GREAT DANE™

Gateway
GDWG17KAE, GDWG22KHE

OPERATOR'S MANUAL

OMGD10004 I4

North American Version
Litho in U.S.A.

⚠ 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

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.

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.

Reading your operator's manual will help you and others avoid personal injury or damage to the machine. Information given in this manual will provide the operator with the safest and most effective use of the machine.

Sections in your operator's manual are placed in a specific order to help you understand all the safety messages and learn the controls so you can operate this machine safely. You can also use this manual to answer any specific operating or servicing questions.

The machine shown in this manual may differ slightly from your machine, but will be similar enough to help you understand our instructions.

RIGHT-HAND and LEFT-HAND sides are determined by facing in the direction the machine will travel when going forward. When you see a broken line (------), the item referred to is hidden from view.

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.

Record Identification Numbers

Gateway

GDWG17KAE Serial No. (414000 - 414999)

GDWG22KHE Serial No. (416000 - 416999)

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:

_____

MODEL NUMBER:

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

SERIAL NUMBER (POWER UNIT):

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

SAFETY LABELS

ENGINE SERIAL NUMBER:

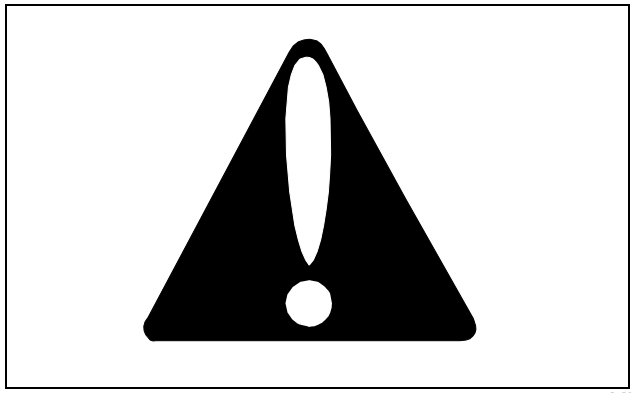
— — — — — — — — — — — — — — — — — — — —

ENGINE SPECIFICATION NUMBER:

— — — — — — — — — — — — — — — — — — — —

Safety Labels

Understanding The Machine Safety Labels

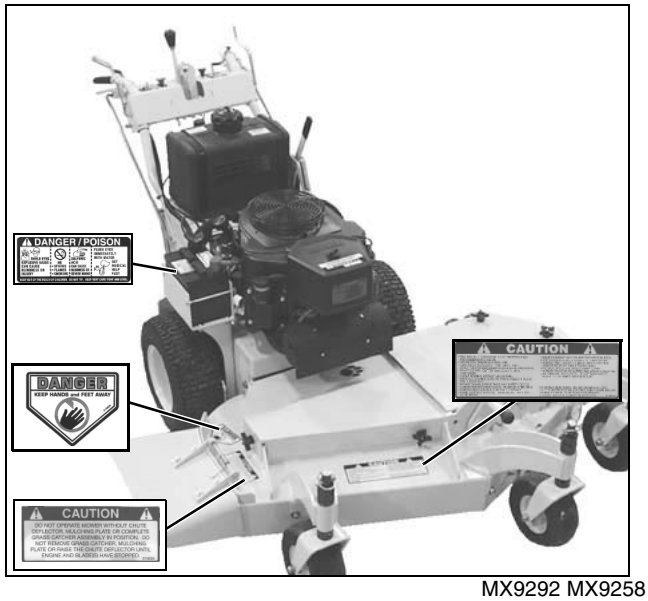


MIF

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.

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.



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DANGER/POISON

- Shield eyes explosive gases can cause blindness or injury.
- No sparks, flames, smoking.
- Sulfuric acid can cause blindness or severe burns.
- Flush eyes immediately with water get medical help fast.
- Keep out of the reach of children.
- Do not tip.
- Keep vent caps tight and level.

CAUTION

- This product is designed for professional and commercial users.
- Operation training is required.
- Carefully read safety instructions.
- Know function of controls before operating.
- Practice with cutter blades off until confident.
- Clear mowing area of all debris.
- Keep all guards, covers and shields in place while working.
- Do not disable or bypass any safety device.
- Always wear safety goggles while operating.
- Always park machine on level surface.
- Avoid contact with cutter blades; They may be rotating.
- Keep children and others clear from area.
- Set ground speed control to safe speed.
- Slowly and smoothly move speed control levers to start and stop machine.
- Reduce speed and avoid sharp turns.
- Be careful on slopes; do not mow where stability or traction is in doubt.
- To obtain additional operator manual and safety instructions, contact Great Dane dealer or write Great Dane Power Equipment, 4700 New Middle Rd., Jeffersonville, IN 47130, USA.

DANGER

- Keep hands and feet away.

CAUTION

- Do not operate mower without chute deflector, mulching plate or complete grass catcher assembly in position.
- Do not remove grass catcher, mulching plate or raise the chute deflector until engine and blade(s) have stopped.

Emission Control System Certification Label (Small Off-Road Gas Engines)

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 (Small Off-Road Gas Engines)

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

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.

• Be sure of your footing while using pedestrian-controlled equipment, especially when backing up. Walk, don't run. Never operate on wet grass. Reduced footing could cause slipping.

• 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 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.

• 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.

• Be sure all drives are in neutral and parking brake is locked before starting engine. Stand as far away from the discharge chute as possible with feet well away from the underside of the deck to start machine.

• Do not hang or secure any item to the control console. The operator's station should always remain unobstructed.

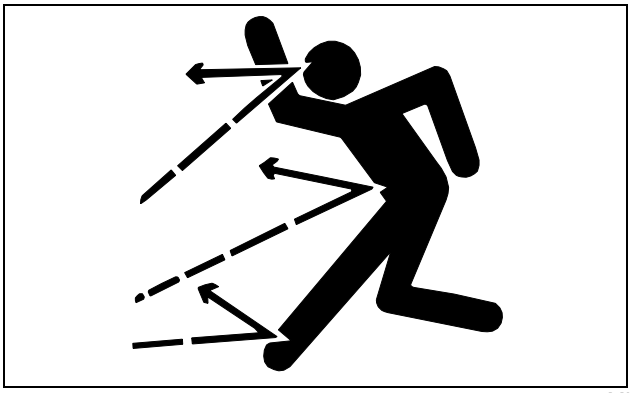
• Do not pull mower backwards while the blades are rotating. Use the reverse gear to move the machine in reverse.

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



MIF

• 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.

Parking Safely

1.Stop machine on a level surface, not on a slope.

2.Disengage mower blades.

3.Lock the park brake.

4.Stop the engine.

5.Remove the key.

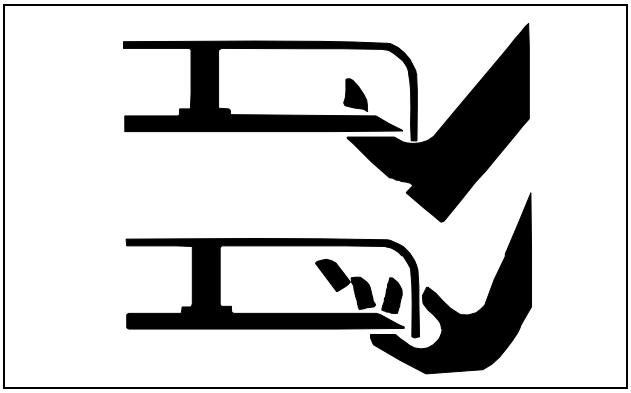
6.Wait for engine and all moving parts to stop before you leave the operator's station.

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

8.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.

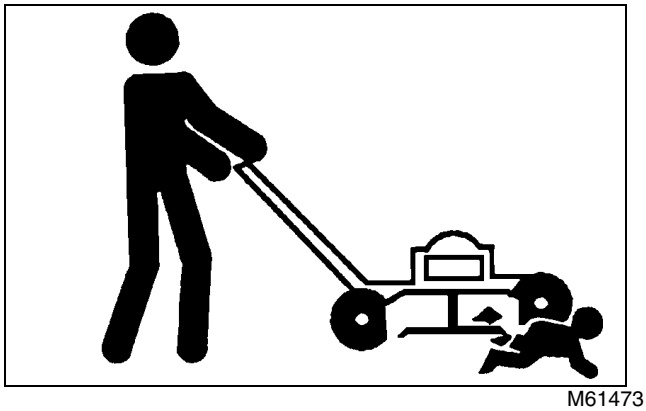
• Be alert at all times, drive forward carefully. People, especially children can move quickly into the mowing area before you know it.

• 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.

Rotating Blades are Dangerous - Protect Children and Prevent Accidents



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Protect Children:

• Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to lawn-mowing machines and mowing activity. Stay alert to the presence of children. Never assume that children will remain where you last saw them.

• 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.

• Be alert and turn mower off if a child enters the work area. They don't understand the dangers of rotating blades or the fact that the operator is unaware of their presence.

• Never allow a child or an untrained person operate the machine.

• Use extra care when approaching blind corners, shrubs, trees, or other

objects that may block your view of a child.

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.

• 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.

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. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A. Information may be obtained in the United States and Canada only by calling 1-800-822-8262.

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.

• 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.

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.

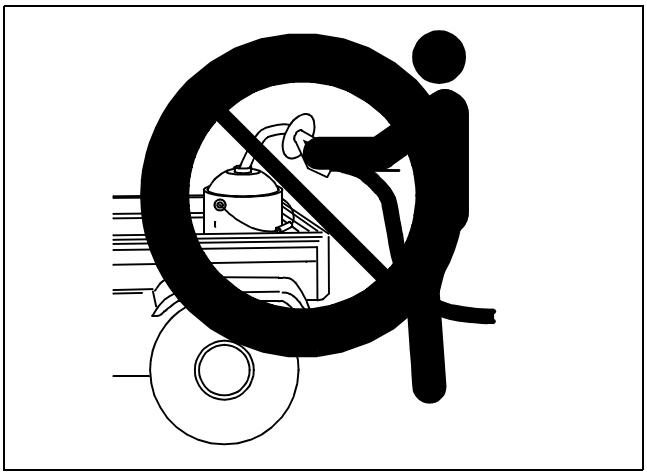
• Use only an approved fuel container. Use only non-metal, portable fuel containers approved by the Underwriter's Laboratory (U.L.) or the American Society for Testing & Materials (ASTM). If using a funnel, make sure it is plastic and has no screen or filter.

• 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

❑ Test safety systems.

❑ Check tire pressure.

❑ Check fuel level.

❑ Check engine oil level.

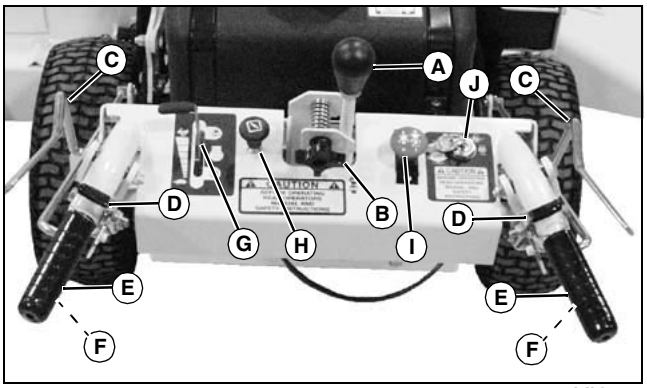
❑ Check transmission oil level.

❑ Remove grass and debris from machine.

❑Clean air intake screen.

❑Check area below machine for leaks.

Console Controls



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A- Speed Control Lever

B- Tracking Adjustment Knob

C- Operator Presence Control Lever

D- Neutral Lock Lever

E- Handle Bar Grip

F- Steering/Reverse Control Grip Lever

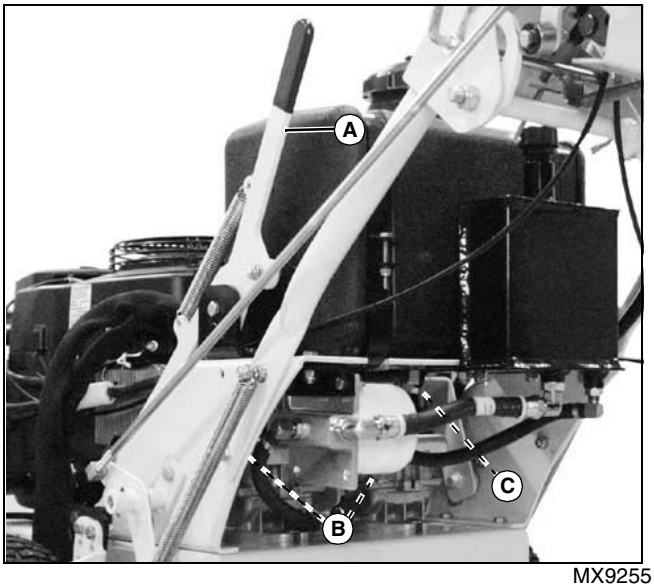
G- Throttle Lever

H- Choke Control (may be incorporated into throttle on some models)

I - PTO/Clutch Switch

J - Key Switch

Miscellaneous Controls



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A- Park Brake Lever

B- Hydraulic Pump Free-Wheel Levers

C- Fuel Shutoff Valve

Testing Safety Systems

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

Move the vehicle 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.**

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

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

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

Testing Operator Presence Safety Interlock System

1.Lock park brake.

2.Engage neutral lock levers.

3.Move speed control lever to neutral position.

4.Move PTO/clutch switch to off position.

5.Do not depress operator presence levers.

6.**Manual Start Engines Only:** Turn key switch to run position. Pull recoil starter.

7.**Electric Start Engines Only:** Turn key switch to start position.

Result: The engine will crank but must not start (electric start engines) or must not start (manual start engines).

Testing Park Brake

Stop the machine on a maximum 17° slope. Stop the engine and lock the park brake.

Result: Park brake must hold the machine stationary. If the machine moves more than 61 cm [24 in.] in one hour, brakes need to be adjusted. See your Great Dane dealer.

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.

1.To lock brake, pull lever back firmly until it locks into place.

2.To unlock, push lever to full forward position.

Starting the Engine

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

Move the vehicle 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.Open the fuel shut-off valve.

2.Lock park brake.

3.Engage neutral lock levers.

4.Move speed control lever to neutral position.

5.Move PTO/clutch switch to off position.

6.Move throttle lever to half-speed position and set choke (separate choke control models). Move throttle lever into choke position on models with choke incorporated into throttle lever.

7.**Manual Start Engines Only:** Turn key switch to run position. Pull recoil starter until the engine starts.

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 the engine does not start.**

8.**Electric Start Engines Only:** Turn key switch to start position for no more than five seconds. Release key to the run position when engine starts.

- 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 may cause engine damage. Excessive idling can cause engine overheating, carbon build-up and poor performance.

9.Let the engine run at half-speed position for several minutes to warm up before operating the machine. Reduce choke setting as the engine warms up.

Stopping the Engine

1.Move the throttle lever to the half-speed position, and let the engine run at low throttle for a few seconds.

2.Turn the key switch to the stop position.

3.Remove key.

4.Lock park brake.

5.Close the fuel shutoff valve.

Operating the Machine

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

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

1.Verify mower deck is adjusted to desired cutting height.

2.Start and warm up engine.

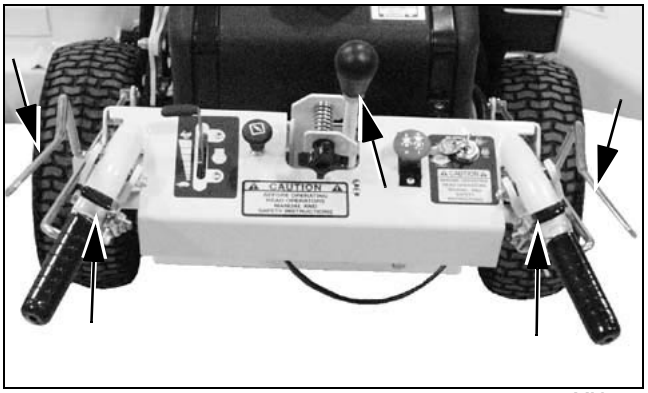
3.Move throttle lever to wide open position.

4.Move PTO/clutch switch to on position.

5.Depress operator presence control levers.

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

6.Unlock park brake and grasp handle bar grips with both hands.



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Picture Note: Control levers shown in neutral position.

7.With thumbs, push the neutral lock levers forward.

To drive the machine forward: Push speed control lever forward smoothly and evenly.

To turn the machine: Squeeze steering control grip lever on the same side as the direction of the desired turn.

To stop the machine: Return both speed control lever to the neutral position.

To drive the machine in reverse: Squeeze both steering control grip levers evenly.

Stopping the Machine

NOTE: For emergency stop of blades and unit drive, release operator presence control levers.

1.Return operator presence and speed control levers to neutral position.

2.Lock park brake.

3.Move the PTO/clutch switch to the off position.

4.Move the throttle lever to the half-speed position, and let the engine run at low throttle for a few seconds.

5.Turn the key switch to the stop position.

6.Remove key.

Adjusting Cutting Height

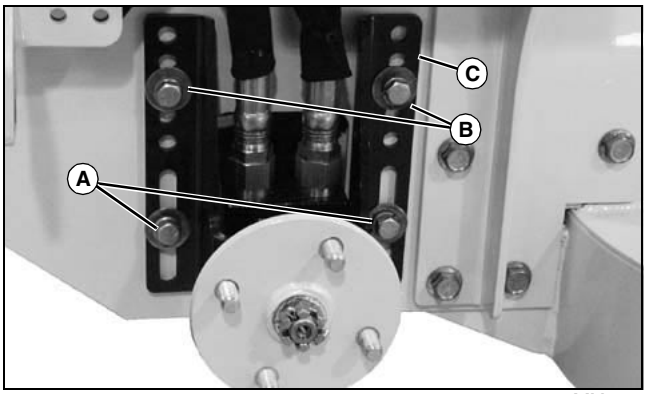
Cutting height can be adjusted from approximately 38-139 mm (1-1/2 - 5-1/2 in.). Each hole adjusts the height of cut (HOC) in 12 mm (1/2 in.) increments.

1.Check tire pressure. Inflate front caster wheels to 172-207 kPa (25-30 psi). Inflate rear tires to 69-83 kPa (10-12 psi).

CAUTION: Avoid injury! Machine must be safely supported on jackstands before removing or installing wheels. Do not use a hoist or floor jack to support the machine.

2.Using a suitable lifting device, lift the rear of the machine.

3.Remove rear wheels.



MX9256

4.Loosen bolts (A).

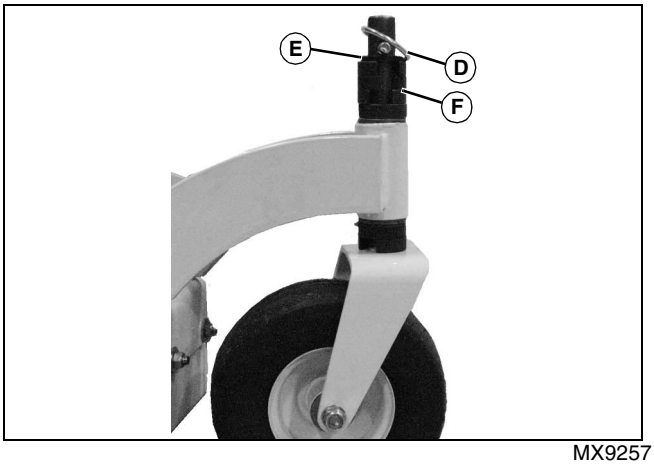
5.Loosen and remove bolts (B).

6.Move wheel motor slide bracket (C) up or down to desired height and tighten bolts (A) to 47-54 N•m (35-40 lb-ft).

7.Insert bolts (B) into holes and tighten to 47-54 N•m (35-40 lb-ft).

8.Install wheels and place machine back on ground.

9.Using a suitable lifting device, lift the front of the machine.



MX9257

10.Remove lynch pin (D) and spacer bushing (E).

NOTE: Adjust caster wheel spacers to keep mower deck tilted slightly down at the front.

11.Adjust caster wheel spacers (F) to compensate front HOC accordingly.

Using the Fuel Shutoff Valve

Move the fuel shut-off valve to the on position for normal operation. Move the fuel shutoff valve to the off position when the machine is not in use.

Moving the Machine Manually

CAUTION: Avoid injury! With the free-wheeling valve open, the machine will have unrestricted motion.

- **The machine may free-wheel out of control if the free-wheeling valve is opened with the machine on an incline.**
- **Park the machine on a level surface before opening the free-wheeling valve.**

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.**

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

2.Turn free-wheeling levers one full turn counterclockwise (open position).

3.Unlock park brake.

4.Push machine to desired location. Due to internal hydraulic system resistance, the machine will move slowly.

5.Turn free-wheeling levers one full turn clockwise (closed position).

6.Lock park brake.

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 and spark plugs 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.

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

Break-In (After First 8 Hours of Operation)

Change engine oil and filter.

Check drive belt tension.

Check transmission neutral adjustment.

Check wheel nut torque.

Break-In (After First 24 Hours of Operation)

Grease caster wheel pivot bearings (2 places).

Check drive belt tension.

SERVICE LUBRICATION

Break-In (After First 40 Hours of Operation)

Change transmission oil and filter.

Every 40 Hours

Change engine oil.

Grease caster wheel bearings (three places).

Grease caster wheel pivot bearings (three places).

Grease mower deck spindles (three places).

Remove debris from the underside of the mower deck.

Check drive belt tension.

Check tire pressure.

Check battery electrolyte level.

Clean engine air filter.

Check wheel nut torque.

Every 160 hours

Clean and inspect spark plugs.

Replace engine oil filter.

Check transmission oil level.

Lubricate mower deck idler pulleys (three places).

Lubricate hydro pump control arms (six places).

Traction control lever pivot shaft.

Lubricate throttle control cable.

Lubricate choke control cable.

Every 500 hours

Change transmission oil and filter.

Annually

Replace all spindle bearings.

Replace all mower deck idler pulleys.

Remove caster wheel roller bushings; clean and lubricate.

Replace drive belts. Run-in and adjust tension.

Clean power unit.

Change transmission oil and filter.

Check all bolts and nuts; tighten as needed.

Remove battery. Clean battery and holder.

Replace spark plugs.

Service Lubrication

Grease

IMPORTANT: Avoid damage! If operating outside that temperature range, contact your Servicing dealer for a special-use grease.

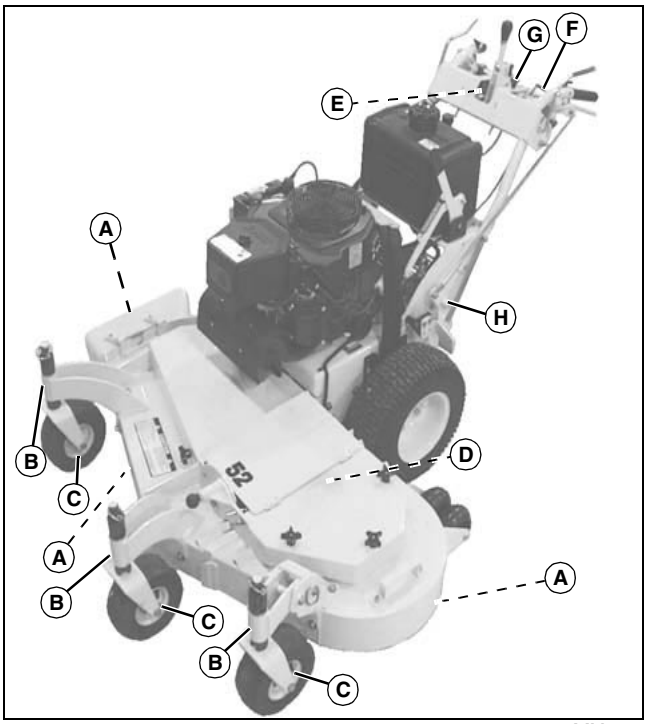
Use a general all-purpose grease with an NLGI grade No.2 rating.

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



MX9259

- Grease mower deck spindle bearings (A).
- Grease caster wheel pivot bushings (B).
- Grease caster wheel bearings (C).

NOTE: Use spray lubricant to lubricate the following items:

- Lubricate mower deck idler pulleys (D).
- Lubricate control lever pivot shaft (E).
- Lubricate throttle control cable (F).
- Lubricate choke control cable (G).
- Lubricate hydro control arms on both sides (H).

Service Engine

Avoid Fumes

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

Move the vehicle 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:

- API Service Classification SG or higher

Checking Engine Oil Level

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.**
- **Check oil level when the engine is cold and not running.**
- **Keep level between the FULL and the ADD marks.**
- **Shut off engine before adding oil.**

NOTE: Check oil twice a day if you run engine over 4 hours in a day.

Make sure engine is cold when checking engine oil level.

1.Park machine safely. (See Parking Safely in the Safety Section.)

2.Clean area around dipstick to prevent debris from falling into crankcase.

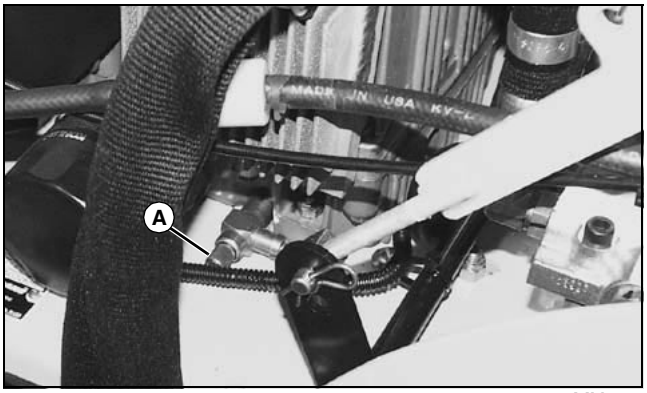
3.Remove dipstick. Wipe with a clean cloth.

4.Install and tighten dipstick.

5.Remove dipstick and check oil level on dipstick. Oil must be between ADD and FULL marks. If oil is low, add oil to bring oil level no higher than FULL mark on dipstick. Do not overfill.

6.Install and tighten dipstick.

Changing Engine Oil and Filter



MX9415

NOTE: An oil drain tube is provided with your machine. Attach the tube to the oil drain fitting on your engine, and open the valve (A) to drain the used oil. Close the valve, and remove the drain tube from the fitting after the oil has been drained. Store the drain tube after use.

Change engine oil and filter 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 Air Intake Screen and Engine Fins

IMPORTANT: Avoid damage! The engine is air-cooled and requires a large amount of air intake when running. Reduced air intake can cause overheating:

- **Keep air intake screen and cooling fins clean.**
- **Keep covers and screens in place.**

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 and components will be hot if the engine has been running. Allow the engine to cool before servicing.

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.**

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.

Checking Spark Plugs

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

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 (6000 ft), some carburetors may require a special high altitude main jet.

If engine is hard to start or runs rough, see the troubleshooting section of the engine manufacturer's owner's manual provided with your machine.

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 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.Turn fuel shutoff valve to off position.

3.Disconnect the fuel hose from the outlet side of the fuel filters and drain gasoline into a properly marked container.

4.Remove the fuel filter from the inlet fuel hose. Discard filter.

IMPORTANT: Avoid damage! When installing a new fuel filter, the filter arrow must be pointing in the direction of fuel flow.

5.Connect a new fuel filter to hoses.

6.Turn fuel shutoff valve to on position.

Service Transmission

Avoid Fumes

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

Move the vehicle to an outside area before running the engine.

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

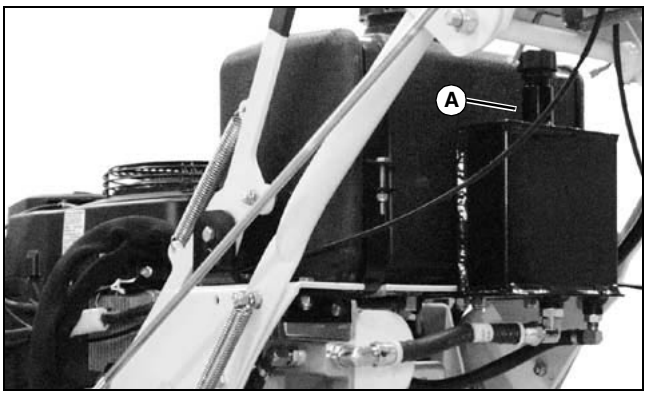
- **Connect a pipe extension to the engine exhaust pipe to direct the exhaust fumes out of the area.**
- **Allow fresh outside air into the work area to clear the exhaust fumes out.**

Transmission Oil

Use only Quaker State® 5W-50 or Mobil-1® 15W-50 all synthetic oil.

Checking Transmission Oil Level

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



MX9255

2.Transmission oil should be visible at base of filler neck of the reservoir (A).

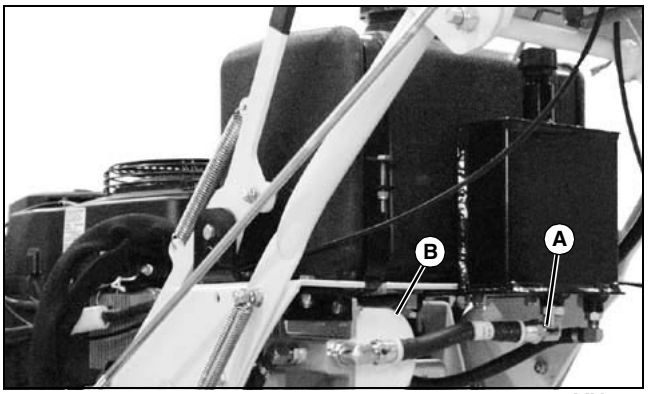
Changing Transmission Oil and Filter

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

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

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

2.Allow engine and transmission to cool.



MX9255

3.Remove hose fitting (A) and drain oil into a properly marked container with a capacity of at least 2.8 L (0.75 gal.)

4.Turn filter (B) counterclockwise to remove.

5.Apply a film of clean oil to gasket of new filter.

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

7.Clean area around filler cap.

8.Remove the filler cap from the reservoir.

9.Fill reservoir with approximately 1.9-2.8 L (0.5-0.75 gal) of oil.

10.Bleed air from hydraulic system. (See Bleed Hydraulic System).

Adjusting Transmission Tracking

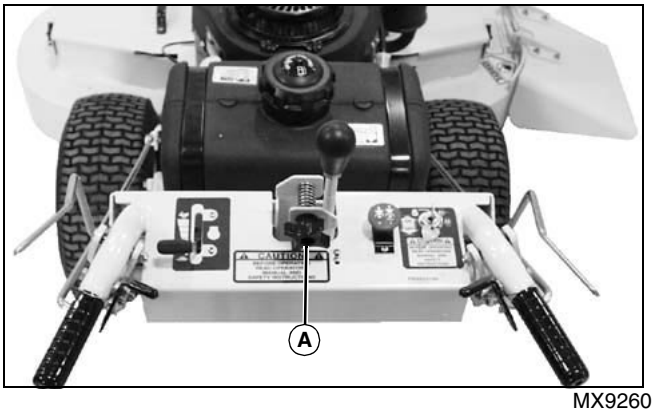
CAUTION: Avoid injury! Clear area of all bystanders before performing this service procedure.

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

2.Start and run engine until it reaches operating temperature.

3.Move machine to an open area for operation.

4.Drive machine forward by pushing speed control lever forward slowly.



MX9260

5.If machine does not drive in a straight line, adjust tracking adjustment knob (A) to compensate.

NOTE: If further adjustment is required, proceed to Adjusting Transmission Neutral Position, then adjust transmission tracking.

Adjusting Transmission Neutral Position

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

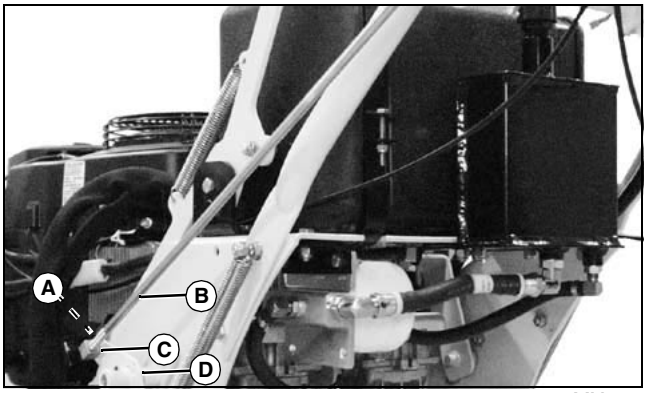
2.Raise drive wheels off the ground, securely support the machine and block caster wheels.

3.Move speed control lever to the neutral position.

4.Start and run the engine until it reaches normal operating temperature.

5.Observe wheel movement. Wheels should not rotate.

6.Determine which drive motor is in need of adjustment.



MX9255

7.Remove retaining clip (A) control rod (B) and swivel (C) from the drive arm (D).

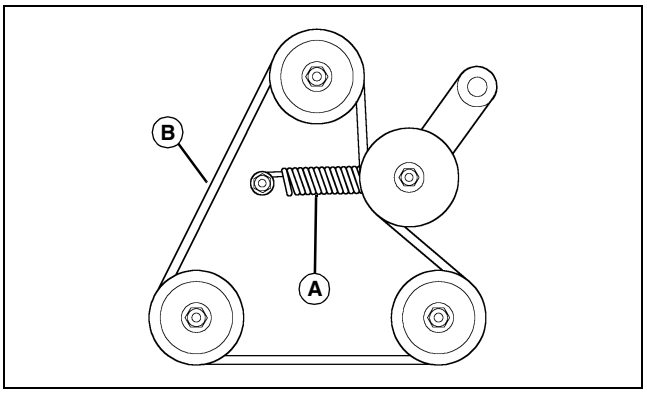
8.Adjust accordingly by turning swivel up or down control rod.

9.Install control rod, swivel and retaining clip into drive arm.

Removing and Installing Drive Belt

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

2.Remove mower deck belt guards.



MX9241

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

3.Disconnect tension spring (A) from anchor pin.

4.Remove drive belt (B).

5.Install new drive belt (B).

6.Connect tension spring (A) to anchor pin.

7.Install mower deck belt guards.

Bleeding Hydraulic System

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.

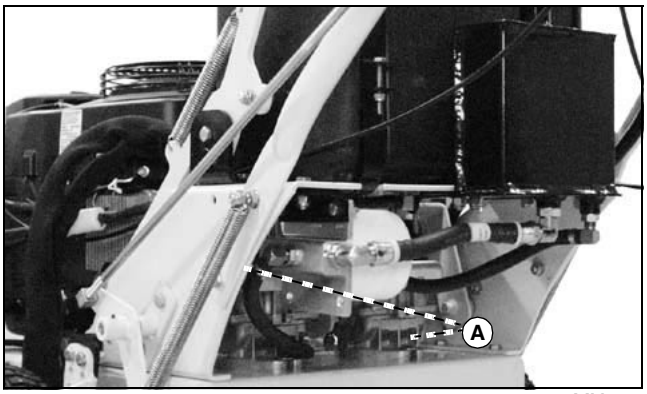
NOTE: Whenever hydraulic components are removed from the system, hoses are disconnected, or the system has been drained, trapped air must be removed from the hydraulic system.

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

2.Check hydraulic oil level. Adjust as necessary.

CAUTION: Avoid injury! Machine must be safely supported on jackstands before removing or installing wheels. Do not use a hoist or floor jack to support the machine.

3.Raise drive wheels off the ground and block caster wheels.



MX9255

4.Open free-wheeling valves (A) one full turn counterclockwise and start engine.

5.Slowly move the control levers in both forward and reverse directions five to six times. As the air is purged from the unit, the oil level will drop.

6.Turn off engine and check oil level. Adjust as necessary.

7.Close the free-wheeling valves and tighten to 9-14 N•m (80-120 lb-in.).

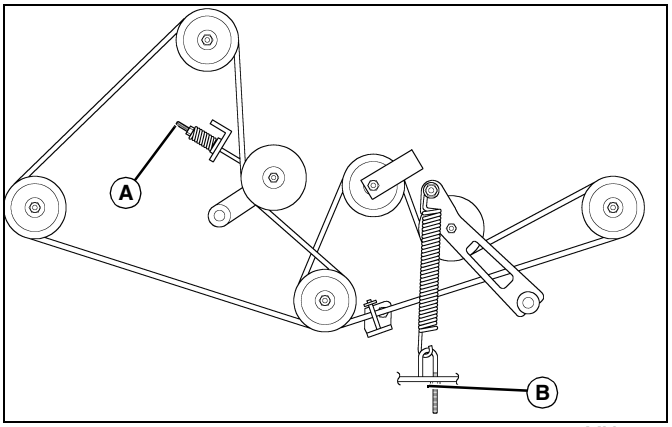
8.Start engine and slowly move the control levers in both forward and reverse directions five to six times.

9.Turn off engine and lower machine to ground. Check oil level and adjust as necessary. Mower should move in forward and reverse at normal speed, if not, repeat procedure.

Service Mower

Adjusting Belt Tension

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



MX9238

2.Remove belt covers.

3.Adjust to proper tension. The belt should deflect a maximum of 13 mm (1/2 in.) when a force of 4.5 kg (10 lbs) is applied to the center of the longest span.

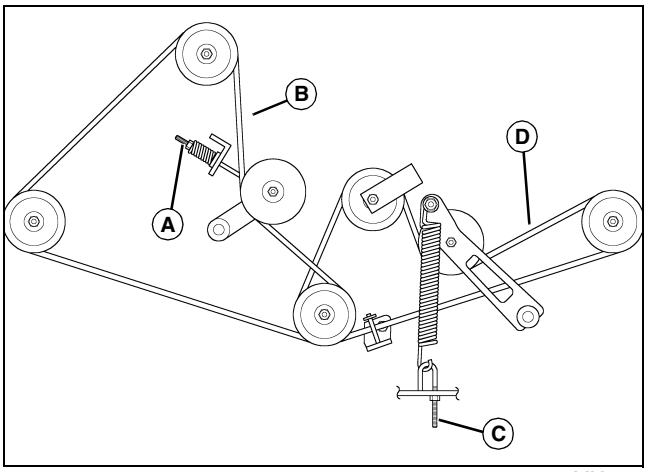
To Increase Belt Tension: Turn nut (A - main mower deck drive belt) or (B - spindle drive belt) clockwise.

To Decrease Belt Tension: Turn nut (A - main mower deck drive belt) or (B - spindle drive belt) counterlockwise.

Removing and Installing Mower Deck Drive Belts

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

2.Remove mower deck belt covers.



MX9238

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

4.Remove mower deck drive belt (B).

5.Release spindle drive belt tension by turning the tensioner adjuster nut (C).

6.Remove spindle drive belt (D).

7.Install the new spindle drive belt (D) and adjust the drive belt tension.

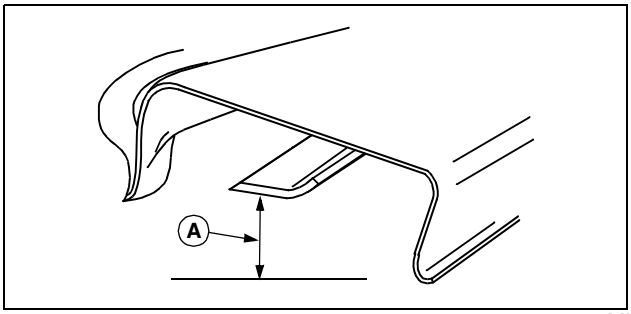
8.Install new mower deck drive belt (B) and adjust the drive belt tension.

9.Install mower deck drive belt covers.

Checking for Bent Mower Blades

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

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



MIF

2.Measure distance (A) between blade tip and flat ground surface.

3.Turn blade 180°. Measure distance between other blade tip and flat ground surface.

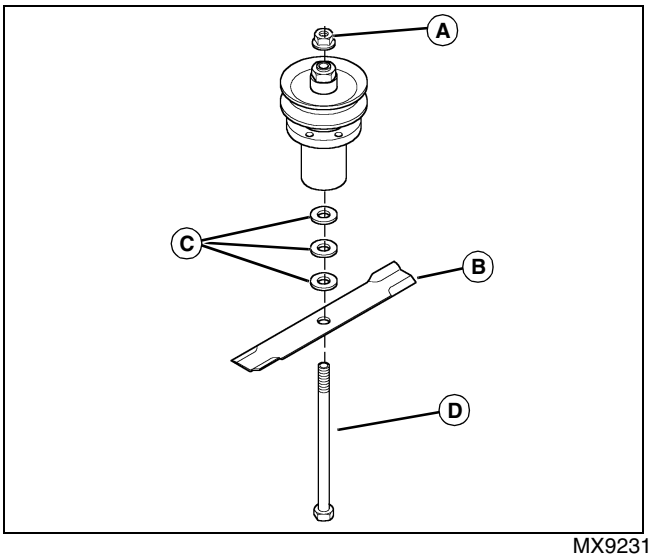
4.Install new blade, if the difference between the two measurements is more than 3 mm (1/8 in.).

Servicing Mower Blades

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

Removing and Installing Mower Blades

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



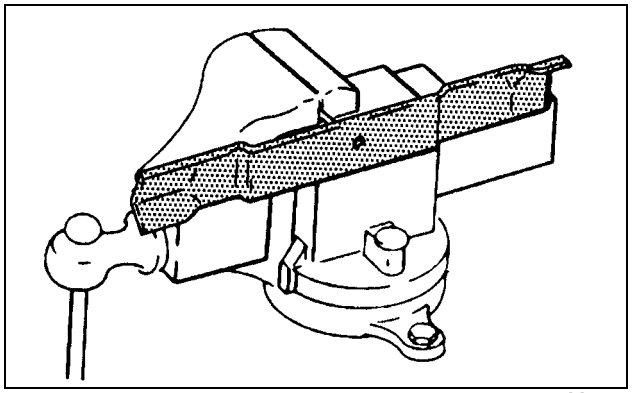
MX9231

2.Remove nut (A), blade (B), blade washers (C) and bolt (D).

3.Install blade (B), blade washers (C), bolt (D) and secure using nut (A). Tighten nut to 80 N•m (60 lb-ft).

Balancing Mower Blades

1.Clean blade.



M61524

2.Put blade on nail in a vise. Turn blade to horizontal position.

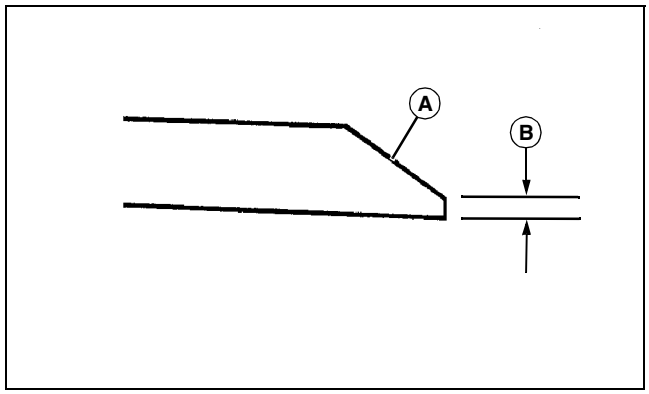
3.Check balance. If blade is not balanced, heavy end of blade will drop.

4.Grind bevel of heavy end. Do not change blade bevel.

Sharpening Blades

CAUTION: Avoid injury! Always wear safety eye protection when grinding.

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



M61830

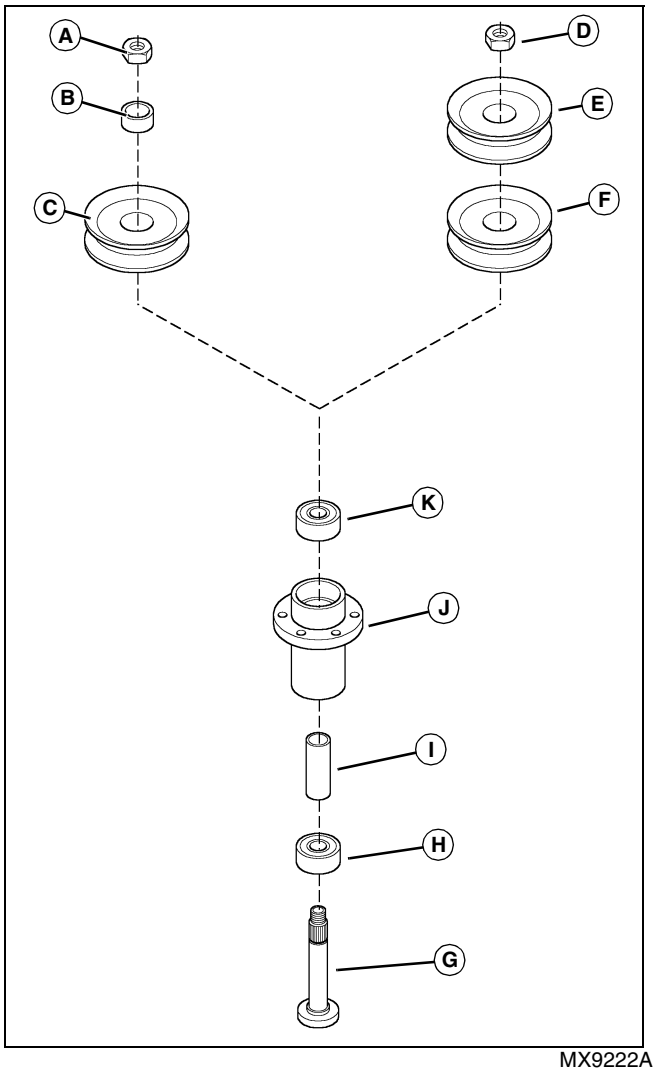
- Keep original bevel (A) when grinding.
- Blade should have 0.40 mm (1/64 in.) cutting edge (B) or less.
- Balance blades before installing.

Replacing Mower Spindle Bearings

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

2.Remove mower deck drive and spindle drive belt.

3.Remove mower blade.



MX9222A

4.Remove upper pulleys:

- **Side Spindles:** Remove nut (A), spacer (B) and pulley (C).
- **Center Spindle:** Remove nut (D), drive pulley (E) and spindle pulley (F).

5.Remove spindle shaft (G), lower bearing (H) and spacer (I) from spindle housing (J). Discard bearing.

6.Remove and discard upper bearing (K).

7.Clean entire assembly.

8.Install a new lower bearing (H) and spacer (I) on the spindle shaft (G).

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.

9.Install the spindle shaft (G), lower bearing (H) and spacer (I) into the spindle housing (J).

10.Install the upper bearing (K).

11.Install upper pulleys:

- **Side Spindles:** Install pulley (C), spacer (B) and nut (A). Tighten nut to 80 N•m (60 lb-ft).
- **Center Spindle:** Install spindle pulley (F), drive pulley (E) and nut (D).

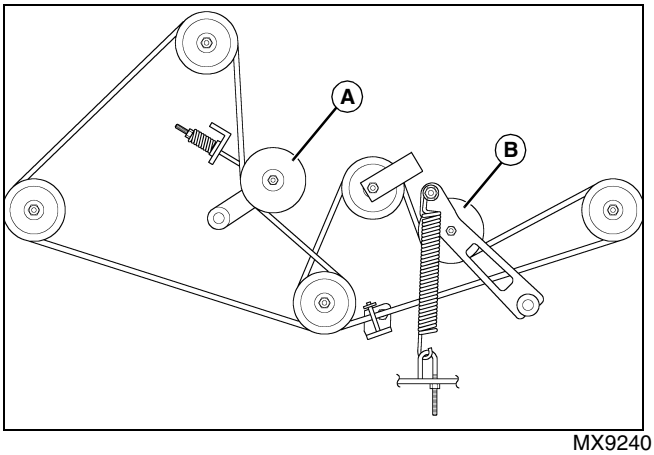
Tighten nut to 80 N•m (60 lb-ft).

12.Install mower blade. Tighten nut to 80 N•m (60 lb-ft).

Replacing Mower Deck Idler Pulleys

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

2.Remove the mower deck drive and spindle drive belts.



MX9240

3.Remove mower deck drive tension idler pulley (A) and spindle drive tension idler pulley (B).

4.Install new idler pulleys.

5.Install spindle drive and mower deck drive belts.

6.Adjust belt tension.

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.**

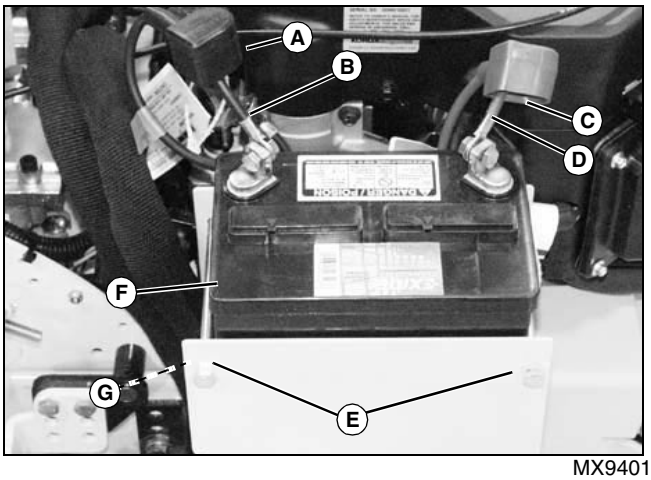
Removing and Installing the Battery

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:

1.Park the vehicle safely. (See Parking Safely in the Safety section.)



MX9401

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.Loosen the cap screws and nuts (E) on both sides of the battery tray.

5.Remove battery (F) and isolator pad (G).

Installing:

1.Place isolator pad (G) in the battery tray.

2.Install battery (F) in the battery tray, making sure that the isolator pad (G) is between the bottom and sides of the battery tray.

3.Tighten the cap screws and nuts (E) to secure the battery in the battery tray. Do not overtighten.

4.Connect the positive (+) battery cable (D) first, then the negative (-) cable (B).

5.Apply general purpose grease or silicone spray to the terminals to prevent corrosion.

6.Slide covers (A and C) over battery terminals.

Checking Battery Electrolyte Level

CAUTION: Avoid injury! Battery electrolyte contains sulfuric acid. It is poisonous and can cause serious burns:

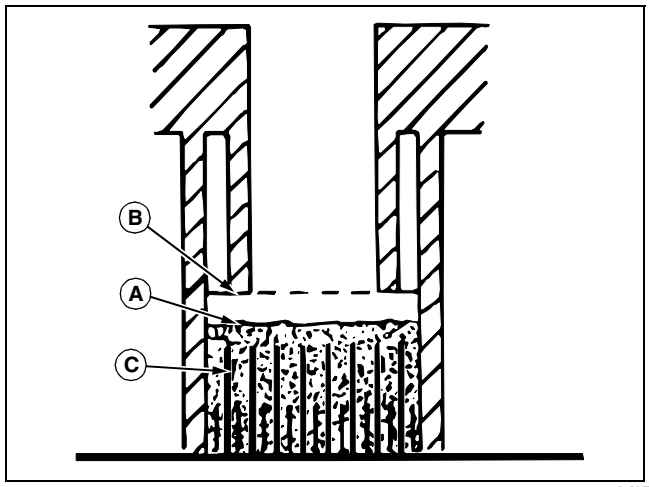
- **Wear eye protection and gloves.**
- **Keep skin protected.**
- **If electrolyte is swallowed, get medical attention immediately.**
- **If electrolyte is splashed into eyes, flush immediately with water for 15-30 minutes and get medical attention.**
- **If electrolyte is splashed onto skin, flush immediately with water and get medical attention if necessary.**

NOTE: Add only distilled water to replace normal electrolyte loss.

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

2.Remove battery from vehicle and set it on a level surface.

3.Remove battery cell caps. Make sure cap vents are not plugged.



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4.Check electrolyte level. Electrolyte (A) should be approximately halfway between bottom of filler neck (B) and top of plates (C).

IMPORTANT: Avoid damage! Do not overfill battery. Electrolyte can overflow when battery is charged and cause damage.

5.Add only distilled water if necessary.

6.Install battery cell caps.

7.Install battery.

Cleaning Battery and Terminals

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.**

1.Disconnect and remove battery.

2.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.

3.Rinse the battery with plain water and dry.

4.Clean terminals and battery cable ends with wire brush until bright.

5.Install battery.

6.Attach cable clamps to battery posts.

7.Apply petroleum jelly or silicone spray to terminal to prevent corrosion.

Replacing Fuses

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

The machine is equipped with two 20-amp fuses (electric start units) and one 20-amp fuse (manual start units) to protect the electric start and/or charging circuit. These fuses are located under the control panel area.

1.Remove defective fuse from socket.

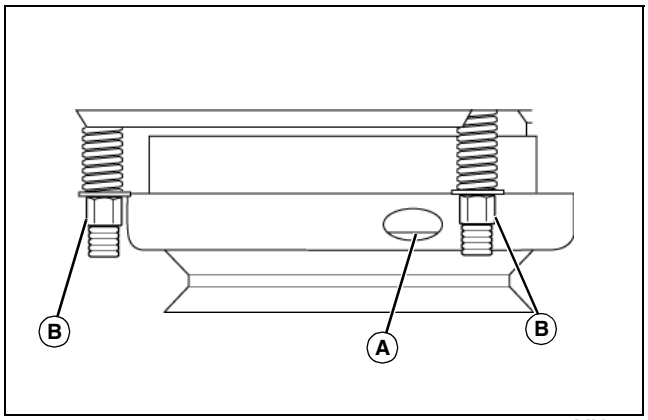
2.Check metal clip in fuse window and discard fuse if clip is broken.

3.Install new fuse into socket.

Check and Adjust PTO Clutch Air Gap

NOTE: If clutch is not equipped with adjusting nuts (B), no adjustment is required.

1.Park the vehicle safely. (See Parking Safely in the Safety section.)



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2.Check the air gap at the three openings (A) around the clutch using a feeler gauge. The air gap should be within 0.012-0.584 mm (0.005-0.023 in.). If the gap is not within specifications, adjust the air gap.

3.Adjust the air gap to 0.34 mm (0.12 in.), by tightening or loosening the three adjustment nuts (B).

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 or injector 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.

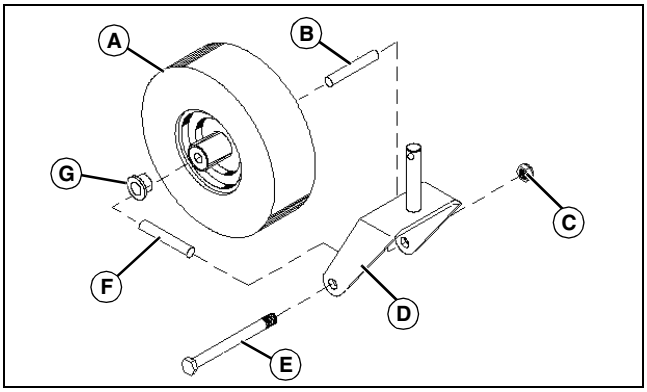
5.Fill fuel tank only to bottom of filler neck.

6.Install fuel tank cap.

Servicing Caster Wheel Roller Bearings

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

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



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3.Remove nut (C), bolt (E) and wheel assembly (A).

4.Remove bushing (F), bearing retainer (G), and roller bearing (B) from wheel.

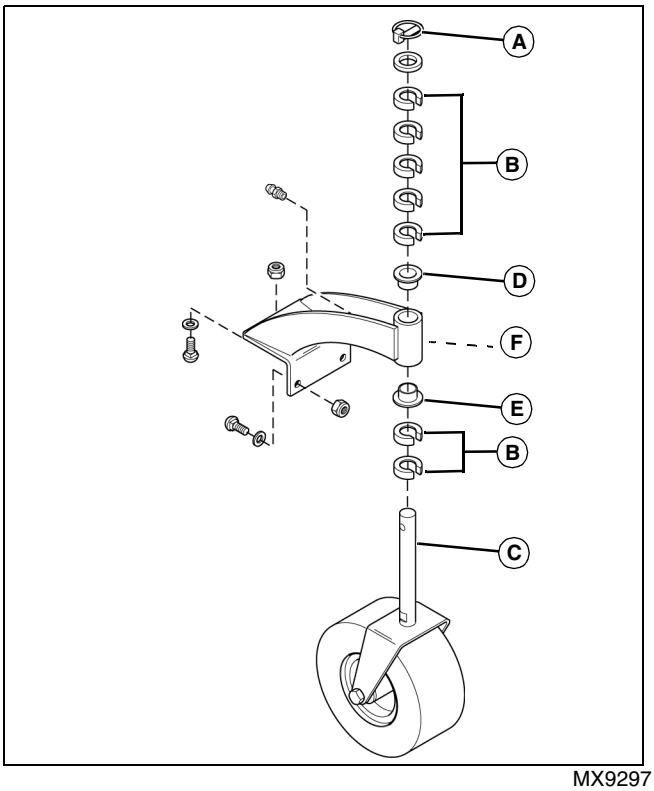
5.Clean bushing and roller bearing; and pack with clean grease.

6.Install wheel assembly (A), roller bearing (B), bearing retainer (G), bushing (F), bolt (E) and nut (C).

Replacing Caster Pivot Bearing Bushings

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

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



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3.Remove lynch pin (A), spacer bushings (B) and caster yoke and wheel assembly (C).

4.Remove and discard upper (D) and lower (E) bushings.

5.Install new bushings (D and E).

6.Install caster yoke and wheel assembly (C), spacer bushings (B) and lynch pin (A).

7.Apply grease to lubrication fitting (F).

Checking Wheel Bolts

Tighten rear wheel nuts in an alternating pattern to 68 N•m (50 lb-ft).

Troubleshooting

Using Troubleshooting Chart

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

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

Engine

NOTE: This engine troubleshooting chart covers items that are

unique to the machine operation. See the engine manufacturer's owner's manual provided with your machine for detailed engine troubleshooting procedures.

If	Check
Poor Engine Performance	Dirt in fuel system or fuel is old; obtain fresh fuel from another supplier before suspecting machine problems. Suppliers blend fuels differently and changing suppliers will generally solve any performance problems. Fuel blended with alcohol or ether may contribute to performance problems by causing gum and varnish deposits, especially if fuel is stored for several weeks or more. Obtain fresh fuel.
Engine Will Not Start	Park brake not locked. Control lever is not in neutral position. PTO/clutch switch is in engaged position. Fuel shutoff valve is in off position. Spark plug wire(s) loose or disconnected. Improper fuel. Plugged fuel filter. Electrical problem-See Electrical Troubleshooting section
Engine Stops Or Misses When Operating On Hillsides	Fuel tank less than half full of fuel.

Electrical

If	Check
Starter Does Not Work Or Will Not Turn Engine	Park brake is not locked. PTO/clutch switch is in engaged position. Battery terminals are corroded. Battery not charged. 20-amp fuse is blown.
Battery Will Not Charge	Dead cell in the battery. Battery cables and terminals are dirty. Low engine speed or excessive idling.

Machine Operation

If	Check
Machine Vibrates Too Much Or Rattles Excessively	Attachment drive belts worn or damaged. Traction drive belt damaged or worn. Dirt on drive sheaves.
Machine Will Not Move With Engine Running	Park brake locked. Transmission hydraulic oil level low. Free-wheeling valves are open. Traction drive belt damaged or worn.
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

If	Check
Discharge Chute Plugged	Travel speed too fast. Grass too long. Grass too wet. Engine rpm not at wide open throttle. Restricted air flow. Belt installed incorrectly.
Patches Of Grass Uncut	Travel speed too fast. Engine rpm not at wide open throttle. Mower deck needs cleaning.
Belt Slipping	Debris in sheaves. Worn belt.
Too Much Vibration	Debris on mower deck or in sheaves. Damaged sheaves or sheaves out of alignment. Damaged drive belt. Blades out of balance.
Blades Scalping Grass	Cutting too low. Mower wheels not adjusted correctly. Turning speed too fast. Ridges in terrain. Rough or uneven terrain. Low tire pressure.
Mower Loads Down Engine	Engine rpm too low. Travel speed too fast. Debris wrapped around mower spindles.
Uneven Cut	Mower deck not leveled properly. Travel speed too fast. Blades dull. Mower wheels not adjusted correctly. Tire pressure unequal.
Grass Tips Are Jagged And Turn Grayish Brown After Mowing	Dull mower blades. Mower deck not leveled properly.

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.Clean under the deck, and remove grass and debris from inside chute and bagger.

4.Wash the machine and apply wax to metal and plastic surfaces.

5.Run machine for five minutes to dry belts and pulleys.

6.Apply light coat of engine oil to pivot and wear points to prevent rust.

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.

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.Turn key to off position.

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.

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.Remove spark plugs. Put 30 mL (1 oz) of clean engine oil in cylinders.

5.Install spark plugs, but do not connect spark plug wires.

6.Crank the engine five or six times to allow oil to be distributed.

7.Clean the engine and engine compartment.

8.Remove battery.

9.Clean the battery and battery posts. Check the electrolyte level.

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

11.Store the battery in a cool, dry place where it will not freeze.

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

12.Charge the battery.

13.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. Charge battery if necessary.

4.Install battery.

5.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 for 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

Activate and Charge Battery

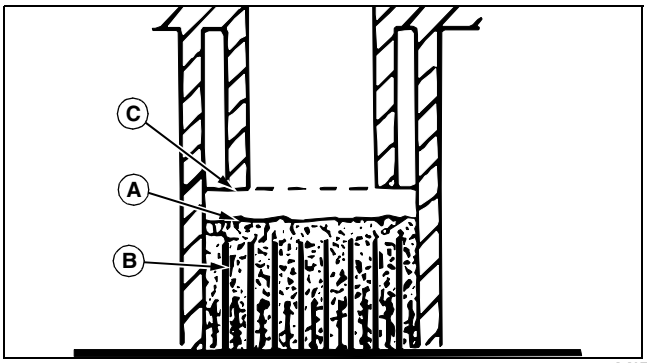
CAUTION: Avoid injury! Battery electrolyte contains sulfuric acid. It is poisonous and can cause serious burns:

- **Wear eye protection and gloves.**
- **Keep skin protected.**
- **If electrolyte is swallowed, get medical attention immediately.**
- **If electrolyte is splashed into eyes, flush immediately with water for 15-30 minutes and get medical attention.**
- **If electrolyte is splashed onto skin, flush immediately with water and get medical attention if necessary.**

1.Park the vehicle safely. (See Parking Safely in the Safety section.)

2.Remove battery from machine and set it on a level surface.

3.Remove battery cell caps. Make sure cap vents are not plugged.



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4.Fill the battery:

- Only use battery acid with a 1.265 specific gravity.
- Slowly add acid (A) to each cell. The solution should be 6 mm (1/4 in.) above plates (B), but no higher than 6 mm (1/4 in.) from the bottom of the filler neck (C).

5.Install the battery caps before charging the battery.

IMPORTANT: Avoid damage! Wait 20 minutes before charging the battery to allow the plates to "absorb" the acid, so they will take a charge well.

Battery must be charged before operation. Adding acid without charging will result in battery damage.

6.Charge the battery for a minimum of 30 minutes at 5-10 amps. If your battery charger has a Deep Cycle or Maintenance Free setting, use this setting to charge the battery. Failure to charge the battery before use will reduce battery performance and life.

7.Install the battery in the machine.

Check Fluid Levels

IMPORTANT: Avoid damage! Check all fluid levels before attempting to start the machine. Machine should be parked on a hard, level surface with the key switch in the STOP position.

Check Engine Oil Level

Oil level should be between the ADD and FULL marks on the dipstick. Add oil as necessary.

Check Transmission Oil Level

Hydraulic oil level should be to the top of the FULL COLD mark on the reservoir dipstick. Add oil as necessary.

Check Safety System

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

Check Tire Pressure

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

•Do not inflate the tires above the recommended pressure.

•Do not stand in front of 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.Check that tires have equal pressure. Add or remove air if necessary.

Tire Size	Pressure
Front: 9 x 3.5 - 4	172-207 kPa (25-30 psi)
Rear: 18 x 7.5 - 8	69-83 kPa (10-12 psi)

Initial Adjustments

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

1.Raise the rear of the machine until the drive wheels are off the ground. Support the machine with jackstands.

2.Start and run the engine until it reaches normal operating temperature.

3.Move control levers to the forward position and observe drive wheel rotation; the drive wheels should rotate in the correct direction.

4.Move the control levers to the reverse position and observe drive wheel rotation; the drive wheels should rotate in the correct direction.

NOTE: Neutral position and transmission linkage adjustments will needed to be rechecked after several hours of operation.

5.Release control levers; the levers should return to the neutral position and wheel rotation should stop. If the wheels do not stop, adjust the neutral adjustment knob on each wheel motor.

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 . . . . . 235 amp @ 0°
Reserve Capacity . . . . . 25 minutes
BCI Group Size U1

Tires

Front. . . . . 9 x 3.50 x 4
Rear . . . . . 16 x 6.50 x 8
Inflation Front . . . . . 172-207 kPa (25-30 psi)
Inflation Rear . . . . . 69-83 kPa (10-12 psi)
Wheel Nut Torque . . . . . 68 N•m (50 lb-ft)

Capacities

Fuel Tank . . . . . 18.9 L (5 gal)
Transmission Oil (With Filter) . . . . . 0.9-1.4 L (2-3 qt)

Dimensions

Wheel Base . . . . . 91 cm (36 in.)
Overall Height . . . . . 1,09 m (43 in.)
Overall Length . . . . . 2,12 m (83.5 in.)
Overall Width (with deck wing up) . . . . . 96 cm (37.75 in.)
Overall Width (with deck wing down) . . . . . 1,60 m (63 in.)

Net Weight (With Mower Deck and no Fuel)

With 17- and 18-hp engines . . . . . 319 kg (710 lb)
With 22-hp engine . . . . . 323 kg (713 lb)

52-Inch Mower Deck

Mower Type . . . . . Side Discharge
Cutting Blades 3
Blade Bolt Torque . . . . . 80 N•m (60 lb-ft)
Cutting Width . . . . . 1,32 m (52 in.)
Cutting Height . . . . . 38-140 mm (1-1/2-5-1/2 in.)
Height Adjustment . . . . . 13 mm (1/2 in.) increments

(Specifications and design subject to change without notice.)

Getting Quality Service

Service Literature

If you would like to order a copy of the Parts Catalog or Operator Manual for this machine, call 1-800-522-7448. 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.

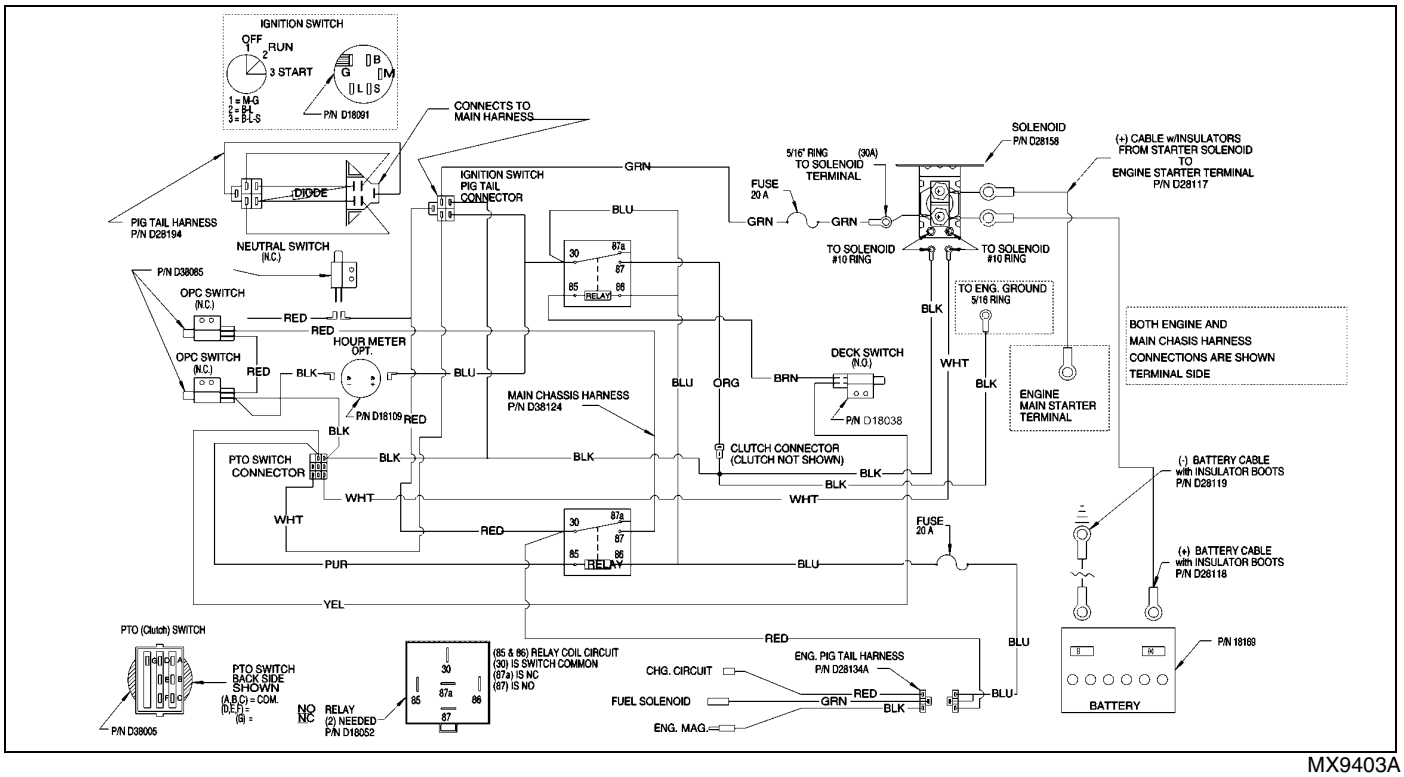
Part Numbers

Item	Part Number
Battery	D18169
Fuel Tank Cap	D18097
Oil Reservoir Cap	D18333
Oil Filter (Hydraulic System)	D18094
Traction (Hydro) Drive Belt	D38132
Engine to Blade Belts: • Drive Belt	D38130
Mower Deck Drive Belts: • Mower Deck Belt	D38131
Mower Blades: • 45 cm (18 in.)	D18037

(Part numbers are subject to change without notice. Part numbers may be different outside the U.S.A.)

Service Electrical

Wiring Schematic



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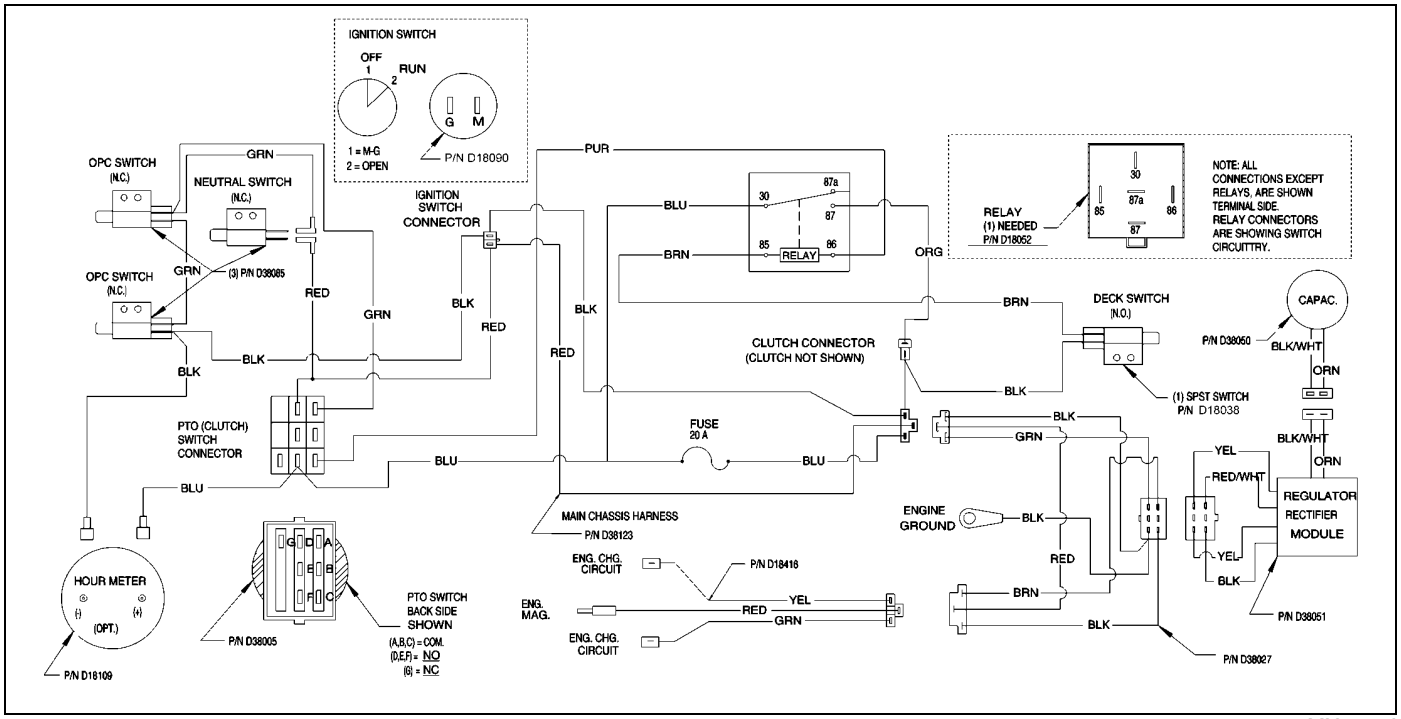
Picture Note: Kawasaki Electric Start



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Picture Note: Kawasaki Manual Start