



GREAT DANE®

Chariot

**GCBR2652S, GCBR2661S, GCKA1948S,
GCKA1952S, GCBV2348S, GCBV2361S,
GCKH2348S, GCKH2352S, GCKH2361S**



OPERATOR'S MANUAL

200964 06/17/2007

INTRODUCTION



WARNING: The Engine Exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

California Proposition 65 Warning

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Introduction

Using Your Operator's Manual

This manual is an important part of your machine and should remain with the machine when you sell it.

Use the safety and operating information in the machine operator's manual to operate and service the machine safely and correctly.

An engine manufacturer's owner's manual has been provided with your machine. This will provide maintenance and troubleshooting information for the engine installed in your machine.

Specifications and design are subject to change without notice.

Special Messages

Your manual contains special messages to bring attention to potential safety concerns, machine damage as well as helpful operating and servicing information. Please read all the information carefully to avoid injury and machine damage.



CAUTION: Avoid injury! This symbol and text highlight potential hazards or death to the operator or bystanders that may occur if the hazards or procedures are ignored.

IMPORTANT: Avoid damage! This text is used to tell the operator of actions or conditions that might result in damage to the machine.

NOTE: General information is given throughout the manual that may help the operator in the operation or service of the machine.

Product Identification

Record Identification Numbers

Chariot

GCBR2652S	S/N 637910001
GCBR2661S	S/N 638910001
GCBV2348S	S/N 638510001
GCBV2361S	S/N 639610001
GCKA1948S	S/N 638710001
GCKA1952S	S/N 638810001
GCKH2348S	S/N 641010001
GCKH2352S	S/N 641110001
GCKH2361S	S/N 641210001

If you need to contact an Authorized Service Center for information on servicing, always provide the product model and serial numbers.

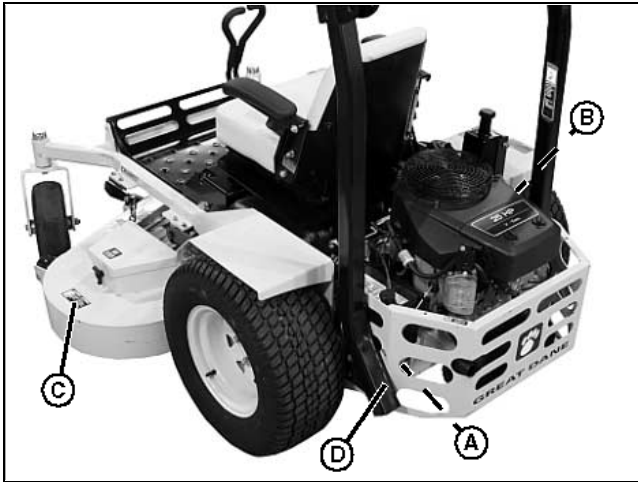
You will need to locate the model and serial numbers for the machine and for the engine of your machine and record the information in the spaces provided.

DATE OF PURCHASE:

DEALER NAME:

DEALER PHONE:

SAFETY LABELS



MODEL NUMBER (POWER UNIT) (A):

SERIAL NUMBER (POWER UNIT) (A):

ENGINE MODEL NUMBER(B):

ENGINE SERIAL NUMBER (B):

ENGINE SPECIFICATION NUMBER (B):

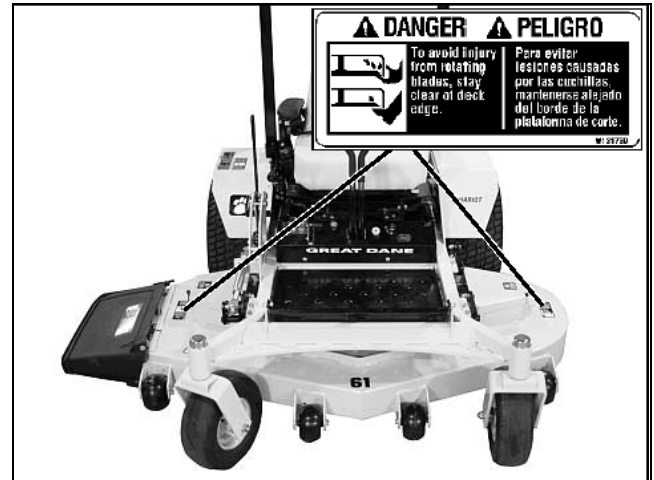
MOWER DECK MODEL NUMBER (C):

MOWER DECK SERIAL NUMBER (C):

ROPS SERIAL NUMBER (D):

The operator's manual also explains any potential safety hazards whenever necessary in special safety messages that are identified with the word, CAUTION, and the safety-alert symbol.

DANGER



To avoid injury from rotating blades, stay clear of deck edge.

Safety Labels

Understanding The Machine Safety Labels



The machine safety labels shown in this section are placed in important areas on your machine to draw attention to potential safety hazards.

On your machine safety labels, the words DANGER, WARNING, and CAUTION are used with this safety-alert symbol. DANGER identifies the most serious hazards.

SAFETY LABELS

DANGER



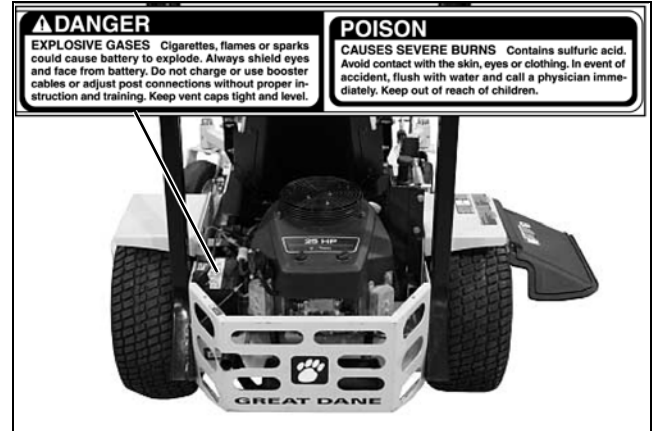
Do not mow without discharge chute or entire grass catcher in place.

DANGER



To avoid injury from rotating blades and thrown objects, stay clear of deck edge and keep others away. Do not mow without discharge chute or entire grass catcher in place.

DANGER



- Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training.
- Contains sulfuric acid. Avoid contact with the skin, eyes or clothing. In event of accident, flush with water and call a physician immediately. Keep out of reach of children.

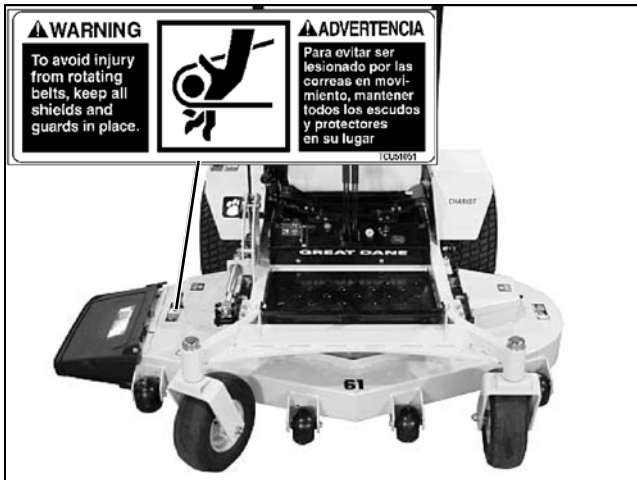
WARNING



To avoid injury from tipover, drive across slopes, not up and down. If machine stops going uphill, stop blades and back down slowly.

SAFETY LABELS

WARNING



To avoid injury from rotating belts, keep all shields and guards in place.

WARNING



Hot surface

CAUTION



- Operator training required

- Read operator's manual
- Keep shields in place
- Never carry riders
- Keep people a safe distance away
- Maintain all safety devices
- Before leaving machine:
 - Stop engine
 - Set park brake
 - Remove key

WARNING



AVOID CRUSHING

- Keep Rollover Protective Structure fully extended
- Do not jump if machine tips
- Use seat belt

When Structure must be down

- DO NOT use seat belt
- Drive with extra care

WARNING



Seat belts are not to be mounted in this hole, because seat will not meet SAE J386 test requirements. Failure to comply with warning could cause serious injury or death.

SAFETY

Emission Control System Certification Label

NOTE: Tampering with emission controls and components by unauthorized personnel may result in severe fines or penalties. Emission controls and components can only be adjusted by EPA and/or CARB authorized service centers. Contact your Great Dane Equipment Retailer concerning emission controls and component questions.

The presence of an emissions label signifies that the engine has been certified with the United States Environmental Protection Agency (EPA) and/or California Air Resources Board (CARB).

The emissions warranty applies only to those engines marketed by Great Dane that have been certified by the EPA and/or CARB; and used in the United States and Canada in off-road mobile equipment.

Emission Compliance Period

If your engine has the emission compliance category listed on the emission control system certification or air index label, this indicates the number of operating hours for which the engine has been certified to meet EPA and/or CARB emission requirements. The following table provides the engine compliance period in hours associated with the category found on the certification label.

Agency	Category	Hours
EPA	C	250
EPA	B	500
EPA	A	1000
CARB	Moderate	125
CARB	Intermediate	250
CARB	Extended	500

Certification

Your product has been tested and evaluated by the manufacturer and conforms with American National Standard B-71.4, "Safety Specifications" for commercial turf care equipment.

Canadian Electromagnetic Compatibility (EMC) Compliance

This spark ignition system complies with Canadian ICES-002.

Safety

Operator Training Required

- Read the operator's manual and other training material. If the operator or mechanic cannot read English, it is the owner's responsibility to explain this material to them. This publication is available in other languages.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner of the machine is responsible for training the users.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people, or property.
- Operate the machine in an open, unobstructed area under the direction of an experienced operator.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including hard hat, safety glasses and hearing protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire which can be thrown by the machine.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
 - a. Use only an approved container.
 - b. Never remove gas cap or add fuel when engine is running. Do not smoke.
 - c. Never refuel or drain the machine indoors.
- Check that the operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operating Safely

- Never run an engine in an enclosed area where dangerous carbon monoxide fumes can collect.
- Only operate in good light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position. Use seat belts if provided.
- Slow down and use extra care on hillsides. Be sure to travel in the recommended direction on hillsides. For this machine, drive across hillsides, not up and down. Turf conditions can affect the machine's stability. Use caution while operating near drop-offs.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise deck with the blades running.
- Never operate with the PTO shield, or other guards, not securely in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Never operate with the discharge deflector raised, removed or altered, unless using a grasscatcher. Do not operate mower without discharge chute or entire grasscatcher in place.
- Do not change the engine governor setting or overspeed the engine. Operating the engine at excessive speed can increase the hazard of personal injury.
- Stop on level ground, lower implements, disengage drives, engage parking brake, and shut off engine before leaving the operator's position for any reason including emptying the grasscatchers or unclogging the chute.
- Stop equipment and inspect blades after striking objects or if an abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Never carry passengers and keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing. Watch for traffic when operating near or crossing roadways.

SAFETY

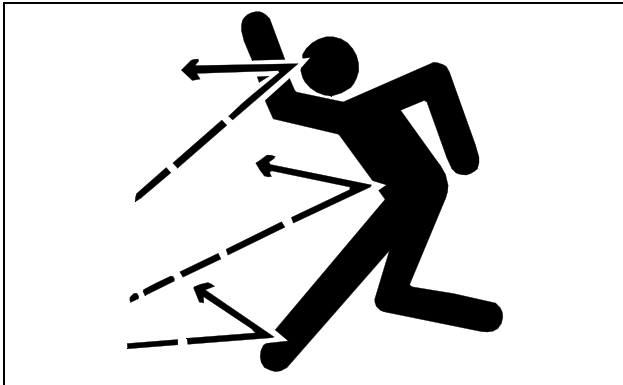
- Be aware of the mower discharge direction and do not point it at anyone.
- Do not operate the machine while under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into or off of a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Inspect machine before you operate. Be sure hardware is tight. Repair or replace damaged, badly worn, or missing parts. Be sure guards and shields are in good condition and fastened in place. Make any necessary adjustments before you operate.
- Before using, always visually inspect to see that the blades, blade bolts and the mower assembly are not worn and damaged. Replace worn and damaged blades and bolts in sets to preserve balance.
- Keep safety labels visible when installing accessories and attachments.
- Do not wear radio or music headphones. Safe service and operation require your full attention.
- When machine is left unattended, stored, or parked, lower the mower deck unless a positive mechanical lock is used.

Using a Spark Arrestor

The engine in this machine is not equipped with a spark arrestor muffler. It is a violation of California Public Resource Code Section 4442 to use or operate this engine on or near any forest-covered, brush-covered or grass-covered land unless the exhaust system is equipped with a spark arrestor meeting any applicable local or state laws. Other states or federal areas may have similar laws.

A spark arrestor for your machine may be available from your authorized dealer. An installed spark arrestor must be maintained in good working order by the operator.

Checking Mowing Area



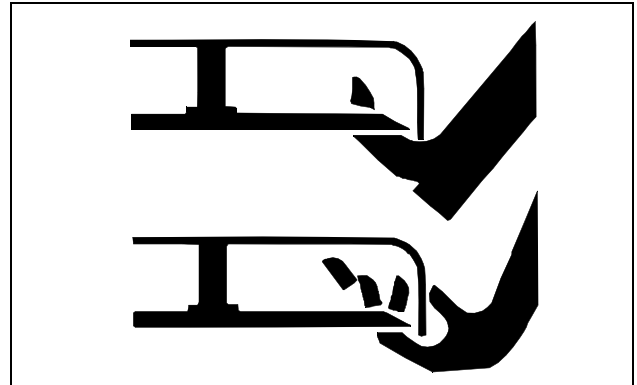
- Clear mowing area of objects that might be thrown. Keep people and pets out of mowing area.
- Low-hanging branches and similar obstacles can injure the operator or interfere with mowing operation. Before mowing, identify potential obstacles such as low-hanging branches, and trim or remove those obstacles.
- Study mowing area. Set up a safe mowing pattern. Do not mow where traction or stability is doubtful.
- Test drive area with mower lowered but not running. Slow down when you travel over rough ground.

Parking Safely

1. Stop machine on a level surface, not on a slope.
2. Move motion control levers out to the neutral lock position.
3. Disengage mower blades.
4. Lower attachments to the ground.
5. Lock the park brake.
6. Stop the engine.
7. Remove the key.
8. Wait for engine and all moving parts to stop before you leave the operator's seat.
9. Close fuel shut-off valve, if your machine is equipped.
10. Disconnect the negative battery cable or remove the spark plug wire (for gasoline engines) before servicing the machine.

Rotating Blades are Dangerous

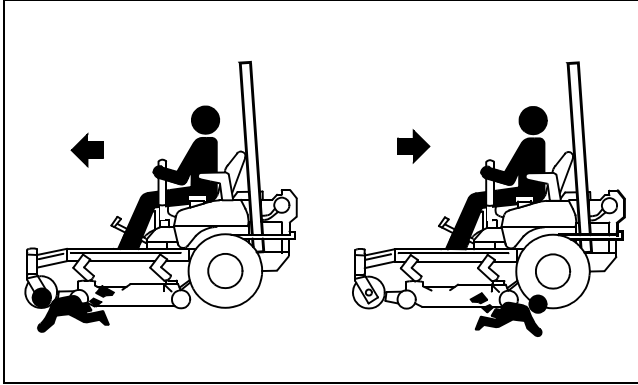
HELP PREVENT SERIOUS OR FATAL ACCIDENTS:



- Rotating blades can cut off arms and legs, and throw objects. Failure to observe safety instructions could result in serious injury or death.
- Keep hands, feet and clothing away from mower deck when engine is running.
- Be alert at all times, drive forward carefully. People, especially children can move quickly into the mowing area before you know it.
- Do not mow in reverse.
- Shut off blades when you are not mowing.
- Park machine safely before leaving the operator station for any reason including emptying the catchers or unplugging the chute.

SAFETY

Protect Children



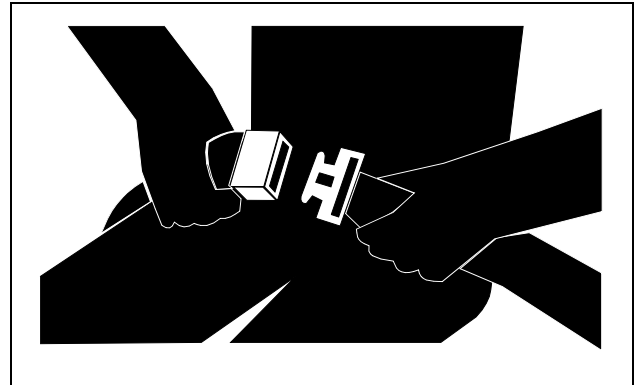
- Death or serious injury can occur when young children associate having fun with a lawn mowing machine simply because someone has given them a ride on a machine.
- Children are attracted to lawn mowing machines and mowing activities. They don't understand the dangers of rotating blades or the fact that the operator is unaware of their presence.
- Children who have been given rides in the past may suddenly appear in the mowing area for another ride and be run over or backed over by the machine.
- Tragic accidents with children can occur if the operator is not alert to the presence of children, especially when a child approaches a machine from behind. Before and while backing up, stop mower blades and look down and behind the machine carefully, especially for children.
- Never carry children on a machine or attachment, even with the blades off. Do not tow children in a cart or trailer. They can fall off and be seriously injured or interfere with safe machine operation.
- Never use the machine as a recreational vehicle or to entertain children.
- Never allow children or an untrained person operate the machine. Instruct all operators not to give children a ride on the machine or in an attachment.
- Keep children indoors, out of the mowing area, and in the watchful eye of a responsible adult, other than the operator, when a mower is being operated.
- Stay alert to the presence of children. Never assume that children will remain where you last saw them. Turn the machine off if a child enters the work area.

Avoid Tipping

- Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. Operation on all slopes requires extra caution.
- If you feel uneasy on a hillside, do not mow it.
- Mow across slopes, not up and down.
- Watch for holes, ruts, bumps, rocks, or other hidden objects. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Choose a low ground speed so you will not have to stop or shift while on a slope.
- Do not mow or operate machine on wet grass. Tires may lose traction. Tires may lose traction on slopes even though the brakes are functioning properly.
- Avoid starting, stopping or turning on a slope. If the tires lose traction, disengage the blades and proceed slowly, straight down the slope.

- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction, which could cause the machine to roll over.
- Use extra care while operating machine with grasscatchers or other attachments, they can affect stability of the machine. Do not use on steep slopes.
- Do not mow near drop-offs, ditches, embankments, or bodies of water. The machine could suddenly roll over if a wheel goes over the edge or the edge caves in.
- Follow the manufacturer's recommendations for wheel weights or counterweights for added stability when operating on slopes or using front or rear mounted attachments. Remove weights when not required.
- Drive machine very slowly and avoid quick stops when attachment is removed.
- Transport machine with decks lowered to improve stability.

Use Seat Belt Properly



- Use a seat belt when operating with the folding Roll-Over Protective Structure (ROPS) in the upright position to minimize chance of injury from an accident, such as an overturn.
- Do not use a seat belt when operating with the folding ROPS in the folded position. Return the folding ROPS to the upright position as soon as possible.
- Never modify, disassemble or attempt to repair the seat belt.
- Replace entire seat belt if mounting hardware, buckle, belt, or retractor show signs of damage.
- Inspect seat belt and mounting hardware at least once a year. Look for signs of loose hardware or belt damage, such as cuts, fraying, extreme or unusual wear, discoloration, or abrasion. Replace only with replacement parts approved by your Great Dane.
- Layers of heavy clothing can interfere with proper positioning of the seat belt and can reduce the effectiveness of the seat belt.

Keep ROPS Installed Properly

- Make certain all parts of the ROPS are installed correctly if the ROPS structure is loosened or removed for any reason. All ROPS hardware should be tightened to the proper torque per manufacturer's recommendations.
- Any alteration of the ROPS must be approved by the manufacturer. The protection provided by the ROPS will be impaired if the ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting.
- Never attempt to repair a damaged or altered ROPS. It must be replaced to maintain the manufacturer's certification of the structure.

SAFETY

Keep Riders Off

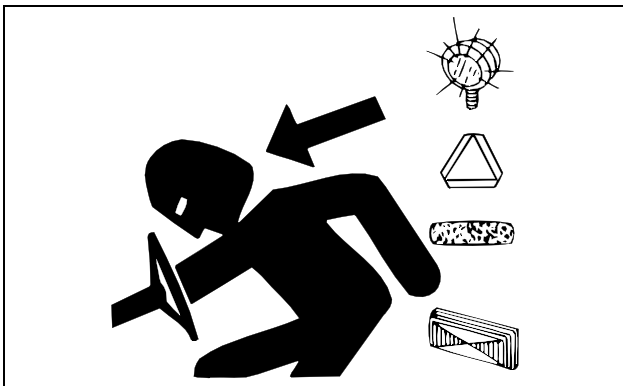
- Only allow the operator on the machine. Keep riders off.
- Riders on the machine or attachment may be struck by foreign objects or thrown off the machine causing serious injury.
- Riders obstruct the operator's view resulting in the machine being operated in an unsafe manner.

Avoid High Pressure Fluids



- Hydraulic hoses and lines can fail due to physical damage, kinks, age, and exposure. Check hoses and lines regularly. Replace damaged hoses and lines.
- Hydraulic fluid connections can loosen due to physical damage and vibration. Check connections regularly. Tighten loose connections.
- Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.
- Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.
- If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.

Driving Safely on Public Roads



Avoid personal injury or death resulting from a collision with another vehicle on public roads:

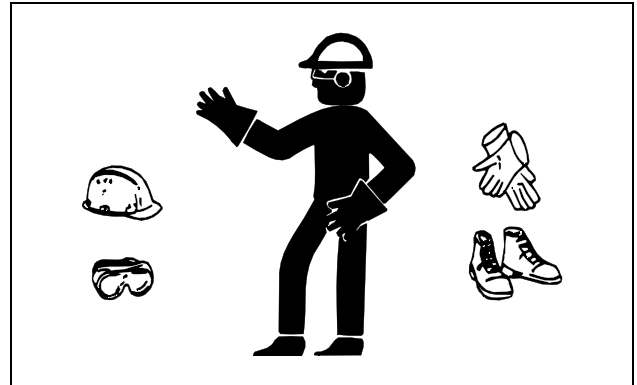
- Use safety lights and devices. Slow moving machines when driven on public roads are hard to see, especially at night.
- Whenever driving on public roads, use flashing warning lights and turn

signals according to local regulations. Extra flashing warning lights may need to be installed.

Checking Wheel Hardware

- A serious accident could occur causing serious injury if wheel hardware is not tight.
- Check wheel hardware tightness often during the first 100 hours of operation.
- Wheel hardware must be tightened to specified torque using the proper procedure anytime it is loosened.

Wear Appropriate Clothing



- Always wear safety goggles, or safety glasses with side shields, and a hard hat when operating the machine.
- Wear close fitting clothing and safety equipment appropriate for the job.
- While mowing, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.
- Wear a suitable protective device such as earplugs. Loud noise can cause impairment or loss of hearing.

Maintenance and Storage

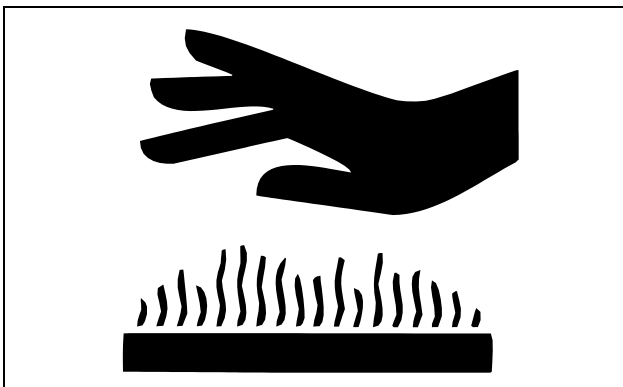


- Never operate machine in a closed area where dangerous carbon monoxide fumes can collect.
- Disengage drives, lower implement, lock parking brake, stop engine and remove key or disconnect spark plug (for gas engines). Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting units, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.

SAFETY

- Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
- Park machine on level ground. Never allow untrained personnel to service machine. Understand service procedure before doing work.
- Use jack stands or lock service latches to support components when required. Securely support any machine elements that must be raised for service work.
- Before servicing machine or attachment, carefully release pressure from any components with stored energy, such as hydraulic components or springs.
- Release hydraulic pressure by lowering attachment or cutting units to the ground or to a mechanical stop and move hydraulic control levers back and forth.
- Disconnect battery or remove spark plug (for gas engines) before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Use care when checking blades. Wrap the blades or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
- Keep hands, feet, clothing, jewelry and long hair away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
- Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.
- Check grasscatcher components and the discharge guard frequently and replace with manufacturer's recommended parts, when necessary. Grasscatcher components are subject to wear, damage, and deterioration which could expose moving parts or allow objects to be thrown.
- Keep all nuts and bolts tight, especially blade attachment bolts, to be sure the equipment is in safe working condition.
- Check brake operation frequently. Adjust and service as required.
- On multi-bladed machines, take care as rotating one blade can cause other blades to rotate.

Prevent Fires



- Remove grass and debris from engine compartment and muffler area, before and after operating machine, especially after mowing or mulching in dry conditions.
- Empty the grasscatcher completely before storing.
- Always shut off fuel when storing or transporting machine, if the machine has a fuel shutoff.

- Do not store machine near an open flame or source of ignition, such as a water heater or furnace.
- Check fuel lines, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.

Tire Safety

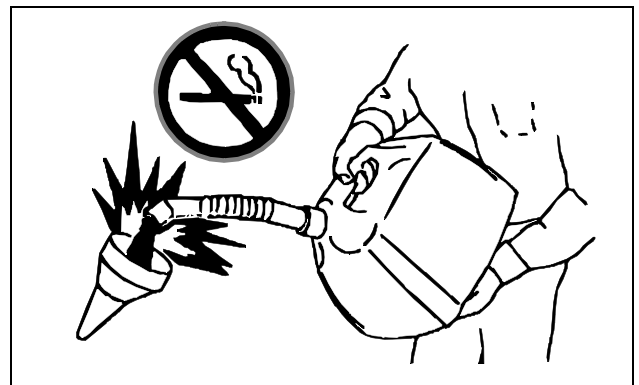


Explosive separation of a tire and rim parts can cause serious injury or death:

- Do not attempt to mount a tire without the proper equipment and experience to perform the job.
- Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.
- When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly.
- Check tires for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

Handling Fuel Safely

To avoid personal injury or property damage, use extreme care in handling fuel. Fuel is extremely flammable and fuel vapors are explosive:



- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container. Use only non-metal, portable fuel containers approved by the Underwriter's Laboratory (U.L.) or the American Society for Testing & Materials (ASTM). If using a funnel, make sure it is plastic and has no screen or filter.

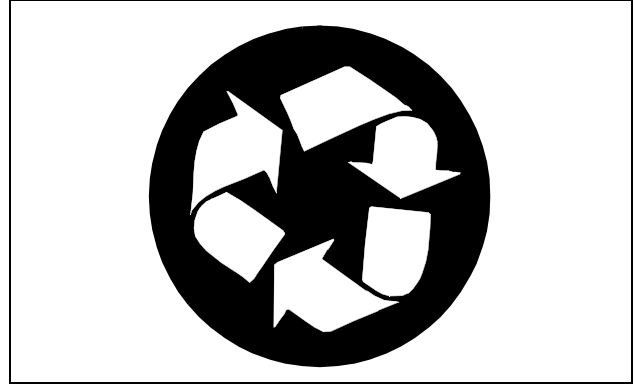
OPERATING

- Never remove the fuel tank cap or add fuel with the engine running. Allow engine to cool before refueling.
- Never add fuel to or drain fuel from the machine indoors. Move machine outdoors and provide adequate ventilation.
- Clean up spilled fuel immediately. If fuel is spilled on clothing, change clothing immediately. If fuel is spilled near machine, do not attempt to start the engine but move the machine away from the area of spillage. Avoid creating any source of ignition until fuel vapors have dissipated.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as on a water heater or other appliance.



- Prevent fire and explosion caused by static electric discharge. Static electric discharge can ignite fuel vapors in an ungrounded fuel container.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before fueling.
- Remove fuel-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until the fueling is complete. Do not use a nozzle lock-open device.
- Never overfill fuel tank. Replace fuel tank cap and tighten securely.
- Replace all fuel container caps securely after use.
- For gasoline engines, do not use gas with methanol. Methanol is harmful to your health and to the environment.

Handling Waste Product and Chemicals



Waste products, such as, used oil, fuel, coolant, brake fluid, and batteries, can harm the environment and people:

- Do not use beverage containers for waste fluids - someone may drink from them.
- See your local Recycling Center or authorized dealer to learn how to recycle or get rid of waste products.
- A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques. The seller of the chemical products used with your machine is responsible for providing the MSDS for that product.

Operating

Daily Operating Checklist

OMake sure all necessary guards and shields are safely and securely attached. Check for loose, missing, or damaged parts.

ORemove mower deck belt shields. Clean grass and debris from belt area.

ORemove grass and debris from machine and mower deck.

OTest park brake.

OTest safety systems.

OInspect battery terminals and hold-downs.

OInspect for oil leaks.

OCheck engine and hydraulic oil levels.

OInspect all belts for damage or cracking.

OInspect engine air filter.

OInspect mower level.

OAdjust cutting height if necessary.

OInspect wheel bolt torque. Tighten if necessary.

OCheck tire air pressure. Check tires for damage or cracking.

OInspect front caster spindles/wheels.

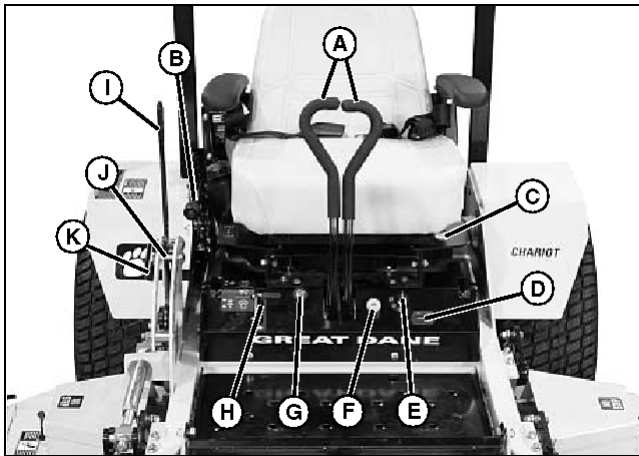
Avoid Damage to Plastic and Painted Surfaces

- Do not wipe plastic parts unless rinsed first.
- Insect repellent spray may damage plastic and painted surfaces. Do not spray insect repellent near machine.

OPERATING

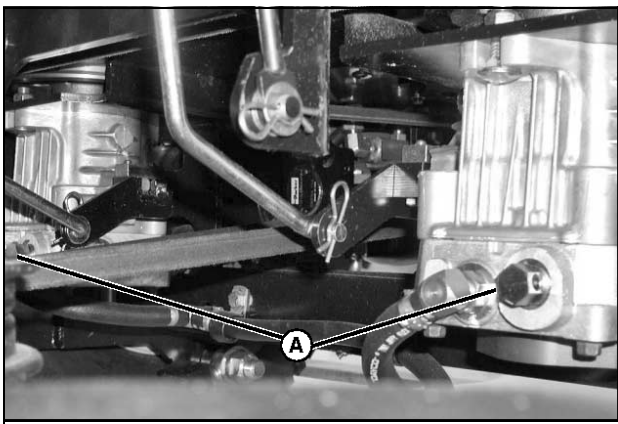
- Be careful not to spill fuel on machine. Fuel may damage surface. Wipe up spilled fuel immediately.
- Prolonged exposure to sunlight will damage the hood surface.

Operator Station Controls



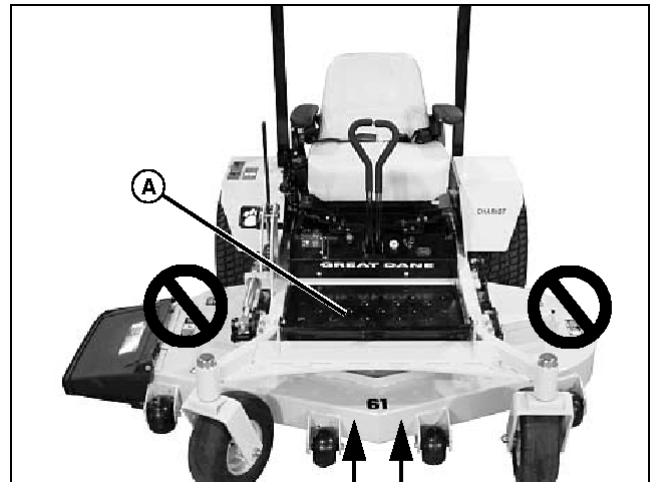
- A- Motion Control Levers
- B- Park Brake Lever
- C- Seat Adjustment Lever
- D- Hourmeter
- E- Ignition Key Switch
- F- PTO Knob
- G- Choke (Carbureted Engines Only)
- H- Throttle Lever
- I - Mower Deck Lift/Lower Lever
- J- Height-of-Cut (HOC) Adjustment Pin
- K- Mower Deck Transport Position Lock Lever

Miscellaneous Controls



A- Hydraulic Pump Free-Wheel Valves

Mounting and Dismounting Machine Safely



Do not step on the mower deck when mounting and dismounting the machine. Mount the machine from the front using the foot plate (A). Park machine safely (See Parking Safely in the SAFETY section) before dismounting.

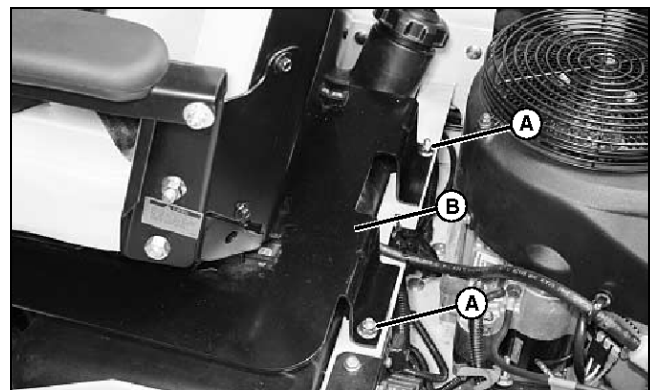
Keep the foot plate clean.

Raising and Lowering Operator Seat

CAUTION: Avoid injury! The seat is heavy and can cause injury if it falls. When performing any service function under the operator seat, make sure the seat is tilted forward and rests against the hinge stops.

Raising the Seat:

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Slide seat to full rear position.



3. Remove two locknuts (A) and capscrews securing the flanges at the rear of the seat frame (B) to the machine.
4. Lift seat frame and tilt forward until it rests against the hinge stops.

Lowering the Seat:

1. Stand on the side of the machine.
2. Slowly lower seat frame. Secure with cap screws and locknuts, removed earlier.
3. Adjust seat as necessary for operator comfort.

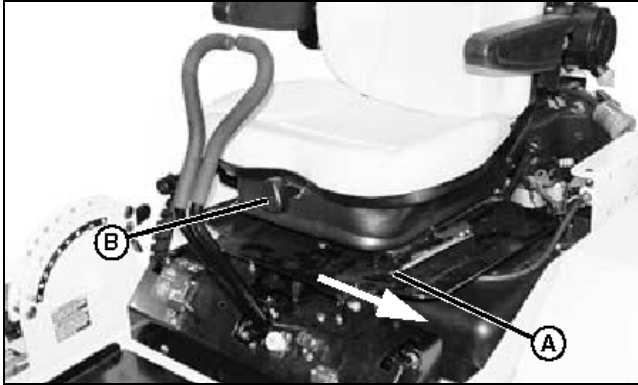
OPERATING

Adjusting Seat

Front-to-Back Adjustment

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Sit on the operator seat.

CAUTION: Avoid injury! Never adjust seat while machine is moving. Stop machine before adjusting seat to prevent loss of machine control.



3. To adjust the seat front to back, push and hold the seat adjustment lever (A) away from the seat.
4. Slide forward or backward to desired position.
5. Release lever.

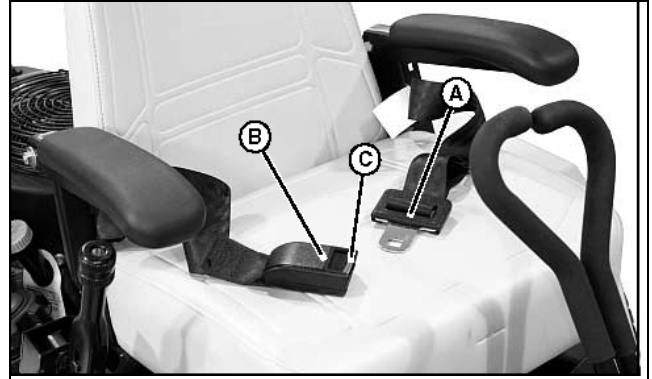
Seat Height Adjustment

1. Sit on the operator seat.
2. To lower the seat, turn knob (B) counterclockwise.
3. To raise the seat, turn knob (B) clockwise.

Using Seat Belt

CAUTION: Avoid injury! Always wear seat belt when operating machine with non-folding Roll-Over Protective Structure (ROPS) or folding ROPS in upright position. Do not jump from machine if machine tips.

• If folding ROPS must be folded to operate in a low clearance area, do not use seat belt. Raise ROPS and use seat belt as soon as conditions permit.

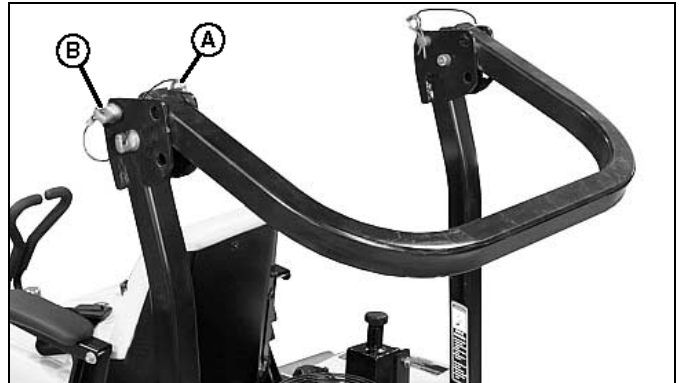


1. Sit in seat.
2. Pull belts across your lap and insert seat belt buckle (A) into latch (B) until it locks.
3. To release seat belt, press red button (C) until buckle comes out of latch.

Raising and Lowering ROPS

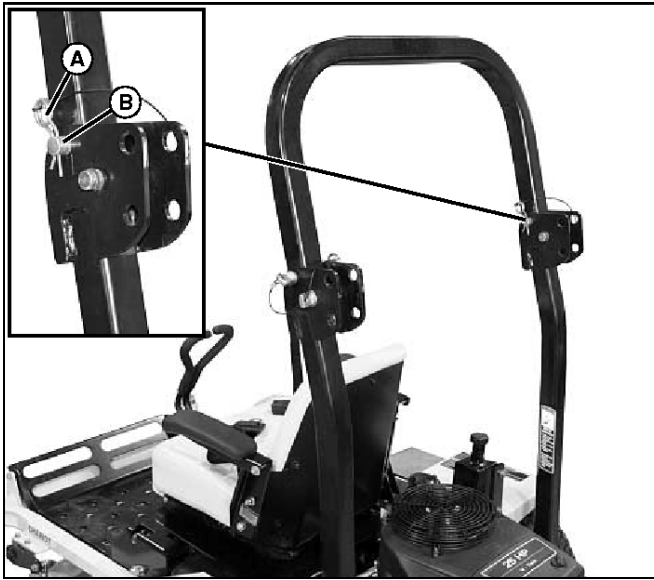
Raising ROPS

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Remove spring pin (A) from drilled pin (B) on left and right side of ROPS.
3. Remove drilled pin from left and right side of ROPS.

OPERATING



4. Push ROPS into upright position.
5. Install drilled pin (B) into holes on left and right side of ROPS, and secure in place with spring pins (A).
6. Check the ROPS bolt torque if the ROPS is loose.

Lowering ROPS

CAUTION: Avoid injury! Use roll-over protection system (ROPS) in lowered position only when low clearance operation is necessary.

- Do not use seat belt when ROPS is in lowered position.
- Do not operate machine on slope with ROPS in folded position.
- Raise ROPS and fasten seat belt as soon as conditions permit.

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Remove spring pin (A) from drilled pin (B) on left and right side of ROPS.
3. Remove drilled pin from left and right side of ROPS.
4. Pull ROPS rearward to lower.
5. Install drilled pins and spring pins back into hole in ROPS to secure in place.

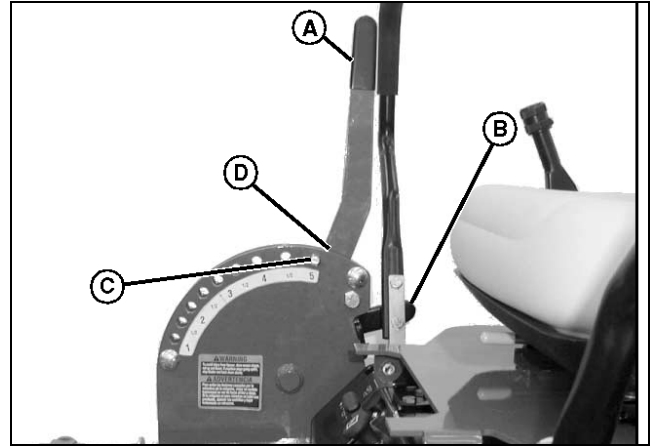
Adjusting Mower Deck Cutting Height

CAUTION: Avoid injury! Rotating blades are dangerous and can cut fingers and toes. Stop engine, lock the park brake, and wait for blade to stop rotating before adjusting cutting height.

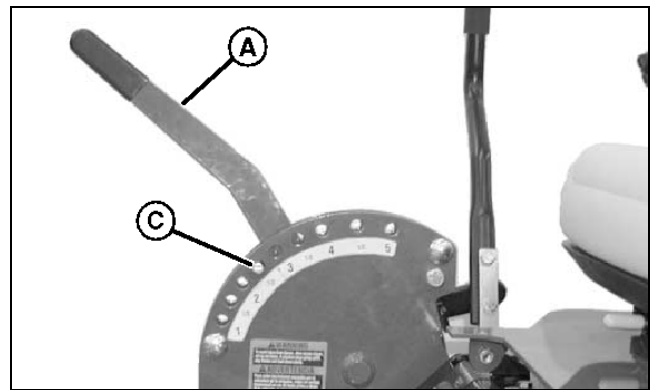
Cutting height can be adjusted from approximately 25-125 mm (1-5 in.). Each hole adjusts the height-of-cut (HOC) in approximately 12 mm (1/2 in.) increments.

The deck can also be raised and locked in a transport position, to provide maximum ground clearance when moving the machine from one area to another.

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Move the mower deck lift lever (A) to the transport position (D).
3. Position the HOC adjustment pin (C) in the proper hole for the desired height-of-cut.
4. Pull back and hold the mower deck lift lever (A) and release the transport position lock lever (B).



5. Allow the mower deck lift lever (A) to rest against the HOC adjustment pin (C).

Adjusting Mower Deck Anti-Scalp Wheels

1. Park machine safely. (See Parking Safely in the SAFETY section.)

CAUTION: Avoid injury! Fingers and loose clothing can get caught in rotating parts. Do not operate machine without all mower deck belt shields installed.

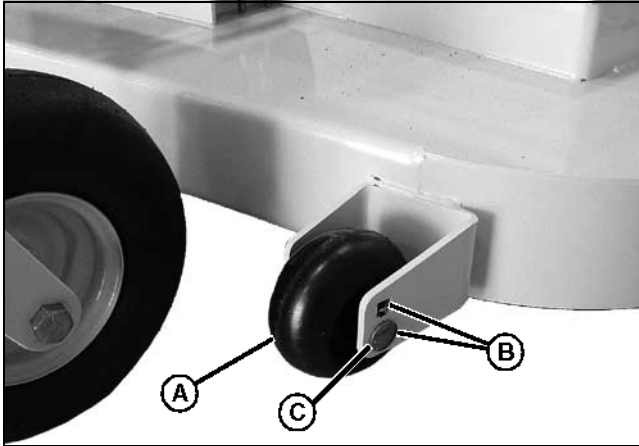
NOTE: The flattest cut can be achieved by having all anti-scalp wheels adjusted off the ground. Check anti-scalp wheel adjustments each time the mower deck cutting height is changed.

It is recommended that all anti-scalp wheels be kept off the ground to minimize scuffing.

2. Inflate tires to correct pressure.
3. Adjust mower deck to desired cutting height.

OPERATING

NOTE: The rear anti-scalp wheels are located under the rear of the mower deck.



4. Adjust anti-scalp wheel (A) to one of two positions (B).
 - Remove screw (C), nut and washer.
 - Adjust wheel up or down so it is approximately 6-13 mm (1/4-1/2 in.) above mowing surface.
5. Install wheel with attaching hardware.
6. Adjust all wheels to same height.

Testing Safety Systems

CAUTION: Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death. Move the machine to an outside area before running the engine. Do not run an engine in an enclosed area without adequate ventilation.

- Connect a pipe extension to the engine exhaust pipe to direct the exhaust fumes out of the area.
- Allow fresh outside air into the work area to clear the exhaust fumes out.

The safety systems installed on your machine should be checked before each machine use. Be sure you have read the machine operator manual and are completely familiar with the operation of the machine before performing these safety system checks.

Use the following checkout procedures to check for normal operation of machine.

If there is a malfunction during one of these procedures, do not operate machine. **See your authorized dealer for service.**

Perform these tests in a clear open area. Keep bystanders away.

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If there is a malfunction during one of these procedures, do not operate machine. **See your authorized dealer for service.**

Perform these tests in a clear open area. Keep bystanders away.

Testing PTO Switch

1. Sit on the operator seat with the motion control levers in the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).

2. Lock the park brake.

3. Pull PTO knob up to engage.

4. Turn key switch to the start position.

Result: The engine must not crank.

Testing Park Brake Switch

1. Sit on the operator seat with the motion control levers in the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).

2. Push PTO knob down to disengage.

3. Unlock the park brake.

4. Turn key switch to the start position.

Result: The engine must not crank.

Testing Neutral Start Switch

NOTE: Repeat this test three times, with the motion control levers in the following positions:

- Right side motion control lever inward.
- Left side motion control lever inward.
- Both motion control levers inward.

1. Move motion control lever(s) out of the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).

2. Lock the park brake.

3. Push PTO knob down to disengage.

4. Turn key switch to the start position.

Result: The engine must not crank.

OPERATING

Testing Seat Switch

Procedure 1:

1. Sit on the operator seat with the motion control levers in the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).
2. Unlock the park brake.
3. Push PTO knob down to disengage.
4. Turn key switch to the start position.
5. Raise slightly off the seat.

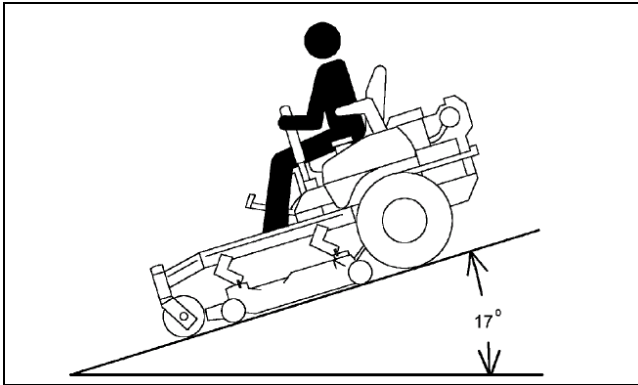
Result: The engine must stop.

Procedure 2:

1. Start engine.
2. Lock the park brake.
3. Pull PTO knob up to engage.
4. Raise slightly off the seat.

Result: The engine must stop.

Testing the Park Brake



1. Stop machine on a 17° slope (30% grade). Stop the engine and lock the park brake.

Result: Park brake must hold the machine stationary. (Machine should move no more than 61 cm (24 in.) in one hour.) If machine moves more than that, brakes need to be adjusted. See Adjusting Park Brake in the Service Steering & Brakes section.

Using the Park Brake



CAUTION: Avoid injury! Children or bystanders may attempt to move or operate an unattended machine.

Always lock the park brake and remove the key before leaving the machine unattended.

Locking Park Brake:



CAUTION: Avoid injury! If the engine should stop while operating on an incline, the mower can free wheel. If this should occur: •lock the park brake,

- start the engine,
- unlock the park brake,
- resume operation.



- Raise and pull rearward park brake lever (A) to lock the park brake.

Unlocking Park Brake:



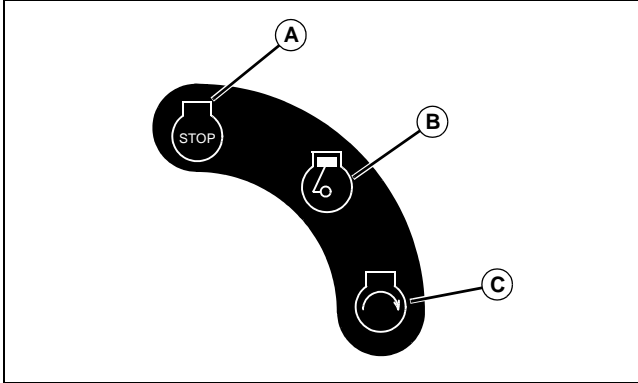
- Lower park brake lever (A) forward to unlock the park brake.

OPERATING

Using the Key Switch

NOTE: Machine will only start if the following conditions exist:

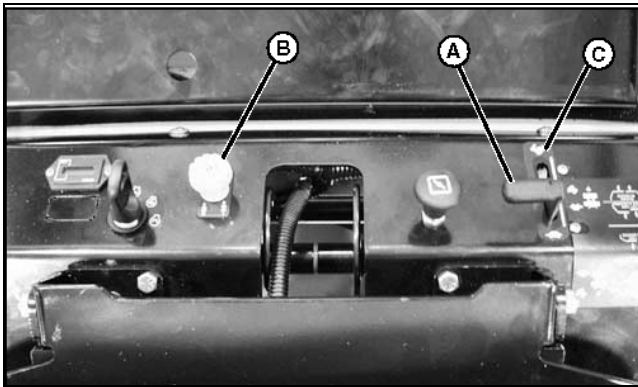
- Park brake is locked.
- PTO is disengaged.
- Motion control levers are in the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).



- To turn ignition off, turn key to the STOP position (A).
- To turn ignition on, turn key to the run position (B).
- To start engine, turn key to the start position (C). Once engine begins to run, release key back to the run position.

Using the PTO

Engage PTO:

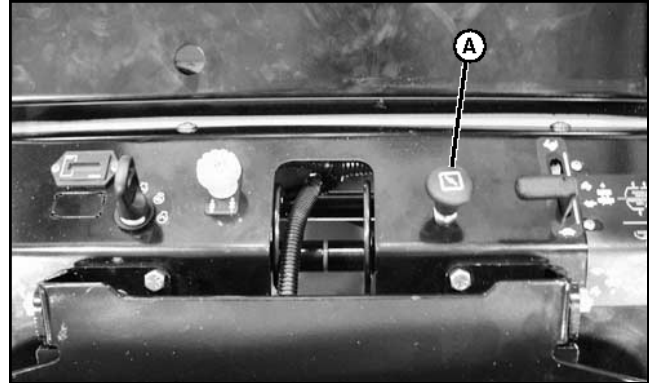


1. Move throttle lever (A) to the 1/2- to 3/4-throttle position.
2. Pull PTO knob (B) up to engage mower deck.
3. Move throttle lever (A) forward to the fast detent position (C) for mowing.

Disengage PTO:

- Push PTO knob (B) down.

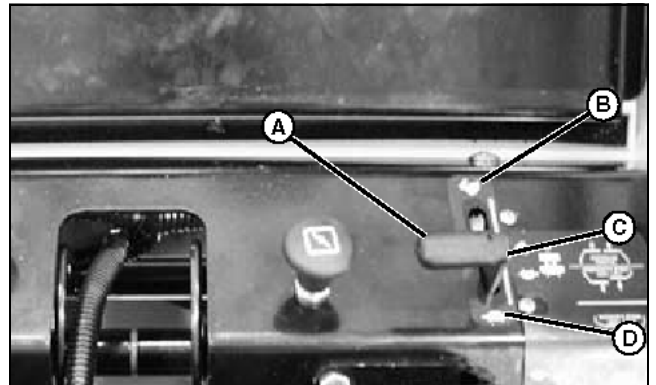
Using the Throttle Lever



- Push throttle lever (A) all the way forward to the full-throttle detent position (B) when mowing.
- Move throttle lever (A) to the 1/2-throttle position (C) when starting and warming the engine.
- Pull throttle lever (A) rearward to the slow position (D) to idle engine. Do not run engine at slow idle any longer than necessary.

Using the Hourmeter

NOTE: The machine is equipped with an electric start. The hourmeter will continue to run with the key switch left in the run position.



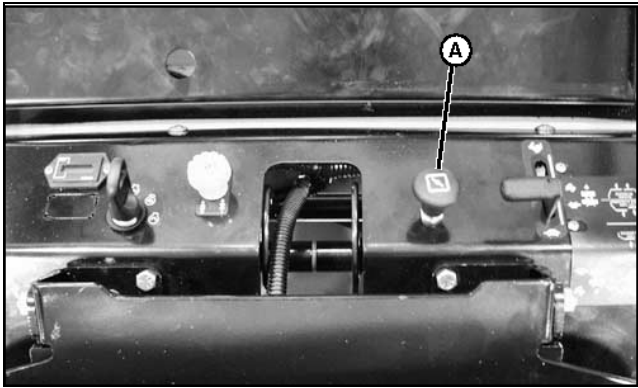
- The hourmeter (A) shows the number of hours the machine has run.
- The service interval chart gives necessary service intervals. Use the hourmeter and service interval chart in the Service Intervals section to determine when machine will need service.

See the service interval chart in the engine manufacturer's owners manual supplied with your machine to determine when the engine will need service.

OPERATING

Using the Choke

Engage Choke:



- Pull choke knob (A) out.

Disengage Choke:

- Push choke knob (A) in.

Using the Motion Control Levers



CAUTION: Avoid injury! Learn use of the motion control levers and practice at half throttle until becoming proficient and comfortable with the operation of the machine.

Do not move motion control levers from forward to reverse or reverse to forward position rapidly. Sudden direction changes could cause loss of control or damage the machine.

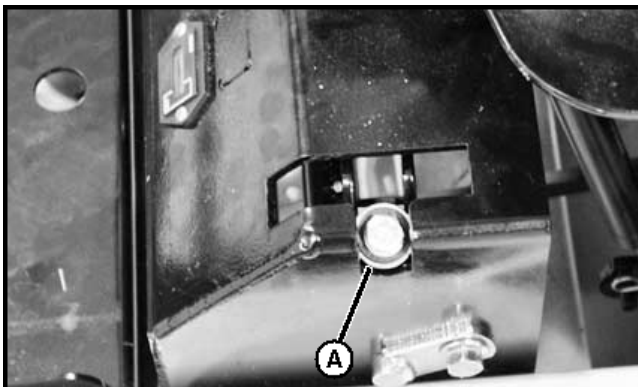
NOTE: Two types of control levers are available - standard "center steer" levers and optional "over the lap" levers. The operation of both styles of levers is the same except as noted.

The functions of the motion control levers are:

- Dual function neutral position.
- Steering.
- Acceleration.
- Braking.

Neutral Detent Position - Standard "Center Steer" Levers

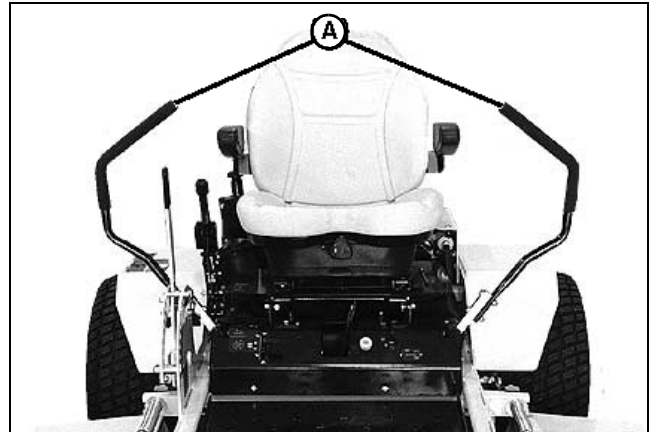
NOTE: When the control levers are in the neutral detent position, the control lever rollers (A) located on each side of the control console will be seated in the notches in the console.



- Motion control levers must be in the neutral detent position, the PTO

switch disengaged and the park brake locked to start the engine.

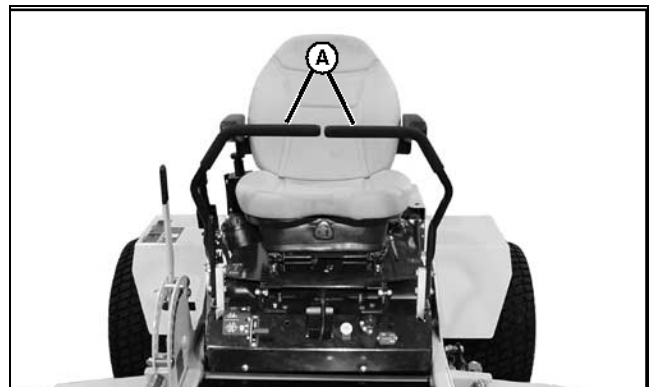
Neutral Lock Position - Optional "Over the Lap" Levers



Picture Note: Motion control levers (A) shown in the neutral lock position.

- Motion control levers must be in the neutral lock position, the PTO switch disengaged and the park brake locked to start the engine.
- Forward and reverse movement of the motion control levers is prevented when levers are moved to the neutral lock position.
- Operator can exit mower with the engine running when the PTO switch is disengaged, the motion control levers are in the neutral lock position and the park brake is locked.
- Motion control levers must be in the neutral lock position to safely enter and exit the operator seat.

Neutral Position - Optional "Over the Lap" Levers



Picture Note: Motion control levers (A) shown in the neutral position.

- Machine speed, motion, and direction can be controlled when the engine is running, operator is on the seat and the park brake is unlocked.

OPERATING

Forward and Reverse Motion:

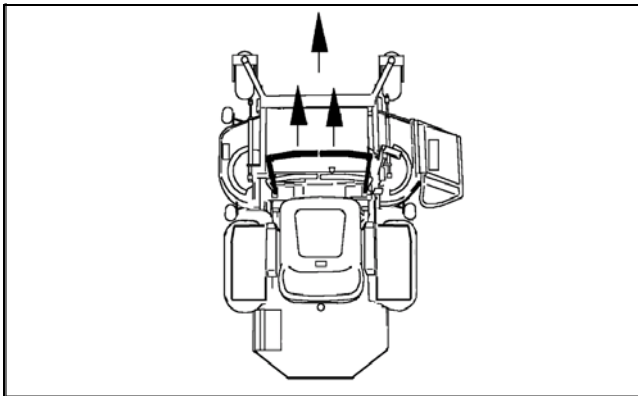
CAUTION: Avoid injury! Children or bystanders can be injured or killed by moving machine and rotating blades. Before traveling forward or rearward:

- Carefully check area around machine.
- Disengage mower before backing up.

1. Move throttle lever to the full-throttle position.
2. Unlock the park brake.
3. Optional "over the lap" levers: Move both motion control levers from the neutral lock position inward to the neutral position.
4. Push the control levers forward to begin forward motion.
 - The farther forward the control levers are moved, the faster the machine will travel.
 - Forward speed range: 0-14 km/h (0-9 mph).
5. Pull both control levers rearward at the same time to begin reverse motion.
 - Reverse speed range: 0-6 km/h (0-4 mph).
6. To stop motion, move both motion control levers forward or rearward until the machine comes to a stop.

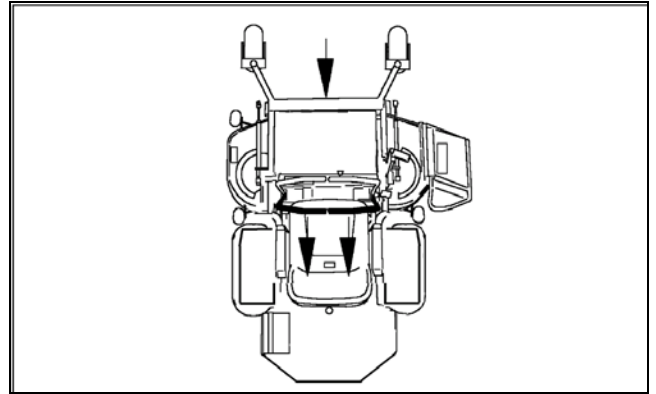
NOTE: The motion control linkages are adjustable. If adjustment is required, see *Checking and Adjusting Motion Control Linkages in the Service Transmission section*.

Forward:



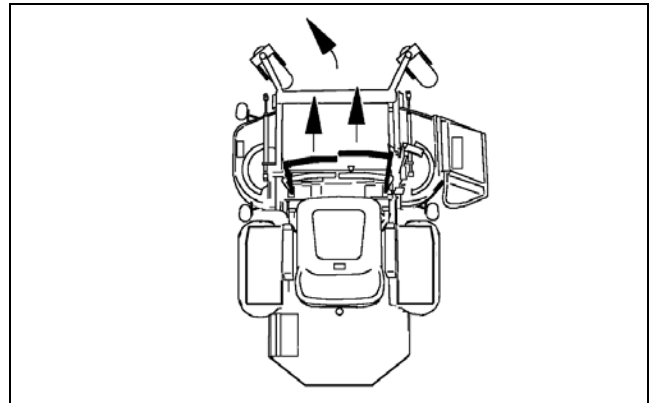
- Push both motion control levers forward at the same time.

Reverse:



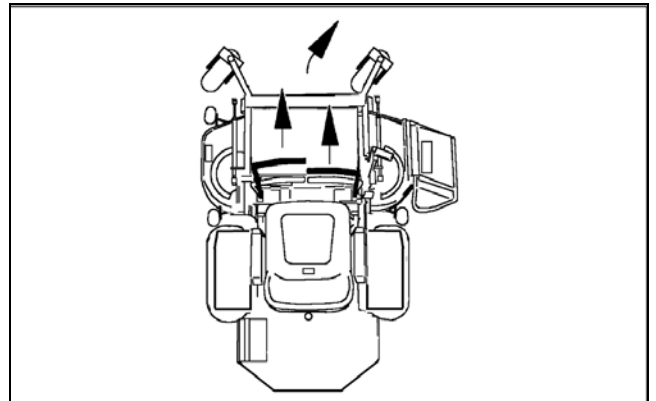
- Pull both control levers past center rearward at the same time.

Gentle Left Turn:



- Push right control lever farther forward than the left control lever.

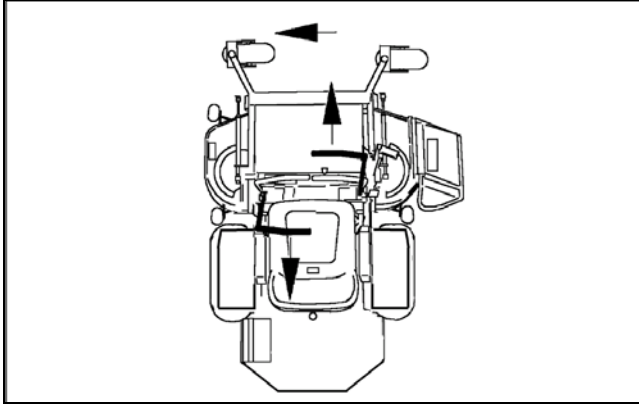
Gentle Right Turn:



- Push left control lever farther forward than the right control lever.

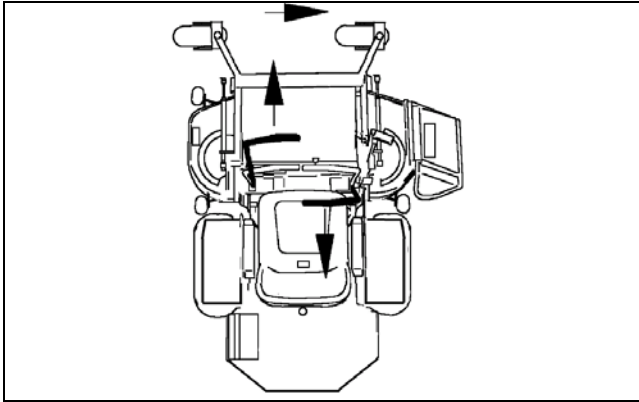
OPERATING

Sharp Left Turn:



- Push right control lever forward and pull left control lever rearward at the same time.

Sharp Right Turn:



- Push left control lever forward and pull right control lever rearward at the same time.

Starting the Engine

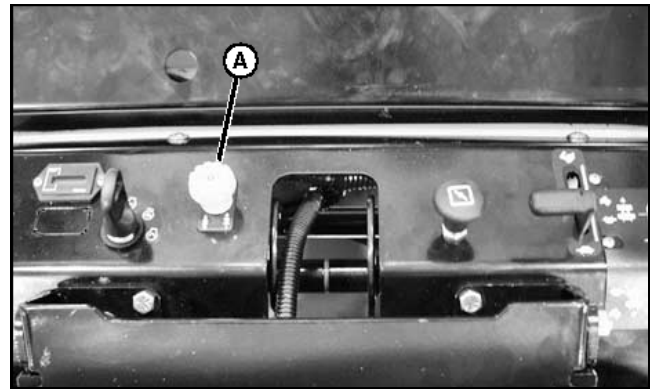


CAUTION: Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

Move the machine to an outside area before running the engine. Do not run an engine in an enclosed area without adequate ventilation.

- **Connect a pipe extension to the engine exhaust pipe to direct the exhaust fumes out of the area.**
- **Allow fresh outside air into the work area to clear the exhaust fumes out.**

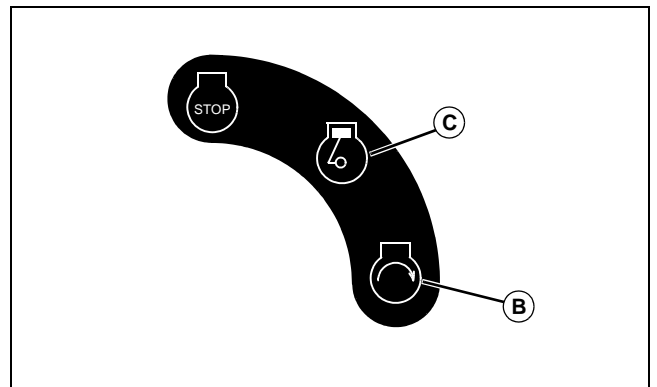
1. Sit on the operator seat.
2. Lock the park brake.
3. Move both motion control levers to the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).



4. Push PTO knob (A) down to disengage PTO.
5. Move throttle lever to set engine speed:
 - Cold engine: Set throttle lever at the 1/2- to 3/4-throttle position.
 - Warm/Hot engine: Set throttle lever to the 1/2-throttle position.
6. Position choke knob (D):
 - Cold engine: Pull knob up and hold in choke position.
 - Warm/Hot engine: If necessary, pull knob up and hold in choke position.

IMPORTANT: Avoid damage! Starter may be damaged if starter is operated for more than 20 seconds at a time:

- **Wait two minutes before trying again if engine does not start.**



7. Turn key switch to start position (B).
If the engine does not start, wait 10 seconds.
 - Turn key to start position again for no more than 5 seconds.
 - Repeat the procedure if necessary.

IMPORTANT: Avoid damage! Unnecessary engine idling can cause engine overheating, carbon build-up, and poor performance.

8. Release key to run position (C) when engine starts.
9. With engine started:
 - Push choke knob to off position.
 - Move throttle lever to full-throttle position.
 - Unlock the park brake.

OPERATING

Engaging Mower

CAUTION: Avoid injury! Clear mowing area of all bystanders when operating this machine.

Thrown objects could cause serious injury or death.

Keep hands and feet away from blades and discharge opening.

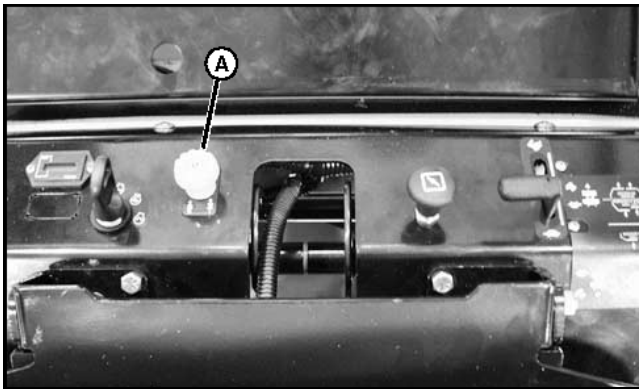
Do not mow in reverse unless absolutely necessary.

IMPORTANT: Avoid damage! To help prevent damage to PTO clutch:

- Do not engage PTO with throttle in the fast position.

1. Adjust mower deck to desired cutting height.

2. Start engine.



3. Move throttle lever to the 1/2 - 3/4 throttle position.

4. Unlock the park brake.

5. Move both motion control levers to the neutral position.

NOTE: In cold weather or with a new machine, it may be necessary to engage the choke at the same time as the PTO knob to prevent the engine from stalling.

6. Pull PTO knob (A) up to engage mower deck.

7. Move throttle lever to full-throttle position.

NOTE: The travel speed and turn rate will vary with the amount that the control levers are moved.

8. Push motion control levers forward slowly. Mow at a safe travel speed.

Stopping the Engine

IMPORTANT: Avoid damage! To help prevent engine backfiring, throttle lever should be set at the 1/4 throttle position and run for 30 seconds prior to stopping the engine.

Do not stop engine when mower is on a slope of more than 30° for an extended period of time. Oil may run through valve train into carburetor and muffler.

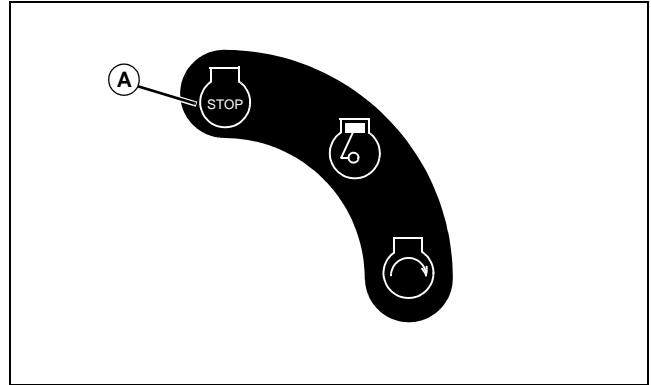
1. Move the motion control levers to the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).

2. Lock the park brake.

3. Push PTO switch down to disengage.

4. Move throttle lever to 1/4-throttle position and run for 30 seconds, then

move throttle to slow position.



5. Turn key switch to STOP position (A).

CAUTION: Avoid injury! Children or bystanders may attempt to move or operate an unattended machine.

Always lock the park brake and remove the key before leaving the machine unattended.

6. Remove key.

Transporting Machine

CAUTION: Avoid injury! Use extra care when loading or unloading the machine into a trailer or truck.

Close fuel shut-off valve, if your machine is equipped.

IMPORTANT: Avoid damage! Transmission damage may occur if the machine is moved or towed incorrectly:

- Move unit by hand only.
- Do not use another vehicle to move unit.
- Do not tow unit.

Use a heavy-duty trailer to transport your machine. Trailer must have signs and lights required by law.

1. Raise the mower deck lift lever to the transport position.

2. Drive machine on trailer.

3. Stop engine and lock the park brake.

4. Remove key.

5. Fasten machine to trailer with heavy-duty straps, chains or cables. Both front and rear straps must be directed down and outward from machine.

Mowing Tips

- Mow grass with throttle lever in the full fast position.
- Cut grass when it is dry.
- Keep mower deck and discharge chute clean.
- Mow with sharp blades.
- Properly level mower deck for a smooth cut.
- Mow grass high and often.
- Use a travel speed that fits the conditions:

SERVICE INTERVALS

- Mow tall or wet grass twice. Cut grass at half desired height – then cut at desired height.
- Travel slow when mowing tall, thick or wet grass.
- Avoid damaging grass by slipping or skidding machine drive wheels. Practice smooth control lever movements.
- When performing sharp turns, do not allow inside machine drive wheel to stop and twist on grass.

Mowing Travel Speeds

Use slow travel speed for:

- Trimming.
- Working in close quarters.
- Mowing tall grass.

Use faster travel speeds for:

- Normal mowing on level ground.

Dismounting to Inspect Mower



CAUTION: Avoid injury! Help prevent serious injury. Keep hands and feet away from blades and the discharge opening. Do not step on either side of the mower deck when mounting and dismounting the machine. Mount and dismount the machine using the front foot plate.

1. Park machine on a hard, level surface.
2. Push PTO knob down to disengage mower.
3. Move motion control levers to the neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).
4. Lock the park brake.
5. Stop engine and remove key. Always wait for mower blades to stop turning before leaving operator seat.

Service Intervals

Servicing Your Machine

IMPORTANT: Avoid damage! Operating in extreme conditions may require more frequent service intervals:

- Engine components may become dirty or plugged when operating in extreme heat, dust or other severe conditions.
- Engine oil may lose efficiency if vehicle is operated constantly at slow or low engine speeds or with frequent short trips.

Please use the following timetables to perform routine maintenance on your machine.

Break-In (After First 8 Hours of Operation)

NOTE: The following initial break-in items must be performed and verified to validate the warranty (dealer service invoice accepted).

- Change engine oil and filter.
- Check drive belt tension.
- Check mower deck drive belt tension.
- Check transmission neutral adjustment.

- Check wheel nut torque.
- Check and adjust (as needed) park brake.
- Remove debris from the underside of the mower deck.

Every 25 Hours or Weekly (Whichever Comes First)

- Grease mower deck thrust arms (two places).
- Grease mower deck thrust arms (two places).
- Grease traction drive belt tension arm.
- Grease mower deck drive belt tension arm.
- Grease HOC shafts (four places).
- Lubricate front caster wheel spindles.
- Remove debris from the underside of the mower deck.

Every 50 Hours or Weekly (Whichever Comes First)

- Change engine oil and filter. See the engine manufacturer's owner's manual provided with your machine for the complete procedure.
- Grease caster wheel spindle bearings (two places).
- Grease mower deck thrust arms (two places).
- Remove debris from the underside of the mower deck.
- Check drive belt tension.
- Check tire pressure.
- Clean engine air filter.
- Check wheel nut torque.

Every 160 Hours or Monthly (Whichever Comes First)

- Grease mower spindle bearings (three places).
- Check transmission oil level.
- Check transmission oil level.
- Lubricate mower deck idler pulley pivots (three places).
- Lubricate seat platform hinges (two places)
- Lubricate pump control arms (five places).
- Lubricate control lever pivot shafts (two places).
- Lubricate throttle cable.
- Lubricate choke control cable.

Annually

- Inspect all spindle bearings (6). Replace as needed.
- Inspect all mower deck idler pulleys (3). Replace as needed.
- Remove and inspect caster wheel roller bearings; clean and pack with grease. Replace as needed.
- Remove and inspect caster pivot bearings; clean and pack with grease. Replace as needed.
- Inspect drive belts. Replace as needed. Run-in and adjust tension.
- Change hydraulic oil and filter (annually or 500 hours whichever comes first).
- Check all bolts and nuts; tighten as needed.
- Remove battery. Clean battery and holder.
- Replace spark plugs.

SERVICE LUBRICATION

Service Lubrication

Grease

IMPORTANT: Avoid damage! The recommended grease is effective within an average air temperature range of -29 to 135 degrees C (-20 to 275 degrees F).

If operating outside that temperature range, contact your servicing dealer for a special-use grease.

Use a general all-purpose grease with an NLGI grade No.2 rating.

Wet or high speed conditions may require use of a special-use grease. Contact your Servicing dealer for information.

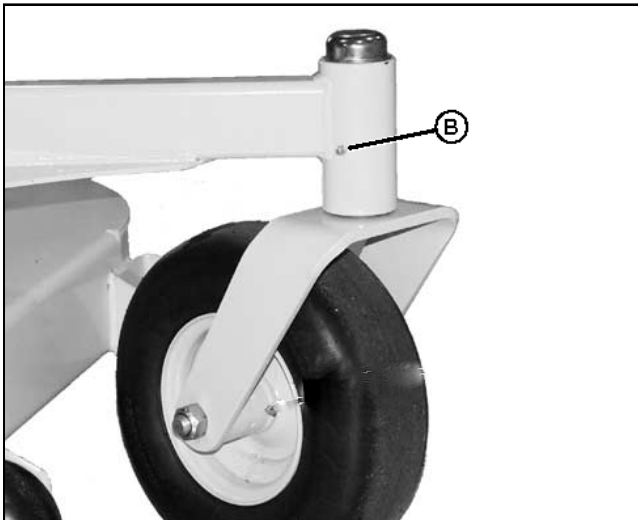
Spray Lubricant

Use a general-purpose petroleum-based spray lubricant.

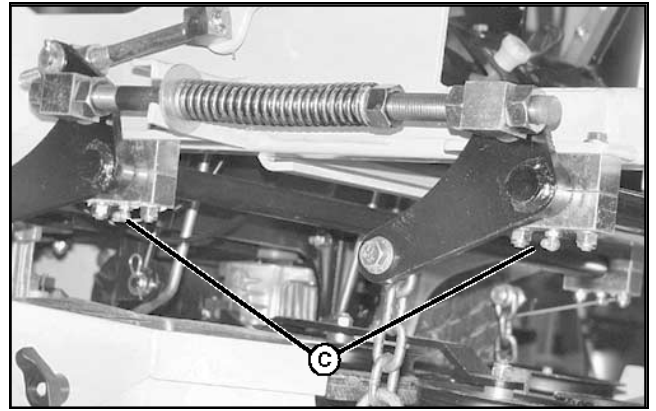
Lubrication Points

CAUTION: Avoid injury! Rotating parts can catch fingers, loose clothing, or long hair. Wait for engine and all moving parts to stop before leaving operator's station to adjust or service machine.

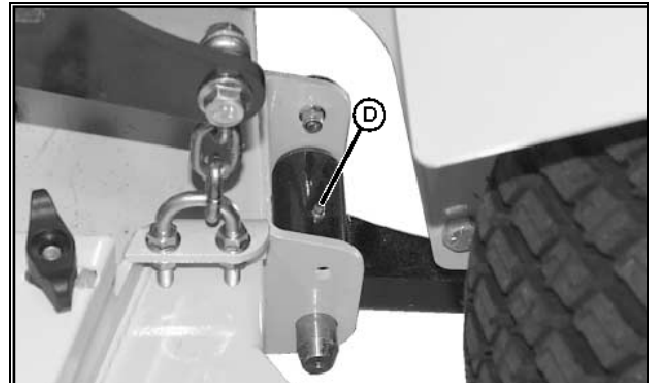
1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Grease caster wheel spindle bearings (B).



3. Grease HOC shafts (C) (two points on each side of the machine).



4. Grease mower deck thrust arms (D), located at the rear of the mower deck.

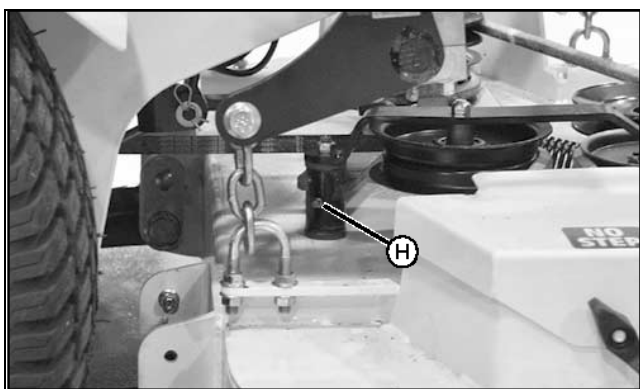


5. Apply grease to three spindle bearings.

SERVICE ENGINE

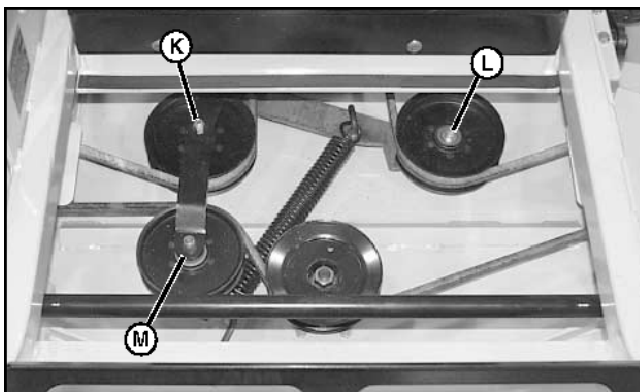


6. Grease traction drive belt tension arm pivot (G).

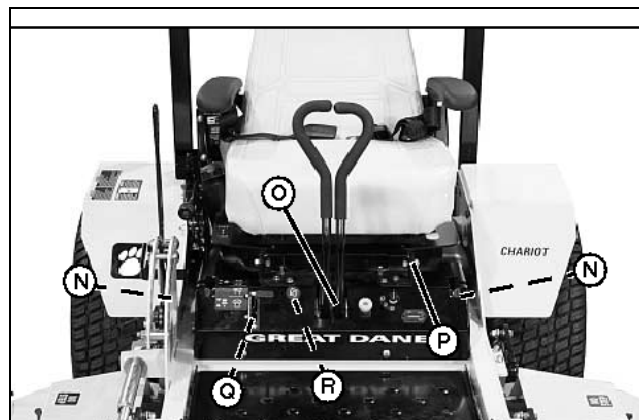


7. Grease mower deck drive belt tension arm (H).

NOTE: Use spray lubricant to lubricate the following items:



8. Lubricate mower deck idler pulleys (K-M).



9. Lubricate hydraulic pump control arms (N).

10. Lubricate control lever pivot shaft (O).

11. Lubricate seat platform hinges (P).

12. Lubricate throttle control cable (Q).

13. Lubricate choke control cable (R).

Service Engine

Engine Warranty Maintenance Statement

Maintenance, repair, or replacement of the emission control devices and systems on this engine, which are being done at the customer's expense, may be performed by any non-road engine repair establishment or individual. Warranty repairs must be performed by an authorized servicing dealer.

Avoid Fumes



CAUTION: Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

Move the machine to an outside area before running the engine. Do not run an engine in an enclosed area without adequate ventilation.

- Connect a pipe extension to the engine exhaust pipe to direct the exhaust fumes out of the area.

- Allow fresh outside air into the work area to clear the exhaust fumes out.

Engine Oil

Use oil viscosity based on the expected air temperature range during the period between oil changes.

Use oil that meets the following specification:

- See the engine manufacturer's owner's manual provided with your machine for the correct specifications.

SERVICE ENGINE

Checking Engine Oil Level

CAUTION: Avoid injury! Touching hot surfaces can burn skin. The engine, components, and fluids will be hot if the engine has been running. Allow the engine to cool before servicing or working near the engine and components.

IMPORTANT: Avoid damage! Failure to check the oil level regularly could lead to serious engine problems if oil level is low:

- Check oil level before operating.
- Keep oil level between the FULL and the ADD marks.
- Check oil level when engine is stopped, level, and is cooled so oil has had time to drain into the sump.

NOTE: Check oil twice a day if you run engine over 4 hours in a day. Make sure engine is cool when checking engine oil level.

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Allow engine to cool.

IMPORTANT: Avoid damage! Dirt and debris in oil may cause damage to the engine. Clean area around opening before removing plug or dipstick.

3. Remove dipstick (A). Wipe with a clean cloth.
4. Install dipstick and allow the cap to rest on the end of the tube. Do not tighten the cap.

IMPORTANT: Avoid damage! To prevent extensive engine wear or damage, always maintain the proper engine oil level. Never operate the engine with the oil level below the add mark or over the full mark.

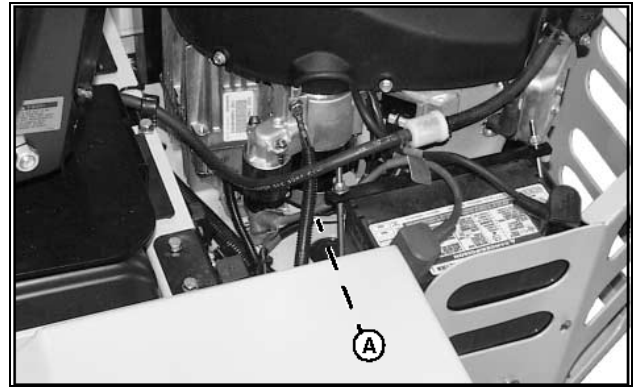
5. Remove dipstick and check oil level on dipstick. Oil must be between the ADD and FULL marks.
 - If oil is low, add oil to bring oil level no higher than the FULL mark on dipstick.
 - If oil level is above the FULL mark, drain to proper level.
6. Install and tighten dipstick.

Changing Engine Oil and Filter

IMPORTANT: Avoid damage! Change the oil more often if the vehicle is used in extreme conditions:

- Extremely dusty conditions.
- Frequent slow or low-speed operation.
- Frequent short trips.

1. Run engine to warm oil.
2. Park machine safely. (See Parking Safely in the SAFETY section).



3. Put container under drain tube.
4. Open drain valve (A) using a 10 mm socket, 1 ft extension, swivel and 3/8 in. drive ratchet.
5. Allow oil to drain into an oil drain pan.
6. After oil drains, close drain valve.
7. Remove oil filter using an appropriate filter wrench. Turn filter counterclockwise to remove.
8. Apply a film of clean engine oil on gasket of new filter.
9. Install filter. Turn filter clockwise until gasket makes contact with mounting surface. Tighten 1/2 to 3/4 turn after gasket contact.
10. Clean area around the dipstick.
11. Unscrew and remove dipstick.

IMPORTANT: Avoid damage! To prevent extensive engine wear or damage, always maintain the proper engine oil level. Never operate the engine with the oil level below the add mark or over the full mark.

12. Add approximately 1.4 L (1.5 qt) of oil.
13. Install and tighten dipstick.
14. Start engine and run at slow throttle for approximately two minutes. Check for leaks around filter and drain valve.
15. Stop engine.
16. Check oil level:
 - Remove dipstick. Wipe with a clean cloth.
 - Install dipstick and allow the cap to rest on the end of the tube. Do not tighten the cap.
 - Remove dipstick and check oil level on dipstick. Oil level should be between the ADD and FULL marks. Add oil if needed.
17. Install and tighten dipstick.

MODEL	Oil Capacity With Filter (Dry)
Kawasaki Engines	1.8 L (1.9 qt)
Kohler Engines	2.0 L (2.1 qt)

SERVICE ENGINE

Cleaning Engine Air Intake Screen and Fan

CAUTION: Avoid injury! Compressed air can cause debris to fly a long distance.

- Clear work area of bystanders.
- Wear eye protection when using compressed air for cleaning purposes.
- Reduce compressed air pressure to 210 kPa (30 psi).

IMPORTANT: Avoid damage! An obstructed air intake screen can cause engine damage due to overheating. Keep air intake screen and other external surfaces of the engine, including cooling fins, clean at all times to allow adequate air intake.

Keep air intake screens and engine cooling fins clear of debris to ensure proper cooling. See the engine manufacturer's owner's manual provided with your machine for the complete procedure.

Checking and Cleaning Air Filter Elements

CAUTION: Avoid injury! Touching hot surfaces can burn skin. The engine, components, and fluids will be hot if the engine has been running. Allow the engine to cool before servicing or working near the engine and components.

IMPORTANT: Avoid damage! Dirt and debris can enter the engine through a damaged filter element:

- Do not wash paper element.
- Do not attempt to clean paper element by tapping against another object.
- Do not use pressurized air to clean element.
- Replace element only if it is very dirty, damaged or the seal is cracked.

NOTE: It may be necessary to check the air filter more frequently if operating machine in dusty conditions.

Check and clean air filter elements at the intervals recommended in the Service Intervals section. See the engine manufacturer's owner's manual provided with your machine for the complete procedure.

Cleaning Engine Oil Cooler - Kohler Engines

Keep engine oil cooler fins clear of debris to ensure proper cooling. See the engine manufacturer's owner's manual provided with your machine for the complete procedure.

Checking Spark Plug

CAUTION: Avoid injury! Touching hot surfaces can burn skin. The engine, components, and fluids will be hot if the engine has been running. Allow the engine to cool before servicing or working near the engine and components.

IMPORTANT: Avoid damage! Do not clean spark plugs with abrasives.

Check spark plugs at the intervals recommended in the Service Intervals section. See the engine manufacturer's owner's manual provided with

your machine for the complete procedure.

Adjusting Carburetor

NOTE: Carburetor is calibrated by the engine manufacturer and is not adjustable.

If engine is operated at altitudes above 1829 m (6,000 ft), some carburetors may require a special high altitude main jet. See your authorized dealer.

If engine is hard to start or runs rough, check the TROUBLESHOOTING section of this manual.

Possible engine surging will occur at high throttle with transmission in "N" neutral and mower engagement lever disengaged. This is a normal condition due to the emission control system.

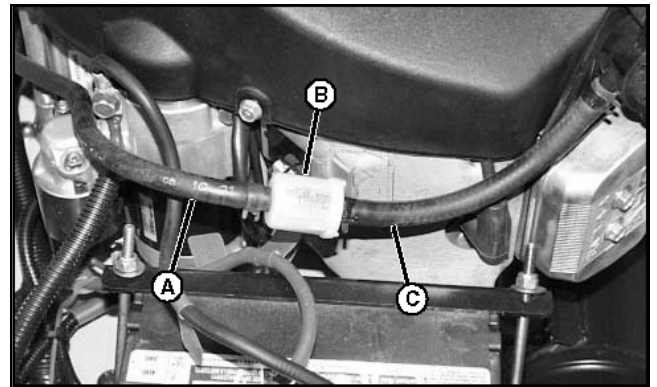
After performing the checks in the troubleshooting section and your engine is still not performing correctly, contact your authorized dealer.

Replacing Fuel Filter

CAUTION: Avoid injury! Fuel vapors are explosive and flammable:•Do not smoke while handling fuel.

- Keep fuel away from flames or sparks.
- Shut off engine before servicing.
- Cool engine before servicing.
- Work in a well-ventilated area.
- Clean up spilled fuel immediately.

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Allow engine to cool.
3. Place a drain pan under hoses to catch any fuel that may be left in hoses.



Picture Note: Kawasaki engine shown.

4. Locate fuel hose (A) coming from fuel tank, disconnect it from the inlet side of fuel filter (B) and drain gasoline into a properly marked container.
5. Remove fuel filter from fuel hose (C) going to engine. Discard filter.

IMPORTANT: Avoid damage! When installing a new fuel filter, the filter arrow must be pointing in the direction of fuel flow. Make sure clamps are installed properly.

6. Connect a new fuel filter to hoses. Make sure fuel filter is installed with arrow pointing in direction of fuel flow.

SERVICE TRANSMISSION

Service Transmission

Hydraulic Oil

Use only 5W-50 or 15W-50 all synthetic oil.

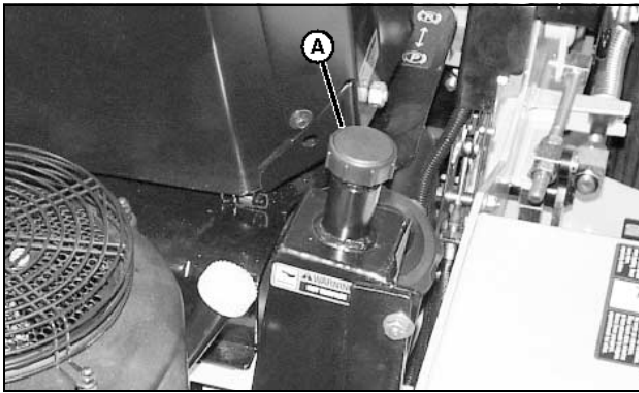
Checking Hydraulic Oil Level

IMPORTANT: Avoid damage! Check oil level in reservoir tank when oil is cold.

Do not overfill oil reservoir tank. Oil will expand during operation and could overflow.

1. Park machine safely. (See Parking Safely in the SAFETY section.)

IMPORTANT: Avoid damage! Dirt and debris in oil may cause damage to the transaxle. Clean area around opening before removing dipstick.



2. Unscrew and remove hydraulic reservoir cap/dipstick (A) from hydraulic oil reservoir.

3. Wipe dipstick with a clean cloth.

4. Install dipstick and allow the cap to rest on the end of the tube. Do not tighten the cap.

5. Remove dipstick and check oil level. Oil level should be at top mark on dipstick.

6. If necessary, add oil through oil reservoir filler neck.

7. Install cap on filler neck.

Changing Hydraulic Oil and Filter



CAUTION: Avoid injury! Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

Use caution when filling and draining hydraulic oil. During periods of machine operation the hydraulic oil reservoir can get hot. Allow engine and oil reservoir to cool before servicing.

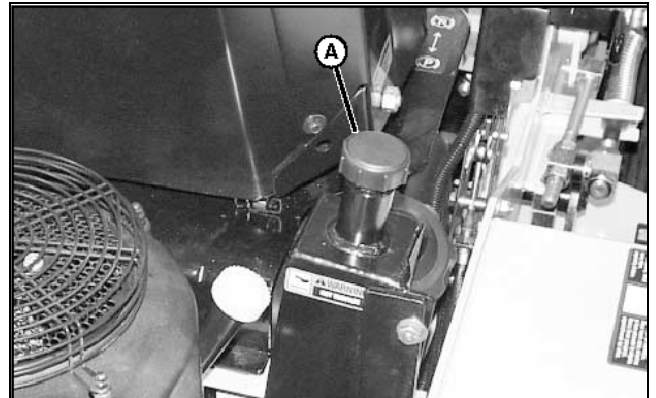
IMPORTANT: Avoid damage! Contamination of hydraulic fluid could cause transmission damage or failure. Do not open oil reservoir cap unless absolutely necessary.

Severe or unusual conditions may require a more frequent service interval.

1. Park machine safely. (See Parking Safely in the SAFETY section.)

2. Allow engine and hydraulic oil reservoir to cool.

3. Clean area around reservoir filler cap, and remove filler cap from reservoir.



4. Remove cap (A) from oil reservoir tank filler neck.



5. Turn hydraulic oil filter (B) counterclockwise to remove.

6. Allow hydraulic oil to drain into a drain pan with at least a 3.8 L (1.0 gal) capacity.

7. Apply a film of clean oil on gasket of new filter.

8. Install filter. Turn filter clockwise until gasket makes contact with mounting surface. Tighten 1/2 to 3/4 turn after gasket contact.

NOTE: Reservoir capacity is approximately 1.9 L (2.0 qt). Total system capacity is approximately 3.5 L (3.75 qt).

9. Fill oil reservoir with approximately 1.9 L (2.0 qt) of oil.

10. Install reservoir cap.

SERVICE TRANSMISSION

CAUTION: Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

Move the machine to an outside area before running the engine. Do not run an engine in an enclosed area without adequate ventilation.

- Connect a pipe extension to the engine exhaust pipe to direct the exhaust fumes out of the area.

- Allow fresh outside air into the work area to clear the exhaust fumes out.

11. Start engine.

12. Move throttle lever to 3/4-throttle position.

13. Unlock the park brake.

CAUTION: Avoid injury! Help prevent serious bodily injury. Remain alert to other people and the surroundings when operating the machine.

14. Run engine in full forward position for several minutes and then cycle motion control levers forward and rearward several times. Check for leaks around filter.

15. Stop engine. Check oil level. Add oil as necessary.

Cleaning Hydraulic Pump Cooling Fins

CAUTION: Avoid injury! Compressed air can cause debris to fly a long distance.

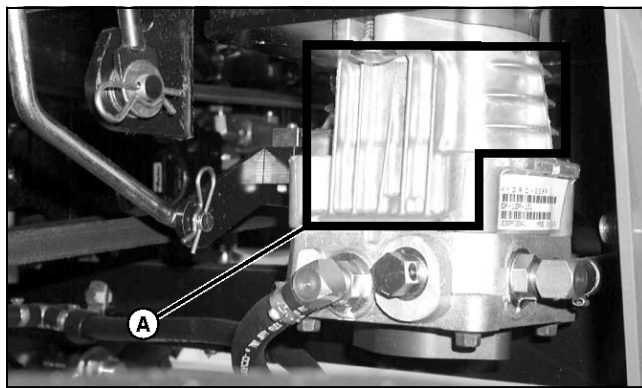
- Clear work area of bystanders.

- Wear eye protection when using compressed air for cleaning purposes.

- Reduce compressed air pressure to 210 kPa (30 psi).

IMPORTANT: Avoid damage! To ensure proper cooling, keep the cooling fins clean at all times. Operating the machine with obstructed cooling fins could cause damage due to overheating.

1. Park machine safely. (See Parking Safely in the SAFETY section.)



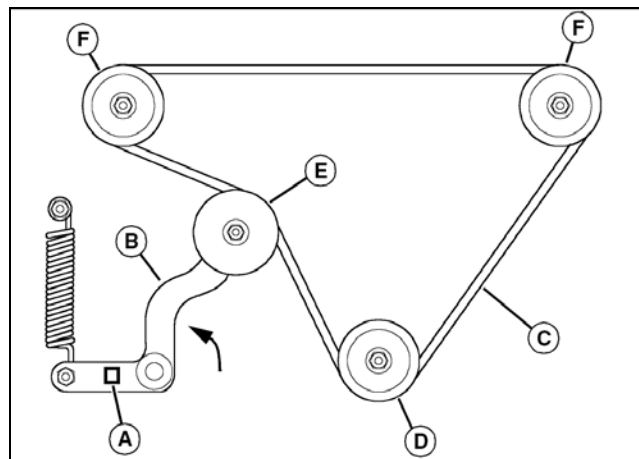
2. Clean hydraulic oil cooler fins (A) on each hydraulic pump with a rag, brush, or compressed air.

Removing and Installing Traction Drive Belt

1. Park machine safely. (See Parking Safely in the SAFETY section.)

2. Remove mower deck drive belt.

CAUTION: Avoid injury! Fingers and hands can be pinched or crushed. Keep hands clear of sheave and belt pinch points when servicing belt.



Picture Note: Drive belt routing as viewed from top of machine.

A- 1/2 in. Square Opening

B- Tension Arm

C- Traction Drive Belt

D- Engine Drive Sheave

E- Tension Idler Sheave

F- Hydraulic Pump Sheave

3. Using a 1/2 in. drive breaker bar and extension, insert end of extension in 1/2 in. drive square opening (A) in tension arm, and carefully move tension arm (B) counter-clockwise to release belt tension.

4. Remove drive belt (C).

5. Install new drive belt.

6. Install mower deck drive belt as shown.

Checking and Adjusting Motion Control Linkages

CAUTION: Avoid injury! Do not attempt this adjustment unless you are a qualified and properly trained technician. Improper adjustment can result in an unsafe machine.

SERVICE TRANSMISSION

Check Neutral Creep

CAUTION: Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death. Move the machine to an outside area before running the engine.

Do not run an engine in an enclosed area without adequate ventilation.

- Connect a pipe extension to the engine exhaust pipe to direct the exhaust fumes out of the area.
- Allow fresh outside air into the work area to clear the exhaust fumes out.

NOTE: Check and adjust motion control linkages with the machine parked on a hard, level surface.

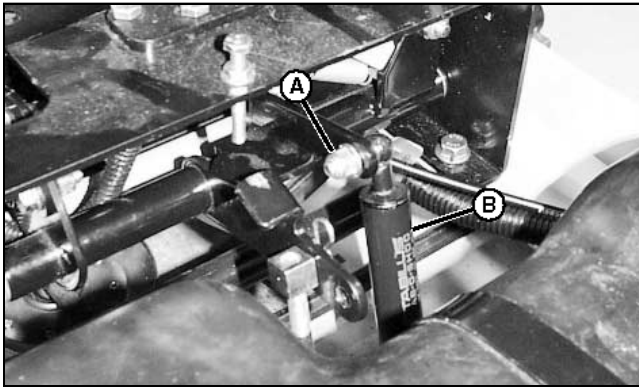
1. Start engine.
2. Set throttle lever to full-throttle position.
3. Unlock the park brake.
4. If the rear drive wheels begin to creep, an adjustment is required.

Neutral Creep Adjustment

1. Stop engine and lock the park brake.
2. Move both motion control levers to neutral detent position (standard levers) or neutral lock position (optional "over the lap" levers).
3. Raise the rear wheels off the ground and securely support the rear of the machine.

NOTE: When tilting the seat forward, do not tilt the seat so far forward that it moves the motion control levers out of the neutral detent position.

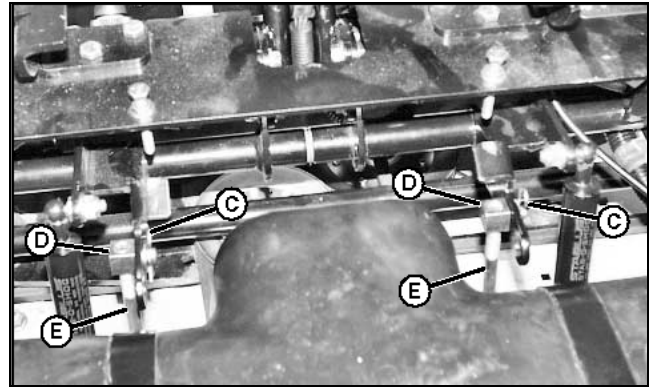
4. Tilt operator seat forward and support the seat frame.



5. Loosen nut (A), and move the dampener (B) in adjusting slot backward or forward to stop machine creep.

- If machine creeps forward, slide dampener to the rear of the adjusting slot. Tighten nut.
- If machine creeps backward, slide dampener to the front of the adjusting slot. Tighten nut.

6. Check for creep, and if the machine still creeps, continue with the next step.



7. Remove pin (C) and disconnect swivel (D) from each traction control rod (E), and rotate the swivel.

8. Rotate swivel (D) to adjust:

- To stop forward creep, rotate each swivel (D) counterclockwise one rotation.
- To stop rearward creep, rotate each swivel (D) clockwise one rotation.

9. Connect swivel to traction control rod.

10. Repeat as needed to stop machine creep.

11. Lower seat.

12. Lower the rear of the machine to the ground.

13. Check maximum speed drift.

Check Maximum Speed Drift

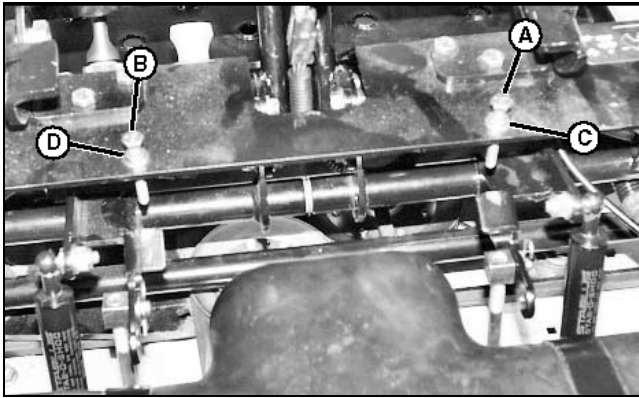
1. Check neutral creep, and adjust as needed.
2. Sit on the seat, and start the engine.
3. Operate machine to bring the hydraulic oil to normal operating temperature.
4. Move the machine in a level, wide-open area, such as an empty parking lot.
5. Run the engine at full throttle.
6. Move and hold both control levers to the full forward position. Observe the machine travel. If the machine does not travel in a straight line, adjustment is required. Note the direction the machine moves.

Maximum Speed Drift Adjustment

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Tilt operator seat forward and support the seat frame.

SERVICE TRANSMISSION

NOTE: If the machine travels to the left, adjust the right speed drift screw (A). If the machine travels to the right, adjust the left speed drift screw (B).



3. Adjust the appropriate speed drift screw (A or B) as follows:

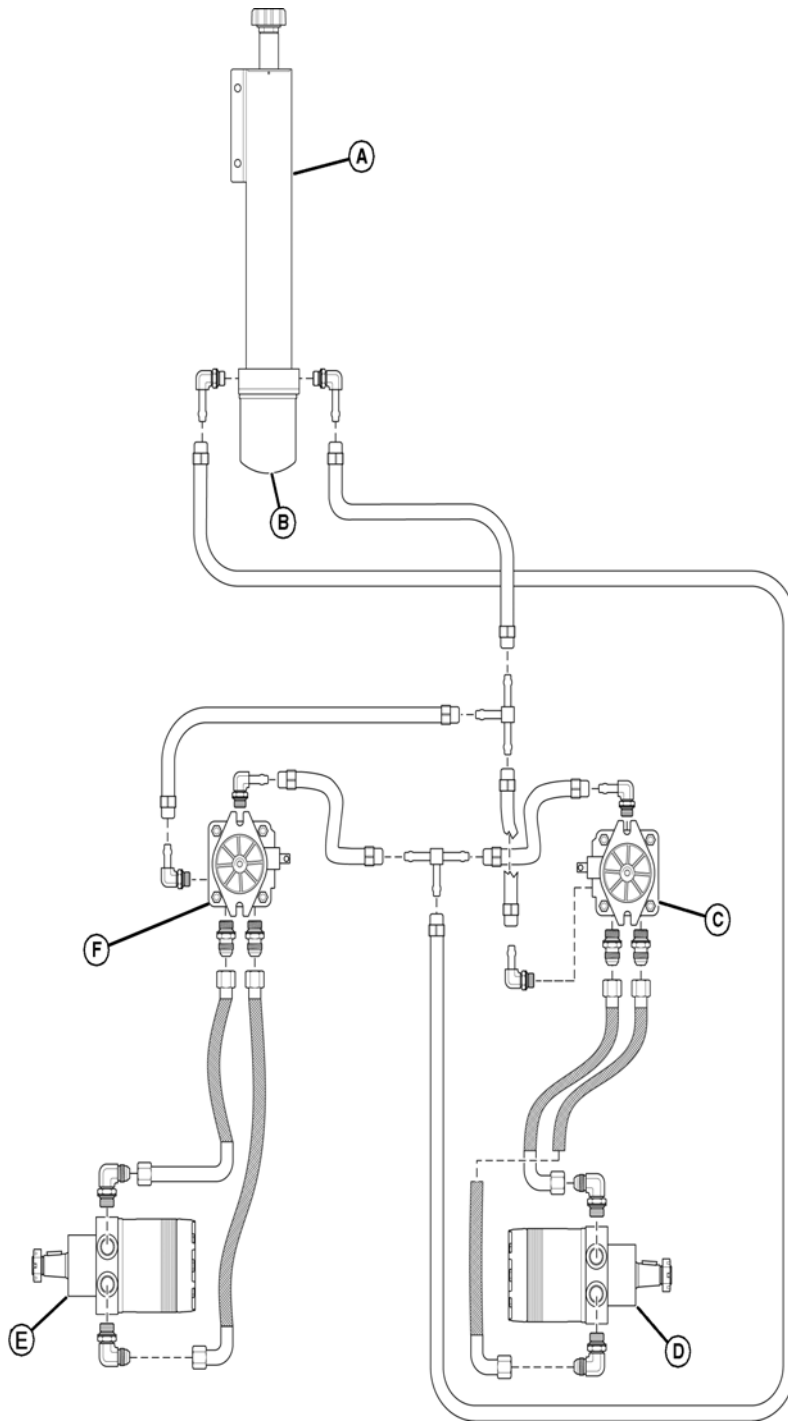
- a. Loosen jam nut (C or D).
- b. Adjust the screw (A or B) one turn clockwise.
- c. Tighten the jam nut (C or D).

4. Lower the seat platform.

5. Perform Check Maximum Speed Drift procedure to check adjustment.
Repeat the adjustment procedure as needed.

SERVICE TRANSMISSION

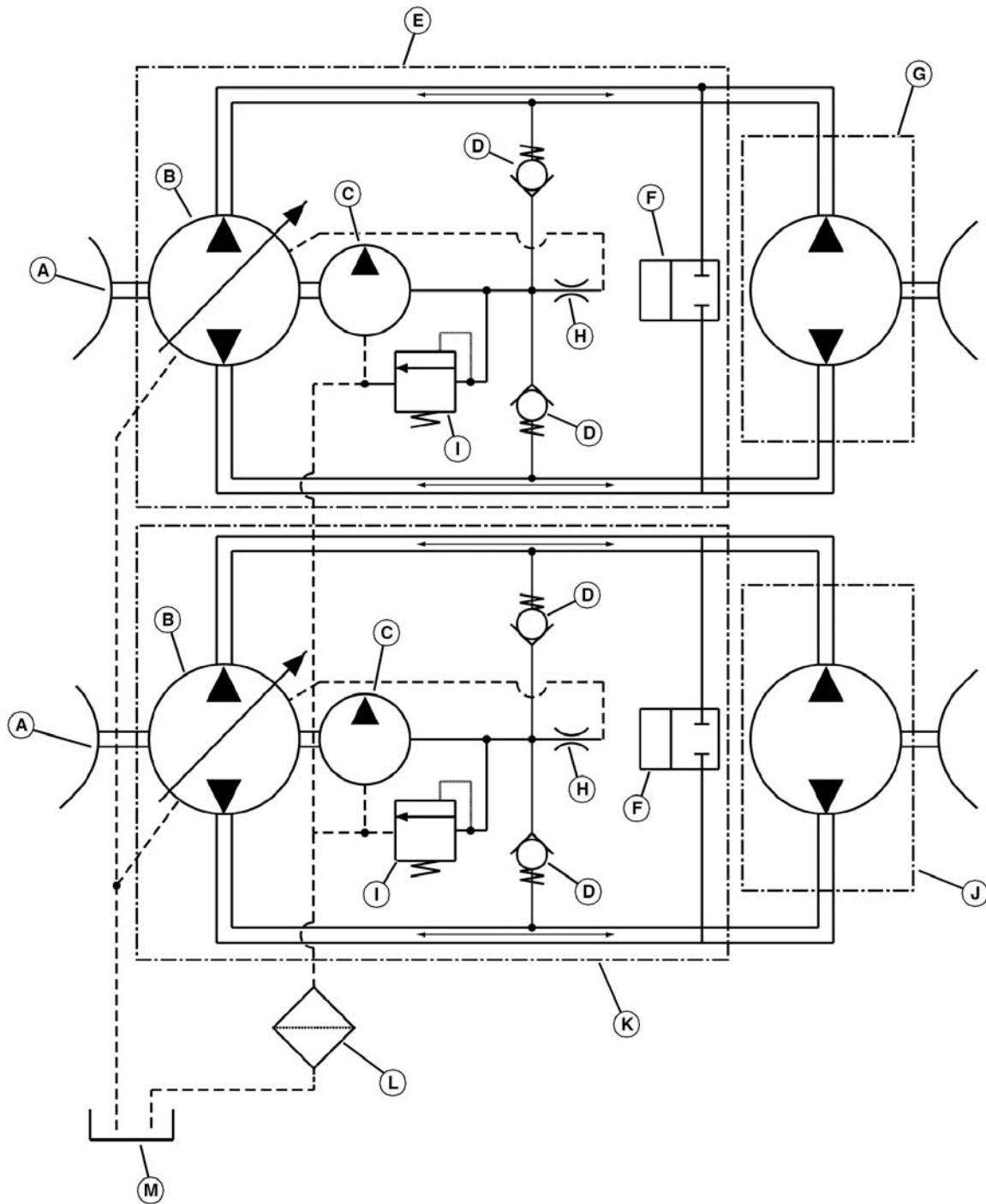
Hydraulic System Hose Routing



- A- Hydraulic Reservoir
- B- Oil Filter
- C- Right Hydraulic Pump
- D- Right Wheel Motor
- E- Left Wheel Motor
- F- Left Hydraulic Pump

SERVICE STEERING & BRAKES

Hydraulic System Schematic



- A- Control Input Shaft
- B- Pump Block
- C- Charge Pump
- D- Charge System Check Valve
- E- Right Hydraulic Pump
- F- Manual Bypass (Free-Wheel) Valve
- G- Right Wheel Motor
- H- Cooling Orifice
- I - Charge Relief Valve

- J - Left Wheel Motor
- K- Left Hydraulic Pump
- L - Oil Filter
- M- Hydraulic Reservoir

Service Steering & Brakes

SERVICE STEERING & BRAKES

Removing and Installing Front Caster Wheels

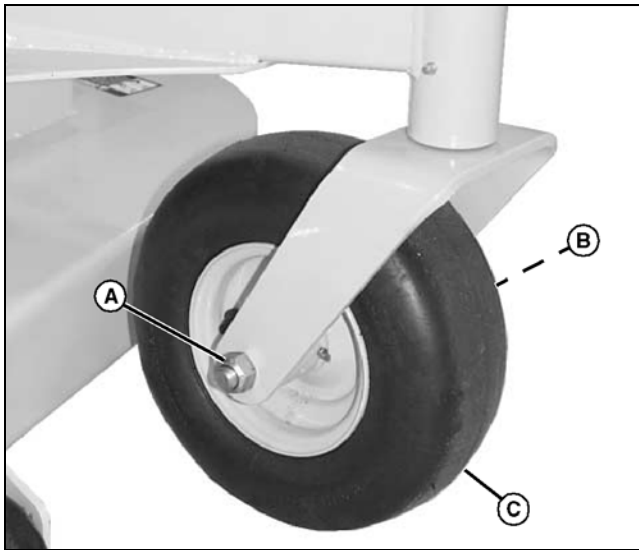
Removing

1. Park machine safely. (See Parking Safely in the SAFETY section.)

CAUTION: Avoid injury! The machine may fall or slip from an unsafe lifting device or supports, injuring anyone beneath it.

- Remove key before raising machine.
- Use a safe lifting device rated for the load to be lifted.
- Lower machine onto stable supports or jack stands and block wheels before servicing.

2. Lift front of machine with a safe lifting device.



3. Remove hex nut (A) and wheel bolt (B).

4. Remove wheel (C) from assembly yoke.

Installing

1. Install replacement wheel (C).

2. Install wheel bolt (B) and hex nut (A).

3. Tighten nut.

4. Lower machine.

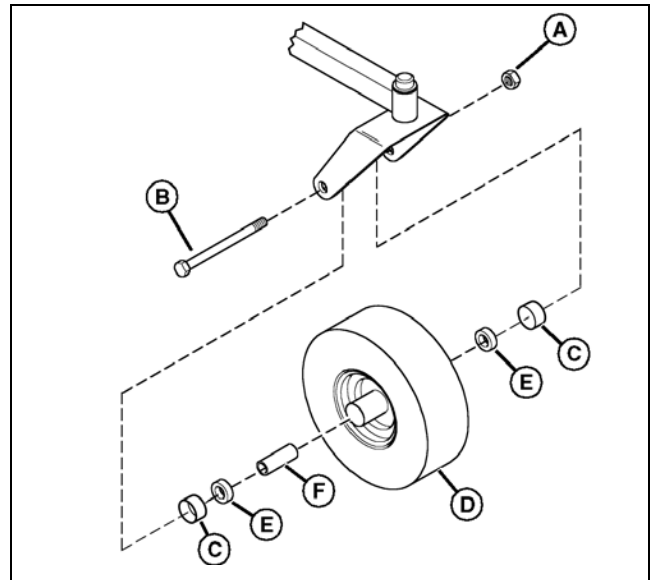
Servicing Front Caster Wheel Roller Bearings - Chariot

1. Park machine safely. (See Parking Safely in the SAFETY section.)

CAUTION: Avoid injury! The machine may fall or slip from an unsafe lifting device or supports, injuring anyone beneath it.

- Remove key before raising machine.
- Use a safe lifting device rated for the load to be lifted.
- Lower machine onto stable supports or jack stands and block wheels before servicing.

2. Raise and securely support the front of the mower deck.



3. Remove locknut (A), cap screw (B), two trash guards (C) and wheel and tire assembly (D).

4. Remove bearings (E) and spacer tube (F) from wheel.

5. Wipe clean and inspect bearings (E). Replace bearings as needed.

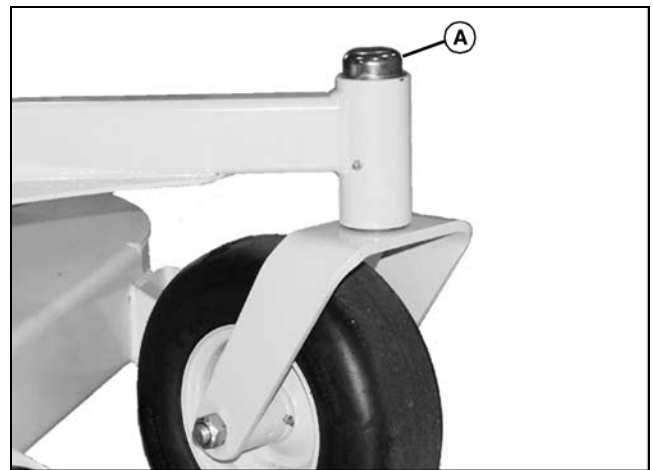
6. Install spacer tube (F), press bearings (E) into wheel and tire assembly.

7. Install wheel and tire assembly (D), two trash guards (C), cap screw (B) and locknut (A).

Adjusting Front Caster Spindle Bearing

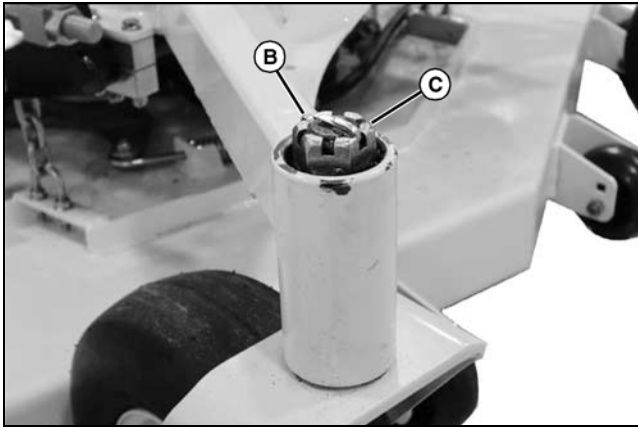
NOTE: Adjustment required only if the front caster wheel shimmies during travel.

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Remove dust cover (A) from top of spindle.

SERVICE STEERING & BRAKES



3. Remove cotter pin (B).
4. Turn castle nut (C) 1/4 turn clockwise.
5. Install a new cotter pin. Do not loosen the castle nut to align cotter pin hole, tighten to align.
6. Replace dust cover.
7. Test machine to determine if shimmy is still present. Repeat adjustment as necessary.

Servicing Caster Spindle Bearings

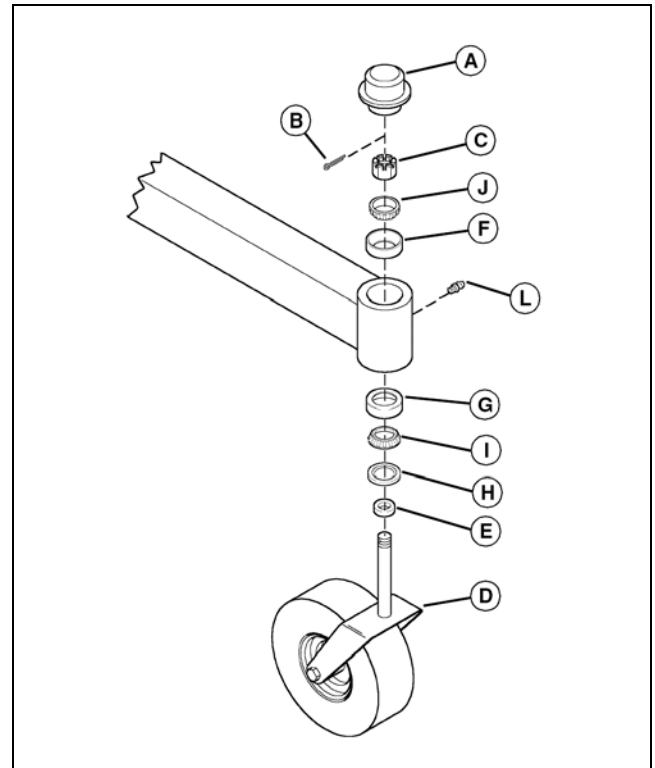
1. Park machine safely. (See Parking Safely in the SAFETY section.)



CAUTION: Avoid injury! The machine may fall or slip from an unsafe lifting device or supports, injuring anyone beneath it.

- Remove key before raising machine.
- Use a safe lifting device rated for the load to be lifted.
- Lower machine onto stable supports or jack stands and block wheels before servicing.

2. Raise and securely support the front of the mower deck.



3. Remove cap (A), cotter pin (B), castle nut (C), caster yoke and wheel assembly (D) and caster bushing (E).

NOTE: It is not necessary to remove the bearing races (F and G), unless the bearings need to be replaced.

4. Remove seal (H) and lower bearing (I).
 5. Remove upper bearing (J).
 6. Clean and inspect bearings (I and J); pack with clean grease. Replace bearings if needed.
 7. Install lower bearing (I).
 8. Install caster bushing (E) into a new seal (H).
 9. Install seal assembly (H).
 10. Carefully install caster yoke and wheel assembly (D).
- NOTE:** Do not overtighten castle nut (C). Tighten castle nut only enough to install the cotter pin (B). The caster wheel yoke assembly must be free to rotate.
11. Install castle nut (C), cotter pin (B) and cap (A).
 12. Apply grease to lubrication fitting (L).

Checking and Aligning Motion Control Levers - Standard Center Steer Levers

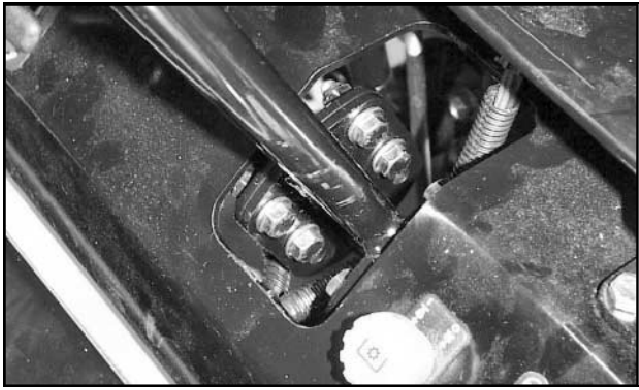
Check Alignment:

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. The control lever gap is pre-set at the factory. If the gap requires adjustment, see your authorized Great Dane servicing dealer.

Height Adjustment Procedure

The position of the control levers can be varied higher or lower by approximately 25 mm (1 in.) depending on the holes chosen for mounting the lever.

SERVICE MOWER

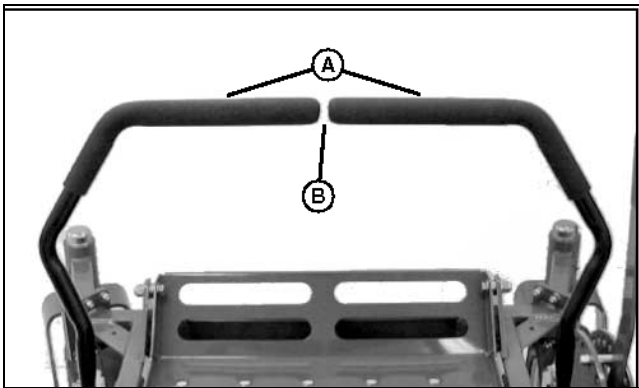


- To mount in the high position, mount the levers to the top four holes in the mounting bracket.
- To mount in the low position, mount the levers to the bottom four holes in the mounting bracket.

Checking and Aligning Motion Control Levers - Optional Over the Lap Levers

Check Alignment:

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Move both motion control levers (A) from the neutral lock to the neutral steer position.

3. Check levers for equal alignment.

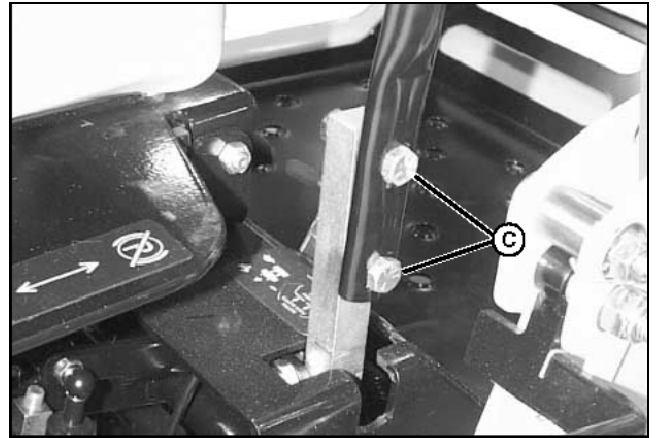
- Check gap (B) between the levers. The recommended gap is 3-6 mm (1/8-1/4 in.).

NOTE: If the ends of the levers strike against each other while in the neutral position, move the levers to the neutral lock position and carefully bend them outward. Move them back to the neutral position and check for the recommended gap of 3-6 mm (1/8-1/4 in.).

- If positions of the control levers are unequal, an adjustment is necessary.

Alignment Procedure

1. Adjust position of motion control levers:



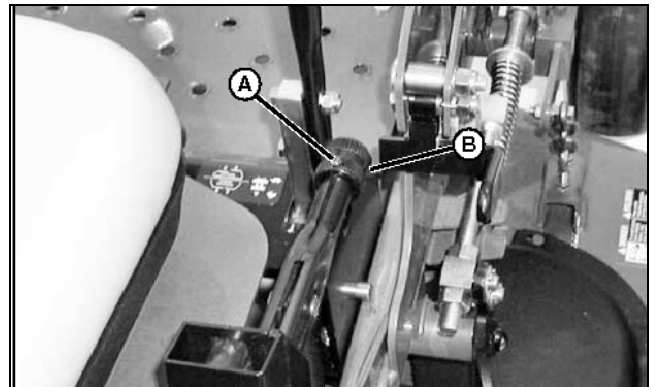
- Loosen cap screws (C).
- Slide both levers forward or rearward to desired position on control arm until levers are aligned.
- Tighten cap screws.

Adjusting Park Brake

IMPORTANT: Avoid damage! Due to initial brake wear, the park brake should be checked and adjusted after the first 25 hours of use.

A park brake that is adjusted too tightly could damage the transmission or cause premature brake wear.

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Loosen set screw (A).
3. Turn knob (B) clockwise several times.
4. Tighten set screw down in the lower slot.
5. Test park brake.

Service Mower

Removing and Installing Mower Deck Foot Plate

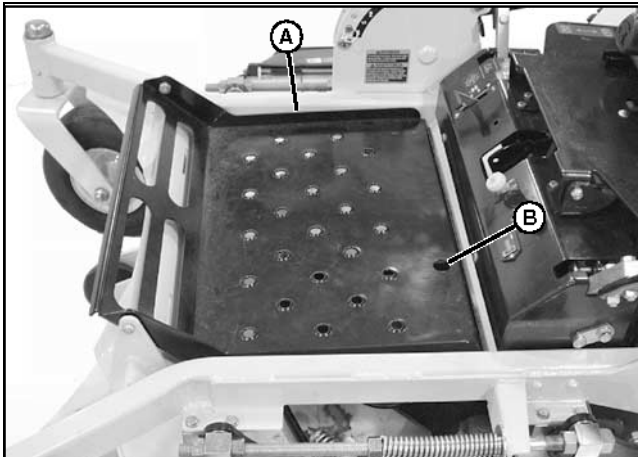


CAUTION: Avoid injury! Always operate the mower with the foot plate installed. Operating with the foot plate removed can cause serious injury.

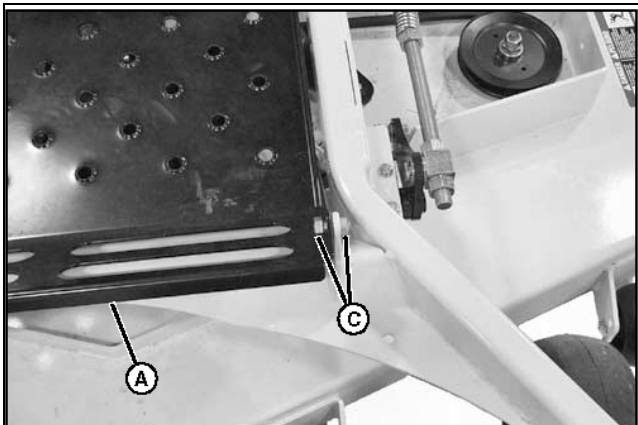
SERVICE MOWER

Removing Foot Plate

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Raise foot plate (A) using hole (B).



3. Remove and retain hardware (C) securing foot plate (A) on both sides of machine.

4. Remove foot plate.

Installing Foot Plate

1. Install foot plate (A) using hardware (C) saved earlier.

2. Lower foot plate.

Removing and Installing Mower Deck Belt Shields



CAUTION: Avoid injury! Help prevent serious personal injury. Do not operate the mower without the belt shields installed.

Removing Belt Shields

1. Park machine safely. (See Parking Safely in the SAFETY section.)

2. Lower mower deck to the lowest cutting height position.



3. Remove knob (A).

4. Remove belt shield (B).

Installing Belt Shields

1. Install belt shield (B).

2. Install knob (A).

Leveling Mower Deck



CAUTION: Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

- Remove ignition key or disconnect battery negative (-) cable to prevent engine from starting accidentally.
- Always wear gloves when handling mower blades or working near blades.

NOTE: Mower deck anti-scalp wheels should not contact the ground.

1. Park machine safely. (See Parking Safely in the SAFETY section.)

2. Inflate tires to the correct pressure.

3. Raise the mower deck lift lever to transport position.

4. Inspect mower blades for:

- Blade sharpness.
- Blade damage.
- Bent blades.

Checking Level (Side-to-Side)

NOTE: Mower deck anti-scalp wheels should not contact the ground.

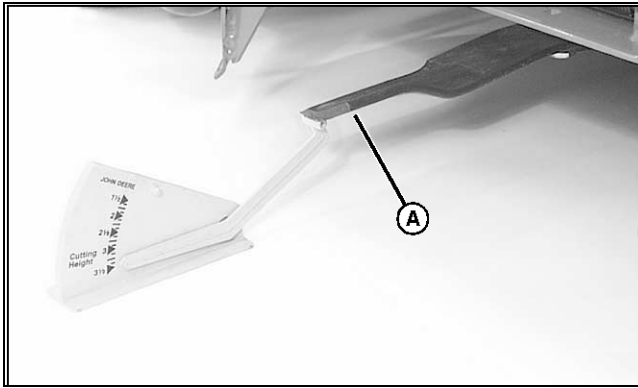
1. Lower deck to the 76 mm (3 in.) cutting height position.

NOTE: Position the left mower blade in the sideways (left-to-right) position.

Use a short ruler or a leveling gauge to check the mower blade level.

2. Measure from outside blade tip to the ground.

SERVICE MOWER



Picture Note: Discharge chute raised for photo clarity.

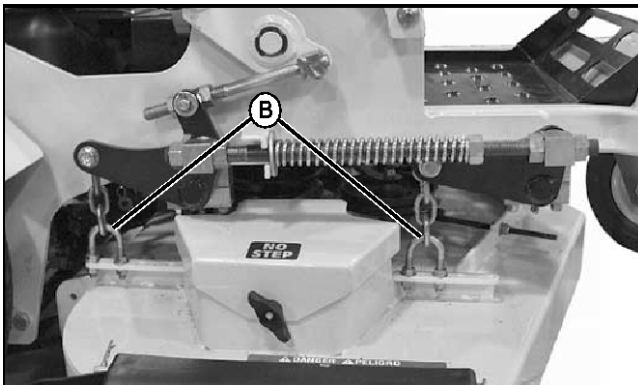
3. Position right mower blade (A) (discharge side) in the side-to-side position.

4. Measure from outside blade tip to the ground.

- The difference between both measurements should be no greater than 3 mm (1/8 in.).

5. If side-to-side level is not within specifications, an adjustment is necessary.

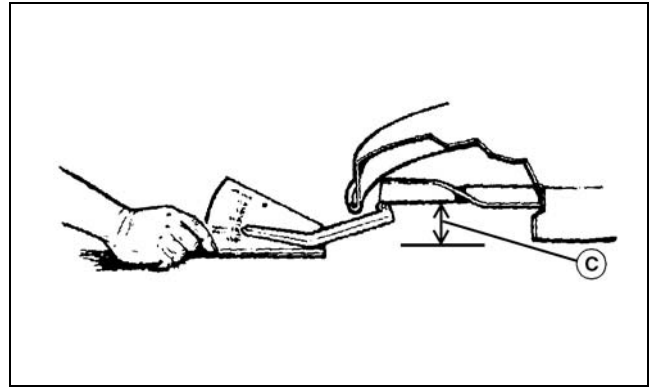
Adjusting Level (Side-to-Side)



1. Adjust four chain U-bolts (B) (two on each side of deck) until deck is within 3 mm (1/8 in.) of level from side to side.

Checking Level (Front-to-Rear)

1. Lower mower deck to the 76 mm (3 in.) cutting height position.
2. Position right mower blade (discharge side) in the straight forward (front-to-rear) position.
3. Measure from right front blade tip to the ground.
4. Turn blade 180° and measure from right rear blade tip to the ground.



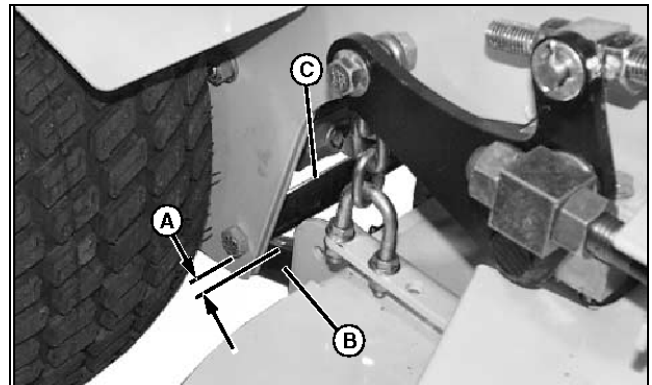
- The height (C) of the rear blade tip should be 3-6 mm (1/8-1/4 in.) higher than the front blade tip.

5. If the front-to-rear level is not within specifications, an adjustment is necessary.

Adjusting Level (Front-to-Rear)

IMPORTANT: Avoid damage! Adjust the left and right deck lift assist rods equally.

NOTE: Adjust side-to-side mower level before adjusting front-to-rear level.



1. Loosen jam nut (D) on deck lift assist rod.
2. While positioned in front of the machine, adjust mower level:
 - Turn hex nut (E) counterclockwise (F) to lower front of mower deck.
 - Turn hex nut (E) clockwise (G) to raise front of mower deck.
3. Tighten jam nuts.
4. Check front-to-rear mower level.

SERVICE MOWER

Checking and Adjusting Cutting Height

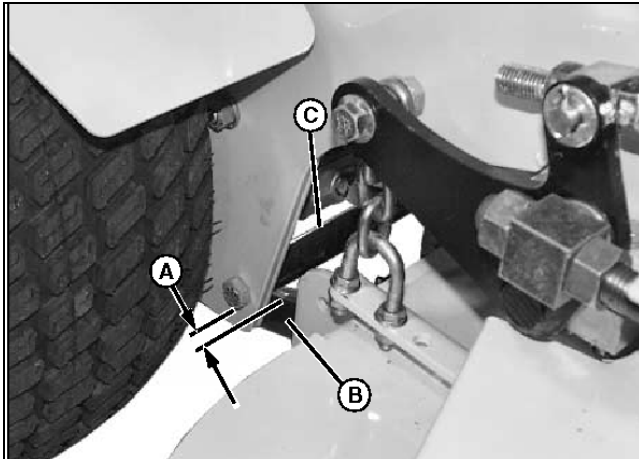


CAUTION: Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

- Remove ignition key or disconnect battery negative (-) cable to prevent engine from starting accidentally.
- Always wear gloves when handling mower blades or working near blades.

Checking Thrust Arm-to-Stop Rod Clearance (Transport Position)

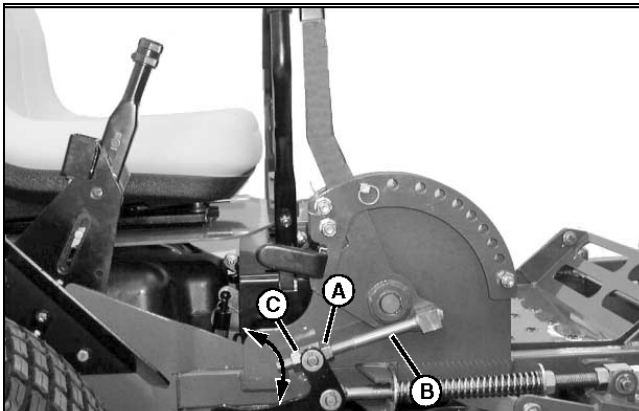
1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Set mower deck to transport (fully raised) position.



3. Check clearance (A) from the top of the thrust arms (B) to the bottom of the thrust arm stop rod (C). The clearance should be 3 mm (1/8 in.).

Adjust Thrust Arm-to-Stop Rod Clearance (Transport Position)

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Loosen jam nut (A).

NOTE: If correct adjustment cannot be obtained by adjusting the lift handle connecting rod, further movement can be gained by adjusting the chain U-bolts.

Adjust all four chain U-bolts equally. All four chains should be tight. Tighten the U-bolt of the loose chain to correct.

3. Adjust deck lift handle connecting rod (B) while viewing adjusting mechanism from rear of machine.

- To lower deck, turn nut (C) counterclockwise.
- To raise deck, turn nut (C) clockwise.

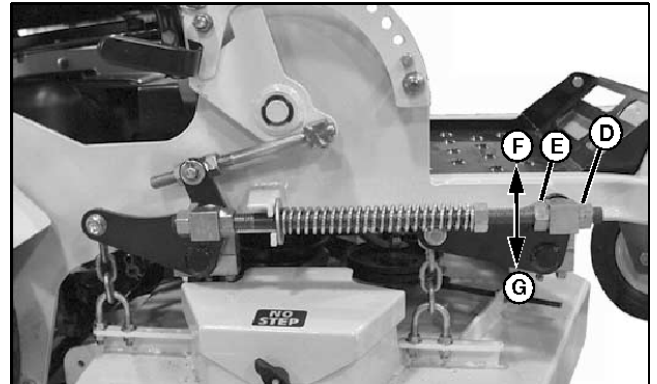
4. Tighten jam nut (A).

Adjusting Deck Lift Assist Spring Tension

NOTE: Deck lift assist spring tension is adjusted at the factory. If the effort required to raise or lower the mower deck is not satisfactory, an adjustment may be necessary.

Check Spring Tension

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Raise the mower deck lift lever to the transport position.



3. Measure distance (A) between the washers (B) on each deck lift spring assembly.

- The recommended factory setting is approximately 1 mm (1/32 in.) gap between the spring coils at the lowest HOC setting.

Adjust Assist Spring Tension

NOTE: Do not overtighten the deck lift assist springs. If the springs are compressed too tightly, the mower deck will float too freely.

Decrease deck lift assist spring tension if operating in rough terrain.

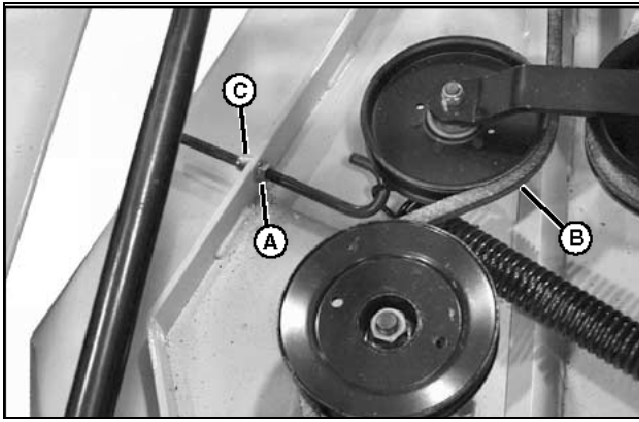
While positioned in front of the machine:

- Turn hex nut (C) clockwise to increase deck lift spring tension and reduce the effort to raise and lower the mower deck.
- Turn hex nut (C) counterclockwise to decrease deck lift spring tension and increase the effort to raise and lower the mower deck.

Checking and Adjusting Mower Deck Drive Belt Tension

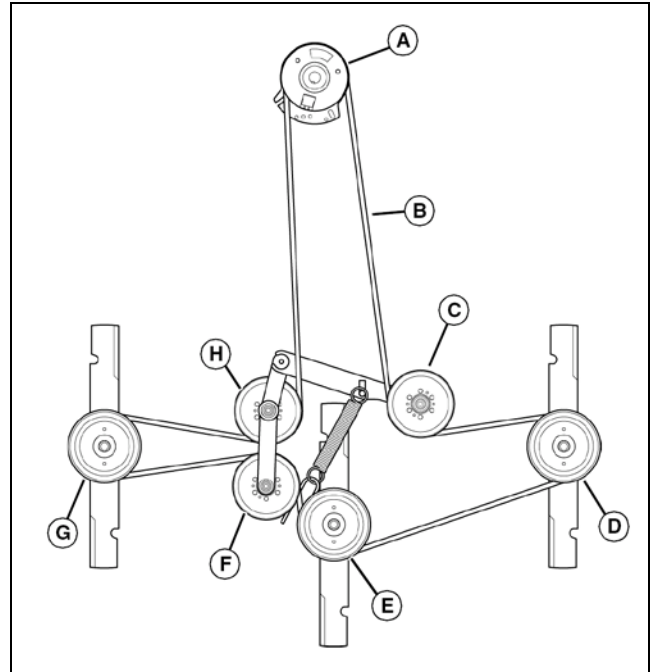
1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Adjust the mower deck for the lowest cutting height, and lower the deck.
3. Raise foot platform.

SERVICE MOWER



CAUTION: Avoid injury! Fingers and hands can be pinched or crushed. Keep hands clear of sheave and belt pinch points when servicing belt.

5. Remove mower deck drive belt (B).



- A- PTO Clutch Sheave
- B- Mower Deck Drive Belt
- C- Tension Idler Sheave
- D- Left Spindle Sheave
- E- Center Spindle Sheave
- F- Idler Sheave
- G- Right Spindle Sheave
- H- Idler Sheave

6. Install new mower deck drive belt (B) as shown.

7. Adjust belt tension.

8. Install mower deck drive belt covers.

9. Lower foot platform.

Checking and Replacing Mower Blades

CAUTION: Avoid injury! Do not work near raised mower deck unless it is safely supported.

- Mower blades are sharp. Wrap blades or wear gloves when servicing.
- Before performing any service function, wait for all moving parts to stop turning.
- Disconnect battery or remove spark plug wire before making repairs.

4. Loosen jam nut (A).

5. Check the mower deck drive belt (B) tension. The belt should deflect a maximum of 13 mm (1/2 in.) when a force of 4.5 kg (10 lb) is applied to the center of the longest span.

When properly adjusted, there would be approximately a 2 mm (1/16 in.) gap between the spring coils.

- To increase belt tension: Turn nut (C) clockwise.
- To decrease belt tension: Turn nut (C) counterclockwise.

6. Tighten jam nut (A).

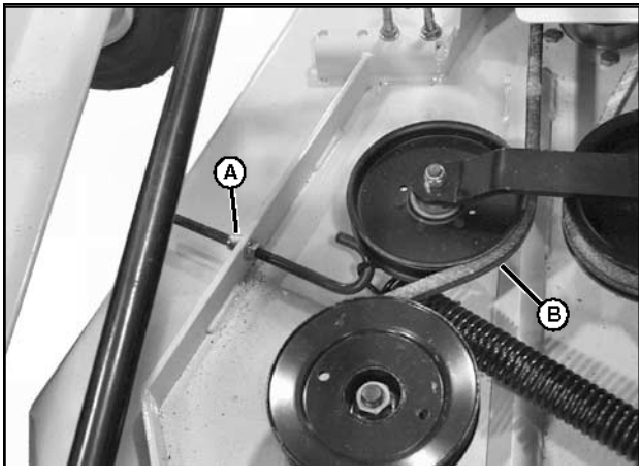
7. Lower foot platform.

Removing and Installing Mower Deck Drive Belt

1. Park machine safely. (See Parking Safely in the SAFETY section.)

2. Raise foot platform.

3. Remove mower deck drive belt covers.



4. Release mower deck drive belt tension by turning the tension adjuster nut (A) counterclockwise.

SERVICE MOWER

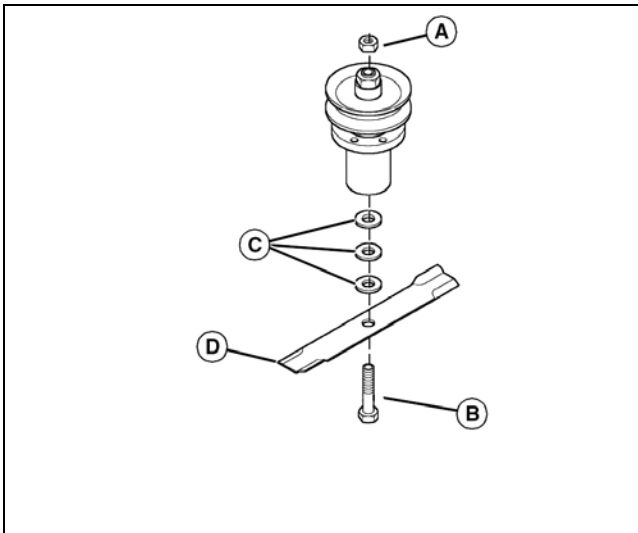
IMPORTANT: Avoid damage! When replacing mower blades, always use genuine Great Dane Service Parts.

NOTE: Only replace blades. Never straighten or weld them.

Checking Mower Blades

1. Park machine safely. (See Parking Safely in the Safety Section).
2. Raise the mower deck to the transport position (also the 12.7 cm [5 in.] cutting height position).
3. Raise front of machine with a safe lifting device.
 - Support with jack stands and/or wooden blocks.
4. Check mower blades:
 - Mower blades should be sharp and free of any damage.
 - Inspect blades; sharpen/balance or replace as necessary.

Replacing Mower Blades



1. Use two long-handled 15/16 in. wrenches to loosen nut (A).
2. Remove nut (A), blade bolt (B), three 1/4 in. washers (C) and blade (D).
3. Install replacement blade:
 - Blade wing must face toward top of mower deck.

IMPORTANT: Avoid damage! When installing the blade:

- Make sure the blade is properly seated on the spindle.
- Make sure the concave side of the large washer faces towards the blade.

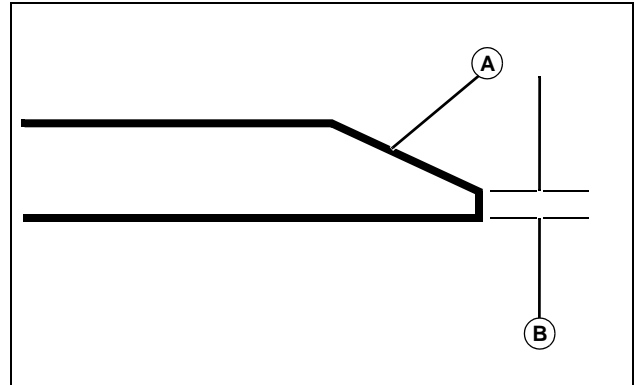
- Install blade bolt (B), blade (D), three 1/4 in. washers (C) and nut (A).
 - Tighten blade nut to 81 N•m (60 lb-ft).
4. Lower machine.
 5. Adjust mower deck to a desirable cutting height.

Sharpening Blades

CAUTION: Avoid injury! Mower blades are dangerous!

- Always wear gloves while working on blades.
- Always wear safety eye protection when grinding.

- Sharpen blades with grinder, hand file, or electric blade sharpener.

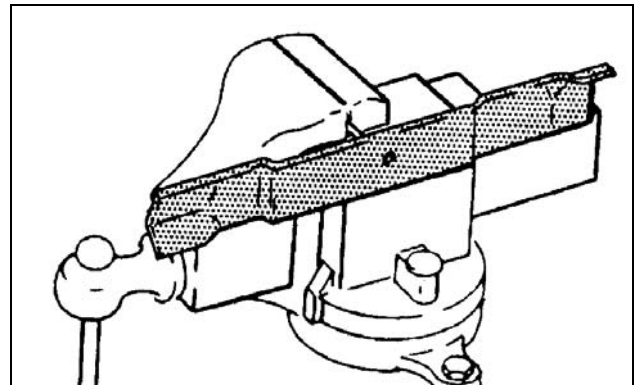


- Keep original bevel (A) when grinding.
- Blade should have 0.40 mm (1/64 in.) cutting edge (B) or less.
- Balance blades before installing.

Balancing Blades

CAUTION: Avoid injury! Mower blades are sharp. Always wear gloves when handling mower blades or working near blades.

1. Clean blade.

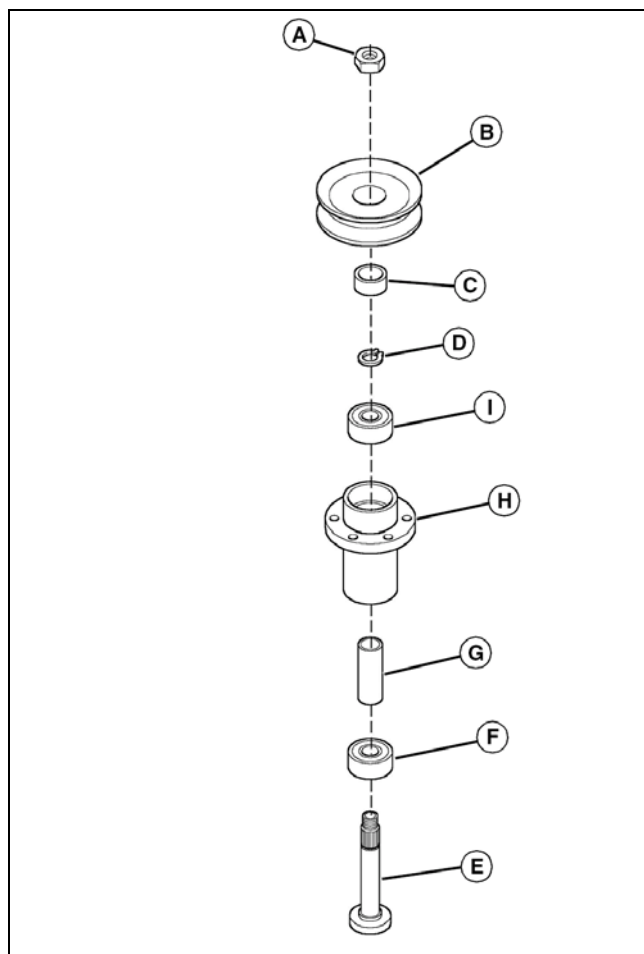


2. Put blade on nail in a vise. Turn blade to horizontal position.
3. Check balance. If blade is not balanced, heavy end of blade will drop.
4. Grind bevel of heavy end. Do not change blade bevel.

Replacing Mower Spindle Bearings

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Remove mower blade. (See Checking and Replacing Mower Blades.)

SERVICE ELECTRICAL



3. Remove nut (A), pulley (B) and spacer (C).
4. Remove retaining ring (D), spindle shaft (E), lower bearing (F) and spacer (G) from spindle housing (H). Discard bearing.
5. Remove and discard upper bearing (I).
6. Clean entire assembly.
7. Install a new lower bearing (F) and spacer (G) on the spindle shaft (E).

IMPORTANT: Avoid damage! The clearance between the lower bearing and the housing is only 0.05 mm (0.002 in.). Do not force bearing into housing.

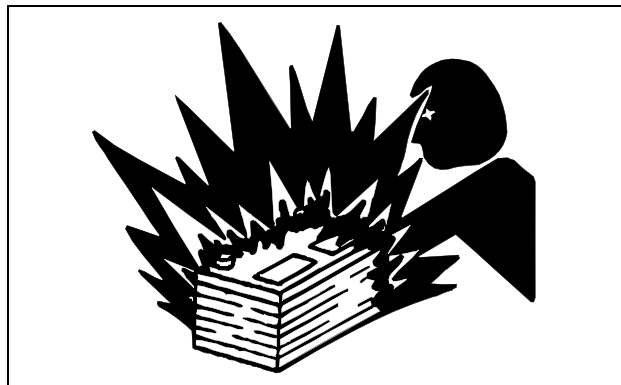
8. Install the spindle shaft (E), lower bearing (F) and spacer (G) into the spindle housing (H).
9. Install the upper bearing (I) and retaining ring (D).
10. Install spacer (C).
11. Install pulley (B) and nut (A). Tighten nut to 61 N•m (50 lb-ft).
12. Install mower blade, blade washers and blade bolt assembly. Tighten nut to 81 N•m (60 lb-ft). (See Checking and Replacing Mower Blades.)

Service Electrical

WARNING: Battery posts, terminals and related accessories contain lead and lead components, chemicals known to the State of California to cause

cancer and reproductive harm. **Wash hands after handling.**

Service the Battery Safely



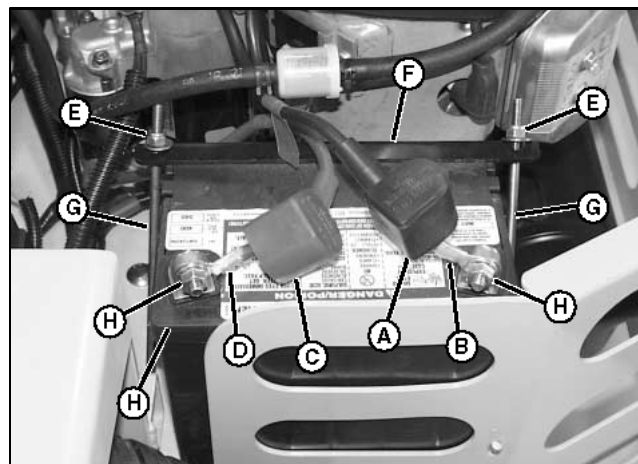
CAUTION: Avoid injury! The battery produces a flammable and explosive gas. The battery may explode:

- Do not smoke near battery.
- Wear eye protection and gloves.
- Do not allow direct metal contact across battery posts.
- Remove negative cable first when disconnecting.
- Install negative cable last when connecting.

Removing and Installing the Battery

Removing:

1. Park machine safely. (See Parking Safely in the SAFETY section.)



2. Slide black cover (A) away from the negative battery terminal and disconnect the negative battery cable (B).
3. Slide red cover (C) away from the positive battery terminal and disconnect the positive battery cable (D).
4. Remove nuts (E) and washers from both sides of the bracket (F).
5. Remove bracket (F) and J-bolts (G).
6. Remove battery (H).

SERVICE ELECTRICAL

Installing:

1. Install battery (H) using J-bolts (G), bracket (F), washers and nuts (E).
2. Connect the positive battery cable (D) first, then the negative cable (B).
3. Apply petroleum jelly or silicone spray to the terminals to prevent corrosion.
4. Slide covers (A and C) over battery terminals.

Cleaning Battery and Terminals

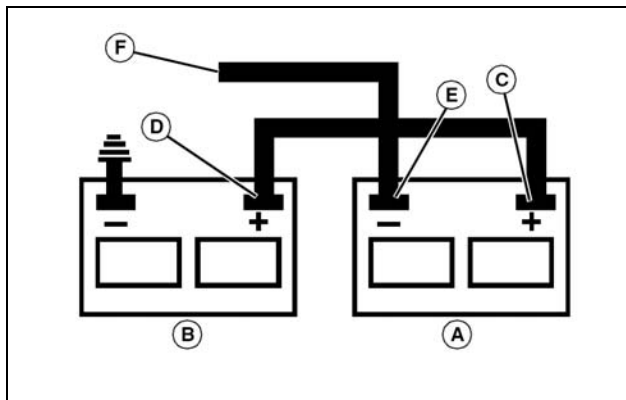
1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Disconnect and remove battery.
3. Wash battery with a solution of four tablespoons of baking soda to one gallon of water. Be careful not to get the soda solution into the battery cells.
4. Rinse the battery with plain water and dry.
5. Clean terminals and battery cable ends with wire brush until bright.
6. Install battery.
7. Attach cables to battery posts using washers and nuts (H).
8. Apply petroleum jelly or silicone spray to terminals to prevent corrosion.

Using Booster Battery



CAUTION: Avoid injury! The battery produces a flammable and explosive gas. The battery may explode:

- Do not smoke or have open flame near battery.
- Wear eye protection and gloves.
- Do not jump start or charge a frozen battery. Warm battery to 16°C (60°F).
- Do not connect the negative (-) booster cable to the negative (-) terminal of the discharged battery. Connect at a good ground location away from the discharged battery.



A- Booster Battery

B- Disabled Vehicle Battery

1. Connect positive (+) booster cable to booster battery (A) positive (+) post (C).
2. Connect the other end of positive (+) booster cable to the disabled vehicle battery (B) positive (+) post (D).
3. Connect negative (-) booster cable to booster battery negative (-) post (E).

IMPORTANT: Avoid damage! Electric charge from booster battery can damage machine components. Do not install negative booster cable to machine frame. Install only to the engine block.
Install negative booster cable away from moving parts in the engine compartment, such as belts and fan blades.

4. Connect the other end (F) of negative (-) booster cable to a metal part of the disabled machine engine block away from battery.
5. Start the engine of the disabled machine and run machine for several minutes.
6. Carefully disconnect the booster cables in the exact reverse order: negative cable first and then the positive cable.

Replacing Fuse

One 20-amp fuse is located behind the seat area.

IMPORTANT: Avoid damage! When replacing fuses - use only a 20-amp fuse or you may damage the circuit.

1. Park machine safely. (See Parking Safely in the SAFETY section.)



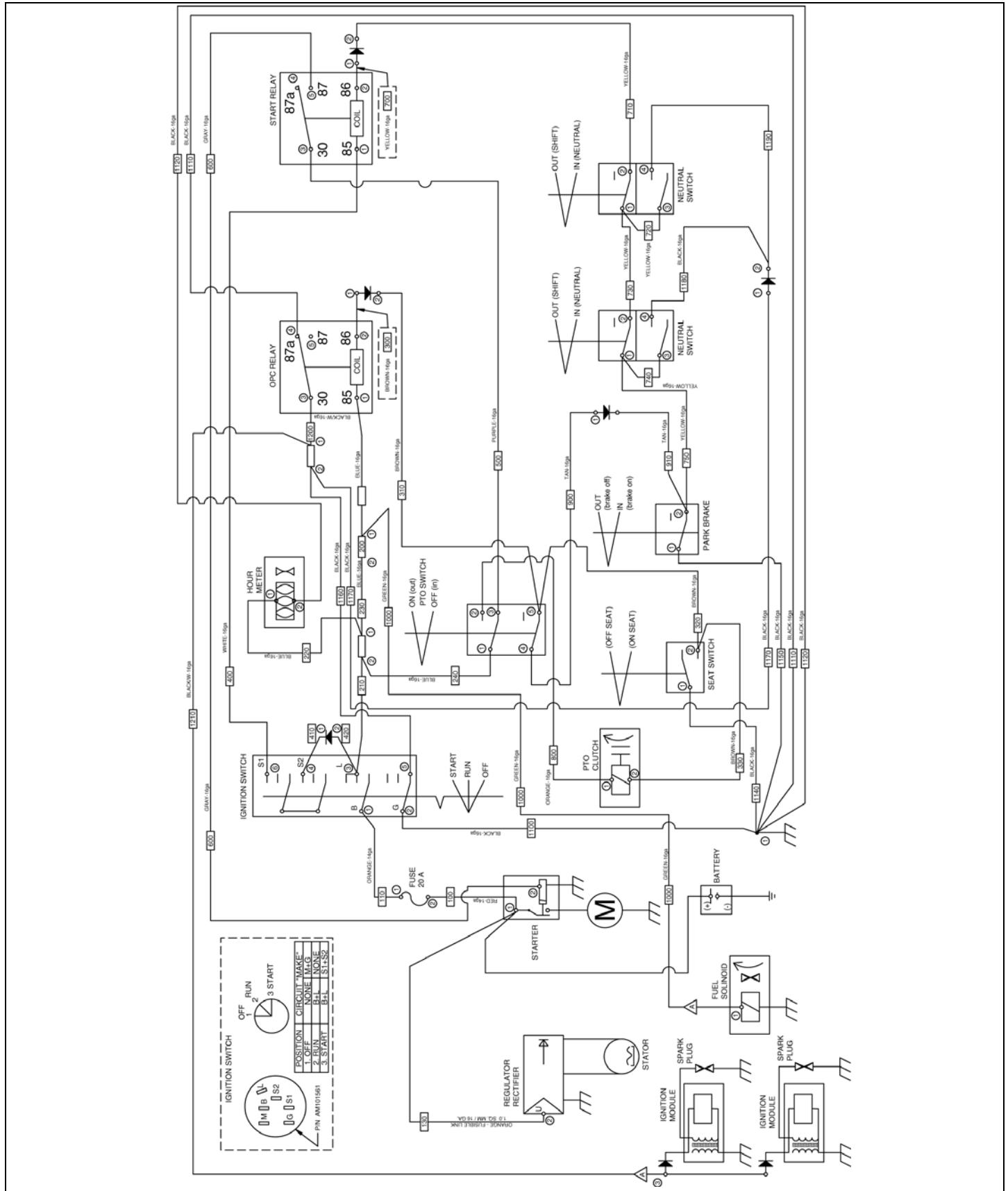
2. Remove defective fuse (A) from socket.
3. Check metal clip in fuse window and discard fuse if clip is broken.
4. Install new fuse in socket.

Burnishing the PTO Clutch

NOTE: The clutch will only require burnishing if a new clutch has been installed.

1. Start and run the engine at 1/2 throttle.
2. Engage and disengage the PTO clutch five times (ten seconds on, ten seconds off).
3. Move throttle lever to 3/4 throttle.
4. Engage and disengage the PTO clutch five times (ten seconds on, ten seconds off).

Wiring Schematic



SERVICE MISCELLANEOUS

Service Miscellaneous

Using Proper Fuel

Use regular grade unleaded fuel with an octane rating of 87 octane or higher. Fuel blends containing up to 10% ethanol or up to 15% MTBE reformulated fuel are acceptable. Do not use fuel or additives containing methanol as engine damage can occur.

Always use fresh, clean fuel that is purchased in a quantity that can be used within approximately 30 days, or add fuel stabilizer.

Fuel is blended to give best seasonal performance. To avoid engine performance problems such as hard starting or vapor lock, use in-season fuel. Use fuel during warm weather that was purchased during that season, and use fuel during cold weather that was purchased during that season.

Fuel can become stale in machines with engines that are used seasonally or infrequently during a season. Stale fuel can produce varnish and plug carburetor components which can affect engine performance.

Keep fuel storage container tightly covered and in a cool area out of direct sunlight. Fuel can break down and degrade if not sealed properly or exposed to sun and heat.

Condensation may collect in the fuel tank because of a variety of operating or environmental conditions and, over time, may affect your machine's operation. Fill fuel tank at the end of daily use and store fuel in plastic containers to reduce condensation.

For best year-round performance and fuel-handling, add stabilizer to fuel immediately after fuel purchase. Such practice helps prevent engine performance problems and allows fuel storage in the machine all year without draining.

Filling Fuel Tank

CAUTION: Avoid injury! Fuel vapors are explosive and flammable:

- Shut engine off before filling fuel tank.
- Do not smoke while handling fuel.
- Keep fuel away from flames or sparks.
- Fill fuel tank outdoors or in well ventilated area.
- Clean up spilled fuel immediately.
- Use clean approved non-metal container to prevent static electric discharge.
- Use clean approved plastic funnel without screen or filter to prevent static electric discharge.

IMPORTANT: Avoid damage! Dirt and water in fuel can cause engine damage:

- Clean dirt and debris from the fuel tank opening.
- Use clean, fresh, stabilized fuel.
- Fill the fuel tank at the end of each day's operation to keep condensation out of the fuel tank.
- Use a non-metallic funnel with a plastic mesh strainer when filling the fuel tank or container.

Fill fuel tank at the end of each day's operation to prevent condensation and freezing during cold weather.

1. Park machine safely. (See Parking Safely in the SAFETY section.)

2. Allow engine to cool.

3. Remove any trash from area around fuel tank cap.

4. Remove fuel tank cap slowly to allow any pressure built up in tank to escape.

5. Fill fuel tank only to bottom of filler neck.

6. Install fuel tank cap.

Checking Tire Pressure



CAUTION: Avoid injury! Explosive separation of tire and rim parts is possible when they are serviced incorrectly:

- Do not attempt to mount a tire without the proper equipment and experience to perform the job.
- Do not inflate the tires above the recommended pressure.
- Do not weld or heat a wheel and tire assembly. Heat can cause an increase in air pressure resulting in an explosion. Welding can structurally weaken or deform the wheel.
- Do not stand in front or over the tire assembly when inflating. Use a clip-on chuck and extension hose long enough to allow you to stand to one side.

1. Park machine safely. (See Parking Safely in the SAFETY section.)

2. Check tires for damage.

3. Check tire pressure with an accurate gauge.

4. Add air, if necessary:

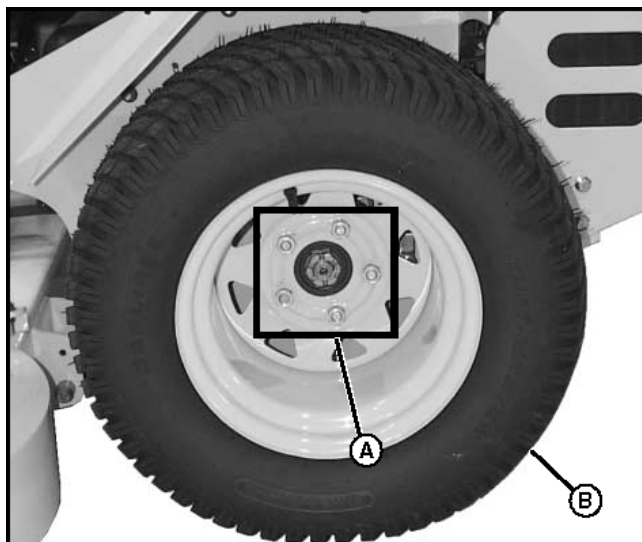
Tire Size	Pressure
Front: 13 x 5.0-6	110-138 kPa (16-20 psi)
Rear - Chariot: 23 x 9.5-12	69-97 kPa (10-14 psi)

Removing and Installing Rear Drive Wheels

Removing:

1. Park machine safely. (See Parking Safely in the SAFETY section.)

TROUBLESHOOTING



2. Slightly loosen five wheel nuts (A).

CAUTION: Avoid injury! The machine can fall or slip from an unsafe lifting device or supports.

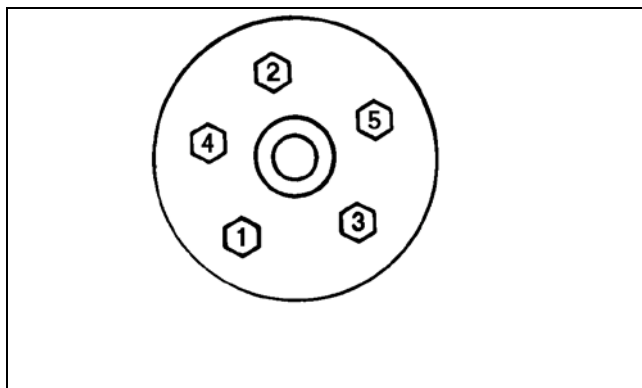
- Use a safe lifting device rated for the load to be lifted.
- Lower machine onto jack stands or other stable supports and block wheels before servicing.

IMPORTANT: Avoid damage! Place jack stands under frame, not under transmission or engine, when raising or supporting machine.

3. Lift machine with a safe lifting device.
4. Remove wheel nuts.
5. Remove wheel and tire assembly (B).

Installing Rear Drive Wheels/Tightening Hardware:

1. Install new wheel and tire assembly.



2. Install and tighten wheel nuts in numbered sequence shown for safe wheel installation. Tighten alternately until recommended torque value is reached.

- Tighten nuts to 100 N•m (75 lb-ft).

3. Lower machine.

Cleaning and Repairing Plastic Surfaces

Your authorized dealer has the professional materials needed to properly remove surface scratches from any plastic surfaces, do not attempt to paint over marks or scratches in plastic parts.

IMPORTANT: Avoid damage! Improper care of machine plastic surfaces can damage that surface:

- Do not wipe plastic surfaces when they are dry. Dry wiping will result in minor surface scratches.
- Use a soft, clean cloth (bath towel, diaper, automotive mitt).
- Do not use abrasive materials, such as polishing compounds, on plastic surfaces.
- Do not spray insect repellent near machine.

1. Wash surface with clean water and a mild liquid automotive washing soap.
2. Dry thoroughly to avoid water spots.

Cleaning and Repairing Metal Surfaces

Cleaning:

Follow automotive practices to care for your vehicle painted metal surfaces. Use a high-quality automotive wax regularly to maintain the factory look of your vehicle's painted surfaces.

Repairing Minor Scratches (surface scratch):

1. Clean area to be repaired thoroughly.

IMPORTANT: Avoid damage! Do not use rubbing compound on painted surfaces.

2. Use automotive polishing compound to remove surface scratches.
3. Apply wax to entire surface.

Repairing Deep Scratches (bare metal or primer showing):

1. Clean area to be repaired with rubbing alcohol or mineral spirits.
2. Use paint stick with factory-matched colors available from your authorized dealer to fill scratches. Follow directions included on paint stick for use and for drying.
3. Smooth out surface using an automotive polishing compound. Do not use power buffer.
4. Apply wax to surface.

Troubleshooting

Using Troubleshooting Chart

If you are experiencing a problem that is not listed in this chart, see your authorized dealer for service.

When you have checked all the possible causes listed and you are still experiencing the problem, see your authorized dealer.

TROUBLESHOOTING

Engine

If	Check
Engine Will Not Start or Is Hard to Start	<p>Motion control levers not in the neutral detent (or neutral lock) position.</p> <p>Park brake lever unlocked.</p> <p>Key switch not in proper position.</p> <p>PTO engaged.</p> <p>Loose or corroded starter cable connections.</p> <p>Stale or improper fuel/fuel level.</p> <p>Plugged fuel filter.</p> <p>Plugged air intake filter.</p> <p>Spark plug wire is loose or disconnected.</p> <p>Spark plug not gapped correctly.</p> <p>Blown 20-amp fuse (main power circuit).</p> <p>Carbureted Engines Only: Blown fusible link (charging circuit).</p> <p>Electrical problem - dead battery.</p> <p>Choke adjusted incorrectly. See your Great Dane servicing dealer.</p>
Engine Will Not Slow Idle	<p>Bent or kinked throttle cable.</p> <p>Bent governor control.</p> <p>Incorrect governor idle control.</p> <p>Carburetion problems. See your Great Dane servicing dealer.</p>
Engine Runs Rough or Stalls	<p>Plugged fuel filter.</p> <p>Plugged air intake system.</p> <p>Fuel cap vent dirty.</p> <p>Stale or improper fuel/fuel level.</p> <p>Spark plug not gapped correctly.</p> <p>Replace spark plug.</p> <p>Choke adjusted incorrectly. See your Great Dane servicing dealer.</p>
Engine Knocks	<p>Engine oil level low.</p> <p>Reduce load. (Slower ground speed.)</p> <p>Fuel is bad. Fill tank with fresh fuel, correct octane.</p> <p>Idle speed too slow.</p>
Engine Overheats	<p>Clean cooling fins.</p> <p>Low oil level.</p> <p>Do not operate at slow idle. Operate at full-throttle setting.</p> <p>Cooling air intake screen is dirty.</p> <p>Plugged air intake filter.</p> <p>Operating at too fast ground speed for conditions.</p>

If	Check
Engine Lacks Power	<p>Plugged air intake system.</p> <p>Plugged fuel filter.</p> <p>Improper type of fuel. Drain tank and fill with correct fuel.</p> <p>Clean cooling fins to help prevent overheating.</p> <p>Replace spark plug.</p>
Engine Uses Too Much Oil	<p>Find and correct oil leaks.</p> <p>Incorrect engine oil.</p> <p>Plugged oil filter.</p> <p>Plugged air intake filter.</p>
Engine Backfires Through Muffler	<p>Throttle should be at low idle for several seconds before turning off machine.</p> <p>Leaking/damaged exhaust manifold gasket.</p>
High Fuel Consumption	<p>Improper type of fuel.</p> <p>Plugged air intake system.</p> <p>Operating at too fast ground speed for conditions.</p> <p>Improper valve clearance. See your Great Dane servicing dealer.</p> <p>Restricted air intake system.</p>

Electrical System

If	Check
Starter Will Not Work	<p>Dead battery.</p> <p>Blown 20-amp fuse (main power circuit).</p> <p>Blown fusible link (charging circuit).</p> <p>Loose or corroded battery or ground connections.</p> <p>Loose or corroded starter cable connections.</p> <p>Neutral start switches faulty or not adjusted properly. See your Great Dane servicing dealer.</p> <p>Key switch or starter faulty. See your Great Dane servicing dealer.</p> <p>PTO engaged.</p> <p>Motion control levers and park brake lever not in proper position.</p>
Battery Will Not Charge	<p>Loose or corroded battery or ground connections.</p> <p>Blown fusible link (charging circuit).</p> <p>Battery cables and terminals are dirty.</p> <p>Dead cell in battery.</p>

TROUBLESHOOTING

If	Check
PTO Clutch Does Not Engage	Blown 20-amp fuse (main power circuit). Faulty PTO switch. Faulty PTO clutch. Loose PTO clutch connections.
Starter Turns Slowly	Loose or corroded battery or ground connections. Low battery power - charge battery. Engine oil viscosity too heavy. Hydraulic pump linkages failed and are engaged.

Machine

If	Check
Excessive Machine Vibration	Engine speed too slow.
Machine Will Not Move With Engine Running	Park brake locked. Transmission hydraulic oil level low. Transmission oil cold - allow engine to warm. Traction drive belt slipping. Hydraulic pump free-wheel valves open. Traction drive belt damaged or worn. Hydrostatic pump and/or wheel motor problems. See your Great Dane servicing dealer.
Machine Creeps With Engine Running and Motion Control Levers in a Neutral Position	Needs shift control linkage adjustment.

Park Brake

If	Check
Park Brake Not Working Correctly	Brakes out of adjustment - adjust linkage. Brake drums wet. Worn brake shoes. Brake cable damaged.

Steering

If	Check
Steering Not Working	Park brake locked. Hydraulic pump free-wheel valves partially open. Improper tire Inflation. Hydrostatic transmission oil low. Traction drive belt slipping. Traction drive belt damaged or worn.

If	Check
Machine Will Not Follow a Straight Path	Steering tracking out of adjustment.
Machine Moves to the Left or Right With Engine Running and Transmission in Neutral	Pump linkage (neutral position) out of adjustment.

Mower Deck

If	Check
Discharge Chute Plugged	Grass is wet - mow grass only when dry. Raise cutting height. Mow at full throttle. Ground speed too fast for conditions. Correct installation of deck drive belt.
Mower Deck Vibrates	Run engine at full throttle. Loose hardware. Check/replace mower deck drive belt. Blades bolts are loose. Blades are bent or worn. Sharpen and balance blades. Remove belt shields and check for debris on sheaves. Check sheaves for proper alignment or damage. See your Great Dane servicing dealer.
Mower Blades Do Not Engage	Mower deck drive belt slipping or broken. Mower deck belt tension spring not installed or broken. PTO switch failure. 20-amp fuse is blown (main power circuit). Loose electrical connections. Faulty PTO clutch.
Mower Mows Unevenly	Mower deck not properly leveled. Ground speed too fast for conditions. Run engine at full throttle. Reduce ground speed when making turns. Blades are bent or worn. Sharpen or replace blades. Change mowing pattern. Check tire pressure.

STORAGE

Storage

Storing Safety



CAUTION: Avoid injury! Fuel vapors are explosive and flammable. Engine exhaust fumes contain carbon monoxide and can cause serious illness or death:

- Run the engine only long enough to move the machine to or from storage.
- Do not store vehicle with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing the machine in any enclosure.

Preparing Machine for Storage

- 1.Repair any worn or damaged parts. Replace parts if necessary. Tighten loose hardware.
- 2.Repair scratched or chipped metal surfaces to prevent rust.
- 3.Remove grass and debris from machine.
- 4.Clean under the deck and remove grass and debris from inside chute and bagger.
- 5.Wash the machine and apply wax to metal and plastic surfaces.
- 6.Run machine for five minutes to dry belts and pulleys.
- 7.Apply light coat of engine oil to pivot and wear points to prevent rust.
- 8.Lubricate grease points and check tire pressure.

Preparing Fuel and Engine For Storage

Fuel:

If you have been using "Stabilized Fuel," add stabilized fuel to tank until the tank is full.

NOTE: Filling the fuel tank reduces the amount of air in the fuel tank and helps reduce deterioration of fuel.

If you are not using "Stabilized Fuel:"

- 1.Park machine safely in a well-ventilated area. (See Parking Safely in the SAFETY section.)

NOTE: Try to anticipate the last time the machine will be used for the season so very little fuel is left in the fuel tank.

- 2.Turn on engine and allow to run until it runs out of fuel.
- 3.For machines equipped with key switch, turn key to off position.

IMPORTANT: Avoid damage! Stale fuel can produce varnish and plug carburetor or injector components and affect engine performance.

- Add fuel conditioner or stabilizer to fresh fuel before filling tank.

- 4.Mix fresh fuel and fuel stabilizer in separate container. Follow stabilizer instructions for mixing.
- 5.Fill fuel tank with stabilized fuel.
- 6.Run engine for a few minutes to allow fuel mixture to circulate through carburetor on gas engine or fuel injectors on diesel engine.

Engine:

Engine storage procedure should be used when vehicle is not to be used

for longer than 60 days.

- 1.Change engine oil and filter while engine is warm.
- 2.Service air filter if necessary.
- 3.Clean debris from engine air intake screen.
- 4.On gas engines:
 - Remove spark plugs. Put 30 mL (1 oz) of clean engine oil in cylinders.
 - Install spark plugs, but do not connect spark plug wires.
 - Crank the engine five or six times to allow oil to be distributed.
- 5.Clean the engine and engine compartment.
- 6.Remove battery.
- 7.Clean the battery and battery posts. Check the electrolyte level, if your battery is not maintenance free.
- 8.Close fuel shut-off valve, if your machine is equipped.
9. Store the battery in a cool, dry place where it will not freeze.

NOTE: The stored battery should be recharged every 90 days.

10. Charge the battery.

IMPORTANT: Avoid damage! Prolonged exposure to sunlight could damage the hood surface. Store machine inside or use a cover if stored outside.

11. Store the vehicle in a dry, protected place. If vehicle is stored outside, put a waterproof cover over it.

Removing Machine From Storage

- 1.Check tire pressure.
- 2.Check engine oil level.
- 3.Check battery electrolyte level, if your battery is not maintenance free. Charge battery if necessary.
- 4.Install battery.
- 5.On gas engines: Check spark plug gap. Install and tighten plugs to specified torque.
- 6.Lubricate all grease points.
- 7.Open fuel shut-off valve, if your machine is equipped.
- 8.Run the engine 5 minutes without the mower or any attachments running to allow oil to be distributed throughout engine.
- 9.Be sure all shields and guards or deflectors are in place.

ASSEMBLY

Assembly

Bag of Parts

Qty.	Description
1	Key
1	Operator's Manual
1	PDR Check List

Prepare for Assembly

- Remove machine from the shipping crate:
 - Remove box containing operator seat.
 - Cut plastic tie straps fastening the front wheels to the shipping crate.
 - Cut plastic tie straps holding the discharge chute up.
 - Cut plastic tie straps securing the motion control levers to the machine.

Check Fluid Levels

NOTE: Refer to the Service sections of the operator's manual for information regarding check locations and proper fluid levels.

- Check engine oil level.
- Check hydraulic oil level.

Check Tire Pressure



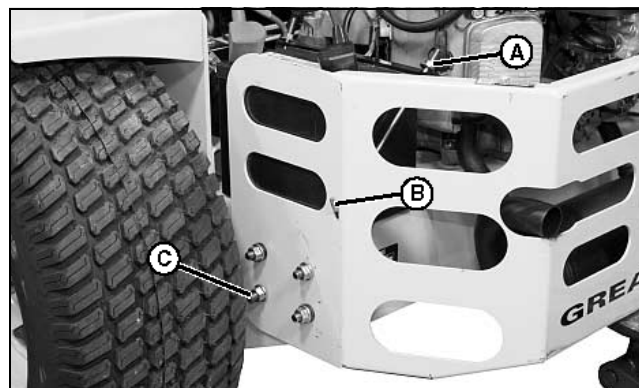
CAUTION: Avoid injury! Explosive separation of tire and rim parts is possible when they are serviced incorrectly:

- Do not attempt to mount a tire without the proper equipment and experience to perform the job.
- Do not inflate the tires above the recommended pressure.
- Do not weld or heat a wheel and tire assembly. Heat can cause an increase in air pressure resulting in an explosion. Welding can structurally weaken or deform the wheel.
- Do not stand in front or over the tire assembly when inflating. Use a clip-on chuck and extension hose long enough to allow you to stand to one side.

1. Check tires for damage.
2. Check tire pressure with an accurate gauge.
3. Add or remove air, if necessary.

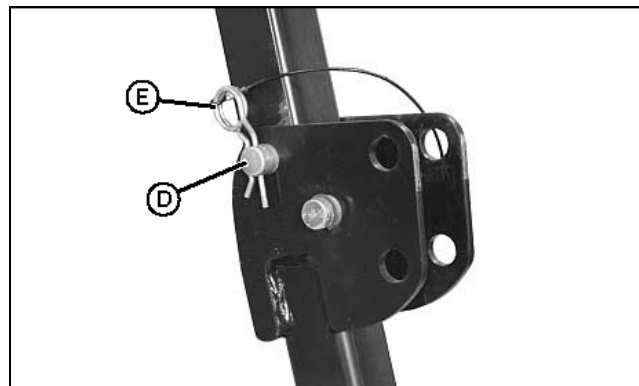
Install ROPS

1. Support rear of bumper with wooden blocks or jack.



2. Loosen nut (A) securing the rear battery hold-down rod and disengage hooked end (B) from bumper.

3. Remove all bumper mounting bolts and retaining hardware except for the lower left cap screw (C) at each side of the machine. Discard any assembly washers, retain bolts and locknuts for later use.

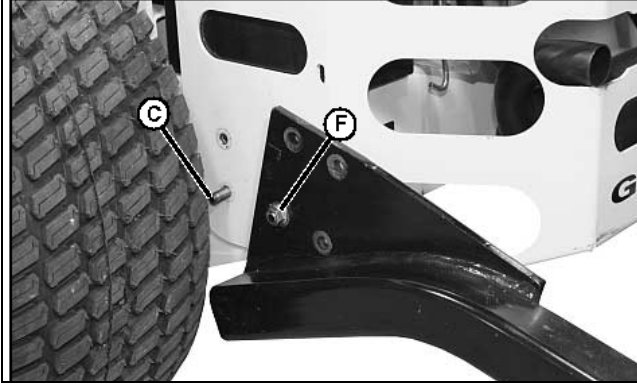


4. Fold ROPS to the upright operating position and install lock pins (D) and spring pins (E).

SPECIFICATIONS

CAUTION: Avoid injury! Machine component is heavy. Use a safe lifting device or get an assistant to help lift and hold component into place for installation.

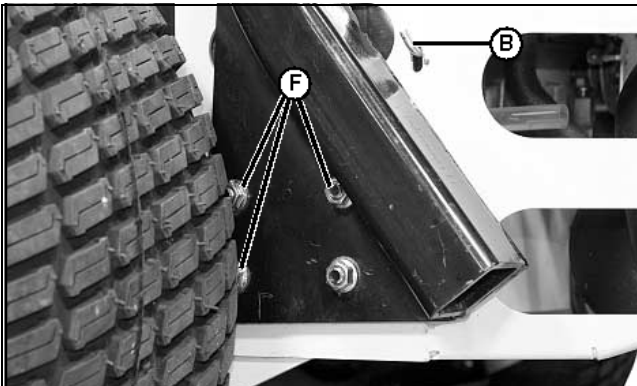
NOTE: Using a tapered drift will aid in the alignment of mounting holes and ease installation of cap screws.



5. Lay ROPS on the ground, slide it up to the bumper and align the appropriate hole in the ROPS flange with the lower rear mounting holes in the machine frame and bumper. Install an M10 cap screw, removed earlier, through the hole from the inside and secure loosely with an M10 locknut (F).

6. Remove cap screw (C).

NOTE: Take care when raising ROPS to avoid damaging paint on bumper.



7. Using the lower rear bolts as a pivot, raise ROPS to the vertical position, and install remaining cap screws and locknuts (F) on each side. Tighten all ROPS mounting hardware to 80 N•m (59 lb-ft).

8. Engage hooked end (B) of rear battery hold-down rod in slot in bumper and tighten nut to secure.

Lubricate Machine

Lubricate all moving parts before operating the machine. See Lubrication Points in the Service Lubrication section.

Check Mower Deck Level

The mower deck is assembled and adjusted at the factory. After machine is completely assembled, check the mower front-to-rear and side-to-side deck level.

Check Safety System

For a complete checkout procedure of the safety interlock system, see Testing the Safety Interlock System in the Operating section.

Initial Adjustments

CAUTION: Avoid injury! Clear area of all bystanders before performing this service procedure.

1. Check free-wheel valves on both pump assemblies to make sure that the valves are closed. Tighten valves to 108-163 N•m (80-120 lb-ft).
2. Raise the rear of the machine until the drive wheels are off the ground. Support the machine with jackstands.

CAUTION: Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

- Move the machine to an outside area before running the engine.
- Do not run an engine in an enclosed area without adequate ventilation.
- Connect a pipe extension to the engine exhaust pipe to direct the exhaust fumes out of the area.
- Allow fresh outside air into the work area to clear the exhaust fumes out.

3. Start and run the engine until it reaches normal operating temperature.
4. Move control levers to the forward position and observe drive wheel rotation; the drive wheels should rotate in the correct direction.
5. Move the control levers to the reverse position and observe drive wheel rotation; the drive wheels should rotate in the correct direction.
6. Move PTO clutch switch to on position; mower clutch should engage. Run blades for several minutes.
7. Move PTO clutch switch to off position and shut the engine off.
8. Check all belts for proper tension.
9. Start the engine and test drive the machine in an open area. Drive the machine forward; if the machine drifts to the right or left, adjust the transmission control linkage.

Specifications

Engine

NOTE: See engine manufacturer's owner's manual provided with your machine for engine specifications.

Battery

Voltage..... 12 volt
CCA..... .340 amp
Reserve Capacity 90 minutes
BCI Group Size 51

Tires

Front 13 x 5.0-6
Rear 23 x 9.50-12
Inflation Front (Maximum) 110-138 kPa (16-20 psi)

GETTING QUALITY SERVICE

Inflation Rear (Maximum)69-97 kPa (10-14 psi)
Wheel Nut Torque 100 N•m (75 lb-ft)

Capacities

Fuel Tank 30.2 L (8 gal)
Hydraulic System 3.54 L (3.75 qt)

Net Weight - Chariot (With Mower Deck and Without Fuel)

Chariot With 48-in. Deck 499 kg (1100 lb)
Chariot With 52-in. Deck 510 kg (1124 lb)
Chariot With 61-in. Deck 521 kg (1149 lb)

Travel Speeds

Forward 0-18 km/h (0-9 mph)
Reverse 0-8 km/h (0-5 mph)

Dimensions

Wheel Base 1.10 m (43.375 in.)
Track Width 1.21 m (47.5 in.)
Overall Height 1.09 m (42.75 in.)
Overall Length 1.97 m (77.75 in.)
Overall Width (with 48-in. Deck) 1.50 m (59 in.)
Overall Width (with 52-in. Deck) 1.70 m (67 in.)
Overall Width (with 61-in. Deck) 1.90 m (74.5 in.)

Getting Quality Service

Service Literature

If you would like to order a copy of the Parts Catalog or Operator Manual for this machine, contact your dealer. Parts catalogs and operator manuals are also available online at **GreatDaneMowers.com**.

Parts

We recommend Great Dane quality parts available at your Great Dane dealer.

Part numbers may change, use part numbers listed below when you order. If a number changes, your dealer will have the latest number.

When you order parts, your Great Dane dealer needs your machine serial number and engine serial number. These are the numbers that you recorded in the Product Identification section of this manual.

Great Dane Quality Continues with Quality Service

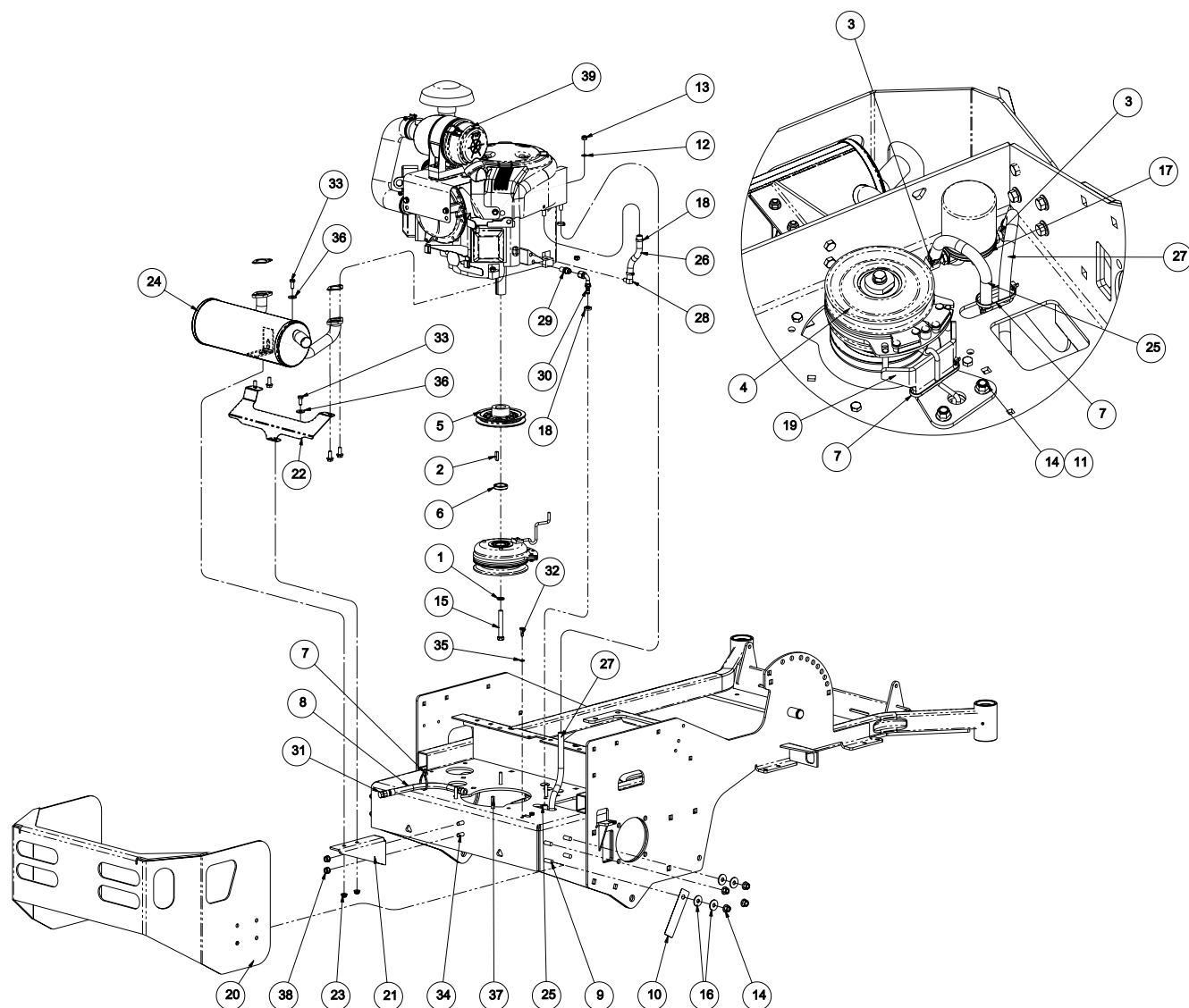
Great Dane provides a process to handle your questions or problems, should they arise, to ensure that product quality continues with your authorized Great Dane dealer's parts and service support.

Follow the steps below to get answers to any questions you may have about your product.

- 1.Refer to your attachment and machine operator manuals.
- 2.Contact your authorized Great Dane dealer with unanswered questions.

GETTING QUALITY SERVICE

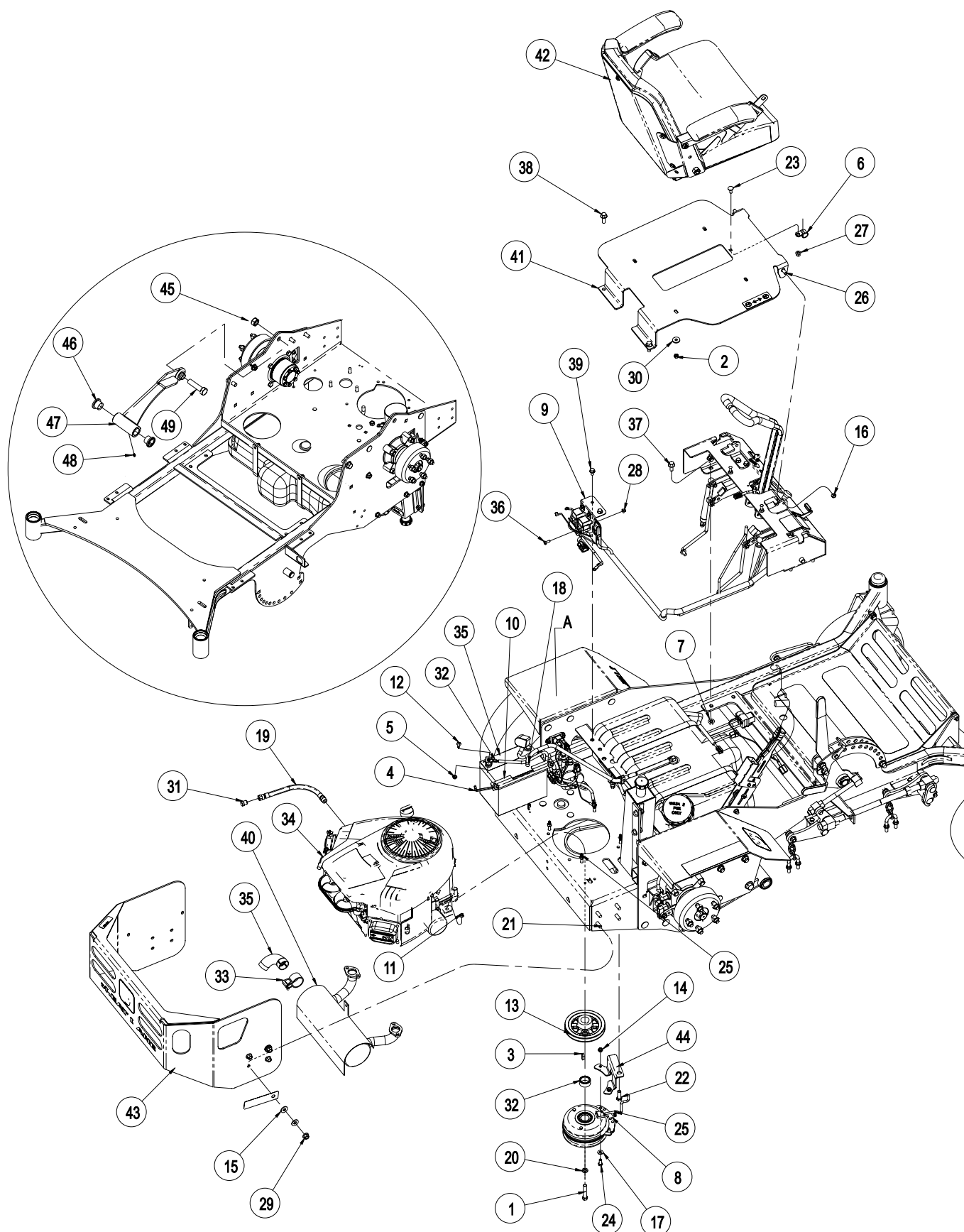
ENGINE AND RELATED COMPONENTS - B&S 23 HP VANGUARD



ENGINE AND RELATED COMPONENTS - B&S 23 HP VANGUARD

Ref. No.	Part No.	Description	Qty.	Remarks
1	D14208	WASHER	1	7/16 SPLIT LOCK
2	D18145	SHAFT KEY	1	
3	D24028	FITTING	2	90 9/16 MOR X 3/8 HOSE
4	GDA10122	ELECTRIC CLUTCH	1	
5	GDU10265	PULLEY	1	
6	GDU10312	SPACER, ENGINE	1	
7	M78480	CABLE TIE, .19 X 10.0	3	
8	TCA15389	HOSE, OIL DRAIN	1	
9	TCU20799	CUSTOM SCREW, HEX, FL, JDS121	8	M10
10	TCU20939	TAG, ROPS CAUTION (GREAT DANE)	1	
11	03M7017	BOLT	2	RD HD SQ LONG NECK
12	12M7032	WASHER, EXT	1	M8.4X15X0.80 ZINC
13	14M7166	LOCKNUT, DIN985	4	M8X1.25-8-ZN
14	14M7518	LOCKNUT, FLANGE	10	M10-1.50
15	19H2531	SCREW, HEX HEAD	1	
16	24M7178	WASHER, FLAT	8	IS07093, 10-ZN
17	180908	HEAD, FILTER	1	
18	191800	CLAMP	6	17.5MM PINCH
19	200316	WLDT, BRACKET CLUTCH	1	
20	200352	BUMPER, REAR KH & BV	1	
21	200376	BRACKET, EXHAUST SUPPORT	1	
22	200377	SHIELD, EXHAUST BV	1	
23	964019	LOCKNUT, 5/16-18 WHIZ Y	2	
24	200372	MUFFLER, ACS BSVG	1	
25	200381	BULK 3/8" HYDRAULIC HOSE	1	8" Length
26	200381	BULK 3/8" HYDRAULIC HOSE	1	7" Length
27	200381	BULK 3/8" HYDRAULIC HOSE	1	18" Length
28	200382	FTG, 90 1/8MNPT X 3/8HOSE	1	
29	200384	FTG, ADP 1/4MNPT X 3/8MJIC	1	
30	200385	FTG, 90 3/8FJICSW X 3/8 HOSE	1	
31	230687	PLUG, 9/16-18 MJIC 37	1	
32	960001	BOLT	2	1/4-20 X .750 HEX 5 Y
33	960022	BOLT	2	5/16-18 X .750 HEX 5 Y
34	960046	BOLT	2	3/8-16 X 1.00 HEX 5 Y
35	960600	WASHER	2	.250 MED SPRG LOCK Y
36	960701	WASHER	2	.313 REG FLAT Y
37	961288	BOLT	4	M8 X 1.25 X 40 HEX 8.8 Y
38	964016	LOCKNUT	2	3/8-16 WHIZ Y
39	191462	FILTER, AIR	1	SINGLE FILTER BV

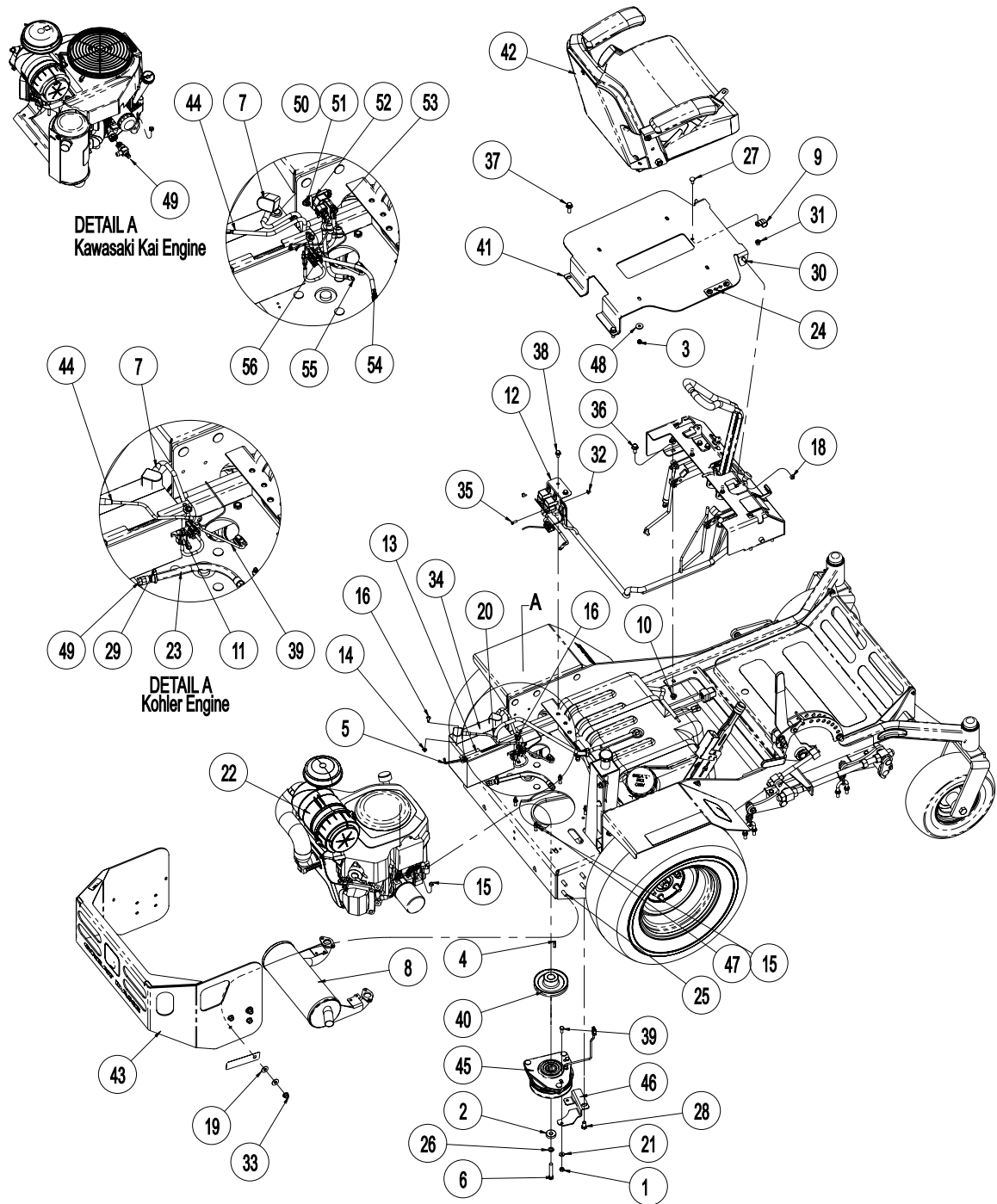
ENGINE AND RELATED COMPONENTS - B&S 26 HP ELS



ENGINE AND RELATED COMPONENTS - B&S 26 HP ELS

Ref. No.	Part No.	Description	Qty.	Remarks
1	967337	BOLT	1	7/16-20 X 2.25 HEX 5 Y
2	D14081	LOCKNUT	4	5/16-18 NYLOCK Y
3	D18145	KEY	1	.250 X .250 X .995 TPR
4	D23047	J BOLT	2	
5	964040	LOCKNUT	2	1/4-20 WHIZ Y
6	E53830	P-CLIP	1	.750 INSULATED
7	E63526	LOCKNUT	4	M10X1.50 WHIZ GR10 Y
8	GDA10122	ELECTRIC CLUTCH	1	
9	GDU10170	BRACKET, ELECTRIC MOUNTING	1	
10	GDU10204	HOLDER, BATTERY	1	
11	964021	LOCKNUT	4	5/16-18 CROWN Y
12	963001	BOLT	2	1/4-20 X .625 WSH Y
13	GDU10265	PULLEY	1	
14	967279	LOCKNUT	2	5/16-18 CENTER Y
15	960702	WASHER	8	.375 REG FLAT Y
16	K40003	NUT	2	3/8 LOCK
17	960700	WASHER	2	.250 REG FLAT Y
18	M68342	CLAMP, HOSE (RED) #	1	
19	TCA15389	HOSE, OIL DRAIN	1	
20	960603	WASHER	1	.438 MED SPRG LOCK Y
21	TCU20799	CUSTOM SCREW	8	HEX,FL,JDS121,M10
22	960080	BOLT	1	7/16-14 X 1.25 HEX 5 Y
23	03M7184	BOLT	1	M8X1.25X20 CRG 8.8 Y
24	960022	BOLT	2	5/16-18 X .750 HEX 5 Y
25	960026	BOLT	4	5/16-18 X 1.75 HEX 5 Y
26	135139	BOLT,	2	1/2 X 1.06 X 3/8-16 SLD 5 Y
27	14M7396	LOCKNUT	1	FLANGE,ISO7043,M8X1.25
28	14M7397	LOCKNUT	3	FLANGE, ISO7043M6X1-10
29	14M7518	LOCKNUT	8	FLANGE,ISO7044,M10-1.50
30	24H1887	WASHER	4	.344X1.00X.134 FLAT Y
31	230687	PLUG	1	9/16-18 MJIC 37
32	200942	SPACER	1	1.50X1.130X.677LONG Y
33	181158	CLAMP, EXHAUST - 1.500	1	
34	181777	ENGINE	1	BRIG 26HP ELS CRTG FLT
35	200939	EXTENSION, TAILPIPE 90	1	
36	19M7775	SCREW	3	HEX JDS123,M6X1X16 Z
37	19M7785	SCREW	4	HEX M10X1.5X25
38	19M7786	SCREW	2	HEX,FL,JDS123,M10X1.5X30
39	19M7865	SCREW	2	HEX,FL,JDS123,M8X1.25X16
40	191838	MUFFLER, B&S ELS HORIZ	1	
41	200323	PLATE, SEAT	1	
42	200351	SEAT, CHARIOT W/ROPS (BLACK)	1	
43	200352	BUMPER, REAR KH & BV	1	
44	200824	BRACKET, CLUTCH STOP	1	
45	964024	LOCKNUT	2	3/4-16 CROWN
46	D18076	BRG, FLANGE	2	1.00 X 1.25 X 1.00
47	GDA10085	WELDMENT, THRUST ARM	1	LH
	GDA10084	WELDMENT, THRUST ARM	1	RH
48	959995	GREASE ZERK FITTING	1	1/4/2028
49	19H3280	BOLT	2	

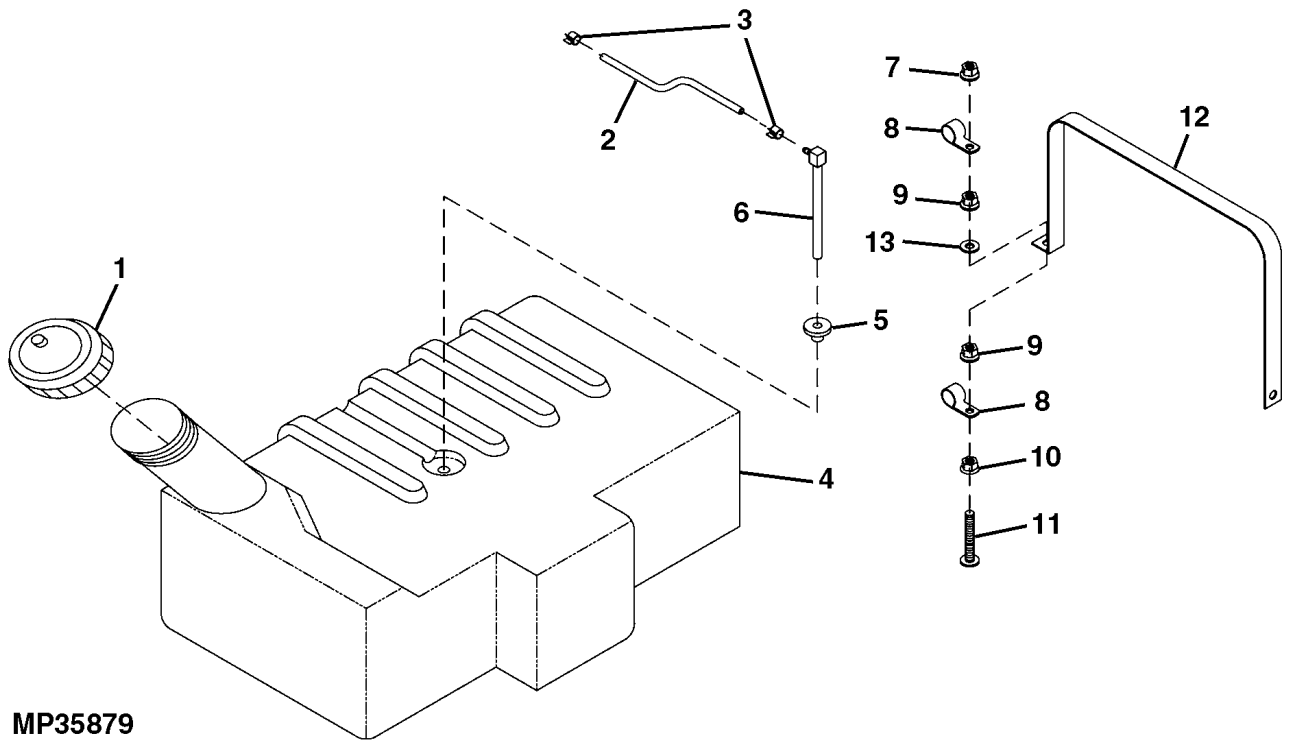
ENGINE AND RELATED COMPONENTS - KAWASAKI KAI/KOHLER



ENGINE AND RELATED COMPONENTS - KAWASAKI KAI/KOHLER

Ref. No.	Part No.	Description	Qty.	Remarks
1	967279	LOCKNUT	2	5/16-18 CENTER Y
2	D18056	SPACER	1	.468 X 1.38 X .375 Y
3	D14081	LOCKNUT	4	5/16-18 NYLOCK Y
4	D18145	KEY	1	.250 X .250 X .995 TPR
5	D23047	J BOLT	2	
6	D24022	BOLT	1	7/16-20X2.50 KOHLER
	D24022	BOLT	1	7/16-20X2.25 - KAWASAKI KAI
7	D28118	CABLE, BATTERY POSITIVE	1	
8	D28121	MUFFLER	1	ACS - KOHLER
	200822	MUFFLER	1	ACS - KAWASAKI KAI
9	E53830	P-CLIP	1	.750 INSULATED
10	E63526	LOCKNUT	4	M10X1.50 WHIZ GR10 Y
11	GDA10109	WIRING HARNESS, KOHLER PIGTAIL	1	
	GDA10055	WIRING HARNESS, KAWASAKI PIGTAIL	1	
12	GDU10170	BRACKET, ELECTRIC MOUNTING	1	
13	GDU10204	HOLDER, BATTERY	1	
14	964040	LOCKNUT	2	1/4-20 WHIZ Y
15	964021	LOCKNUT	4	5/16-18 CROWN Y
16	963001	BOLT	2	1/4-20 X .625 WSH Y
17	J16931	PIN	2	HAR .094X1.53 5/16-1/2 Y
18	K40003	NUT	2	3/8 LOCK
19	960702	WASHER	8	.375 REG FLAT Y
20	M68342	CLAMP, HOSE (RED) #	1	
21	960700	WASHER	2	.250 REG FLAT Y
22	N/A	ENGINE, 23 HP KOHLER	1	
	N/A	ENGINE, 19 HP KAWASAKI KAI	1	
23	TCA15389	HOSE, OIL DRAIN	1	KOHLER ONLY
24	TCU14862	LABEL - PARK BRAKE DIRECTION	1	
25	TCU20799	CUSTOM SCREW, HEX, FL, JDS121, M10	8	
26	960603	WASHER	1	.438 MED SPRG LOCK Y
27	03M7184	BOLT	1	M8X1.25X20 CRG 8.8 Y
28	960078	BOLT	1	7/16-14 X .750 HEX 5 Y
29	111910	CABLE TIE	2	.15 X 8.50
30	135139	BOLT	2	1/2 X 1.06 X 3/8-16 SLD 5 Y
31	14M7396	LOCKNUT	1	FL, ISO7043, M8X1.25
32	14M7397	LOCKNUT	3	F1, ISO7043M6X1-10
33	14M7518	LOCKNUT	8	FL, ISO7044, M10-1.50
34	N/A	BATTERY, 12V-U1-CCA400MIN	1	
35	19M7775	SCREW	3	HEX JDS123, M6X1X16 Z
36	19M7785	SCREW	4	HEX M10X1.5X25
37	19M7786	SCREW	2	HEX, FL, JDS123, M10X1.5X30
38	19M7865	SCREW	2	HEX, FL, JDS123, M8X1.25X16
39	960022	BOLT	2	5/16-18 X .750 HEX 5 Y
40	200318	PULLEY	1	V-BELT 4.78PD X 1.000 W/KEY
41	200323	PLATE, SEAT	1	
42	200351	SEAT, CHARIOT W/ROPS (BLACK)	1	
43	200352	BUMPER, REAR KH & BV	1	BRIGGS AND KOHLER UNITS
	TCU20695	BUMPER, REAR KA	1	KAWASAKI KAI UNITS
44	200590	CABLE, BATTERY NEGATIVE	1	KOHLER UNITS
	180843	CABLE, BATTERY NEGATIVE	1	KAWASAKI KAI UNITS
45	200665	CLUTCH ASSY, OGURA	1	
46	200666	PLATE, CLUTCH DOG	1	
47	960026	BOLT	4	5/16-18 X 1.75 HEX 5 Y
48	24H1887	WASHER	4	.344X1.00X.134 FLAT Y
49	230687	PLUG	1	9/16-18 MJIC 37
50	960001	BOLT	2	1/4-20 X .750
51	964031	LOCKNUT	2	1/4-20 CENTER
52	180640	SOLENOID	1	STARTER KAWASAKI KAI
53	200924	FUSIBLE LINK	1	KAWASAKI KAI
54	180843	CABLE	1	20" CABLE GROUND - KAI
55	180842	CABLE	1	12" STARTER KAWASAKI KAI
56	GDA10055	HARNESS	1	PIGTAIL - KAWASAKI KAI

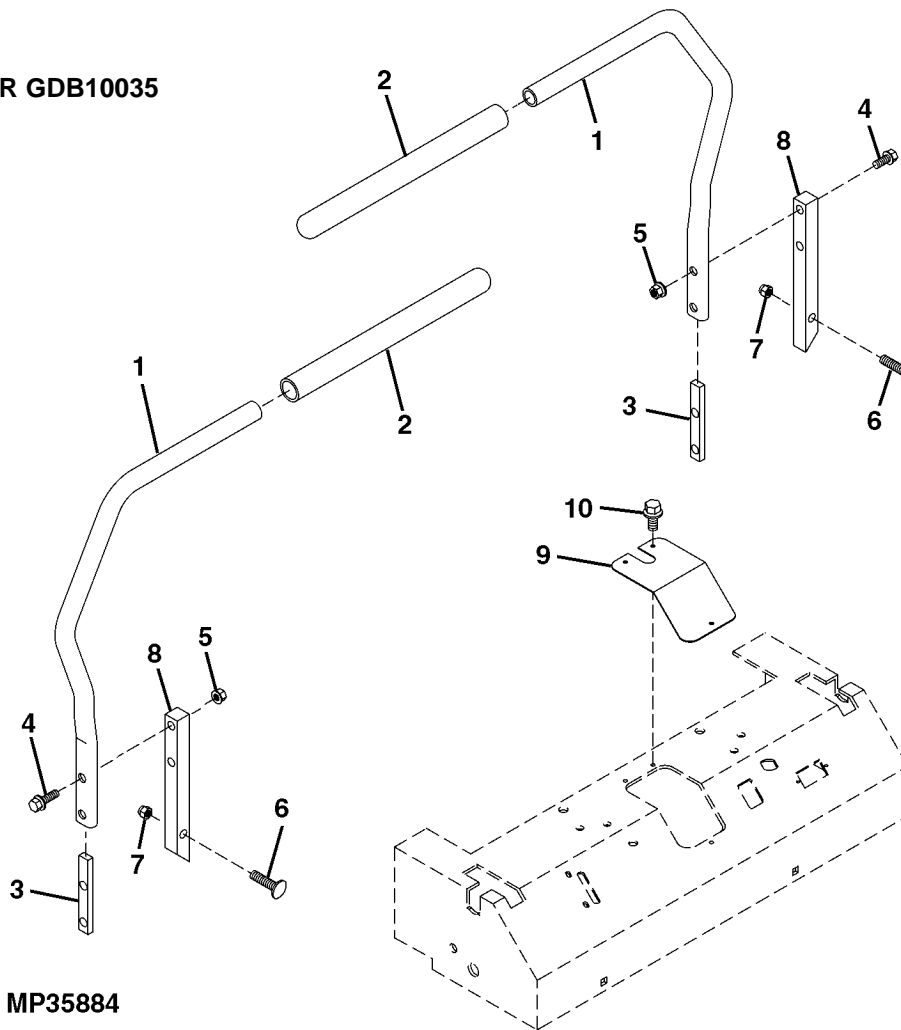
FUEL DELIVERY SYSTEM COMPONENTS



Ref. No.	Part No.	Description	Qty.	Remarks
1	181251	FILLER CAP	1	
2	M88753	HOSE	1	
3	R56101	CLIP	2	
4	GDA10012	FUEL TANK	1	
5	D18144	BUSHING	1	
6	GDU10026	FUEL PICKUP	1	(INCLUDES M145626)
7	M63277	LOCK NUT	2	7.925 MM (5/16")
8	E53830	CLAMP	2	
9	D14081	LOCK NUT	2	7.925 MM (5/16")
10	N10213	LOCK NUT	1	7.925 MM (5/16")
11	D14235	BOLT	2	7.925 MM X 63.5 MM (5/16"X 2-1/2")
12	GDU10028	STRAP	2	
13	24H1776	WASHER	2	5/16" X 47/64" X .065

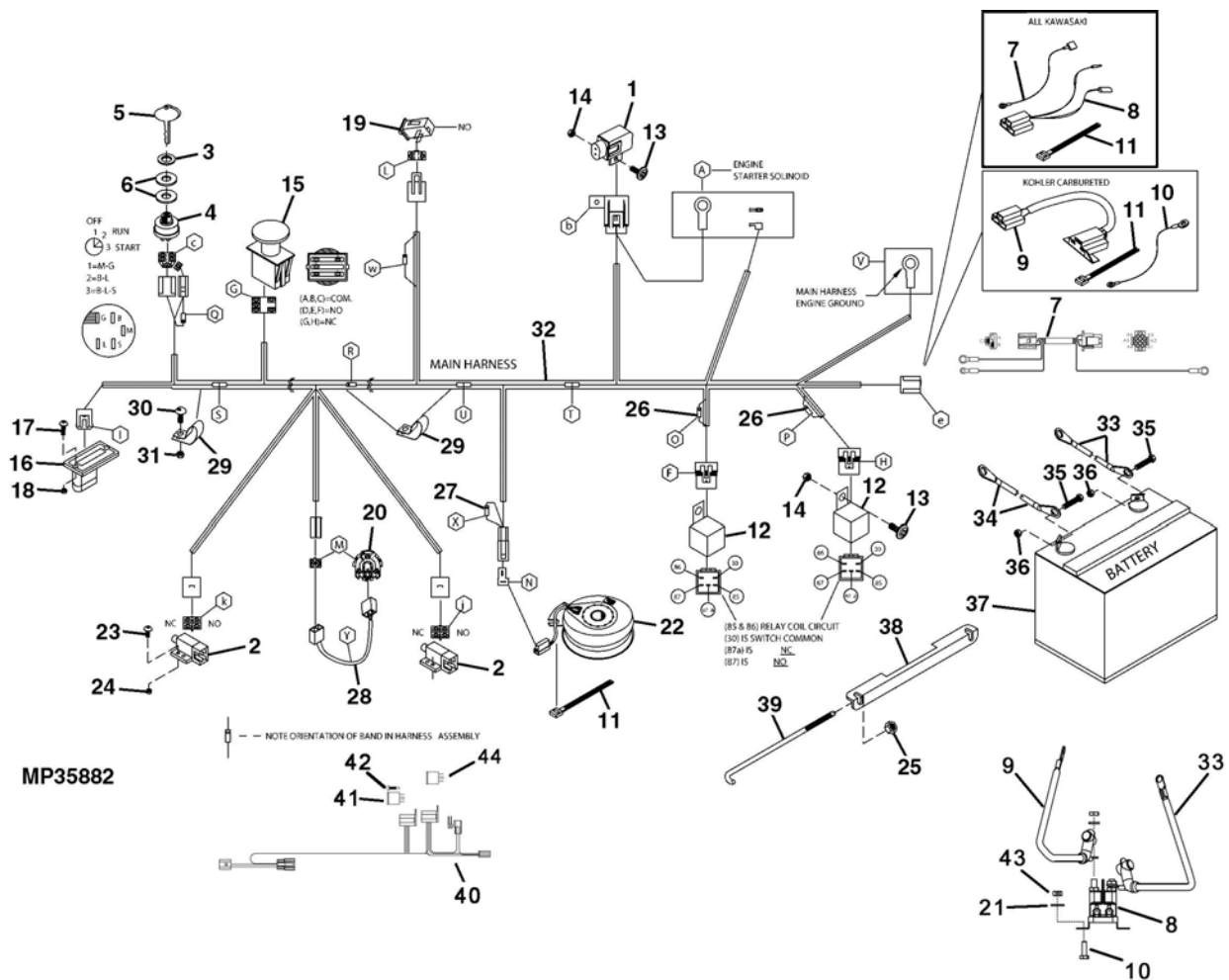
OVER THE LAP CONTROL ASSEMBLY

KIT NUMBER GDB10035



Ref. No.	Part No.	Description	Qty.	Remarks
1	TCU14989	TUBE	2	
2	M131171	GRIP	2	
3	GDU10047	STRAP	2	
4	19M8320	SCREW	4	M10 X 45
5	14M7518	FLANGE NUT	4	M10
6	03M7195	BOLT	2	M10 X 45
7	M85516	LOCK NUT	2	M10
8	TCU13271	ARM	2	
9	GDU10275	COVER	1	
10	37M7059	SCREW	3	M5 X 12

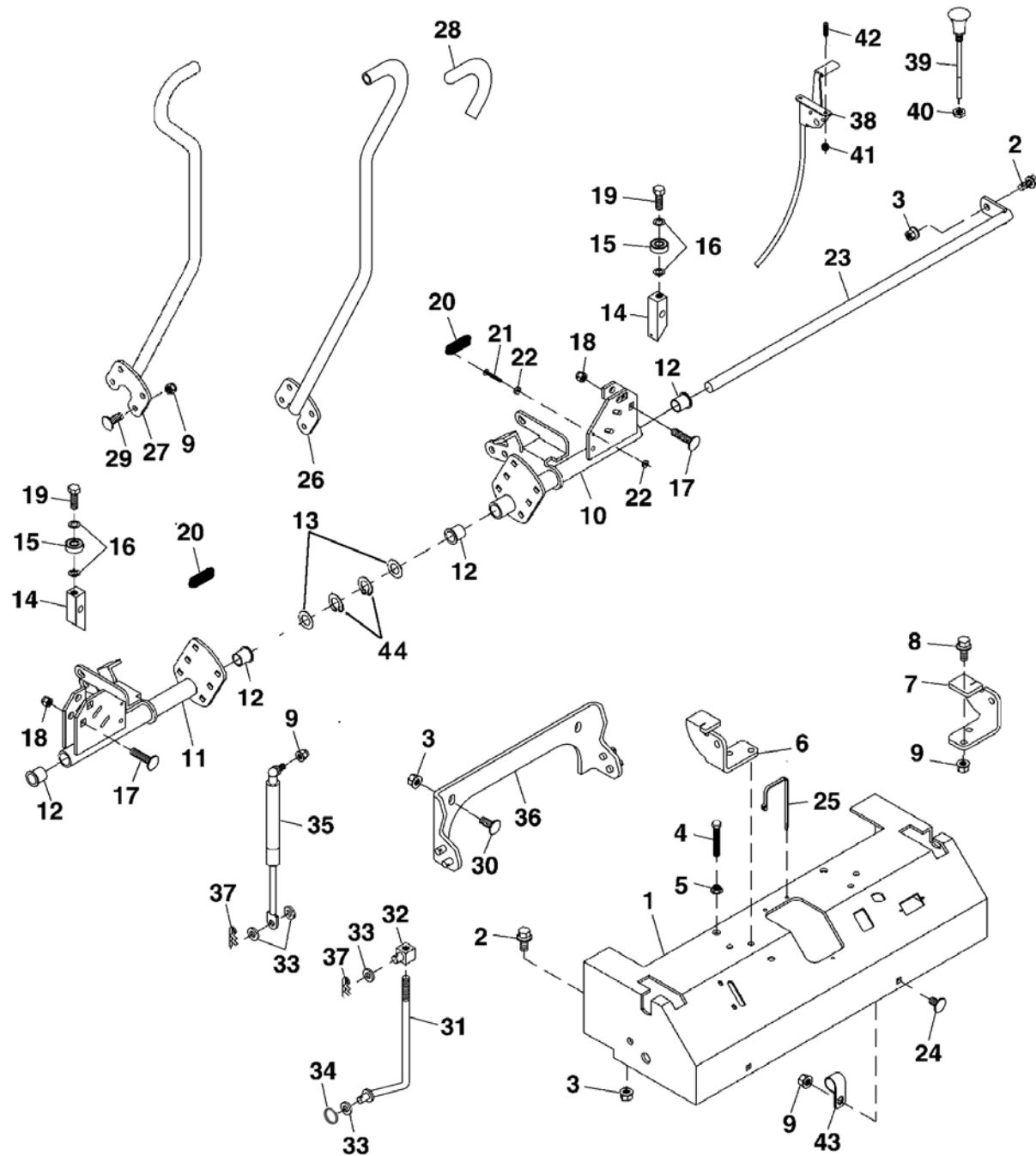
ELECTRICAL AND RELATED COMPONENTS



ELECTRICAL AND RELATED COMPONENTS

Ref. No.	Part No.	Description	Qty.	Remarks
1	57M7120	FUSE	1	20 AMP
2	191256	SWITCH	2	NEUTRAL
3	M110159	NUT	1	
4	TCA15075	SWITCH	1	IGNITION
5	TCU17401	KEY	1	
6	24M7349	WASHER	2	21 X 37 X 3 MM
7	200373	PIGTAIL HARNESS	1	BRIGGS VANGUARD
8	180640	STARTER SOLENOID	1	BRIGGS VANGUARD
9	180842	STARTER CABLE	1	12"
10	960001	BOLT	2	1/4-20 X .750
11	M78480	TIE BAND	3	
12	AM123716	RELAY	2	
13	21M7246	SCREW	3	M6 X 16
14	14M7397	LOCK NUT	3	M6
15	AM118802	SWITCH	1	BLADE ENGAGEMENT
16	AM129887	HOUR METER	1	
17	D14304	BOLT	2	
18	D14305	LOCK NUT	2	
19	D38001	SWITCH	1	PARK BRAKE
20	AM103119	SWITCH	1	SEAT - FULL SUSPENSION ONLY
21	960700	WASHER	2	1/4 FLAT
22	GDA10122	CLUTCH	1	WARNER 1.125" HUB Briggs
	200665	CLUTCH	1	OGURA - Kai & Kohler
23	D14288	SCREW	4	
24	M63431	LOCK NUT	4	
25	H122207	FLANGE NUT	2	
26	AM101006	DIODE	5	1000V -3AMP
27	TCU17832	DIODE	1	400V - 6AMP
28	D38018	WIRING HARNESS	1	FULL SUSPENSION SEAT ONLY
29	D28082	CLAMP	3	
30	03M7184	BOLT	2	M8 X 20
31	14M7396	LOCK NUT	2	M8
32	GDA10037	WIRING HARNESS	1	MAIN CHASSIS
33	D28118	BATTERY CABLE	1	POSITIVE WITH BOOT
34	180843	BATTERY CABLE	1	NEGATIVE - Briggs
	200590	BATTERY CABLE	1	NEGATIVE - Kohler/Kai
35	963001	BOLT	2	1/4-20 x .625
36	964040	LOCK NUT	2	1/4-20
37	AM124356	WET CHARGED BATTERY	1	
38	GDU10204	HOLDER	1	
39	D23047	HOOK BOLT	2	
**	14M7396	LOCK NUT	1	M8 MAIN STARTER (KAWASAKI)
40	200388	SEAT RELAY HARNESS	1	BRIGGS VANGUARD
41	102770	RELAY	1	ISO MINI
42	963101	SCREW	1	12/24 SELF DRILLING
43	964031	LOCKNUT	2	1/4-20 CENTER
44	192071	RELAY	1	MICRO
45	200924	WIRING LEAD	1	KAWASAKI
46	GDA10055	WIRING HARNESS	1	KAWASAKI
47	GDA10109	WIRING HARNESS	1	CARBURETED KOHLER
48	GDA10110	WIRING LEAD	1	GROUND (FUEL PUMP) KOHLER

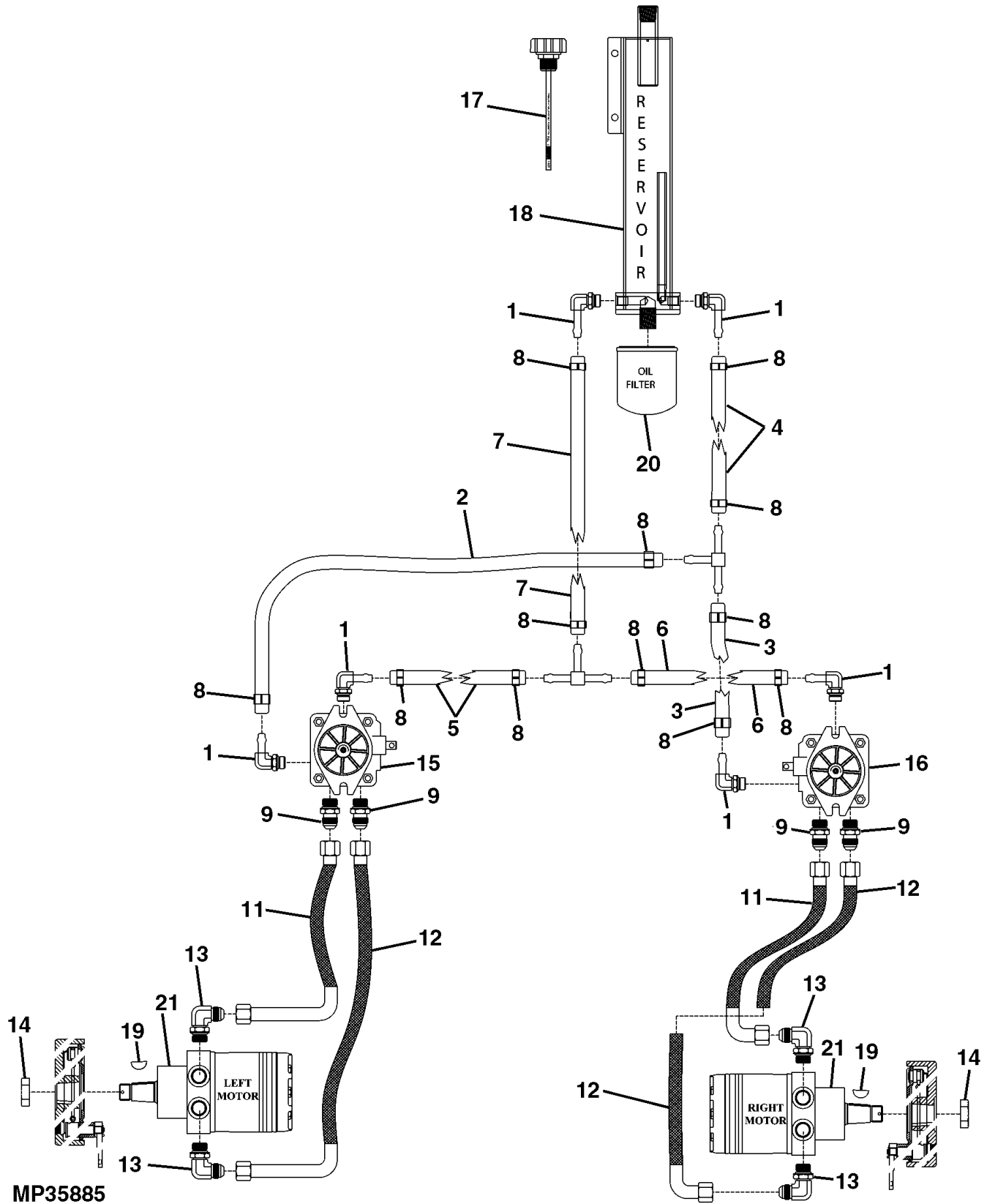
CONSOLE AND CONTROL ASSEMBLY



CONSOLE AND CONTROL ASSEMBLY

Ref. No.	Part No.	Description	Qty.	Remarks
1	GDA10083	CONSOLE	1	
2	19M7785	SCREW	5	M10 X 25
3	14M7400	LOCK NUT	7	M10
4	D14133	CAP SCREW	2	
5	N10217	LOCK NUT	2	
6	GDU10046	BRACKET	1	RH SEAT PLATE
7	GDU10045	BRACKET	1	LH SEAT PLATE
8	19M7867	SCREW	4	M8 X 25
9	14M7396	LOCK NUT	16	M8
10	GDA10097	PIVOT	1	LH CONTROL
11	GDA10098	PIVOT	1	
12	M44508	BUSHING	4	
13	200397	THRUST WASHER	4	
14	GDU10253	ARM	2	
15	AA34134	BALL BEARING	2	
16	24M7388	WASHER	6	10 X 16 X 1 MM
17	03M7195	BOLT	2	M10 X 45
18	M85516	LOCK NUT	2	
19	19H1936	CAP SCREW	2	3/8" X 3/4"
20	GX10707	EXTENSION SPRING	2	
21	D14236	SCREW	2	
22	14H778	NUT	4	.190"
23	TCA13253	PIVOT	1	
24	03M7184	BOLT	2	M8 X 20
25	M78480	TIE BAND	1	
26	GDA10081	CONTROL LEVER	1	LH
27	GDA10080	CONTROL LEVER	1	RH
28	D18093	GRIP	2	
29	03M7184	BOLT	8	M8 X 20
30	19H3693	SCREW	2	3/8" X 1 1/4"
31	TCU17400	ROD	2	CONTROL
32	D33002	SWIVEL	2	ADJUSTER
33	24M7106	WASHER	8	10 X 18 X 2.500 MM
34	M88183	LOCKING RING	2	
35	TCA15322	GAS OPERATED CYLINDER	2	
36	GDA10136	BRACKET	1	
37	J16931	PIN	4	
38	200591	ACCELERATOR	1	
39	D38146	CABLE	1	CHOKE
40	14H1080	NUT	1	3/8"
41	M63431	LOCK NUT	2	
42	21H1158	SCREW	2	M8 X 25
43	E53830	CLAMP	2	
44	P46402	RING	2	RETAINING

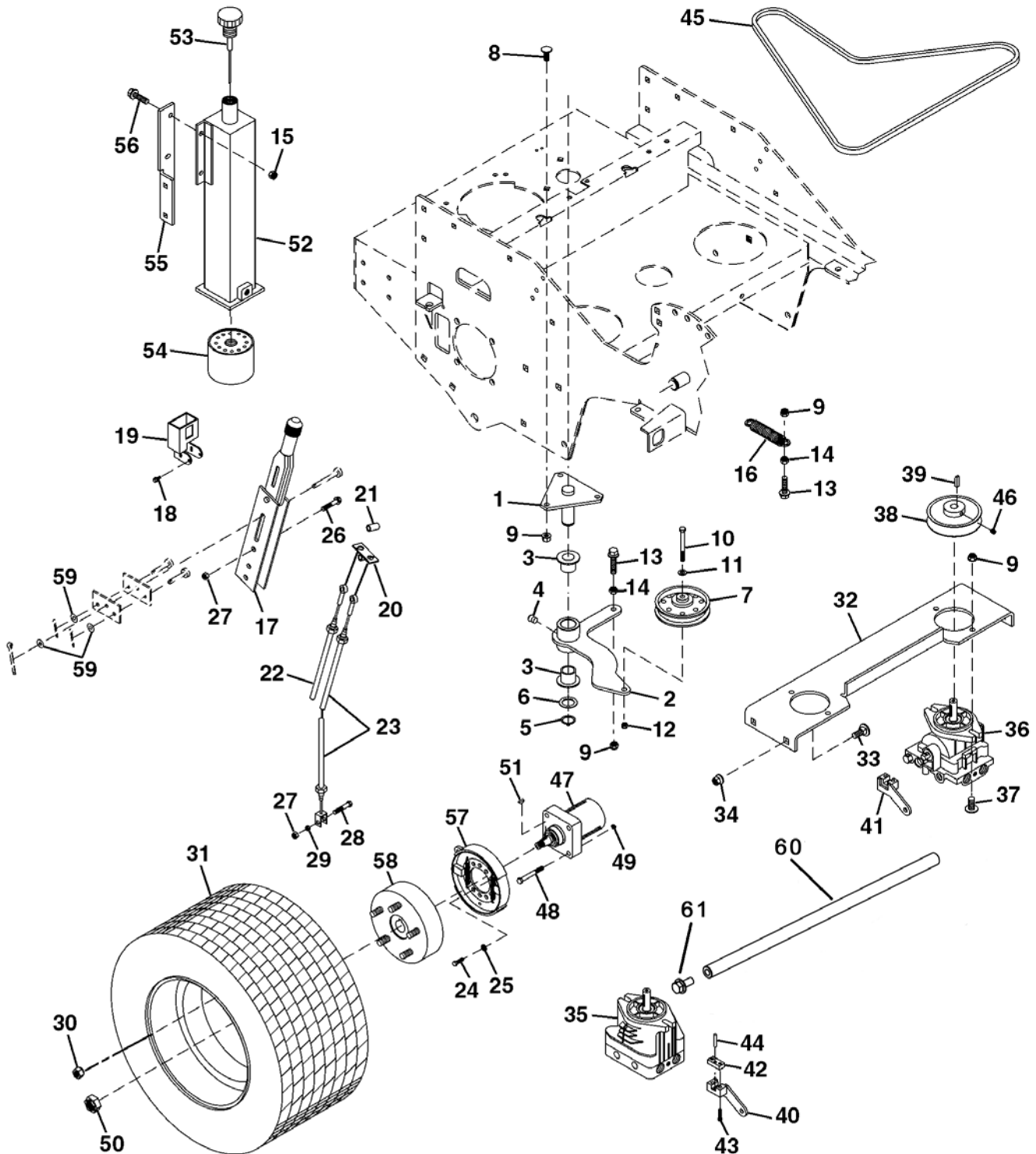
HYDROSTATIC DRIVE SYSTEM COMPONENTS



HYDROSTATIC DRIVE SYSTEM COMPONENTS

Ref.No.	Part No.	Description	Qty.	Remarks
1	D24028	FITTING	6	
2	- — — -	BULK HOSE	AR	(21") CASE RETURN, (MAKE FROM TY22503)
3	- — — -	BULK HOSE	AR	(5") CASE RETURN, (MAKE FROM TY22503)
4	- — — -	BULK HOSE	AR	(11-1/4") CASE RETURN, (MAKE FROM TY22503)
5	- — — -	BULK HOSE	AR	(11-1/4") CHARGE INLET, (MAKE FROM TY22503)
6	- — — -	BULK HOSE	AR	(5") CHARGE INLET, (MAKE FROM TY22503)
7	- — — -	BULK HOSE	AR	(29") CHARGE INLET, (MAKE FROM TY22503)
8	D18379	CLAMP	12	
9	D14197	FITTING	4	
10	M86863	TEE FITTING	2	
11	D28026	HOSE	2	HIGH PRESSURE (SHORT)
12	GDA10089	HYDRAULIC HOSE	2	HIGH PRESSURE (LONG)
13	D24026	FITTING	4	
14	MT2119	NUT	2	PATCH LOCK
15	D28227	PUMP	1	HYDROSTATIC (BDP - 10) RH
16	D28228	PUMP	1	HYDROSTATIC (BDP - 10) LH
	D19000	SEAL KIT	1	
17	TCA15122	DIPSTICK	1	
18	TCA15373	HYDRAULIC RESERVOIR	1	
19	D18207	KEY	2	
20	GDA10137	OIL FILTER	1	
21	200882	RH WHEEL MOTOR	1	HYDRO-GEAR
	200883	LH WHEEL MOTOR	1	HYDRO-GEAR
	AZ45116	GASKET KIT	1	
	M78480	TIE BAND	4	

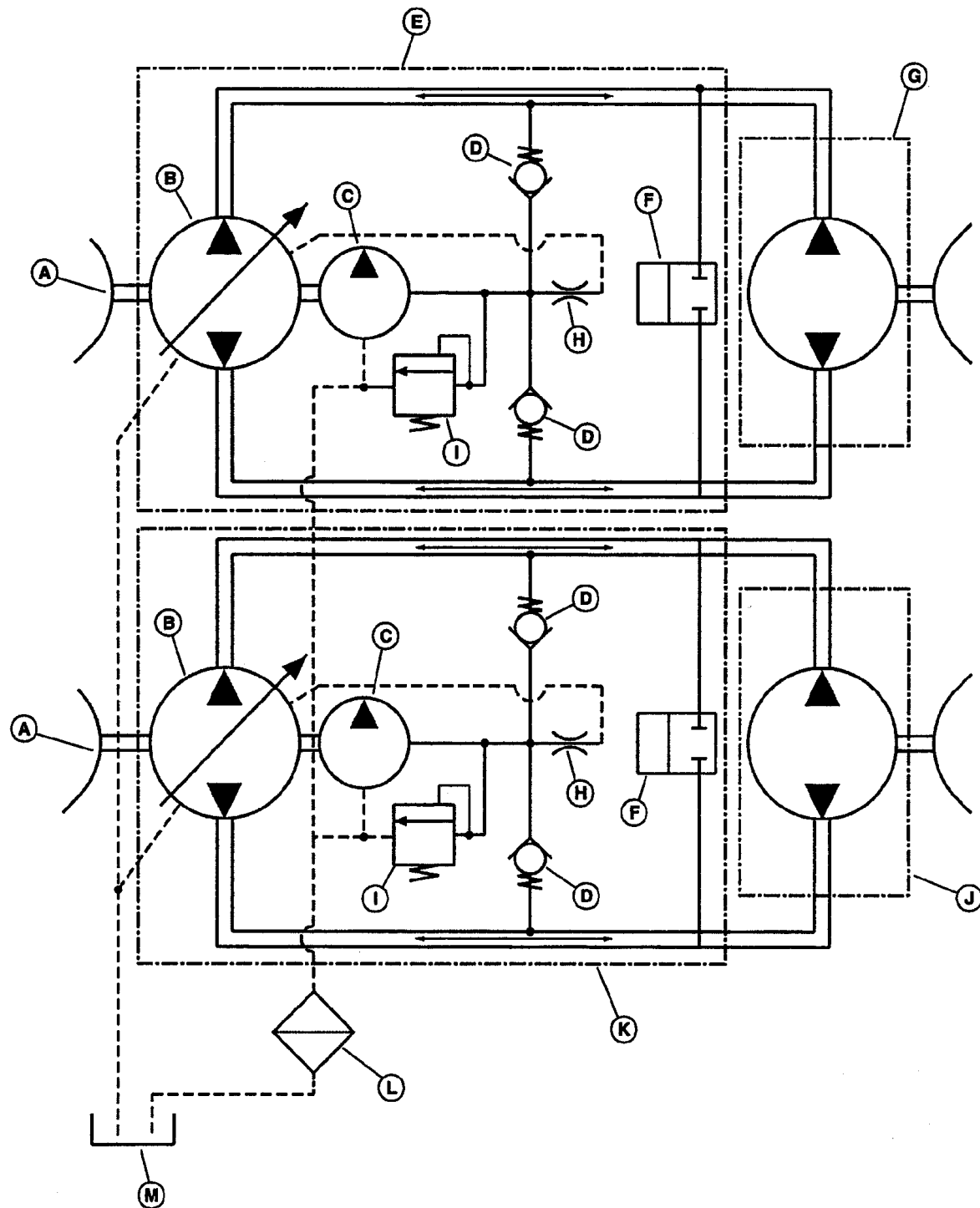
TRACTION DRIVE AND BRAKES



TRACTION DRIVE AND BRAKES

Ref. No.	Part No.	Description	Qty.	Remarks
1	GDA10036	PIVOT	1	
2	D25059	ARM	1	IDLER
3	D18076	BUSHING	2	
4	959995	FITTING	1	
5	D14104	SNAP RING	1	
6	24H1441	WASHER	1	
7	GDA10032	IDLER	1	
8	03M7192	BOLT	3	M10 X 30
9	14M7518	FLANGE NUT	6	M10
10	19H1801	CAP SCREW	1	3/8" X 2"
11	24H1305	WASHER	1	13/32" X 13/16" X .065"
12	D14010	LOCK NUT	1	
13	19M8162	SCREW	2	M10 X 40
14	14M7152	NUT	2	M10
15	14M7517	LOCK NUT	2	M10
16	D18071	EXTENSION SPRING	1	
17	D28019	LEVER	1	PARKING BRAKE
18	37M7059	SCREW	4	M5 X 12
19	200326	BRACKET	1	
20	D25014	RETAINER	1	
21	D23062	SPACER	2	Includes O-ring
22	D28099	PUSH PULL CABLE	1	RH BRAKE
23	D28100	PUSH PULL CABLE	1	LH BRAKE
24	19H1900	CAP SCREW	8	5/16" X 3/4"
25	24H1136	WASHER	8	11/32" X 11/16" X .065"
26	19M8319	SCREW	3	M8 X 50
27	H137328	LOCK NUT	5	
28	19M8008	CAP SCREW	2	M8 X 25
29	14M7151	NUT	2	M8
30	960526	NUT	10	1/2-20 LUG
31	GDA10000	TIRE AND WHEEL ASSEMBLY	2	23 X 9.5 X 12
32	GDU10096	SUPPORT	1	
33	03M7199	BOLT	4	M12 X 35
34	H137329	LOCK NUT	4	M12
35	D28227	PUMP	1	RH HYDROSTATIC
36	D28228	PUMP	1	LH HYDROSTATIC
37	03M7192	BOLT	4	M10 X 30
38	TCA15316	PULLEY	2	
39	D18067	SHAFT KEY	2	
40	D25146	ARM	1	RH PUMP
41	D25147	ARM	1	LH PUMP
42	D13336	PLATE	2	
43	19H2975	CAP SCREW	4	1/4" X 1-1/4"
44	34M5722	SPRING PIN	2	5 X 30 MM
45	D28125	V-BELT	1	
46	22H907	SET SCREW	2	5/16" X 7/8"
47	200882	MOTOR	1	RH
	200883	MOTOR	1	LH
48	19H1930	CAP SCREW	8	1/2" X 2-1/2"
49	H32811	LOCK NUT	8	
50	MT2119	NUT	2	PATCH LOCK
51	D18207	KEY	2	
52	TCA15373	HYDRAULIC RESERVOIR	1	
53	GDA10022	DIPSTICK	1	
54	GDA10137	OIL FILTER	1	
55	200836	BRACKET	1	
56	19M7785	SCREW	2	M10 X 25
57	D28089	BRAKE SHOE	2	
58	D28088	BRAKE DRUM	2	
59	24H1776	WASHER	3	5/16" X 47/64" X .065"
60	GDU10124	FRONT RAIL REINFORCEMENT	1	
61	19M8832	FLANGE BOLT	2	M14 X 2.0 X 30-10

HYDRAULIC SCHEMATIC

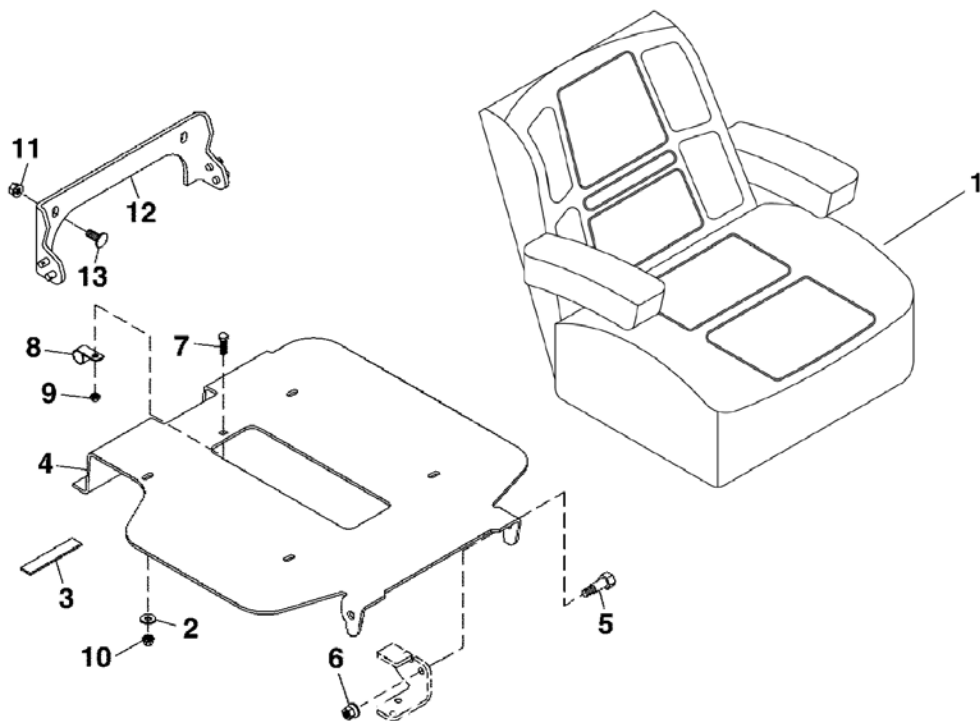


A - Control Input Shaft
B - Pump Block
C - Charge Pump
D - Charge System Check Valve
E - Right Hydraulic Pump
F - Manual Bypass (Free-Wheel) Valve
G - Right Wheel Motor

H - Cooling Orifice
I - Charge Relief Valve
J - Left Wheel Motor
K - Left Hydraulic Pump
L - Oil Filter
M - Hydraulic Reservoir

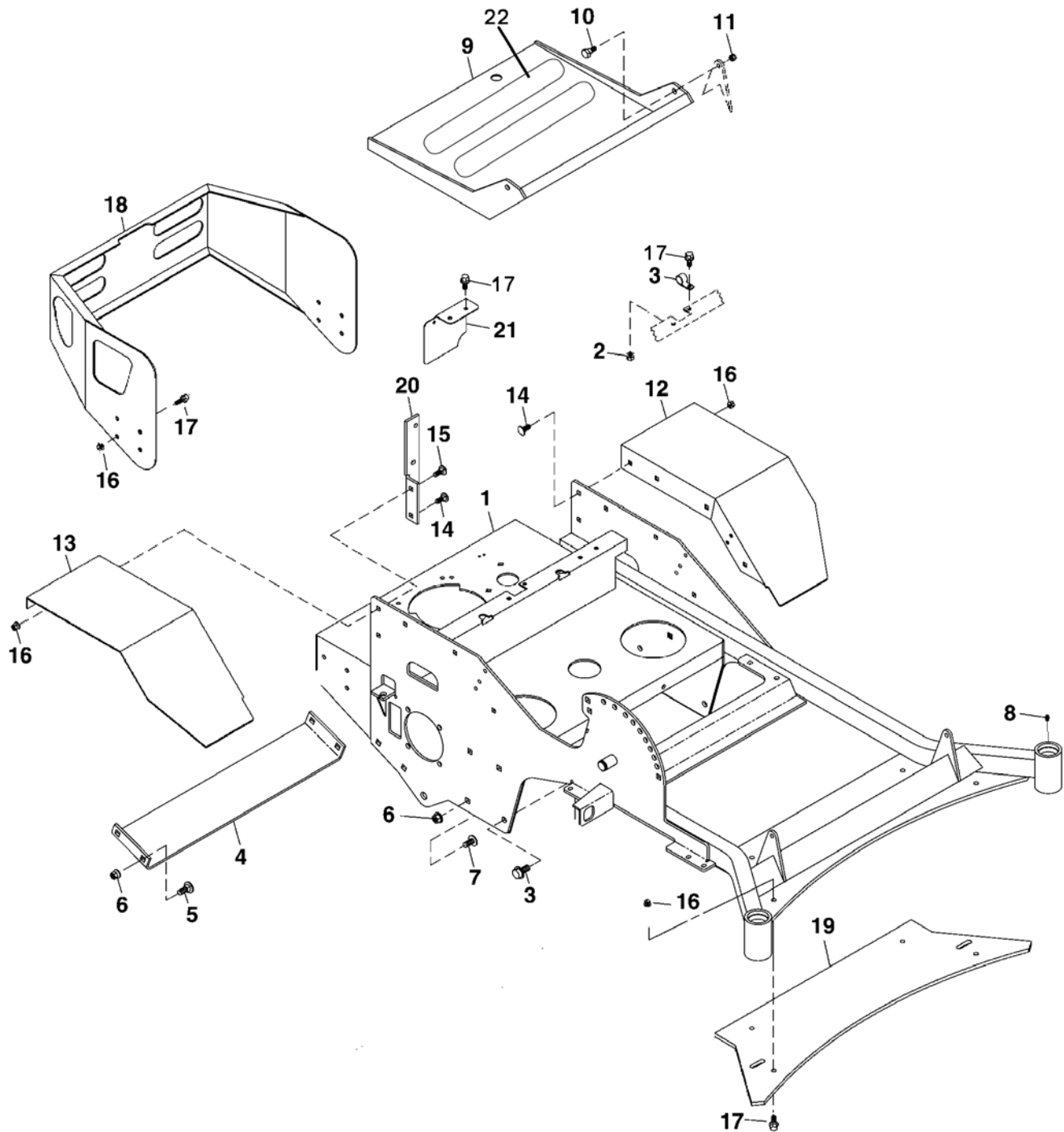
MP35887

HYDRAULIC SCHEMATIC



Ref. No.	Part No.	Description	Qty.	Remarks
1	200351	SEAT	1	STANDARD CHARIOT
	TCA51308	SEAT BELT	1	
	200876	SPRING	1	SEAT SPRING ADJUSTMENT
2	24H1887	WASHER	4	11/32" X 1" X 0.134"
3	TCU17356	PAD	1	CUT TO LENGTH
4	200324	SEAT PLATE (YELLOW)	1	
5	135139	BOLT	1	1/2 X 1.06 X 3/8-16
6	K40003	LOCK NUT	1	
7	03M7184	BOLT	1	M8 X 20
8	E83830	CLAMP	3	
9	14M7396	LOCK NUT	1	M8
10	M63277	LOCK NUT	4	
11	14M7518	FLANGE NUT	4	M10
12	GDA10136	BRACKET	1	
13	19M7786	SCREW	4	M10 X 30
14	181572	SEAT BELT	1	RETRACTABLE MALE + FEM.
15	960703	FLAT WASHER	4	
16	960079	BOLT	2	
17	964025	LOCK NUT	2	

FRAME ASSEMBLY



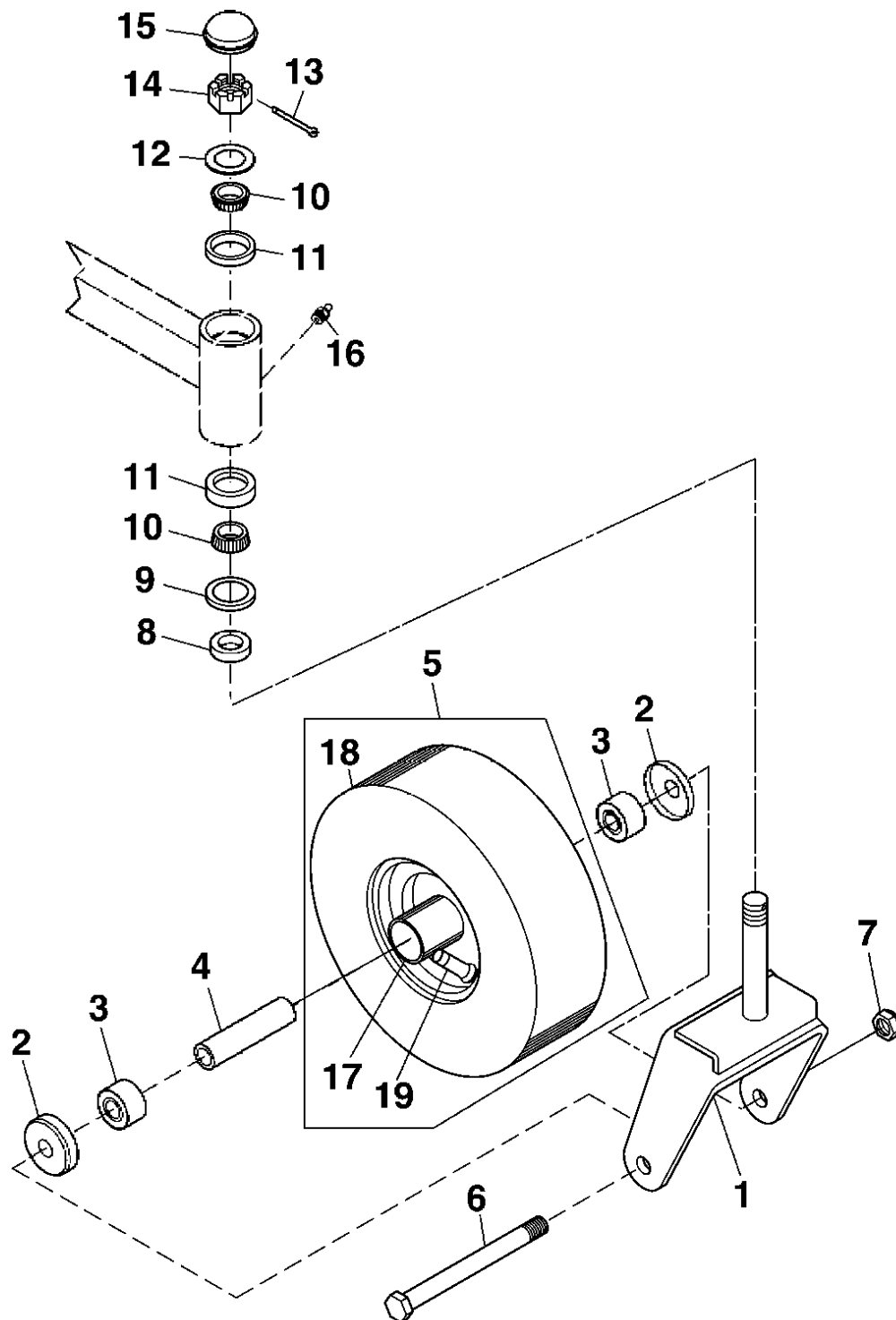
FRAME ASSEMBLY

Ref. No.	Part No.	Description	Qty.	Remarks
1	200886	FRAME	1	
2	14M7396	LOCK NUT	1	M8
3	E53830	CLAMP	1	
4	GDU10222	PLATE	1	
5	03M7199	BOLT	4	M12 X 35
6	H137329	LOCK NUT	8	
7	03M7197	BOLT	4	M12 X 25
8	JD7844	LUBRICATION FITTING	2	
9	200329	PLATFORM	2	
10	135139	LOCK NUT	2	
11	964022	LOCK NUT	2	
12	GDU10165	FENDER	1	LH
13	GDU10164	FENDER	1	RH
14	03M7017	BOLT	7	M10 X 25
15	03M7085	BOLT	1	M10 X 30
16	14M7518	FLANGE NUT	21	M10
17	19M7865	SCREW	3	M8 X 16
18	200352	BUMPER	1	KOHLER/BRIGGS ENGINE
	200845	BUMPER	1	KAWASAKI
19	GDU10285	PLATE	2	
20	GDU10184	BRACKET	1	
21	GDU10170	BRACKET	1	
22	180658	TRACTION TAPE	2	

* NOTE: See authorized servicing engine dealer for engines and engine related service items. Always reference the engine model number when ordering parts.

NOTES

FRONT CASTER ASSEMBLY



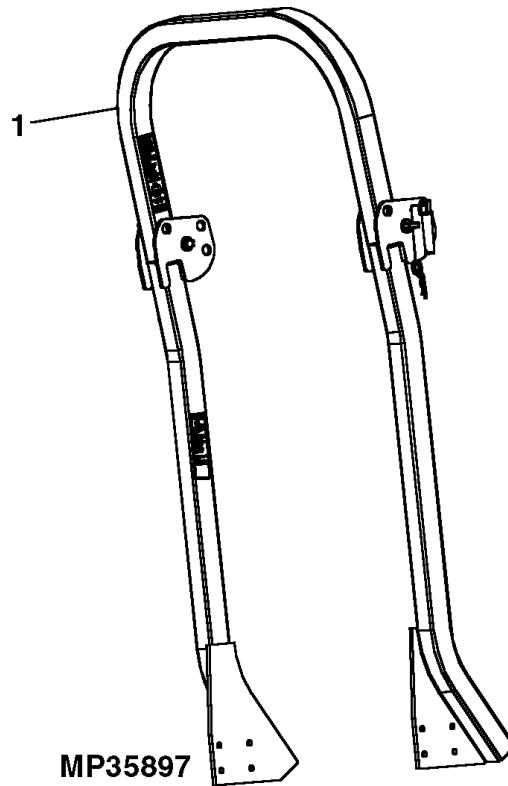
FRONT CASTER ASSEMBLY

FRONT CASTER ASSEMBLY

Ref. No.	Part No.	Description	Qty.	Remarks
1	200334	YOKE	1	CASTER
2	TCU14490	ROUND RETAINER	2	
3	AA21840	BALL BEARING	2	
4	TCU13871	SPACER	1	
5	TCA13769	TIRE AND WHEEL ASSEMBLY	1	13" CASTER
6	19M7978	CAP SCREW	1	M16
7	14M7276	NUT	1	
8	TCU13454	SPACER	1	
9	E14625	SEAL	1	
10	JD8933	BEARING CONE	2	3.200 X 50 MM
11	145553	BEARING CUP	2	
12	24H1801	WASHER	1	
13	11M7083	COTTER PIN	1	
14	A12188	LOCK NUT	1	13"
15	M35582	DUST CAP	1	
16	JD7844	LUBRICATION FITTING	1	
17	TCU13604	RIM	1	
18	TCU15970	TIRE	1	13 X 5.00-5, 4 PLY
19	AM30795	TIRE VALVE STEM	1	

NOTES

ROPS

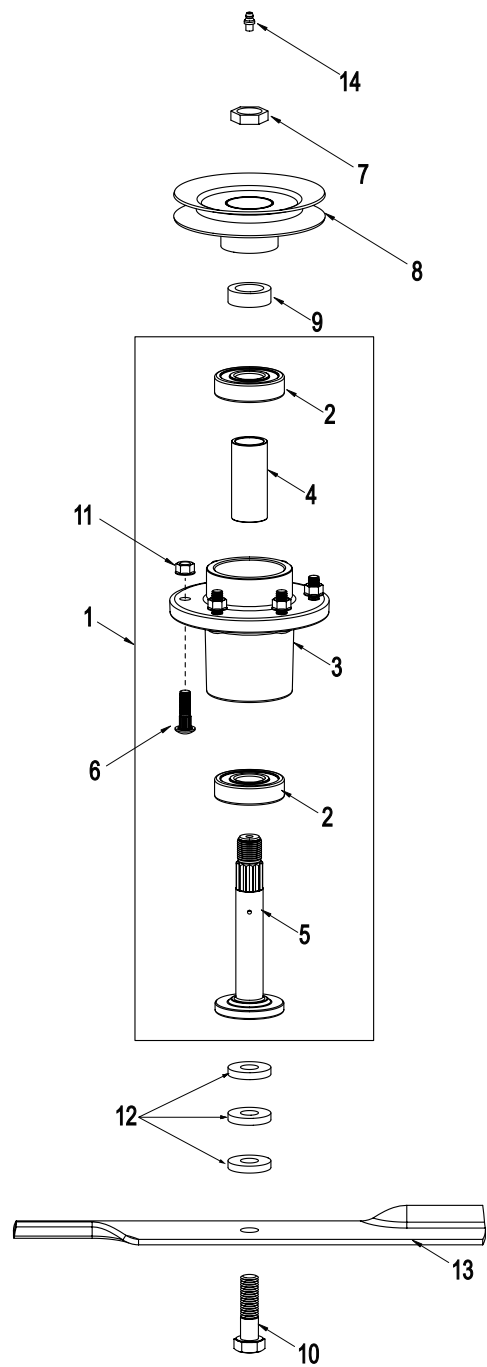


Ref. No.	Part No.	Description	Qty.	Remarks
1	200550	ROPS	1	

NOTES

NOTES

SPINDLE ASSEMBLY

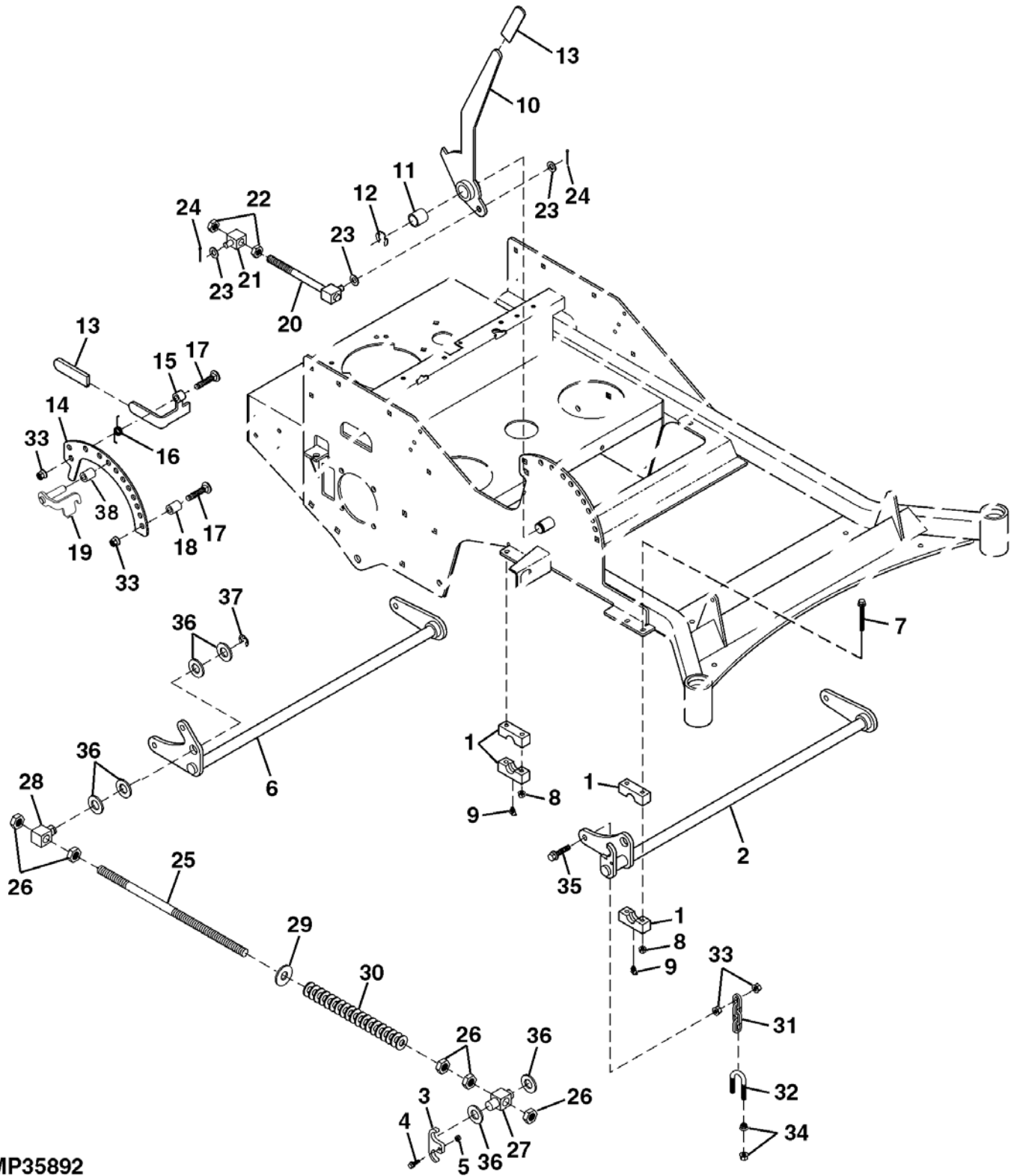


SPINDLE ASSEMBLY

Ref. No.	Part No.	Description	Qty.	Remarks
1	200262	Spindle Assembly	1	Includes items 2, 3, 4, 5, 6, 14
2	200046	Ball Bearing	2	
3	200042	Housing	1	
4	200044	Spacer	1	
5	200261	Shaft, Spindle	1	1.000 x 1.250 x 2.772
6	200045	Bolt	3	Includes items 7, 10, 14 3/8-16
7	967333	Nut, Pulley (Special)	3	
8	D18209	Pulley, Cutter Housing, 48" Deck	3	
	D18084	Pulley, Cutter Housing, 52" Deck	3	
	D18211	Pulley, Cutter Housing, 61" Deck	3	5/8-11 x 2 3/8-16 Std Hex GR5
9	D13024	Spacer, Pulley	3	
10	967348	Bolt, Blade	3	
11	960502	Nut	18	
12	D18055	Spacer, Blade Bolt	9	
13	GDU10230	16.5" Blade, 48" Deck	3	
	GDU10231	18.0" Blade, 52" Deck	3	
	GDU10232	21.0" Blade, 61" Deck	3	
14	200047	Zerk, Grease S/O	3	

NOTES

DECK LIFT ASSEMBLY



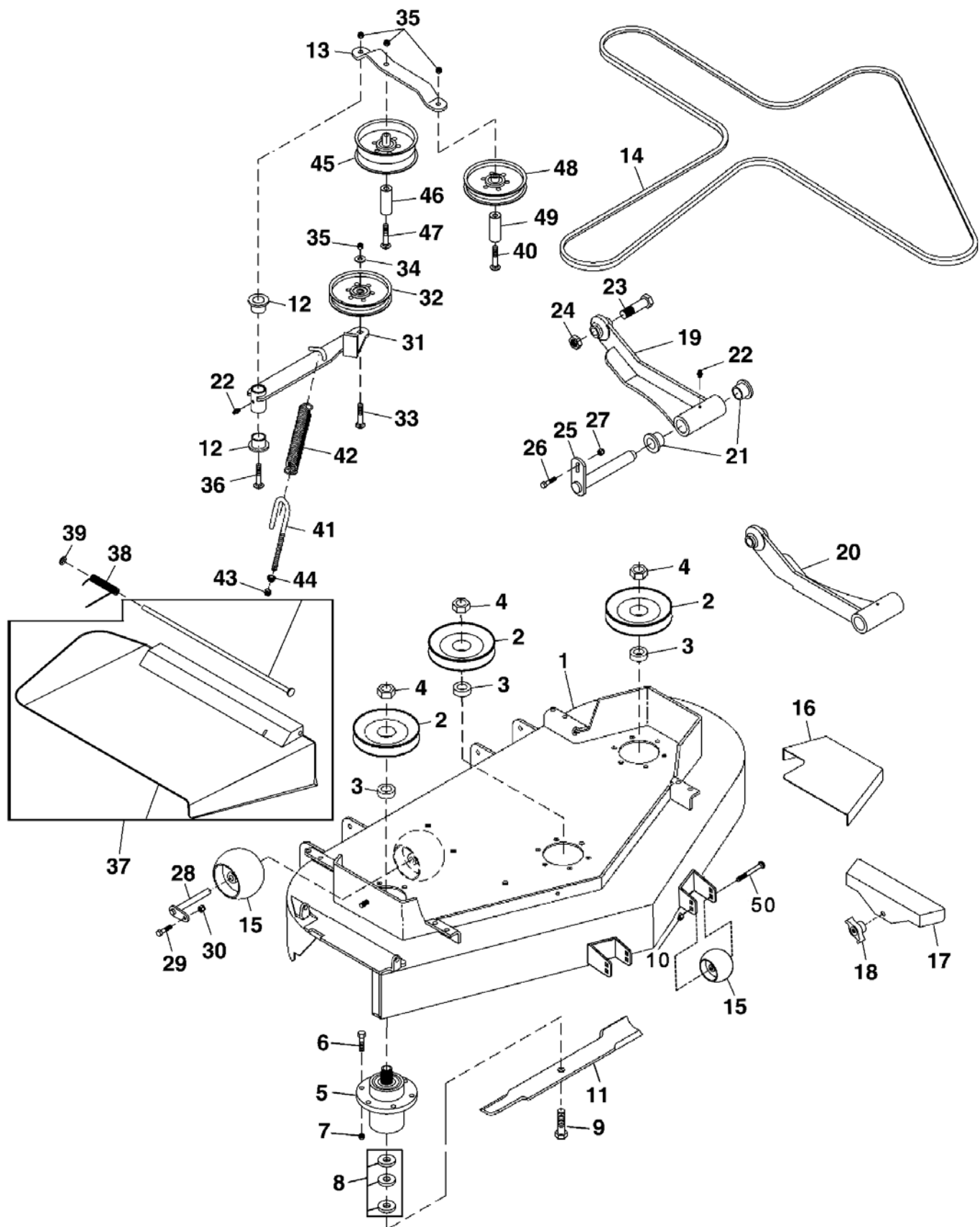
MP35892

DECK LIFT ASSEMBLY

Ref. No.	Part No.	Description	Qty.	Remarks
1	TCU18697	BEARING CAP	8	
2	GDA10093	ARM	1	
3	GDU10242	PLATE	1	
4	19M7796	SCREW	1	M6 X 30
5	H137327	LOCK NUT	1	
6	GDA10092	ARM	1	
7	19M7803	SCREW	8	M8 X 70
8	14M7396	LOCK NUT	8	M8
9	JD7849	LUBRICATION FITTING	4	
10	GDA10101	LEVER	1	
11	W10728	BUSHING	1	
12	R58806	SNAP RING	1	
13	D18079	GRIP	2	
14	200866	OUTER HOC PLATE	1	
15	TCA15049	LEVER	1	
16	TCU17371	TORSION SPRING	1	
17	03M7204	BOLT	3	M12 X 60
18	TCU15816	SPACER	2	
19	200355	HOC PIN	1	
20	D25107	ROD	1	
21	D23049	SWIVEL	1	
22	14H1039	NUT	2	5/8"
23	24H1111	WASHER	3	17/32" X 1-1/16" X .090"
24	11M7015	COTTER PIN	2	3.200 X 25 MM
25	TCU16862	THREADED ROD	1	
26	14H1058	NUT	5	3/4"
27	GDU10238	SWIVEL	1	
28	TCU17245	SWIVEL	1	
29	24H1236	WASHER	1	13/16" X 2" X .149"
30	D28200	COMPRESSION SPRING	1	
31	TCA13510	LINK CHAIN	4	
32	GDU10048	U-BOLT	4	
33	H137329	LOCK NUT	11	
34	N10215	LOCK NUT	16	
35	19M8162	SCREW	4	M10 X 40
36	24H1413	WASHER	6	57/64" X 1-3/8" X 0.048"
37	A15147	SPRING LOCKING PIN	1	
38	200841	HOC SPACER	1	

NOTES

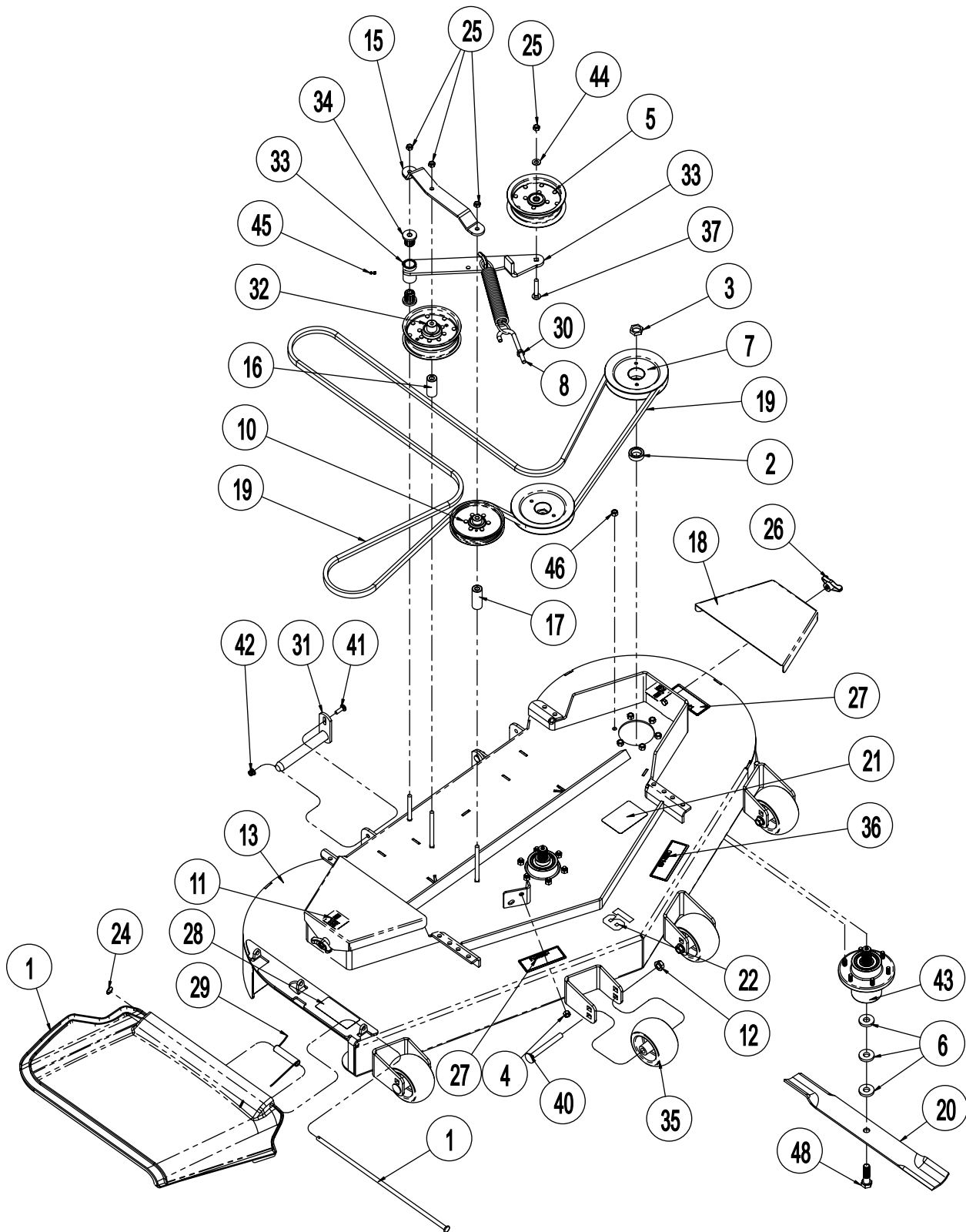
48" CUTTING DECK



48" CUTTING DECK

Ref. No.	Part No.	Description	Qty.	Remarks
1	GDA10104	MOWER DECK	1	48"
2	D18209	PULLEY	3	CUTTER HOUSING 48"
3	D13024	SPACER	3	
4	D13055	NUT	3	
5	200041	SPINDLE	3	
6	19M7786	BOLT	18	M10 X 1.5 X30 HHFCS
7	960502	Nut	18	3/8-16 HEX NUT
8	D18055	SPACER	9	
9	967347	BOLT	3	5/8-11 X 2.25
10	E62934	FLANGE NUT	2	
11	GDU10230	BLADE	3	48" HIGH LIFT
12	TCU14540	BUSHING	2	
13	GDU10119	STRAP	1	
14	TCU16092	V-BELT	1	ENGINE TO BLADES 48"
15	TCU18744	WHEEL	4	GAGE
16	GDU10251	COVER	1	LH 48"
17	GDU10252	COVER	1	RH 48"
18	M119352	KNOB	2	
19	GDA10084	ARM	1	RH
20	GDA10085	ARM	1	LH
21	D18076	BUSHING	4	
22	JD7844	LUBRICATION FITTING	3	
23	19H3280	SCREW	2	1/4" X 1"
24	964024	LOCK NUT	2	
25	TCA13292	PIN FASTENER	2	
26	03M7185	BOLT	2	M8 X 25
27	14M7396	LOCK NUT	2	M8
28	GDA10103	PIVOT	2	
29	03H1729	BOLT	2	1/4" X 1
30	H122207	FLANGE NUT	2	
31	TCA15346	ARM	1	
32	D18032	PULLEY	1	
33	03H1658	BOLT	1	3/8" X 2-1/4"
34	24H1305	WASHER	1	13/32" X 13/16" X .065"
35	K40003	LOCK NUT	4	
36	03H1836	BOLT	1	3/8" X 3-1/2"
37	AM127235	CHUTE	1	
38	M132768	TORSION SPRING	1	
39	H141123	PUSH NUT	1	
40	03H2040	BOLT	1	
41	D13005	HOOK BOLT	1	48"
42	D28025	SPRING	1	
43	D14010	LOCK NUT	1	
44	N10215	LOCK NUT	1	
45	TCA14548	PULLEY	1	
46	GDU10180	SPACER	1	
47	03H1838	BOLT	1	3/8" X 5"
48	D28050	IDLER	1	
49	GDU10181	SPACER	1	
50	03H1853	BOLT	2	

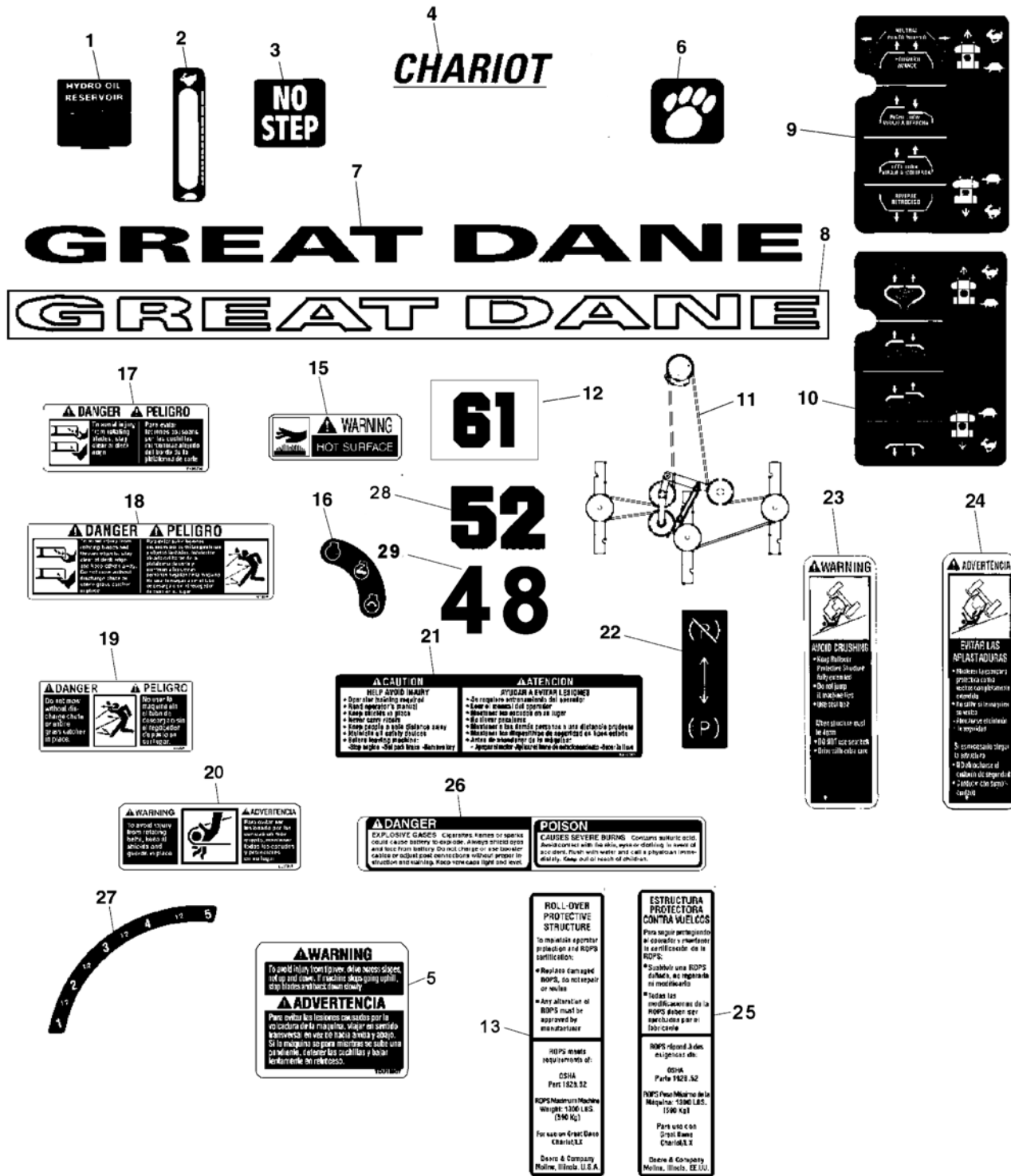
52" & 61" CUTTING DECK



52" & 61" CUTTING DECK

Ref. No.	Part No.	DESCRIPTION	Qty.	Remarks
1	AM127488	CHUTE, ASSY - 61"	1	
	TCA16387	CHUTE, ASSY - 52"	1	
2	D13024	SPACER	3	1.500X1.000X.510
3	D13055	NUT, 7/8-14	3	
4	D14010	NUT, 3/8-16 PTHN	1	
5	D18032	PULLEY, FLAT 5.0x.38 w/BRG	1	
6	D18055	WASHER, BLADE	9	
7	D18211	SPINDLE PULLEY - 61"	3	
	D18084	SPINDLE PULLEY - 52"	3	
8	D23058	J-BOLT - 61" DECK	1	3/8-16 X 4.00
	D13005	J-BOLT - 52" DECK	1	
9	D28025	SPRING, DECK IDLER	1	
10	D28050	PULLEY, FLAT 5.00X.375 W/BRG	1	
11	D28181	DECAL, NO STEP	2	
12	E62934	LOCKNUT 1/2 W/FLANGE	4	
13	GDA10077	WLDT, 61" MOWER DECK	1	
	GDA10088	WLDT, 52" MOWER DECK	1	
14	GDA10103	PIVOT, RETAINER WELD	2	
15	GDU10119	STRAP, IDLER PULLEY	1	
16	GDU10180	SPACER, .437 X 1.00 X 2.25 SMLS	1	
17	GDU10181	SPACER, .437X1.00X2.50 SMLS	1	
18	GDU10187	COVER, BELT LH & RH 61" DECK	2	
	GDU10249	COVER, BELT LH 52" DECK	1	
	GDU10250	COVER, BELT RH 52" DECK	1	
19	GDU10228	BELT, V	1	
20	GDU10232	BLADE, 20.940 LO-LIFT 61"	3	
	GDU10231	BLADE, 18.00 LO-LIFT 52"	3	
21	GDU10262	DECAL, BELT PATH (48,52,61)	1	
22	GDU10269	DECAL, 61	1	
23	H122207	NUT-1/4" FLANGE PREVAILING TOR	2	
24	H141123	RETAINER #	1	
25	K40003	NUT	4	3/8 LOCK
26	M119352	KNOB, LOCKING	2	
27	M131739	DECAL, DANGER	2	
28	M137637	DECAL, DANGER	1	
29	M132768	SPRING,CHUTE GUARD	1	
30	N10215	LOCKNUT, 3/8-16 WHIZ Y	1	
31	TCA13292	PIN, WELDED	2	
32	TCA14548	PULLEY, FLAT	1	5.25X.375 W/BRG
33	TCA15346	ARM, IDLER *	1	
34	TCU14540	BRG, FLG M10XM25XM27 FLUTED	2	
35	TCU18744	WHEEL, GAGE	6	
36	TCU51051	DECAL, WARNING	1	
37	03H1658	BOLT	1	3/8-16X2.25 CRG 5
38	03H1836	BOLT	1	3/8-16X3.50 CRG 5
39	03H1838	BOLT	2	CAR 3/8-16 X 5.00
40	03H1853	BOLT	4	1/2-13X4.50 CRG 5
41	03M7185	BOLT,RH,SQNECK	2	JDS137,M8X1.25X
42	14M7396	LOCKNUT	2	FLANGE ISO7043,M8X1.25
43	200041	ASSY, SPINDLE HOUSING	3	
44	24H1305	WASHER	1	.406X.812X.065
45	959995	FTG, STRGT GREASE ZERK	1	1/4/2028
46	960502	NUT	18	3/8-16 STD HEX GR5
47	963095	BOLT	2	1/4-20 X .750 CRG 5
48	967347	BOLT	3	5/8-11 X 2.25 HEX 8

LABELS



LABELS

Ref. No.	Part No.	Description	Qty.	Remarks
1	181023	DECAL	1	HYDRO OIL SPECS.
2	D28167	DECAL	1	THROTTLE CONSOLE
3	D28181	DECAL	1	NO STEP
4	GDU10254	DECAL	1	CHARIOT
5	TCU15907	LABEL	1	WARNING SLOPE
6	GDU10256	LABEL	2	PUPPY PAW
7	GDU10257	LABEL	1	GREAT DANE BLACK
8	GDU10258	LABEL	1	GREAT DANE WHITE
9	GDU10259	LABEL	1	MOTION CONTROL OTL KIT
10	GDU10260	LABEL	1	MOTION CONTROL CONSOLE
11	GDU10262	LABEL	1	BELT PATH 48", 52", 61" DECK
12	GDU10269	LABEL	1	
13	TCU20575	LABEL	4	ROPS CERTIFICATION
14	TCU51051	LABEL	1	DANGER, ROTATING BELTS
15	M17554	LABEL	2	WARNING - HOT SURFACES
16	M127610	LABEL	1	IGNITION
17	M131739	LABEL	2	DANGER BLADE CONTACT
18	M131748	LABEL	1	DANGER THROWN OBJECTS
19	M137637	LABEL	1	DISCHARGE
20	TCU51051	LABEL	1	DANGER, ROTATING BLADES
21	TCU14840	LABEL	1	GENERAL CAUTION
22	TCU14862	LABEL	1	PARK BRAKE DIRECTION
23	TCU13514	LABEL	4	ROPS WARNING - ENGLISH
24	TCU13515	LABEL	4	ROPS WARNING - SPANISH
25	TCU20576	LABEL	4	ROPS CERTIFICATION - SPANISH
26	TCU14885	LABEL	1	DANGER, EXPLOSIVE GASES/POISON
27	200266	LABEL	1	CUT HEIGHT
28	GDU10268	LABEL	1	
29	GDU10267	LABEL	1	

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