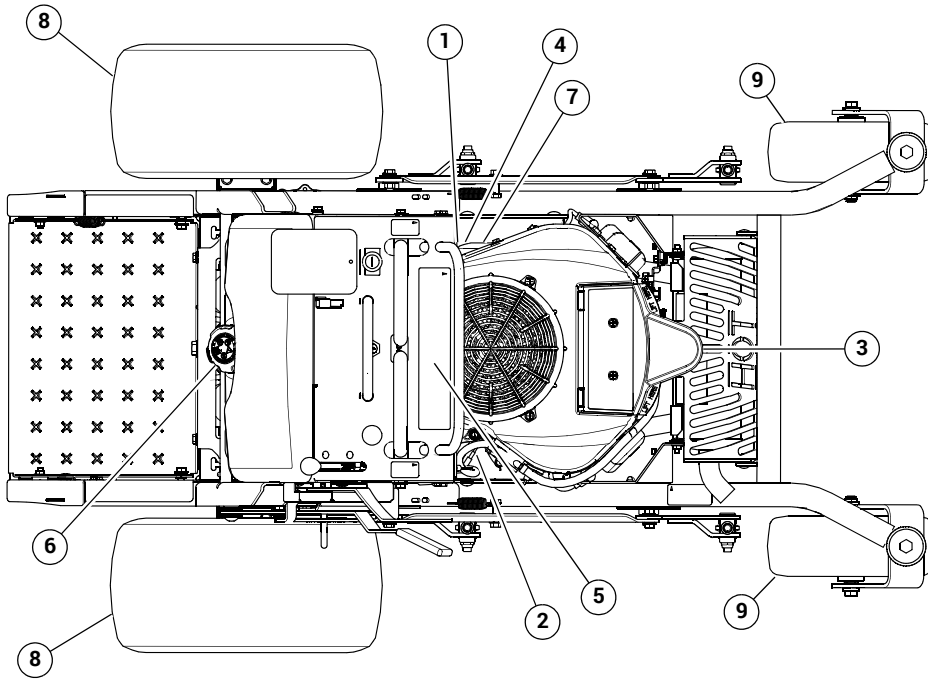
**NOTES:**

1. Initial engine oil change is after 5 hours of operation. Thereafter, change oil after every 40 hours operation. Change more often under dusty or dirty conditions and during hot weather periods. Hustler® Engine Oil is recommended.
2. Torque initially and after first 2 hours of operation.
3. Change engine oil filter per the engine manufacturer's recommendations. Refer to Engine Owner's Manual for recommendations and other maintenance items.
4. Service more often under dusty or dirty conditions. Use caution when servicing to prevent dust contamination in the engine. **Do not** clean filter element. Replace with a new one.
5. **Transmission drive belt only - Inspect every month** and replace if worn or cracking is noticed. Otherwise, **replace every 2 years**.
6. Check fuel system for any cracks or leaks including, but not limited to, fuel line, fuel tank, cap, and fittings. Replace as needed.
7. More often under dusty or dirty conditions and during hot weather.
8. Refer to engine owner's manual for engine service information.

\* After completing maintenance cycle (100 hours), repeat cycle.

# Maintenance Locator Chart

Kawasaki Engine FS541V



1. Engine Oil Fill & Dipstick
2. Fuel Filter
3. Engine Air Cleaner
4. Engine Oil Drain Valve
5. Battery
6. Fuel Tank
7. Engine Oil Filter
8. Drive Tire
9. Front Wheel Tires
10. Pump Belt
11. Deck Belt
12. Blades
13. Jackshaft Belt

Figure 8-1

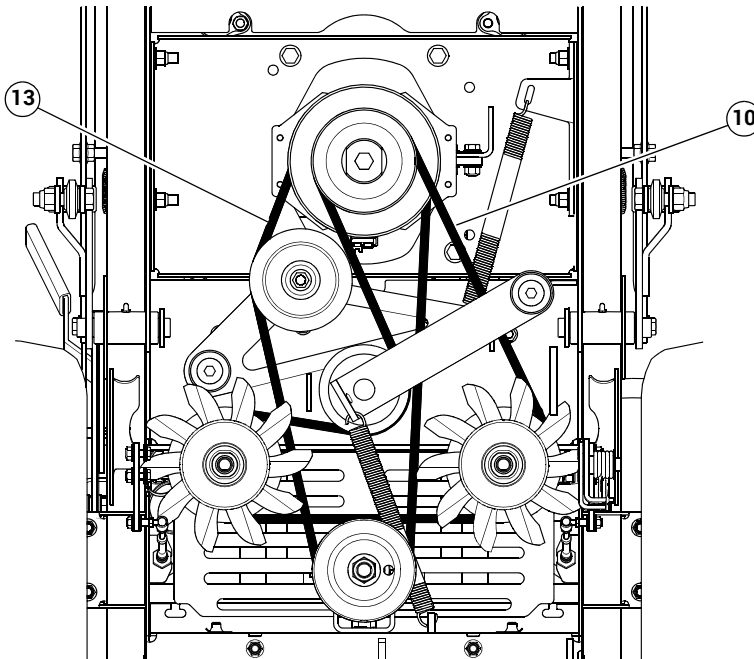
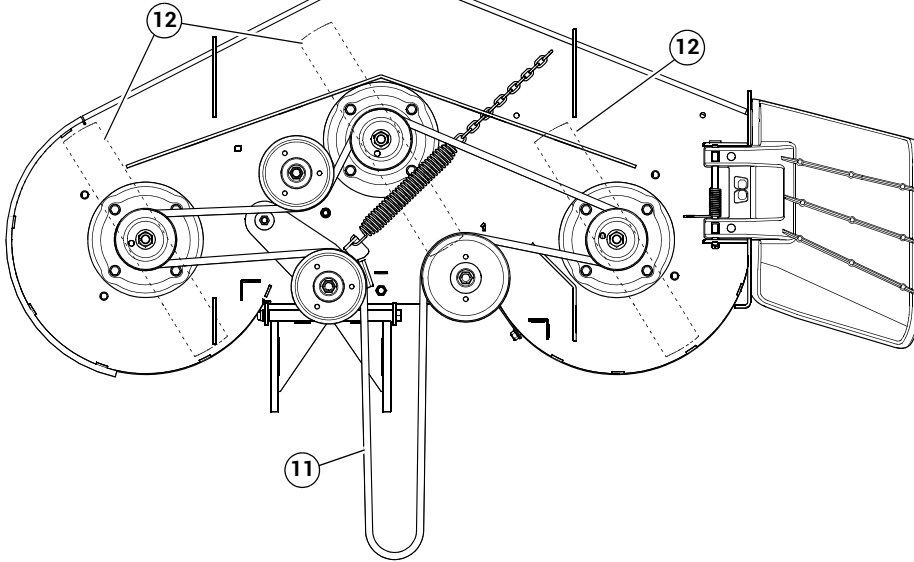


Figure 8-2



Figure 8-3

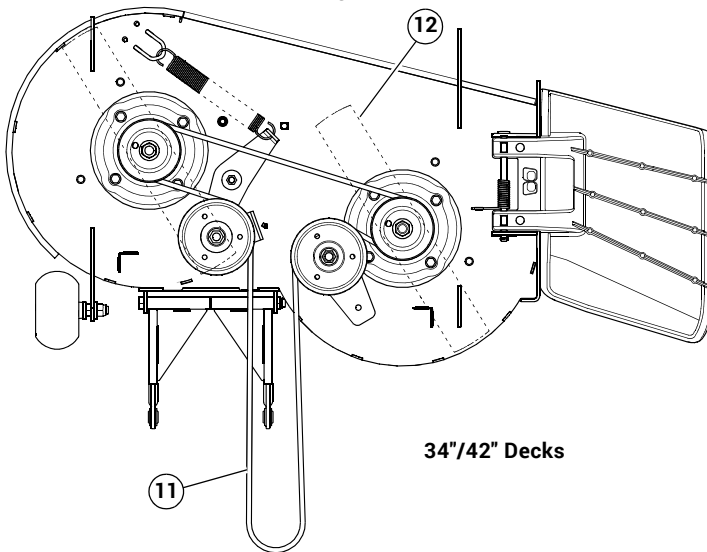
48" Decks



1. Engine Oil Fill & Dipstick
2. Fuel Filter
3. Engine Air Cleaner
4. Engine Oil Drain Valve
5. Battery
6. Fuel Tank
7. Engine Oil Filter
8. Drive Tire
9. Front Wheel Tires
10. Pump Belt
11. Deck Belt
12. Blades
13. Jackshaft Belt

Figure 8-4

34"/42" Decks





# 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
	Master in-line fuse (15 amp) is blown	Replace the master in-line 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)
	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 is not on (if equipped)	Move the choke control 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
	Poor compression	Contact 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
	For additional causes	See engine manual
Air cooled engine overheating	Air intake screen or cooling fins clogged	Clean screen and fins
	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
	Loose steering linkage	Tighten linkage
	Transaxle component faulty	Contact your Dealer

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
	Brake cable is damaged or worn	Replace brake cable
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	Install a new deck drive belt
	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 15 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</i> section of the General Service Manual
	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	



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