Form No. 3358-665 Rev A

TORO®

Count on it.

Operator's Manual

Polar Trac Groundsmaster® 7210 Tractor

Model No. 30383—Serial No. 270000001 and Up



Register at www.Toro.com.

Original Instructions (EN)

Warning

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Because in some areas there are local, state, or federal regulations requiring that a spark arrester be used on the engine of this machine, a spark arrester is available as an option. If you require a spark arrestor, contact your Authorized Service Dealer.

Genuine Toro spark arresters are approved by the USDA Forestry Service.

Important: It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land without a spark arrester muffler maintained in working order, or the engine constricted, equipped, and maintained for the prevention of fire. Other states or federal areas may have similar laws.

Introduction

Read this information carefully to learn how to operate and maintain your product properly and to avoid injury and product damage. You are responsible for operating the product properly and safely.

You may contact Toro directly at www.Toro.com for product and accessory information, help finding a dealer, or to register your product.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 identifies the location of the model and serial numbers on the traction unit. The model and serial numbers for the cab are printed on a plate located on inside the cab, on the frame above the door. Write the numbers in the space provided.

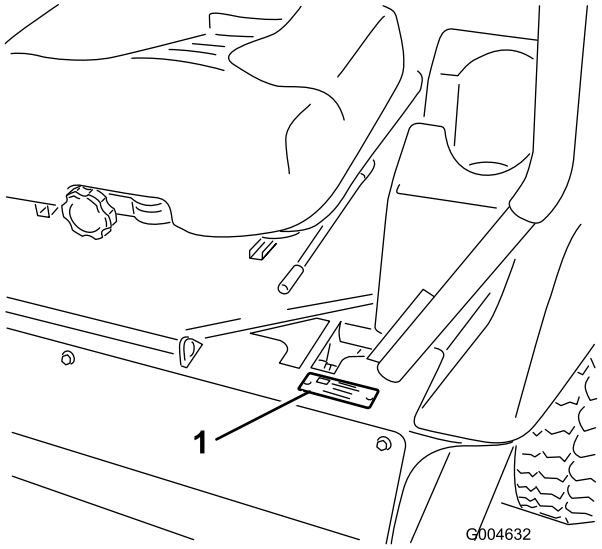


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety alert symbol (Figure 2), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



Figure 2

1. Safety alert symbol

This manual also uses 2 words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

© 2007—The Toro® Company
8111 Lyndale Avenue South
Bloomington, MN 55420

Contact us at www.Toro.com.
Printed in the USA.
All Rights Reserved

Contents

Introduction 2
Safety 4
- Safe Operating Practices 4
- Slope Chart 6
- Safety and Instructional Decals 7

Setup 11
- 1 Checking the Tire Pressure 11
- 2 Checking Fluid Levels 11

Product Overview 12
- Controls 12
- Specifications 15
- Attachments/Accessories 15

Operation 15
- Adding Fuel 15
- Checking the Engine Oil Level 16
- Checking the Cooling System 16
- Checking the Hydraulic System 16
- Think Safety First 17
- Operating the Parking Brake 17
- Starting the Engine 18
- Driving the Machine 18
- Stopping the Machine/Engine 19
- Operating Attachments 20
- The Safety Interlock System 21
- Positioning the Seat 22
- Unlatching the Seat 23
- Moving a Non-functioning Machine 23
- Loading Machines 24
- Transporting the Machine 25

Maintenance 26
- Recommended Maintenance Schedule(s) 26
  - Daily Maintenance Checklist 27
- Lubrication 28
  - Greasing the Bearings and Bushings 28
- Engine Maintenance 29
  - Air Cleaner Maintenance 29
  - Servicing the Engine Oil 30
- Fuel System Maintenance 31
  - Servicing the Water Separator 31
  - Cleaning the Fuel Tank 32
  - Replacing the Fuel Pre-Filter 32
  - Fuel Lines and Connections 32
  - Bleeding the Fuel System 32
  - Bleeding Air From the Injectors 33
- Electrical System Maintenance 34
  - Servicing the Battery 34
  - Storing the Battery 34
  - Checking the Fuses 34
- Drive System Maintenance 36
  - Checking the Tire Pressure 36
- Cooling System Maintenance 36
  - Checking the Cooling System 36
  - Cleaning the Radiator 37
- Brake Maintenance 37
  - Adjusting the Parking Brake Interlock Switch 37
- Belt Maintenance 38
  - Checking the Alternator Belt Tension 38
- Controls System Maintenance 39
  - Adjusting the Control Lever Neutral Interlock Switch 39
  - Adjusting the Control Lever Neutral Return 39
  - Adjusting the Traction Drive for Neutral 40
  - Adjusting the Maximum Ground Speed 41
  - Adjusting the Tracking 42
- Hydraulic System Maintenance 43
  - Checking the Hydraulic Fluid Level 43
  - Changing the Hydraulic Oil And Filter 43
- Cab Maintenance 44

Storage 45
- Machine 45
- Engine 45

Schematics 46

Safety

This machine meets or exceed ANSI B71.4-2006 specifications in effect at the time of production.

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert symbol, which means **Caution, Warning, or Danger**—personal safety instruction. Failure to comply with the instruction may result in personal injury or death.

Safe Operating Practices

The following instructions are adapted from ANSI B71.4-2006.

This product is capable of amputating hands and feet and throwing objects. Always follow all safety instructions to avoid serious injury or death.

Important: Refer to the *ROPS Hard Cab Operator's Manual* for additional cab safety information.

Training

- Read the *Operator's Manual* and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
- Never allow children or people unfamiliar with these instructions to use the machine. Local regulations can restrict the age of the operator.
- Never operate while people, especially children, or pets are nearby.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Do not carry passengers.
- All drivers should seek and obtain professional and practical instruction. Such instruction should emphasize:
  - the need for care and concentration when working with ride-on machines;
  - control of a ride-on machine sliding on a slope will not be regained by the application of the control levers. The main reasons for loss of control are:
    - ◊ insufficient track grip, especially on wet grass, ice or snow;
    - ◊ being driven too fast;
    - ◊ inadequate braking;
    - ◊ the type of machine is unsuitable for its task;
    - ◊ lack of awareness of the effect of ground conditions, especially slopes;
    - ◊ incorrect hitching and load distribution.

Preparation

- While operating, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- **Warning**- Fuel is highly flammable.
  - Store fuel in containers specifically designed for this purpose.
  - Refuel outdoors only and do not smoke while refueling.
  - Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
  - If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
  - Replace all fuel tank and container caps securely.
- Replace faulty silencers/mufflers.
- Before using, always visually inspect to see that the attachments are not worn or damaged. Replace worn or damaged components.

Operation

- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions.
- Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you. Do not run engine indoors or in an enclosed area where fumes can collect.
- Operate only in daylight or in good artificial light.
- Before attempting to start the engine, disengage all attachment clutches and place the control levers in the neutral, locked position.
- When operating near drop-offs or bodies of water, do not use on slopes greater than 15 degrees.
- Use care when pulling loads or using heavy equipment.
  - Use only approved draw bar hitch points.
  - Limit loads to those you can safely control.

  - Do not turn sharply. Use care when reversing.
- Watch out for traffic when crossing or near roadways.
- When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation. Some attachments, such as a snowthrower, are capable of amputating hands and feet and throwing objects
- Never operate the machine with damaged guards, shields, or without safety protective devices in place.
- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operators position:
  - disengage the power take off and lower the attachments;
  - place in neutral and set the parking brake;
  - stop the engine and remove the key.
- If an attachment should start to vibrate abnormally, stop the machine and check immediately for the cause.
- Disengage drive to attachments, stop the engine, set the parking brake and remove the ignition key:
  - before clearing blockages or unclogging chute;
  - before checking, cleaning or working on the attachment
  - after striking a foreign object. Inspect the attachment for damage and make repairs before restarting and operating the equipment;
  - if the machine starts to vibrate abnormally (check immediately).
- Disengage drive to attachments when transporting, not in use or any time the attachment is in the raised position.
- Stop the engine and disengage drive to attachment:
  - before refuelling;
  - before making height adjustment unless adjustment can be made from the operators position.
- Use only Toro approved attachments.

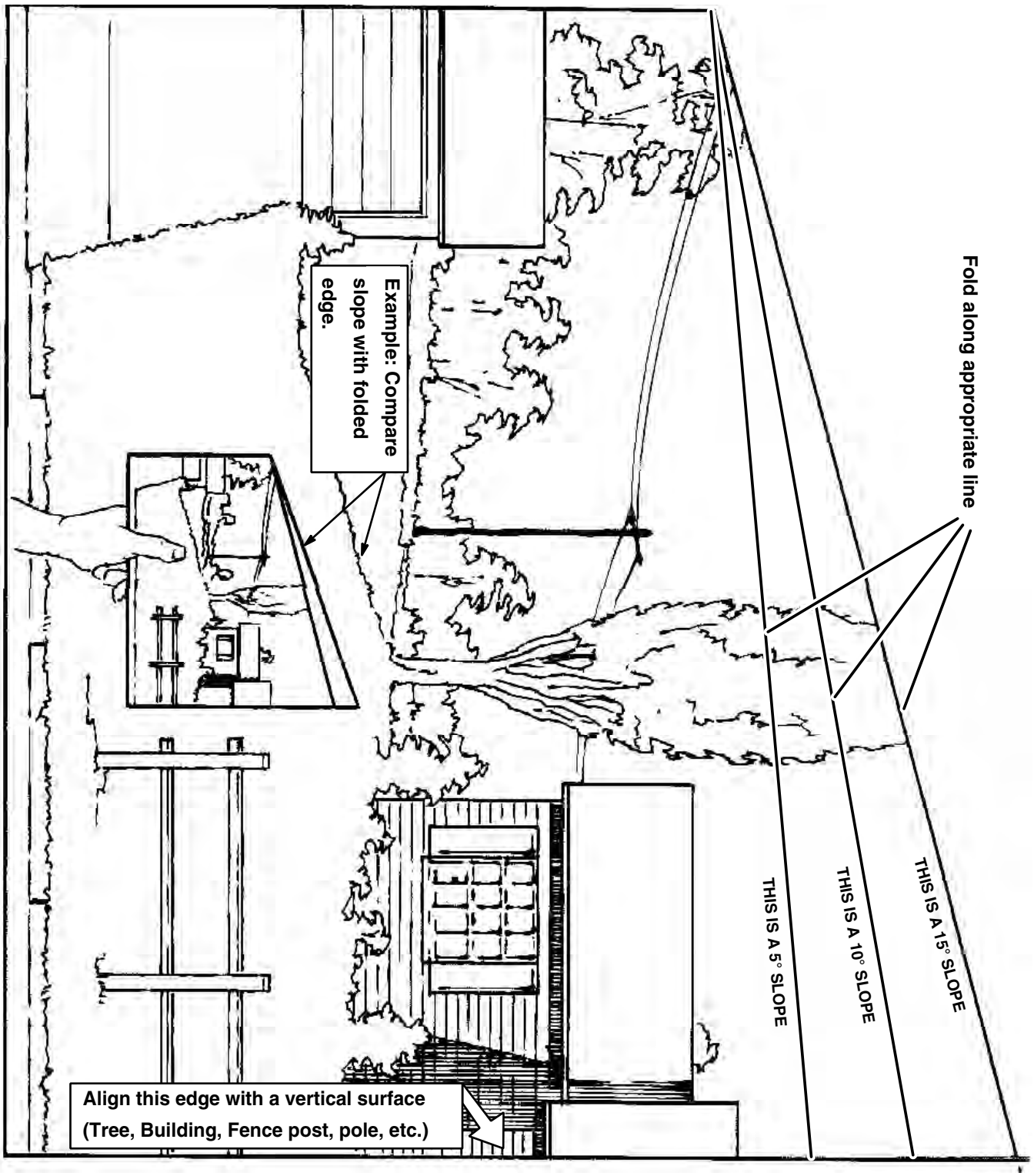
Slope Operation

- Remember there is no such thing as a safe slope. Travel on slopes requires particular care. To guard against overturning:
  - do not stop or start suddenly when on a slope;
  - use slow speeds on slopes and during tight turns;
  - stay alert for humps and hollows and other hidden hazards;
- Do not operate near drop-offs, ditches, steep banks or water. Tracks dropping over edges can cause roll overs, which may result in serious injury, death or drowning.
- Do not operate on slopes where slippery conditions could reduce traction and could cause sliding and loss of control.
- Do not make sudden turns or rapid speed changes.
- Reduce speed and use extreme caution on slopes.
- Remove or mark obstacles such as rocks, tree limbs, etc. from the operating area. Tall grass can hide obstacles.
- Watch for ditches, holes, rocks, dips, and rises that change the operating angle, as rough terrain could overturn the machine.
- Avoid sudden starts when operating uphill because the machine may tip backwards.
- Do not operate on ice incapable of supporting the weight of this machine.

Maintenance and Storage

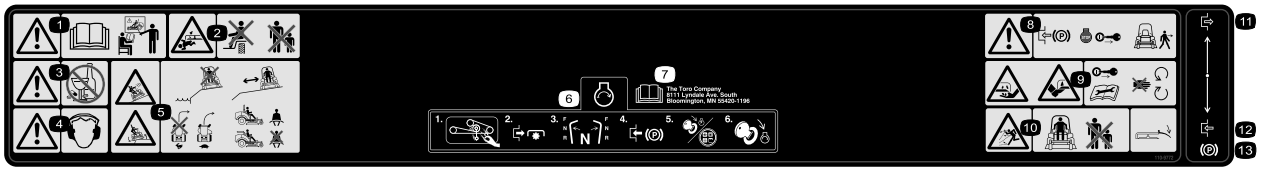
- Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment and fuel storage area free of grass, leaves, or excessive grease.
- Replace worn or damaged parts for safety.
- If the fuel tank has to be drained, do this outdoors.
- When machine is to be parked, stored or left unattended, lower the attachment unless a positive mechanical lock is used.
- Use only genuine Toro replacement parts to ensure that original standards are maintained.

Slope Chart


Fold along appropriate line
Example: Compare slope with folded edge.
THIS IS A 5° SLOPE
THIS IS A 10° SLOPE
THIS IS A 15° SLOPE
Align this edge with a vertical surface
(Tree, Building, Fence post, pole, etc.)

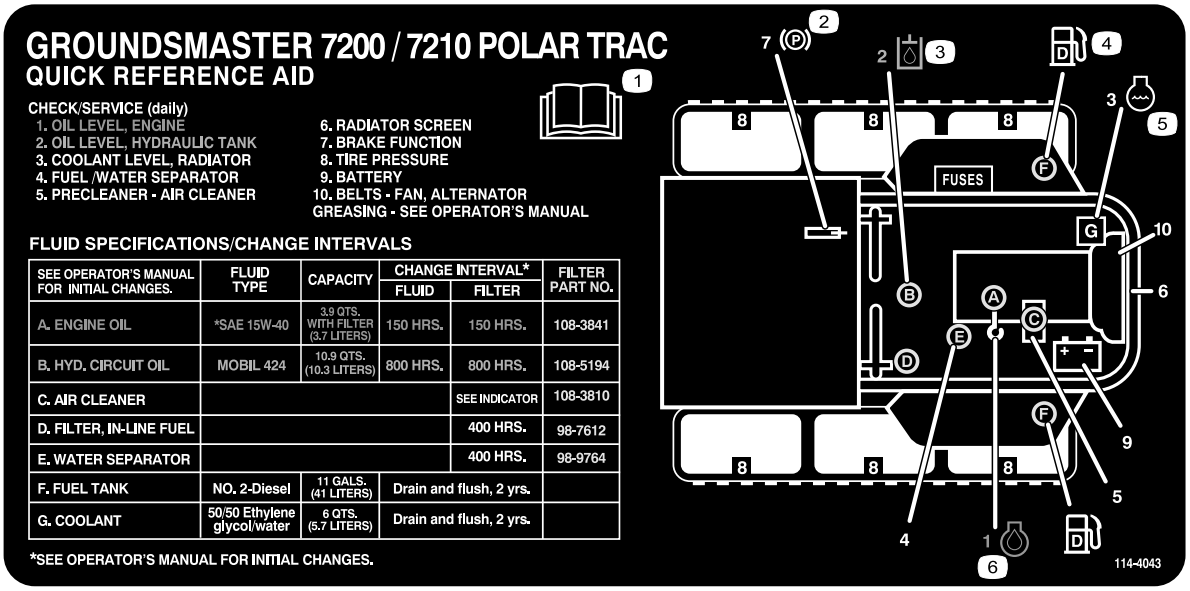
Safety and Instructional Decals

Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



110-9772

1. Warning—read the *Operator's Manual* before operating and do not operate this machine unless you are trained.
2. Crushing/dismemberment hazard of bystanders—do not carry passengers, keep bystanders a safe distance from the machine.
3. Warning—do not use drugs or alcohol.
4. Warning—wear hearing protection.
5. Tipping, drop off hazard—do not operate near water drop-offs, stay a safe distance from drop-offs, slow machine before turning, do not turn at high speeds, wear a seat belt when a ROPS is in place, do not wear a seat belt when ROPS is lowered.
6. To start the engine: clear any debris from the attachment, disengage the PTO, move the motion control levers to the neutral position, engage the parking brake, turn the ignition to Run and wait for the glow plug light to turn off, turn the ignition key to Start.
7. Read the *Operator's Manual.*
8. Warning—engage the parking brake, stop the engine and remove the ignition key before leaving the machine.
9. Cutting hazard of hand or foot—remove the ignition key and read the instructions before servicing or performing maintenance, keep away from moving parts.
10. Thrown object hazard—keep bystanders a safe distance from the machine; keep all deflectors and shields in place.
11. Disengage
12. Engage
13. Parking brake

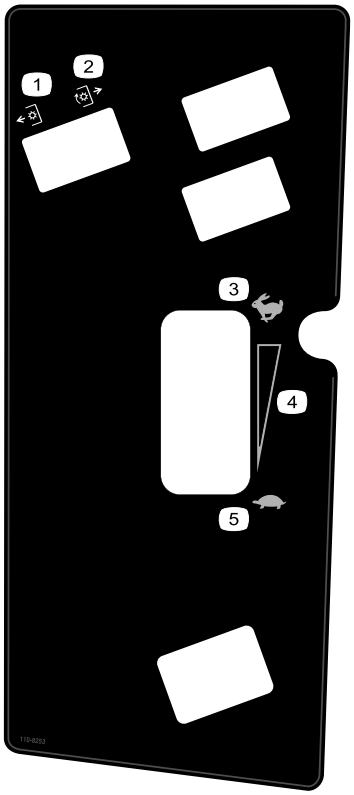


SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL*		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	*SAE 15W-40	3.9 QTS. WITH FILTER (3.7 LITERS)	150 HRS.	150 HRS.	108-3841
B. HYD. CIRCUIT OIL	MOBIL 424	10.9 QTS. (10.3 LITERS)	800 HRS.	800 HRS.	108-5194
C. AIR CLEANER				SEE INDICATOR	108-3810
D. FILTER, IN-LINE FUEL				400 HRS.	98-7612
E. WATER SEPARATOR				400 HRS.	98-9764
F. FUEL TANK	NO. 2-Diesel	11 GALS. (41 LITERS)	Drain and flush, 2 yrs.		
G. COOLANT	50/50 Ethylene glycol/water	6 QTS. (5.7 LITERS)	Drain and flush, 2 yrs.		

*SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.

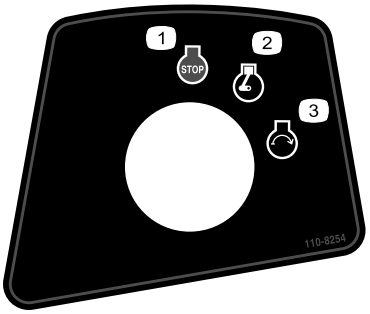
114-4043

1. Read the *Operator's Manual.*
2. Parking brake
3. Hydraulic oil
4. Fuel
5. Engine coolant
6. Engine oil



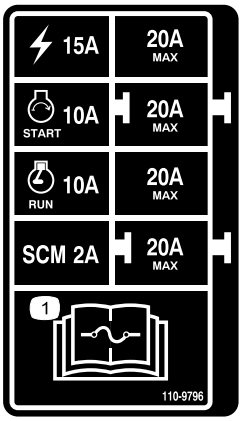
110-8253

1. PTO–Off
2. PTO—On
3. Fast
4. Continuous variable setting
5. Slow



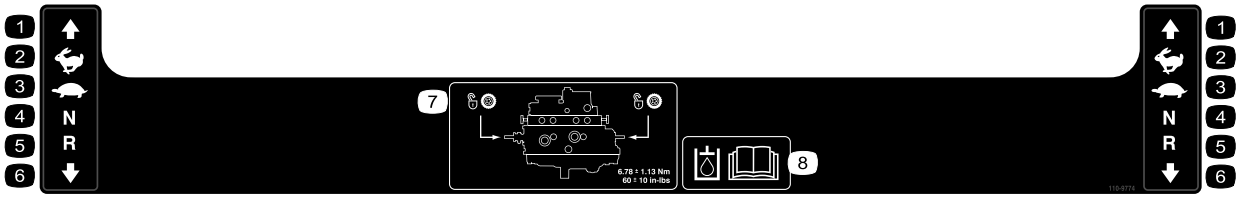
110-8254

1. Engine–Stop
2. Engine—Run
3. Engine—Start



110-9796

1. Read the *Operator's Manual* for information on fuses.



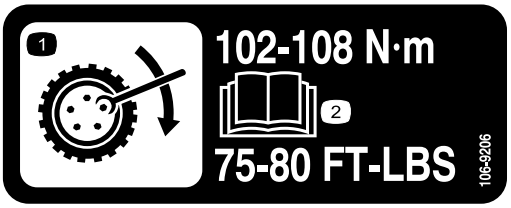
110-9774

1. Forward
2. Fast
3. Slow
4. Neutral
5. Reverse
6. Backward
7. Tow valve location; torque the tow valves to 6.78 ± 1.13 N·m (60 ± 10 in-lbs).
8. Read the *Operator's Manual* for more information on the hydraulic oil.



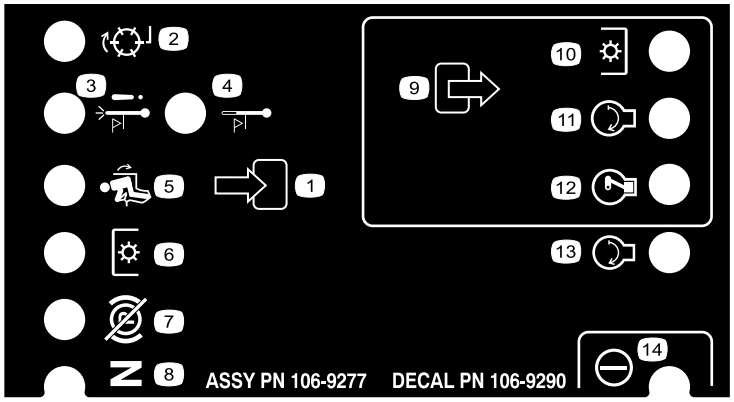
106-6755

1. Engine coolant under pressure.
2. Explosion hazard—read the *Operator's Manual.*
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual.*



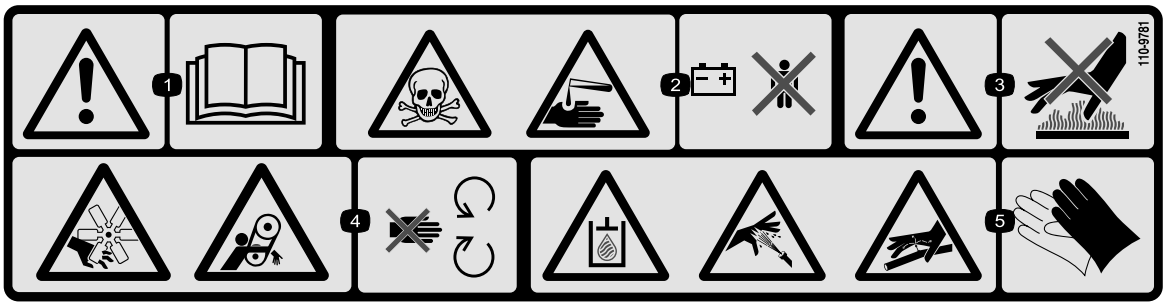
106-9206

1. Wheel torque specifications
2. Read the *Operator's Manual*.



106-9290

1. Inputs
2. (not active on this machine)
3. High temperature shutdown
4. High temperature warning
5. In seat
6. Power Take-off (PTO)
7. Parking brake Off
8. Neutral
9. Outputs
10. Power Take-off (PTO)
11. Start
12. Energize to Run (ETR)
13. Start
14. Power



110-9781

1. Warning—read the *Operator's Manual.*
2. Poison and caustic liquid/chemical burn hazard—keep children a safe distance from the battery.
3. Warning—do not touch the hot surface.
4. Cutting/dismemberment hazard, fan and entanglement hazard, belt—stay away from moving parts.
5. Hydraulic oil in system under pressure, escaping hydraulic oil penetrating skin hazard, broken hydraulic lines hazard—wear protective hand protection when handling hydraulic system components.



Battery Symbols

Some or all of these symbols are on your battery

1. Explosion hazard
2. No fire, open flame, or smoking.
3. Caustic liquid/chemical burn hazard
4. Wear eye protection
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries
8. Battery acid can cause blindness or severe burns.
9. Flush eyes immediately with water and get medical help fast.
10. Contains lead; do not discard.

Setup

Loose Parts

Use the chart below to verify that all parts have been shipped.

Procedure	Description	Qty.	Use
1	No parts required	–	Check the tire pressure.
2	No parts required	–	Check the hydraulic fluid, engine oil, and coolant levels.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Read before operating the machine.
Engine Operator's Manual	1	Read before operating the machine.
Parts Catalog	1	Use to lookup and order parts.
ROPS Hard Cab Operator's Manual	1	Read before operating the machine.
Operator Training DVD	1	View before operating the machine.
Pre-delivery Inspection Sheet	1	Read to verify proper delivery.
Engine warranty	1	Save for future use.

1

Checking the Tire Pressure

No Parts Required

Procedure

Ensure that the tires are inflated to 35 psi (241 kPa).

2

Checking Fluid Levels

No Parts Required

Procedure

1. Check the hydraulic fluid level before starting the engine, refer to Checking the Hydraulic Fluid Level in Hydraulic System Maintenance.
2. Check the engine oil level before and after starting the engine, refer to Checking the Engine Oil Level in Engine Maintenance.
3. Check the cooling system before starting the engine; refer to Checking the Cooling System in Cooling System Maintenance.

Product Overview

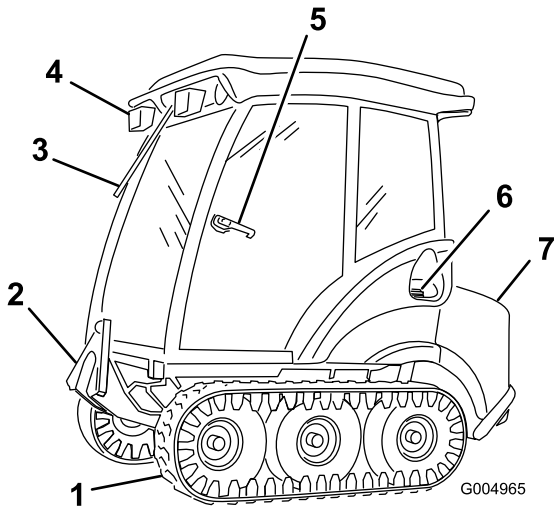


Figure 3

1. Track
2. Front lift arm
3. Windshield wiper
4. Work lights
5. Door latch
6. Fuel cap (both sides)
7. Hood

Controls

Become familiar with all the controls before you start the engine and operate the machine (Figure 3 and Figure 4).

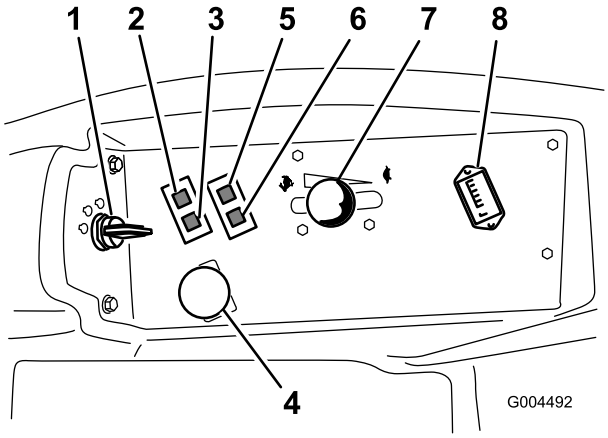


Figure 4

Tractor Control Panel

1. Ignition switch
2. Engine coolant temperature warning light
3. Glow plug light
4. Power take off (PTO) Switch
5. Oil pressure warning light
6. Charge indicator light
7. Throttle lever
8. Hour meter

Motion Control Levers

The motion control levers control the forward and rearward motions as well as the turning of the machine.

Parking Brake Lever

Whenever the engine is shut off, engage the parking brake to prevent accidental movement of the machine. To engage the parking brake, pull the parking brake lever rearward and up (Figure 5). To release the parking brake, push the parking brake lever forward and down.

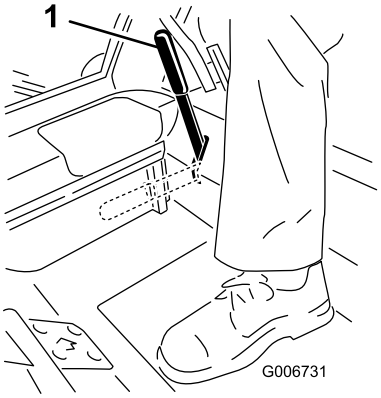


Figure 5

1. Parking brake lever

Do not park the machine on a slope.

Ignition Switch

The ignition switch has three positions: Off, On/Preheat, and Start.

Throttle Lever

The throttle lever controls the speed of the engine. Moving the throttle lever forward toward the Fast position increases the engine speed. Moving it rearward toward the Slow position decreases the engine speed. The throttle, in conjunction with motion control levers, controls ground speed of the machine. Always run the machine with the throttle in the Fast position when using attachments.

Power Take Off (PTO) Switch

The power take off (PTO) switch starts and stops powered attachments.

Hour Meter

The hour meter records the number of hours the engine has operated. It operates when the key switch is in the Run position. Use these times for scheduling regular maintenance.

Glow Plug Light (Orange Light)

The glow plug indicator light turns on when the ignition switch is turned to the On position. It remains lit for 6 seconds. When the light turns off, the engine is ready to be started.

Engine Coolant Temperature Warning Light

This light glows and the powered attachments will stop if the engine coolant temperature is high. If the machine is not stopped and the coolant temperature rises another 20° F, the engine will stop.

Important: If the attachment shuts down and the temperature warning light is on, push PTO knob down, drive to a safe flat area, move the throttle lever to the Slow position, move the motion control levers into the neutral locked position, and engage the parking brake. Allow the engine to idle for several minutes while it cools to a safe level. Stop the engine and check the cooling system; refer to Checking the Cooling System in Cooling System Maintenance.

Charge Indicator

Illuminates when the system charging circuit malfunctions.

Oil Pressure Warning Light

The oil pressure warning light glows when the oil pressure in the engine drops below a safe level. If low oil pressure ever occurs, stop the engine and determine the cause. Repair the damage before starting the engine again.

Fuel Gauge

The fuel gauge (Figure 6) indicates the quantity of fuel remaining in the fuel tanks.

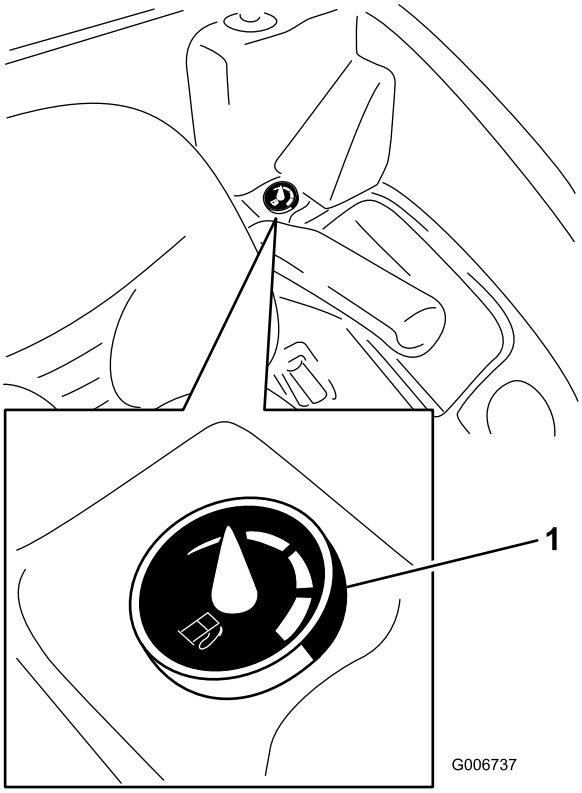


Figure 6

1. Fuel gauge

Signal Light Switch

Turn the signal light switch (Figure 7) to the left to activate the left turn signal, or right to activate the right turn signal. When finished turning, return the switch to the Off position.

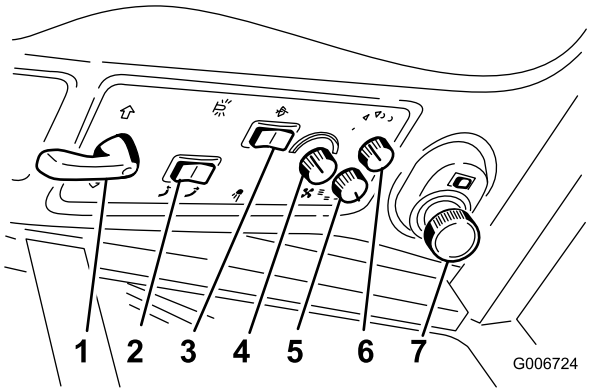


Figure 7

1. Signal light switch
2. Snowthrower deflector control switch
3. Windshield wiper switch
4. Temperature control knob
5. Fan control knob
6. Lights control knob
7. Cab light

Snowthrower Deflector Control Switch

Press the snowthrower deflector control switch (Figure 7) forward to lower the snowthrower deflector, or rearward to raise the deflector.

Note: This switch operates only when a snowthrower attachment is installed.

Windshield Wiper Switch

- Press the rear side of the windshield wipe switch to activate the wipers.

  Important: If the windshield is icy or snow covered, scrape it off first before using the wipers. If the wipers are covered in ice and/or are frozen to the windshield, remove the ice before using the wipers.

- Press the front side of the switch to momentarily activate the wipers.

  Note: If you have the optional Washer Kit installed, this side of the switch will also activate a stream of washer fluid onto the window for as long as you press the switch.

Temperature Control Knob

Turn this knob to activate and set the temperature of the heater. Blue indicates less to no heat, and red indicates more to full heat.

Fan Control Knob

This knob controls the speed of the fan, which blows air from the heater through the vents located in the ceiling of the cab. The knob has 4 positions: Off, Low, Medium, and High.

Lights Control Knob

This knob controls the lights on the outside of the cab. It has the following positions:

- Off
- Hazard lights—the hazard lights flash.
- Hazard lights/Operating lights—the hazard lights flash and the operating lights (headlights and tail lights) shine.
- Head lights—the operating lights shine.

Cabin Light

Press the switch next to the cabin light (Figure 7) to turn the light on and off. You can adjust the light to aim a different parts of the cab.

Attachment Control Pedals

Use the attachment control pedals (Figure 8) to control the physical orientation of the attachment. Use the left pedal to raise and lower the attachment. Use the right pedal to swing the attachment to the right or left.

Note: The right pedal is not used on all attachments. Also, on snowthrowers, only the chute swings right and left.

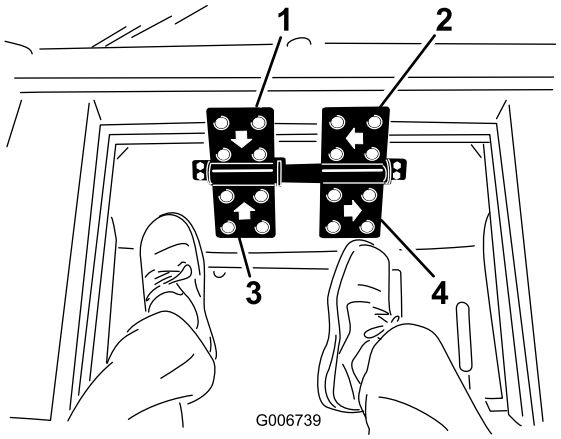


Figure 8

1. Press to lower the attachment
2. Press to swing the attachment to the left
3. Press to raise the attachment
4. Press to swing the attachment to the right

Window Latches

Open the front, right side window and rear side windows by lifting up on the window latches and pushing out (Figure 9).

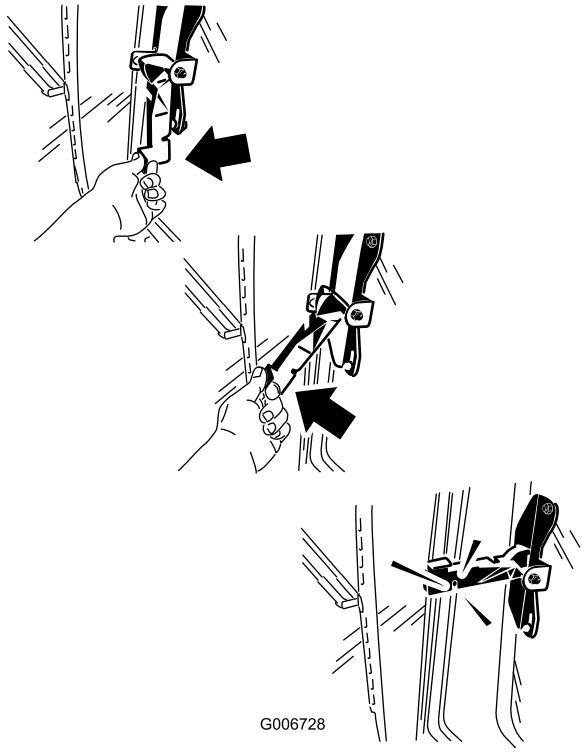


Figure 9
Front Side Window Shown

In an emergency, you can escape using the front side window. Open the window as normal, then pull the latch rearward and off of the retaining post to enable you to swing the window all the way open.

Specifications

Note: Specifications and design are subject to change without notice.

Length	91 inches (231 cm)
Width	49.5 inches (126 cm)
Height	78 inches (198 cm)
Weight	2320 lb (1052 kg)

Attachments/Accessories

A selection of Toro approved attachments and accessories are available for use with the machine to enhance and expand its capabilities. Contact your Authorized Service Dealer or Distributor or go to www.Toro.com for a list of all approved attachments and accessories.

Operation

Note: Determine the left and right sides of the machine from the normal operating position.

Adding Fuel

The engine runs on clean, fresh diesel fuel with a minimum octane rating of 40. Purchase fuel in quantities that can be used within 30 days to ensure fuel freshness.

Combined tank capacity: 11.5 US gallons (43.5 l)

Use summer grade diesel fuel (No. 2-D) at temperatures above 20° F (-7° C) and winter grade diesel fuel (No. 1-D or No. 1-D/2-D blend) below 20° F (-7° C). Use of winter grade diesel fuel at lower temperatures provides lower flash point and pour point characteristics, therefore easing starting and lessening chances of chemical separation of the fuel due to lower temperatures (wax appearance, which may plug filters).

Use of summer grade diesel fuel above 20° F (-7° C) will contribute toward longer life of the pump components.

Important: Do not use kerosene or gasoline instead of diesel fuel. Failure to observe this caution will damage the engine.

Fuel is harmful or fatal if swallowed. Long-term exposure to vapors can cause serious injury and illness.

- **Avoid prolonged breathing of vapors.**
- **Keep face away from nozzle and gas tank or conditioner opening.**
- **Keep fuel away from eyes and skin.**

In certain conditions, fuel is extremely flammable and highly explosive. A fire or explosion from fuel can burn you and others and can damage property.

- **Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any fuel that spills.**
- **Never fill the fuel tank inside an enclosed trailer.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of fuel.**
- **Do not operate without entire exhaust system in place and in proper working condition.**

In certain conditions during fueling, static electricity can be released causing a spark which can ignite the fuel vapors. A fire or explosion from fuel can burn you and others and can damage property.

- **Always place fuel containers on the ground away from your vehicle before filling.**
- **Do not fill fuel containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.**
- **When practical, remove equipment from the truck or trailer and refuel the equipment with its wheels on the ground.**
- **If this is not possible, then refuel such equipment on a truck or trailer from a portable container, rather than from a fuel dispenser nozzle.**
- **If a fuel dispenser nozzle must be used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.**

Filling the Fuel Tank

1. Park the machine on a level surface.

   Important: The fuel tanks are connected, but the fuel does not transfer quickly from one tank to the other. It is important when filling that you park on a level surface. If you park on a hill, you may inadvertently overfill the tanks.

2. Shut the engine off and set the parking brake.
3. Clean around each fuel tank cap and remove the cap.

   Important: Do not open the fuel tanks when parked on a hill. The fuel could spill out.

4. Add fuel to both fuel tanks, until the level is even with the bottom of the filler neck (Figure 10). **Do not over fill the fuel tanks.**

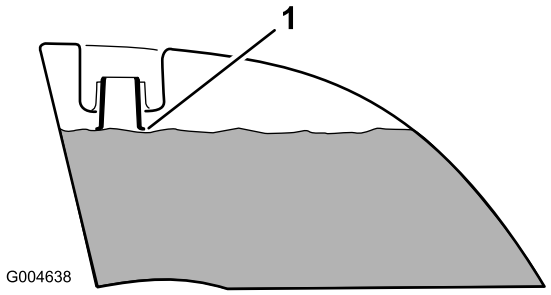


Figure 10

1. Bottom of the filler neck

5. Install the fuel tank caps securely. Wipe up any fuel that may have spilled.

Note: If possible, fill the fuel tanks after each use. This will minimize possible buildup of condensation inside the fuel tank.

Checking the Engine Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking Oil Level in Engine Maintenance.

Checking the Cooling System

Before you start the engine and use the machine, check the cooling system; refer to Checking the Cooling System in Cooling System Maintenance.

Checking the Hydraulic System

Before you start the engine and use the machine, check the hydraulic system; refer to Checking the Hydraulic System in Hydraulic System Maintenance.

Think Safety First

Please read all safety instructions and symbols in the safety section. Knowing this information could help you or bystanders avoid injury.

Operating on icy or steep slopes can cause sliding and loss of control.

A track dropping over an edge can cause a rollover, which may result in serious injury, death, or drowning.

Always use the seat belt.

Read and follow the rollover protection instructions and warnings.

To avoid loss of control and possibility of rollover:

- **Do not operate near drop-offs or near water.**
- **Reduce speed and use extreme caution on slopes.**
- **Avoid sudden turns or rapid speed changes.**

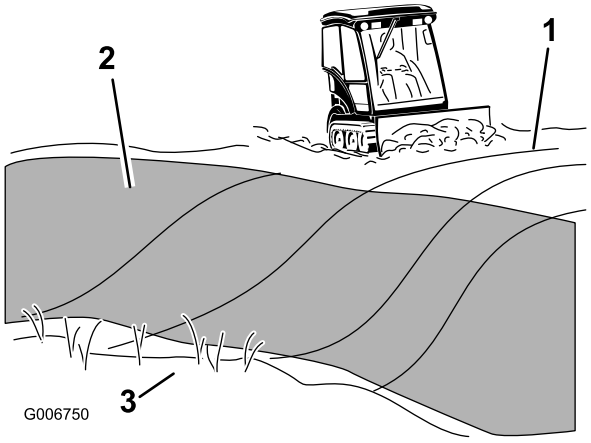


Figure 11

1. Safe Zone
2. Use walk behind equipment near drop-offs and water.
3. Water/unsafe ice

This machine produces sound levels in excess of 85 dBA at the operators ear and can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

The use of protective equipment for eyes, ears, feet, and head is recommended.

Operating the Parking Brake

Always set the parking brake when you stop the machine or leave it unattended.

Setting the Parking Brake

1. Move the motion control levers (Figure 16) out to the neutral locked position.
2. Pull up and back on the parking brake lever to set the parking brake (Figure 12). The parking brake lever should stay firmly in the engaged position.

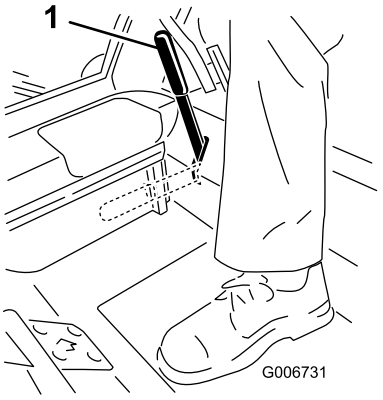


Figure 12

1. Parking brake lever

The parking brake may not hold the machine parked on a slope and could cause personal injury or property damage.

Do not park on slopes unless the tracks are chocked or blocked

Releasing the Parking Brake

Push forward and down on the parking brake lever to release the parking brake (Figure 12).

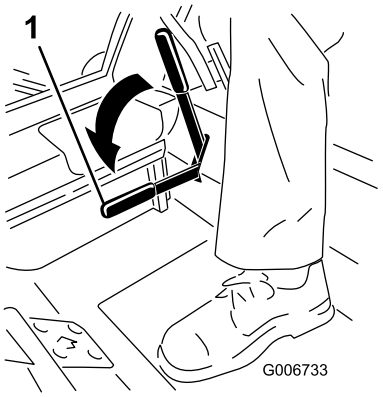


Figure 13

1. Parking brake lever

Starting the Engine

1. Sit on the seat and fasten the seat belt.
2. Ensure that the motion controls are in the neutral locked position.
3. Set the parking brake; refer to Setting the Parking Brake.
4. Move the PTO (power take off) switch to the off position (Figure 14).

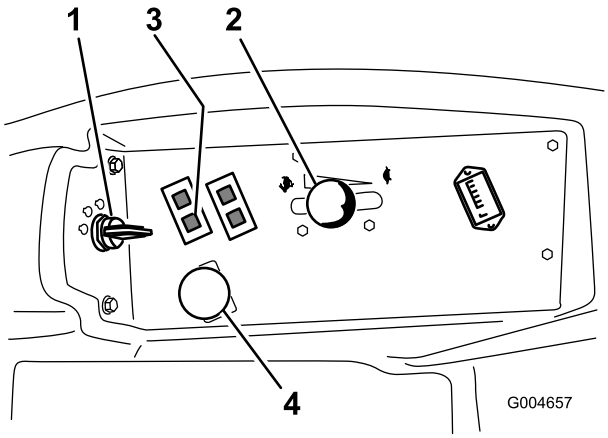


Figure 14

1. Ignition switch
2. Throttle control
3. Glow plug light
4. Power take off switch (PTO)

5. Move the throttle lever midway between the Fast and Slow positions (Figure 14).
6. Turn the ignition key clockwise to the Run position (Figure 15).

   The glow plug light will turn on for 6 seconds.

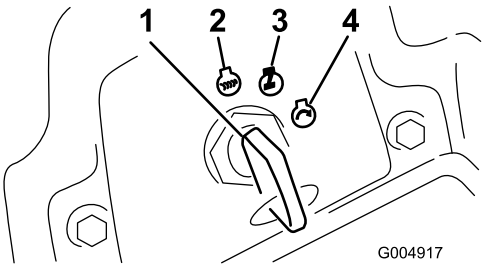


Figure 15

1. Ignition switch
2. Off
3. Run/glow pug
4. Start

7. After the glow plug indicator light goes out, turn the key to the Start position. When the engine starts release the key.

   Important: Use starting cycles of no more than 15 seconds per minute to avoid overheating the starter motor.

   Note: Additional starting cycles may be required when starting the engine for the first time after the fuel system has been completely drained.

8. Leave the throttle midway between the Slow and Fast positions until the engine and hydraulic system warm up.

   Important: When engine is started for the first time, or after an engine oil change, or an overhaul of the engine, transmission, or wheel motor, operate the machine with the throttle lever in the Slow position in both the forward and reverse directions for one to two minutes. Also operate the lift lever and PTO lever to ensure proper operation of all parts. Then shut the engine off and check fluid levels, check for oil leaks, loose parts, and any other noticeable malfunctions.

Shut the engine off and wait for all moving parts to stop before checking for oil leaks, loose parts, or other malfunctions.

Driving the Machine

The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle control in the Fast position for best performance. Always operate in the Fast throttle position when running powered attachments.

The machine can turn very rapidly. You may lose control of it and cause personal injury or damage to machine.

- **Use caution when making turns.**
- **Slow the machine down before making sharp turns.**

1. Release the parking brake.

   Note: The engine will kill if the traction control levers are moved with the parking brake engaged.

2. Move the levers to the center, un-locked position.
3. Drive the machine as follows:
   - To go straight forward, slowly push the motion control levers forward (Figure 16).
   - To go straight rearward, slowly pull the motion control levers rearward (Figure 16).
   - To turn, slow the machine by pulling back on both levers and then push forward on the lever on the opposite side from which you want to turn (Figure 16).
   - To stop, pull the motion control levers to the neutral position.

   Note: The farther you move the traction control levers in either direction, the faster the machine will move in that direction.

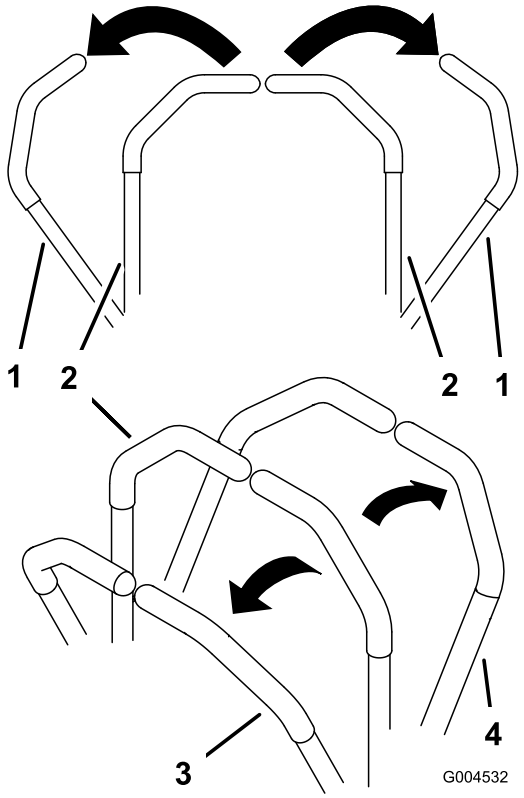


Figure 16

1. Motion control lever-neutral locked position
2. Center un-lock position
3. Forward
4. Backward

Stopping the Machine/Engine

1. Move the traction control levers to neutral and to the locked position.
2. Disengage the PTO, set the parking brake, and move the throttle lever to the Slow position.
3. Let the engine idle for 60 seconds.
4. Turn the ignition key to the Off position (Figure 15). Wait for all moving parts to stop before leaving the operating position.
5. Remove the key before transporting or storing machine.

   Important: Make sure to remove the key as the fuel pump or accessories may run and cause the battery to lose charge.

Children or bystanders may be injured if they move or attempt to operate the machine while it is unattended.

Always remove the ignition key and set the parking brake when leaving the machine unattended, even if just for a few minutes.

Operating Attachments

Changing the Attachment Orientation

Use the attachment control pedals (Figure 17) to control the physical orientation of the attachment. Use the left pedal to raise and lower the attachment. Use the right pedal to swing the attachment to the right or left.

Note: The right pedal is not used on all attachments. Also, on snowthrowers, only the chute swings right and left.

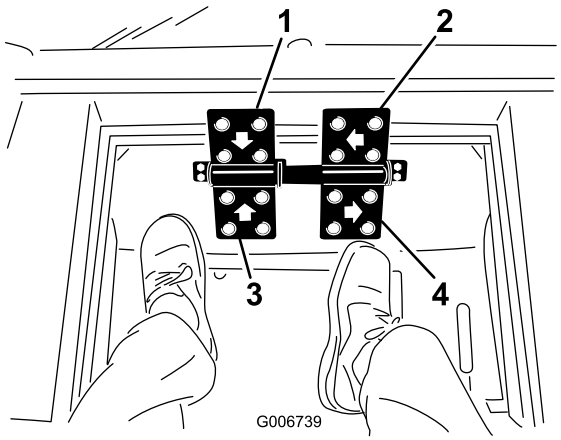


Figure 17

1. Press to lower the attachment/lift arm
2. Press to swing the attachment to the left
3. Press to raise the attachment/lift arm
4. Press to swing the attachment to the right

Important: Do not continue to hold a pedal after the attachment has finished moving. Doing so will damage the hydraulic system.

Connecting/Disconnecting an Attachment

Read the *Operator's Manual* supplied with the attachment before operating.

1. Lower the front lift arm.
2. Drive the machine into position behind the attachment adapter.
3. Raise the machine adapter on the lift arm into the attachment adapter.
4. Secure the adapters together with the attachment pin and hairpin cotter as shown in Figure 18.

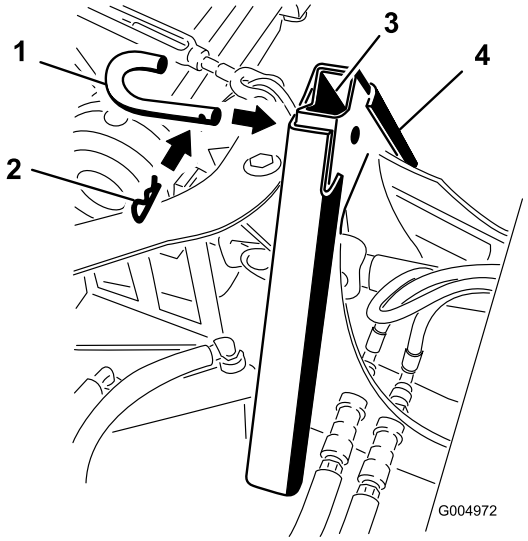


Figure 18

1. Attachment pin
2. Cotter pin

5. If the attachment is powered by hydraulics, connect the hydraulic coupler on the attachment to those on the front lift arm.

   Important: Ensure that the couplers are clean before connecting them to prevent hydraulic system contamination.

6. If the attachment is powered by the PTO, extend the attachment PTO shaft and insert it onto the machine PTO shaft (Figure 19).

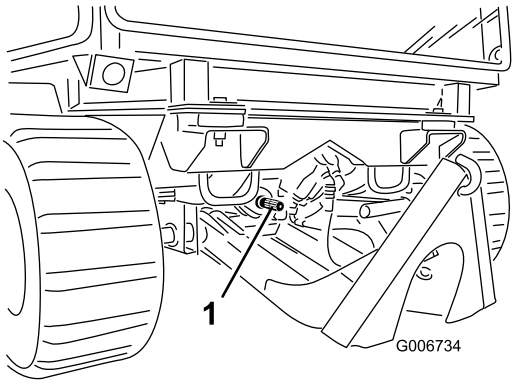


Figure 19

1. PTO shaft

Note: To remove an attachment, perform the above steps in reverse.

Engaging the Power Take Off (PTO)

The power take off (PTO) switch starts and stops powered attachments.

1. If the engine is cold, allow the engine to warm up 5 to 10 minutes before engaging the PTO.
2. While seated in the seat, release the pressure on the traction control levers and place them in neutral.
3. Pull up on the PTO switch to engage it (Figure 20).

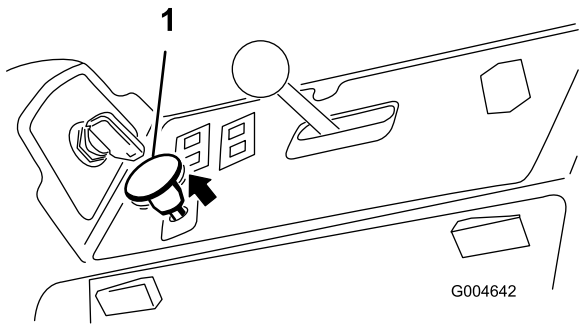


Figure 20

1. PTO switch

Disengaging the PTO

To disengage, push the PTO switch to the off position.

The Safety Interlock System

If the safety interlock switches are disconnected or damaged the machine could operate unexpectedly causing personal injury.

- **Do not tamper with the interlock switches.**
- **Check the operation of the interlock switches daily and replace any damaged switches before operating the machine.**

Understanding the Safety Interlock System

The safety interlock system is designed to prevent the engine from starting unless:

- You are sitting on the seat or the parking brake is engaged.
- The power take off (PTO) is disengaged.
- The motion control levers are in the neutral locked position
- The engine temperature is below the maximum operating temperature.

The safety interlock system also is designed to stop the engine when the traction controls are moved from the neutral locked position with the parking brake engaged. If you rise from the seat when the PTO is engaged there is a 1 second delay and then the engine stops.

Testing the Safety Interlock System

Service Interval: Before each use or daily

Test the safety interlock system before you use the machine each time. If the safety system does not operate as described below, have an Authorized Service Dealer repair the safety system immediately.

1. Sitting on the seat, engage the parking brake and move the PTO to on. Try starting the engine; the engine should not crank.
2. Sitting on the seat, engage the parking brake and move the PTO to off. Move either motion control lever (out of neutral locked position). Try starting the engine; the engine should not crank. Repeat for other control lever.
3. Sitting on the seat, engage the parking brake, move the PTO switch to off and move the motion control levers to the neutral locked position. Now start the engine. While the engine is running, release the parking brake, engage the PTO and rise slightly from the seat; the engine should stop within 2 seconds.
4. Without an operator on the seat, engage the parking brake, move the PTO switch to off and move the motion control levers to the neutral locked position. Now start the engine. While the engine is running, center either motion control; the engine should stop within 2 seconds. Repeat for the other motion control.
5. Without an operator on the seat, disengage the parking brake, move the PTO switch to off, and move the motion control levers to the neutral locked position. Try starting the engine; the engine should not crank.

Using the SCM to Diagnose System Problems

The machine is equipped with a standard control module (SCM) monitoring system that tracks the function of various key systems. The SCM is located under the right control panel. Access it through the side panel cover (Figure 21). To open the side panel cover, release the 2 latches and pull out on it.

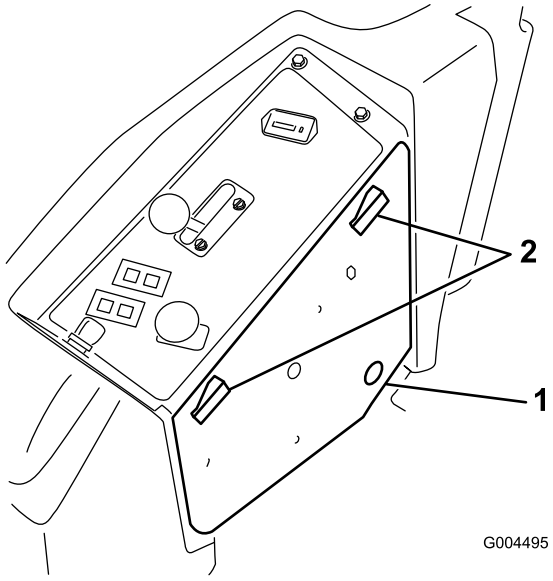


Figure 21

1. Side panel cover
2. Latches

On the face of the SCM are 11 LEDs that illuminate to indicate various system conditions. Seven of these lights can be used by the operator for system diagnosis. Refer to Figure 22 for a description of what each light means. For details on using the rest of the SCM functions, refer to the *Service Manual*, available through your Authorized Toro Distributor.

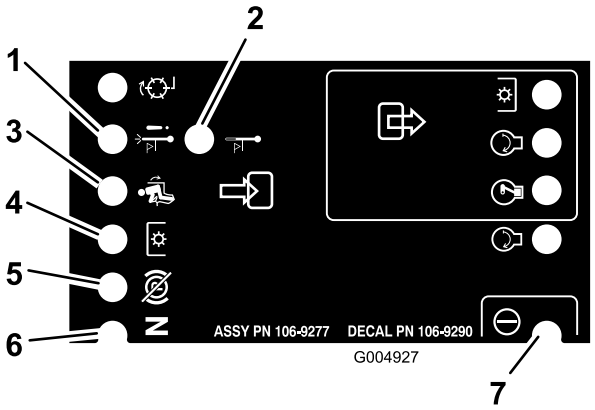


Figure 22

1. High temperature shutdown—the engine temperature has exceeded safe levels and the engine has been shut down. Check the cooling system.
2. High temperature warning—the engine temperature is approaching unsafe levels and the PTO has been shut down. Check the cooling system.
3. Operator is in the seat
4. The PTO is On
5. The parking brake is not engaged
6. Controls are in Neutral
7. The SCM is receiving power and is operational

Positioning the Seat

Changing the Seat Position

The seat can move forward and backward. Position the seat where you have the best control of the machine and are most comfortable.

1. To adjust, move the lever sideways to unlock the seat (Figure 23).

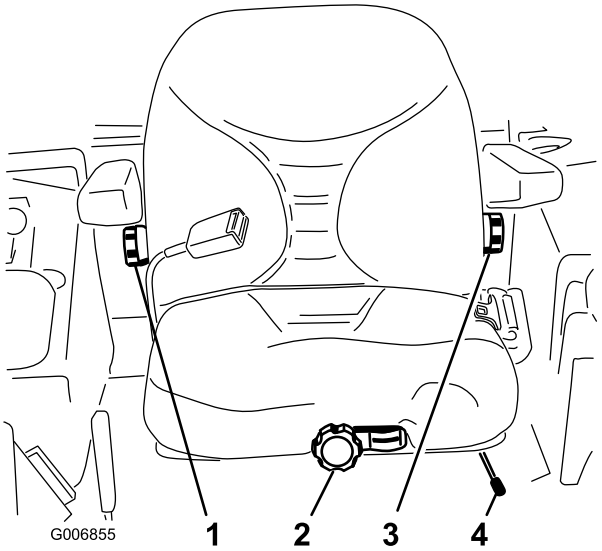


Figure 23

1. Back rest knob
2. Seat suspension knob
3. Lumbar support adjustment knob
4. Seat position adjustment lever

2. Slide the seat to the desired position and release lever to lock in position.
3. Verify that the seat has locked into place by attempting to move it back and forth.

Changing the Seat Suspension

The seat can be adjusted to provide a smooth and comfortable ride. Position the seat where you are most comfortable.

Without sitting on the seat, turn the knob in front either direction to provide the best comfort (Figure 23).

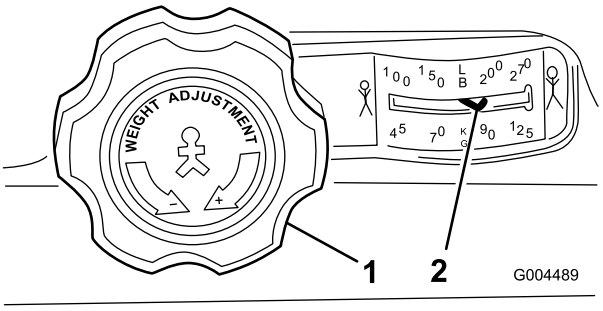


Figure 24

1. Seat suspension knob
2. Operator weight setting

Changing the Back Position

The back of the seat can be adjusted to provide a comfortable ride. Position the back of the seat where it is most comfortable.

To adjust it, turn the knob, under the right-side arm rest, in either direction to provide the best comfort (Figure 23).

Changing the Lumbar Support

The back of the seat can be adjusted to provide a customized lumbar support for your lower back.

To adjust it, turn the knob under the left-side arm rest, in either direction to provide the best comfort (Figure 23).

Unlatching the Seat

To access the hydraulic and other systems under the seat, you need to unlatch the seat and swing it forward.

1. Use the seat position adjustment lever to slide the seat all the way forward.
2. Push one of the seat latches, located behind and to the sides of the seat, rearward to unlatch the seat and pull forward on the top of the seat (Figure 25).

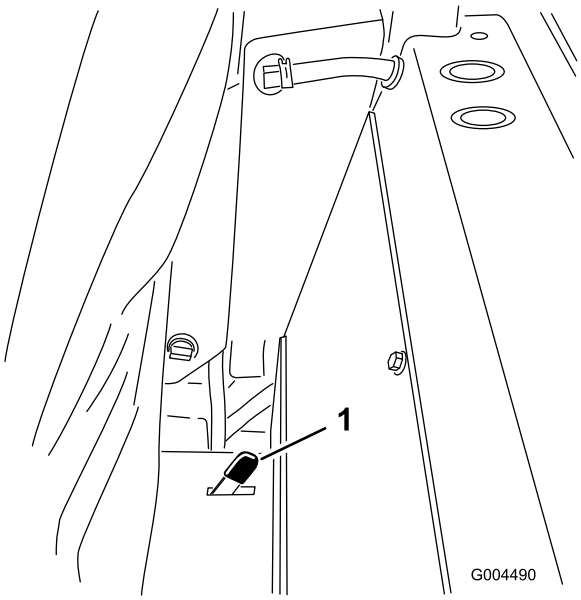


Figure 25

1. Seat latch

Moving a Non-functioning Machine

If the machine breaks down, runs out of fuel, etc. you may need to pull it with a winch to load it onto a trailer.. To do so, you first need to open the hydraulic by-pass valves.

Important: Never tow the machine because hydraulic damage may occur.

Moving the Machine

1. Disengage the power take off (PTO) and turn the ignition key to off. Move the levers to the neutral locked position and apply the parking brake. Remove the key.
2. Lift the seat.
3. Rotate **both** by-pass valves counterclockwise 1 turn (Figure 26).

   This allows hydraulic fluid to by-pass the pump enabling the tracks to turn .

   Important: Do not rotate the by-pass valves more than 2.5 turns. This prevents valves from coming out of the body and causing fluid to run out.

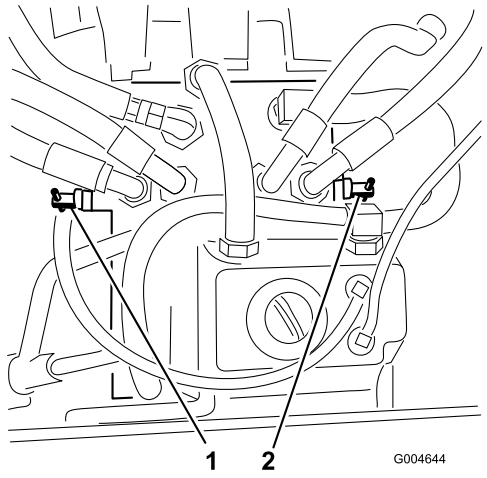


Figure 26

1. Right by-pass valve
2. Left by-pass valve

4. Disengage the parking brake before moving the machine.

Changing to Machine Operation

Rotate each by-pass valve clockwise and hand tighten them (torque of approximately 71 in-lb (8 N·m)) (Figure 26).

Note: Do not over tighten the by-pass valves.

The machine will not drive unless by-pass valves are turned in.

Loading Machines

Use extreme caution when loading units on trailers or trucks. One full width ramp that is wide enough to extend beyond the end of the tracks is recommended instead of individual ramps for each side of the unit (Figure 27). The lower rear section of the machine frame extends back between the rear wheels and serves as a stop for tipping backward. Having a full width ramp provides a surface for the frame members to contact if the unit starts to tip backward. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

The ramp should be long enough so that the angles do not exceed 15 degrees (Figure 27). A steeper angle may cause attachment components to get caught as the unit moves from ramp to trailer or truck. Steeper angles may also cause the unit to tip backward. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramp extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: Do not attempt to turn the unit while on the ramp; you may lose control and drive off the side, or the tracks may come off.

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the unit to tip backward.

Loading a unit onto a trailer or truck increases the possibility of backward tip-over and could cause serious injury or death.

- **Use extreme caution when operating a unit on a ramp.**
- **Use only a single, full width ramp; Do not use individual ramps for each side of the unit.**
- **If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the unit.**
- **Do not exceed a 15 degree angle between ramp and ground or between ramp and trailer or truck.**
- **Avoid sudden acceleration while driving unit up a ramp to avoid tipping backward.**
- **Avoid sudden deceleration while backing unit down a ramp to avoid tipping backward.**

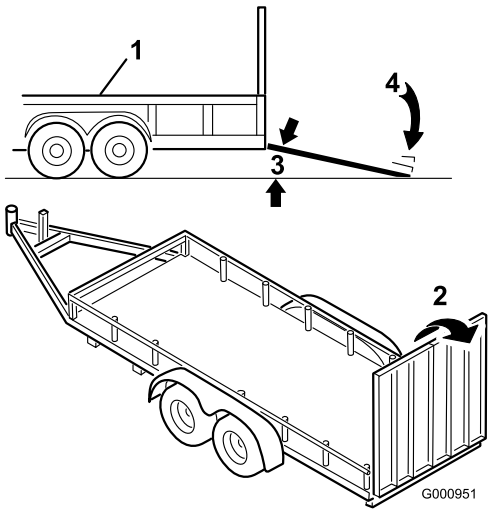


Figure 27

1. Trailer
2. Full width ramp
3. Not greater than 15 degrees
4. Full width ramp—side view

Transporting the Machine

Use a heavy-duty trailer or truck to transport the machine. Ensure that the trailer or truck has all necessary lighting and marking as required by law. Please carefully read all the safety instructions. Knowing this information could help you or bystanders avoid injury.

To transport the machine:

- Ensure that your vehicle, hitch, safety chains, and trailer are adequate for the load you are pulling and that they meet all local traffic regulations for your area.
- Lock the brake and block the tracks.
- Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes as required by local traffic regulations in your area (Figure 28).

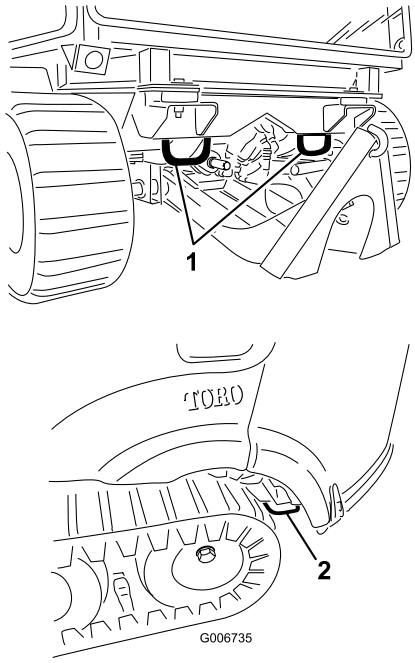


Figure 28

1. Front tie-downs
2. Rear tie-down (left side shown)

Maintenance

Note: Determine the left and right sides of the machine from the normal operating position.

Important: Engine oil, batteries, hydraulic oil, and engine coolant are pollutants to the environment. Dispose of these according to your state and local regulations.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 10 hours	• Check the alternator belt tension. • Torque the wheel lug nuts.
After the first 50 hours	• Change the engine oil and filter.
After the first 200 hours	• Change the hydraulic oil and filter.
Before each use or daily	• Test the safety system. • Check the engine oil level. • Drain water/contaminants from the water separator. • Check the engine coolant level. • Clean the radiator with compressed air (do not use water) • Check the hydraulic fluid level.
Every 50 hours	• Grease the bearing and bushing grease fittings. (Grease more frequently when operating conditions are extremely dusty or sandy.) • Check battery cable connections. • Check the tire pressure.
Every 150 hours	• Change the engine oil and filter.
Every 200 hours	• Inspect cooling system hoses and seals. Replace them if cracked or torn. • Check the alternator belt tension. • Torque the wheel lug nuts.
Every 400 hours	• Service the air cleaner. • Replace the fuel filter canister. • Replace the fuel pre-filter. • Check the fuel lines and connections.
Every 800 hours	• Change the hydraulic oil and filter. • Inspect engine valve clearance. Refer to your Engine Operator's Manual.
Every 1,500 hours	• Replace moving hoses
Every 2 years	• Drain and clean the fuel tank. • Flush and replace cooling system fluid.

Important: Refer to your *Engine Operator's Manual* for additional maintenance procedures. A detailed Service Manual is also available for purchase from your Authorized Toro Distributor.

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check Safety Interlock Operation							
Check Parking Brake Operation							
Check Fuel Level							
Check Hydraulic Oil Level							
Check Engine Oil Level							
Check Cooling System Fluid Level							
Check Drain Water/Fuel Separator							
Check Air Filter Restriction Indicator[3]							
Check Radiator & Screen for Debris							
Check Unusual Engine Noises[1]							
Check Unusual Operating Noises							
Check Hydraulic Hoses for Damage							
Check Fluid Leaks							
Check Tire Pressure							
Check Instrument Operation							
Lubricate All Grease Fittings[2]							
Touch-up Damaged Paint							

1. Check glow plug and injector nozzles, if hard starting, excess smoke or rough running is noted.
2. Immediately after every washing, regardless of the interval listed.
3. If indicator shows red

Notation for Areas of Concern		
Inspection performed by:		
Item	Date	Information

If you leave the key in the ignition switch, someone could accidently start the engine and seriously injure you or other bystanders.

Remove the key from the ignition before you do any maintenance.

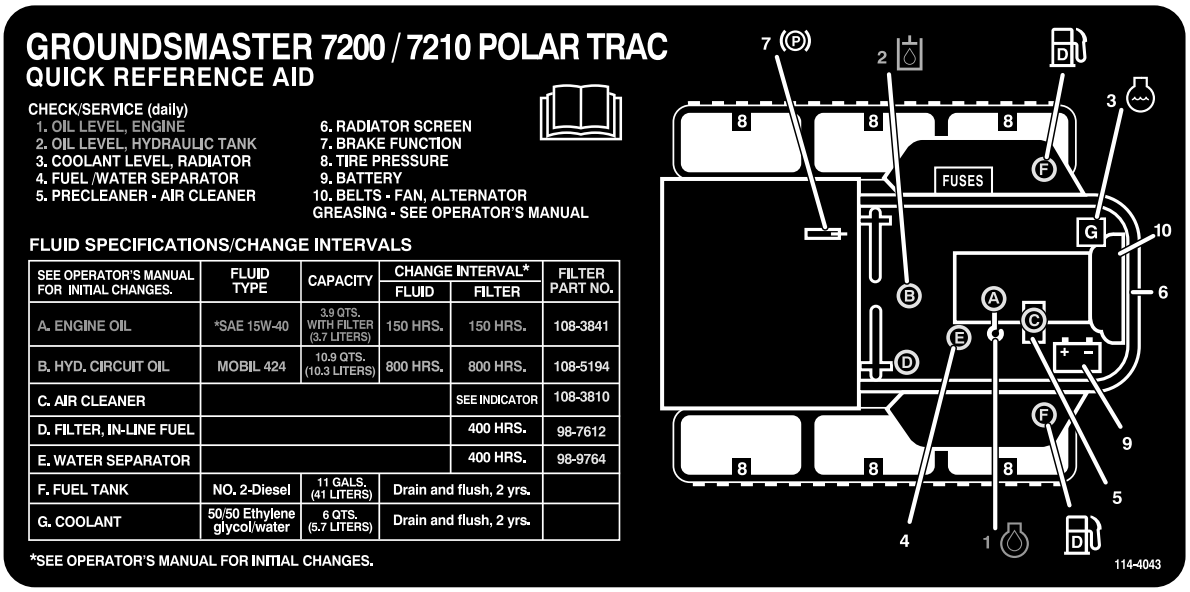


Figure 29
Service Interval Chart

Lubrication

Greasing the Bearings and Bushings

Service Interval: Every 50 hours (Grease more frequently when operating conditions are extremely dusty or sandy.)

Grease Type: No. 2 General Purpose Lithium Base Grease.

Important: Lubricate the grease fittings immediately after every washing, regardless of interval specified. Bearing life can be negatively affected by improper wash down procedures. Do not wash down the unit when it is still hot and avoid directing high-pressure or high volume spray at the bearings or seals.

1. Wipe the grease fittings clean so foreign matter cannot be forced into the bearing or bushing.
2. Pump grease into the fittings.
3. Wipe off excess grease.

The grease fitting locations and quantities are as follows:

- Bogie pivot assembly—2 (Figure 30)

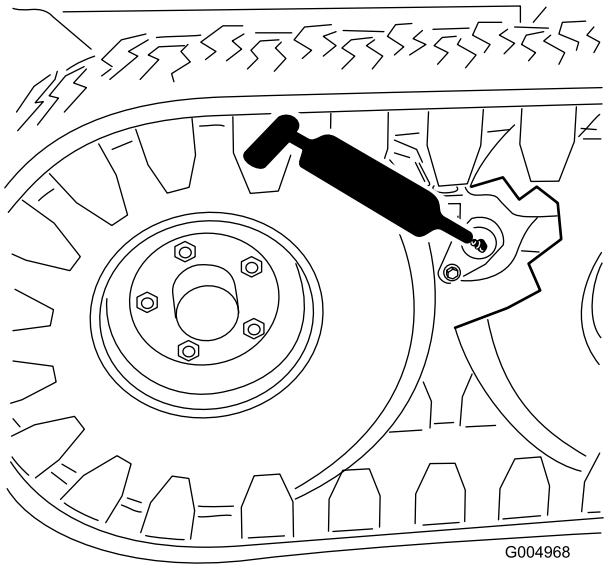


Figure 30

1. Bogie pivot assembly (2)

- PTO shaft bearings—2 (Figure 31)
- 2 PTO shaft universal joints—2 per joint (Figure 31, rear joint shown)

- Hydraulic cylinder pivot pins—2 (Figure 31)
- Lift arm pivot—1 (Figure 31)

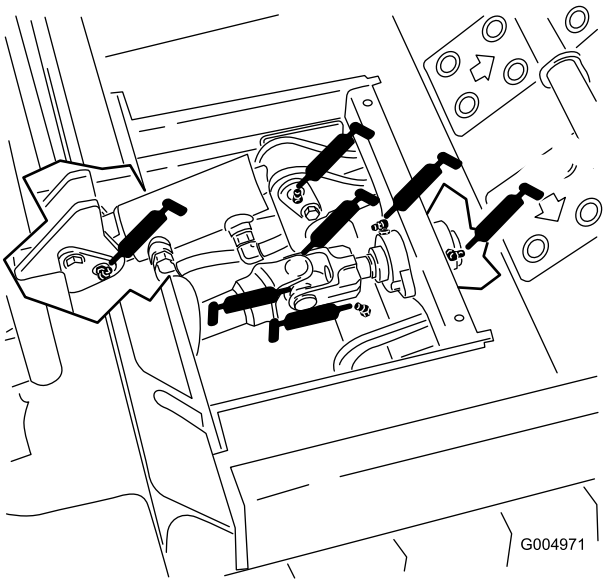


Figure 31

Engine Maintenance

Air Cleaner Maintenance

- Check the air cleaner body for damage which could possibly cause an air leak. Replace a damaged air cleaner body. Check the whole clean air intake system for leaks, damage, or loose hose clamps.
- Service the air cleaner filter when the air cleaner indicator (Figure 32) shows red or every 400 hours (more frequently in extremely dusty or dirty conditions). Do not over service the air filter.

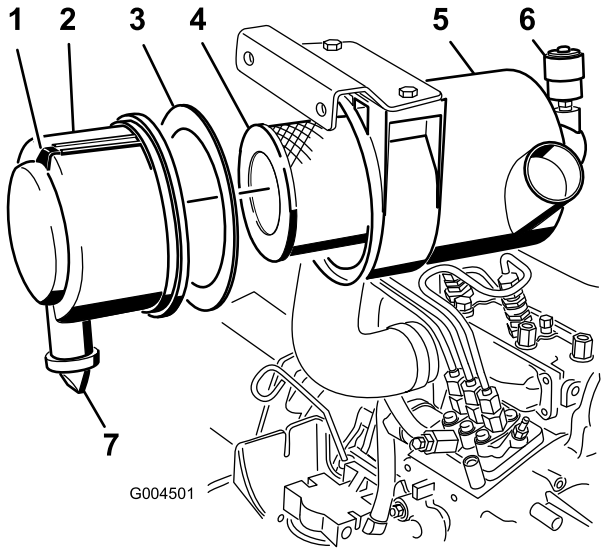


Figure 32

1. Air cleaner latch
2. Air cleaner cover
3. Gasket
4. Filter
5. Air cleaner body
6. Air cleaner indicator
7. Rubber outlet valve

- Be sure the cover is seated correctly and seals with the air cleaner body.

Servicing the Air Cleaner

Service Interval: Every 400 hours

1. Pull the latch outward and rotate the air cleaner cover counter-clockwise (Figure 32).
2. Remove the cover from the air cleaner body (Figure 32).
3. Before removing the filter, use low pressure air (40 psi, clean and dry) to help remove large accumulations of debris packed between outside of primary filter and the canister.

   This cleaning process prevents debris from migrating into the intake when the primary filter is removed.

Important: Avoid using high pressure air which could force dirt through the filter into the intake tract.

4. Remove and replace the primary filter (Figure 32).

Important: Do not clean the used element to avoid damage to the filter media.

5. Inspect the new filter for shipping damage, checking the sealing end of the filter and the body.

Important: Do not use a damaged element.

6. Ensure that the foam gasket is in place in the cover and that it is not torn or damaged (Figure 32). If it is damaged, replace it.
7. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister.

Important: Do not apply pressure to the flexible center of the filter.

8. Clean the dirt ejection port located in the removable cover, as follows:
   A. Remove the rubber outlet valve from the cover (Figure 32).
   B. Clean the cavity.
   C. Replace the outlet valve.
9. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.
10. Reset the indicator (Figure 32) if showing red.

Servicing the Engine Oil

Checking the Engine Oil Level

Service Interval: Before each use or daily

The engine is shipped with oil in the crankcase; however, the oil level must be checked before and after the engine is first started. Check oil level before each day's operation or each time machine is used.

The crankcase capacity is approximately 4 qt. (3.8 l) with the filter. Use high-quality engine oil that meets the following specifications:

- API Classification Level Required: CH-4, CI-4 or higher.
- Preferred oil: SAE 15W-40 (above 0°F (-17°C)
- Alternate oil: SAE 10W-30 or 5W-30 (all temperatures)

Note: Toro Premium Engine oil is available from your distributor in either 15W-40 or 10W-30 viscosity. See the parts catalog for part numbers.

1. Park the machine on a level surface, lower the attachment, move the throttle lever to the Slow position, stop the engine, and remove the key from the ignition switch. Open the hood.
2. Remove the dipstick (Figure 33), wipe it clean, and install the dipstick. Remove the dipstick and check the oil level.

   The oil level should be up to the Full mark on the dipstick.

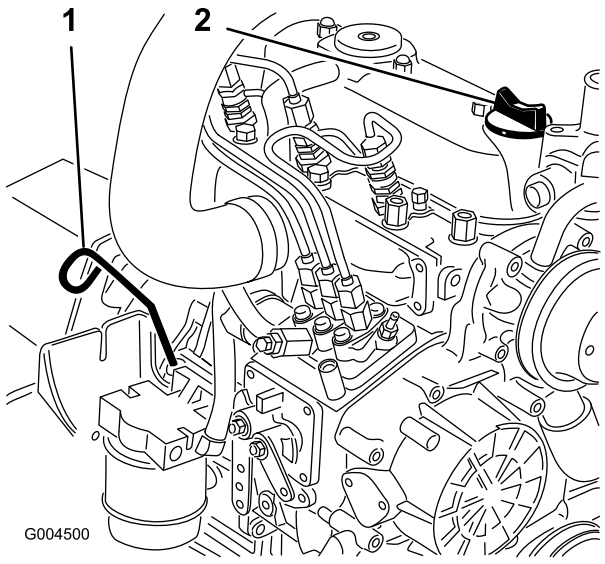


Figure 33

1. Dipstick
2. Oil fill

3. If the oil level is below the Full mark, remove the fill cap (Figure 33) and add oil until the level reaches the Full mark on the dipstick.

Important: Do not overfill.

Note: Use a clean funnel to prevent spills.

4. Install the oil fill cap and close the hood.

Changing the Engine Oil And Filter

Service Interval: After the first 50 hours

Every 150 hours

Change the oil and filter initially after first 50 hours of operation and then every 150 hours of operation thereafter. If possible, run the engine just before changing the oil because warm oil flows better and carries more contaminants than cold oil.

1. Position the machine on a level surface.
2. Open the hood.
3. Set a drain pan under the oil pan and in line with the drain plug (Figure 34).

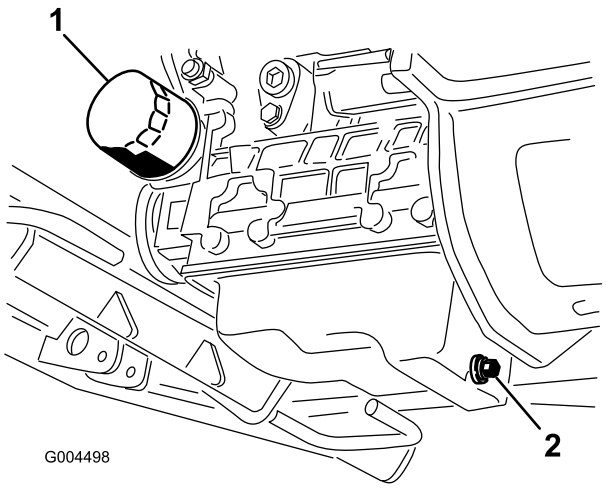


Figure 34

1. Oil filter
2. Drain plug

4. Clean the area around the drain plug.
5. Remove the drain plug and allow the oil to flow into drain pan.
6. Remove and replace the oil filter (Figure 34).
7. After the oil is drained, install the drain plug and wipe up any oil that is spilled.
8. Fill the crankcase with oil; refer to Checking the Engine Oil Level.

Fuel System Maintenance

Note: Refer to Adding Fuel for proper fuel recommendations.

Under certain conditions, diesel fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is to the bottom of the filler neck.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, safety-approved container and keep the cap in place.**

Servicing the Water Separator

Service Interval: Before each use or daily—Drain water/contaminants from the water separator.

Every 400 hours—Replace the fuel filter canister.

1. Place a clean container under the fuel filter.
2. Loosen the drain plug on the bottom of the filter canister.

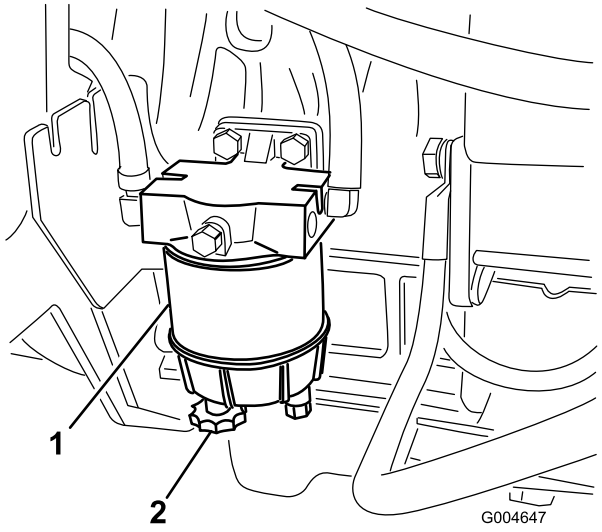


Figure 35

1. Water separator
2. Drain plug

3. Clean the area where the filter canister mounts.
4. Remove the filter canister and clean the mounting surface.
5. Lubricate the gasket on the filter canister with clean oil.
6. Install the filter canister by hand until the gasket contacts mounting surface, then rotate it an additional 1/2 turn.
7. Tighten the drain plug on the bottom of the filter canister.

Cleaning the Fuel Tank

Service Interval: Every 2 years

Note: Also, drain and clean the tank if the fuel system becomes contaminated or if the machine is to be stored for an extended period.

Use clean diesel fuel to flush out the tank.

Replacing the Fuel Pre-Filter

Service Interval: Every 400 hours/Yearly (whichever comes first)

The fuel pre-filter (Figure 36) is located between the fuel tank and fuel pump.

1. Clamp both fuel lines that connect to the pre-filter so fuel cannot drain when the lines are removed (Figure 36).

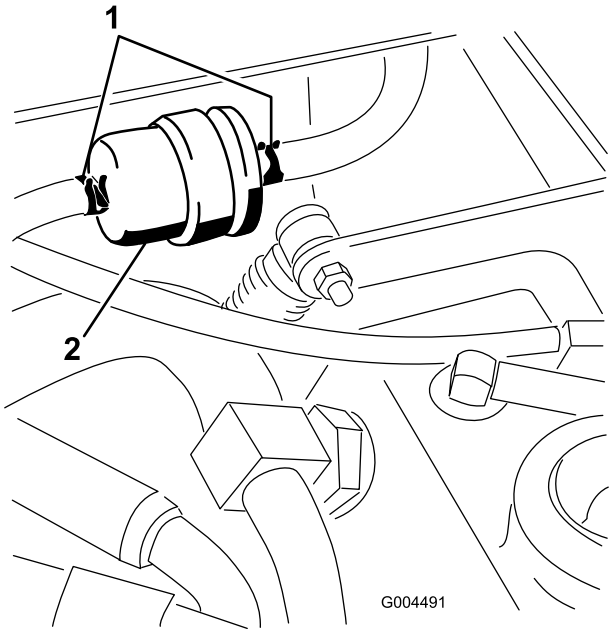


Figure 36

1. Hose clamps
2. Fuel pre filter

2. Loosen the hose clamps at both ends of the filter and pull the fuel lines off of the filter.
3. Slide the hose clamps onto ends of the fuel lines.
4. Push fuel lines onto the pre-filter and secure them with hose clamps.

   Important: Ensure that the arrow on the side of the filter points toward the injection pump.

Fuel Lines and Connections

Service Interval: Every 400 hours/Yearly (whichever comes first)

Inspect the fuel lines for deterioration, damage, chaffing, or loose connections.

Bleeding the Fuel System

1. Park the machine on a level surface. Ensure that the fuel tank is at least half full.
2. Unlatch and raise the hood.
3. Place a rag under the air bleed screw on the fuel injection pump and open it (Figure 37).

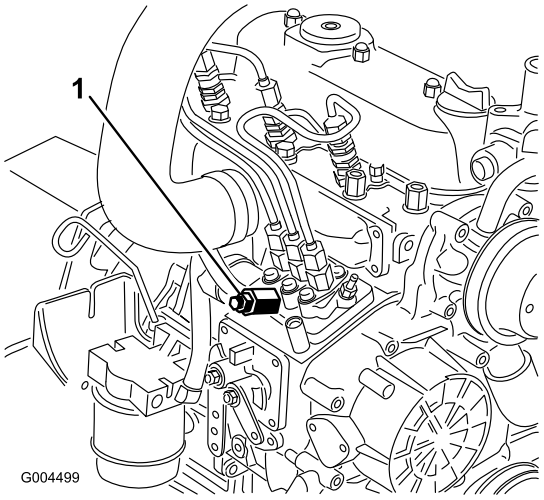


Figure 37

1. Fuel injection pump bleed screw

4. Turn the key in the ignition switch to the Run position.

   The electric fuel pump will begin operation, thereby forcing air out around the air bleed screw.

The engine may start during this procedure. Moving fans and belts in a running engine can severely injure you or bystanders.

Keep hands, fingers, loose clothing/jewelry, and hair away from the engine fan and belt during this procedure.

5. Leave the key in the On position until a solid stream of fuel flows out around the screw.
6. Tighten the screw and turn key to the Off position.

   Note: Normally, the engine should start after above bleeding procedures are followed. However, if engine does not start, air may be trapped between injection pump and injectors; refer to Bleeding Air From the Injectors.

Bleeding Air From the Injectors

Note: This procedure should be used only if the fuel system has been purged of air through normal priming procedures and engine will not start; refer to Bleeding the Fuel System.

1. Place a rag under the pipe connection coming from the injection pump to the No. 1 injector nozzle as illustrated in Figure 38.

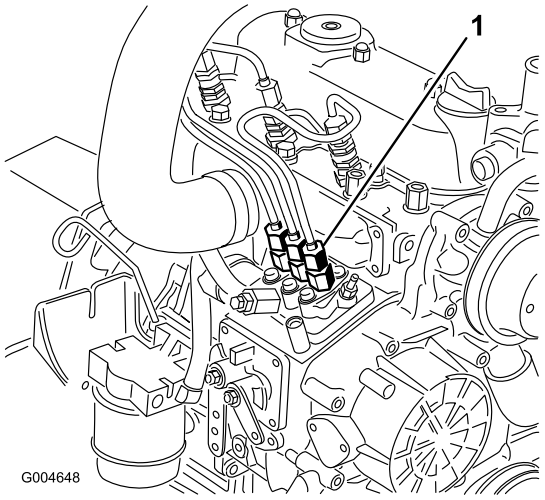


Figure 38

1. Pipe connection from the injection pump to the No. 1 injector nozzle

2. Move the throttle to the Fast position.
3. Turn the ignition key the Start position and watch the fuel flow around the connector.

The engine may start during this procedure. Moving fans and belts in a running engine can severely injure you or bystanders.

Keep hands, fingers, loose clothing/jewelry, and hair away from the engine fan and belt during this procedure.

4. Tighten the pipe connector securely when it attains a solid flow.
5. Turn the key to the Off position.
6. Repeat this procedure for the remaining nozzles.

Electrical System Maintenance

Important: Whenever working with the electrical system, always disconnect the battery cables, negative (-) cable first, to prevent possible wiring damage from short-outs.

Servicing the Battery

Service Interval: Every 50 hours—Check battery cable connections.

Warning

CALIFORNIA
Proposition 65 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.

Keep the top of the battery clean. If you store the machine in a location where temperatures are extremely high, the battery will run down more rapidly than if the machine is stored in a location where temperatures are cool.

Keep the top of the battery clean by washing it periodically with a brush dipped in ammonia or bicarbonate of soda solution. Flush the top surface with water after cleaning it. Do not remove the fill caps while cleaning the battery.

The battery cables must be tight on the terminals to provide good electrical contact.

If corrosion occurs at the terminals, disconnect the cables, negative (-) cable first, and scrape the clamps and terminals separately. Reconnect the cables, positive (+) cable first, and coat the terminals with petroleum jelly.

⚠

Battery terminals or metal tools could short against metal machine components causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **When removing or installing the battery, do not allow the battery terminals to touch any metal parts of the machine.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the machine.**

⚠

Incorrect battery cable routing could damage the machine and cables causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **Always disconnect the negative (black) battery cable before disconnecting the positive (red) cable.**
- **Always connect the positive (red) battery cable before connecting the negative (black) cable.**

Storing the Battery

If the machine will be stored more than 30 days, remove the battery and charge it fully. Either store it on a shelf or on the machine. Leave the cables disconnected if it is stored on the machine. Store the battery in a cool atmosphere to avoid quick deterioration of the charge in the battery. To prevent the battery from freezing, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265-1.299.

Checking the Fuses

The machine fuses are located under the control panel. Access them through the side panel cover (Figure 39). To open the side panel cover, release the 2 latches and pull out on it.

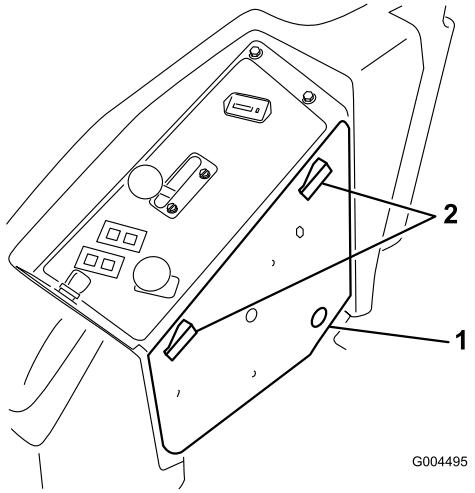


Figure 39

1. Side panel cover
2. Latches

The cab fuses are located in front of the cab control panel (Figure 40). Access them by removing the finger bolts securing the fuse access cover.

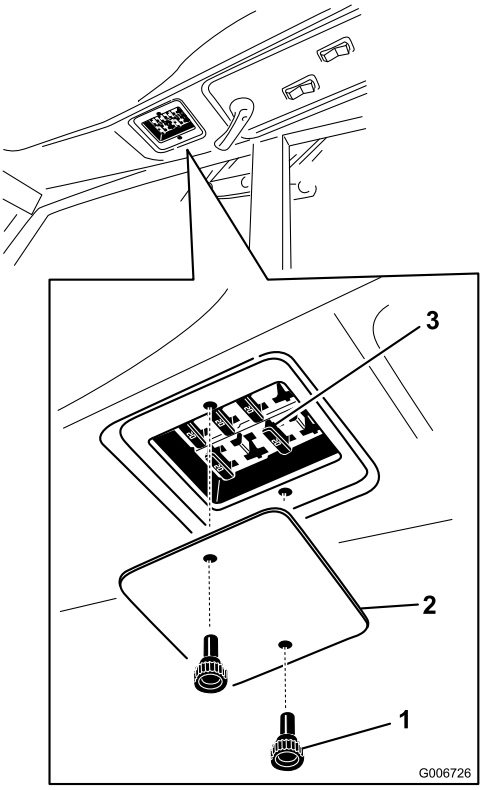


Figure 40

1. Thumb screws
2. Fuse access cover
3. Cab fuses

If the machine stops or has other electrical system issues, check the fuses. Grasp each fuse in turn and remove them one at a time, checking to see if any are blown. If you need to replace a fuse, always use the **same type and amperage rated fuse** as the one you are replacing, **otherwise you could damage the electrical system.** Refer to the decal next to the machine fuses (Figure 41) for a diagram of each fuse and its amperage (the cab fuses are all 20A fuses and are used to protect the heater, windshield wipers, lights, fan, and other cab functions).

Note: If a fuse blows frequently, you probably have a short in the electrical system and should have it serviced by a qualified service technician.

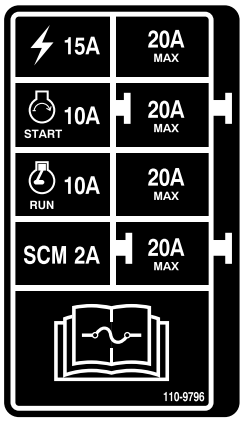


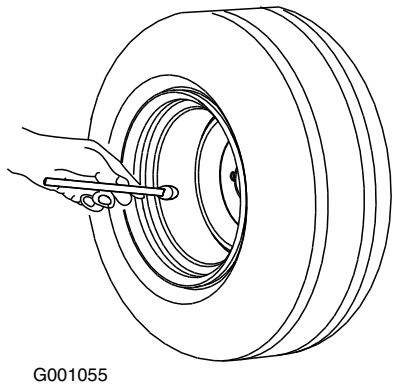
Figure 41

Drive System Maintenance

Checking the Tire Pressure

Service Interval: Every 50 hours

Maintain the air pressure in the tires at 35 psi (241 kPa) (Figure 42). Uneven tire pressure can cause the tracks to slip. If the tracks slip, evenly increase the tire pressure in each tire by 10 psi (69 kPa) until the tracks no longer slip when driving. Do not exceed 50 psi (345 kPa) in each tire.



G001055

Figure 42

Note: Check the tires when they are cold to get the most accurate pressure reading.

Cooling System Maintenance

Discharge of hot pressurized coolant or touching hot radiator and surrounding parts can cause severe burns.

- **Do not remove the radiator cap when the engine is hot. Always allow the engine to cool at least 15 minutes or until the radiator cap is cool enough to touch without burning your hand before removing the radiator cap.**
- **Do not touch radiator and surrounding parts that are hot.**

The rotating fan and drive belt can cause personal injury.

- **Do not operate the machine without the covers in place.**
- **Keep fingers, hands and clothing clear of rotating fan and drive belt.**
- **Shut off the engine and remove the ignition key before performing maintenance.**

Swallowing engine coolant can cause poisoning.

- **Do not swallow engine coolant.**
- **Keep out of reach from children and pets.**

Checking the Cooling System

Service Interval: Before each use or daily—Check the engine coolant level.

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol anti freeze. Check the level of the coolant in the expansion tank at the beginning of each day before starting the engine. The capacity of the cooling system is 6 quarts (7.5 l).

1. Check the level of the coolant in the expansion tank (Figure 43). The coolant level should be between the marks on the side of the tank.

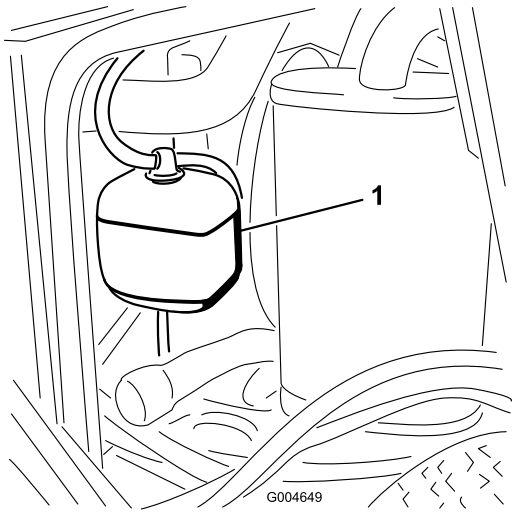


Figure 43

1. Expansion tank

2. If coolant level is low, remove the expansion tank cap and replenish the system. **Do not overfill**.
3. Install the expansion tank cap.

Cleaning the Radiator

Service Interval: Before each use or daily—Clean the radiator with compressed air (do not use water)

To prevent the engine from overheating, the radiator must be kept clean. Normally, check the radiator daily and, if necessary, clean any debris off these parts. However, it will be necessary to check and clean the radiator frequently in extremely dusty and dirty conditions.

Note: If the PTO or engine shuts off due to overheating, first check the radiator for excessive buildup of debris, ice, or snow.

Clean the radiator as follows:

1. Open the hood.
2. Working from the fan side of the radiator, blow out debris with low pressure (50 psi) compressed air **(do not use water)**. Repeat the step from the front of the radiator and again from the fan side.
3. After the radiator is thoroughly cleaned, clean out debris that may have collected in the channel at the radiator base.
4. Close the hood.

Brake Maintenance

Adjusting the Parking Brake Interlock Switch

1. Stop the machine, move the control levers fully into the neutral-locked position, set the parking brake, and remove the ignition key.
2. Remove the bolts securing the front panel and remove the panel (Figure 44).

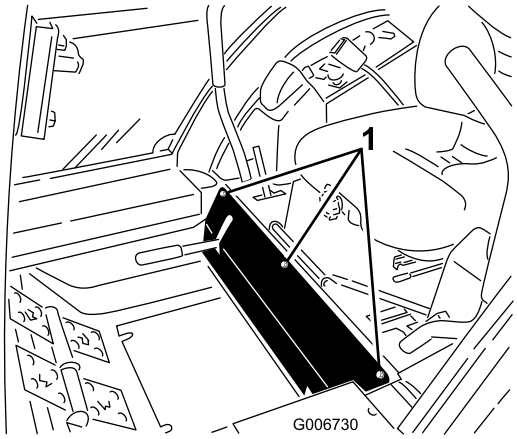


Figure 44

1. Front panel bolts

3. Loosen the 2 screws securing the interlock switch.

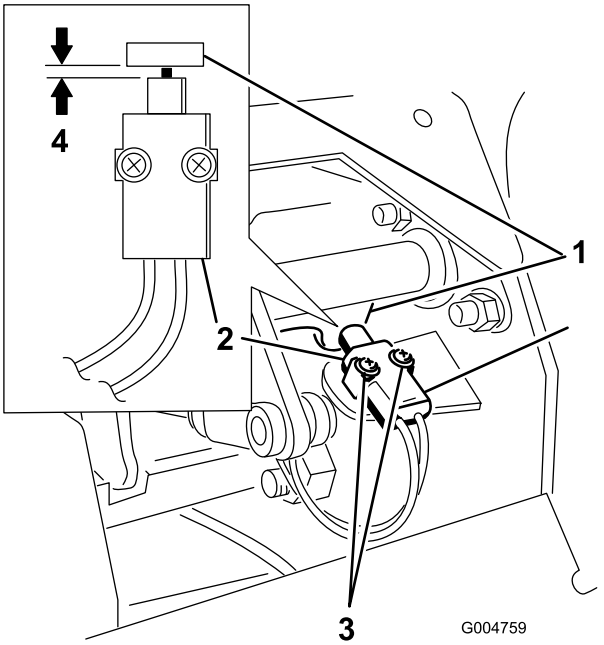


Figure 45

1. Tab on the brake shaft
2. Parking brake interlock switch
3. Screws
4. 0.015 to 0.045 inch (0.4 to 1 mm)

4. Move the switch toward the tab on the brake shaft until the distance between the tab and switch body is 0.015 to 0.045 inch (0.4 to 1 mm) (Figure 45).
5. Secure the switch.
6. Test the adjustment as follows:
   A. Ensure that the parking brake is engaged and you are not sitting on the seat, then start the engine.
   B. Move the control levers out of the neutral locked position.

      The engine should stop. If not, recheck the adjustment you made to the switch.
7. Install the front panel.

Belt Maintenance

Checking the Alternator Belt Tension

Service Interval: After the first 10 hours

Every 200 hours

1. Apply 10 lb of force to the alternator belt, midway between the pulleys.
2. If the deflection is not 3/8 in. (10 mm), loosen the alternator mounting bolts (Figure 46).

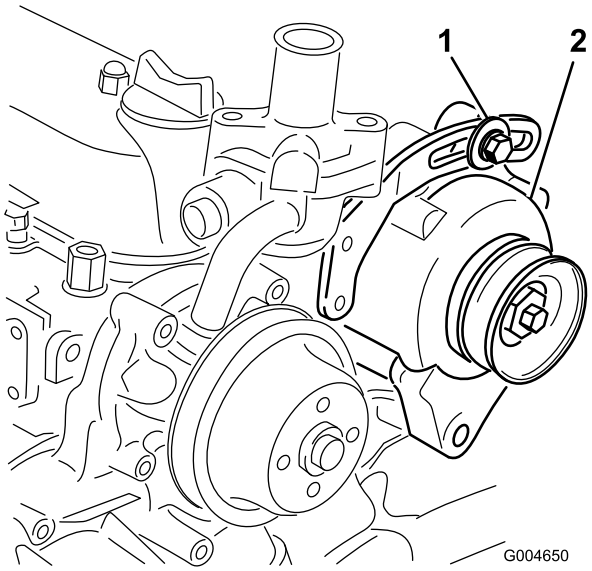


Figure 46

1. Mounting bolt
2. Alternator

3. Increase or decrease the alternator belt tension and tighten the bolts.
4. Check the deflection of the belt again to ensure that the tension is correct.

Controls System Maintenance

Adjusting the Control Lever Neutral Interlock Switch

1. Stop the machine, move the control levers fully into the neutral-locked position, set the parking brake, and remove the ignition key.
2. Remove the bolts securing the front panel and remove the panel (Figure 47).

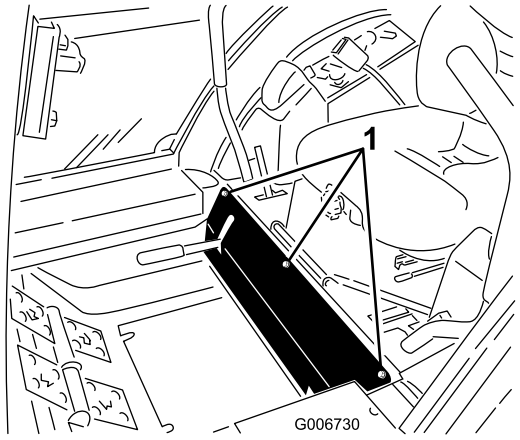


Figure 47

1. Front panel bolts

3. Loosen the 2 screws securing the interlock switch (Figure 48).

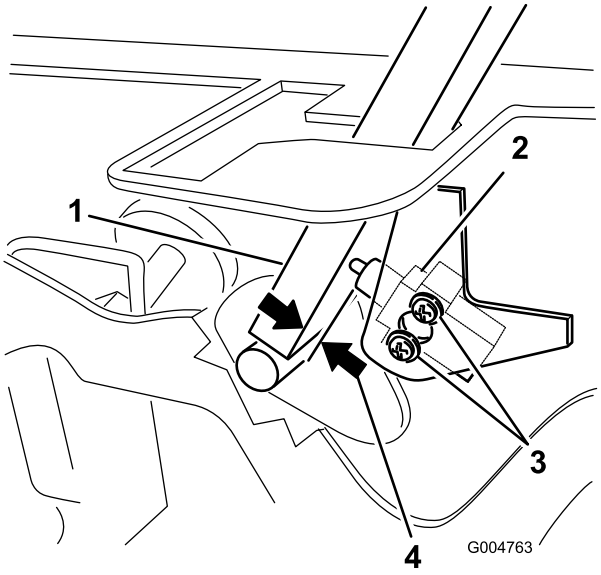


Figure 48

1. Control lever
2. Neutral interlock switch
3. Screws
4. 0.015 to 0.045 inch (0.4 to 1 mm)

4. Holding the control lever against the frame, move the switch toward the lever until the distance between lever and switch body is 0.015 to 0.045 inch (0.4 to 1 mm) (Figure 48).
5. Secure the switch.
6. Repeat steps 3 to 5 for the other lever.
7. Install the front panel.

Adjusting the Control Lever Neutral Return

If the motion control levers do not align with the neutral slots when released from the reverse drive position, adjustment is required. Adjust each lever, spring, and rod separately.

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Move the throttle lever to the Slow position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the bolts securing the front panel and remove the panel (Figure 49).

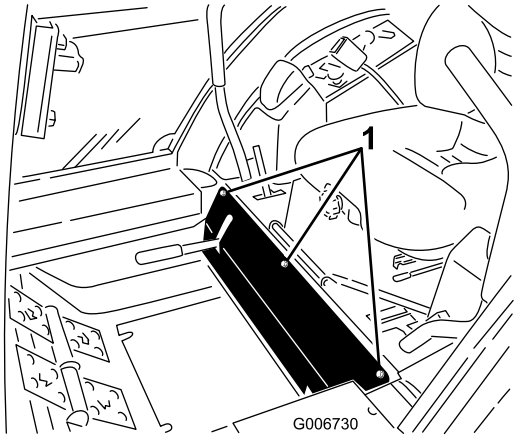


Figure 49

1. Front panel bolts

4. Move one of the levers to the neutral position but **not locked** (Figure 51).
5. Pull the lever back until the clevis pin (on an arm above the pivot shaft) contacts the end of the slot (just beginning to put pressure on the spring) (Figure 50).

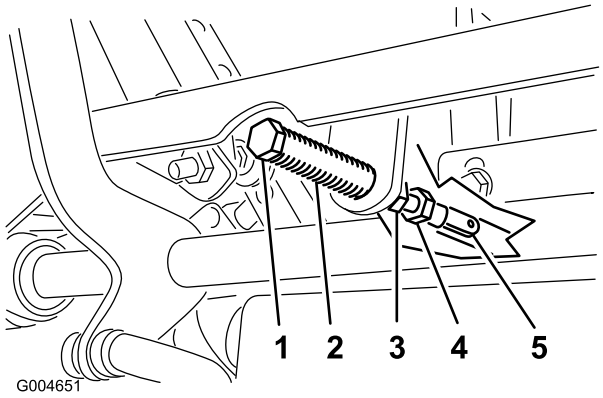


Figure 50

1. Clevis pin
2. Slot
3. Jam nuts
4. Adjustment bolt
5. Yoke

6. Check where the control lever is relative to notch in console (Figure 51). It should be centered allowing lever to pivot outward to the neutral lock position.

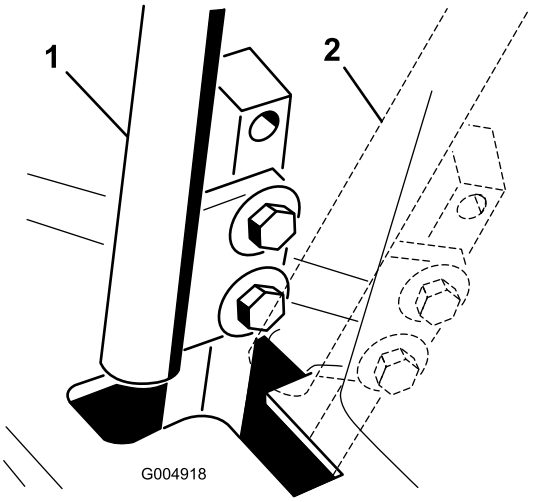


Figure 51

1. Neutral position
2. Neutral locked position

7. If adjustment is needed, loosen the nut and jam nut against the yoke (Figure 50).
8. Applying slight rearward pressure on the motion control lever, turn the head of the adjustment bolt in the appropriate direction until the control lever is centered in the neutral lock position (Figure 50).

   Note: Keeping rearward pressure on the lever will keep the pin at the end of the slot and allow the adjustment bolt to move the lever to the appropriate position.
9. Tighten the nut and jam nut (Figure 50).
10. Repeat steps 4 through 9 for the other control lever.
11. Install the front panel.

Adjusting the Traction Drive for Neutral

This adjustment must be made with tracks turning.

Mechanical or hydraulic jacks may fail to support machine and cause a serious injury.

- **Use jack stands when supporting machine.**
- **Do not use hydraulic jacks.**

The engine must be running to perform this adjustment. Contact with moving parts or hot surfaces may cause personal injury.

Keep hands, feet, face, clothing, and other body parts away from rotating parts, muffler, and other hot surfaces.

1. Raise the frame onto stable jack stands so that the tracks can rotate freely.
2. Slide seat forward, unlatch it, and swing it up and forward.
3. Disconnect the electrical connector from the seat safety switch. Temporarily install a jumper wire across terminals in the wiring harness connector.
4. Start the engine, ensure that the throttle lever is midway between the Fast and Slow positions, and release the parking brake

   Note: The motion control levers must be in the neutral locked position while making any adjustments.
5. Adjust the pump rod length on one side by rotating the hex shaft, in the appropriate direction, until the corresponding wheel is still or slightly creeping in reverse (Figure 52).

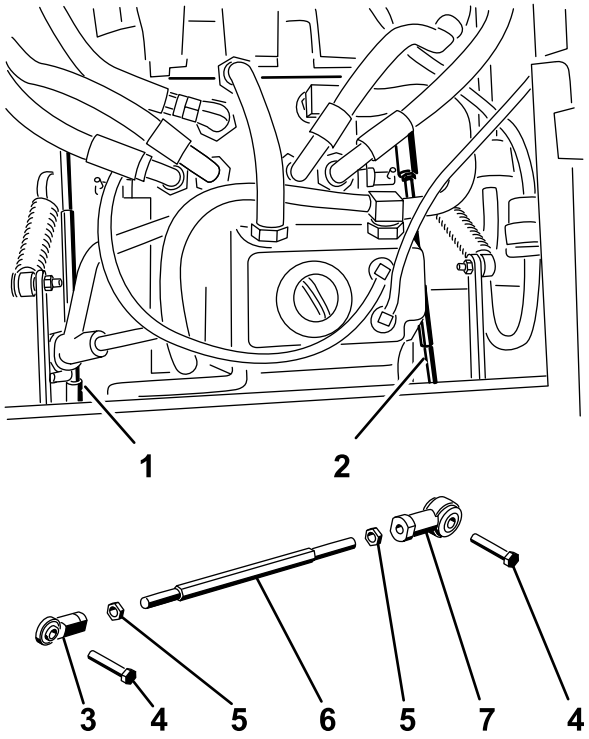


Figure 56

Figure 52

1. Right pump rod
2. Left pump rod
3. Ball joint
4. Bolt
5. Jam Nut
6. Hex shaft
7. Ball joint

6. Move the motion control lever forward and reverse, then back to neutral. The wheel must stop turning or slightly creep in reverse.
7. Move the throttle lever to the Fast position. Make sure wheel remains stopped or slightly creeps in reverse, adjust if necessary.
8. Repeat steps 5 through 7 for the other side.
9. Tighten the jam nuts at the ball joints (Figure 50).
10. Move the throttle lever to the Slow position and stop the engine.
11. Remove the jumper wire from the wire harness connector and plug the connector into the seat switch.

Electrical system will not perform proper safety shut off with jumper wire installed.

- **Remove jumper wire from wire harness connector and plug connector into seat switch when adjustment is completed.**
- **Never operate this unit with jumper installed and seat switch bypassed.**

12. Lower the seat into position.
13. Remove the jack stands.

Adjusting the Maximum Ground Speed

Note: If you wish to reduce the maximum machine speed, set the speed for both control levers as directed below, then back each stop bolt out an equal amount toward the control lever until you reach the maximum speed you desire (you will likely have to test your adjustment several times). Ensure that the machine drives straight and does not turn when both control levers are pushed all the way forward. If the machine turns, you do not have the stop bolts evenly set and will need to adjust them further.

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Move the throttle lever to the Slow position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the bolts securing the front panel and remove the panel (Figure 53).

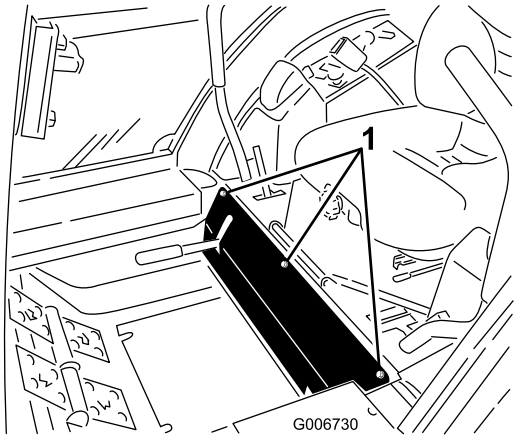


Figure 53

1. Front panel bolts

4. Loosen the jam nut on the stop bolt for one of the control levers (Figure 54).

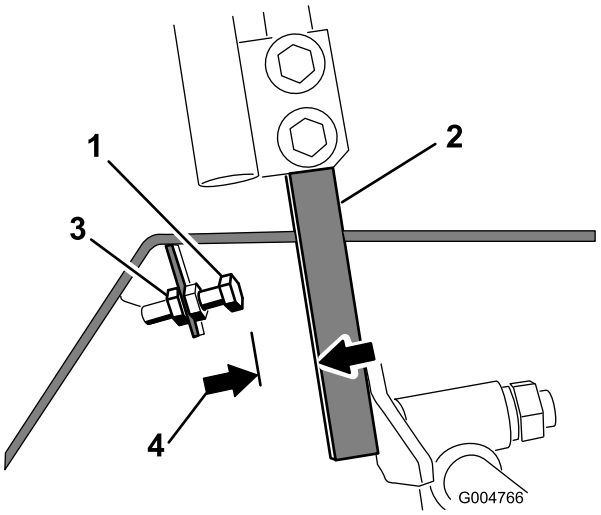


Figure 54

1. Stop bolt
2. Control lever
3. Jam nut
4. 0.060 inch (1.5 mm)

5. Thread the stop bolt all the way in (away from the control lever).
6. Push the control lever all the way forward until it stops and hold it there.
7. Thread the stop bolt out (towards the control lever) until there is a gap of 0.060 inch (1.5 mm) between the head of the stop bolt and the control lever.
8. Tighten the jam nut to secure the stop bolt in place.
9. Repeat steps 4 through 8 for the other control lever.
10. Install the front panel.

Adjusting the Tracking

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Move the throttle lever to the Slow position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the bolts securing the control levers (Figure 55)

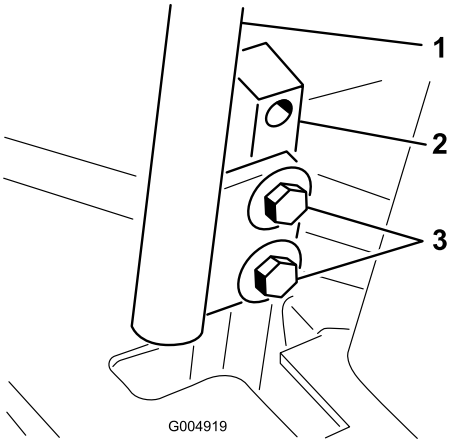


Figure 55

1. Control lever
2. Control lever post
3. Bolts

4. Have someone push the control lever posts (not the control levers) all the way forward into the maximum speed position and hold them there.
5. Adjust the control levers so that they line up (Figure 56) and tighten the bolts, securing the levers to the posts.

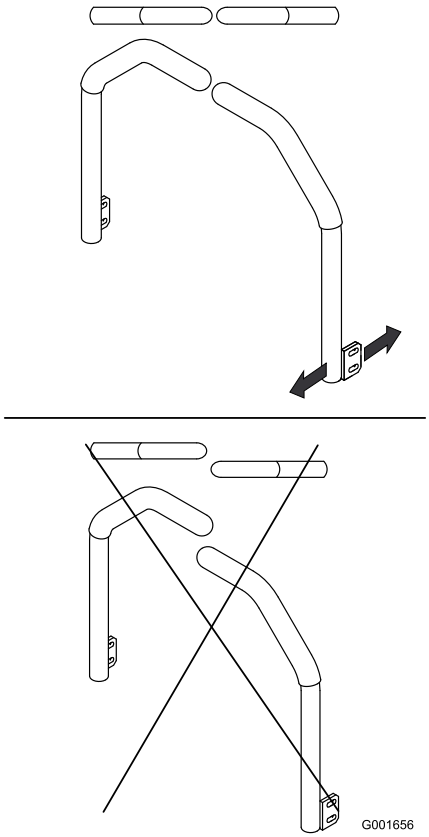


Figure 56

Hydraulic System Maintenance

The reservoir is filled at the factory with approximately 5 quarts (4.7 l) of high quality tractor transmission/hydraulic fluid. The recommended replacement fluid is as follows:

Toro Premium Transmission/Hydraulic Tractor Fluid
(Available in 5 gallon pails or 55 gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, Mobil® 424 hydraulic fluid may be used.

Note: Toro will not assume responsibility for damage caused by improper substitutions.

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz. (20 ml) bottles. One bottle is sufficient for 4-6 gal (15-22 1) of hydraulic oil. Order part number 44-2500 from your authorized Toro distributor.

Checking the Hydraulic Fluid Level

Service Interval: Before each use or daily

1. Position the machine on a level surface. Place the controls in the neutral locked position and start the engine. Run engine at lowest possible RPM to purge the system of air. **Do not engage the PTO**. Raise the deck to extend lift cylinders, stop the engine, and remove the key.
2. Raise the seat to access the hydraulic fluid tank.
3. Remove the hydraulic fill cap (Figure 57) from filler neck.

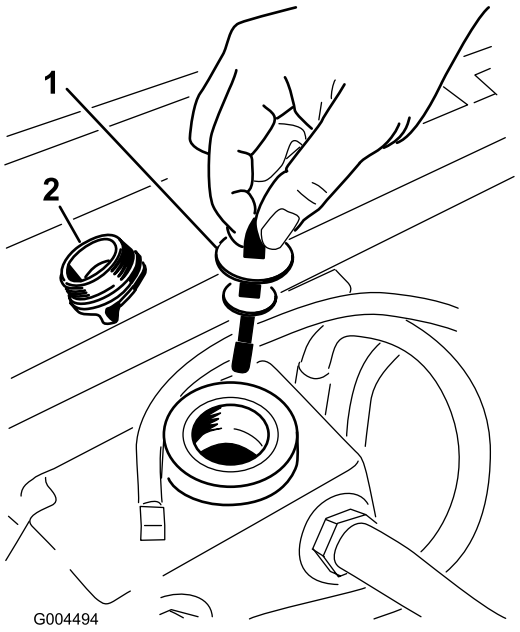


Figure 57

1. Dipstick
2. Fill cap

4. Remove the dipstick and wipe it with a clean rag (Figure 57).
5. Place the dipstick into the filler neck; then remove it and check level of fluid (Figure 57).

   If level is not within notched area of the dipstick, add enough high quality hydraulic fluid to raise level to within the notched area. **Do not overfill**.
6. Replace the dipstick and thread the fill cap finger-tight onto filler neck.
7. Check all hoses and fittings for leaks.

Changing the Hydraulic Oil And Filter

Service Interval: After the first 200 hours

Every 800 hours

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Move the throttle lever to the Slow position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Place a large pan under the hydraulic reservoir and transmission case and remove the plugs, draining all of the hydraulic fluid (Figure 58).

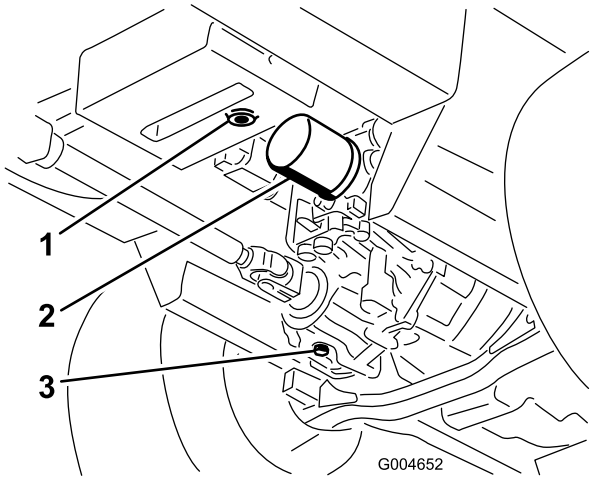


Figure 58

1. Hydraulic reservoir drain plug
2. Filter
3. Transmission case drain plug

4. Clean the area around the hydraulic oil filter and remove it (Figure 58).
5. Immediately install a new hydraulic oil filter.
6. Install the hydraulic reservoir and transmission case drain plugs.
7. Fill the reservoir to the proper level; refer to Checking the Hydraulic Fluid.
8. Start the engine and check for oil leaks. Allow the engine to run for about five minutes, then shut it off.
9. After two minutes, check the level of the hydraulic fluid; refer to Checking the Hydraulic Fluid.

Cab Maintenance

Refer to the *ROPS Hard Cab Operator's Manual* for additional cab maintenance procedures.

Storage

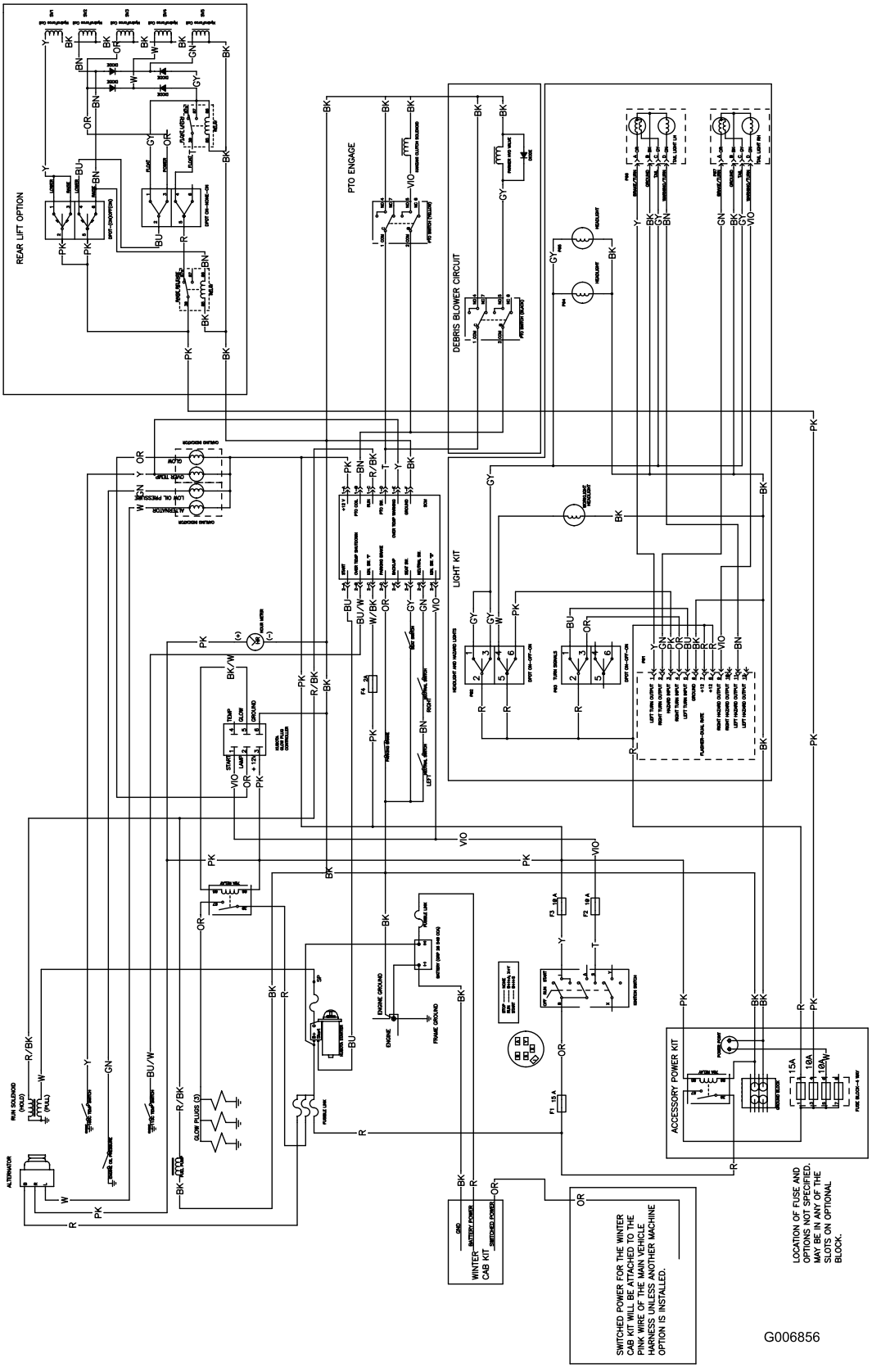
Machine

1. Thoroughly clean the machine, deck and the engine, paying special attention to these areas:
   - Radiator and radiator screen
   - Underneath the deck
   - Under the deck belt covers
   - Counterbalance springs
   - PTO shaft assembly
   - All grease fittings and pivot points
   - Remove the control panel and clean out inside of the control box
   - Beneath the seat plate and top of the transmission
2. Check and adjust the tire pressure; refer to Checking Tire Pressure.
3. Check all fasteners for looseness and tighten them as necessary.
4. Grease or oil all grease fittings, pivot points, and transmission by-pass valve pins. Wipe off any excess lubricant.
5. Lightly sand and use touch up paint on painted areas that are scratched, chipped or rusted. Repair any dents in the metal body.
6. Service the battery and cables as follows:
   A. Remove the battery terminals from the battery posts.
   B. Clean the battery, terminals, and posts with a wire brush and baking soda solution.
   C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
   D. Slowly recharge the battery for 24 hours every 60 days to prevent lead sulfation of the battery.

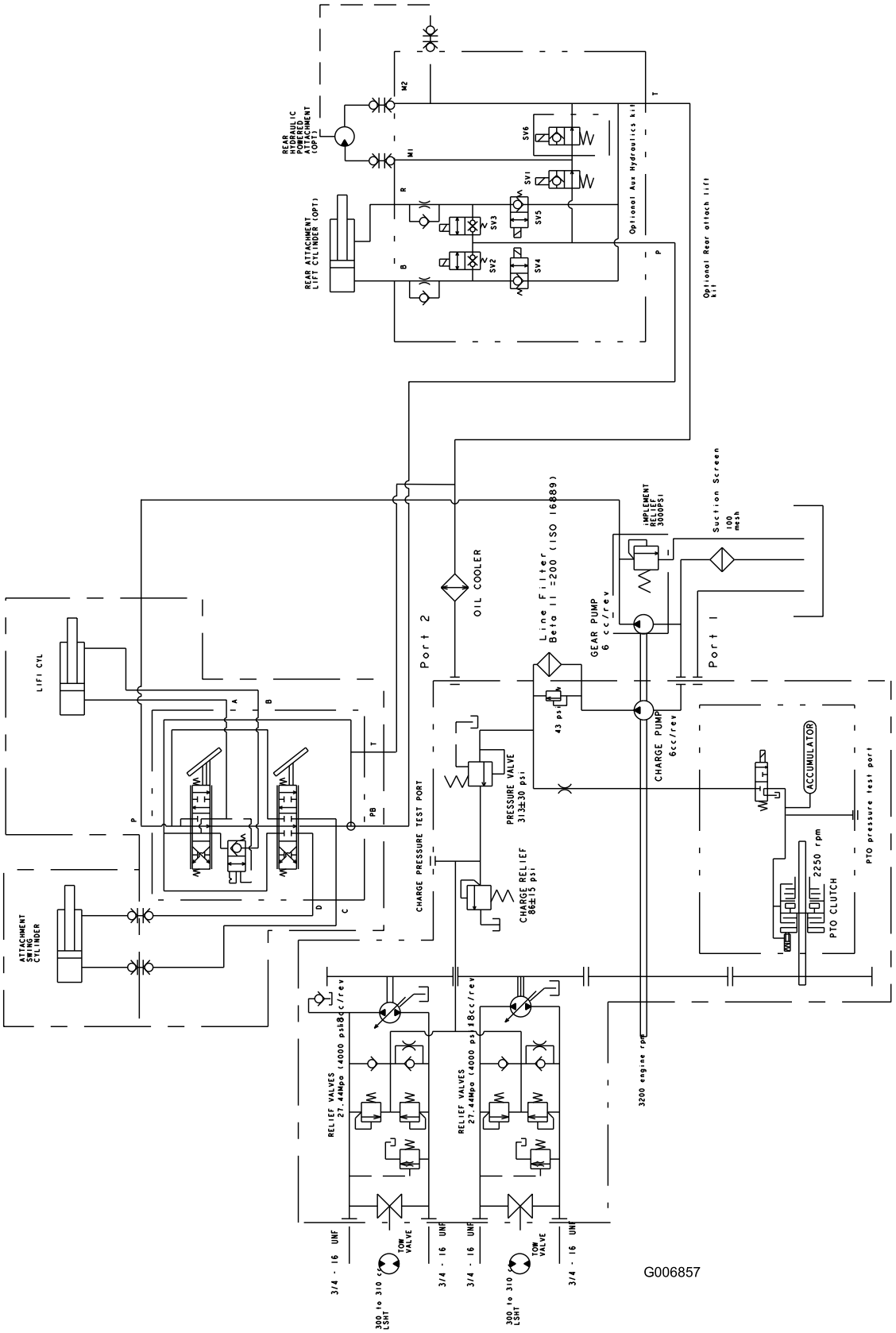
Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new filter.
3. Refill the engine with 4 quarts (3.8 l) of recommended motor oil. Refer to Changing the Engine Oil.
4. Start the engine and run it at idle speed for two minutes.
5. Drain the fuel from the fuel tank, fuel lines, pump, filter, and separator. Flush the fuel tank with clean diesel fuel and connect all fuel lines.
6. Thoroughly clean and service the air cleaner assembly.
7. Seal the air cleaner inlet and the exhaust outlet with weather proof masking tape.
8. Check the oil filler cap and fuel tank cap to ensure they are securely in place.

Schematics



Electrical Schematic (Rev. A)



Hydraulic Schematic (Rev. A)

The Toro General Commercial Products Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Commercial Product ("Product") to be free from defects in materials or workmanship for two years or 1500 operational hours*, whichever occurs first. Where a warrantable condition exists, we will repair the Product at no cost to you including diagnosis, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.

* Product equipped with hour meter

Instructions for Obtaining Warranty Service

You are responsible for notifying the Commercial Products Distributor or Authorized Commercial Products Dealer from whom you purchased the Product as soon as you believe a warrantable condition exists.

If you need help locating a Commercial Products Distributor or Authorized Dealer, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Toro Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
952-888-8801 or 800-982-2740
E-mail: commercial.service@toro.com

Owner Responsibilities

As the Product owner, you are responsible for required maintenance and adjustments stated in your operator's manual. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

Items and Conditions Not Covered

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. This express warranty does not cover the following:

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, modified, or unapproved accessories
- Product failures which result from failure to perform required maintenance and/or adjustments
- Product failures which result from operating the Product in an abusive, negligent or reckless manner
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, blades, reels, bedknives, tines, spark plugs, castor wheels, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.
- Normal "wear and tear" items. Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

Parts scheduled for replacement as required maintenance are warranted for the period of time up to the scheduled replacement time for that part.

Parts replaced under this warranty become the property of Toro. Toro will make the final decision whether to repair any existing part or assembly or replace it. Toro may use factory remanufactured parts rather than new parts for some warranty repairs.

General Conditions

Repair by an Authorized Toro Distributor or Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note regarding engine warranty: The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB). The hour limitations set forth above do not apply to the Emissions Control System Warranty. Refer to the Engine Emission Control Warranty Statement printed in your operator's manual or contained in the engine manufacturer's documentation for details.

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.

Part No. 374-0031 Rev. C