

GRAVELLY®

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**OPERATOR'S
MANUAL**

9000 Series

**Grounds Maintenance
Tractor**

Form: 31196 (5/79)
Printed in U.S.A.





The instructions on how to operate the tractor and do maintenance on the tractor are in this Operator's Manual.

The tractor must be operated and given maintenance according to this operator's manual.

All reference to left side, right side, front and back are given from the operator's position.

It is important that you make a record of the tractor serial number, engine model number and engine specification number for your future use. Write the numbers in the spaces below.

Tractor Serial Number _____

Engine Model Number _____

Engine Specification Number _____

LEARN ABOUT YOUR TRACTOR

Read this Operator's Manual carefully and learn how to operate and do maintenance on your tractor before use.

Learning how to use your tractor is part of doing the job. Learn how to start, turn, change direction, change speeds, and stop. Know what the tractor can do.

It is very important that the Warnings - For Your Safety are read, learned, and followed. See Section 1.0. Use caution, SAFETY FIRST.

ABOUT THE WARRANTY

It is the purchaser's responsibility to make sure that the tractor is operated and the maintenance is done as shown in this book. A failure caused by bad maintenance or using the tractor in the wrong way stops the warranty.

Read the Limited Warranty on the inside back cover of this Operator's Manual.

To continue its program of quality and design improvement, the manufacturer reserves the right to change specifications, designs and prices without notice and incurring obligation.

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1.0 WARNINGS - FOR YOUR SAFETY

NOTE: This warning symbol  indicates that there is danger to persons or equipment. Read these warnings carefully and follow them.

This section gives warnings for you about operating and doing maintenance on this equipment.

Using this equipment the wrong way can cause injury to persons and damage to the equipment. Persons operating or doing maintenance on this equipment must read this Operator's Manual and follow the instructions.

It is important to understand that this Operator's Manual and other Gravely instructions books do not list every possible danger. It is not possible for Gravely to know and tell of all the dangers in operating and doing maintenance on the equipment.

The purchaser must give these instructions to the persons operating and doing maintenance on this equipment. The purchaser must get the operator and person doing maintenance on this equipment to use eye and foot protection.

1.1 INSTRUCTIONS BEFORE OPERATION

1. Read the tractor Operator's Manual and the attachment Operator's Manual carefully before operating or doing maintenance.
2. Learn the location and the function of all the tractor and attachment controls.
3. Know how to use the controls to stop the tractor and attachment quickly.
4. Never permit children to operate or ride on the tractor or the attachment.
5. Use caution with gasoline. Gasoline is very flammable. Keep gasoline in a clean and tight container. Keep gasoline away from fire or hot items. Never put gasoline in the fuel tank while the engine is running or hot. Clean any gasoline from the equipment before starting the engine.

1.2 PREPARATION FOR OPERATION

1. Keep all shields, guards and safety interlock switches in the correct position.
2. Wear strong shoes and wear clothing that is not loose when operating the tractor. Wear protection for your eyes.

3. Before starting the engine, put the direction control lever in the "Neutral" position and the PTO control in the "DISENGAGE" position.
4. Do not operate the tractor where the work area is too dark for the operator to see.
5. Keep the tractor in good operating condition. Do the maintenance as shown in this Operator's Manual.
6. Never operate the tractor or attachment when there is damage to any part or any part is not in the correct position. Replace all parts that are damaged or missing before operating.
7. Use only Gravely accessories and attachments or attachments shown by Gravely to be correct for use with the tractor.

1.3 OPERATION

1. Do not change the governor so the engine will run over 3200 revolutions per minute.
2. Keep away from moving parts.
3. Keep all persons and animals away from the area of operation.

4. Do not let persons other than the operator ride on the tractor.
5. When operating on slopes, use a slow tractor speed and engage the direction control lever slowly.
6. Always look for and keep away from holes and other hazards.
7. Use more caution when moving backwards. Look for persons and danger in the way.
8. After hitting an object, stop the tractor and engine and check for damage. If there is damage, make repairs before restarting.
9. Operate the equipment only when in the seat of the tractor.
10. Travel up and down slopes, not across.
11. When moving the tractor on a transport, connect the chassis and the rear hitch of the tractor to the transport. Never connect from the control levers, rods, or like items that can be damaged.
12. Before leaving the tractor, put the PTO control in the "DISENGAGE" position and lower the attachment. Engage the parking brake and turn the ignition switch to the "OFF" position. Remove the key from the ignition switch.
13. If there is a sudden change in the sound or vibration of the tractor or the attachment, stop the tractor and the engine and check for damage. If there is damage, make repairs before operating the tractor or the attachment.
14. Never start and run the engine inside a building except to move the equipment outside. Exhaust fumes are dangerous.
15. Go slow on surfaces where the tractor can slide.
16. Always follow traffic laws while going on or near a road.
17. Before leaving the seat of the tractor to make adjustments or to do maintenance, put the PTO control in the "DISENGAGE" position, turn the ignition switch to the "OFF" position and wait until the engine and moving parts have stopped.

2.0 CONTROLS AND INSTRUMENTS

This section gives the location of the controls and instruments and how they are used.

2.1 THE STEERING WHEEL

The steering wheel is used to steer the tractor. Rotate the steering wheel clockwise to steer the tractor to the right. Rotate the steering wheel counterclockwise to steer the tractor to the left. The location of the steering wheel is shown in figure 2.0-1.



- 1 - Steering Wheel
- 2 - Ignition Switch
- 3 - Choke Control
- 4 - Throttle Lever
- 5 - Light Switch
- 6 - Hourmeter
- 7 - Ammeter
- 8 - Tachometer
- 9 - Temperature Gauge
- 10 - Oil Pressure Gauge

Figure 2.0-1

2.2 THE IGNITION SWITCH

The ignition switch is used to start, run and stop the engine. The ignition switch has a key that must be used to operate the ignition switch. See figure 2.0-1 for the location of the ignition switch.

2.3 THE CHOKE CONTROL

The choke control is used to start a cold engine. Pull the choke control out before starting the

engine. Push the choke control in when the engine starts and is running smoothly. See figure 2.0-1 for the location of the choke control.

2.4 THE THROTTLE LEVER

The throttle lever is used to change the revolutions per minute (RPM) of the engine. Push the throttle lever forward to increase the RPM of the engine. Pull the throttle lever backward to decrease the RPM of the engine. See figure 2.0-1 for the location of the throttle lever.

2.5 THE LIGHT SWITCH

The light switch is used to activate the lights at the front of the tractor. Pull the switch out to activate the lights. Push the switch in to deactivate the lights. See figure 2.0-1 for the location of the light switch.

2.6 THE HOURMETER

The hourmeter shows the number of hours the tractor has been operated. See figure 2.0-1 for the location of the hourmeter.

2.7 THE AMMETER

The ammeter shows if the electrical system of the tractor is charging the battery. See figure 2.0-1 for the location of the ammeter.

2.8 THE TACHOMETER

The tachometer shows the revolutions per minute of the engine. See figure 2.0-1 for the location of the tachometer.

2.9 THE TEMPERATURE GAUGE

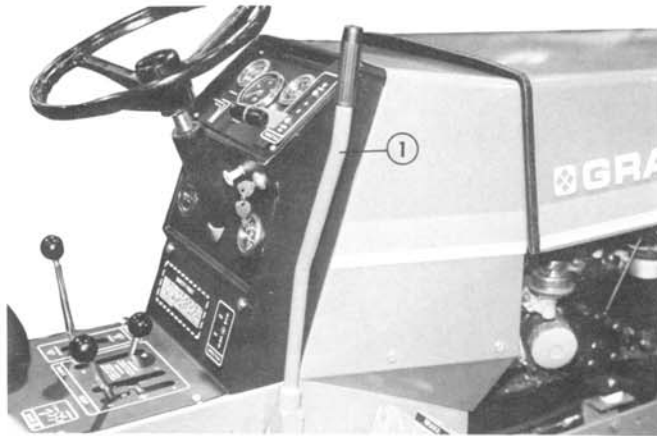
The temperature gauge shows the temperature of the cooling fluid in the engine. See figure 2.0-1 for the location of the temperature gauge.

2.10 THE OIL PRESSURE GAUGE

The oil pressure gauge shows the pressure in the lubricant system in the engine. See figure 2.0-1 for the location of the oil pressure gauge.

2.11 THE DIRECTION CONTROL LEVER

The direction control lever controls the forward and backward movements of the tractor. Push the direction control lever forward to cause the tractor to move forward. Pull the direction control lever backward to cause the tractor to move backward. See figure 2.0-2 for the location of the direction control lever.



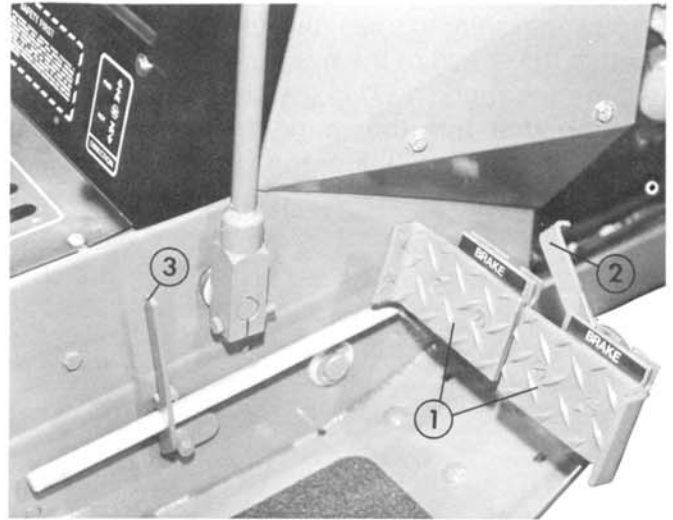
1 - Direction Control Lever

Figure 2.0-2

2.12 THE BRAKE PEDALS

The brake pedals are used to stop the tractor and to give assistance to steering the tractor. To stop the tractor, both brake pedals must be pushed at the same time. Use the brake lock arm to hold the brake pedals together. When using the brake pedals to give assistance to steering, do not use the brake lock arm to hold the brake pedals together.

Rotating the steering wheel and pushing the brake pedal at the same time will decrease the turning radius of the tractor. To turn right with a minimum turning radius, rotate the steering wheel to the right and push the brake pedal on the right. To turn left, rotate the steering wheel to the left and push the brake pedal on the left. See figure 2.0-3 for the location of the brake pedals.



1 - Brake Pedals
2 - Brake Lock Arm
3 - Brake Lock

Figure 2.0-3

2.13 THE BRAKE LOCK

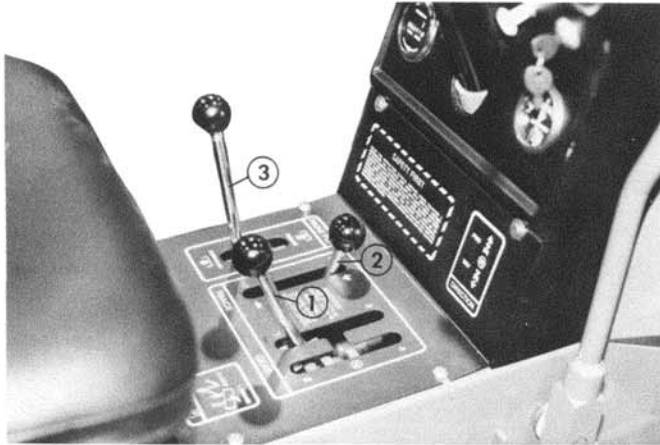
The brake lock is used to hold the brake pedals in the engaged position for holding the tractor in position. The brake lock arm must be used to hold the brake pedals together. To hold the tractor in position, push the brake pedals and at the same time move the brake lock backwards. To disengage the brakes, push the brake pedals and at the same time move the brake lock forward. See figure 2.0-3 for the location of the brake lock.

2.14 THE GEAR SELECTOR AND RANGE SELECTORS

The gear selector and range selector are used to change the speed of the tractor. The gear selector and range selector are used together to give the tractor eight different forward speeds.

The gear selector has four positions that will change the speed of the tractor and a neutral position. The position that has the mark "1" is the slowest speed. The position that has the mark "4" is the fastest speed.

The range selector has two positions that will change the speed of the tractor. The position that has the mark "LO" is the slowest speed. The position that has the mark "HI" is the fastest speed. See figure 2.0-4 for the location of the gear selector and range selector.



- 1 - Gear Selector
- 2 - Range Selector
- 3 - PTO Control

Figure 2.0-4

2.15 THE POWER TAKE-OFF (PTO) CONTROL

The Power Take-Off (PTO) is used to give power to an attachment. To engage the PTO, push the PTO control forward. To disengage the PTO, pull the PTO control backward. See figure 2.0-4 for the location of the PTO control.

2.16 THE ATTACHMENT LIFT LEVERS

There are three attachment lift levers that control the hydraulic system flow to raise and lower a front, center, or rear attachment. See figure 2.0-5 for the location and identification of the attachment lift levers.



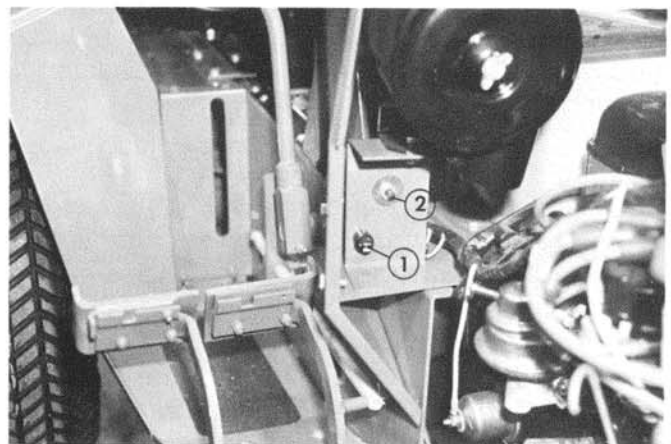
- 1 - Center Attachment Lift
- 2 - Remote Quick Disconnects
- 3 - 3-Point Hitch

Figure 2.0-5

2.17 THE FUSE HOLDER AND RESET BUTTON

The fuse holder has a fuse that protects the electrical system. An open fuse will stop the engine and must be replaced.

The reset button is used to reset the magnetic ignition switch. The magnetic ignition switch will stop the engine when the cooling fluid in the engine reaches the limit for safe operation. See figure 2.0-6 for the location of the fuse holder and the reset button.



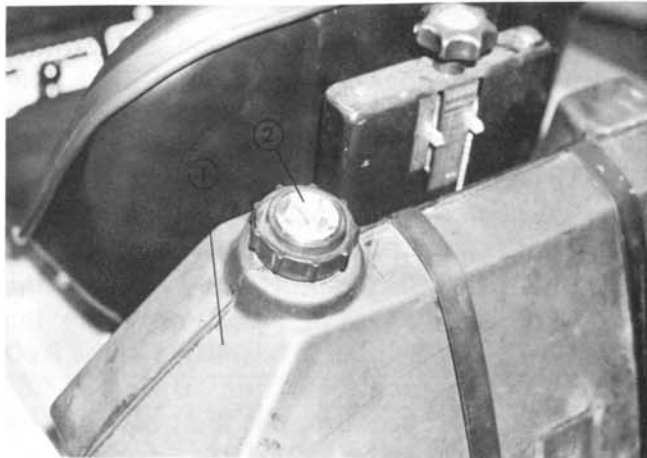
- 1 - Fuse Holder
- 2 - Reset Button

Figure 2.0-6

2.18 THE FUEL TANK CAP WITH GAUGE

⚠ WARNING: Gasoline is highly flammable.

The fuel tank cap with gauge indicates the level of the gasoline in the fuel tank. To remove the fuel tank cap, turn the fuel tank cap counterclockwise. Lift the fuel tank cap up using caution not to damage the mechanism of the gauge. See figure 2.0-7 for the location of the fuel tank cap gauge.

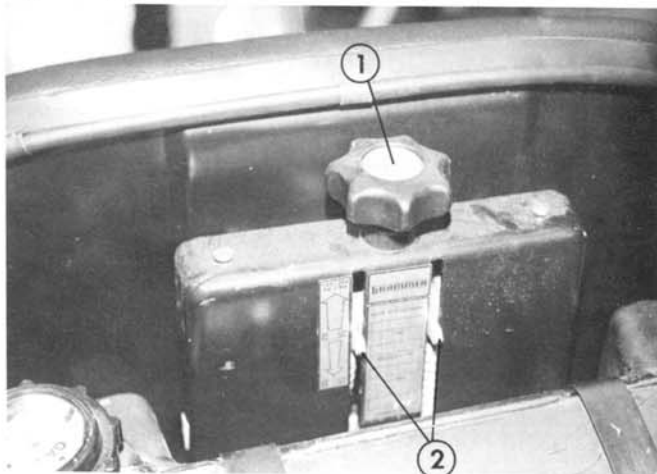


- 1 - Fuel Tank
- 2 - Fuel Tank Cap with Gauge

Figure 2.0-7

2.19 THE SEAT

The seat of the tractor can be adjusted to the weight of the person operating the tractor. The adjusting knob and the weight gauge is behind the seat. See figure 2.0-8 for the location of the adjusting knob and the weight gauge.



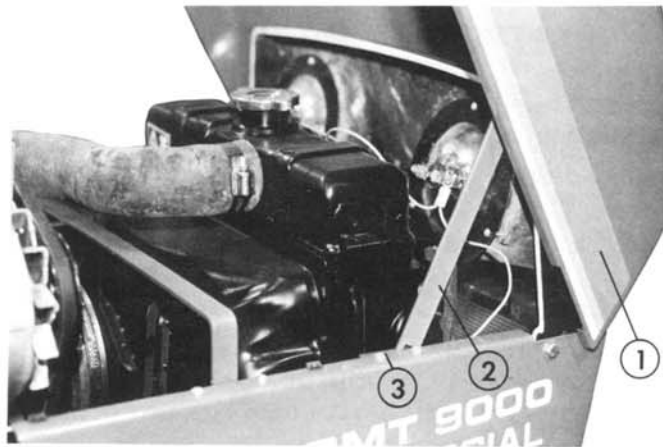
- 1 - Adjusting Knob
- 2 - Weight Gauge

Figure 2.0-8

To adjust the seat for heavier weight, turn the adjusting knob clockwise. To adjust the seat for lighter weight, turn the adjusting knob counterclockwise.

2.20 THE HOOD SUPPORT

The hood support is used to hold the hood of the tractor in the open position. See figure 2.0-9 for the location of the hood support.



- 1 - Hood
- 2 - Hood Support
- 3 - Hood Support Bracket

Figure 2.0-9

To hold the hood in the open position, raise the back of the hood from the right side of the tractor. Engage the notch in the hood support with the hood support bracket. To close the hood, raise the back of the hood and disengage the hood support from the hood support bracket then lower the hood.

3.0 HOW TO OPERATE THE TRACTOR

Read this Operator's Manual before operating the tractor. Read the Operator's Manual for the attachment to be used. Operate the tractor only from the operator's position and follow the Warnings - For Your Safety.

Before starting the engine, do the daily maintenance as shown in section 4.0.

3.1 HOW TO START AND STOP THE ENGINE

To start the engine, the direction control lever must be in the "NEUTRAL" position. The PTO control must be in the "DISENGAGED" position.

1. Put the key in the ignition switch.
2. Move the throttle lever forward half-way.
3. If the engine is cold, pull the choke control out. If the engine is warm or hot, do not move the choke control.
4. Turn the key in the ignition switch to the "START" position. When the engine starts, release the key. When the engine is running smoothly, push the choke control all the way in.
5. If the engine does not start in five seconds, pull the choke control out and try again. If the engine does not start after trying this procedure, see section 6.0 for instructions.

NOTE: Do not keep the starter engaged for more than 15 seconds. Do not engage the starter more than 15 seconds in one minute.

Before stopping the engine, engage the brake lock and move the PTO control to the "DISENGAGED" position. Move the throttle lever to the "SLOW" position. Lower the attachment to the ground.

To stop the engine, turn the key in the ignition switch to the "OFF" position. Always remove the key from the ignition switch when leaving the tractor.

3.2 HOW TO OPERATE THE GEAR SELECTOR AND THE RANGE SELECTOR

NOTE: Changing the position of the gear selector and the range selector while the tractor is moving will damage the gears inside the transmission. Do not move the gear selector or the range selector while the tractor is moving.

Use the gear selector to change the speed of the tractor. To change the position of the gear selector, stop the tractor. Move the gear selector to the position needed. The position that has the mark "1" is the slowest speed. The position that has the mark "4" is the fastest speed.



WARNING: If it is necessary to leave the operator's position while the engine is running, put the PTO control in the "DISENGAGE" position, put the gear selector in the "NEUTRAL" position and engage the parking brake.

The range selector is also used to change the speed of the tractor. To change the position of the range selector, stop the tractor. Move the range selector to the position needed. The position that has the mark "LO" is the slowest speed. The position that has the mark "HI" is the fastest speed.

- Use a slow speed when operating on rough ground that has a slope.
- Use a slow speed when operating the mower in high grass
- Use a slow speed when operating near buildings or other objects.
- Use slow speed when operating a snowblower or a tiller.

3.3 HOW TO USE THE ATTACHMENT LIFT LEVERS

The attachment lift levers control the hydraulic system used to raise or lower an attachment. The system can hold an attachment in position above the ground or let an attachment follow the ground.

1. To raise an attachment, pull the attachment lift lever backwards. Release the lever as soon as the attachment is in position.

NOTE: Continuous pressure on the hydraulic system will cause damage.

2. To lower an attachment, push the attachment lift lever forward so the attachment is lowered to the ground slowly.
3. To let an attachment follow the ground, push the attachment lift lever all the way forward. The lever will stay in this position until the lever is pulled backwards.

NOTE: The center attachment lift lever will raise, lower or hold an attachment. There is no position to let an attachment follow the ground.

3.4 HOW TO MOVE THE TRACTOR IN A FORWARD OR REVERSE DIRECTION

Use a slow speed the first time the tractor is used and until the operator knows how to operate the tractor.

1. Start the engine and wait until the engine is running smoothly.
2. Raise the attachment.
3. Put the gear selector and the range selector in the position needed.
4. Move the throttle lever to the position needed.
5. Push the direction control lever forward to move the tractor forward. Pull the direction control lever backwards to move the tractor backwards.

NOTE: When the tractor is moving, push the direction control lever until it stops and holds in position. If the lever is not all the way in position damage can be caused to the clutches.



WARNING: Use caution while learning to operate the direction control lever.

3.5 HOW TO STOP THE TRACTOR

Move the direction control lever to the "NEUTRAL" position. Push the brake pedals down to stop the tractor. Always use the brake pedals to stop the tractor.

3.6 HOW TO USE THE PTO CONTROL

The PTO gives power to the attachment from the engine. To activate the attachment, push the PTO control forward to the "ENGAGED" position. To deactivate an attachment, pull the PTO control backwards to the "DISENGAGE" position.

4.0 HOW TO DO MAINTENANCE

It is important that the maintenance items shown in the tractor maintenance schedule, figure 4.0-1, be done at the correct time interval. Correct maintenance can increase the life of the tractor.

The maintenance items are shown in the left column of the tractor maintenance schedule. The correct time interval for each maintenance item is shown by the mark (X) in the daily, 40 hours, 100 hours, 250 hours and 500 hours columns. Do each maintenance item at the correct time interval.

Read the Operator's Manual for the engine. Follow the instructions for doing maintenance as shown in that book.

Tractor Maintenance Schedule

Maintenance Items	Location	Time Intervals for Maintenance				
		Daily	40 Hours	100 Hours	250 Hours	500 Hours
Check the Level of the Lubricant in the Engine	Section 4.1	X				
Check the Level of the Lubricant in the Transmisson	Section 4.2	X				
Check the Level of the Cooling Fluid in the Radiator	Section 4.3	X				
Clean the Radiator Screen and Core	Section 4.4	X				
Clean the Engine	Section 4.5	X				
Check the Air Pressure in the Tires	Section 4.6	X				
Check the Air Cleaner Bulb	Section 4.7	X				
Change the Lubricant in the Engine and Replace the Filter	Section 4.8		X			
Check the Tension of the Fan Belt	Section 4.9		X			
Check the Tension of the Governor and Alternator Belt	Section 4.10		X			
Check the Tension of the Water Pump Belt	Section 4.11		X			
Clean the Air Cleaner Element	Section 4.12		X			
Lubricant the Chassis	Section 4.13		X			
Check the Level of the Lubricant in the Governor	Section 4.14			X		
Adjust the Brakes	Section 4.15			X		
Check the Fasteners	Section 4.16				X	
Lubricate the Throttle Control Rods	Section 4.17				X	
Change the Air Cleaner Element	Section 4.18				X	
Clean the Battery Terminals	Section 4.19				X	
Lubricate the Front Wheel Bearings	Section 4.20					X
Change Lubricant in Transmission and Replace the Filter (note)	Section 4.21					X

Note: Change the lubricant filter for the transmission after the first 10 hours of operation.

Figure 4.0-1

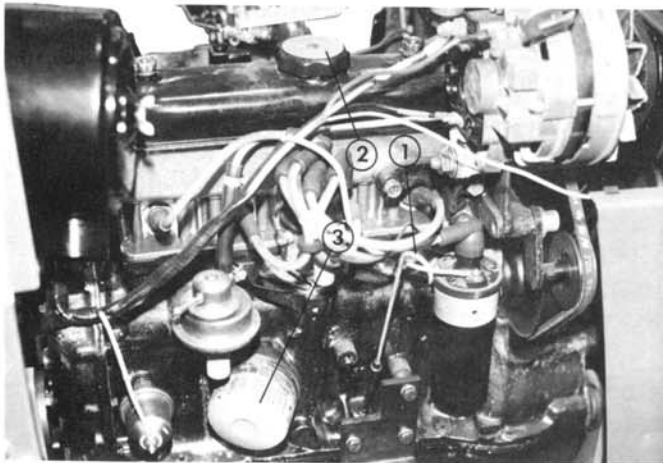
4.1 HOW TO CHECK THE LEVEL OF THE LUBRICANT IN THE ENGINE

Check the level of the lubricant in the engine each day. Never operate the engine when the level of the lubricant is below the "ADD" mark on the dipstick. If the level of the lubricant is below the "ADD" mark on the dipstick, add new lubricant that has the specifications shown in figure 4.0-2.

ENGINE LUBRICANT SPECIFICATIONS	
Grade —	API Service SC, SD or SE
Viscosity —	10W-40 Below 0°F (-18° C) use 5W-20

Figure 4.0-2

1. Stop the engine. Engage the parking brake.
2. Clean the area around the dipstick and the lubricant fill cap. See figure 4.0-3.



- 1 - Dipstick
- 2 - Lubricant Fill Cap
- 3 - Lubricant Filter

Figure 4.0-3

3. Remove the dipstick and clean it.
4. Push the dipstick all the way down into the tube.

5. Pull the dipstick out of the tube and look at the level of the lubricant on the dipstick.
6. If the level of the lubricant is below the "ADD" mark, remove the lubricant fill cap and add lubricant through the hole for the lubricant fill cap.
7. Install the lubricant fill cap and the dipstick.

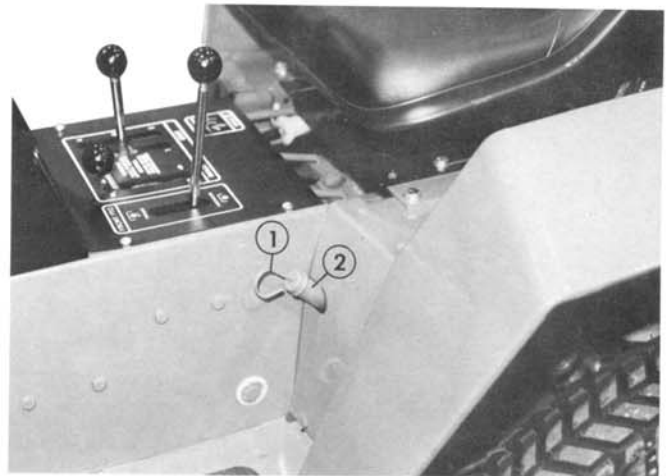
4.2 HOW TO CHECK THE LEVEL OF THE LUBRICANT IN THE TRANSMISSION

Check the level of the lubricant in the transmission each day. Never operate the tractor when the level of the lubricant in the transmission is below the "ADD" mark on the dipstick. If the level of the lubricant is below the "ADD" mark on the dipstick, add any of the transmission lubricants shown in figure 4.0-4.

Mobil 423 Fluid	Exxon Torque Fluid 56
Gulf Universal Tractor Fluid	Union Hydraulic Tractor Fluid
Amoco 1000	Shell Donax T-4
Citgo Tractor Hydraulic Fluid	Pennzoil Hydratranz
Conoco Power Tran II	Ashland Valvoline Unitrac

Figure 4.0-4

1. Stop the engine. Engage the parking brake.
2. Clean the area around the dipstick and tube. See figure 4.0-5.



- 1 - Dipstick
- 2 - Tube

Figure 4.0-5

3. Remove the dipstick and clean it.
4. Push the dipstick all the way down into the tube.
5. Pull the dipstick out of the tube and look at the level of the lubricant on the dipstick.
6. If the level of the lubricant is below the "ADD" mark, add new lubricant through the tube.
7. Push the dipstick all the way down into the tube.

4.3 HOW TO CHECK THE LEVEL OF THE COOLING FLUID IN THE RADIATOR

Check the level of the cooling fluid in the radiator each day. If the level of the cooling fluid is low, add a solution of 50% water and 50% anti-freeze.

⚠ WARNING: The radiator and other engine parts are hot.

1. Stop the engine. Engage the parking brake.
2. Open the hood.

⚠ WARNING: The radiator has pressure. Turn the radiator cap one notch counterclockwise to release the pressure before removing the radiator cap.

3. Remove the radiator cap by turning the cap counterclockwise. See figure 4.0-6.



1 - Radiator
2 - Radiator Cap

Figure 4.0-6

4. If the level of the cooling fluid is more than 2-1/2 inches (6.35 cm) below the top of the radiator, add cooling fluid until the level of the cooling fluid is 1-1/2 inches (3.8 cm) from the top of the radiator.
5. Install the radiator cap.

4.4 HOW TO CLEAN THE RADIATOR SCREEN AND THE RADIATOR CORE

Check the radiator screen and the radiator core each day for grass or other material. The radiator screen and the radiator core must be clean at all times.

1. Use a soft brush to remove grass or other material from the radiator screen.
2. Remove the wing nuts that fasten the radiator screen in position.
3. Pull the top of the radiator screen and lift the screen out of position.
4. Use a soft brush and a hose and water to clean the radiator core.

NOTE: The radiator core is easily damaged.

5. Install the radiator screen and fasten in position with the wing nuts.

4.5 HOW TO CLEAN THE ENGINE

Check the engine each day for grass or other material. Use a brush to remove any grass or other material from the engine.

4.6 HOW TO CHECK THE AIR PRESSURE IN THE TIRES

Use a low pressure tire gauge to check the air pressure in the tires each day. If the air pressure in the tires is low, use an air pump to bring the air pressure up to 20 psi (1.4 kg/sq cm) in each tire.


4.7 HOW TO CHECK THE AIR CLEANER BULB

Check the air cleaner bulb on the air cleaner each day. Press the sides of the bulb by hand to release any dirt.

4.8 HOW TO CHANGE THE LUBRICANT IN THE ENGINE AND REPLACE THE LUBRICANT FILTER

Change the lubricant in the engine and replace the lubricant filter after every 40 hours of operation.

1. Stop the engine. Engage the parking brake.
 - A. If the engine is warm, stop the engine.
 - B. If the engine is cold, let the engine run five minutes at a slow RPM.
2. Open the hood.

 **WARNING: The engine muffler and other engine parts are hot.**

3. Clean the area around the dipstick, the lubricant filter, the fill cap, and the drain plug. See figure 4.0-3.

NOTE: Keep any dirt out of the engine.

4. Turn the fill cap counterclockwise and remove it.
5. Put a four quart (4 liter) container under the drain plug.
6. Turn the drain plug counterclockwise and remove it.
7. Drain all the old lubricant from the engine. Install the drain plug.

NOTE: If the gasket on the drain plug has damage, replace the gasket.

8. Turn the lubricant filter counterclockwise and remove the filter.

NOTE: Make sure the new lubricant filter has a gasket in the groove.

9. Apply clean engine lubricant to the gasket.
10. Install the new lubricant filter (turn the filter clockwise). Tighten the lubricant filter with your hand.

11. Add 3 U.S. quarts (2.85 liters) of new engine lubricant through the hole for the fill cap. Install the fill cap.
12. Start the engine. Let the engine run for five minutes. Stop the engine.
13. Check the level of the engine lubricant with the dipstick. Add more lubricant if needed.
14. Check for leakage around the lubricant filter and the drain plug. Tighten the drain plug and the lubricant filter if there is leakage.

4.9 HOW TO CHECK AND ADJUST THE TENSION OF THE FAN BELT

Check the tension of the fan belt after every 40 hours of operation. Make an adjustment of the tension if needed.

1. Stop the engine. Engage the parking brake.
2. Open the hood.
3. The tension of the fan belt is correct when the belt moves .5 inches (1.27 cm) down when using a force of 10 pounds (4 kg). Push down on the fan belt at the center between the fan belt pulley and the idler.
4. If the tension of the fan belt is not correct, loosen the nut on the idler pulley bracket.
5. Use a lever to move the idler pulley to adjust the tension of the fan belt.
6. When the adjustment of the fan belt is correct, tighten the nut on the idler pulley bracket.
7. Close the hood.

4.10 HOW TO CHECK AND ADJUST THE TENSION OF THE GOVERNOR AND ALTERNATOR BELT

Check the tension of the governor and alternator belt after every 40 hours of operation. Make an adjustment of the tension if needed.

1. Stop the engine. Engage the parking brake.

2. Open the hood.
3. The tension of the governor and alternator belt is correct when the belt moves .75 inches (2.0 cm) down when using a force of 10 pounds (4 kg.). Push down on the belt at the center between the governor and alternator.
4. If the tension of the belt is not correct, loosen the bolt on the alternator bracket.
5. Use a lever to move the alternator to adjust the tension of the belt.
6. When the adjustment of the belt is correct, tighten the bolt on the alternator bracket.
7. Close the hood.

4.11 HOW TO CHECK AND ADJUST THE TENSION OF THE WATER PUMP BELT

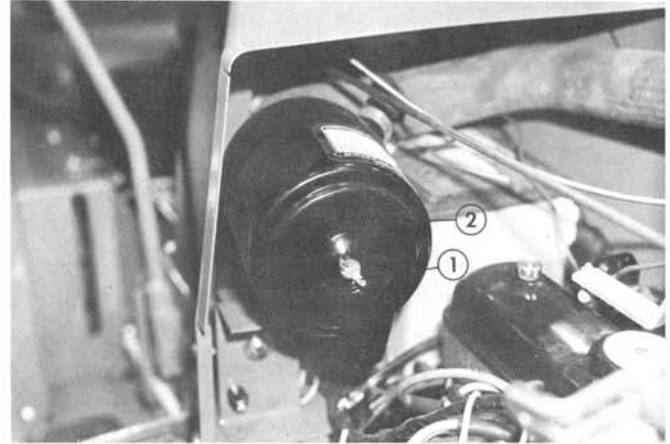
Check the tension of the water pump belt after every 40 hours of operation. Make an adjustment of the tension if needed.

1. Stop the engine. Engage the parking brake.
2. Open the hood.
3. The tension of the water pump belt is correct when the belt moves .5 inches (1.27 cm) down when using a force of 10 pounds (4 kg.). Push down on the belt at the center between the water pump and the idler pulley.
4. If the tension of the belt is not correct, loosen the bolt on the idler pulley bracket.
5. Use a lever to move the idler pulley to adjust the tension of the belt.
6. When the adjustment of the belt is correct, tighten the bolt on the idler pulley bracket.
7. Close the hood.

4.12 HOW TO CLEAN THE AIR CLEANER ELEMENT

Clean the air cleaner element after 40 hours of operation.

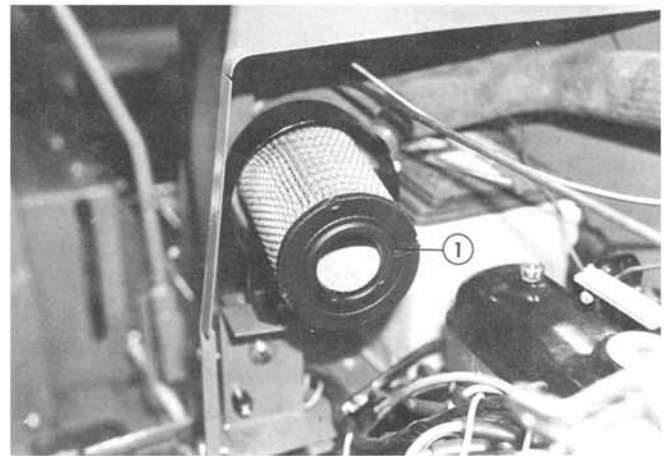
1. Stop the engine. Engage the parking brake.
2. Open the hood.
3. Turn the special bolt counterclockwise and remove the bolt and the air cleaner cover. See figure 4.0-7.



1 - Special Bolt
2 - Air Cleaner Cover

Figure 4.0-7

4. Remove the air cleaner element. See figure 4.0-8.



1 - Air Cleaner Element

Figure 4.0-8

5. To clean the air cleaner element, hit the element lightly on a flat surface or wash the element with clean water.

NOTE: The air cleaner element must be replaced after ten washings, after service of one year, or if the air cleaner element is damaged in any way.

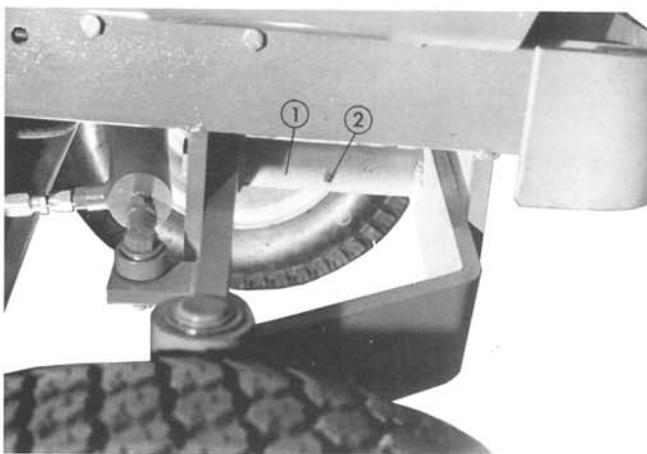
6. Clean all dirt from the air cleaner base before installing the air cleaner element.
7. Install the air cleaner element and the air cleaner cover.
8. Install the special bolt.
9. Inspect the clamps for the air cleaner hose. Make sure the clamps are tight.
10. Close the hood.

4.13 HOW TO LUBRICATE THE CHASSIS

Add multi-purpose grease to the grease fittings on the chassis after every 40 hours of operation.

1. Stop the engine. Engage the parking brake.
2. Clean the grease fittings and the area around the grease fittings.
3. Put multi-purpose grease in the grease fittings until it shows at the ends of the bearings.
4. The grease fitting locations are:

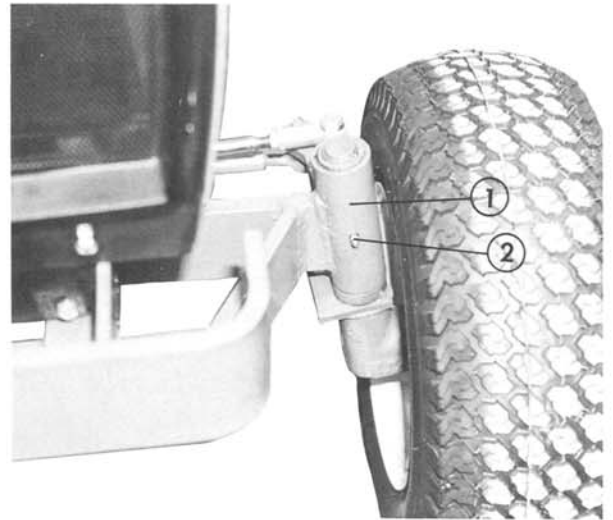
A. The front axle -- one. See figure 4.0-9.



1 - Front Axle
2 - Grease Fitting

Figure 4.0-9

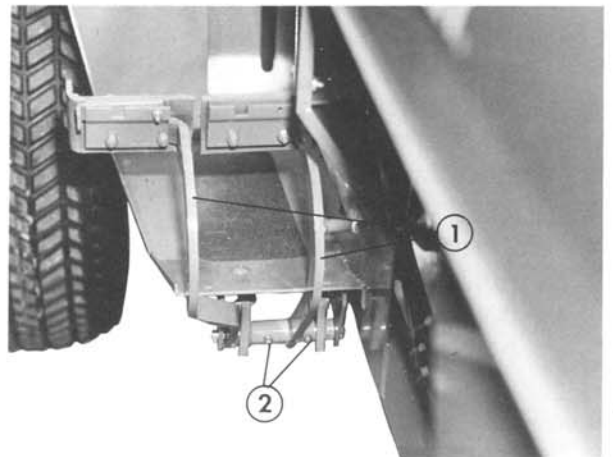
B. The right side and left side king pins - one each. See figure 4.0-10.



1 - King Pin
2 - Grease Fitting

Figure 4.0-10

C. The brake pedals -- one each. See figure 4.0-11.



1 - Brake Pedals
2 - Grease Fittings

Figure 4.0-11

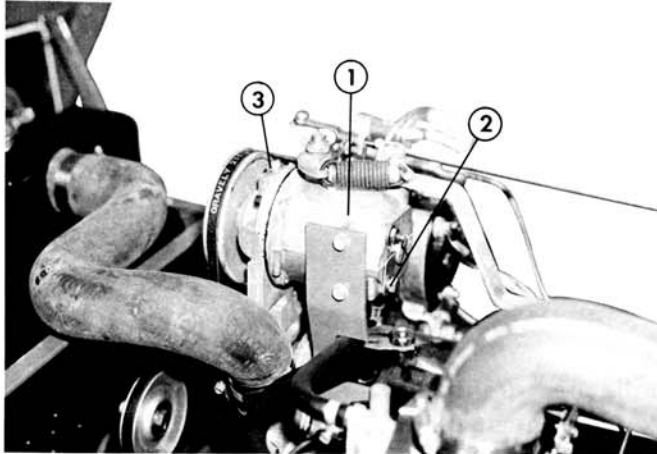
D. The front end of the drive shaft -- one. Not shown.

E. The rear end of the drive shaft -- one. Not shown.

4.14 HOW TO CHECK THE LEVEL OF THE LUBRICANT IN THE GOVERNOR

Check the level of the lubricant in the governor after every 100 hours of operation.

1. Stop the engine. Engage the parking brake.
2. Open the hood.
3. Clean the area around the check plug and the fill plug. See figure 4.0-12.



- 1 - Governor
- 2 - Check Plug
- 3 - Fill Plug

Figure 4.0-12

4. Turn the fill plug counterclockwise and remove the plug. The level of the lubricant is correct when the lubricant comes out the hole for the check plug.
5. If the lubricant does not come out, turn the fill plug counterclockwise and remove the plug.
6. Add engine lubricant through the hole for the fill plug until the lubricant comes out the hole for the check plug.

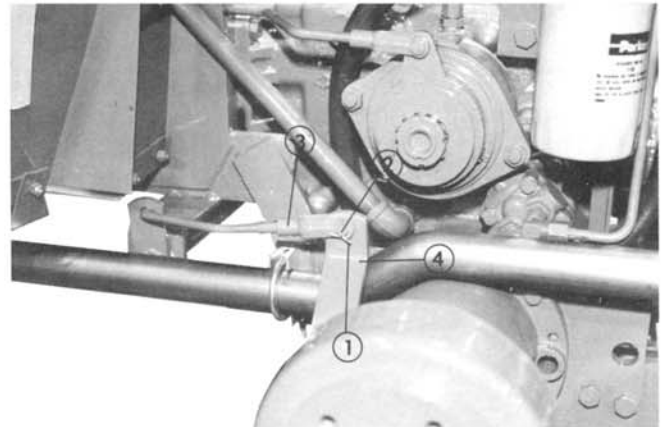
NOTE: Do not add lubricant with the check plug installed.

7. Install the fill plug and the check plug.

4.15 HOW TO ADJUST THE BRAKES

Adjust the brakes after every 100 hours of operation. The procedure for adjusting the brakes is the same for both brakes.

1. Stop the engine. Do not engage the parking brake. Put the gear selector and the direction control lever in the "NEUTRAL" position.
2. Put blocks on the ground to the front of the front tires and to the rear of the front tires. The blocks must be against the tires to prevent movement of the tractor.
3. Use a jack to lift the rear of the tractor above the ground. Put stands under the frame on the left side and right side in front of the transmission. Remove the jack.
4. Remove the cotter pin and the clevis pin that fastens the clevis to the actuating arm. See figure 4.0-13.



- 1 - Cotter Pin
- 2 - Clevis Pin
- 3 - Clevis
- 4 - Actuating Arm

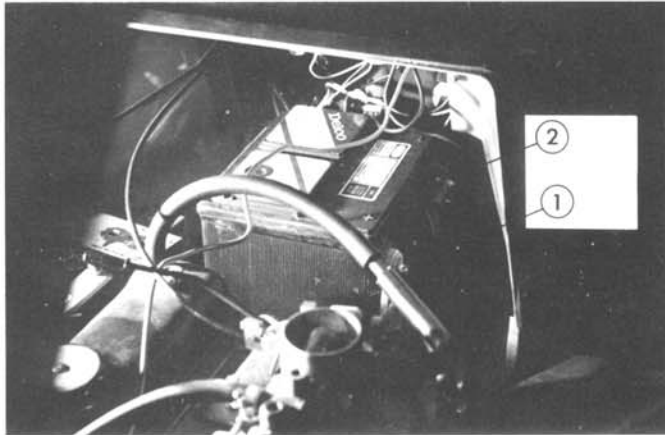
Figure 4.0-13

5. Turn the clevis one complete turn clockwise. Fasten the clevis to the actuating arm with the clevis pin.
6. Rotate the rear wheel. There will be a small amount of resistance when the brake is adjusted correctly. Repeat steps 4 and 5 if necessary.



WARNING: Always disconnect the negative terminal (“—”) first.

3. Turn the bolt of the negative terminal (“—”) counterclockwise and remove the bolt. See figure 4.0-15.



1 - Positive Terminal (“+”)
2 - Negative Terminal (“—”)

Figure 4.0-15

4. Turn the bolt of the positive terminal (“+”) counterclockwise and remove the bolt.
5. Clean the bolts and the terminals with a solution of sodium bicarbonate (baking soda) and water. Use one unit of baking soda to four units of water.
6. Reconnect the positive terminal (“+”).
7. Reconnect the negative terminal (“—”).
8. Close the hood.

4.20 HOW TO LUBRICATE THE FRONT WHEEL BEARINGS

Lubricate the front wheel bearings after every 500 hours of operation. If the tractor is operated with the front wheel bearings under water, the bearings must be cleaned and lubricated.

1. Stop the engine. Engage the parking brake.
2. Put blocks on the ground to the front of the rear tires and to the rear of the rear tires.

These blocks must be against the tires to prevent movement of the tractor.

3. Use a jack to lift the front wheels above the ground.
4. Put stands under the right side and the left side of the frame at the front of the tractor.
5. Use a snap-on GCP-10 grease cap tool to remove the dust cap.
6. Remove the five rim nuts and remove the wheel.
7. Remove the cotter pin and the slotted nut from the axle.
8. Remove the washer.
9. Remove the bearing assembly.
10. Remove the wheel hub.

NOTE: Be careful, do not damage the oil seal when removing the seal from the hub.

11. Remove the oil seal from the hub.
12. Remove the bearing assembly.
13. Clean the bearing assemblies, the wheel hub, and the axle with degreaser.
14. Inspect all the parts of the wheel for damage. Replace any part that has scratches or cracks.
15. Put multi-purpose grease on the bearing assemblies. Make sure the bearing cage is full of grease.
16. Put the bearing assembly in the wheel hub with the tapered end of the bearing towards the wheel hub.
17. Put multi-purpose on the lip of the oil seal.
18. Put the oil seal in the wheel hub with the lip of the oil seal towards the wheel hub.
19. Put clean engine lubricant on the axle. Put the wheel hub on the axle.

20. Put the other bearing assembly in the wheel hub with the tapered end towards the hub.
21. Put the washer on the axle and then the slotted nut.
22. Install the wheel on the wheel hub.
23. Turn the wheel slowly by hand while turning the slotted nut clockwise until there is a small amount of resistance in turning the wheel.
24. Turn the slotted nut counterclockwise until one of the slots in the nut is in alignment with the hole in the axle.

NOTE: The wheel must turn freely with no clearance in the bearings.

25. Install the cotter pin in the hole in the axle.
26. Install the dust cap.
27. Repeat steps 5 through 26 for the other wheel.
28. Use a jack to lift the front of the tractor. Remove the stands.
29. Lower the tractor. Remove the stands.
30. Remove the blocks at the rear wheels.

4.21 HOW TO CHANGE THE LUBRICANT IN THE TRANSMISSION AND REPLACE THE FILTER

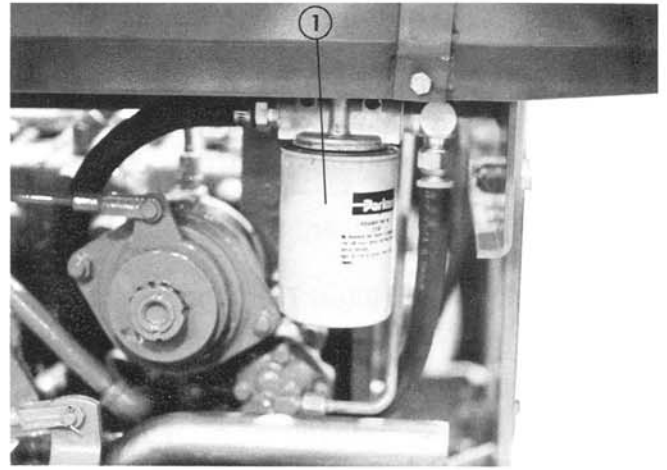
Change the lubricant in the transmission and replace the filter after every 500 hours of operation.

1. Stop the engine. Engage the parking brake.



WARNING: The exhaust pipe is hot.

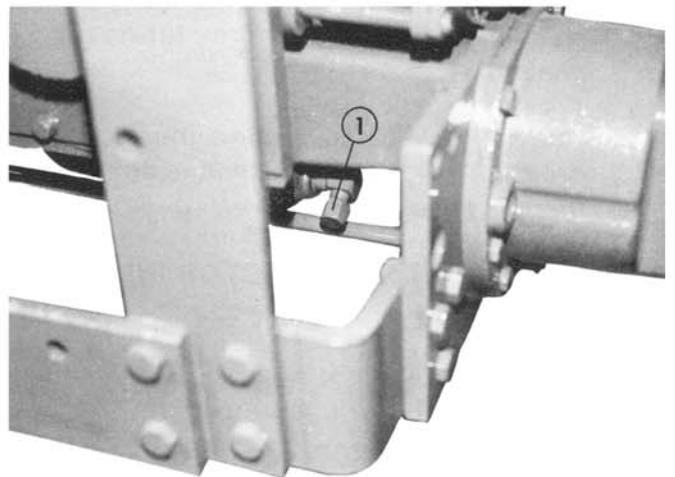
2. Clean the area around the filter. See figure 4.0-16.



1 - Filter

Figure 4.0-16

3. Clean the area around the drain cap. See figure 4.0-17.



1 - Drain Cap

Figure 4.0-17

4. Put a 14 U.S. quart (14 liter) container under the drain cap.
5. Turn the drain cap counterclockwise and remove it.
6. Drain all the old lubricant from the transmission. Install the drain cap.

7. Turn the filter counterclockwise and remove the filter.

NOTE: Make sure the new filter has a gasket in the groove.

8. Apply clean lubricant to the gasket.
9. Install the new filter. Tighten the filter with your hand.
10. Clean the area around the dipstick and tube for the transmission. Remove the dipstick.
11. Add 10 U.S. quarts (9.5 liters) of new lubricant for the transmission through the tube for the dipstick. Install the dipstick.
12. Start the engine. Operate the hydraulic levers. Stop the engine.
13. Check the level of the lubricant in the transmission. Add more lubricant if needed.
14. Check for leakage around the filter and drain cap. Tighten the filter and drain cap if there is leakage.

5.0 HOW TO PUT THE TRACTOR IN STORAGE

When the tractor will not be operated for three months or more, follow this procedure.

1. Do the maintenance shown in section 4.0.
2. Close the fuel valve on the fuel tank.
3. Get a clean fuel container.

 **WARNING: Gasoline is highly flammable.**

4. Disconnect the fuel line from the fuel pump.
5. Open the fuel valve and drain the gasoline into the fuel container.
6. Connect the fuel line to the fuel pump.
7. Start the engine and let it run until all the gasoline in the fuel tank and fuel line is used and the engine stops running.

NOTE: Make sure the key in the ignition switch is in the "OFF" position before leaving the operator's position.

8. Read the Operator's Manual for the engine and follow the procedure shown for putting the engine in storage.
9. Remove the key from the ignition switch.

6.0 HOW TO TAKE THE TRACTOR OUT OF STORAGE

1. Read the Operator's Manual for the engine and follow the procedures shown.
2. Charge the battery.
3. Put gasoline in the fuel tank.



WARNING: Gasoline is highly flammable.

4. Use the procedure for doing maintenance shown in section 4.0.

7.0 Tractor Specifications and Capacities

Engine:

Manufacturer of Engine.....	Continental
Model of Engine	R 800-46
Number of Cylinders	4
Horsepower Rating @ 3200 RPM	26
Gap for the Points of the Distributor	0.018" (0.4572 mm)
Gap for the Spark Plugs	0.025" (0.635 mm)
Capacity of Crankcase	2.75 U.S. Quarts (2.61 liters)
	Add 1/2 U.S. Pint (.24 liter) when replacing filter

Transmission:

Type	Sliding Gear
Number of Speeds: Forward	8
Number of Speeds: Reverse	4
Speed of PTO.....	Front - 1893 RPM at 3200 Engine RPM Rear - 540 RPM at 3200 Engine RPM
Capacity of Transmission Case	10 U.S. Quarts (9.5 liters)

Electric:

Battery	Delco 12 Volt Maintenance-Free (F-22 Case)
Headlights	35 Watt 12 Volt Sealed Beam No. 441
Fuse.....	Buss AGC 30
Fuse for Temperature Gauge	Buss SFE 14

General:

Capacity of Fuel Tank	7 U.S. Gallons (26.5 liters)
Type of Fuel	86 Octane or Higher (regular grade)

Tires:

Front	20 x 8-10
Rear	29 x 12-15
Tire Pressure	20 psi, Front and Rear (1.406 kg/sq cm)

Dimensions:

Length.....	90.5" (2.3 m)
Height	48.5" (1.2 m)
Width.....	44" (1.1 m)
Turning Radius (Inside Dimension).....	2.83 ft. (.86 m) Minimum

 **GRAVELY.**
GRAVELY COMMERCIAL TRACTORS
LIMITED WARRANTY

This Limited Warranty is issued by Clarke-Gravely Corporation, Gravely Division, and consists of the following term:

1. Only the original purchaser of new Gravely equipment is covered by this Warranty.
2. This Warranty covers repairs or replacement of parts manufactured by Gravely which are defective in material or workmanship. Gravely will pay for parts and labor only.
3. The Warranty starts the date of purchase and lasts TWELVE (12) MONTHS.
4. Some components of Gravely equipment are not covered by the Gravely Warranty. These components are covered by the original manufacturer's warranty, they are:
 - (a) Battery — Delco-Remy
 - (b) Tires — Goodyear
 - (c) Hydraulic Pump — Parker Hannifin Corp.
 - (d) Hydraulic Valve — Cessna Fluid Power
 - (e) Relief Valve — Parker Hannifin Corp.
5. To obtain warranty service on Gravely equipment including components not manufactured by Gravely, use this procedure:
 - (a) Notify the Gravely dealer from whom you purchase the equipment.
 - (b) Make arrangements to have the equipment delivered to the dealer (refer to paragraph 6 (a) below).
 - (c) If you have any questions concerning the Gravely Warranty, they should be referred to:

Gravely
Clarke-Gravely Corporation
A Studebaker-Worthington Company
One Gravely Lane
Clemmons, N. C. 27012
Attn: Manager of Customer Services

- (d) Warranty service on Gravely equipment must be performed by an authorized Gravely commercial dealer or Gravely factory branch.
6. This Warranty does not cover the following:
 - (a) Transportation between owner's home or place of business and the dealership. If the dealer provides the transportation of the equipment, he will charge the owner his usual rate for such service.
 - (b) Normal maintenance services and normal replacement of items such as spark plugs, belts, oil, oil filters, air filters and mower blades.
7. GRAVELY MAKES NO OTHER EXPRESS WARRANTIES. ANY IMPLIED WARRANTIES, INCLUDING WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE PERIOD SET OUT IN PARAGRAPH 3 ABOVE.
8. GRAVELY SHALL HAVE NO RESPONSIBILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE BREACH OF ANY WARRANTY, INCLUDING, BUT NOT LIMITED TO, INCONVENIENCE, RENTAL OR PURCHASE OF REPLACEMENT EQUIPMENT, LOSS OF PROFITS OR COMMERCIAL LOSS.
9. A Gravely equipment registration card is supplied with each Gravely tractor or major attachment. Please complete the card and return it to Gravely at the address listed on the card. The return registration card is not required in order to take advantage of this Warranty.
10. This Warranty is not subject to change or modification by anyone, including Gravely dealers and no Gravely dealer is authorized to make any representations or promises on Gravely's behalf.