



Promaster 310

Owner/Operator Manual

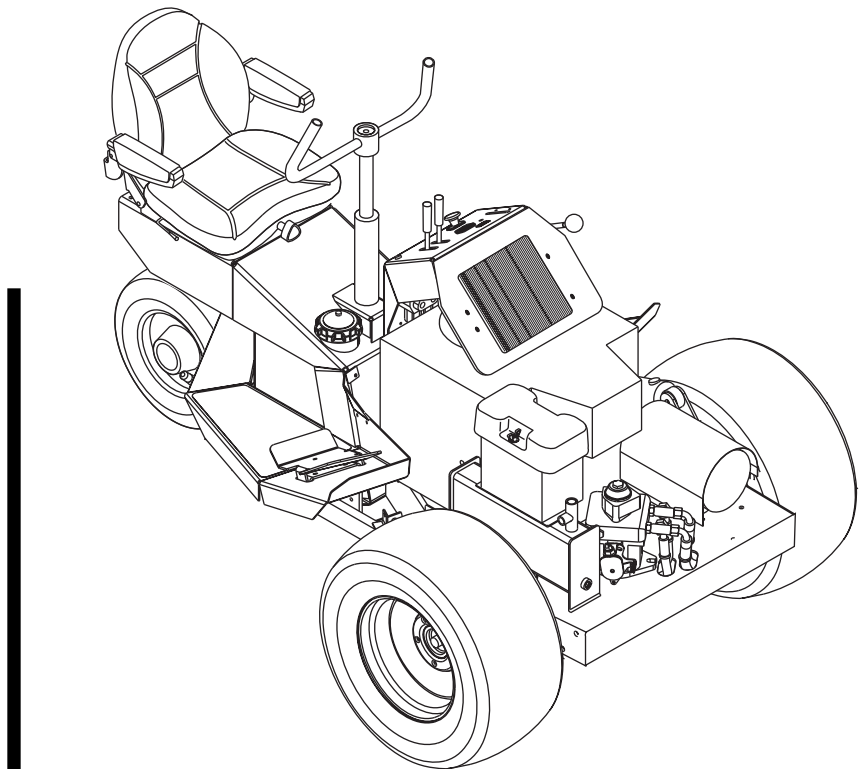
Models

990018

25 HP Kohler

990020

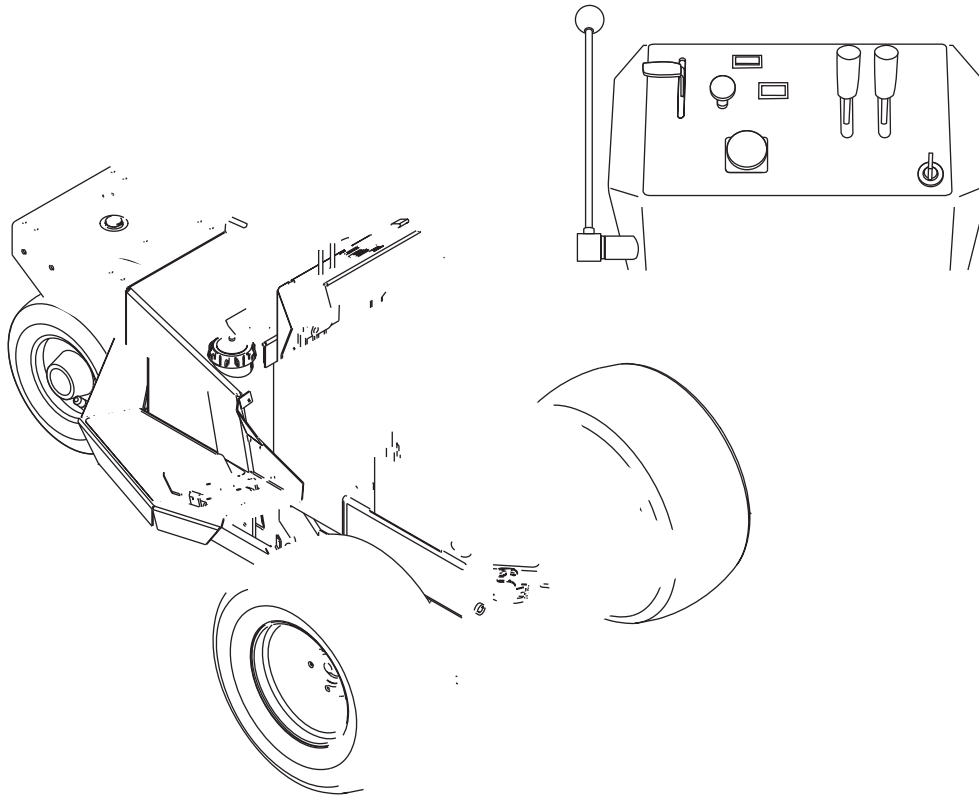
23 HP Kawasaki



GB ENGLISH
F FRANÇAIS
E ESPAÑOL

08495100A 1/02
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Printed in USA

CONTROLS AND FEATURES



ENGLISH

1. Parking Brake Lever
2. Throttle Lever
3. Choke Control
4. Oil Pressure Warning Light
5. Deck Lift Lever
6. Cut Height Lever
7. Ignition Switch
8. PTO Switch
9. Handlebar
10. Hydraulic Oil Cooler
11. Muffler
12. Hydraulic Pump
13. Transmission Bypass Valve
14. Hydraulic Reservoir Fill
15. Battery
16. Direction Control Pedal
17. Fuel Tank Cap
18. Seat Suspension Adjustment Knob
19. Seat Adjustment Lever
20. Hourmeter

FRANÇAIS

1. Levier de frein de stationnement
2. Manette des gaz
3. Starter
4. Voyant de pression d'huile
5. Levier de relevage du carter de coupe
6. Levier de hauteur de coupe
7. Contacteur d'allumage
8. Commande de la PdF
9. Guidon
10. Refroidisseur d'huile hydraulique
11. Silencieux
12. Pompe hydraulique
13. Distributeur de dérivation de la transmission
14. Remplissage du réservoir d'huile hydraulique
15. Batterie
16. Pédale de commande de direction
17. Bouchon du réservoir de carburant
18. Molette de réglage de la suspension du siège
19. Levier de réglage du siège
20. Compteur horaire

ESPAÑOL

1. Palanca del freno de estacionamiento
2. Palanca del acelerador
3. Control del estrangulador
4. Luz de advertencia de la presión del aceite
5. Palanca de elevación de la plataforma
6. Palanca de la altura de corte
7. Interruptor de encendido
8. Interruptor de la TDF
9. Manillar
10. Refrigerador del aceite hidráulico
11. Escape
12. Bomba hidráulica
13. Válvula de desviación de la transmisión
14. Llenado del depósito hidráulico
15. Batería
16. Pedal de control de la dirección
17. Tapón del depósito del combustible
18. Perilla de ajuste de la suspensión del asiento
19. Palanca de ajuste del asiento
20. Horómetro

⚠ WARNING ⚠

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

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INTRODUCTION

THE MANUAL

Before operation of unit, carefully and completely read your manuals. The contents will provide you with an understanding of safety instructions and controls during normal operation and maintenance.

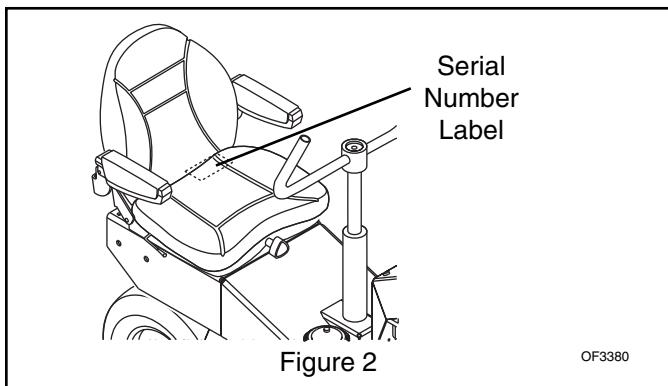
All reference to left, right, front, or rear are given from operator sitting in operation position and facing the direction of forward travel.

MODEL AND SERIAL NUMBERS

Transfer model & serial number label from product registration here.

When ordering replacement parts or making service inquiries, know the Model and Serial numbers of your unit and engine.

Numbers are located on the product registration form in the unit literature package. They are printed on a serial number label, located on the frame of your unit.



- Record Unit Model and Serial numbers here.

- Record Engine Model and Serial numbers here.

UNAUTHORIZED REPLACEMENT PARTS

Use only Gravelly replacement parts. The replacement of any part on this vehicle with anything other than an Gravelly authorized replacement part may adversely

affect the performance, durability, or safety of this unit. Gravelly disclaims liability for any claims or damages, whether warranty, property damage, personal injury or death arising out of the use of unauthorized replacement parts.

DISCLAIMER

Gravelly reserves the right to discontinue, make changes to, and add improvements upon its products at any time without public notice or obligation. The descriptions and specifications contained in this manual were in effect at printing. Equipment described within this manual may be optional. Some illustrations may not be applicable to your unit.

DELIVERY

Customer Note: If you have purchased this product without complete assembly and instruction by your retailer, it is your responsibility to:

1. Read and understand all assembly instructions in this manual. If you do not understand or have difficulty following the instructions, contact your nearest Gravelly Dealer for assistance. Make sure all assembly has been properly completed and safety interlock system works properly.

NOTE: To locate your nearest Gravelly Dealer, call 1-800-472-8359 or go to www.gravelly.com on the internet.



WARNING: Improper assembly or adjustments can cause serious injury.

2. Understand all Safety Precautions provided in the manuals.
3. Review control functions and operation of the unit. Do not operate unit unless all controls function as described in this manual.
4. Review recommended lubrication, maintenance and adjustments.
5. Fill out Original Purchaser Registration Card and return the card to Gravelly Company.

SAFETY

SAFETY ALERTS



Look for these symbols to point out important safety precautions. They mean:

Attention!



Personal Safety Is Involved!

Become Alert!

Obey The Message!

The safety alert symbols above and signal words below are used on decals and in this manual.

Read and understand all safety messages.



DANGER: IMMINENTLY HAZARDOUS SITUATION! If not avoided, WILL RESULT in death or serious injury.



WARNING: POTENTIALLY HAZARDOUS SITUATION! If not avoided, COULD RESULT in death or serious injury.



CAUTION: POTENTIALLY HAZARDOUS SITUATION! If not avoided, MAY RESULT in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTATIONS

NOTE: General reference information for proper operation and maintenance practices.

IMPORTANT: Specific procedures or information required to prevent damage to unit or attachment.

PRACTICES AND LAWS

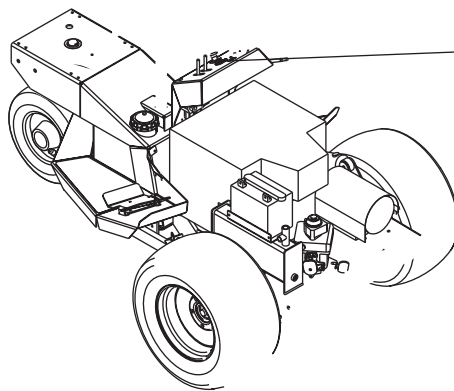
Practice usual and customary safe working precautions, for the benefit of yourself and others. Understand and follow all safety messages. Be alert to unsafe conditions and the possibility of minor, moderate, or serious injury or death. Learn applicable rules and laws in your area. Always follow the practices set forth in this manual.

REQUIRED OPERATOR TRAINING

Original purchaser of this unit was instructed by the seller on safe and proper operation by the seller. If unit is to be used by someone other than original purchaser; loaned, rented or sold, ALWAYS provide this manual and any needed safety training before operation.

SAFETY DECALS AND LOCATIONS

ALWAYS replace missing or damaged Safety Decals. Refer to figure below for Safety Decal locations.



1 & 2. DANGER



Read the operator's manual.



Keep children and others away from unit while operating.



Never direct discharge toward other people. Thrown objects can cause injury.



Look down and behind before and while backing.



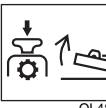
Keep children out of work area and under watchful care of a responsible adult.



Never carry children.



Go up and down slopes, not across.



Disengage PTO before tilting deck upward.

•Never allow operation by untrained persons.

- If machine stops going uphill, stop blade and back down slowly.
- Avoid sudden turns.
- Keep safety devices (guards, shields, switches, etc.) in place and working.
- Check interlock system per manual before use.
- Understand location and function of all controls.

3. HOT SURFACES!



DO NOT touch parts which are hot from operation. ALWAYS allow parts to cool.

4. DANGER!



PINCH POINT

ASSEMBLY SAFETY RULES

Read, understand, and follow all safety practices in Owner/Operator Manual before beginning assembly. Failure to follow instructions could result in personal injury and/or damage to unit.

ALWAYS remove key and/or wire from spark plug before assembly. Unintentional engine start up can cause death or serious injury.

OPERATIONAL SAFETY RULES

Walk Around Inspection

Complete a walk around inspection of unit and work area to understand:

- Work area
- Your unit
- All safety decals

Work Area

ALWAYS check overhead and side clearances carefully before operation. ALWAYS be aware of traffic when operating along streets or curbs.

Keep children and people away. Keep children out of work area and under watchful care of a responsible adult.

Keep area of operation clear of all toys, pets, and debris. Thrown objects can cause injury.

Check for weak spots on dock, ramps or floors. Avoid uneven work areas and rough terrain. Stay alert for hidden hazards.

Avoid uneven and rough terrain. DO NOT operate near drop offs, ditches, or embankments. Unit can suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.

Personal Safety

Data indicates that operators, age 60 and above, are involved in a larger percentage of riding mower related injuries. These operators should evaluate their ability to operate the riding mower safely enough to protect themselves and others from serious injury.

Only trained adults may operate unit.

Training includes actual operation.

NEVER allow children to operate or play on or near unit. Be alert and shut off unit if children enter area.

NEVER operate unit after or during the use of medication, drugs or alcohol. Safe operation requires your complete and unimpaired attention at all times.

DO NOT wear loose clothing or jewelry and tie back hair that may get caught in rotating parts.

Wear adequate outer garments.

NEVER wear open sandals or canvas shoes during operation. Wear adequate safety gear, protective gloves and footwear.

Wear proper footwear to improve footing on slippery surfaces.

Always wear safety goggles or safety glasses with side shields when operating mower.

Moving parts can cut or amputate fingers or a hand. Wrap blade(s) or wear gloves to service.

IMPORTANT: On multi-blade mowers, rotation of one blade will cause all blades to rotate.

NEVER place your hands or any part of your body or clothing inside or near any moving part while unit is running.

ALWAYS keep hands and feet away from all rotating parts during operation. Rotating parts can cut off body parts.

ALWAYS keep body and hands away from pin holes or nozzles which eject hydraulic fluid under pressure.

DO NOT touch parts which are hot. Allow parts to cool.

ALWAYS keep hands and feet away from all pinch points.

Fumes from the engine exhaust can cause death or serious injury. DO NOT run engine in an enclosed area.

Always provide good ventilation.

Operation

Understand:

- How to operate all controls
- The functions of all controls
- How to STOP in an Emergency
- Braking and steering characteristics
- Turning radius and clearances

Keep safety devices or guards in place and functioning properly. NEVER modify or remove safety devices.

Ensure Safety Interlock System is functioning properly. DO NOT operate unit if safety interlock is damaged or disabled.

Before starting engine: disengage PTO, place direction control pedal in neutral, lower attachment and set parking brake.

Dust, smoke, fog, etc. can reduce vision and cause an accident. Mow only in daylight or good artificial light.

Avoid slippery surfaces. Always be sure of your footing.

DO NOT mow on wet grass. Reduced traction could cause sliding.

Watch for traffic when operating near or crossing roadways.

Never carry passengers.

DO NOT try to stabilize the machine by putting your foot on the ground.

Never direct discharge towards persons or property that may be injured or damaged by thrown objects. Use extreme caution on gravel surfaces. Stay alert for hidden hazards or traffic.

Always stand clear of the discharge area.

ALWAYS disengage PTO, stop unit and engine, remove key, engage parking brake and allow moving parts to stop before leaving operator's position.

Never engage PTO while raising attachment or when attachment is in raised position.

DO NOT operate at too fast a rate. DO NOT change engine governor settings or over-speed engine. Slow down before turning.

DO NOT operate in reverse unless absolutely necessary. ALWAYS look down and behind before and while backing.

If equipment vibrates abnormally, stop engine at once, wait for moving parts to stop and remove wire from spark plug. Repair any damage before restarting unit.

Take all possible precautions when leaving unit unattended. Shut off engine. Remove wire from spark plug and secure it away from spark plug.

ALWAYS remove key to prevent unauthorized use.

Know the weight of loads. Limit loads to those you can safely control and the unit can safely handle.

Disengage PTO when attachment is not in use. ALWAYS turn off power to attachment when travelling, crossing driveways, etc.

Replace fuel cap securely and clean up spilled fuel.
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 filling.

When practical, remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.

Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.

If fuel is spilled on clothing, change clothing immediately.

BATTERY

Avoid Electric Shock. Objects contacting both battery terminals at the same time may result in injury and unit damage. DO NOT reverse battery connections.

Explosive Gases from battery can cause death or serious injury. Poisonous battery fluid contains sulfuric acid and its contact with skin, eyes or clothing can cause severe chemical burns.

No flames, No sparks, No smoking near battery.

ALWAYS wear safety glasses and protective gear near battery.

DO NOT TIP battery beyond a 45° angle in any direction.

ALWAYS keep batteries out of reach of children.

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm.

Wash hands after handling.

Battery Electrolyte First Aid

Follow First Aid directions for contact with battery fluid.

- External Contact: Flush with water.
- Eyes: Flush with water for at least 15 minutes and get medical attention immediately!
- Internal Contact: Drink large quantities of water. Follow with Milk of Magnesia, beaten egg or vegetable oil. Get medical attention immediately!

In case of internal contact, DO NOT induce vomiting!

MAINTENANCE AND SERVICE SAFETY RULES

ALWAYS block wheels and know all jack stands are strong and secure and will hold weight of unit during maintenance.

Keep nuts and bolts tight, especially blade attachment bolts, and keep equipment in good condition.

NEVER attempt to make any adjustments to unit while engine is running. Stop engine, remove spark plug wire and wait for all moving parts to stop before servicing (except where specifically recommended).

Check parking brake operation frequently. Adjust and service as required.

ALWAYS maintain unit in safe operating condition. Damaged or worn out muffler can cause fire or explosion.

NO smoking, NO sparks, NO flames. ALWAYS allow engine to cool before servicing.

Maintain or replace safety and instructions labels, as necessary.

STORAGE SAFETY RULES

NEVER store unit with fuel in fuel tank, inside a building where any ignition sources are present.

Allow engine to cool completely before storing in closed area or covering unit.

For extended storage, clean unit thoroughly. See engine manual for proper storage.

Lower cutting deck unless a positive mechanical lock is used.

ACCESSORY AND ATTACHMENT SAFETY RULES

Use only attachments or accessories designed for your unit.

Check attachment components frequently. If worn or damaged, replace with manufacturer's recommended parts.

ASSEMBLY



WARNING: AVOID INJURY. Read and understand *Assembly, Fuel and Battery Safety Rules* before proceeding.

Tools required:

- socket wrench, 15/16"
- tire gauge

Unpack Unit

Remove unit and all other components from the shipping container.

Install Handlebar

1. Remove nut securing handlebar to shaft.
2. Remove handlebar from shaft.
3. Place handlebar on shaft so handle grips are up and angled toward front of unit.
4. Replace nut securing handlebar to shaft.

Prepare Seat

Remove and discard hair pin and clevis pin from back of seat.

Check Tire Pressure

Check tire pressure and adjust. Adjust front tires to 12-15 PSI (82.8 - 103.4 kPa). Adjust rear tires to 20-25 PSI (137.9 - 172.4 kPa).

Fill Engine Crankcase

The unit is shipped *without* oil in engine crankcase. Refer to engine manual for proper oil type and crankcase capacity.

Check Hydraulic Oil

See *Maintenance*.

Fill Engine Fuel Tank

See *Filling Fuel Tank in Operation*.

Charge Battery

See instructions for battery removal and charging in *Service and Adjustments*.

Install Deck

See deck Owner/Operator Manual.

Check Safety Interlock System

See *Maintenance*.



WARNING: Failure of safety interlock and improper operation could result in death or serious injury.

Check Function of All Controls

Ensure unit runs and performs properly. Refer to *Operation*.



WARNING: Failure of controls could result in death or serious injury.

OPERATION



WARNING: AVOID INJURY. Read and understand *Operational, Fuel and Battery Safety Rules* before proceeding.

CONTROLS AND FEATURES

See Figure on page 2 for all Controls and Features locations.

Safety Interlock System

PTO must not engage unless operator is sitting in seat.

Engine must not start unless PTO is disengaged and direction control pedal is in neutral position.

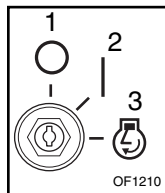


CAUTION: Safety interlock system failure and improper operation of unit can result in death or serious injury. Test this system each time the unit is operated. If this system does not function as described, do not operate until repairs are made.

Parking Brake Interlock System

Moving direction control pedal with parking brake engaged will shut off engine.

Ignition Switch



The ignition switch is operated by a removable key.

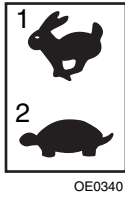
To start:

1. Insert the key.
2. Turn the switch clockwise from the OFF (1) position to the START (3) position.

The key will spring back to the RUN (2) position.

To stop the engine, turn key to the OFF (1) position.

Throttle Lever



Move lever to FAST (1) position to increase engine speed. Move lever to SLOW (2) position to decrease engine speed.

OE0340

Choke



Pull choke control out to start a cold engine. Push control in as engine warms up.

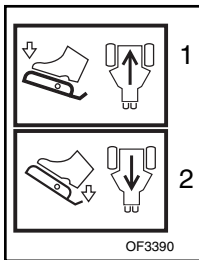
OE0590

Handlebar

Turn handlebar clockwise to steer right. Turn handlebar counterclockwise to steer left.

NOTE: Unit spins in a zero turn radius when handlebar is turned to maximum position in either direction.

Speed and Direction Control Pedal



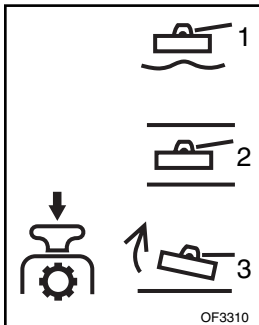
Press pedal forward (1) to move tractor forward.

Press pedal backward (2) to move the tractor backward.

Remove foot from pedal to return unit to neutral.

OF3390

Deck Lift Lever



Pull lever backwards to LIFT (3) position to lift mower.

Place lever in HOLD (2) position to hold mower in current position.

Push lever forward to FLOAT (1) position for mowing.

IMPORTANT: Disengage PTO before pulling lever back to LIFT.

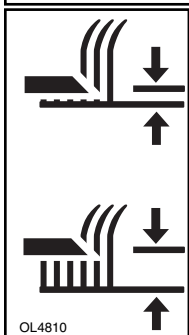
Cut Height Lever

To raise attachment, move lever backward.

To lower attachment, move lever forward.

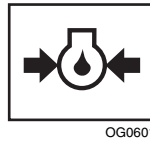
To hold attachment in place, release lever.

OF3310



OL4810

Oil Pressure Warning Light



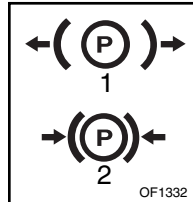
OG0601

If light turns on during operation:

1. Stop unit and engine.
2. Wait five minutes.
3. Check engine oil level and fill if necessary.
4. Check for external damage to engine.

To test oil pressure warning light, turn ignition key to the run position. Light should turn on.

Parking Brake Lever

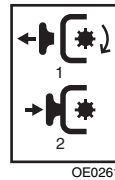


OF1332

Pull lever backward to engaged (2) position to activate parking brake.

Push lever forward in disengaged (1) position to deactivate parking brake.

PTO Switch



OE0261

The power take-off switch is used to engage and disengage the attachment.

Lift switch to engage (1) attachment.

Push switch down to disengage (2) attachment.

Hourmeter

Records total time key is in RUN position.

Seat Adjustment Lever

Pull lever out and slide seat to desired position. Release lever to lock seat in position.

Seat Suspension Adjustment Knob

To make seat more firm turn knob clockwise. To make seat less firm turn knob counterclockwise.

Transmission Bypass Valve

The transmission bypass valve disengages the transmission to allow manual movement of unit. See *Moving Unit Manually*.

FILLING FUEL TANK



WARNING: AVOID INJURY. Read and understand *Fuel Safety Rules* before proceeding.

To add fuel to fuel tank:

1. Place unit in an open or well-ventilated area.
2. Stop engine and allow to cool.
3. Clean fuel cap and surrounding area to prevent dirt from entering fuel tank.
4. Remove fuel cap.

IMPORTANT: See engine manual for correct type and grade of fuel.

5. Fill fuel tank to within 1/2" (1.3 cm) below bottom of filler neck.

NOTE: Fuel tank capacity is 7.5 gal. (28.4L).

6. Replace fuel cap and tighten.
7. Clean up any spilled fuel.

TO STOP IN AN EMERGENCY

Turn ignition key to OFF.

STARTING THE ENGINE

1. Check each item in *Before Each Use* in the Maintenance Schedule.
2. Disengage PTO.
3. Engage parking brake.
4. Apply choke to a cold engine.
5. Place throttle lever to FAST when starting a warm engine. Place throttle lever in a middle position when starting a cold engine.
6. Turn key to START position.

IMPORTANT: DO NOT operate starter motor more than 15 seconds per minute, as overheating and damage can occur. If engine will not start, refer to *Troubleshooting or Engine Manual*.

7. When engine starts, release to RUN position.
8. Disengage parking brake.

OPERATING UNIT

To mow:

1. Take foot off direction control pedal to place unit in neutral.
2. Place throttle lever in middle position.
3. Engage PTO.
4. Set throttle to FAST.
5. Depress direction control pedal for desired mowing speed.
6. Disengage PTO when finished mowing.

STOPPING

1. Take foot off direction control pedal to place unit in neutral.
2. Move throttle lever to SLOW.
3. Turn ignition key to OFF.

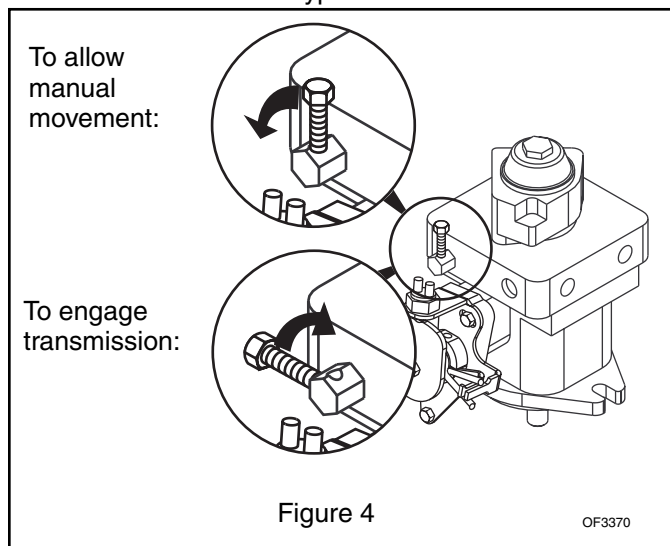
PARKING

1. Stop as instructed above.
2. Engage parking brake.
3. Remove ignition key.

MOVING UNIT MANUALLY

IMPORTANT: Never tow unit.

1. Stop engine.
2. Turn transmission bypass valve counterclockwise 1/4 turn.
3. Disengage parking brake.
4. Push unit to desired location.
5. Engage parking brake.
6. Turn transmission bypass valve clockwise 1/4 turn.



MAINTENANCE

Gravely Dealers will provide any service or adjustments which may be required to keep your unit operating at peak efficiency. Should engine service be required, contact an Gravely dealer or an authorized engine manufacturer's service center.



WARNING: AVOID INJURY. Read and understand *Maintenance and Service* and *Battery Safety Rules* in *Safety* section before attempting any maintenance.

CHECKING SAFETY INTERLOCK SYSTEM

Test the safety interlock system before each use. If the system does not function properly, do not operate the unit until repairs are made.



CAUTION: Safety interlock system failure and improper operation of unit can result in death or serious injury. Test this system each time the unit is operated. If this system does not function as described, do not operate until repairs are made.

MAINTENANCE SCHEDULE

Intervals	Service Performed
Before each use:	Check Safety Interlock System Check Fasteners Check Parking Brake Interlock Check Parking Brake Check Tires Check Hydraulic Oil Level Clean Unit Check Engine Oil Level Check Air Cleaner ¹ Check Air Intake ¹
Every 25 hours:	Check and Clean Battery Clean Hydraulic Pump Lubricate Unit Service Precleaner ¹ Check Engine Oil Cooler ¹ Clean Hydraulic Oil Cooler
After first 50 hours:	Replace Hydraulic Oil Filter
Every 50 hours:	Inspect Spark Arrestor
Every 100 hours:	Check Fasteners Check Belts Replace Air Cleaner ¹ Change Oil Clean Cooling Areas ¹
Every 200 hours:	Replace Hydraulic Oil Filter Change Engine Oil Filter Check Spark Plugs
Every season:	Check Belts
Before storage:	Check Fasteners Check and Clean Battery Clean Hydraulic Pump Lubricate Unit Clean Unit

¹ Change more often in dirty, dusty conditions.

The PTO must not engage unless operator is sitting on seat. To test:

1. Start engine.
2. Stand up off of seat.
3. Lift PTO switch. PTO must not engage.

Engine must not start unless PTO is disengaged and the speed control pedal is in neutral. To test:

1. With engine off, engage PTO.
2. Turn ignition switch to Start. Engine must not crank.
3. Disengage PTO.
4. Press speed control pedal forward.
5. Turn ignition switch to Start. Engine must not crank.

CHECK FASTENERS

Be certain that all hardware is tightened to the proper torque. Pay special attention to mower blades, guards and safety shields.

CHECK PARKING BRAKE INTERLOCK

Ensure unit shuts off when direction control pedal is depressed with the parking brake engaged.

CHECK PARKING BRAKE

With parking brake engaged, push unit. If unit rolls, adjust parking brake. See *Service and Adjustments*.

CHECK TIRES

Adjust front tires to 12 - 15 PSI (82.8 - 103.4 kPa). Adjust rear tires to 20 - 25 PSI (137.9 - 172.4 kPa).

CHECK AND CLEAN BATTERY



WARNING: AVOID INJURY. Read and understand *Battery Safety Rules* in *Safety* section before proceeding.

Clean Battery

Keep battery and its terminals clean. Inspect every 25 operating hours or monthly for best performance.

1. Remove battery cover.

2. Disconnect cables from battery (negative, then positive).
3. Clean terminals and battery cable ends with wire brush.
4. Coat terminals with grease or petroleum jelly.
5. Reconnect cables to battery (positive, then negative).
6. Replace battery cover.

Electrolyte Level

Every 25 hours of operation or each week check electrolyte level of each cell by removing caps one at a time. The electrolyte level should be at level indicator. Use distilled water to fill each cell if needed.

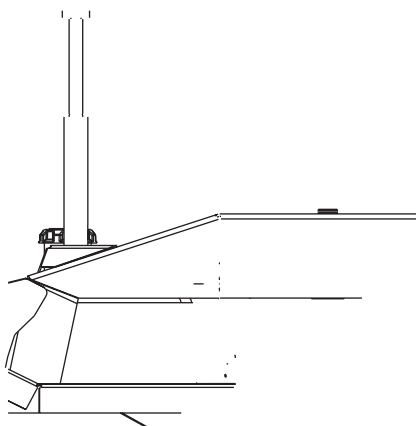
CLEAN HYDRAULIC PUMP

Clean hydraulic pump before each use and before storage. Keep pump surface free from buildup of dirt and debris.

LUBRICATE UNIT

Every 25 hours and before storage:

- Grease steering caster spindle and handlebars.



CHECK HYDRAULIC OIL LEVEL

Check hydraulic oil level before each use.

IMPORTANT: Hydraulic tank **MUST** be filled before starting engine.

1. Stop engine.
2. Place deck lift lever in FLOAT position.
3. Remove any dirt that may be around the cap on the tank.
4. Remove cap and dipstick.
5. Check hydraulic oil level mark on dipstick.
6. Add hydraulic oil through the dipstick tube as needed. Do not overfill.

IMPORTANT: Fluid should be changed only if it is contaminated.

REPLACING HYDRAULIC OIL FILTER

Replace hydraulic oil filter after the first 50 hours of operation and every 200 hours thereafter.

1. Clean around dipstick cap and dipstick. Remove dipstick.
2. Place container under oil filter to catch dripping oil.
3. Remove oil filter.
4. Install new oil filter.
5. Check hydraulic oil level and add if necessary.
6. Clean up any oil spills.

IMPORTANT: See *Service and Adjustments* for changing hydraulic oil.

CHECK BELTS

Check belts every 100 hours and every season. Replace worn or deteriorated belts. Replace belts to accommodate belt stretch and wear in the traction drive or mower drive. Refer to *Service and Adjustments* for procedures.

CLEAN UNIT

Clean unit before each use and before storage.

- Clean engine, battery, seat, deck, etc. of all dirt and debris with a brush or cloth. Do not use solvents, harsh cleaners or abrasives.
- Keep finished surfaces and wheels free of all gasoline, oil, etc.
- Protect painted surfaces with automotive type wax. Lightly coat unpainted surfaces with spray lubricant and wipe off excess with soft cloth.

CHECK ENGINE OIL LEVEL

Check engine oil level before each use.

1. Remove oil fill cap/dipstick.
2. Check level on oil dipstick.
3. Add more oil if needed.
4. Tighten fill cap securely.

See engine manual for detailed instructions.

IMPORTANT: Maintain proper oil level to prevent engine damage.

CHECK AIR CLEANER

Check air cleaner before each use. See engine manual for detailed instructions.

CHECK AIR INTAKE

Check air intake before each use. See engine manual for detailed instructions.

SERVICE PRECLEANER

Service precleaner every 25 hours. Service more often when operating in dirty or dusty conditions. See engine manual for detailed instructions.

CHECK ENGINE OIL COOLER

Check engine oil cooler every 25 hours. Check more often when operating in dirty or dusty conditions. See engine manual for detailed instructions.

CLEAN HYDRAULIC OIL COOLER

Blow out hydraulic oil cooler with compressed air every 25 hours of operation to remove dust and debris.

INSPECT MUFFLER/SPARK ARRESTOR

Inspect muffler and spark arrestor every 50 hours. Replace muffler if corroded.

REPLACE AIR CLEANER

Replace air cleaner every 100 hours. Replace more often when operating in dirty or dusty conditions. See engine manual for detailed instructions.

CHANGE OIL

Change engine oil every 100 hours. See engine manual for detailed instructions.

CLEAN COOLING AREAS

Remove shrouds and clean cooling areas every 100 hours. Clean more often in dirty or dusty conditions. See engine manual for detailed instructions.

CHANGE ENGINE OIL FILTER

Change oil filter every 200 hours. See engine manual for detailed instructions.

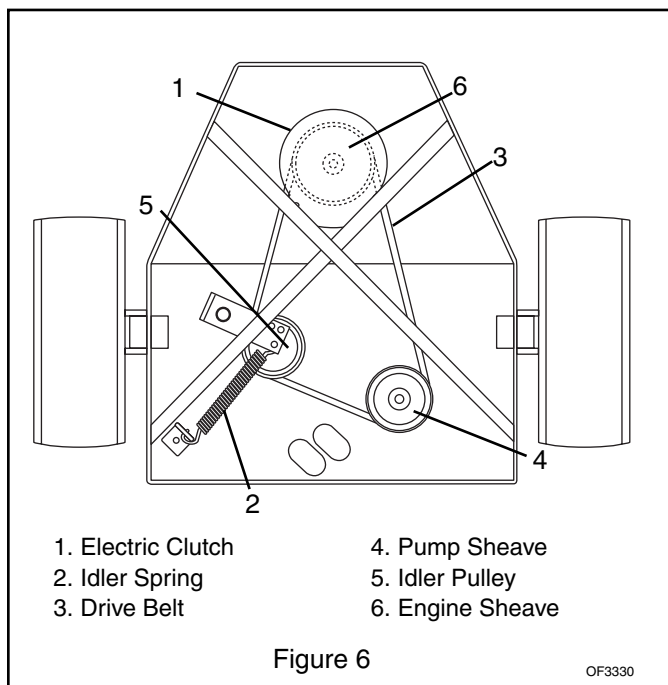
CHECK SPARK PLUGS

Check condition of spark plugs and spark plug gap every 200 hours. See engine manual for detailed instructions.

SERVICE AND ADJUSTMENTS

REPLACING THE DRIVE BELT

1. Stop engine and remove key.
2. Disengage PTO.
3. Remove remove mower belt from electric clutch (see mower owner's manual).
4. Remove idler spring and drive belt.
5. Place the new belt on the pump sheave, idler pulley and engine sheave.
6. Reinstall idler spring.
7. Reinstall mower belt. Adjust mower belt tension per mower Owner/Operator Manual.



ADJUSTING NEUTRAL

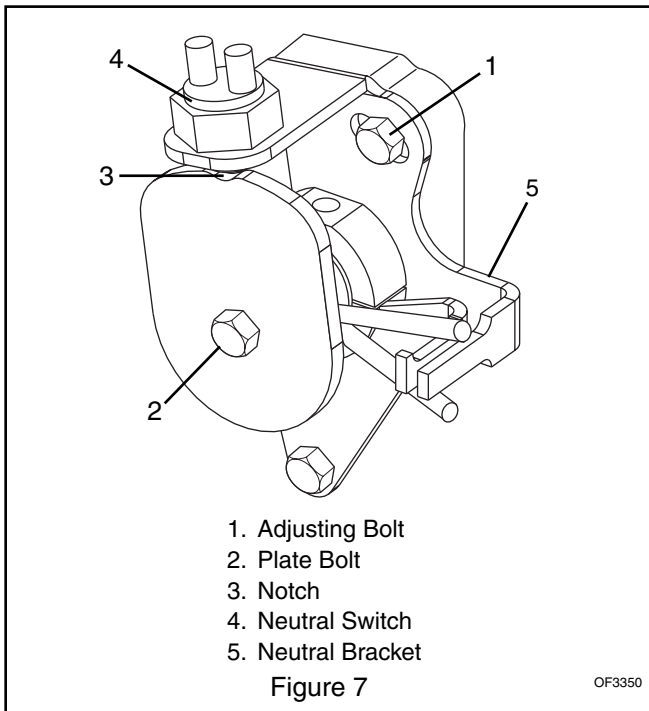
Adjust neutral on hydraulic pump if tractor "creeps" when direction control pedal is not depressed.



WARNING: The following adjustment requires engine running and guards removed. Use extreme caution when performing this adjustment.

1. Shut off engine and remove key.
2. Jack or hoist one of the drive wheels off the ground.
3. Start the engine. Do not engage parking brake.
4. Loosen adjusting bolt.
5. To correct forward creep, turn neutral bracket clockwise.
To correct backward creep, turn neutral bracket counterclockwise.
6. Retighten the adjusting bolt.
7. Ensure neutral switch sits in notch on plate. If it does not, loosen plate bolt and rotate plate until neutral switch sits in notch.

NOTE: This adjustment will affect the direction control pedal angle. See *Adjusting Direction Control Pedal* to adjust angle.

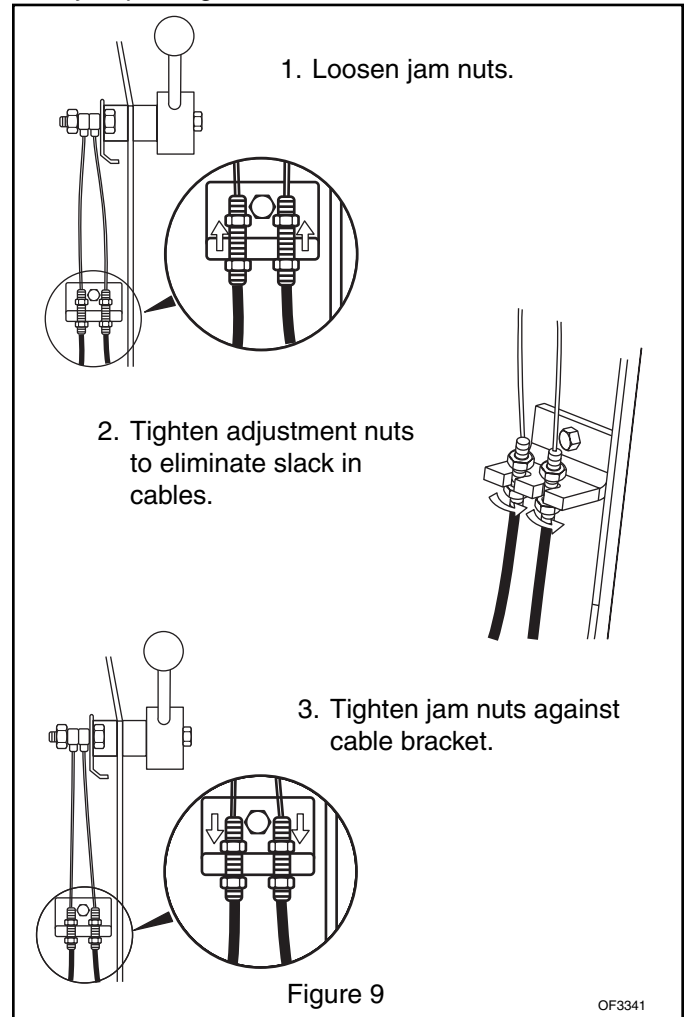


ADJUSTING PARKING BRAKE

To test parking brake:

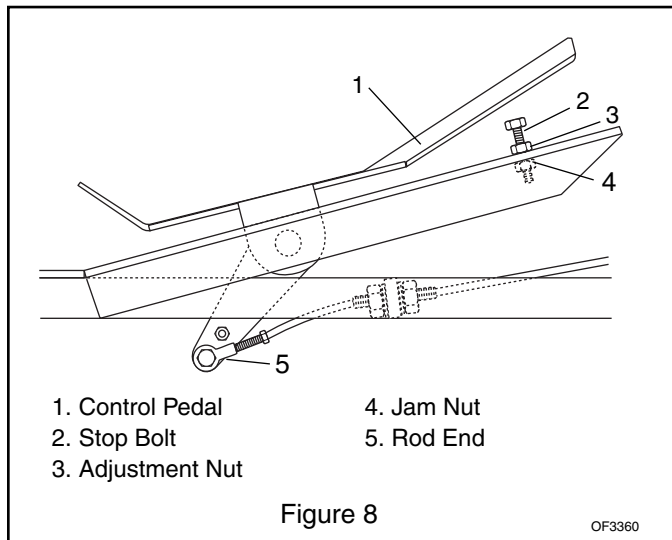
1. Engage parking brake, shut off engine and remove key.
2. Disengage transmission. See *Moving Unit Manually in Operation*.
3. Push unit. If unit can be moved, adjust parking brake.

To adjust parking brake:



ADJUSTING DIRECTION CONTROL PEDAL

1. Remove jam nut from stop bolt and remove stop bolt from frame.



2. Remove bolt and nut connecting rod end to direction control pedal.
3. Turn rod end farther onto rod to angle pedal back. Turn rod end farther off of rod to angle pedal forward.
4. Check that pedal is in a comfortable position. Adjust again if necessary.
5. Replace bolt and nut removed in step 2.
6. Reinstall stop bolt and turn adjustment nut until pedal hits bolt when fully depressed forward.
7. Reinstall jam nut on stop bolt and tighten.

ing freely
over three 30 minute

charging, check electrolyte level.
ned water to bring cell up to required

nd tighten caps, wash off and dry battery.

NOTE: Dispose of used c.

STORAGE



WARNING: AVOID INJURY. Read and understand *Storage Safety Rules* in *Safety* section before proceeding.

SHORT TERM

IMPORTANT: NEVER spray unit with water or store unit outdoors.

Inspect unit for visible signs of wear, breakage or damage.

Keep all nuts, bolts and screws properly tightened and know unit is in safe working condition.

Store unit in a cool, dry protected area.

LONG TERM

Clean unit thoroughly and lubricate (see *Maintenance*). Touch up all scratched painted surfaces.

Remove weight from wheels by putting blocks under frame or axle.

When storing unit for extended periods of time, remove all fuel from tank and carburetor (run dry). Refer to engine manual.

Clean and charge the battery. Charge battery every three to four weeks when storing unit.

ACCESSORIES

See your authorized Gravelly Dealer to add these optional accessories.

Part No.	Description
78900300	Steering Wheel Kit
79200300	Mulching Kit - 60" Mower
79200400	60" Mower Discharge Cover Kit
79200500	Mulching Kit - 50" Mower
79200600	50" Mower Discharge Cover Kit
79200900	Mulching Kit - 72" Mower
79201000	72" Mower Discharge Cover Kit
79201800	50" Bahia Baffle Kit
79207600	72" & 60" Bahia Baffle Kit

ATTACHMENTS

See your authorized Gravelly Dealer to add these optional attachments.

Part No.	Description
890012	50" Fabricated Mower Deck
890013	60" Fabricated Mower Deck
890014	72" Fabricated Mower Deck

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTION
No sound when ignition key placed in start position	<ol style="list-style-type: none"> 1. PTO engaged. 2. Directional control pedal depressed. 3. Loose battery cables. 4. Discharged battery. 5. Blown fuse. 6. Neutral switch adjusted improperly. 	<ol style="list-style-type: none"> 1. Disengage PTO. 2. Place direction control pedal in neutral. 3. Check connections. Tighten battery cable clamps. 4. Recharge battery. 5. Replace fuse. 6. Adjust neutral switch per <i>Service and Adjustments</i>.
Starter clicks but engine does not start	<ol style="list-style-type: none"> 1. Discharged battery. 2. Battery cable corroded. 3. Starter damaged. 	<ol style="list-style-type: none"> 1. Charge battery. 2. Clean battery connections. 3. See your dealer.
Engine cranks but does not start	<ol style="list-style-type: none"> 1. Fuel tank empty. 2. Bad spark plug. 3. Engine problem. 	<ol style="list-style-type: none"> 1. Fill fuel tank. 2. See engine manual. 3. See engine manual.
Engine continues to run when ignition key in off position	<ol style="list-style-type: none"> 1. Ignition ground wire disconnected. 2. Ignition switch failure. 	<ol style="list-style-type: none"> 1. Connect ground wire to clean, metal surface. 2. Replace ignition switch (see Dealer).
Mower won't engage	<ol style="list-style-type: none"> 1. Attachment blocked. 2. Bad PTO switch. 	<ol style="list-style-type: none"> 1. Stop unit, remove key and clear attachment. 2. Replace switch (see Dealer).

SPECIFICATIONS

Model Number	990018	990020
Description Name	PM 310 25 HP	PM 310 23 HP
Length	70" (177.8 cm)	
Height	50.8" (129 cm)	
Width	50.3" (127.8 cm)	
Weight lbs. (kg.)	929 (422)	913 (415)
Battery	12 Volt	
Brakes	Dynamic Disc - Parking	
Steering	Yoke	
Turning Radius	0°	
Tire Size - Front - Rear	23 x 10.5 - 12 4 ply 16 - 6.50 - 8	
Engine Manufacturer	Kohler	Kawasaki
Cycle	4	
Engine Power - HP	25 (18.6)	23 (17.2)
Starting System	electric	
Idle RPM	1800	
Governed RPM	3600	
Fuel Tank Capacity	7.5 gal. (28.4L)	
Fuel	See engine manual.	
Crankcase Capacity	See engine manual.	
Engine Oil Type	See engine manual.	
Air Cleaner	See engine manual.	
Spark Plug Gap	See engine manual.	
Transmission	Hydrostatic Drive	
Speed - Forward - Reverse	9.5 mph (15.2 kph) 5 mph (8 kph)	
Hydraulic System Lube	Mobil 15W-50 Synthetic	
Drive Clutch	Hydrostatic	
Tire Pressure Front Rear	12 - 15 PSI (82.8 - 103.4 kPa) 20 - 25 PSI (137.9 - 172.4 kPa)	
Lift System	Hydraulic	
PTO	Electric Clutch/Brake	

SERVICE PARTS

Part No.	Description
03621100	Battery
21416800	Air Filter - Kohler
21535900	Air Filter - Kawasaki
21410800	Fuel Filter
21397200	Engine Oil Filter - Kohler
21535800	Engine Oil Filter - Kawasaki
09246900	Hydraulic Filter
21525900	Spark Plug - Kohler (Qty. 2)
21536100	Spark Plug - Kawasaki (Qty. 2)
07237800	PTO (Engine to Deck) Belt (72")
07235100	PTO (Engine to Deck) Belt (60")
07234600	PTO (Engine to Deck) Belt (50")
07237700	Mower Drive Belt (72")
07235000	Mower Drive Belt (60")
07234900	Mower Drive Belt (50")
07224300	Hydraulic Belt
21416700	Element Precleaner - Kohler
21536000	Element Precleaner - Kawasaki
09246700	Blade 50"
08899200	Mulching Blade 50"
09246600	Blade 60"
08899100	Mulching Blade 60"
09097100	Blade 72"
09254700	Mulching Blade 72"



Gravely Division of Ariens Company
655 West Ryan Street
P.O. Box 157
Brillion, WI 54110-0157
920-756-2141
Fax 920-756-2407

2 Year Limited Warranty

Ariens Company hereby warrants to the original consumer purchaser that all Gravely Two-Wheel, Professional G, Pro, and ProMaster products will be free from defects in material and workmanship for a period of two (2) years from the date of purchase or 1000 hours, whichever comes first.

Protection Plan

Ariens Company will repair or replace any part found upon examination by the Ariens Company to be defective. Such repair or replacement will be free of charge to the purchaser (labor and parts), except as noted below.

This warranty is subject to the following exceptions, conditions, and limitations:

Usage Requirement

The duration of this warranty shall be ninety days or 1000 hours, whichever comes first, if the product is rented or leased.

Purchaser's Responsibilities

- The purchaser must perform maintenance & minor adjustments per the operator's manual.
- The purchaser must notify Ariens Company or an authorized Gravely service representative of the need for warranty service.
- The purchaser must transport the product to and from the place of warranty repair.

Product Registration

- The Gravely dealer must fill out and return the warranty registration card to validate the warranty.

Service Parts and Accessories

- Service parts and accessories not purchased with the product covered by this warranty are warranted to be free of defects for a period of ninety (90) days following the date of purchase, and will be replaced free of charge (except for labor).

Service

- Warranty service must be done by an authorized Gravely dealer. To find a Gravely dealer near you, contact Ariens Company.

Battery Warranty Prorated

- One to three months - Free replacement
- Four to twelve months - Prorated over 12 months

Exclusions (No Warranty)

- Normal maintenance, services, and normal replacement items, such as spark plugs, oil, oil filters, air filters, mufflers, belts, tires, shoes, runners, scraper blades, shear bolts, mower blades, mower vanes, headlights, light bulbs, knives, etc. are not covered by this warranty.
- Any equipment which has been altered, misused, misassembled, improperly adjusted, neglected, or damaged by accident is not covered by this warranty.
- Service completed by someone other than an authorized Gravely dealer is not covered by this warranty.
- Any attachment not approved by Gravely nor any parts that are not genuine Gravely service parts are not covered by this warranty.
- Engines and engine accessories are covered only by the warranty made by the engine manufacturer, and are not covered by this warranty.
- If the product is equipped with a Hydro-Gear transmission and/or Hydro-Gear drive components, the Hydro-Gear transmission and/or drive components are covered only by the warranty made by Hydro-Gear, and are not covered by this warranty.
- This warranty applies only to products purchased in the United States (including Puerto Rico) and Canada. In all other countries, contact place of purchase.

Ariens Company may from time to time change the design of its products. Nothing contained in this warranty shall be construed as obligating Ariens Company to incorporate such design changes into previously manufactured products, nor shall such changes be construed as an admission that previous designs were defective.

LIMITATION OF REMEDY AND DAMAGES

Ariens Company's liability under this express warranty, and under any implied warranty that may exist, is limited to repair or replacement of any defective part. In no event shall Ariens Company be liable for incidental, special, or consequential damages (including lost profits). This warranty gives you specific legal rights. You may also have other rights which vary from state to state. Some states do not allow the exclusion of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you.

DISCLAIMER OF FURTHER WARRANTY

Ariens Company makes no warranty other than what is expressly made in this warranty. If the law of your state provides that an implied warranty of merchantability, or an implied warranty of fitness for a particular purpose, applies to Ariens Company, any such implied warranty is limited to the duration of this express warranty.

Form: GLW2-112701



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