



# Professional 2-Wheel Tractor

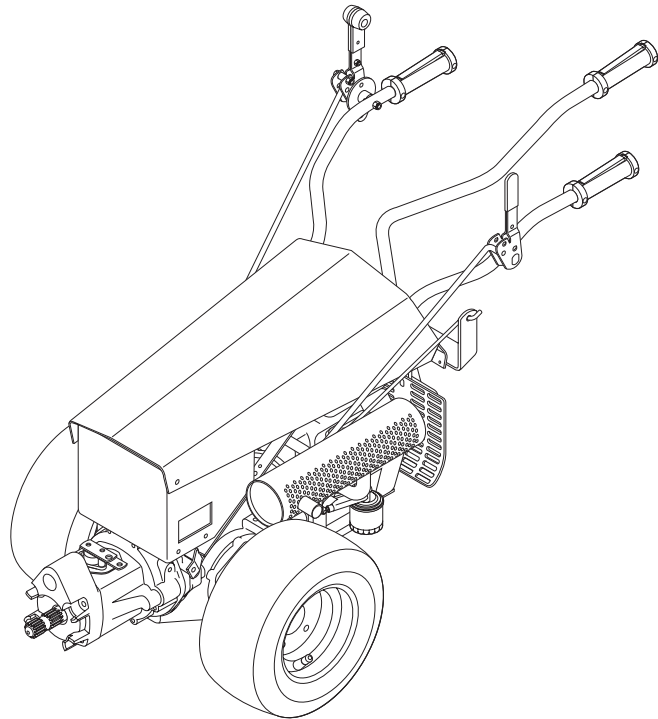
## Owner/Operator Manual

### Models

985114 - 16 HP

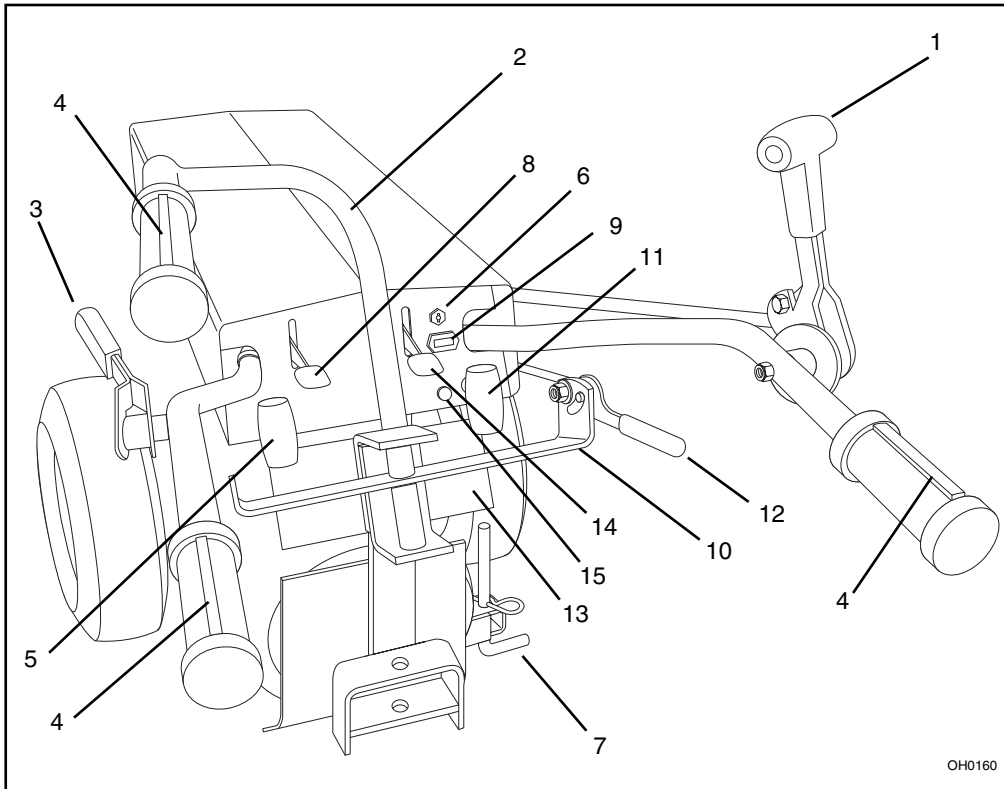
985115 - 8.5 HP

985117 - 13.5 HP



08468600E 6/00  
Supersedes 08468600,A-D  
Printed in USA

## CONTROLS AND FEATURES



### ENGLISH

1. Direction Control Lever
2. Steering Brake Handlebar
3. Gear Shift Lever (Hi/Low Gear)
4. Operator Presence Control
5. PTO Control
6. Ignition Switch
7. Kick Stand
8. Throttle Control
9. Hourmeter
10. Brake Handle Cross Bar
11. Range Shift Handle (Two Speed Axle)
12. Parking Brake Handle (Optional on 8.5HP)
13. Instruction Plate
14. Choke Lever (Robin)
15. Choke Control Knob (Briggs & Stratton)

### **⚠ WARNING ⚠**

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

OL4030

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## INTRODUCTION

### THE MANUAL

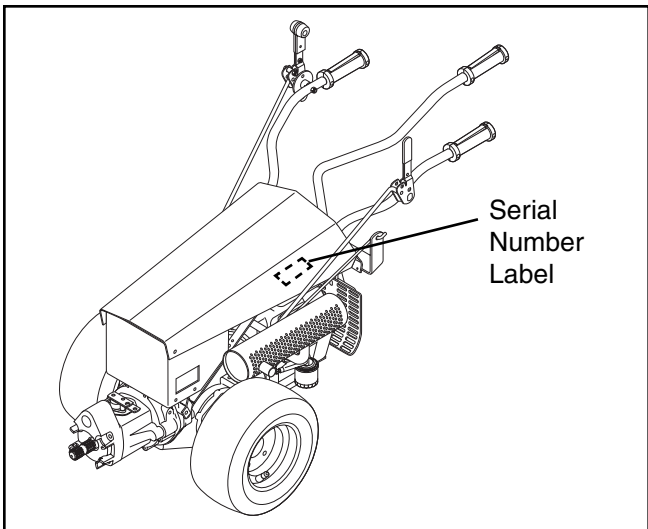
Before operation of unit, carefully and completely read your manuals. The contents will provide you with an understanding of safety instructions and controls during normal operation and maintenance.

All reference to left, right, front, or rear are given from operator standing 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 also printed on a serial number label, located on the frame of your unit.



- Record Engine Model and Serial numbers here.

### PRODUCT REGISTRATION

A warranty registration card must be filled out, signed, and returned at time of purchase. This card activates the warranty. Claims meeting requirements during limited warranty period will be honored.

### UNAUTHORIZED REPLACEMENT PARTS

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

# 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 symbol is used in decals on the unit and with proper operation procedures in this manual. Understand the safety message. It contains important information about personal safety on or near the unit.



**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

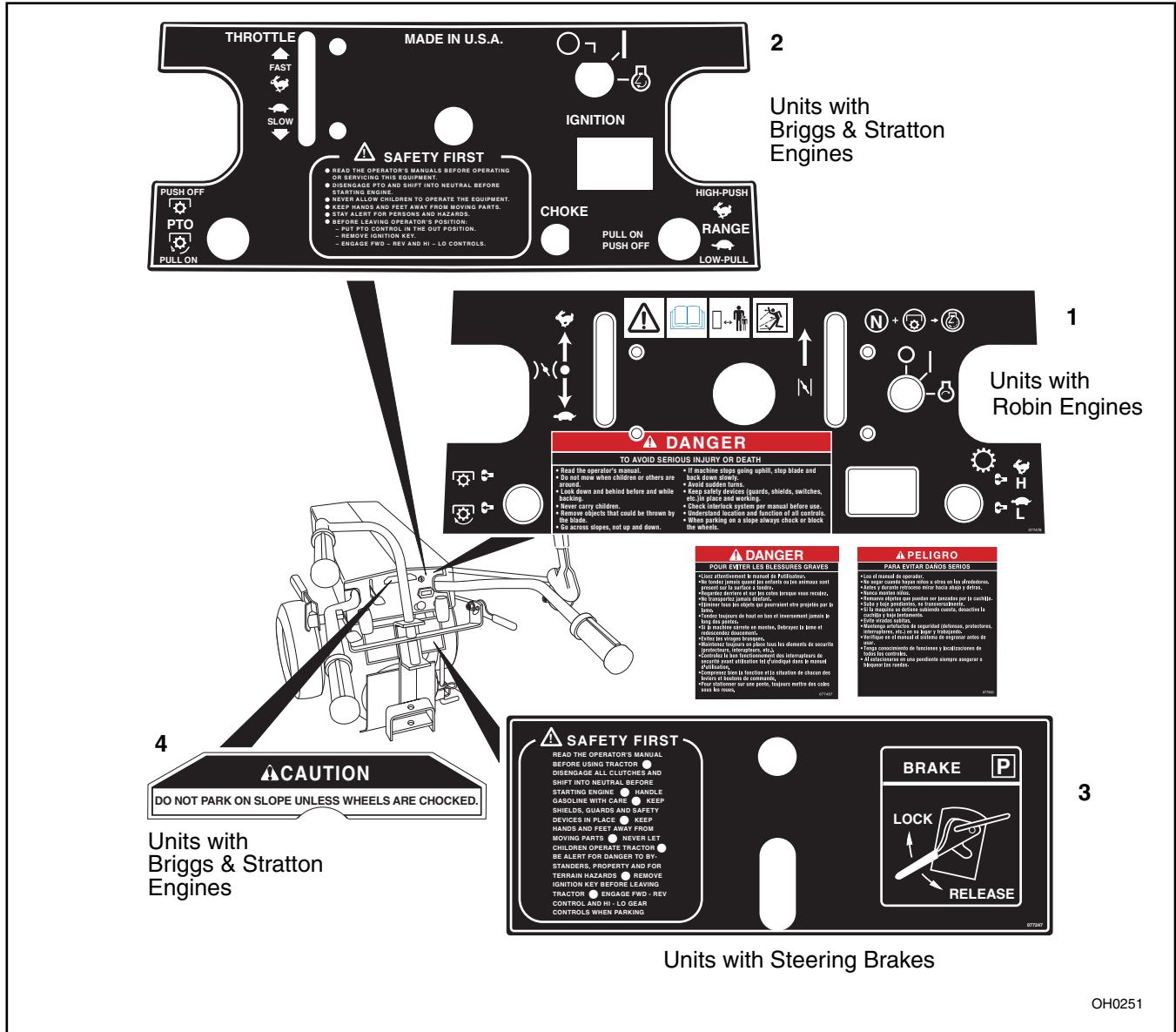
Practice usual and customary safe working precautions, for the benefit of yourself and others. Understand and follow all safety messages. Be alert to unsafe conditions and the possibility of minor, moderate, or serious injury or death. Learn applicable rules and laws in your area.

## 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 below for Safety Decal locations.



## 1. DANGER! To avoid serious injury or death.

- Never carry children.



Read Operator's Manual.



Remove objects that could be thrown by the blade.



Do not mow when children or others are around.

- Look down and behind before and while backing

- Go across slopes, not up and down.
- 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.
- When parking on a slope always chock or block the wheels.

## 2. Safety First

- Read the operator's manuals before operating or servicing this equipment.
- Disengage the PTO and shift into neutral before starting engine.
- Never allow children to operate the equipment.
- Keep hands and feet away from moving parts.
- Stay alert for persons and hazards.
- Before leaving operator's position:
  - Put PTO control in the out position.
  - Remove ignition key.
  - Engage FWD-REV and Hi-Lo controls.

## 3. Safety First

- Read the operator's manuals before using tractor.
- Disengage all clutches and shift into neutral before starting engine.
- Handle gasoline with care.
- Keep shields, guards and safety devices in place.
- Keep hands and feet away from moving parts.
- Never let children operate tractor.
- Be alert for danger to bystanders, property and for terrain hazards.
- Remove ignition key before leaving tractor.
- Engage FWD-REV control and Hi-Lo gear controls when parking.

## 4. CAUTION

Do not park on slope unless wheels are chocked.

## SAFETY RULES

### Preparation

Improper use of this tractor can injure people and damage the equipment. People using or servicing this tractor must read and follow the instructions in this manual.

It is important to understand that this manual and any other Gravely instruction manuals do not cover every possible danger. It is impossible for Gravely to know of all possible dangers in operating and servicing the tractor and attachments.

The purchaser must give these instructions to the people operating and maintaining this tractor. These people must use eye and foot protection.

Read this manual, the attachment manual and the engine manual carefully before operating unit.

Learn the location and function of all controls.

Know how to stop in an emergency.

Understand and follow each danger, warning, caution and instruction decal installed on this product.

Never permit children to operate the unit. Do not allow adults to operate it without proper instruction.

Safe operation of this equipment requires your complete and unimpaired attention at all times. Do not operate unit after or during the use of drugs or alcohol.

Keep all people and animals away from the operating area.

Use caution with gasoline. Gasoline is very flammable and its vapors are explosive. Keep it in a clean, tight and approved (Red) container. Never put gasoline in the fuel tank while the engine is running or hot. Clean up spilled gasoline before starting engine. Do not fill fuel tank indoors. Never allow smoking materials, sparks or flame (match, pilot light, etc.) near mower or fuel container. Replace fuel tank cap and fuel container cap securely.

Inspect area of operation and remove all material which could be thrown by the attachment such as stones, sticks, wires and other foreign objects.

When transporting the unit, connect the chassis to the transport vehicle. Never secure by control levers, rods, or like items that could be damaged.

Replace all parts that become damaged or lost.

Wear hand, foot, head, ear and eye protection. Do not wear loose clothing which might get caught in rotating parts.

## Operation

Be certain that all shields, guards, and interlock switches are in the correct position and operating properly.

Before starting the engine, put the PTO lever in the "OFF" position and the gear shift lever in the neutral "N" position.

Check the operation of the operator presence controls before operating the tractor. With either the PTO or the direction control lever engaged, the engine should run only if at least one of the operator presence switches is depressed.

Do not use the equipment in the dark without adequate lighting.

Keep away from moving parts. Stay clear of the attachment when the engine is running.

Do not let people other than the operator near the operating equipment. Never direct discharge of material towards bystanders. The operator is responsible for the safety of bystanders.

Operate the attachment only on safe surfaces as prescribed in the attachment manual. Disengage the attachment drive when moving the tractor to and from work areas.

Use a slow speed and engage the shift lever slowly when operating on slopes.

Travel across slopes, not up and down. Use extreme caution when changing direction on slopes. Do not operate on steep slopes.

Look for and keep away from hazards such as drop-offs. Stay alert for holes, rocks and other hidden hazards in the area of operation.

After hitting an object, disengage the PTO, turn off and remove the ignition key and wait for all motion to stop. Check for damage. Repair any damage before restarting unit.

Look behind when operating in reverse. Look for people and hazards.

Operate only from the operator's position just behind the handlebars.

If there is a sudden change in the sound or vibration of the equipment, disengage the PTO, turn off and remove the ignition key, wait for all motion to stop and check for damage. Repair any damage or failure before restarting unit.

Never run the engine indoors except to move it outside. Exhaust fumes are dangerous.

Go slowly on slick surfaces. Always be sure of your footing, keep a firm grip on the handlebars and walk, never run.

Follow traffic laws when operating on or near a road.

Before leaving the operator's position, put the PTO lever in the "OFF" position, turn off and remove ignition key. Move the shift control to first gear position.

Do not touch parts which might be hot from operation. Before attempting to maintain, adjust or service allow hot parts to cool.

## Maintenance and Storage

Keep the equipment in good condition. Maintain it as directed in this manual. Check all hardware at regular intervals.

Use only Gravely accessories, attachments and replacement parts.

Do not overspeed the engine. Do not override the governor.

Before making any repairs or adjustments, disengage the PTO, turn off and remove the ignition key and wait for all motion to stop.

To reduce fire hazard and overheating, keep equipment free of grass, leaves, debris or excessive lubricants.

Worn out mufflers can result in fire or explosion and should be replaced immediately.

Never store equipment with gasoline in tank inside a building where fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.

Refer to *Storage* if unit is to be stored for extended periods.

## SPARK ARRESTER

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

# ASSEMBLY

## TOOLS REQUIRED

Phillips Screwdriver, Needle Nose Pliers, Open-End Wrench: 3/8, 7/16, 9/16 & 3/4 and or Adjustable Wrench

## REMOVE UNIT FROM CARTON

Remove the unit and components from the shipping container.

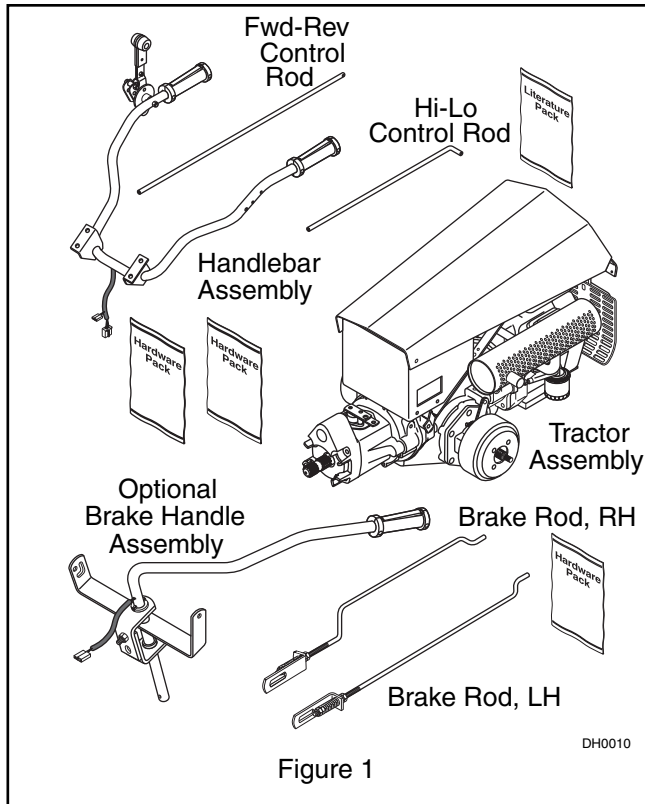
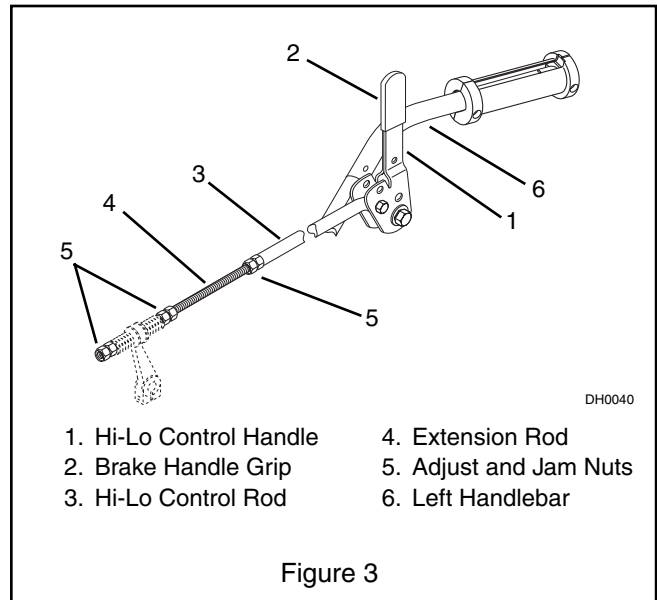


Figure 1

DH0010

## Position Handlebar

1. Disconnect Ignition Harness.
2. Position the handlebar right side up.
3. Move the left handle of the handlebar under the right side of the frame, across the engine and out between the left side of the frame and the PTO control.
4. Rotate the handlebar into the mounting position.
5. Reconnect ignition harness.
6. Retain the handlebar in position with four 3/8-16 x 1.25 bolts and locknuts and tighten hardware (Figure 2).
7. Connect the wiring harness from handlebar to the unit.
8. Mount the Hi-Lo gear control handle assembly and pivot to the left handlebar with a 1/2-13 x 3.50 bolt, locknut, and washer (Figure 3).

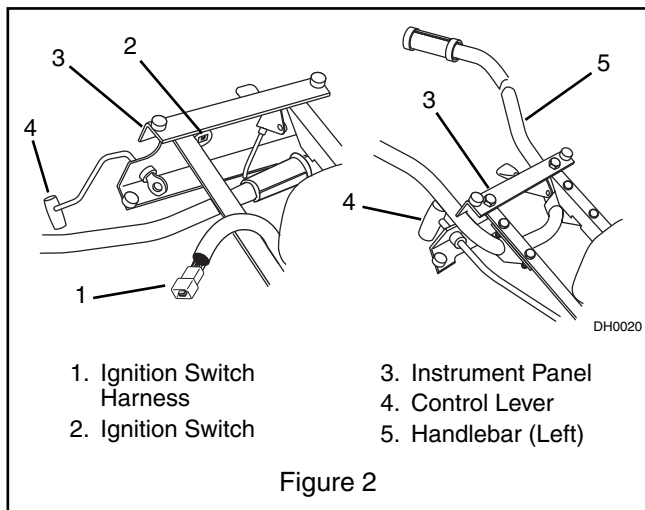


- |                         |                        |
|-------------------------|------------------------|
| 1. Hi-Lo Control Handle | 4. Extension Rod       |
| 2. Brake Handle Grip    | 5. Adjust and Jam Nuts |
| 3. Hi-Lo Control Rod    | 6. Left Handlebar      |

Figure 3

DH0040

## ASSEMBLY



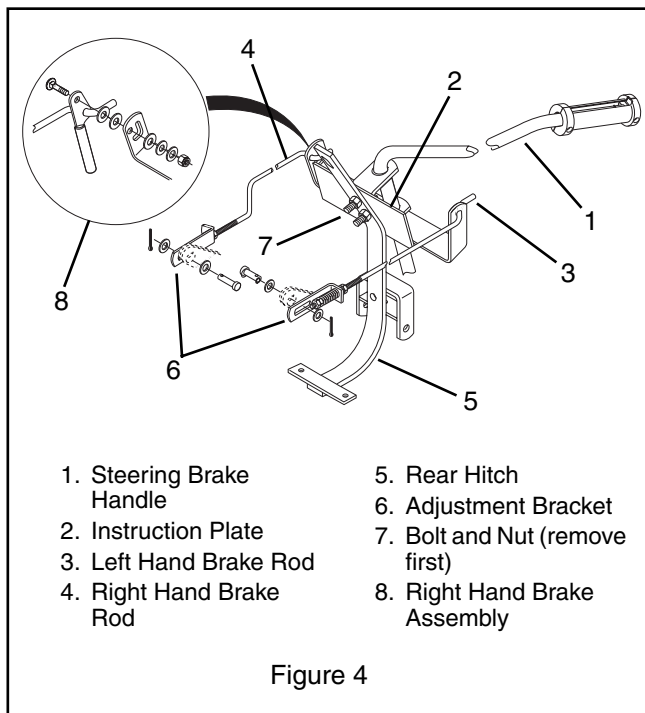
- |                            |                     |
|----------------------------|---------------------|
| 1. Ignition Switch Harness | 3. Instrument Panel |
| 2. Ignition Switch         | 4. Control Lever    |
|                            | 5. Handlebar (Left) |

Figure 2

DH0020



## Assemble Steering Brakes (Optional)



1. Remove nut and bolt from handle brackets. (Figure 4)

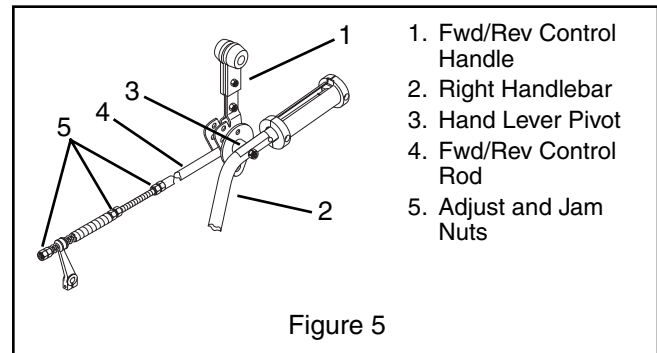
### Left Hand Rod:

2. Hook the rear of the left hand brake rod into the left side of the brake handle weldment. Before installing on hitch, place the forward end of the left hand brake rod below muffler brace.
3. Connect the forward end to the pivot plate with a .375 x .75 clevis pin, (2) .406 x .812 x .065 flat washers and a .09 x .75 cotter pin. Insert clevis pin with cotter pin to the outside of adjustment bracket. (Figure 4)

### Right Hand Rod:

1. Hook the rear of the right hand brake rod into the right outside end of the brake handle weldment.
2. Place the carriage bolt through the brake handle
3. Put two nylon washers on the bolt between the handle and the handlebar weldment
4. Retain with another nylon washer, rubber washer, steel washer and lock nut. (Figure 4)
5. Connect the adjustment bracket to the cam lever arm with a clevis pin, two .406 x .812 x .065 flat washers and .09 x .75 cotter pin.
6. Push brake handle grip onto handle.
7. Connect the interlock plug to the wiring harness.
8. Fasten the instruction plate and the brake handle brackets to the rear hitch with the nut and bolt just removed and an additional 1/2-13 bolt and locknut.
9. Adjust brakes per *Adjustments*.

## Connect Gear Shift and Directional Control Rods



Connect the Fwd/Rev and Hi-Lo gear control rods to the tractor and their respective handles using bushings, 1/4-20 x 1.5 bolts, .281 x .625 x .065 x flat washers and 1/4-20 locknuts. See the gear shift control and direction control. (Figure 1) and (Figure 5) Adjust per Owner/Operator Manual.

## Install Hubs and Wheels

For Semi-Pneumatic Wheels: install bushings and wheel/hub assemblies onto tractor axles. For all other wheels: install hubs to axles and secure wheels to hubs with hardware provided.

## Install Attachment(s)

Install each attachment following instructions provided.

## Charge Battery

See Service Battery in *Maintenance*.

## Fill Engine Fuel Tank

Add clean fuel to fuel tank. See Engine Manual for correct type and capacity.

## Check Engine Oil

Check and add oil if needed. See Engine Manual for specifications.

## Check Safety Interlock System



**WARNING:** FAILURE OF INTERLOCK, together with improper operation could result in death or serious injury.

## Lubricate Pivot Points

Put a drop of engine oil on the pivots of the throttle lever, the direction control lever, the gear shift lever, the PTO control, and range shift handle.

## Check Function of all Controls



**WARNING:** FAILURE OF CONTROLS could result in death or serious injury.

Ensure unit runs and performs properly.

# OPERATION

## CONTROLS AND FEATURES

**NOTE:** Read the attachment(s) and tractor manuals before operating the equipment. Operate the tractor only from the operator's position, behind the handlebars. Service the tractor and attachment before operating.

Refer to Controls and Features for the following.



### Direction Control Lever

The direction control lever controls the movement of the tractor. Push the control forward to go forward. Pull the control back to move the tractor backwards.



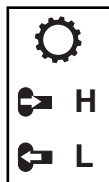
### Gear Shift Lever

The gear shift lever has two operating positions. The forward ("HIGH") position is the fast gear. The rearward ("LOW") position is the slow gear.

The gear shift lever also controls the PTO speed. The forward ("HIGH") position is the fast PTO speed. The rearward ("LOW") position is the slow PTO speed.

**NOTE:** The gear shift lever must be in the neutral position to engage PTO lever.

**NOTE:** The gear shift lever must be in the "HIGH" or "LOW" position to properly transmit power to the PTO or wheels.



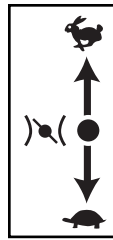
### Range Shift Handle

The range shift handle has two operating positions. Pull the handle to the rearward ("LOW") position for the slow speed. Push the handle to the forward ("HIGH") position for the fast speed.

Rock the tractor back and forth by moving the direction control lever back and forth while moving the range shift handle helps align the clutch teeth to engage the two-speed axle.

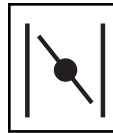


**WARNING:** Never move the range shift handle while on a slope or while the tractor is moving. Move the handle only when the tractor is on level ground and stopped (except for rocking to engage the clutch as described above).



### Throttle Lever

The throttle lever is used to control the engine speed. To increase the engine speed, move the lever up to the "FAST" position. To decrease the engine speed, move the lever down to the "SLOW" position.



### Choke Control

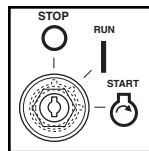
The choke control is used to choke a cold engine for starting. The choke control is located on the instrument panel. On 8.5HP and 13.5HP tractors, push the choke lever

up to the "ON" position to choke the engine. On all other tractors, pull the choke control knob out to the "ON" position to choke the engine.



### PTO Control

The PTO control is used to connect or disconnect the engine power to an attachment. The forward position is "OFF"; the rearward position is "ON".



### Ignition Switch

The ignition switch is used to start (electric start models) and stop the engine.

### Hourmeter

The hourmeter shows total time which the ignition switch has been in the "ON" position.

### Fuse

Electric start models have a fuse to protect the electrical system.

### Kick Stand

The kick stand is used to hold the tractor level when there is no attachment on the tractor. The kick stand must be in the raised position when moving the tractor.

### Brake Handlebar

On tractors with steering brakes, the brake handlebar is used to steer the tractor. Swing the brake handlebar left for a right turn or right for a left turn.

### Parking Brake

The parking brake is used to hold the tractor in position when not in use.

## FILL FUEL TANK



**WARNING:** Use caution with fuel. Fuel is very flammable. Keep fuel in a clean and tight container. Keep fuel away from fire or heat. Never put fuel in the fuel tank while the engine is running or hot. Clean up any spilled fuel before starting the engine.

Add fuel to the fuel tank as needed. See engine manual for the correct type and grade of fuel.

1. Put the unit in an open area.
2. Stop the engine and lock the brake.
3. Clean the fuel cap and the area around the fuel cap to prevent dirt from entering the fuel tank.
4. Remove the cap from the fuel tank.
5. Fill the fuel tank. Be careful not to spill the fuel.
6. Install the cap on the fuel tank and tighten.
7. Clean up any spilled fuel before starting the engine.

## SAFETY INTERLOCK SYSTEM

One of the operator presence control levers must be depressed so the power take off (PTO) or direction control lever can be operated.



**CAUTION:** The operator presence control is to protect the operator from the moving parts of the attachment and the powered moving of the equipment. Operate the equipment only when the operator presence control is in working condition.

## TO STOP IN AN EMERGENCY

1. Turn the ignition key to "Off".
2. Move the HI/LO to the "NEUTRAL" position and the PTO control to the "OFF" position.
3. Wait for all moving parts to stop before leaving the operator's position.

## TO START AND SHUT OFF ENGINE

### Before Each Use

Check each item in "Before Each Use" in the Maintenance Schedule.

### Manual Start

1. Move the direction control lever to the "NEUTRAL" position.
2. Ensure the PTO control is in the "OFF" position and the gear shift lever is in the "NEUTRAL" position.
3. Put the key in the ignition switch and turn it to the "ON" position.

4. If the engine is cold, apply the choke. See Engine Manual for detailed instructions.
5. Set the throttle to the proper starting position. After the engine starts, adjust the choke as needed.
6. Pull the starter handle out until compression is felt in the engine. Then pull with one swift continuous motion. Hold the starter handle to allow a slow rewind of the rope.
7. If the engine does not start after six pulls of the starter, see *Troubleshooting*.

## Electric Start Engine

1. Move the direction control lever to the "NEUTRAL" position.
2. Ensure the PTO control is in the "OFF" position and the gear shift lever is in the "NEUTRAL" position.
3. If the engine is cold, apply the choke. See Engine Manual for detailed instructions.
4. Set the throttle to the proper position. After the engine starts, adjust the choke as needed.
5. Put the key in the ignition switch. Turn the key to the "START" position. When the engine starts, release the key.
6. NOTE: Do not operate the starter for more than 15 seconds. Allow 45 seconds for cooling before operating the starter again.
7. If the engine does not start after six tries, see *Troubleshooting*.

## Stopping the Engine

1. Move the direction control lever to the "NEUTRAL" position.
2. Move the throttle control to the "SLOW" position.
3. Move the HI/LO to the "NEUTRAL" position and the PTO control to the "OFF" position.
4. Turn the ignition key to the "OFF" position. Remove the ignition key before leaving the tractor.

## TO OPERATE UNIT

### Operating the Transmission

Learn to operate the tractor in an open area while using a slow gear and slow engine speed.

1. Start the engine.
2. Move the gear shift lever to the "HIGH" or "LOW" position.
3. Move the range shift handle to the "HIGH" or "LOW" position.
4. Move the throttle lever above the "SLOW" position (fast enough so that the engine will not stall).
5. Depress an operator presence handle.

**NOTE:** One of the operator presence control levers must be held down at all times whenever the transmission is in gear and/or the PTO lever is in the "ON" position.

6. To go forward, move the direction control lever forward until the lever stays in the forward position. If the lever is not in the full forward position, the clutch will slip and cause premature clutch wear.
7. To move backward, hold the direction control lever to the rear. The lever will return to "NEUTRAL" when released.
8. To stop the tractor, put the direction control lever in the "NEUTRAL" position. If the PTO is off, you can release the operator presence handle.

## USING THE PTO

### To Engage PTO:

1. Start the engine.
2. After the engine is warm, move the throttle lever just above the "SLOW" position.
3. Move the gear shift lever to the "NEUTRAL" position. Depress an operator presence handle.
4. Pull the PTO control back to the "ON" position with one continuous, fast pull.
5. Move the throttle lever to the "FAST" position.
6. Move the gear shift lever to the "HIGH" or "LOW" position.

**NOTE:** The gear shift lever must be in either the "HIGH" or "LOW" position to properly power the attachment.

7. Operate the direction control lever for desired travel.

### To Disengage PTO:

1. Stop the tractor with the direction control lever.
2. Move the throttle lever to the "SLOW" position.
3. Move the gear shift to the "NEUTRAL" position.
4. Push the PTO control in (forward) to the "OFF" position.

## Using the Steering Brakes (optional)

The steering brakes are used when the tractor is being driven forward.

To make a right turn, push the brake handlebar to the left.

To make a left turn, pull the brake handlebar to the right.



**CAUTION:** Use only the tractor handlebars to steer when driving in reverse.

## To Travel to Another Work Area

1. Disengage PTO.

2. Reduce engine speed.
3. Travel forward to other work area.

## PARKING

1. Stop the unit on level ground.
2. Put the PTO lever in the "OFF" position.
3. Turn off and remove ignition key.
4. Move the shift control to first gear position.
5. Apply parking brake (if equipped.) Pull up on the brake handle until the brake rod is at the top of the slot.

## TO TRANSPORT UNIT

1. Move unit onto transport vehicle.
2. Tie unit down securely. Do not secure by rods, linkages or controls that may be damaged.

## TIPS FOR OPERATION

Use slow gears when operating the tractor on rough ground, slopes, small areas, near buildings or other obstacles.

Use a slow gear and a fast engine speed when operating a snowblower, rotary cultivator, or a mower in heavy grass.

Walk behind, never between the handlebars.

# MAINTENANCE

## MAINTENANCE SCHEDULE

	Before Each Use	25	100	200	Before Storage
Check Engine Oil	●				●
Check Air Cleaner	● *	●			●
Check Engine Cooling		●			
Lubricate Control Linkage		●			
Check Fasteners		●			
Check Clutches		●			
Adjust PTO Brake			●		
Adjust Slip Clutch			●		
Lubricate Transmission					
Service Battery				●	●

### CHECK ENGINE OIL

Check the engine oil daily, or before each use. Never operate the engine when the oil level is below the low mark on the dipstick. See the engine manual for oil change schedule and detailed instructions.

### CHECK AIR CLEANER

Check the air cleaner daily. See the engine manual for detailed instructions.

### CHECK ENGINE COOLING

Check the cooling system every 25 hours. Clean all of the grass and other material from the cooling fins and intake screen of the engine. If necessary, remove the engine shrouds to clean the engine.

### LUBRICATE CONTROL LINKAGE

Every 25 hours of operation put a drop of engine oil on the pivots of the throttle lever, the direction control lever, the gear shift lever, the PTO control, and range shift handle.

**NOTE:** There are no grease fittings on the tractor.

### CHECK FASTENERS

Check all fasteners after 25 hours of operation to make sure that they are tight. Replace any fastener that is missing.

### CHECK CLUTCHES

After 25 hours of operation, check the adjustment of the forward-reverse and gear clutches.

The reverse clutch is adjusted correctly when the direction control lever stops 15 degrees past vertical to the rear. The lever should return to neutral position from reverse.

The forward clutch is adjusted correctly when the direction control lever is in the full forward position and the large spring has a coil clearance of .010" (.254mm).

The Hi-Low Gear clutch is adjusted correctly when the gear shift lever is in the "HIGH" or "LOW" position and the spring coils are .010" (.254mm) apart.

To adjust clutches, see *Service and Adjustments*.

### ADJUST PTO BRAKE

Adjust the PTO brake after every 100 hours of operation. See *Service and Adjustments*.

### ADJUST SLIP CLUTCH

Adjust the slip clutch after every 100 hours of operation. See *Service and Adjustments*.

### LUBRICATE TRANSMISSION

After every 100 hours of operation, check the level of the lubricant in the transmission. Never operate the tractor when the transmission oil level is below the "LOW" mark on the dipstick.

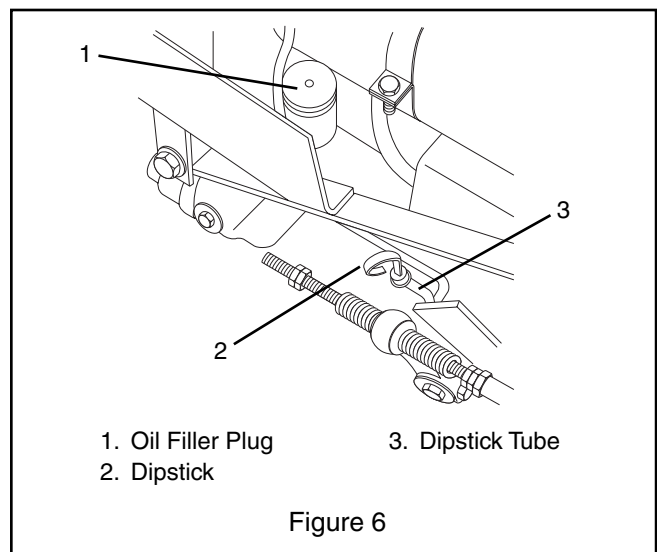


Figure 6

1. Stop the engine and raise the hood.
2. Make sure that the tractor is level.

3. Clean the dipstick tube and the dipstick (Figure 6).
4. Remove the dipstick, wipe it with a clean cloth or towel and put it back in the tube.
5. Pull the dipstick out again and look at the oil.
6. If the oil level is below the low mark on the dipstick, add oil.
7. Clean the area around the filler plug.
8. Remove the filler plug.
9. Add new, clean lubricant until the dipstick indicates that the oil level is correct. See Engine Manual.
10. Install the filler plug and the dipstick.

## SERVICE BATTERY

When charging the battery remove it from the unit first.



**WARNING:** ELECTRIC SHOCK may result in injury and/or damage to unit.

DO NOT allow objects to come into contact with both terminals at the same time.

REVERSE CONNECTIONS may result in sparks which can cause death or serious injury. ALWAYS connect positive (+) lead of charger to positive (+) terminal, and negative (-) to negative (-) terminal.

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



**WARNING:** EXPLOSIVE GASES from battery can cause death or serious injury. ALWAYS keep open flames, sparks or smoking materials away from batteries.

POISONOUS BATTERY FLUID contains sulfuric acid. Contact with skin, eyes or clothing can cause severe chemical burns. ALWAYS wear safety glasses and protective gear near battery.

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

ALWAYS KEEP BATTERIES OUT OF REACH of children.



**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.

## 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!

**IMPORTANT:** In case of internal contact, DO NOT induce vomiting!

The tractor is equipped with a low maintenance battery. Check the fluid level every 200 hours or at the end of the year. Keep the battery clean. If acid is on the outside of the battery or the electrical connections are corroded, clean the outside of the battery with water and baking soda solution. (Figure 7)

When the battery cables are disconnected, remove the negative (-) (ground) cable first. When replacing the battery cable connect the positive (+) cable first. Any time the battery cables are disconnected, clean the cable clamps and the battery post or connection.

On tractors not equipped with a maintenance-free battery, remove the battery and place on a bench or other place which is well ventilated and acid spill will not create damage. Fill the battery to the bottom of the fill tubes with 1.265 specific gravity electrolyte. Twenty minutes after filling with electrolyte, charge the battery at 6 to 8 amps for 20 minutes. Follow charger manufacturer's instructions for safe procedure. Wait 20 minutes after charging before replacing the battery vent caps and placing on chassis.

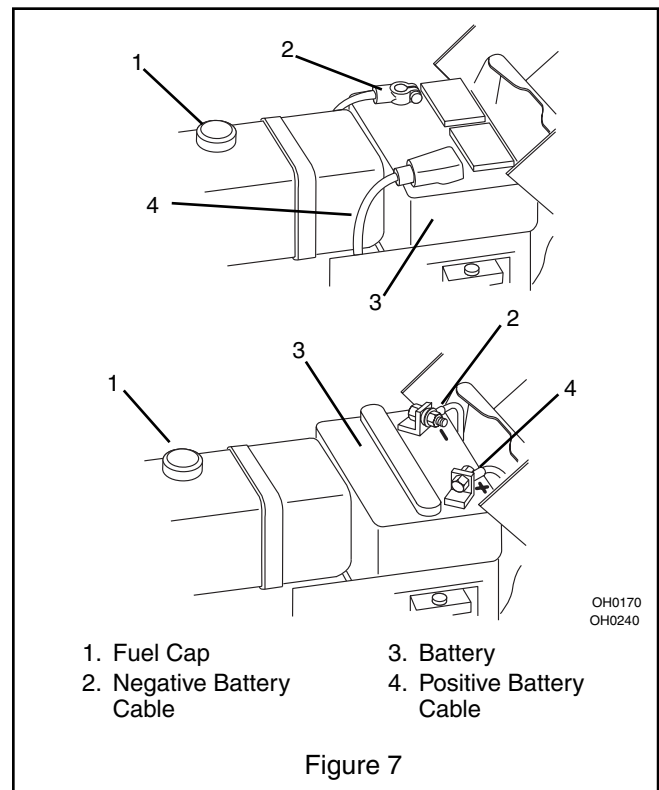


Figure 7

# SERVICE AND ADJUSTMENTS

## FORWARD-REVERSE CLUTCH



**WARNING:** Stop the engine before adjusting the forward-reverse clutch.

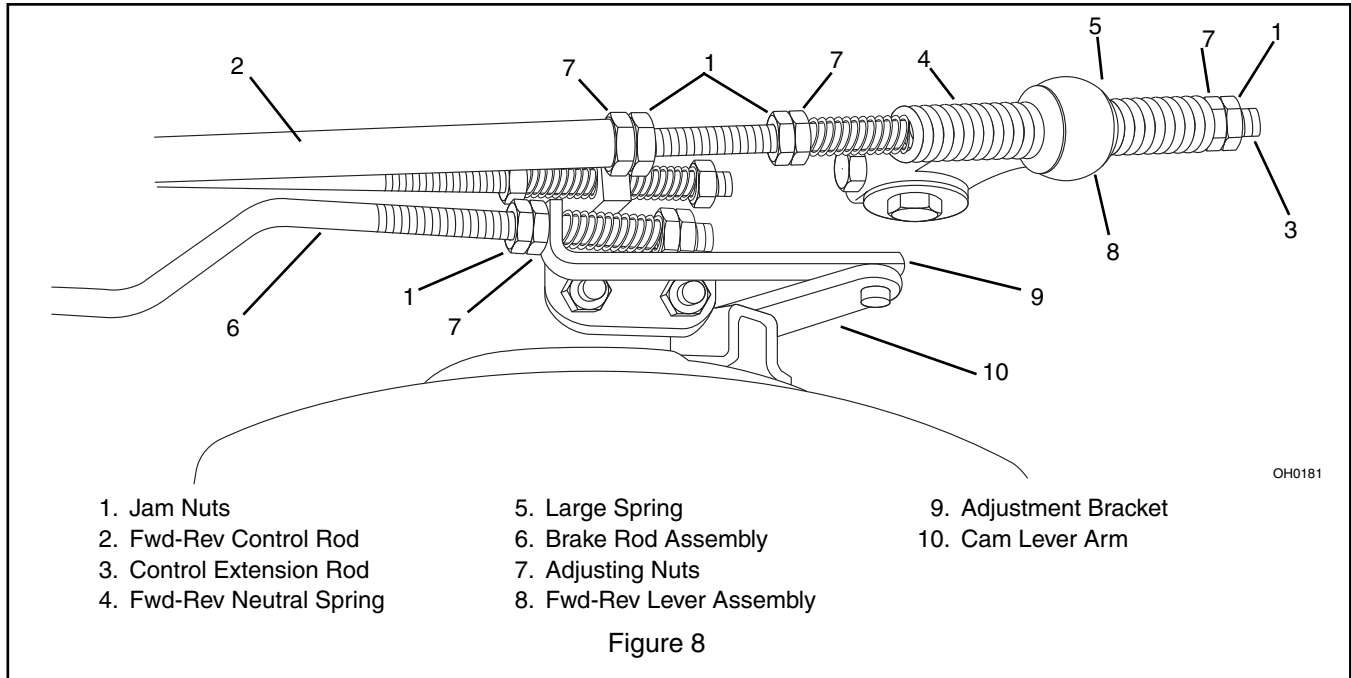
To adjust the reverse clutch (Figure 8) :

1. Loosen the jam nuts on the end of the control extension rod in the fwd-rev control rod.
2. Adjust the rear nut so that the direction control lever stops 15 degrees past vertical to the rear.

3. Hold the rear nut and jam with the forward nut.

To adjust the forward clutch (Figure 8) :

1. Put the direction control in the forward position.
2. Loosen the rear set of jam nuts on the control extension rod in the fwd-rev control rod.
3. Adjust the forward nut until the large spring coils are .010" (.254mm) apart.
4. Hold the forward nut and jam with the rear nut.



## HI/LOW GEAR CLUTCH



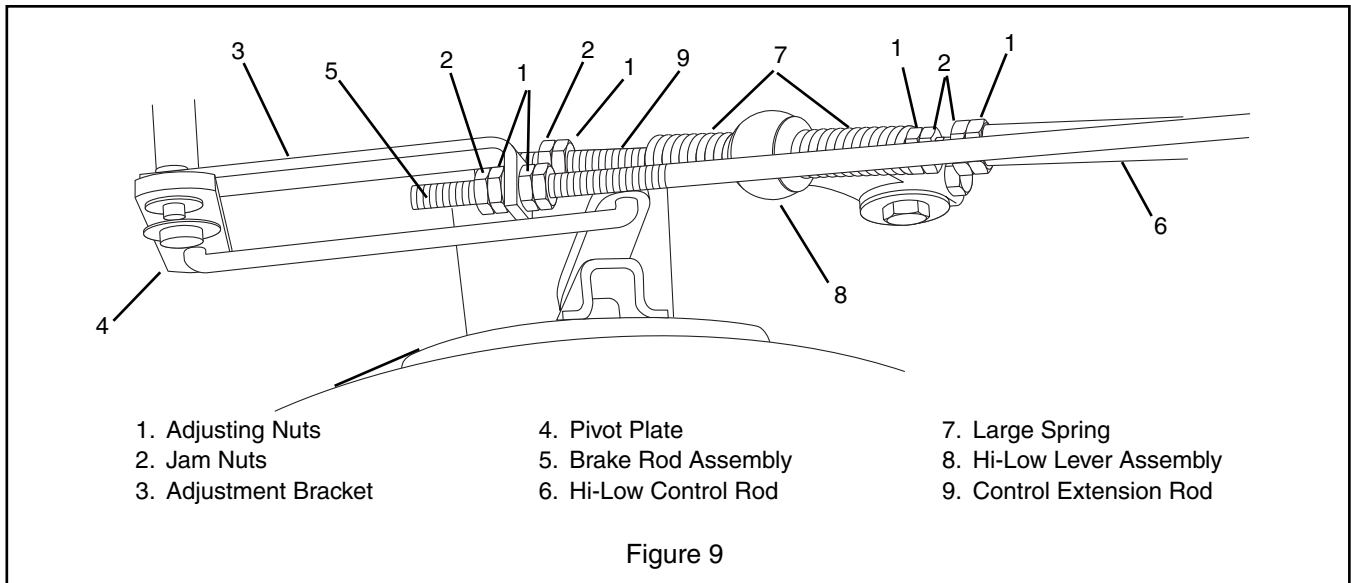
**WARNING:** Stop the engine before adjusting the gear clutch.

To adjust the "HIGH" clutch:

1. Loosen and separate the jam nuts on the rear of the control extension rod in the Hi-Low control rod.
2. Put the gear shift lever in the "HIGH" position.
3. Adjust the nut (front) near the spring until the spring coils are .010" (.254mm) apart.
4. Move the gear shift lever to the "NEUTRAL" position.
5. Hold the nut adjusted to the spring and jam with the other (rear) nut (Figure 9).

1. Loosen and separate the jam nuts on the end of the control extension rod in the Hi-Low control rod.
2. Put the gear shift lever in the "LOW" position.
3. Adjust the nut (rear) near the spring until the spring coils are .010" (.254mm) apart.
4. Move the gear shift lever to the "NEUTRAL" position.
5. Hold the nut adjusted to the spring and jam with the other (front) nut.

To adjust the "LOW" clutch:



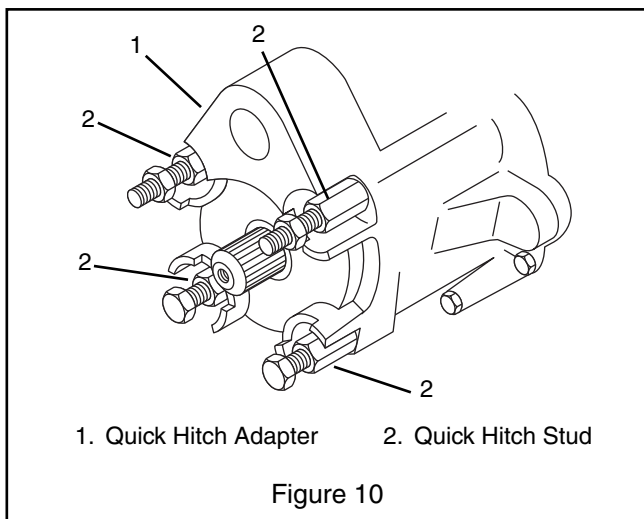
## PTO BRAKE

To adjust the PTO brake:



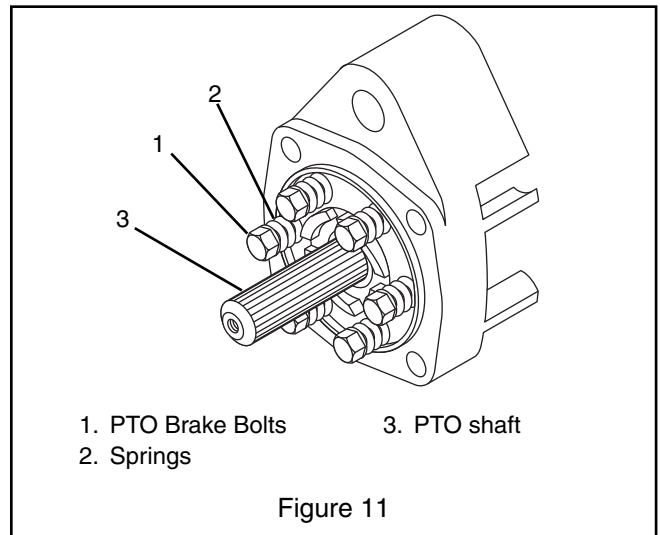
**WARNING:** Stop the engine before adjusting the PTO brake.

1. Remove the attachment and lower the rear of the tractor to the ground.
2. Carefully clean the front of the transmission. Remove the quick hitch studs from the transmission.
3. Remove the quick hitch casting and PTO brake assembly (Figure 10).



**NOTE:** The attachment gasket must be replaced if damaged.

4. Tighten all PTO brake bolts until the springs are solid. Back all bolts up 1/2 turn (Figure 11).



**NOTE:** Do not tighten the bolts in a circular sequence, that is, by tightening the bolt next to one which was just tightened. The bolts should be tightened in a cross sequence, that is, by tightening one bolt, then tightening the bolt which is across from it on the plate. Continue tightening the bolts in this sequence until all the bolts are tightened.

Make sure the trunnion block is on the shipper shaft and held in place by the dog. The dog should rest on the spiral teeth of the clutch dog plate. Install the gasket.

Align the splines on the quick hitch shaft with those in the dog. Slide the quick hitch casting and PTO brake assembly back into the place on the front of the transmission. Install the quick hitch studs and tighten.



## SLIP CLUTCH

To adjust the slip clutch:



**WARNING:** Stop the engine before adjusting the slip clutch.

1. Remove the attachment and lower the rear of the tractor to the ground.
2. Carefully clean the front of the transmission.
3. Remove the quick hitch studs from the transmission.
4. Remove the quick hitch PTO assembly and PTO brake assembly.

**NOTE:** The attachment gasket must be replaced if damaged.

5. Remove the dog and trunnion block.
6. Disconnect the wiring harness from the PTO brake interlock switch.
7. Remove the shifter parts.
8. Slide the shipper shaft assembly through the top of the advance casting.
9. Slide the clutch assembly and pinion shaft out of the transmission.
10. Remove the retaining ring and slide the clutch assembly off of the pinion shaft.
11. Turn all of the jam nuts counterclockwise to loosen.
12. Torque bolts to 70 in. lbs. in two stages. First tighten bolts to 20 in. lbs. in pattern shown (Figure 12). Then tighten to 70 in. lbs. in same pattern.

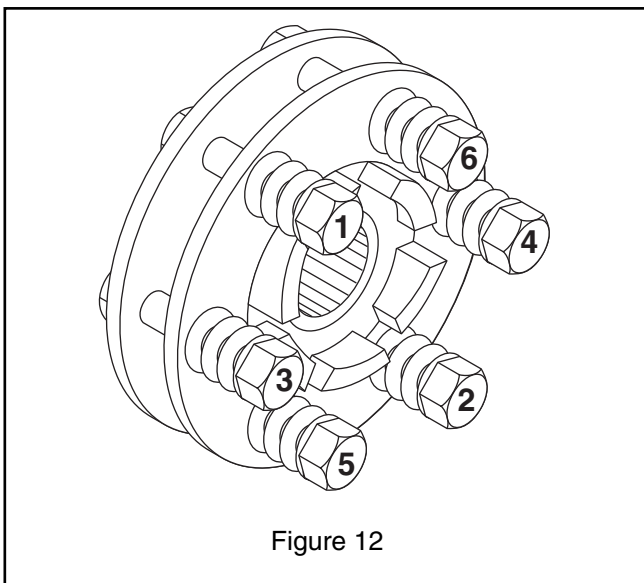


Figure 12

**NOTE:** Do not tighten the bolts in a circular sequence, that is, by tightening the bolt next to one which was just tightened. The bolts should be tightened in a cross sequence, that is, by tightening one bolt, then tightening the bolt which is across from it on the plate. Continue tightening the bolts in this sequence until all the bolts are tightened. (Figure 12)

13. Slide the clutch assembly back onto the pinion shaft.
14. Install the retaining ring and slide the pinion shaft completely into the transmission.
15. Reinstall the shipper shaft and other parts that were removed. Make sure the trunnion block is on the shipper shaft and held in place by the dog. The dog should rest on the spiral teeth of the clutch dog plate.
16. Install the gasket.
17. Align the splines on the quick hitch shaft with those in the dog.
18. Slide the quick hitch casting and PTO brake assembly back into place on the front of the transmission.
19. Install the quick hitch studs and tighten.

## STEERING BRAKE ADJUSTMENT (OPTIONAL):

1. Park the tractor in a level area.
2. Put the parking brake handle in the "OFF" (down) position.
3. Loosen the jam nuts on the right and left brake rod assemblies (Figure 8)(Figure 9).
4. Turn the adjusting nuts until the brake handle cross bar is parallel with the instrument panel. (See *Controls and Features*.)
5. Move the brake handlebar all the way to the right and measure the distance from the right end edge of the brake handle cross bar to the right side of the instrument panel.
6. Move the brake handlebar all the way to the left and make the same measurement on the left.
7. Adjust the nuts until the difference between the two measurements is 1/2" to 3/4" (13 to 19mm).
8. Turn both adjusting nuts the same amount, clockwise to increase the measurement difference or counterclockwise to decrease the measurement difference.
9. Tighten the jam nuts.
10. Loosen the jam nuts below the compression spring on the right side of the tractor and adjust until one has the desired tension for the right brake.
11. Tighten the jam nuts.

## STORAGE

Check each item in "Before Storage" in the Maintenance Schedule. See Engine Manual for detailed instructions on preparing the engine for storage.

### When The Tractor Will Not Be Operated For Two Months Or More:

1. Do the daily and 25-hour maintenance, but do not add gasoline.
2. Clean the tractor. Paint or oil bare metal surfaces to prevent rust.

**IMPORTANT:** NEVER spray unit with water or store unit outdoors. Water can seep into sealed bearings, which are sealed against dirt and debris only, causing reduced component life.

**NOTE:** Do not use harsh or abrasive cleaners on any painted surface. Do not allow gasoline or oil to remain on any surface.

3. Refer to the engine manual and prepare the engine for storage.
4. Charge the battery initially and then every three weeks.

### To Put The Tractor Into Service:

1. Refer to the engine service manual and prepare the engine for service.
2. Charge the battery.
3. Put fresh, clean gasoline in the fuel tank.

## TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTION
<b>Starter will not operate when ignition key is turned to "S" position.</b>	<ol style="list-style-type: none"> <li>1. Fwd-Rev lever in "FORWARD" position</li> <li>2. PTO engaged</li> <li>3. Loose battery cable(s)</li> <li>4. Blown fuse</li> <li>5. Discharged battery</li> <li>6. Defective solenoid switch</li> <li>7. Defective starter</li> </ol>	<ol style="list-style-type: none"> <li>1. Place Fwd-Rev lever in neutral position.</li> <li>2. Disengage PTO.</li> <li>3. Clean and tighten battery connections.</li> <li>4. Replace fuse.</li> <li>5. Charge battery.</li> <li>6. Replace. Call your dealer.</li> <li>7. Replace starter. Call your dealer.</li> </ol>
<b>Solenoid switch clicks but starter will not operate when ignition is turned to "S" position.</b>	<ol style="list-style-type: none"> <li>1. Discharged battery</li> <li>2. Loose battery cable</li> <li>3. Defective starter</li> </ol>	<ol style="list-style-type: none"> <li>1. Charge the battery. See <i>Maintenance</i>.</li> <li>2. Clean and tighten battery connections.</li> <li>3. Replace starter. Call your dealer.</li> </ol>
<b>Engine starter operates but engine will not start when ignition switch is turned to "S" position.</b>	<ol style="list-style-type: none"> <li>1. Fuel tank empty</li> <li>2. Fuel shut-off valve at the fuel tank turned off</li> <li>3. Relay defective</li> <li>4. Engine failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill tank with clean, fresh fuel.</li> <li>2. Turn fuel shut-off valve on.</li> <li>3. Replace relay. Call your dealer.</li> <li>4. See Engine Manual</li> </ol>
<b>Engine starts but runs roughly.</b>	<ol style="list-style-type: none"> <li>1. Engine choke in "ON" position</li> <li>2. Restricted air cleaner element</li> <li>3. Restricted fuel cap vent</li> <li>4. Engine carburetor malfunction</li> <li>5. Engine electrical system trouble</li> </ol>	<ol style="list-style-type: none"> <li>1. Move engine choke to "OFF".</li> <li>2. Clean air cleaner. See engine manual.</li> <li>3. Clear obstruction from fuel cap vent.</li> <li>4. See Engine Manual</li> <li>5. See Engine Manual</li> </ol>

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTION</b>
<b>Engine stops when PTO or Fwd-Rev is engaged.</b>	<ol style="list-style-type: none"> <li>1. Operator presence handle not pressed</li> <li>2. Operator presence handle out of adjustment</li> <li>3. Faulty switch</li> </ol>	<ol style="list-style-type: none"> <li>1. Press and hold at least one operator presence control.</li> <li>2. Call your dealer.</li> <li>3. Replace switch. Call your dealer.</li> </ol>
<b>The tractor will not move when the direction control lever is moved to 'FORWARD' or 'REVERSE'.</b>	<ol style="list-style-type: none"> <li>1. Gear shift lever in "NEUTRAL" position</li> <li>2. Range shift handle in 'NEUTRAL' position</li> <li>3. Fwd-Rev clutch needs adjustment</li> <li>4. Internal transmission damage</li> </ol>	<ol style="list-style-type: none"> <li>1. Place gear shift lever in Hi or Low position.</li> <li>2. Place range shift lever in Hi or Low position.</li> <li>3. Adjust Fwd-Rev clutch. See <i>Adjustments</i> or call your dealer.</li> <li>4. Call your dealer.</li> </ol>
<b>Attachment will not operate.</b>	<ol style="list-style-type: none"> <li>1. Gear shift lever in "NEUTRAL" position</li> <li>2. Attachment jammed or damaged</li> <li>3. Attachment slip clutch out of adjustment or damaged</li> <li>4. Shipper shaft and clutch dog loose and out of adjustment</li> </ol>	<ol style="list-style-type: none"> <li>1. Place gear shift lever in Hi or Low position.</li> <li>2. Clear debris from attachment. Repair before restarting engine.</li> <li>3. Adjust or repair.</li> <li>4. Adjust or repair.</li> </ol>
<b>Attachment operates slowly</b>	<ol style="list-style-type: none"> <li>1. Hi/Low clutch worn</li> <li>2. Attachment slip clutch needs adjustment or repair</li> <li>3. Attachment damaged</li> <li>4. Engine problems</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust or repair.</li> <li>2. Adjust or repair.</li> <li>3. Repair</li> <li>4. See Engine Manual</li> </ol>
<b>Transmission will not go into "HIGH" range. Jumps out of range</b>	<ol style="list-style-type: none"> <li>1. Debris blocking the linkage</li> <li>2. Rust on the clutch sliding pin</li> <li>3. Shifting clutch dogs worn/damaged</li> </ol>	<ol style="list-style-type: none"> <li>1. Clear debris from linkage. Repair before restarting engine.</li> <li>2. Clean or replace.</li> <li>3. Adjust or replace.</li> </ol>

## ACCESSORIES

See your authorized Gravelly dealer to add these optional accessories.

### Mowing

78500600	30" Mower Drive (Short)
78500700	30" Mower Drive (Long)
78500800	40" Commercial Mower Drive Prior to 5000 Series
78500900	40" Commercial Mower Drive On 5000 Series & Newer Models
78501000	42" Sickle Mower Cutter Bar
78501100	Chain Guard
78501200	Front Mount Kit
78501300	Front Anti-Scalp Roller
78501400	Rear Anti-Scalp Roller
78501500	30" Weight Kit

### Garden

78501600	Rotary Cultivator Drive
78501700	Planter Drill (Less Blades)
78505900	10" Planter Drill Blade
78506000	19" Planter Drill Blade

### Snow Removal

73500700	Snowblower Drift Bar
78501900	48" Snow Dozer Hitch
78502000	48" Snow Dozer Counterweight Kit
78502100	48" Snow Dozer Skid Kit
78502200	Power Brush Conversion Kit
78502300	44" Power Brush Completing Kit
78502400	Tire Chains (4:00 x 8) (Pair)
78502500	Tire Chains (7:50 x 8) (Pair)
78502600	Tire Chains (8:50 x 8) (Pair)

### Miscellaneous

78502700	Pow-R-Steering Kit
78502900	Quick Hitch Pin Kit
78503000	Attachment Adapter Kit
78503100	Dual Wheel Spacers
78509800	Dual Wheel Spacers
78503200	Trailing Hitch Kit
78510600	Coupler Strut Weldment Kit
78503400	Remote Air Cleaner Kit
78503500	High Performance Air Cleaner Kit
78503600	QS Muffler Kit
78506100	Triple Purpose Wrench

## ACCESSORIES

78506400	Tractor Cover
78506500	Retro-Fit Kit
78506600	High Lift Blade Kit, 40" Mowers
78506700	High Lift Blade Kit, 50" Mowers
78506800	Sand Blade Kit, 40" Mowers
78506900	Sand Blade Kit, 50" Mowers
78802700	Handle Interlock Kit

## ATTACHMENTS

See your authorized Gravelly dealer to add these optional attachments.

885001	30" Mower Deck
885002	30" Mower Deck
885003	40" Mower Deck
885004	40" Commercial Mower Deck
785009	Drive not included
885007	50" Mower Deck
885008	32" Flail Mower
885009	42" Sickle Mower
885010	Rotary Plow
885011	Cultivator
833007	32" Sno Thro
885014	48" Dozer Blade
885015	44" Brush
885013	Winter Cab
885016	Cart
885017	Sulky

## SERVICE PARTS

Be sure to always use genuine Gravely parts to keep your Sno-Thro running like new.

Part no.	Qty	Description
03621100	1	Battery (Robin Model)
04202200	1	Battery (Briggs Model)
21527200	1	Air Cleaner (Robin EH25)
21527300	1	Assembly-Air Cleaner Element (Robin EH41)
21527100	1	Air-Cleaner Element (Robin EH25)
08811700	1	Fuel-Filter (Robin)
21526800	1	Spark Plug (Robin EH25)
21526900	1	Spark Plug (Robin EH41)
08861651	3	Blade-50"
03498451	3	Blade-40"
08526151	1	Blade-30"
07226600	1	Belt-50" Mower drive
07226700	1	Belt-40" Mower drive

## SPECIFICATIONS

Model Number	985114	985115	985117
Height - in (cm)	36.5 (92.7)		
Length - in (cm)	58 (147.3)		
Width - in (cm)	25 (63.5)		
Weight - lbs (Kg)	425 (192.8)	420 (183)	428 (195)
Wheel Size - in (cm)	4.0 x 8 (10.2 x 20.3) Stud Tread 4.0 x 8 (10.2 x 20.3) Trac Tread 18 x 8.5-8 (45.7 x 21.6-20.3) Turf Chief 18 x 8.5-8 (45.7 x 21.6-20.3) Turf Saver 16 x 5 x 3 (40.6 x 12.7x 7.2) Semi-Pneumatic Ground Grip		
Tire Pressure	See Tire Sidewall		
Steering Brakes	7 x 1.75 Drum Type	N/A	7 x 1.75 Drum Type
Engine	16 HP Briggs & Stratton 16HP	8.5 HP Robin EH25	13.5 HP Robin EH41
Engine Operating Fast Idle Speed - RPM	3300-1600		
Fuel	See Engine Manual for type and grade		
Fuel Tank Capacity - gal (Liters)	1.5 (5.68)		
Transmission Oil Capacity - qt (Liters)	5.0 (4.73)		
Transmission Oil Type	SAE 30		
Engine Oil Type and Capacity	See Engine Manual		
Battery	12V BCI Group 22F, 42amp/Hr	12V BCI Group, 230 CCA. 29 min. Reverse Capacity	



**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.
- 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: GLW2-062399



**GRAVELY**

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