

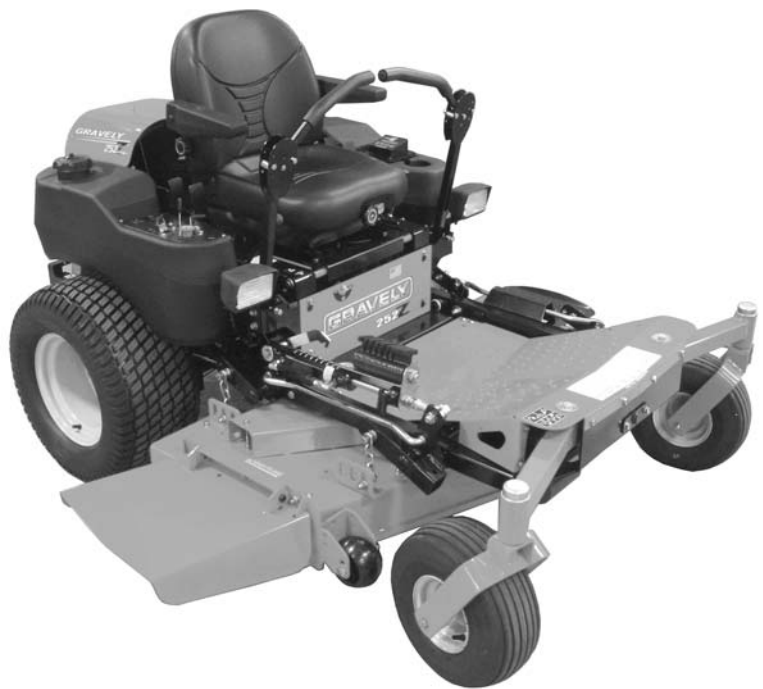


Promaster 252Z / 260Z / 272Z

Owner/Operator Manual

Models

992045	992086
992046	992087
992047	992088
992052	992089
992066	992091
992067	992102
992068	992103
992071	992104
992084	992105
992085	992107
	992108



US Patent 6,301,864



(GB) ENGLISH

(F) FRANÇAIS

(E) ESPAÑOL

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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.

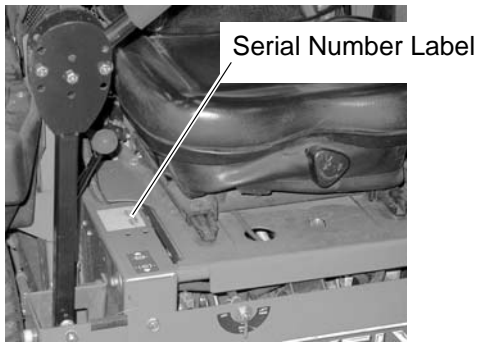


Figure 1

OF3510

- Record Unit Model and Serial numbers here.

- Record Engine Model and Serial numbers here.

UNAUTHORIZED REPLACEMENT PARTS

Use only Gravely replacement parts. The replacement of any part on this vehicle with anything other than a Gravely authorized replacement part may adversely affect performance, durability, or safety of this unit. Gravely 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

Gravely 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.

PRODUCT REGISTRATION

The Gravely dealer must register the product at the time of purchase. Registering the product will help the company process warranty claims or contact you with the latest service information. All claims meeting requirements during the limited warranty period will be honored, whether or not the product registration card is returned. Keep a proof of purchase if you do not register your unit.

Customer Note: If the dealer does not register your product, please fill out, sign, and return the product registration card to Gravely.

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 Gravely Dealer for assistance. Make sure all assembly has been properly completed and safety interlock system works properly.

NOTE: To locate your nearest Gravely Dealer, call 920-756-4664 or go to www.gravely.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 Product Registration Card and return the card to Ariens Company or go to www.gravely.com.

SAFETY



WARNING: This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the safety instructions in the manuals and on decals could result in serious injury or death.

Slopes are a major factor related to loss-of-control and tip-over accidents. Operation on all slopes requires extra caution.

Tragic accidents can occur if the operator is not alert to the presence of children. Never assume that children will remain where you last saw them.

Gasoline is extremely flammable and the vapors are explosive, handle with care.

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



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, including those that may restrict the age of the operator.

REQUIRED OPERATOR TRAINING

Original purchaser of this unit was instructed by the seller on safe and proper operation. 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 2 for Safety Decal locations.



OL1253



OL3900

SAFETY ALERT SYSTEM

These are safety alert symbols. They mean:

- **ATTENTION!**
- **YOUR SAFETY IS INVOLVED!**

When you see this symbol:

- **BECOME ALERT!**
- **OBEY THE MESSAGE!**

SIGNAL WORDS

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.

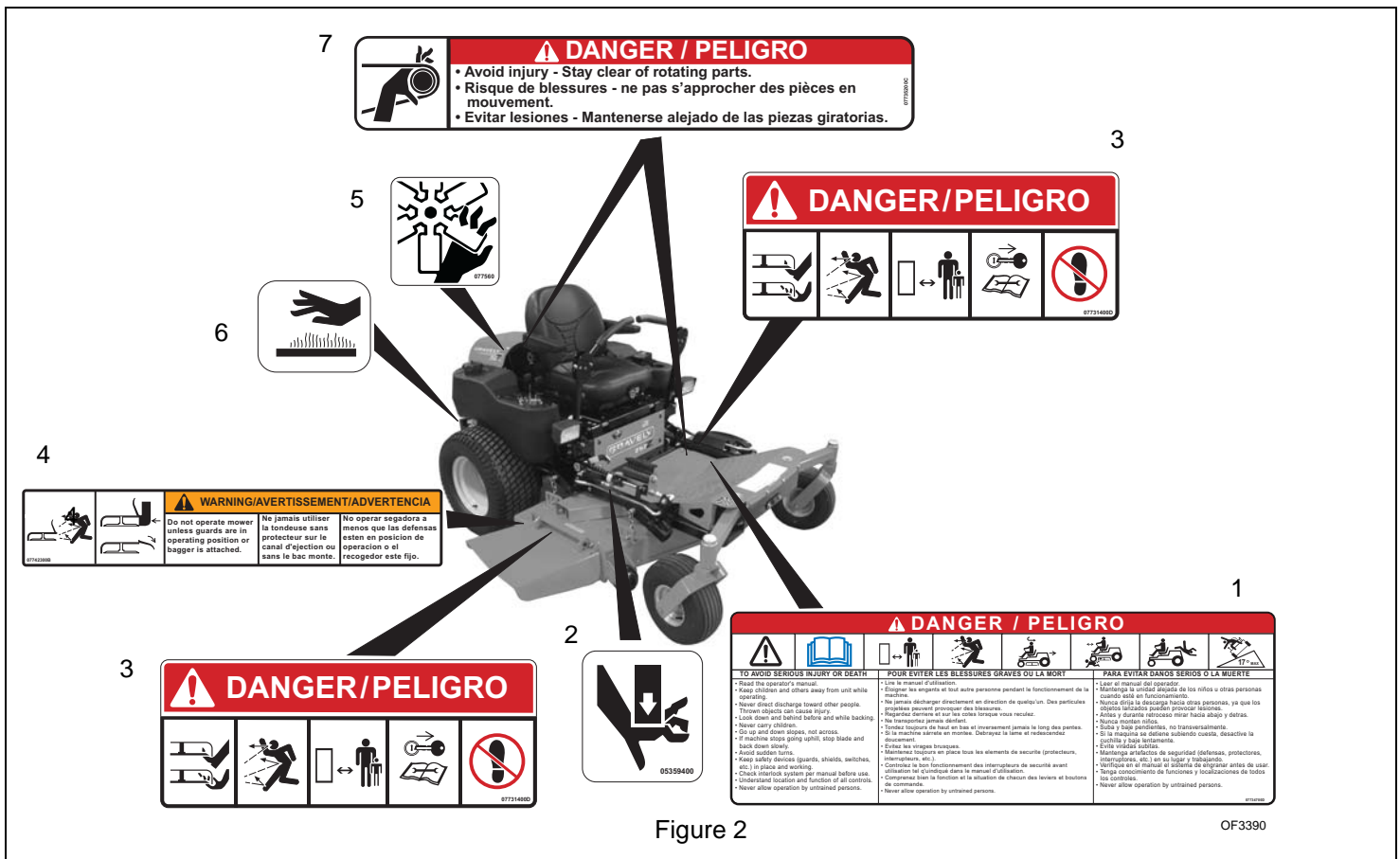


Figure 2

OF3390

1. DANGER! TO AVOID SERIOUS INJURY OR DEATH



OL1801

Read Operator's Manual.



OL4370

Keep children and others away from unit while operating.



OL0910

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



OL4460

Look down and behind before and while backing.



OL4470

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



OL4480

NEVER CARRY CHILDREN.



OL4450

Go up and down slopes, not across.
DO NOT operate on slopes over 17°.

- 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.
- Never allow operation by untrained persons.

2. PINCH POINT!



OF3330

Avoid pinch points.

3. DANGER!

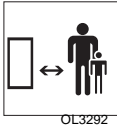


OL3030

Always keep feet and hands away from rotating parts.



Always stand clear of discharge area. Do not direct discharge toward other people.



Keep people away from unit while operating.



Shut off engine, remove key, and read manual before you adjust or repair unit.

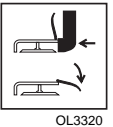


NO STEP! Always keep feet away from rotating parts.

4. WARNING!



Always stand clear of discharge area.



Do not operate mower unless guards are in operating position or bagger is attached.

5. DANGER!



AVOID INJURY. Stay clear of rotating fan.

6. HOT SURFACES!



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

7. DANGER!



AVOID INJURY. Stay clear of rotating parts.

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.

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

- Work area
- Your unit
- All safety decals

Determine which attachments are needed and can be used safely.

Inspect unit before each use for: missing or damaged decals and shields, correctly operating safety interlock system, and deterioration of grass catchers. Replace or repair as needed.

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 docks, ramps or floors. Avoid uneven work areas and rough terrain. Stay alert for hidden hazards or traffic.

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.

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.

Read the entire Owner/Operator manual and other training material. If the operator or the mechanic cannot read the manual, it is the owner's responsibility to explain it to them. Only the user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property.

Only trained adults may operate or service unit. Training includes actual operation.

Local regulations may restrict the age of the operator.

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. On multiblade 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.

Read, understand, and follow all instructions in the manual and on the machine before starting.

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.

Do not operate without either entire grass catcher or the discharge guard in place.

Stop engine before removing grass catcher or unclogging chute.

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

Start and operate unit only when seated in operator's position. Steering control levers must be in neutral, PTO disengaged and parking brake set when starting engine.

Use care when approaching blind corners, shrubs, trees or other objects that may obscure vision.

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 and effect the machine's stability.

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.

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.

Stop and inspect equipment if you strike an object or if there is an unusual vibration. Repair, if necessary, before restarting. Never make adjustments or repairs with the engine running.

Mower blades are sharp and can cut you. Wrap the blade(s) or wear gloves, and use extra caution when servicing them. NEVER weld or straighten mower blades.

Rotation of one blade may cause rotation of the other blades.

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.

Mow up and down slopes, not across them.

DO NOT operate on slopes of more than 17 degrees.

Use of a Rollover Protection System (ROPS) is recommended for slope operation. See Attachments and Accessories.

Always wear a seat belt when operating unit using a Rollover Protection System (ROPS).

Keep all movements on the slope *slow* and *gradual*. Do not make sudden changes in speed or direction.

Avoid starting or stopping on the slope. If tires lose traction, disengage the blades and proceed slowly *straight* down the slope.

If you cannot back up a slope or you feel uneasy on it, do not mow it.

DO NOT park on slopes unless necessary. When parking on slope always chock or block wheels. Always set parking brake.

Use a slow speed. Tires may lose traction on slopes even though the brakes are functioning properly.

Do not bypass transmission when on a slope.

Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.

Follow the manufacturer's recommendations for weight limits for towed equipment and towing on slopes.

NEVER allow children or others in or on towed equipment.

On slopes, the weight of the towed equipment may cause loss of control.

Travel slowly and allow extra distance to stop.

Use extra care when loading or unloading unit onto trailer or truck.

Secure unit chassis to transport vehicle. NEVER secure from rods or linkages that could be damaged.

DO NOT transport machine while engine is running.

ALWAYS turn off power to attachment and shut off fuel when transporting unit.

Keep unit free of debris. Clean up oil or fuel spills.

This product is equipped with an internal combustion type engine. DO NOT use unit on or near any unimproved, forest-covered or brush covered land unless exhaust system is equipped with a spark arrester meeting applicable local, state or federal laws. A spark arrester, if it is used, must be maintained in effective working order by operator.

Fuel is highly flammable and its vapors are explosive. Handle with care. Use an approved fuel container.

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

NEVER fill fuel tank when engine is running or hot from operation.

NEVER fill or drain fuel tank indoors.

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.

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

Reverse connections may result in sparks which can cause serious injury. Always connect positive (+) lead of charger to positive (+) terminal, and negative (-) lead to negative (-) terminal.

ALWAYS disconnect negative (-) cable FIRST and positive (+) cable SECOND. ALWAYS connect positive (+) cable FIRST, and negative (-) cable SECOND.

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. Use insulated tools.

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.

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

Release pressure slowly from components with stored energy.

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

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.

Maintain or replace safety and instruction labels, as necessary.

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

Shut off fuel and allow engine to cool completely before storing in closed area or covering unit.

Clean grass and debris from unit, especially from around muffler and engine, to help prevent fires.

For extended storage, shut off fuel and clean unit thoroughly. See engine manual for proper storage.

Lower cutting deck unless a positive mechanical lock is used.

Use only attachments or accessories designed for your unit.

Check all hardware at regular intervals, especially blade attachment bolts. Keep all hardware properly tightened.

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

ASSEMBLY



WARNING: AVOID INJURY. Read and understand entire *Safety* section before proceeding.

Unpack Unit

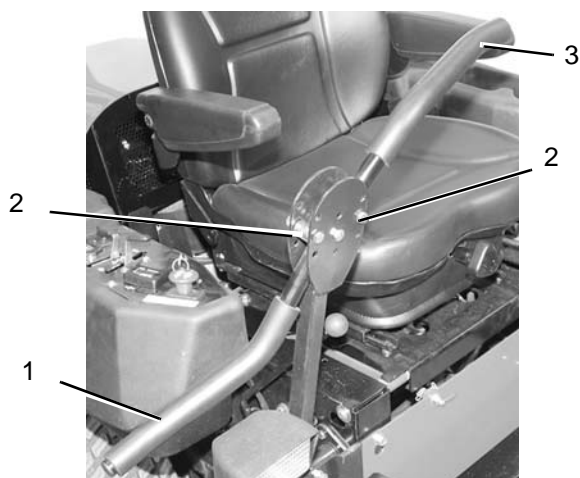
Remove unit and all other components from shipping container. Open bypass valves (see *MOVING UNIT MANUALLY* on page 12). Push unit from container onto a level surface. Close bypass valves.

Prepare Seat

Remove nuts from seat studs in hood frame. Peel off paper backing from foam tape and place between hood frame and chassis. Lift and rotate seat onto hood frame. Secure with nuts.

Install Steering Levers

Remove spacers, bolts, and nuts from steering levers. Turn the steering levers into the operating position. Re-install spacers, bolts and nuts. Tighten hardware securely (figure 3).



1. Steering Lever in Shipping Position
2. Spacers and Hardware

3. Steering Lever in Operation Position

Figure 3

OF3520

Install Deflector



WARNING: Deflector must pivot freely. DO NOT overtighten pivot bolts.

Remove, reverse, and reinstall deflector and mounting bracket.

Check Tire Pressure

See *SPECIFICATIONS* on page 27.

Check Engine Oil

Refer to Engine Manual.

Check Hydraulic Oil

See *Checking Hydraulic Oil Level* on page 24.

Check Coolant Level

Refer to Engine Manual.

Fill Fuel Tank

See *FILLING FUEL TANK* on page 12.

Connect Battery

Place hood in the full service position (see *SERVICE POSITIONS* on page 15). Connect negative (–) battery cable to battery (see *Battery Removal and Installation* on page 16 and perform steps 2 through 4 in the installation section).

Level Mower Deck

See *LEVELING THE MOWER DECK* on page 19.

Check Safety Interlock System



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

See *Safety Interlock System* on page 10.

Check Function of All Controls

Ensure unit runs and performs properly.

CONTROLS AND FEATURES

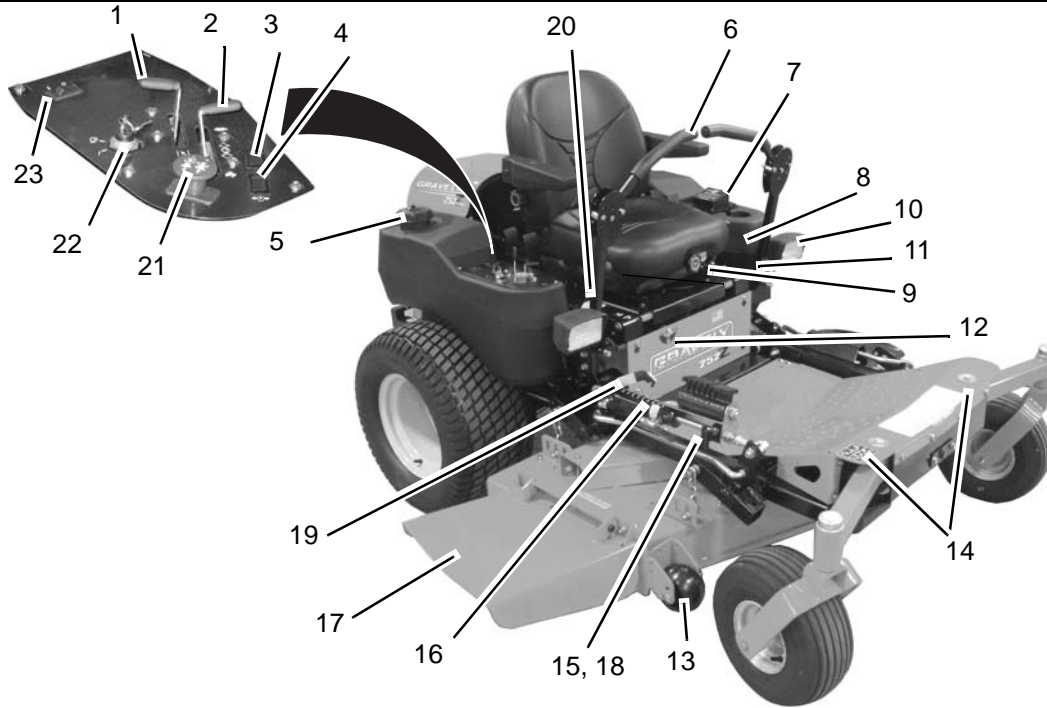


Figure 4

1. Choke Control (992045, 046, 047, 052, 066, 068, 071, 084, 085, 086, 103, 104, 105, 106, 108)
2. Throttle Lever
3. Malfunction Indicator Light (992091, 107)
4. Oil Pressure Indicator / High Temperature Indicator
5. Fuel Tanks and Caps
6. Steering Levers
7. Eye-Q™ (992066, 067, 071, 084, 085, 086, 091)
8. Mower Lift Lever (992045, 046, 047, 052, 066, 067, 068, 071, 084, 085, 086, 091, 104, 106, 107, 108)
9. Seat Suspension Adjustment Knob
10. Headlight (992045, 046, 047, 052, 066, 067, 068, 071, 091, 107)
11. Seat Adjustment Lever
12. Fuel Shut Off Valve
13. Anti-scalp Rollers
14. Axle Locks
15. Cylinder Stops (992045, 046, 047, 052, 066, 067, 068, 071, 084, 085, 086, 091, 104, 106, 107, 108)
16. Height of Cut Indicator (992045, 046, 047, 052, 066, 067, 068, 071, 084, 085, 086, 091, 104, 106, 107, 108)
17. Mower Deck with Chute Deflector
18. Cylinder Stop Storage Post (992045, 046, 047, 052, 066, 067, 068, 071, 084, 085, 086, 091, 104, 106, 107, 108)
19. Foot Board Latch
20. Parking Brake
21. Power Take Off (PTO) Switch
22. Ignition Switch
23. Headlight Switch (992045, 046, 047, 052, 066, 067, 068, 071, 091, 107)

OPERATION



WARNING: AVOID INJURY. Read and understand entire *Safety* section before proceeding.

CONTROLS AND FEATURES

See figure 4 for Controls and Features locations.

Safety Interlock System



WARNING: 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.

Perform the following tests to ensure the safety interlock system is working properly. If the unit does not perform as stated, contact your Gravely dealer for repairs.

IMPORTANT: With the parking brake engaged, the steering levers must be locked in neutral.

IMPORTANT: With the parking brake disengaged, the engine must not start and the engine must shut off if the operator leaves the seat.

Test	Steering Levers	PTO	Parking Brake	Engine
STARTING INTERLOCK				
1	Neutral	Off	Engaged	Starts
2	Neutral	On	Engaged	Doesn't Start
3	Neutral	Off	Disengaged	Doesn't Start
OPERATING INTERLOCK (ENGINE ON)				
4*	Neutral	On	Engaged	Shuts Off
5*	Neutral	Off	Disengaged	Shuts Off
6*	Neutral	Off	Engaged	On

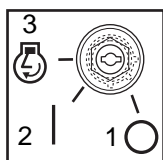
* Operator lifts off seat.

Eye-Q™ (992066, 067, 068, 071, 084 085, 086, 091)



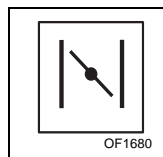
Monitors equipment performance, operator performance, and equipment maintenance. See Eye-Q Owner's Manual for how to access these features.

Ignition Switch



Operate the ignition switch with the removable key. The switch has three positions: Off (1), On (2) and Start (3). See *STARTING AND SHUTTING OFF ENGINE* on page 12 for detailed instructions on how to start engine.

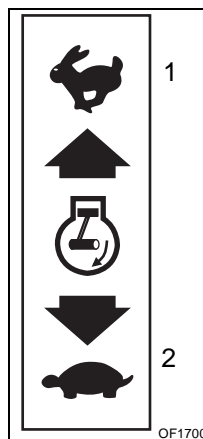
Choke Control (992045, 046, 047, 052, 066, 068, 071, 084, 085, 086, 103, 104, 105, 106, 108)



Use to start a cold engine. Push choke lever forward to start a cold engine. Pull the choke lever to the rear when the engine is warm.

Throttle Lever

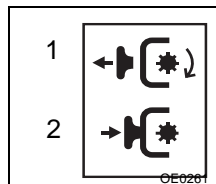
Changes the speed of engine.



Fast (1) – Increases engine speed.

Slow (2) – Decreases engine speed.

Power Take Off (PTO) Switch



Engages (1) and disengages (2) mower blades.

Oil Pressure Indicator / High Temperature Indicator



Lights up when engine oil pressure is low or when coolant temperature is high. See *TROUBLESHOOTING* on page 25 or refer to Engine Manual for details.

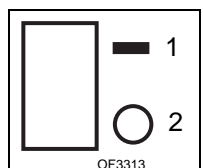
Malfunction Indicator Light (992091, 107)



The malfunction indicator light flashes when there is a problem with the electronic fuel injection system. When indicator light flashes, disengage PTO, shut off engine, remove key, and see engine manual.

Headlight Switch (992045, 046, 047, 052, 066, 067, 068, 071, 091, 107)

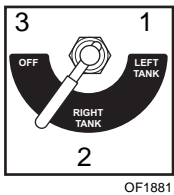
Turns headlights on and off.



Off (1)

On (2)

Fuel Shut-Off Valve

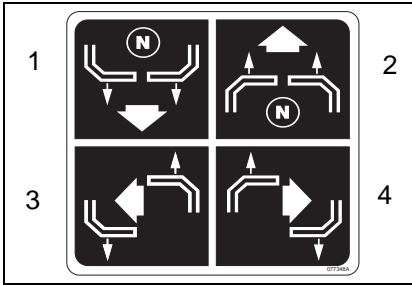


Controls fuel flow from left fuel tank (1) or right fuel tank (2).

Open valve to operate the engine. Turn the valve to off (3) when storing or transporting the unit.

NOTE: Fuel shut-off valve on models 992091 and 992107 do not have an off (3) position.

Steering Levers



Control speed, directional control, and stopping unit.

- Reverse (1) – Pull both steering levers backward.
- Forward (2) – Push both steering levers forward.

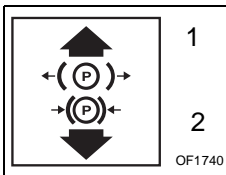
- Left (3) – Pull left steering lever back or push right steering lever forward or a combination of both.
- Right (4) – Pull right steering lever back or push left steering lever forward or a combination of both.

To stop, return both steering levers to neutral.

NOTE: Steering levers are mechanically locked in neutral whenever parking brake is engaged.

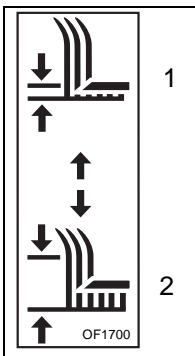
NOTE: Aggressive turning can scuff or damage lawns. ALWAYS keep both wheels rotating when making sharp turns. DO NOT make turns with inside wheel completely stopped. To obtain minimum turning radius, slowly reverse inside wheel while moving outside wheel slowly forward.

Parking Brake Lever



Engages (2) and disengages (1) parking brake.

Mower Lift Lever (992045, 046, 047, 052, 066, 067, 068, 071, 084, 085, 086, 091, 104, 106, 107, 108)



Raises and lowers mower deck.

To lower (1) – Move mower lift lever forward.

To raise (2) – Move mower lift lever rearward.

Cylinder Stops (992045, 046, 047, 052, 066, 067, 068, 071, 084, 085, 086, 091, 104, 106, 107, 108)



CAUTION: AVOID PINCH POINTS. Always use the T-portion of the cylinder stop when removing or installing the cylinder stops.

Ensure the same cutting height after raising mower deck to clear an obstacle. Cylinder stops are stored on a post behind hydraulic lift cylinder and come in two sizes: 11/32 in. and 11/16 in. (8.73 mm and 17.5 mm).

1. Remove cylinder stops from post and snap onto lift cylinder rod.
2. Push lift lever forward until cylinder rests against cylinder stops.

Mower Lift Pedal (992087, 088, 089, 102, 103, 105)



Mower lift pedal raises and lowers the mower deck for transporting the unit and for setting the cutting height.

To Transport: Push mower lift pedal (1) all the way forward until lift lock (2) engages.

To Set Cutting Height: Put cutting height adjustment pin in desired hole. Push mower lift pedal (1) forward and hold while pushing down on the lift lock (2). Slowly lower mower lift pedal (1) until deck lift contacts cutting height adjustment pin.

NOTE: See *MOWER LIFT PEDAL ADJUSTMENT* on page 22 to adjust the force required to lift the mower deck.

Seat Adjustment Lever

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

Seat Suspension Adjustment Knob

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

Axle Locks

For a solid front axle, install axle locks on front axle. For a pivoting front axle, remove axle locks from front axle and store on unit (figure 5).

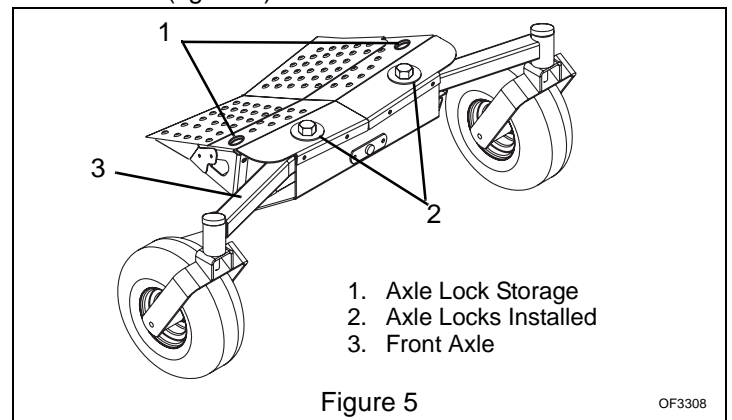


Figure 5

FILLING FUEL TANK



WARNING: AVOID INJURY. Read and understand entire *Safety* section before proceeding.

To add fuel to fuel tank:

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

IMPORTANT: Refer to Engine Manual for correct type and grade of fuel. See *SPECIFICATIONS* on page 27 for fuel tank capacity.

5. Fill fuel tank to within 1 in. (2.54 cm) below bottom of filler neck.
6. Replace fuel cap and tighten.
7. Clean up any spilled fuel.

PRIOR TO STARTING THE UNIT



CAUTION: Make sure all hardware is tight, all safety devices are in place and all adjustments are made correctly.

1. Check Safety Interlock System

If this system does not function as described do not operate until repairs are made.

2. Check Air Cleaner

Check air filter for dirt. Clean as required. Follow Engine Manual for maintenance schedule.

3. Check Engine Fuel and Engine Oil

Check and add fuel if required. Check that engine oil level is within operating range. Follow Engine Manual for maintenance schedule.

4. Check Tire Pressure

5. Check Hydraulic Fluid Level

6. Adjust Seat

Be sure all controls can be reached safely from operator's position.

7. Set Cutting Height

Make sure the deck is set to the correct cutting height.

8. Check Radiator Screen (992084, 085, 086, 103, 104, 105, 106, 108)

Check radiator screen for debris see *MAINTENANCE SCHEDULE* on page 14 and refer to Engine Manual for detailed instructions.

STOPPING IN AN EMERGENCY

Bring steering levers back to neutral, set parking brake, and turn off engine.

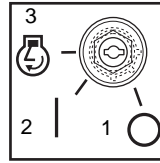
STARTING AND SHUTTING OFF ENGINE

NOTE: DO NOT operate starter more than 15 seconds per minute, as overheating and damage can occur. If engine will not start, see *TROUBLESHOOTING* on page 25 or refer to Engine Manual.

NOTE: The engine will not start unless the steering control levers are in the neutral position, the PTO switch is in the off position, and parking brake is engaged.

To start:

1. Insert ignition key.
2. For models with choke:
If engine is cold, move choke control to the on position. Once engine has started and is warmed up, move choke control to the off position. If engine is warm, do not use choke.
3. Move the throttle to 3/4 fast position.
4. Turn ignition key to Start (3) position. If engine does not start in five seconds, release ignition key, wait, and then repeat. Once engine has started, ignition key will return to the Run (2) position.



To shut off:

1. Disengage PTO.
2. Set parking brake.
3. Turn ignition key to Off (1) position.

OPERATING MOWER

1. Start engine.
2. Move throttle lever three-fourths of the way up to fast.

IMPORTANT: Never engage the PTO if the mower is plugged with grass or other material.

3. Engage PTO to engage mower blades.
4. Move throttle lever to fast.
5. Release parking brake.



WARNING: Move the steering control levers slowly and keep the throttle control lever at slow speed until you learn how to operate the unit.

6. Use steering levers to move the unit.
7. Disengage PTO to stop mower blades.

PARKING THE UNIT

1. Move steering levers to the neutral position. Shut off PTO.
2. Move throttle lever to the slow position.
3. Engage parking brake.

MOVING UNIT MANUALLY

IMPORTANT: Never tow unit.

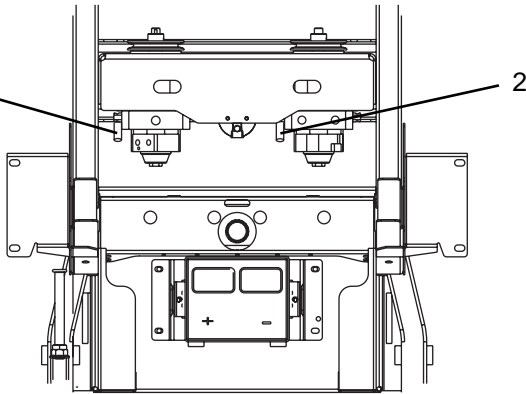
1. Place hood in the full service position (see *SERVICE POSITIONS* on page 15).

2. Turn right and left bypass valve levers counterclockwise 1/2 turn (figure 6).



WARNING: Do not bypass transmission when on a slope.

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



1. Right Bypass Valve Lever

2. Left Bypass Valve Lever

Figure 6

OF3221

TRANSPORTING UNIT

ALWAYS shut off engine, set parking brake, and remove key when transporting unit on a truck or trailer. Tie unit down securely. Do not tie down by linkages, guards, cables or other parts that may be damaged.

FOR BEST PERFORMANCE

Cut grass when it is dry.

Keep mower blades sharp.

Keep mower deck properly leveled.

Adjust anti-scalp rollers to prevent scalping.

Do not set height of cut too low. For very tall grass, mow twice.

Do not travel too fast.

Mow with the engine set at full throttle.

When mulching, only remove 1/3 of grass length per cutting.

Discharge clippings into areas already cut.

Vary cutting pattern with each mowing.

Do not allow grass or debris to collect inside of mower deck.
Clean after each use.

MAINTENANCE SCHEDULE



WARNING: AVOID INJURY. Read and understand entire *Safety* section before proceeding.

Proper maintenance can prolong the life of unit. The following chart shows the recommended service schedule. More frequent service may be required due to working conditions (heavy loads, high ambient temperatures, dusty conditions, or airborne debris).

See the maintenance instructions in the Engine Manual for additional information.

Interval	Task	Action
Each Use	Check Safety Interlock System	WARNING: 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. See <i>Safety Interlock System</i> on page 10.
	Check Parking Brake	Engage parking brake. Push unit. If unit rolls adjust parking brake (see <i>PARKING BRAKE ADJUSTMENT</i> on page 23).
	Check Hydraulic Oil Level	See <i>Checking Hydraulic Oil Level</i> on page 24.
	Check Tires	See <i>SPECIFICATIONS</i> on page 27 for correct tire pressure.
	Clean Unit	Clean engine, battery, seat, mower deck, etc. of dirt and debris. Do not use solvents, hard cleaners, or abrasives. NOTE: Protect painted surfaces with automotive type wax.
	Follow Engine Maintenance Schedule	Perform scheduled engine maintenance. Refer to Engine Manual for detailed instructions.
	Check Cooling System (992084, 085, 086, 103, 104, 105, 106, 108)	IMPORTANT: To avoid damaging the radiator, DO NOT USE high-pressure water to clean the radiator. Check cooling system for dirt and debris in radiator screen, hoses, fan, etc. Refer to Engine Manual for detailed instructions.
Every 25 Hours	Check Mower Blades	Ensure mower blade hardware is tightened to 115 – 125 lbf-ft. (156 – 169 N•m). Check mower blades for wear. Sharpen or replace mower blades as needed (see <i>SHARPENING MOWER BLADE</i> on page 17).
Every 50 Hours	Lubricate Front Axle and Pivot Points	Oil all pivot points, pin connections, and apply grease to front axle grease zerk (see <i>LUBRICATING UNIT</i> on page 16).

Interval	Task	Action
Every 100 Hours	Clean Battery Check Fasteners Check All Belts	Keep battery and battery terminals clean (see <i>Cleaning the Battery</i> on page 16). Check mower blade mounting hardware and all other fasteners. Replace missing or damaged fasteners. Tighten all nuts and bolts to their correct torque value. Replace worn or deteriorated belts. <ul style="list-style-type: none"> • Check mower drive belt. See <i>MOWER DRIVE BELT REMOVAL</i> on page 20 for belt location. • Check PTO belt. See <i>PTO BELT REMOVAL</i> on page 20 for belt location. • Check transmission belt. See <i>TRANSMISSION BELT REMOVAL</i> on page 21 for belt location. • Check radiator fan belt. Refer to Engine Manual (992084, 085, 086, 103, 104, 105, 106, 108).
Every 400 Hours	Grease Front Axle Castor Pivots	Repack front axle castor pivots (see <i>LUBRICATING UNIT</i> on page 16).
Every 500 Hours	Change Hydraulic Oil and Filter	See <i>Changing Hydraulic Oil and Filter</i> on page 24.

SERVICE AND ADJUSTMENTS

Gravely Dealers will provide any service which may be required to keep your unit operating at peak efficiency. Should engine service be required, it can be obtained from a Gravely Dealer or the engine manufacturer's authorized service center.



WARNING: AVOID INJURY. Read and understand entire *Safety* section before proceeding.



CAUTION: HOT SURFACES may result in injury. DO NOT touch engine or drive parts which are hot from operation. Allow parts to cool before servicing.

SERVICE POSITIONS

IMPORTANT: Place unit on a flat level surface. ALWAYS shut off engine, set parking brake, and remove ignition key. Ensure unit is secure and will not tip over. When a lift is used, strap and clamp unit to the lift.

1. Place steering levers in neutral position and engage parking brake.
2. Unhook hood latches. Firmly grasp hood frame handle and lift to the desired service position (figure 7).

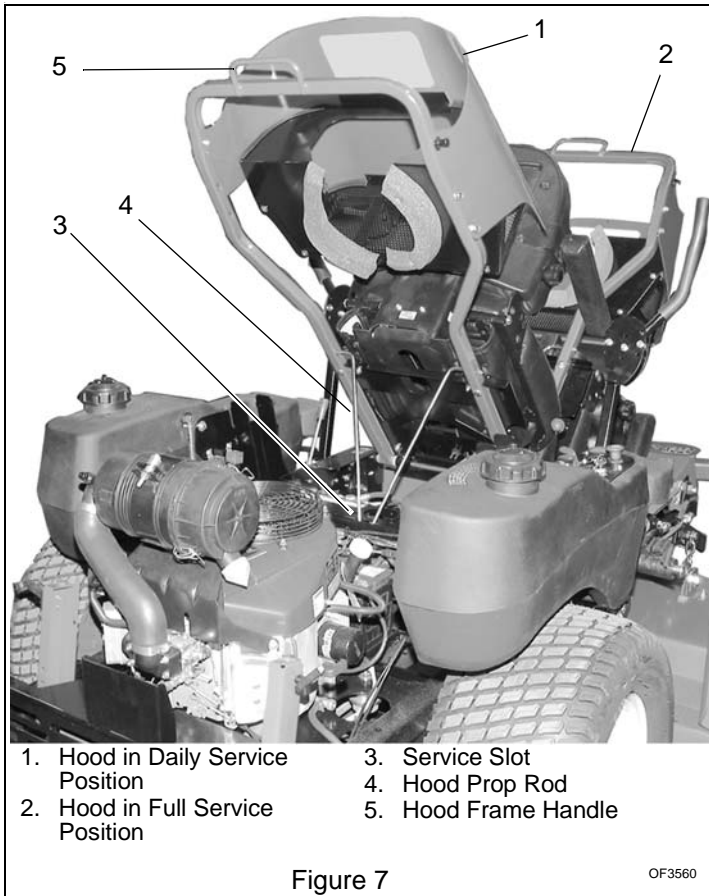


CAUTION: When opening hood, use care to properly engage hood prop rod into service slot. Be sure footing is secure to accommodate weight shift of hood when rotating to full service position.

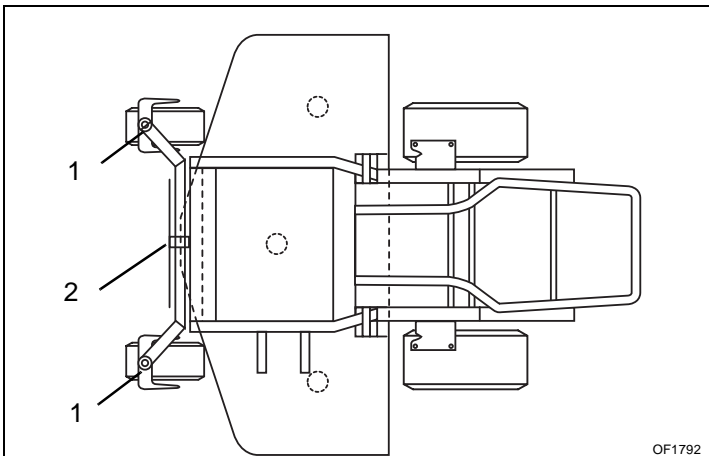
Daily Service Position: Place hood prop rod into service slot. Ensure prop rod is engaged in service slot properly.

Full Service Position: Slowly release hood after seat contacts foot board. Use care and be sure of your footing. Do not step on mower deck.

3. When service is complete, lower hood, and secure with hood latches.



LUBRICATING UNIT



Item	Lubrication	Location	Interval
1	Repack	Front Axle Caster Pivot	400 hours
2	Grease	Front Axle Grease Zerk	50 hours
	Oil	All Pivot Points and Pin Connections	50 hours

Figure 8

IMPORTANT: Wipe front axle grease zerk and two front axle castor pivots clean before and after lubrication.

NOTE: Use Stens Mix Hi-Temp Grease or equivalent (part number 00036700).

SERVICING THE BATTERY



WARNING: AVOID INJURY. Read and understand the entire *Safety* section before proceeding.



WARNING: 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.

NOTE: Unit comes equipped with a maintenance-free battery that requires no regular maintenance except cleaning the terminals.

Battery Removal and Installation (Figure 9)

Removal

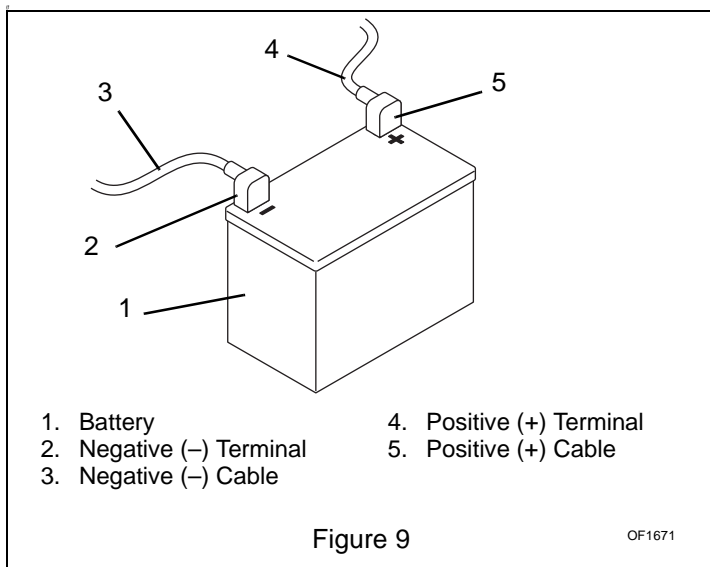
1. Place hood in full service position (see *SERVICE POSITIONS* on page 15).
2. Disconnect negative (–) cable first, then positive (+) cable.
3. Remove battery hold-down bracket and battery from unit.

Installation

1. Install battery on unit with battery hold-down bracket.
2. Connect positive (+) cable first, then negative (–) cable.
3. Coat terminals with dielectric grease or petroleum jelly.
4. Close hood (see *SERVICE POSITIONS* on page 15).

Cleaning the Battery (Figure 9)

1. Disconnect negative (–) cable first, then positive (+) cable.
2. Clean battery cable ends and terminals with wire brush. Rinse with a weak baking soda solution.
3. Connect positive (+) cable first, then negative (–) cable.
4. Coat terminals with dielectric grease or petroleum jelly.



Charging the Battery (Figure 9)

WARNING: FROZEN BATTERIES CAN EXPLODE and result in death or serious injury. DO NOT charge a frozen battery. Let battery thaw before charging.

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!

IMPORTANT: DO NOT fast charge. Charging at a higher rate will damage or destroy battery. ALWAYS follow information provided on battery and battery charger. Contact battery manufacturer and battery charger manufacturer for detailed instructions.

1. Remove battery from unit (see *Battery Removal and Installation* on page 16).
2. Place battery on bench or other well-ventilated area.
3. Connect positive (+) lead of charger to positive (+) terminal, and negative (-) lead to negative (-) terminal.
4. Charge battery according to the instructions from battery charger manufacturer and battery manufacturer.
5. Install battery on unit (see *Battery Removal and Installation* on page 16).

Jump-Starting

Gravely does not recommend jump-starting your unit. Jump-starting can damage engine and electrical system components. See your Engine Manual for more detailed information.

MOWER BLADE REMOVAL

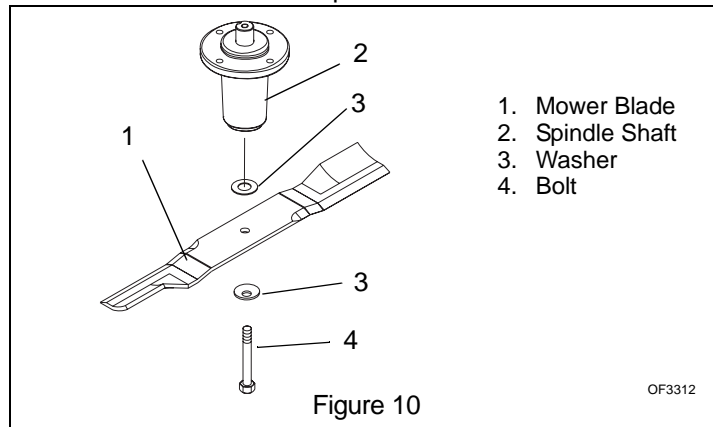
NOTE: If mower is used under sandy soil conditions, replace mower blades when air lifts become eroded through at ends (figure 11).

Removal (Figure 10)



CAUTION: Mower blades are sharp and can cut you. Wrap mower blades or wear gloves, and use extra caution when servicing.

1. Block mower blades to prevent rotation.



2. Remove bolts, washers, and mower blades from spindle shafts.

Installation (Figure 10)

1. Install mower blades, washers, and bolts on spindle shafts.
2. Tighten bolts to 115-125 lbf-ft (156-169 N•m).

SHARPENING MOWER BLADE

NOTE: If mower is used under sandy soil conditions, replace mower blades when air lifts become eroded through at ends (figure 11).



CAUTION: DO NOT sharpen mower blades while on unit. An unbalanced mower blade will cause excessive vibration and eventual damage to unit. Check mower blade balance before reinstalling blades.

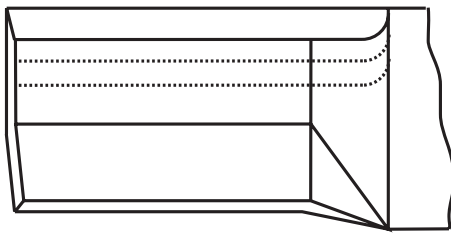
NEVER weld or straighten bent blades.

1. Remove mower blade from unit.

Discard mower blade if (figure 11):

- More than 1/2 in. (1.27 cm) of metal is removed.
- Air lifts become eroded.
- Blade is bent or broken.

DO NOT Sharpen To This Pattern



Sharpen To This Pattern

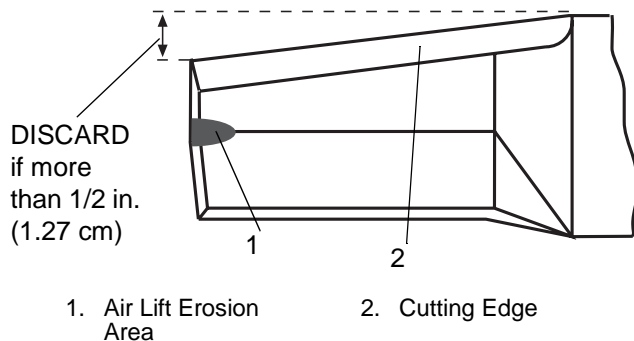


Figure 11

OF3310

2. Sharpen mower blade by removing an equal amount of material from each end of mower blade. DO NOT change angle of cutting edge or round the corner of mower blade.
3. Check mower blade balance. Slide mower blade on an unthreaded bolt. A balanced blade should remain in a horizontal position. If either end of mower blade moves downward, sharpen the heavy end until blade is balanced.
4. Install mower blade on unit.

ANTI-SCALP ROLLER ADJUSTMENT

The anti-scalp rollers are set at the factory for typical mowing height, but can be adjusted for high or low cutting conditions (figure 12).

Anti-Scalp rollers are intended to prevent lawn scalping, not to control cutting height.

For a very high cutting height, set the anti-scalp rollers in the lowest position on the bracket.

For a very low cutting height, set the anti-scalp rollers in the highest position on the bracket.

All anti-scalp rollers should be set at the same height.

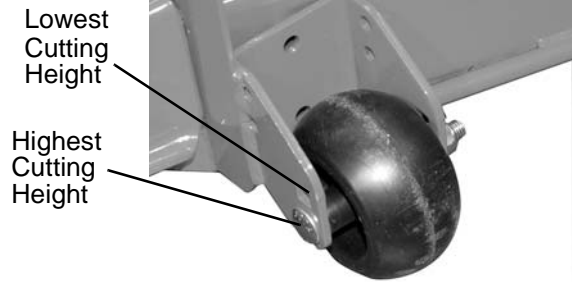


Figure 12

OF3590

MOWER DECK REMOVAL



DANGER: MOVING PARTS can cut or amputate body parts. ALWAYS wait for moving parts to stop before performing maintenance or service.

Removal (Figure 14)

NOTE: Only remove PTO belt from electric clutch.

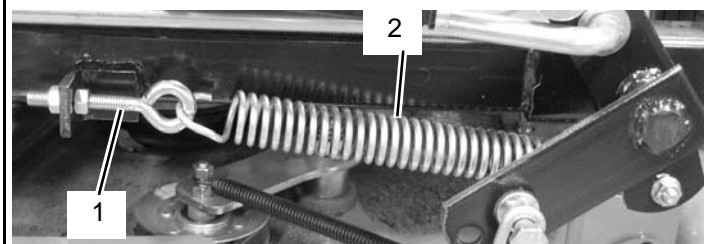
1. Remove PTO belt from electric clutch (see *PTO BELT REMOVAL* on page 20).

NOTE: Perform steps 2 and 3 for mechanical lift mower decks only (992087, 088, 089, 102, 103, 105).



CAUTION: Use care when releasing mechanical lift spring tension. Keep body parts well away from springs when performing this operation.

2. Raise mower deck to transport position (see *Mower Lift Pedal* on page 11).
3. Remove mechanical lift spring from each side of unit (figure 13).



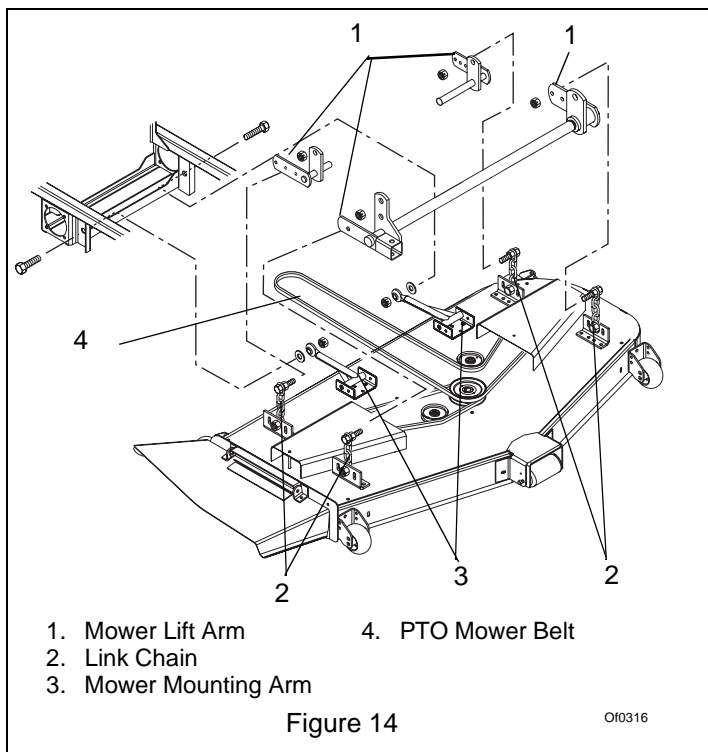
1. Eye-Bolt

2. Mechanical Lift Spring

Figure 13

OF4040

4. Lower mower deck all the way down.
5. Remove link chains from mower lift arms. Note hole location on mower lift arms for replacement.
6. Remove mower mounting arms from frame.
7. Slide mower deck out from under unit.

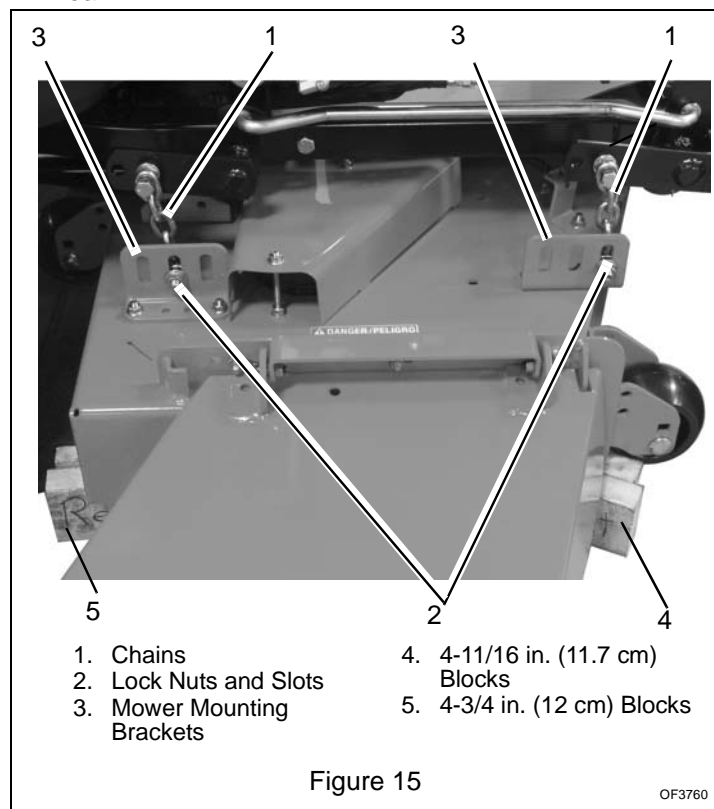


LEVELING THE MOWER DECK

These adjustments should be made on a level surface with the tires inflated to the correct air pressure.

Level the mower with the slots where 4 chains fasten to the mower mounting brackets (figure 15).

1. Shut off engine. Engage parking brake. Remove the ignition key.
2. Raise mower deck to its highest position and place 4-11/16 in. (12.1 cm) tall blocks at each rear corner and 4-5/8 in. (11.7 cm) tall blocks at each front corner.
3. Lower deck onto the blocks.
4. Loosen the locknuts on the side where the chains are slack and slide the bolt down the slot until the chains are tight.
5. Tighten the locknuts.
6. Lift mower and remove blocks.
7. Measure height of deck at each side. Measurements must be within 3/16 in. (4.76 mm) of each other.
8. If measurements are out of range, fix by adjusting chains on low side of deck.
9. Once deck is level side to side, measure height of deck at middle of front and on both sides of rear. Front of deck should be 1/8 in. \pm 1/8 in. (3.18 \pm 3.18 mm) lower than rear.



Installation (Figure 14)

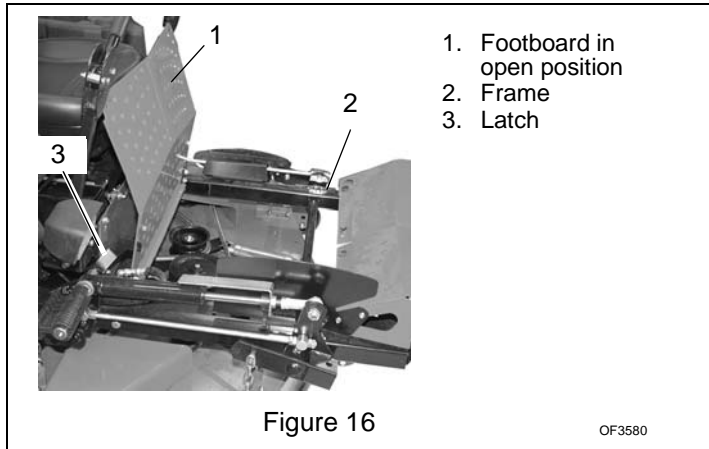
1. Slide mower deck under unit.
2. Install mower mounting arms on frame.
3. Install link chains on the mower lift arms in the same holes they were removed from.

NOTE: Perform steps 4 and 5 for mechanical lift mower decks only (992087, 088, 089, 102, 103, 105).

4. Raise mower deck to transport position (see *Mower Lift Pedal* on page 11).
5. Install mechanical lift spring on each side of unit (figure 13).
6. Install PTO belt on electric clutch (see *PTO BELT REMOVAL* on page 20).
7. Level mower deck (see *LEVELING THE MOWER DECK* on page 19).

MOWER DRIVE BELT AND PTO BELT ACCESS

1. Lower the mower deck.
2. Place seat in most rearward position.
3. Place foot board in open position (figure 16).
4. Secure raised footboard with latch.



PTO BELT REMOVAL



WARNING: MOVING PARTS can cut or amputate body parts. ALWAYS wait for moving parts to stop before performing maintenance or service.



CAUTION: DAMAGED OR WORN BELTS may result in injury and/or damage to unit. Check belts for excessive wear or cracks often.

Removal (Figure 17)

1. Open footboard (see *MOWER DRIVE BELT AND PTO BELT ACCESS* on page 20)
2. Remove left hand belt cover from mower deck.



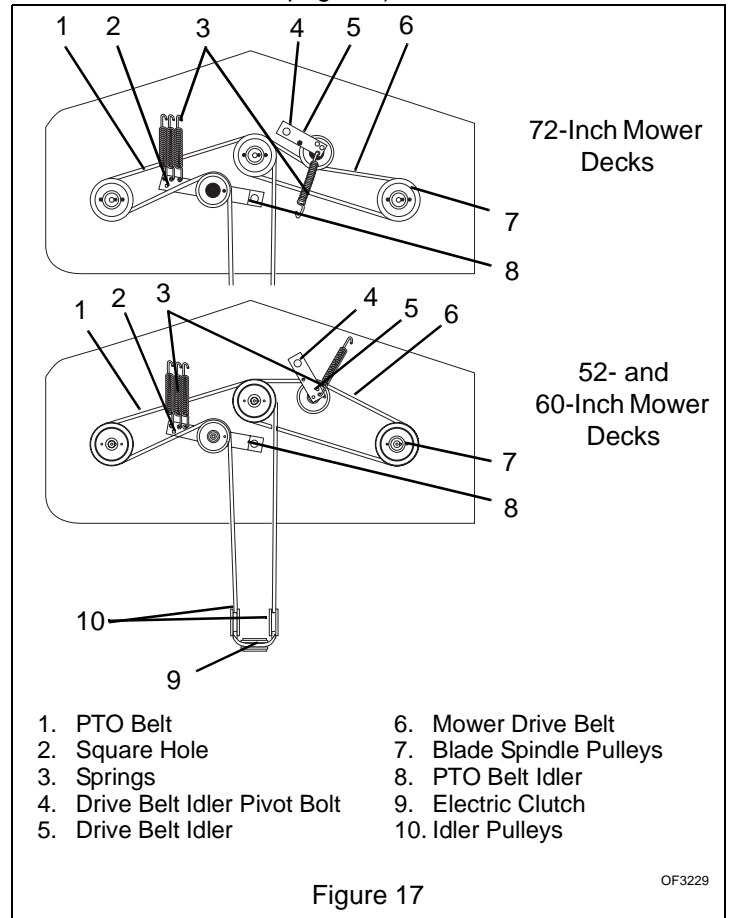
CAUTION: Use care when releasing idler spring tension. Keep body parts well away from idlers when performing this operation.

3. Place 1/2-inch driver and ratchet extension into square hole in PTO belt idler.
4. While pulling PTO belt idler towards rear of unit, remove PTO mower belt from PTO belt idler.
5. Slowly release tension on PTO belt idler until all tension is removed from springs.
6. Remove PTO mower belt from blade spindle pulleys, idler pulleys, and electric clutch.

Installation (Figure 17)

1. Install the new PTO belt on electric clutch, idler pulleys, and blade spindle pulleys.
2. Place 1/2-inch driver and ratchet extension into square hole in PTO belt idler.
3. While pulling PTO belt idler towards the rear of unit, install PTO mower belt on PTO belt idler.
4. Slowly release the tension until PTO belt idler is firmly against PTO belt.

5. Install belt guard on rear of unit.
6. Install left hand belt cover on mower deck.
7. Close footboard (see *MOWER DRIVE BELT AND PTO BELT ACCESS* on page 20).



MOWER DRIVE BELT REMOVAL

Removal (Figure 17)

NOTE: The PTO belt must be removed from blade spindle pulleys prior to removing mower drive belt. The PTO belt does not need to be removed from electric clutch.

1. Remove PTO belt from blade spindle pulleys (see *PTO BELT REMOVAL* on page 20).
2. Remove mower drive belt from right blade spindle pulley and then from center blade spindle pulley.
3. Loosen drive belt idler pivot bolt just enough to gain clearance to remove mower drive belt from under drive belt idler.
4. Remove mower drive belt from unit.

Installation (Figure 17)

1. Install the new mower drive belt on center blade spindle pulley, right blade spindle pulley, and drive belt idler.
2. Tighten drive belt idler pivot bolt.
3. Install PTO belt on blade spindle pulleys (see *PTO BELT REMOVAL* on page 20).

TRANSMISSION BELT REMOVAL

Removal (Figure 18)

1. Remove PTO belt from electric clutch (see *PTO BELT REMOVAL* on page 20).

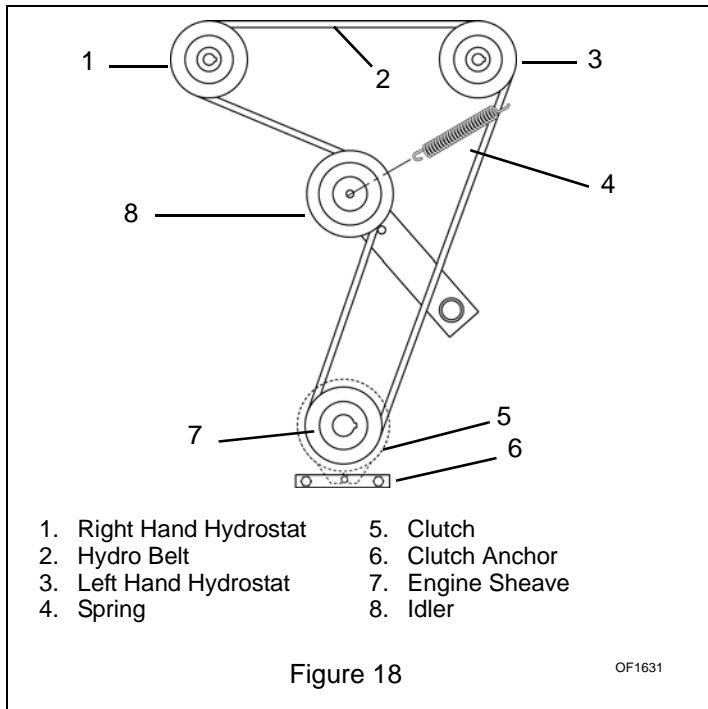


CAUTION: Use care when releasing idler spring tension. Keep body parts well away from idlers when performing this operation.

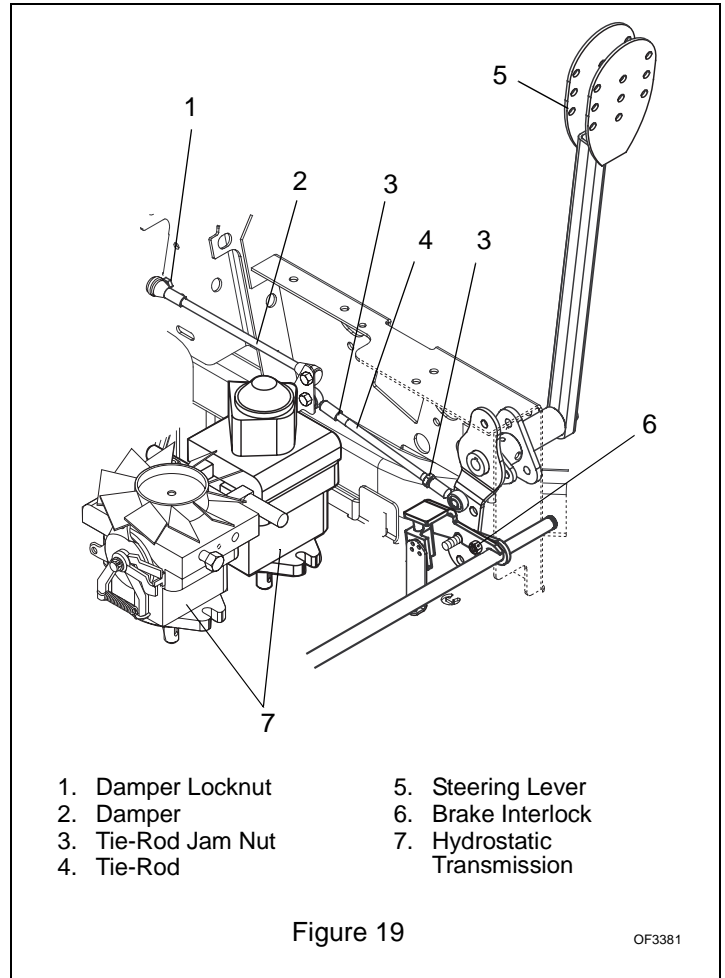
2. Remove clutch anchor.
3. Slowly release the tension on the hydro pump belt idler until all the tension is removed from the springs.
4. Remove old hydro pump belt from right hand hydrostat sheave first.

Installation (Figure 18)

1. Install new hydro pump belt by positioning belt on sheaves. Put belt onto right hand hydrostat sheave last.
2. Replace clutch anchor.
3. Install PTO belt on electric clutch (see *PTO BELT REMOVAL* on page 20).



3. Loosen damper locknut on the same side as the steering lever to be adjusted.
4. Loosen brake interlock on the same side as steering lever to be adjusted.
5. Loosen tie rod jam nut and turn tie rod until steering levers are aligned.
6. Tighten jam nut on tie rod, tighten brake interlock and tighten damper locknut.



STEERING CONTROL NEUTRAL ADJUSTMENT

If the steering levers do not line up (match) or the unit has excessive creeping when the steering levers are in neutral, adjust as follows.

Adjusting the Steering Levers to Line Up (Match) (Figure 19)

1. Shut off engine. Engage parking brake. Remove the ignition key.
2. Place seat in the service position (see *SERVICE POSITIONS* on page 15).

Eliminating Excessive Creeping of the Unit (Figure 19)



WARNING: This adjustment requires operating the engine. Use extreme care to avoid contact with moving parts and hot surfaces. Be sure rear of unit is well supported and secure before starting engine.

1. If hydraulic system is cold, run unit for a minimum of five minutes, then shut off engine.
2. With the unit up to and facing a wall, jack the unit up so that both drive wheels are off the ground.
3. Start the engine and release the parking brake.
4. Move the steering levers from Forward to Reverse several times to make sure controls are free. Then return steering levers to neutral position.
5. Check wheel(s) for movement.
6. Shut off engine.

NOTE: The right and left steering levers are adjusted the same way. To access the tie-rod, place seat in service position.

7. Adjust tie-rod(s):

If the wheel is moving in a forward direction:

- a. Loosen the jam nut on each end of the tie-rod.
- b. Turn tie-rod counterclockwise (lengthening the distance between the steering lever and hydrostatic transmission) several times.

If the wheel is moving in a reverse direction:

- a. Loosen the jam nut on each end of the tie-rod.
- b. Turn tie-rod clockwise (decreasing the distance between the steering lever and hydrostatic transmission) several times.

8. Return seat to operating position.
9. Start engine.
10. Move steering levers from Forward to Reverse several times. Then return steering levers to neutral position.
11. Shut off engine.
12. If wheel is not moving, tighten jam nuts on tie-rod. The adjustment is complete.
13. If wheel is still moving, repeat steps 7 through 12.

ADJUSTING UNIT TO TRACK STRAIGHT



WARNING: Prior to adjusting the tracking of the unit, shut off engine, engage parking brake, and remove the ignition key.

Check and adjust tire pressure. Increase pressure on side unit tracks to. DO NOT exceed maximum recommended tire pressure. See *SPECIFICATIONS* on page 27 for correct tire pressure.

If tire pressure adjustment does not solve tracking problem, adjust the limiter bolts on the stop bracket (figure 20). Front bolts adjust forward and rear bolts adjust reverse. Lengthen the limiter bolt (move closer to lever) on side which is too fast.

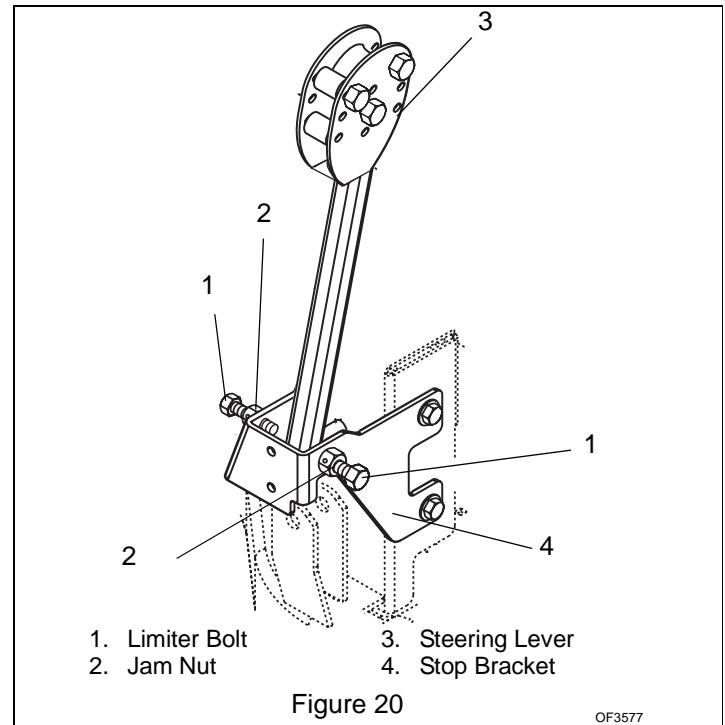


Figure 20

OF3577

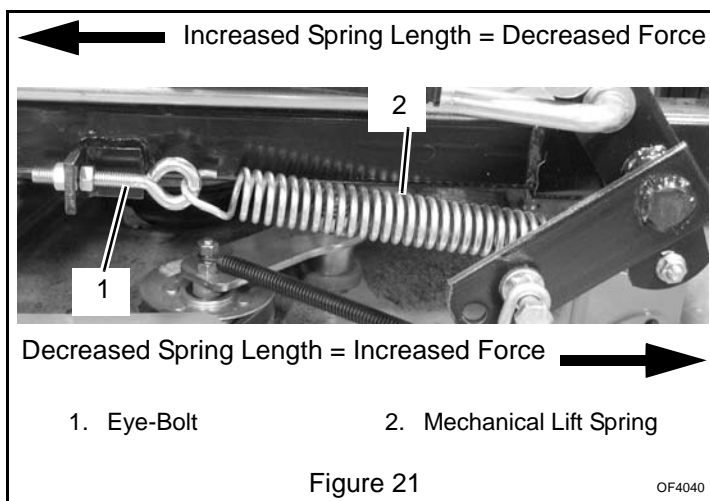
MOWER LIFT PEDAL ADJUSTMENT (992087, 088, 089, 102, 103, 105)

The mower lift pedal can be adjusted to decrease or increase the amount of force required to lift the mower deck.

NOTE: Decreasing the amount of force required to lift the mower deck will increase the mower deck's bouncing. Increasing the amount of force required to lift the mower deck will decrease the mower deck's bouncing.

IMPORTANT: Adjust the mechanical lift spring on each side of the unit to the same length.

- Adjust the eye-bolt to increase the length of the mechanical lift spring which will decrease the amount of force required to lift the mower deck.
- Adjust the eye-bolt to decrease the length of the mechanical lift spring which will increase the amount of force required to lift the mower deck.



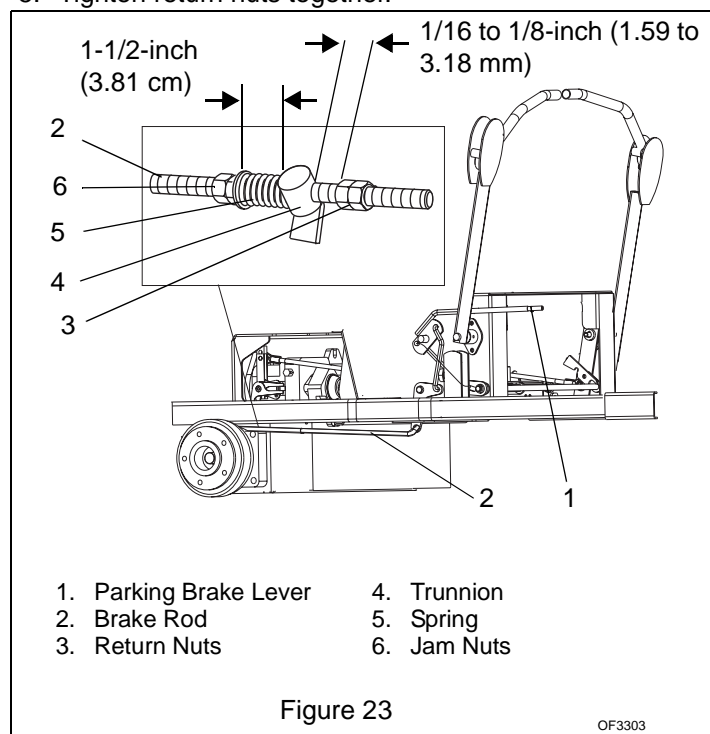
Check Adjustment

NOTE: Be sure to check parking brake on both sides of unit (figure 23).

With parking brake engaged, spring length should measure 1-1/2 in. (3.81 cm) between jam nuts and trunnion and the clearance between return nuts and trunnion should be 1/16 to 1/8 in. (1.59 to 3.18 cm). If the measurements are not within specifications, adjust the parking brake.

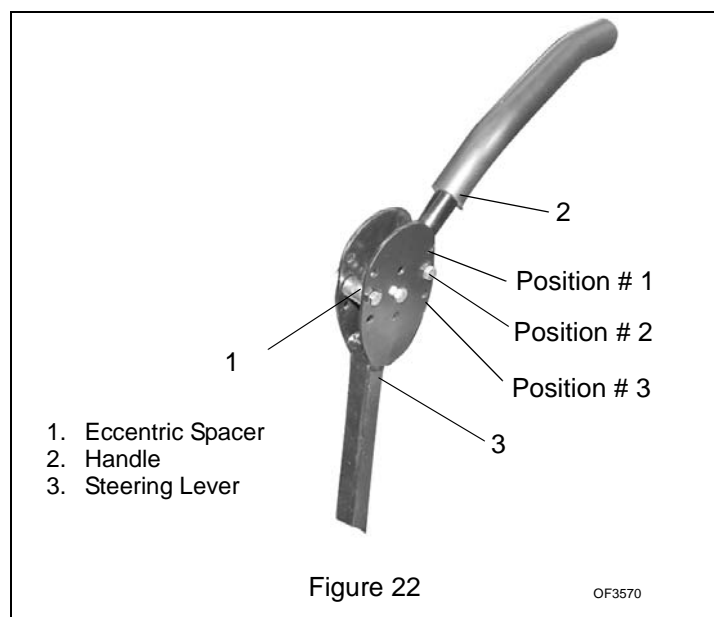
Adjusting the parking brake

1. Engage parking brake.
2. Turn jam nuts clockwise to compress spring or counter clockwise to extend spring until there is 1-1/2 in. (3.81 cm) clearance between jam nuts and trunnion.
3. Tighten jam nuts together.
4. Turn return nuts clockwise to decrease the distance or counter clockwise to increase the distance until there is 1/16 to 1/8 in. (1.59 to 3.18 mm) between return nuts and trunnion.
5. Tighten return nuts together.



STEERING LEVER HANDLE HEIGHT ADJUSTMENT

The handles have three height positions (figure 22).



1. Remove spacer, handle, and eccentric spacer from steering lever.

NOTE: Position the right and left handles at the same height.

2. Install spacer, handle, and eccentric spacer in the appropriate height position. Do not tighten nut holding eccentric spacer.
3. Turn eccentric spacer until the right and left handles are the same height. Tighten nut.

PARKING BRAKE ADJUSTMENT

The parking brake might need adjustment over time and after new brake pads have been installed.

NOTE: After installing new brake pads in calipers, they must be burnished by driving for a short distance (about 100 feet) with the brake on. To do this, bring parking brake lever part-way up while driving normally (in a straight line).

HYDRAULIC OIL SYSTEM



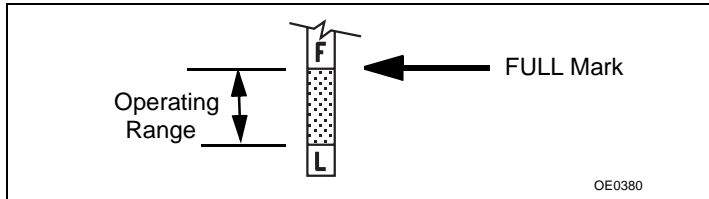
WARNING: HYDRAULIC FLUID can result in severe burns. Fluid in hydraulic system can penetrate skin and result in serious injury or death. Be sure to stop the engine before doing any work on hydraulic parts.

Keep body and hands away from pin holes or nozzles which expel hydraulic fluid when under pressure. Use paper or cardboard, not hands, to search for leaks.

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

FOREIGN FLUID INJECTED INTO BODY can result in gangrene. Fluid must be surgically removed within a few hours by a doctor familiar with this form of injury.

Checking Hydraulic Oil Level



1. Start the unit and run it to operating temperature (about 10 minutes).
2. Cycle the control levers forward and backward two or three times.
3. For units equipped with a hydraulic deck lift, raise and lower the deck completely two or three times.
4. Shut off engine. Engage parking brake. Remove the ignition key.
5. Put hood in service position (see *SERVICE POSITIONS* on page 15).
6. Remove any dirt that may be around the cap/dipstick on the hydraulic reservoir.
7. Remove cap/dipstick.
8. Check hydraulic oil level mark on cap/dipstick.
9. Add 15W50 synthetic oil as needed. Do not overfill.

Changing Hydraulic Oil and Filter

Change the hydraulic oil filter and hydraulic oil every 500 hours. Use Mobil 15W50 synthetic oil for best component life.

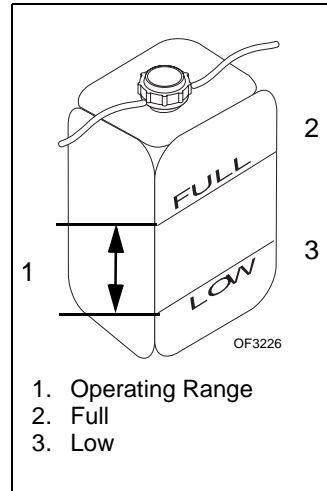
1. Clean around dipstick cap and dipstick. Remove dipstick.
2. Place container under oil filter to catch oil.
3. Remove oil filter.
4. Allow tank to drain.
5. Lubricate rubber gasket on new oil filter with clean hydraulic oil.
6. Spin new oil filter onto filter housing until it makes contact. Tighten oil filter another 1/2 turn.
7. Add new oil to the oil tank. It will take about 4 quarts (4 liters). Use Mobil 15W50 synthetic oil for best pump and wheel motor life.
8. Properly dispose of waste oil.

COOLING SYSTEM (992084, 085, 086, 103, 104, 105, 106, and 108)

Checking Coolant Level



WARNING: To avoid personal injury DO NOT remove radiator cap when engine is hot. Check coolant level at coolant reservoir, not at radiator.



Check coolant level when engine is cold. Check coolant level at overflow reservoir.

1. Place hood in the daily service position (see *SERVICE POSITIONS* on page 15).
2. Check coolant reservoir. Coolant should be between the low and full marks with engine cold.
3. If coolant is below the low mark, remove cap, and add coolant to the full mark. Refer to Engine Manual for the correct type of coolant.

Changing Coolant

Refer to Engine Manual for the correct procedure on when and how to change the coolant.

STORAGE



WARNING: AVOID INJURY. Read and understand entire *Safety* section before proceeding.

SHORT TERM

NEVER spray unit with high-pressure 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 with mild soap and low pressure water and lubricate (see *LUBRICATING UNIT* on page 16). 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.

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTION
Engine does not crank.	<ol style="list-style-type: none"> 1. PTO engaged. 2. Parking brake disengaged. 3. Loose or corroded battery cables. 4. Discharged battery. 5. Faulty starter. 	<ol style="list-style-type: none"> 1. Disengage PTO. 2. Engage parking brake. 3. Clean and tighten battery cables (see <i>SERVICING THE BATTERY</i> on page 16). 4. Charge battery (see <i>Charging the Battery</i> on page 17). 5. See your Gravely Dealer.
Engine cranks but does not start.	<ol style="list-style-type: none"> 1. Fuel tank empty. 2. Faulty spark plug. 3. Air cleaner is plugged or dirty. 4. Fuel filter is dirty. 5. Faulty engine. 	<ol style="list-style-type: none"> 1. Fill fuel tank (see <i>FILLING FUEL TANK</i> on page 12). 2. Replace spark plug. Refer to Engine Manual. 3. Clean or replace air cleaner. Refer to Engine Manual. 4. Clean or replace fuel filter. Refer to Engine Manual. 5. Refer to Engine Manual or see your Gravely Dealer.
Oil Pressure Indicator / High Temperature Indicator is on.	<ol style="list-style-type: none"> 1. Engine oil level low. 2. Coolant level low. 3. Radiator plugged with debris. 4. Faulty radiator. 	<ol style="list-style-type: none"> 1. Check engine oil and add if needed. Refer to Engine Manual for clarification. 2. Check coolant level and add coolant if needed (see <i>Checking Coolant Level</i> on page 24). 3. Check and clean radiator if needed. Refer to Engine Manual. 4. See your Gravely dealer.
Engine continues to run when ignition key is in the 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 your Gravely Dealer.
PTO or mower blades do not engage or shuts off.	<ol style="list-style-type: none"> 1. Operator presence switch not depressed. 2. Faulty PTO switch. 	<ol style="list-style-type: none"> 1. Depress operator presence switch by sitting on seat. 2. See your Gravely Dealer.

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTION
Unit does not drive.	<ol style="list-style-type: none"> 1. Parking brake engaged. 2. Transmission bypass levers open. 3. Hydraulic oil level low. 4. Faulty hydraulic drive system. 	<ol style="list-style-type: none"> 1. Disengage parking brake. 2. Close transmission bypass levers (see <i>MOVING UNIT MANUALLY</i> on page 12). 3. Add hydraulic oil (see <i>Checking Hydraulic Oil Level</i> on page 24). 4. See your Gravely Dealer.

ACCESSORIES

Part No.	Description
78803500	52-Inch Mulching Kit
78803900	52-Inch Bahia/Tall Grass Baffle Kit
79200300	60-Inch Mulching Kit
79200400	60-Inch Discharge Cover Kit
79200900	72-Inch Mulching Kit
79201000	72-Inch Discharge Cover Kit
79201600	60-Inch Bahia/Tall Grass Baffle Kit
79201700	Counterweight Kit
79202000	72-Inch Bahia/Tall Grass Baffle Kit
79202100	Liftmaster Kit
79202300	Hitch Kit
79202400	Anti-Scalp Wheel Kit
79202600	60-Inch and 72-Inch Lawn Striper Kit
79202800	52-Inch Discharge Cover Kit
79203100	52-Inch Lawn Striper Kit
79204000	Eye-Q Engine RPM Kit
79204100	Eye-Q RFID Kit
79204300	Eye-Q Accelerometer Kit
79204400	Eye-Q Temperature Kit
79204600	Eye-Q Scan Mate
79204700	Eye-Q Accessory Wire Harness Kit
79205000	Eye-Q GPS Kit
79205200	24 x 12-12 Bar Style Tire Kit
79201900	Headlight Kit
89200100	Rollover Protection System (ROPS)
89200800	Snow Blower Kit (requires kits 8920100 and 79204500)
89200900	Sweeper Brush Kit (requires kits 8920100 and 79204500)
89201000	Quick Hitch Kit
89201100	Blade Kit (requires kits 8920100 and 79204500)
89201200	60-Inch Bagger

89201300	Debris Blower kit (requires kits 8920100 and 79204500)
89201500	52-Inch Bagger
89201800	52-Inch Bagger (requires kit 79203600)
89201800	60-Inch Bagger (requires kit 79203500)

SERVICE PARTS

Part No.	Qty	Description
01554800	1	Battery
21539600	1	Air Filter Outer Element - Kawasaki
21539700	1	Air Filter Inner Element - Kawasaki
21537000	1	Outer Primary Element - Kohler
21536900	1	Inner Safety Element - Kohler
21536300	1	Element Precleaner - Kohler 25hp
21535800	1	Engine Oil Filter - Kawasaki
21397200	1	Engine Oil Filter - Kohler
09414200	1	Hydraulic Oil Filter
21538500	1	Spark Plug - Kawasaki (9920084, 085, 086, 103, 104, 105, 106, 108)
21536100	2	Spark Plug - Kawasaki (992045, 046, 066, 067, 088, 102)
21525900	2	Spark Plug - Kohler
07240700	1	52-Inch PTO Belt
07241300	1	60-Inch PTO Belt
07242300	1	72-Inch PTO Belt
07222300	1	52-Inch Mower Drive Belt
07235000	1	60-Inch Mower Drive Belt
07237700	1	72-Inch Mower Drive Belt
07242000	1	Transmission Belt
04916400	1	52-Inch Mower Blade
04917900	1	52-Inch Mower Blade, Mulching
09081200	1	60-Inch Mower Blade
08866900	1	60-Inch Mower Blade, Mulching
09290500	1	72-Inch Mower Blade
09290600	1	72-Inch Mower Blade, Mulching
09212200	1	Cylinder Stop 11/32 in. (8.73 mm)
09212300	1	Cylinder Stop 11/16 in. (17.5 mm)

SPECIFICATIONS

Model Number	992045	992046	992047	992052	992066	992067	992068	992071
Model	PM252Z	PM260Z	PM260Z	PM252Z	PM252Z	PM260Z	PM260Z	PM252Z
Eye-Q	Optional				Standard			
Engine								
Engine	Kawasaki		Kohler		Kawasaki		Kohler	
Engine Model Number	FH721V		CV740S		FH721V		CV740S	
Engine Power – hp (kW) at Maximum RPM	25 (18.6)		27 (20.1)		25 (18.6)		27 (20.1)	
Governed RPM (May be different from maximum RPM)	3600	3700		3600		3700		3600
Liquid or Air Cooled	Air							
Cooling System Capacity	NA							
Speed								
Forward Maximum – mph (km/h)	13 (20.8)							
Reverse Maximum – mph (km/h)	6 (9.6)							
Turning Radius	Zero							
Brakes	Hydro/Dynamic Drum – Parking							
Electrical								
Starter	Electric							
Battery	12-Volt Maintenance Free							
Power Take-Off	Electric PTO Clutch/Brake							
Fuel								
Fuel Type	Refer to Engine Manual							
Fuel Tank Capacity – gal. (L)	14 (53)							
Transmission								
Type	Hydrostatic Drive							
Transmission Oil	Mobil 1 15W-50 Synthetic							
Hydraulic System Capacity – qt (L)	4.8 (4.5)							
Hydraulic Oil Filter	Yes							
Size and Weight								
Length – in. (cm)	80 (203)							
Width – in. (cm)	65 (165)	73 (185)		65 (165)		73 (185)		65 (165)
Height – in. (cm)	50 (127)							
Height with ROPS – in. (cm)	75 (190)							
Weight – lbs (kg)	1050 (476)	1125 (510)		1050(476)		1125 (510)		1050 (476)
Tires								
Front Tire Size – in. (cm)	15 x 6 -6 (38 x 15 -15)							
Rear Tire Size – in. (cm)	24 x 12 -12 (61 x 30 -30)							
Front Tire Pressure – psi (kPa)	20 -25 (138 - 172)							
Rear Tire Pressure – psi (kPa)	12 -15 (83 -103)							
Mower Deck								
Mower Deck Lift	Hydraulic							
Cutting Width – in. (cm)	52 (132)	60 (152)		52 (132)		60 (152)		52 (132)
Cutting Height – in. (cm)	1 - 5 (2.5 - 12.7)							
Cutting Height Increments – in. (cm)	1 to 5 (2.5 to 12.7)							
Maximum Towing Capacity – lbs (kg)	500 (227)							
Maximum Tongue Weight – lbs (kg)	50 (23)							

SPECIFICATIONS

Model Number	992084	992085	992086	992087	992088	992089	992091	992102
Model	PM252Z	PM260Z	PM272Z	PM252Z	PM260Z	PM260Z	PM272Z	PM252Z
Eye-Q	Standard			Optional			Standard	Optional
Engine								
Engine	Vertical Liquid Cooled Kawasaki			Kohler	Kawasaki	Kohler	Kohler Electronic Fuel Injection	Kawasaki
Engine Model Number	FD731V			CV740S	FH721V	CV740S	CV74SS	FH721V
Engine Power – hp (kW) at Maximum RPM	26 (19.4)			27 (20.1)	25 (18.2)	27 (20.1)	28 (20.9)	25 (18.2)
Governed RPM (May be different from maximum RPM)	3600	3700		3600	3700			3600
Liquid or Air Cooled	Liquid			Air				
Cooling System Capacity	Refer to Engine Manual			NA				
Speed								
Forward Maximum – mph (km/h)	13 (20.8)							
Reverse Maximum – mph (km/h)	6 (9.6)							
Turning Radius	Zero							
Brakes	Hydro/Dynamic Drum – Parking							
Electrical								
Starter	Electric							
Battery	12-Volt Maintenance Free							
Power Take-Off	Electric PTO Clutch/Brake							
Fuel								
Fuel Type	Refer to Engine Manual							
Fuel Tank Capacity – gal. (L)	14 (53)							
Transmission								
Type	Hydrostatic Drive							
Transmission Oil	Mobil 1 15W-50 Synthetic							
Hydraulic System Capacity – qt (L)	4.8 (4.5)							
Hydraulic Oil Filter	Yes							
Size and Weight								
Length – in. (cm)	80 (203)							
Width – in. (cm)	65 (165)	73 (185)	85 (216)	65 (165)	73 (185)	73 (185)	85 (216)	65 (165)
Height – in. (cm)	50 (127)							
Height with ROPS – in. (cm)	75 (190)							
Weight – lbs (kg)	1066 (484)	1141 (518)	1066 (484)	1042 (473)	1119 (508)			1042 (473)
Tires								
Front Tire Size – in. (cm)	15 x 6 -6 (38 x 15 -15)							
Rear Tire Size – in. (cm)	24 x 12 -12 (61 x 30 -30)							
Front Tire Pressure – psi (kPa)	20 -25 (138 - 172)							
Rear Tire Pressure – psi (kPa)	12 -15 (83 -103)							
Mower Deck								
Mower Deck Lift	Hydraulic			Mechanical			Hydraulic	Mechanical
Cutting Width – in. (cm)	52 (132)	60 (152)	72 (183)	52 (132)	60 (152)		72 (183)	52 (132)
Cutting Height – in. (cm)	1 - 5 (2.5 - 12.7)							
Cutting Height Increments – in. (cm)	1 to 5 (2.5 to 12.7)							
Maximum Towing Capacity – lbs (kg)	500 (227)							
Maximum Tongue Weight – lbs (kg)	50 (23)							

SPECIFICATIONS						
Model Number	992103	992104	992105	992106	992107	992108
Model	PM252Z	PM252Z	PM260Z	PM260Z	PM272Z	PM272Z
Eye-Q	Optional					
Engine						
Engine	Vertical Liquid Cooled Kawasaki				Kohler Electronic Fuel Injection	Vertical Liquid Cooled Kawasaki
Engine Model Number	FD731V				CV74SS	FD731V
Engine Power – hp (kW) at Maximum RPM	26 (19.4)				28 (20.9)	26 (19.4)
Governed RPM (May be different from maximum RPM)	3600		3700			
Liquid or Air Cooled	Liquid				Air	Liquid
Cooling System Capacity	Refer to Engine Manual			NA		
Speed						
Forward Maximum – mph (km/h)	13 (20.8)					
Reverse Maximum – mph (km/h)	6 (9.6)					
Turning Radius	Zero					
Brakes	Hydro/Dynamic Drum – Parking					
Electrical						
Starter	Electric					
Battery	12-Volt Maintenance Free					
Power Take-Off	Electric PTO Clutch/Brake					
Fuel						
Fuel Type	Refer to Engine Manual					
Fuel Tank Capacity – gal. (L)	14 (53)					
Transmission						
Type	Hydrostatic Drive					
Transmission Oil	Mobil 1 15W-50 Synthetic					
Hydraulic System Capacity – qt (L)	4.8 (4.5)					
Hydraulic Oil Filter	Yes					
Size and Weight						
Length – in. (cm)	80 (203)					
Width – in. (cm)	65 (165)		73 (185)		85 (216)	
Height – in. (cm)	50 (127)					
Height with ROPS – in. (cm)	75 (190)					
Weight – lbs (kg)	1058 (480)	1066 (484)	1133 (514)	1141 (518)	1125 (510)	1191 (540)
Tires						
Front Tire Size – in. (cm)	15 x 6 -6 (38 x 15 -15)					
Rear Tire Size – in. (cm)	24 x 12 -12 (61 x 30 -30)					
Front Tire Pressure – psi (kPa)	20 -25 (138 - 172)					
Rear Tire Pressure – psi (kPa)	12 -15 (83 -103)					
Mower Deck						
Mower Deck Lift	Mechanical	Hydraulic	Mechanical	Hydraulic		
Cutting Width – in. (cm)	52 (132)		60 (152)		72 (183)	
Cutting Height – in. (cm)	1 - 5 (2.5 - 12.7)					
Cutting Height Increments – in. (cm)	1 to 5 (2.5 to 12.7)					
Maximum Towing Capacity – lbs (kg)	500 (227)					
Maximum Tongue Weight – lbs (kg)	50 (23)					



Gravely Division of Ariens Company
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920-756-2141
Fax 920-756-2407
www.gravely.com

2-Year Limited Warranty

Gravely Division of Ariens Company (Gravely) 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

Gravely will repair or replace any part found upon examination by Gravely 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 and minor adjustments per the operator's manual.
- The purchaser must notify Gravely 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

- Returning the product registration card to Gravely will enable the company to contact the registrant with repair or replacement part information.

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 an authorized Gravely service representative, contact Gravely at the website, number or address above.

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.

Gravely may from time to time change the design of its products. Nothing contained in this warranty shall be construed as obligating Gravely 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

Gravely'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 Gravely 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

Gravely 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 Gravely, any such implied warranty is limited to the duration of this express warranty.

Form: GLW2-122002



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WARNING



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