



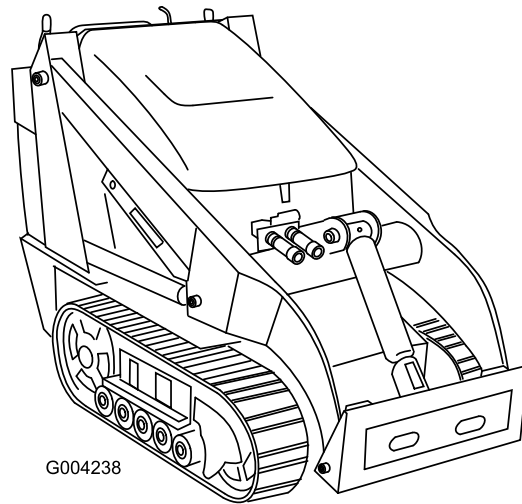
**Count on it.**

**Operator's Manual**

**Dingo<sup>®</sup> TX 420 and TX 425  
Compact Utility Loader**

**Model No. 22306—Serial No. 260000001 and Up**

**Model No. 22307—Serial No. 260000001 and Up**



G004238

## Warning

### CALIFORNIA Proposition 65 Warning

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

This spark ignition system complies with Canadian ICES-002

The enclosed Engine Owner's Manual is supplied for information regarding the US Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance, and warranty. Replacements may be ordered through the engine manufacturer.

## 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](http://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. The model and serial numbers are stamped into a plate mounted under the hood near the belt drive. Write the numbers in the space provided.

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

This manual identifies potential hazards and has safety messages identified by the safety alert symbol (Figure 1), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



**Figure 1**


1. Safety alert symbol

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

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# Safety

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

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



Engine exhaust contains carbon monoxide, an odorless, deadly poison that can kill you.

Do not run the engine indoors or in an enclosed area.

## Training

- Read the *Operator's Manual* and other training material. If the operator(s) or mechanic(s) can not read English, it is the owner's responsibility to explain this material to them.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people or property.

## Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including hard hat, safety glasses, long pants, safety shoes, and

hearing protection. Long hair, loose clothing or jewelry may get tangled in moving parts.

- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys, and wire which can be thrown by the machine.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
  - Use only an approved container
  - Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling. Do not smoke.
  - Never refuel or drain the machine indoors.
- Check that the operator's presence controls, safety switches, and shields are attached and functioning properly. Do not operate unless they are functioning properly.

## Operation

- Never run an engine in an enclosed area.
- Only operate in good light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting the engine. Only start the engine from the operator's position.
- Slow down and use extra care on hillsides. Be sure to travel in the recommended direction on hillsides. Turf conditions can affect the machine's stability.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never operate with the guards not securely in place. Be sure all interlocks are attached, adjusted properly, and functioning property.
- Do not change the engine governor setting or overspeed the engine.
- Stop on level ground, lower implements, disengage the auxiliary hydraulics, engage parking brake, shut off the engine before leaving the operator's position for any reason.
- Keep hands and feet away from moving attachments.
- Look behind and down before backing up to be sure of a clear path.

- Never carry passengers and keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks.
- Do not operate the machine under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Read all attachment manuals.
- Ensure that the area is clear of other people before operating the traction unit. Stop the traction unit if anyone enters the area.
- Never leave a running traction unit unattended. Always lower the loader arms, stop the engine, set the parking brake, and remove the key before leaving.
- Do not exceed the rated operating capacity, as the traction unit may become unstable which may result in loss of control.
- Do not carry a load with the arms raised. Always carry loads close to the ground.
- Do not over-load the attachment and always keep the load level when raising the loader arms. Logs, boards, and other items could roll down the loader arms, injuring you.
- Never jerk the controls; use a steady motion.
- Watch for traffic when operating near or crossing roadways.
- Do not touch parts which may be hot from operation. Allow them to cool before attempting to maintain, adjust, or service.
- Check for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Ensure that you operate the traction unit in areas where there are no obstacles in close proximity to the operator. Failure to maintain adequate distance from trees, walls, and other barriers may result in injury as the traction unit backs up during operation if the operator is not attentive to the surroundings. Only operate the unit in areas where there is sufficient clearance for the operator to safely maneuver the product.
- Before digging, have the area marked for underground utilities, and do not dig in marked areas.
- Locate the pinch point areas marked on the traction unit and attachments and keep hands and feet away from these areas.
- Before operating the traction unit with an attachment, ensure that the attachment is properly installed.

## Slope Operation

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. All slopes require extra caution.

- Do not operate the traction unit on hillsides or slopes exceeding the angles recommended in the Stability Data section in Specifications, page 16, and those in the attachment *Operator's Manual*. See also the Slope Chart, page 8.
- **Operate up and down slopes with the heavy end of the traction unit uphill.** Weight distribution changes. An empty bucket will make the rear of the traction unit the heavy end, and a full bucket will make the front of the traction unit the heavy end. Most other attachments will make the front of traction unit the heavy end.
- Raising the loader arms on a slope will affect the stability of the machine. Whenever possible, keep the loader arms in the lowered position when on slopes.
- Removing an attachment on a slope will make the rear of the traction unit heavy. Refer to the Stability Data section in Specifications, page 16, to determine whether the attachment can be safely removed on the slope.
- Remove obstacles such as rocks, tree limbs, etc. from the work area. Watch for holes, ruts, or bumps, as uneven terrain could overturn the traction unit. Tall grass can hide obstacles.
- Use only Toro-approved attachments. Attachments can change the stability and the operating characteristics of the traction unit. Warranty may be voided if used with unapproved attachments.
- Keep all movements on slopes slow and gradual. Do not make sudden changes in speed or direction.

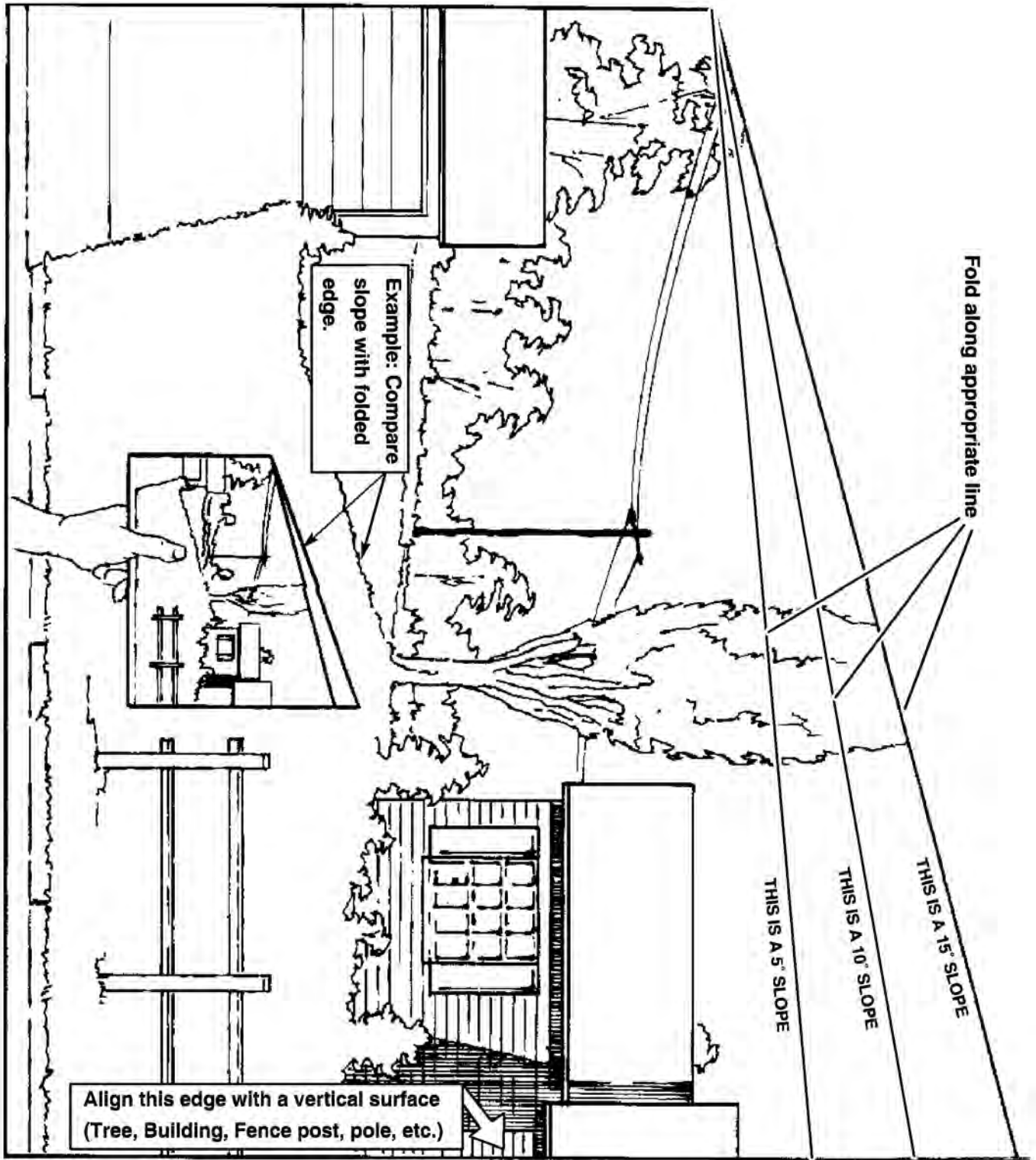
- Avoid starting or stopping on a slope. If the traction unit loses traction, proceed slowly, straight down the slope.
- Avoid turning on slopes. If you must turn, turn slowly and keep the heavy end of the traction unit uphill.
- Do not operate near drop-offs, ditches, or embankments. The traction unit could suddenly turn over if a track goes over the edge of a cliff or ditch, or if an edge caves in.
- Do not operate on wet grass. Reduced traction could cause sliding.
- Do not park the traction unit on a hillside or slope without lowering the attachment to the ground, setting the parking brake, and chocking the tracks.
- Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.
- If any maintenance or repair requires the loader arms to be in the raised position, secure the arms in the raised position with the hydraulic cylinder lock.
- Secure the loader arm valve with the loader valve lock anytime you need to stop the machine with the loader arms raised.
- Keep nuts and bolts tight. Keep equipment in good condition.
- Never tamper with safety devices.
- Keep the traction unit free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage. Allow the traction unit to cool before storing.

## **Maintenance and Storage**

- Disengage the auxiliary hydraulics, lower the attachment, set the parking brake, stop the engine, and remove the key. Wait for all movement to stop before adjusting, cleaning, or repairing.
- Clean debris from attachments, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Let the engine cool before storing and do not store near flame.
- Do not store fuel near flames or drain indoors.
- Park the machine on level ground. Never allow untrained personnel to service the machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect the battery or remove the spark plug wires before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug the charger before connecting or disconnecting it from the battery. Wear protective clothing and use insulated tools.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
  - Use only an approved container.
  - Never remove the gas cap or add fuel when the engine is running. Allow the engine to cool before refueling. Do not smoke.
  - Never refuel the traction unit indoors.
  - Never store the traction unit or fuel container inside where there is an open flame, such as near a water heater or furnace.
  - Never fill a container while it is inside a vehicle, trunk, pick-up bed, or any surface other than the ground.
  - Keep container nozzle in contact with the tank during filling.
- Stop and inspect the equipment if you strike an object. Make any necessary repairs before restarting.
- Use only genuine Toro replacement parts to ensure that original standards are maintained.
- Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes, and clothing. Protect your face, eyes, and clothing when working with a battery.
- Battery gases can explode. Keep cigarettes, sparks and flames away from the battery.
- Keep your body and hands away from pin hole leaks or nozzles that eject high pressure

hydraulic fluid. Use cardboard or paper to find hydraulic leaks; never use your hands. Hydraulic fluid escaping under pressure can penetrate skin and cause injury requiring surgery within a few hours by a qualified surgeon or gangrene may result.

# Slope Chart

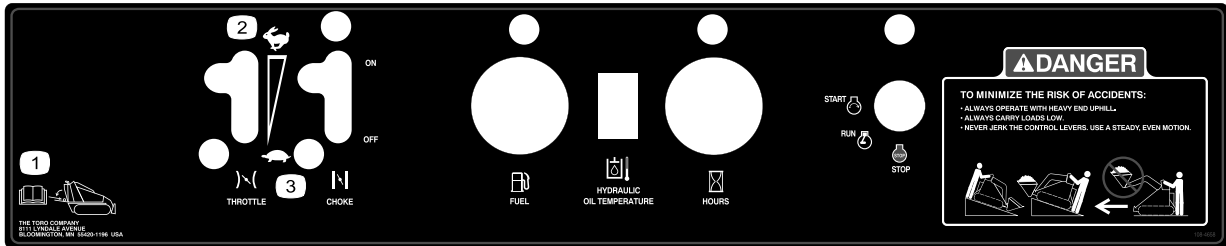




# Safety and Instructional Decals



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.



**108-4658**

1. Operator's Manual location.

2. Fast

3. Slow

**! DANGER TO MINIMIZE THE RISK OF ACCIDENTS, INJURY, OR DEATH:**

- OPERATOR MUST BE SKILLED AND TRAINED IN OPERATION.
- NEVER USE WHEN UNDER THE INFLUENCE OF ALCOHOL OR DRUGS.
- USE SAFELY, MACHINE IS NOT A TOY.
- STOP ENGINE AND REMOVE KEY BEFORE LEAVING MACHINE. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING.
- USE CYLINDER LOCKS IF SERVICING WHILE LIFT ARMS ARE RAISED.
- KEEP GUARDS, COVERS AND OTHER SAFETY DEVICES IN PLACE.
- WEAR CLOSE FITTING PROTECTIVE CLOTHING AND SHOES.
- KEEP HANDS, FEET AND CLOTHING AWAY FROM ALL MOVING PARTS.
- NEVER SMOKE WHILE FUELING. STOP ENGINE BEFORE FUELING.
- NEVER RUN ENGINE WITHOUT ADEQUATE VENTILATION.
- KEEP CHILDREN AND OTHER PEOPLE A SAFE DISTANCE AWAY.
- NEVER LET CHILDREN OPERATE THE MACHINE.
- NEVER CARRY CHILDREN OR OTHER PASSENGERS.
- LOOK DOWN AND BEHIND BEFORE AND WHILE BACKING UP.
- GO SLOW AND AVOID SHARP TURNS ON SLOPES.
- ALWAYS PLACE IMPLEMENT ON GROUND WHEN LEAVING MACHINE. USE PARKING BRAKE WHEN PARKING ON A SLOPE.
- KEEP HAND IN CONTACT WITH THE REFERENCE BAR WHEN OPERATING TRACTION CONTROL.
- KNOW THE WORK AREA. CHECK FOR HOLES AND OVERHEAD CLEARANCES. AVOID OVERHEAD POWER LINES.
- KNOW LOCATION OF UNDERGROUND UTILITIES BEFORE YOU DIG.

108-4674

**108-4674**

**DINGO TX 420/425  
QUICK REFERENCE AID**

SEE OPERATOR'S MANUAL

CHECK/SERVICE (daily)


1. OIL LEVEL, ENGINE
2. OIL LEVEL, HYDRAULIC TANK
3. BRAKE FUNCTION
4. AIR FILTER AND PRECLEANER
5. TRACTION PUMP BELT
6. GREASE POINTS (12)

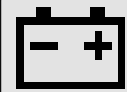
FLUID SPECIFICATIONS / CHANGE INTERVALS


See operator's manual for initial change	FLUID TYPE	CAPACITY	CHANGE INTERVALS		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	SAE 10w-30, SAE 10w-40	2.1 qts.	100 HRS.	200 HRS.	52 050 02-S
B. HYDRAULIC OIL	SAE 10W-30	12 gals.	400 HRS.	200 HRS.	86-3010
C. AIR FILTER	---	---	---	100 HRS.	24 083 03-S
D. FUEL FILTER	---	---	---	200 HRS.	24 050 02-S
E. FUEL TANK	UNLEADED GAS	6 gals.	---	---	---


108-5599


**108-5599**












**IMPORTANT !**

**BATTERY CHARGING INSTRUCTIONS**

Prior to first use of the battery, charge for a minimum of one hour at 6-10 amps.



107-9309

**107-9309**

1. Warning—read the *Operator's Manual* for information on charging the battery; contains lead; do not discard.
2. Read the *Operator's Manual*.

**CAUTION**

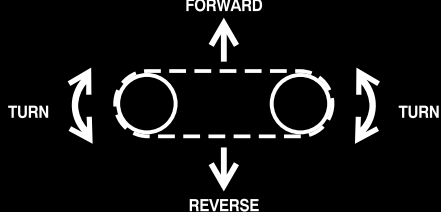
HYDRAULIC COUPLERS MAY BE HOT. GLOVES SHOULD BE WORN WHEN CONNECTING COUPLERS.

100-6101

**100-6101**

**TRACTION CONTROL**

FORWARD



REVERSE

106-9453

**106-9453**

**CAUTION**

SECURE QUICK ATTACH BEFORE OPERATING MACHINE. RATED OPERATING CAPACITY: 500 LBS.

100-6132


**100-6132**

**DANGER**

AVOID PERSONAL INJURY. ALWAYS INSTALL CYLINDER LOCK OVER CYLINDER ROD BEFORE WORKING UNDER RAISED LOADER ARMS.

100-6135

**100-6135**



**WARNING**

**ROTATING MEMBERS**

80-8040

**80-8040**

**WARNING**

**PINCH AREA, KEEP CLEAR**

100-6141

**100-6141**



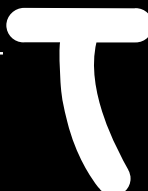
**HYDRAULIC OIL:**  
USE SAE 10W30 OR 15W40 DIESEL ENGINE OIL, API SERVICE CH-4 OR HIGHER.

105-8432

**105-8432**

**AUXILIARY POWER**

REVERSE FLOW
FORWARD FLOW



DETENT
NEUTRAL

108-4686

**108-4686**

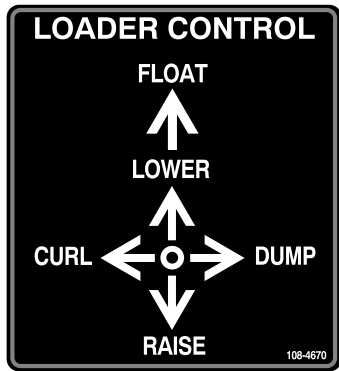


**WARNING**

**HOT SURFACES**

80-8290

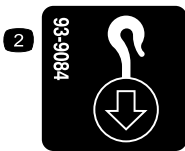
**80-8290**



**108-4670**



**108-4671**



**93-9084**

1. Lift point

2. Tie-down point

# Setup

## Step

# 1

## Charging the Battery

### No Parts Required

### Procedure

#### 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.

1. Open the rear access cover.
2. Connect a charger to the battery (Figure 2) and charge it for a minimum of 1 hour at 6 to 10 amps. Do not overcharge the battery.

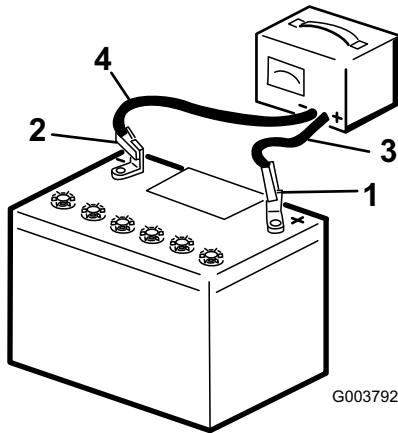


Figure 2

- |                  |                           |
|------------------|---------------------------|
| 1. Positive post | 3. Charger red (+) wire   |
| 2. Negative post | 4. Charger black (-) wire |



Charging the battery produces gasses that can explode.

Never smoke near the battery and keep sparks and flames away from battery.

3. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 2).
4. Close the rear access cover.

## Step

# 2

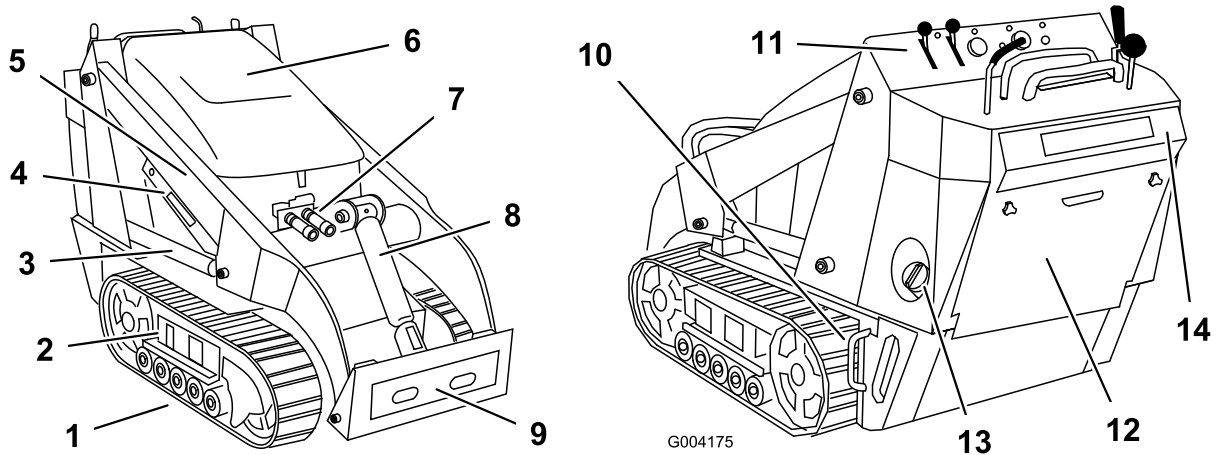
## Checking Fluid Levels

### No Parts Required

### Procedure

Before starting the engine for the first time, check the engine oil and hydraulic fluid levels. Refer to Operation for more information.

# Product Overview

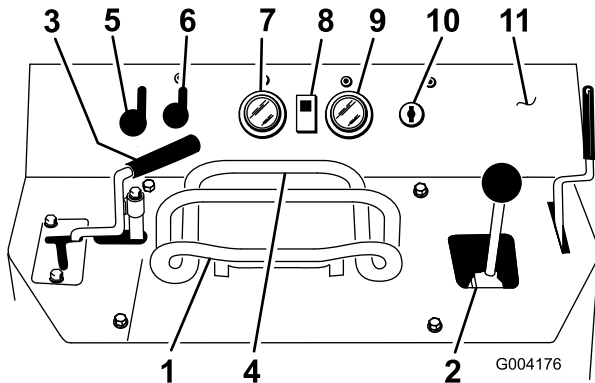


**Figure 3**

- |                             |                                 |                        |                          |
|-----------------------------|---------------------------------|------------------------|--------------------------|
| 1. Track                    | 5. Loader arms                  | 9. Mount plate         | 13. Fuel tank            |
| 2. Track adjustment chamber | 6. Hood                         | 10. Tie-down/lift loop | 14. Reverse safety plate |
| 3. Lift cylinder            | 7. Auxiliary hydraulic couplers | 11. Control panel      |                          |
| 4. Cylinder lock            | 8. Tilt cylinder                | 12. Rear access cover  |                          |

## Controls

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



**Figure 4**

- |                               |                                    |
|-------------------------------|------------------------------------|
| 1. Traction control           | 7. Fuel gauge                      |
| 2. Loader arm/attachment tilt | 8. Hydraulic oil temperature lever |
| 3. Auxiliary hydraulics lever | 9. Hour meter/tachometer           |
| 4. Reference bar              | 10. Key switch                     |
| 5. Throttle lever             | 11. Parking brake lever            |
| 6. Choke lever                |                                    |

## Key Switch

The key switch, used to start and stop the engine, has three positions: off, run, and start.

To start the engine, rotate the key to the start position. Release the key when engine starts and it will move automatically to the run position.

To stop the engine, rotate the key to the off position.

## Throttle Lever

Move the control forward to increase the engine speed and rearward to decrease speed.

## Choke Lever

Before starting a cold engine, move the choke lever forward. After the engine starts, regulate the choke to keep the engine running smoothly. As soon as possible, move the choke lever all the way rearward.

**Note:** A warm engine requires little or no choking.

## Reference Bar

When driving the traction unit, use the reference bar as a handle and a leverage point for controlling the traction control and the auxiliary hydraulics lever. To ensure smooth, controlled operation, do not take both hands off of the reference bar while operating the traction unit.

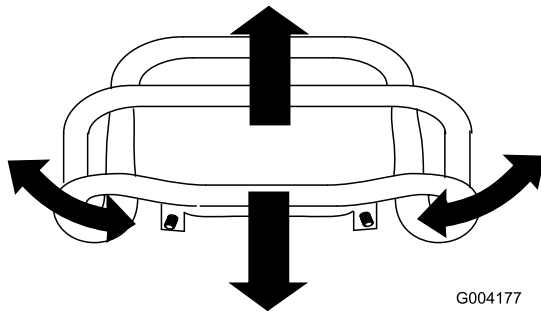
## Traction Control

To move forward, move the traction control forward. To move rearward, move the traction control rearward (Figure 5).

To turn, rotate the traction control in the desired direction (Figure 5).

The farther you move the traction control in any direction, the faster the traction unit will move in that direction.

To stop, release the traction control.



**Figure 5**

## Loader Arm/Attachment Tilt Lever

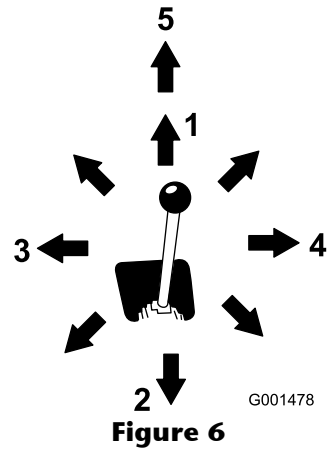
To tilt the attachment forward, slowly move the lever to the right (Figure 6).

To tilt the attachment rearward, slowly move the lever to the left (Figure 6).

To lower the loader arms, slowly move the lever forward (Figure 6).

To raise the loader arms, slowly move the lever rearward (Figure 6).

You can also push the lever fully forward into a detent position (Figure 6) to release the loader arms so that the attachment rests on the ground. This allows attachments such as the leveler and the hydraulic blade to follow the contours of the ground (i.e., float) when grading.



**Figure 6**

1. Lower the loader arms
2. Raise the loader arms
3. Tilt the attachment rearward
4. Tilt the attachment forward
5. Detent (Float) position

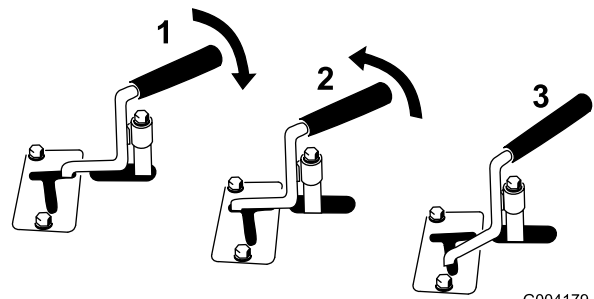
By moving the lever to an intermediate position (such as, forward and left), you can move the loader arms and tilt the attachment at the same time.

## Auxiliary Hydraulics Lever

To operate a hydraulic attachment in the forward direction, rotate the auxiliary hydraulics lever rearward and pull it down to the reference bar (Figure 7, number 1).

To operate a hydraulic attachment in reverse direction, rotate the hydraulics lever rearward, then move it left into the upper slot (Figure 7, number 2).

If you release the lever while in the forward position, the lever will automatically return to the neutral position (Figure 7, number 3). If it is in the reverse position, it will remain there until you pull it out of the slot.



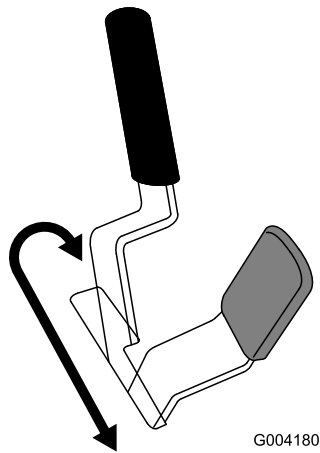
**Figure 7**

1. Forward flow hydraulics
2. Reverse flow hydraulics
3. Neutral

## Parking Brake Lever

To set the parking brake, push the brake lever forward and to the left and then pull it rearward (Figure 8).

**Note:** The traction unit may roll slightly before the brakes engage in the drive sprocket.



**Figure 8**

procedures based on a 100, 200, or 400 hour schedule. These reminders come on starting three hours prior to the service interval time and flash at regular intervals for six hours.

---

To release the brake, push the lever forward and then right, into the notch.

## Fuel Gauge

This gauge measures the amount of fuel in the fuel tank.

## Hydraulic Oil Temperature Light (Dingo TX 425 only)

If the hydraulic oil gets too hot, this light illuminates and an audible alarm sounds. If this happens, stop the engine and allow the traction unit to cool.

## Hour Meter/Tachometer

When the engine is off, the hour meter/tachometer displays the number of hours of operation that have been logged on the traction unit. When the engine is running, it displays the speed of the engine in revolutions per minute (rpm).

After 50 hours and then every 100 hours thereafter (that is at 150, 250, 350, etc.) the screen displays CHG OIL to remind you to change the engine oil. After every 100 hours, the screen displays SVC to remind you to perform the other maintenance

# Specifications

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

<b>TX 420, Model 22306</b>	
Width	34 inches (86 cm)
Length	71 inches (180 cm)
Height	43 inches (109 cm)
Weight	1880 lb (853 Kg)
Operating capacity	500 lb (227 Kg)
Tipping capacity	1530 lb (694 Kg)
Wheelbase	31.2 inches (79 cm)
Dump height (with narrow bucket)	47 inches (119 cm)
Reach—fully raised (with narrow bucket)	22 inches (55 cm)
Height to hinge pin (narrow bucket in highest position)	66 inches (168 cm)

<b>TX 425, Model 22307</b>	
Width	41 inches (104 cm)
Length	71 inches (180 cm)
Height	43 inches (109 cm)
Weight	2060 lb (935 Kg)
Operating capacity	500 lb (227 Kg)
Tipping capacity	1530 lb (694 Kg)
Wheelbase	31.2 inches (79 cm)
Dump height (with narrow bucket)	47 inches (119 cm)
Reach—fully raised (with narrow bucket)	22 inches (55 cm)
Height to hinge pin (narrow bucket in highest position)	66 inches (168 cm)

## 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](http://www.Toro.com) for a list of all approved attachments and accessories.

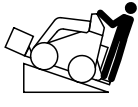


**Important:** Use only Toro approved attachments. Other attachments may create an unsafe operating environment or damage the traction unit.

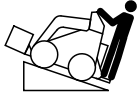

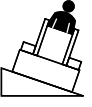


## Stability Data

The following tables list the maximum slope recommended for the traction unit in the positions listed in the tables. Slopes over the listed degree may cause the traction unit to become unstable. The data in the tables assume that the loader arms are fully lowered; raised arms may affect the stability.

In each attachment manual is a set of three stability ratings, one for each hill position. To determine the maximum slope you can traverse with the attachment installed, find the degree of slope that corresponds to the stability ratings of the attachment. Example: If the attachment installed on a TX 420 traction unit has a Front Uphill rating of B, a Rear Uphill rating of D, and a Side Uphill rating of C, then you could drive forward up a 20° slope, rearward up a 12° slope, or sideways on a 14° slope, as listed in the following table for the TX 420 traction unit.

<b>TX 420, Model 22306</b>			
<b>Configuration</b>	<b>Maximum Recommended Slope when Operating with:</b>		
	<b>Front Uphill</b> 	<b>Rear Uphill</b> 	<b>Side Uphill</b> 
Traction unit without attachment	11°	21°	19°
Traction unit with an attachment rated with one of the following stability ratings for each slope position:*			
<b>A</b>	25°	25°	20°
<b>B</b>	20°	20°	18°
<b>C</b>	17°	17°	14°
<b>D</b>	10°	12°	9°
<b>E</b>	5°	5°	5°

<b>TX 425, Model 22307</b>			
<b>Configuration</b>	<b>Maximum Recommended Slope when Operating with:</b>		
	<b>Front Uphill</b> 	<b>Rear Uphill</b> 	<b>Side Uphill</b> 
Traction unit without attachment	12°	20°	23°
Traction unit with an attachment rated with one of the following stability ratings for each slope position:*			
<b>A</b>	25°	25°	25°
<b>B</b>	22°	22°	22°
<b>C</b>	18°	16°	16°
<b>D</b>	10°	10°	10°
<b>E</b>	5°	5°	5°

# Operation

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

**Important:** Before operating, check the fuel and oil level, and remove debris from the traction unit. Also, ensure that the area is clear of people and debris. You should also know and have marked the locations of all utility lines.

## Adding Fuel

Use unleaded gasoline (87 pump octane minimum). Leaded, regular gasoline may be used if unleaded is not available.



In certain conditions, gasoline is extremely flammable and highly explosive. A fire or explosion from gasoline 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 gasoline that spills.
- Never fill the fuel tank inside an enclosed trailer.
- Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1/4 to 1/2 inch (6 to 13 mm) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.
- Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by a spark.
- Store gasoline in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of gasoline.
- 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 gasoline vapors. A fire or explosion from gasoline can burn you and others and can damage property.

- Always place gasoline containers on the ground away from your vehicle before filling.
- Do not fill gasoline 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 gas-powered 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 gasoline dispenser nozzle.
- If a gasoline 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.

**Important:** Do not use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol because the fuel system could be damaged. Do not mix oil with gasoline.

## Using Stabilizer/Conditioner

Use a fuel stabilizer/conditioner in the traction unit to provide the following benefits:

- Keeps gasoline fresh during storage of 90 days or less. For longer storage it is recommended that the fuel tank be drained.
- Cleans the engine while it runs
- Eliminates gum-like varnish buildup in the fuel system, which causes hard starting

**Important:** Do not use fuel additives containing methanol or ethanol.

Add the correct amount of gas stabilizer/conditioner to the gas.

**Note:** A fuel stabilizer/conditioner is most effective when mixed with fresh gasoline. To minimize the chance of varnish deposits in the fuel system, use fuel stabilizer at all times.

## Filling the Fuel Tank

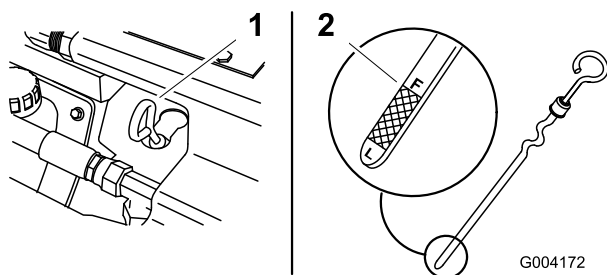
1. Park the traction unit on a level surface, lower the loader arms, and stop the engine.
2. Remove the key and allow the engine to cool.
3. Clean around the fuel tank cap and remove it.
4. Add unleaded gasoline to the fuel tank, until the level is just below the bottom of the filler neck.

**Important:** This space in the tank allows gasoline to expand. Do not fill the fuel tank completely full.

5. Install the fuel tank cap securely.
6. Wipe up any gasoline that may have spilled.

## Checking the Engine Oil Level

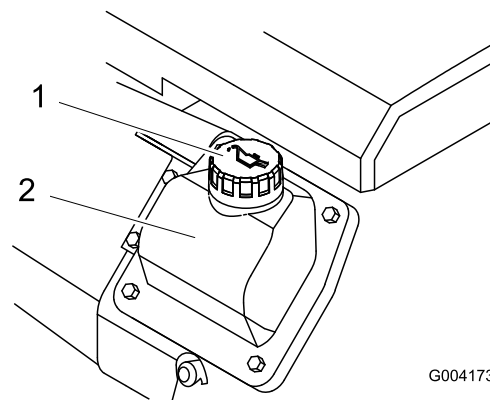
1. Park the traction unit on a level surface, lower the loader arms, and stop the engine.
2. Remove the key and allow the engine to cool.
3. Open the hood.
4. Clean around the oil dipstick (Figure 9).



**Figure 9**

1. Oil dipstick
2. Metal end

5. Pull out the dipstick and wipe the metal end clean (Figure 9).
6. Slide the dipstick fully into the dipstick tube (Figure 9).
7. Pull the dipstick out and look at the metal end.
8. If the oil level is low, clean around the oil filler cap and remove the cap (Figure 10).



**Figure 10**

1. Filler cap
2. Valve cover

9. Slowly pour only enough oil into the valve cover to raise the level to the F (full) mark.

**Important:** Do not overfill the crankcase with oil because the engine may be damaged.

10. Replace the filler cap and dipstick.
11. Close the hood.

## Checking the Hydraulic Fluid Level

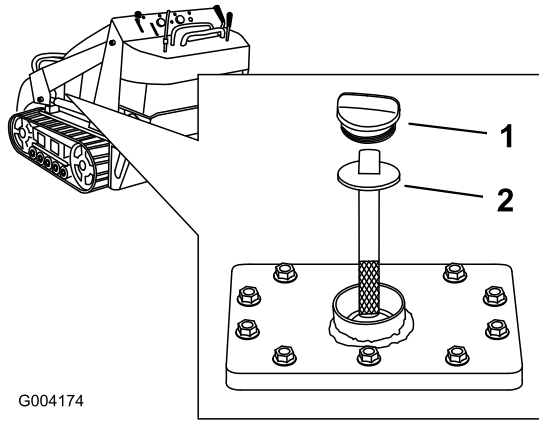
Check the hydraulic fluid level before the engine is first started and after every 25 operating hours.

Hydraulic Tank Capacity: 12 US gallons (45.4 l)

Use 10W-30 detergent, diesel engine oil (API service CH-4 or higher).

1. Remove the attachment, if one is installed; refer to Removing an Attachment.
2. Park the traction unit on a level surface, lower the loader arms, and fully retract the tilt cylinder.
3. Stop the engine, remove the key, and allow the engine to cool.
4. Open the hood.
5. Clean the area around the filler neck of the hydraulic tank (Figure 11).
6. Remove the cap from the filler neck and check the fluid level on the dipstick (Figure 11).

The fluid level should be between the marks on the dipstick.



G004174

**Figure 11**

1. Filler neck cap                      2. Dipstick

7. If the level is low, add enough fluid to raise it to the proper level.
8. Install the cap on the filler neck.
9. Close the hood.

## Starting and Stopping the Engine

### Starting the Engine

1. Ensure that the auxiliary hydraulics lever is in neutral.
2. Pull out the choke lever if you are starting a cold engine.
3. Move the throttle lever midway between slow (turtle) and fast (rabbit) positions.

**Note:** A warm or hot engine may not require choking.

4. Turn the ignition key to the start position. When the engine starts, release the key.

**Important:** Do not engage the starter for more than 10 seconds at a time. If the engine fails to start, allow a 30 second cool-down period between attempts. Failure to follow these instructions can burn out the starter motor.

5. After the engine starts, gradually push the choke down. If the engine stalls or hesitates, pull the choke out again until the engine warms up.
6. Move the throttle lever to desired setting.

**Important:** If the engine is run at high speeds when the hydraulic system is cold (i.e., when the ambient air temperature is near freezing or lower), hydraulic system damage could occur. When starting the engine in cold conditions, allow the engine to run in the middle throttle position for 2 to 5 minutes before moving the throttle to fast (rabbit).

**Note:** If outdoor temperature is below freezing, store the traction unit in a garage to keep it warmer and aid in starting.

### Stopping the Engine

1. Move the throttle lever to the slow (turtle) position.
2. Lower the loader arms to the ground.
3. Turn the ignition key off.

**Note:** If the engine has been working hard or is hot, let it idle for a minute before turning the ignition key off. This helps cool the engine before it is stopped. In an emergency, the engine may be stopped immediately.

## Stopping the Traction Unit

To stop the traction unit, release the traction control, move the throttle lever to slow (turtle), lower loader arms to the ground, and stop the engine. Set the parking brake and remove the key.



**A child or untrained bystander could attempt to operate the traction unit and be injured.**

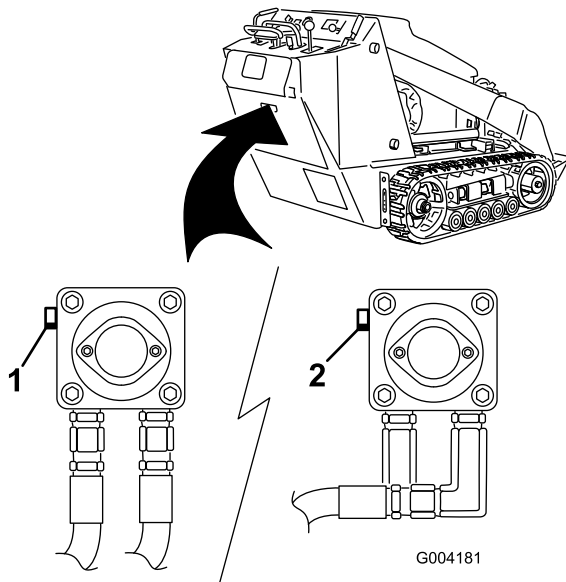
**Remove the key from the switch when leaving the traction unit, even if just for a few seconds.**

## Moving a Non-functioning Traction Unit

**Important:** Do not tow or pull the traction unit without first opening the tow valves, or the hydraulic system will be damaged.

1. Stop the engine.

2. Open the rear access cover.
3. Using a wrench, turn the tow valves on the hydraulic pumps twice counter-clockwise (Figure 12).



**Figure 12**

1. Left tow valve (right track)
2. Right tow valve (left track)

4. Tow the traction unit as required.
5. When the traction unit has been repaired, close the tow valves before operating it.

## Using the Cylinder Lock

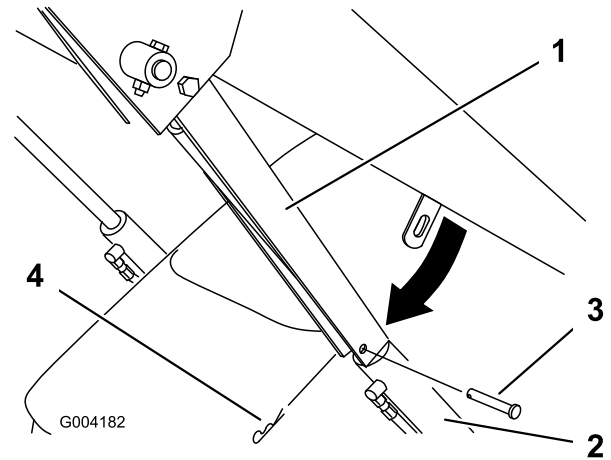


The loader arms may lower when in the raised position crushing anyone under them.

Install the cylinder lock before performing maintenance that requires raised loader arms.

### Installing the Cylinder Lock

1. Remove the attachment.
2. Raise the loader arms to the fully raised position.
3. Stop the engine.
4. Remove the hairpin cotter and clevis pin securing the cylinder lock to the loader arm (Figure 13).



**Figure 13**

1. Cylinder lock
2. Lift cylinder
3. Clevis pin
4. Hairpin cotter

5. Lower the cylinder lock over the cylinder rod and secure it with the clevis pin and hairpin cotter (Figure 13).
6. **Slowly** lower the loader arms until cylinder lock contacts the cylinder body and rod end.

### Removing/Storing the Cylinder Lock

**Important:** Ensure that the cylinder lock is removed from the rod and fully secured in the storage position before operating the traction unit.

1. Start the engine.
2. Raise the loader arms to the fully raised position.
3. Stop the engine.
4. Remove the clevis pin and cotter pin securing the cylinder lock.
5. Rotate the cylinder lock up to the loader arm and secure it with the clevis pin and hairpin cotter.
6. Lower the loader arms.

# Using Attachments

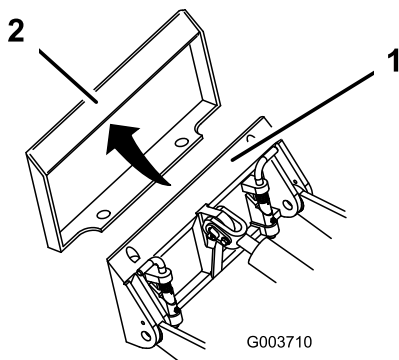
**Important:** If you are using an attachment with a serial number of 200999999 or earlier, the manual for the attachment may contain information specific to the use of the attachment with other Dingo models, such as settings for the flow divider control and speed selector lever and the use of a counterweight on the traction unit. These systems are built into the Dingo TX, and you should ignore any references to them.

## Installing an Attachment

**Important:** Use only Toro-approved attachments. Attachments can change the stability and the operating characteristics of the traction unit. The warranty of the traction unit may be voided if used with unapproved attachments.

**Important:** Before installing the attachment, ensure that the mount plates are free of any dirt or debris and that the pins rotate freely. If the pins do not rotate freely, grease them.

1. Position the attachment on a level surface with enough space behind it to accommodate the traction unit.
2. Start the engine.
3. Tilt the attachment mount plate forward.
4. Position mount plate into the upper lip of the attachment receiver plate (Figure 14).



**Figure 14**

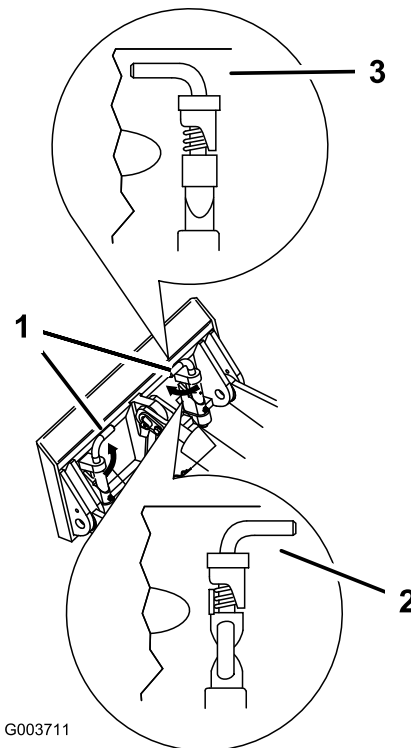
1. Mount plate
2. Receiver plate

5. Raise the loader arms while tilting back the mount plate at the same time.

**Important:** The attachment should be raised enough to clear the ground, and the mount plate should be tilted all the way back.

6. Stop the engine.
7. Engage the quick attach pins, ensuring that they are fully seated in the mount plate (Figure 15).

**Important:** If the pins do not rotate to the engaged position, the mount plate is not fully aligned with the holes in the attachment receiver plate. Check the receiver plate and clean it if necessary.



**Figure 15**

1. Quick attach pins (shown in engaged position)
2. Disengaged position
3. Engaged position



If you do not fully seat the quick attach pins through the attachment mount plate, the attachment could fall off of the traction unit, crushing you or bystanders.

Ensure that your quick attach pins are fully seated in the attachment mount plate.

## Connecting the Hydraulic Hoses

If the attachment requires hydraulics for operation, connect the hydraulic hoses as follows:

1. Stop the engine.
2. Move the auxiliary hydraulics lever forward, backward, and back to neutral to relieve pressure at the hydraulic couplers.
3. Move the auxiliary hydraulics lever into the reverse position.
4. Remove the protective covers from the hydraulic couplers on the traction unit.
5. Ensure that all foreign matter is cleaned from the hydraulic connectors.
6. Push the attachment male connector into the female connector on the traction unit.

**Note:** When you connect the attachment male connector first, you will relieve any pressure built up in the attachment.



**Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.**

- Keep your body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid.
- Use cardboard or paper to find hydraulic leaks, never use your hands.



**Hydraulic couplers, hydraulic lines/valves, and hydraulic fluid may be hot. If you contact hot components you may be burned.**

- Wear gloves when operating the hydraulic couplers.
- Allow the traction unit to cool before touching hydraulic components.
- Do not touch hydraulic fluid spills.

7. Push the attachment female connector into the male connector on the traction unit.

8. Confirm that the connection is secure by pulling on the hoses.
9. Move the auxiliary hydraulics lever to neutral.

## Removing an Attachment

1. Lower the attachment to the ground.
  2. Stop the engine.
  3. Disengage the quick attach pins by turning them to the outside.
  4. If the attachment uses hydraulics, move the auxiliary hydraulics lever forward, backward, and back to neutral to relieve pressure at the hydraulic couplers.
  5. If the attachment uses hydraulics, slide the collar back on the hydraulic couplers and disconnect them.
- Important:** Connect the attachment hoses together to prevent hydraulic system contamination during storage.
6. Install the protective covers onto the hydraulic couplers on the traction unit.
  7. Start the engine, tilt the mount plate forward, and back the traction unit away from the attachment.

## Securing the Traction Unit for Transport

When transporting the traction unit on a trailer, always use the following procedure:

**Important:** Do not operate or drive the traction unit on roadways.

1. Lower the loader arms.
2. Stop the engine.
3. Secure the traction unit to the trailer with chains or straps using the tie-down/lift loops (Figure 3) to secure the rear of the traction unit and the loader arms/mount plate to secure the front of the traction unit.

## Lifting the Traction Unit

You can lift the traction unit using the tie-down/lift loops as lift points (Figure 3).

# Maintenance

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

## ***Recommended Maintenance Schedule(s)***

<b>Maintenance Service Interval</b>	<b>Maintenance Procedure</b>
After the first 8 operating hours	<ul style="list-style-type: none"> <li>• Replace the hydraulic filter.</li> </ul>
After the first 50 operating hours	<ul style="list-style-type: none"> <li>• Change the engine oil.</li> <li>• Check and adjust the track tension.</li> </ul>
Before each use or daily	<ul style="list-style-type: none"> <li>• Check the engine oil level.</li> <li>• Grease the traction unit.</li> <li>• Check the condition of and clean the tracks.</li> <li>• Remove debris from the traction unit.</li> <li>• Check for loose fasteners.</li> </ul>
Every 25 hours	<ul style="list-style-type: none"> <li>• Check the hydraulic fluid level.</li> <li>• Clean the foam and paper air filters.</li> </ul>
Every 100 hours	<ul style="list-style-type: none"> <li>• Replace the paper air filter.</li> <li>• Change the engine oil (more frequently when operating conditions are extremely dusty or sandy).</li> <li>• Check the battery electrolyte level (replacement battery only).</li> <li>• Check the battery cable connections.</li> <li>• Check and adjust the track tension.</li> <li>• Check the hydraulic lines for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather, and chemical deterioration.</li> <li>• Check for dirt build-up in the chassis.</li> </ul>
Every 200 hours	<ul style="list-style-type: none"> <li>• Change the oil filter.</li> <li>• Check the spark plugs.</li> <li>• Change the fuel filter.</li> <li>• Replace the hydraulic filter.</li> </ul>
Every 250 hours	<ul style="list-style-type: none"> <li>• Check and grease the road wheels.</li> </ul>
Every 400 hours	<ul style="list-style-type: none"> <li>• Change the hydraulic fluid.</li> </ul>
Every 1,500 hours	<ul style="list-style-type: none"> <li>• Replace all moving hydraulic hoses.</li> </ul>
Yearly or before storage	<ul style="list-style-type: none"> <li>• Check and adjust the track tension.</li> <li>• Touch up chipped paint</li> </ul>

**Important:** Refer to your **Engine Operator's Manual** for additional maintenance procedures.

**Note:** After 50 hours and then every 100 hours thereafter (that is at 150, 250, 350, etc.) the hour meter displays CHG OIL to remind you to change the engine oil. After every 100 hours, the screen displays SVC to remind you to perform the other maintenance procedures based on a 100, 200, or 400 hour schedule. These reminders come on starting three hours prior to the service interval time and flash at regular intervals for six hours.





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

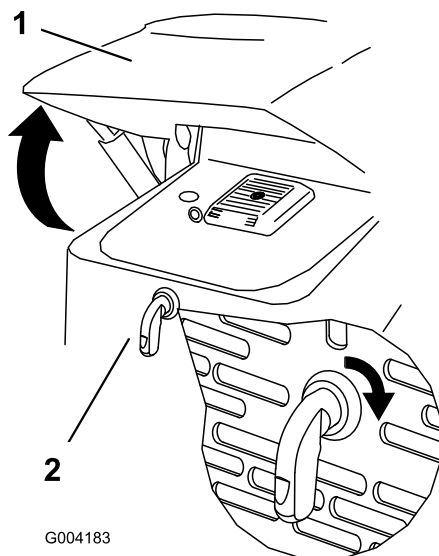
Remove the key from the ignition and disconnect the wire from the spark plug before you do any maintenance. Set the wire aside so that it does not accidentally contact the spark plug.

## Premaintenance Procedures

Before opening any of the covers, stop the engine and remove the key. Allow the engine to cool before opening any covers

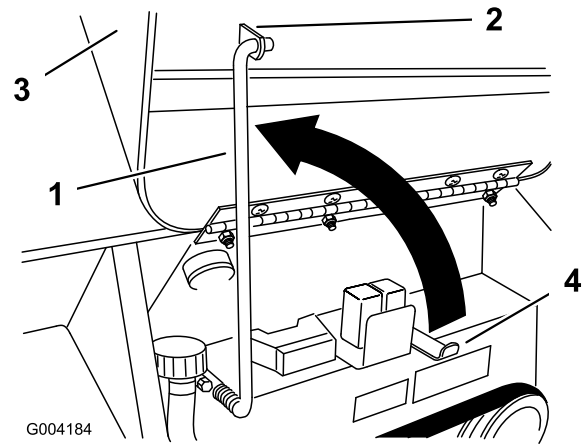
### Opening the Hood

1. Turn the hood latch clockwise (Figure 16).



**Figure 16**

1. Hood
2. Hood latch



**Figure 17**

1. Prop rod
2. Bracket
3. Hood
4. Prop rod holder

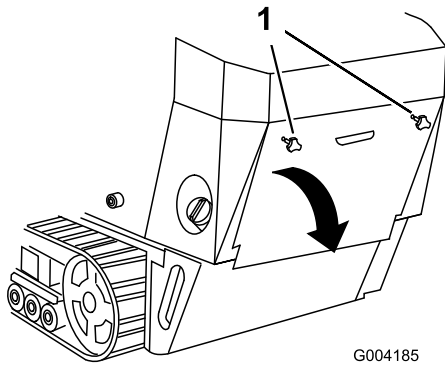
### Closing the Hood

1. Pull the prop rod out of the bracket on the hood and lower it into its holder.
2. Lower the hood and secure it by pushing down on the front of the hood until it locks in place.

### Opening the Rear Access Cover

1. Unscrew the 2 hand knobs securing the rear access cover to the machine (Figure 18).

2. Swing the hood up (Figure 16).
3. Swing the prop rod up and secure it in the bracket on the hood (Figure 17).



**Figure 18**

1. Hand knob

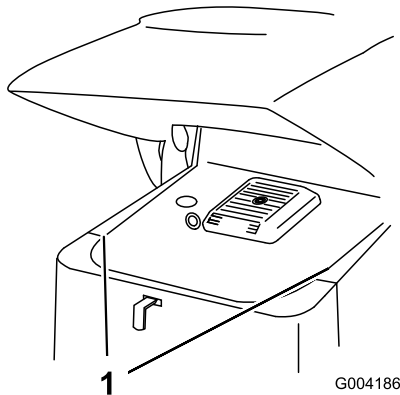
2. Tilt the rear access cover down and remove to access the internal components (Figure 18).

## Closing the Rear Access Cover

1. Move the rear access cover in place over the back of the traction unit making sure the tabs line up in the slots.
2. Push the access cover forward, lining up the hand knob screws with the threaded holes in the machine.
3. Screw the hand knobs tight to secure the rear access cover in place.

## Removing the Side Screens

1. Open the hood.
2. Slide the side screens (Figure 19) up and out of the slots in the front screen and frame.



**Figure 19**

1. Side screen

## Installing the Side Screens

Slide the side screens into place in the slots in the front screen and frame.

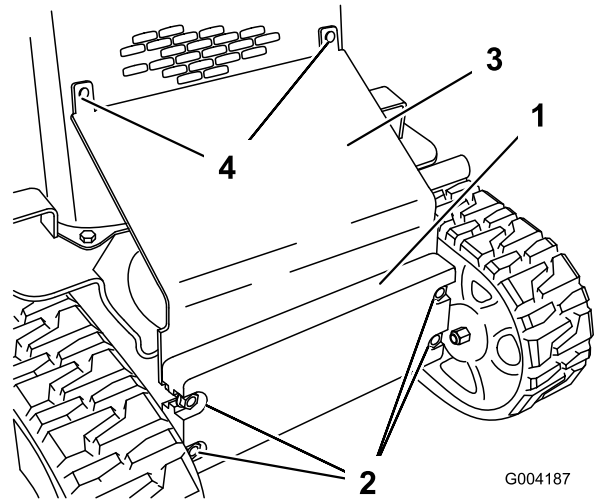
## Removing the Front Screen



If the engine has been running the heat shield will be very hot and could burn you.

Allow the traction unit cool completely before touching the heat shield.

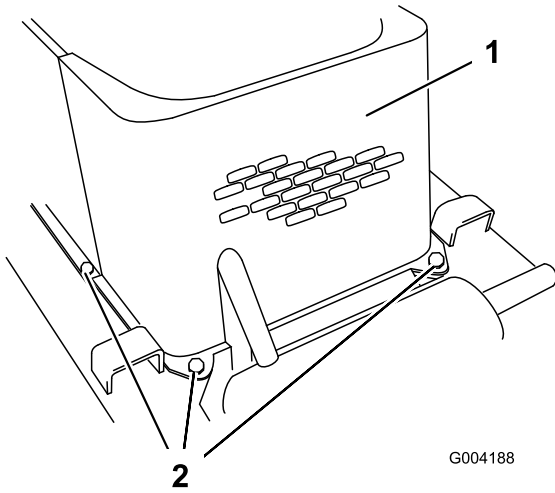
1. Open the hood and remove both side screens.
2. Loosen the bolts securing the front weight (Figure 20).



**Figure 20**

- |                 |                   |
|-----------------|-------------------|
| 1. Front weight | 3. Heat shield    |
| 2. Bolts        | 4. Carriage bolts |

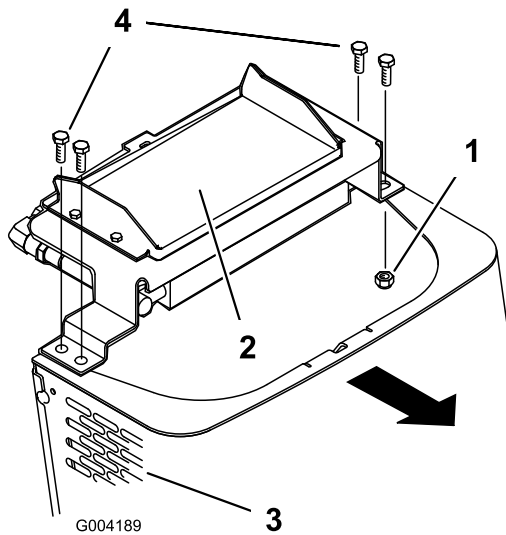
3. Remove the carriage bolts and nuts securing the heat shield (Figure 20).
4. Lift the heat shield up and off of the traction unit.
5. Remove the 4 bolts securing the front screen to the traction unit frame (Figure 21).



**Figure 21**

- 1. Front screen
- 2. Bolts (left side bolt not shown)

- 
- 6. Remove the shoulder bolts and nuts securing the oil cooler to the top of the front screen (Figure 22).



**Figure 22**

- 1. Nut
- 2. Oil cooler
- 3. Front screen
- 4. Shoulder bolts

- 
- 7. Remove the front screen.
  - 8. When finished, install the front screen with the 4 bolts removed previously.
  - 9. Install the oil cooler to the front screen with the 4 shoulder bolts and nuts removed previously.
  - 10. Slide the heat shield between the frame and the front weight and secure it to the front screen grill using the carriage bolts and nuts removed previously (Figure 20).

- 11. Tighten the bolts securing the front weight (Figure 20).
- 12. Install the side screens and close the hood.

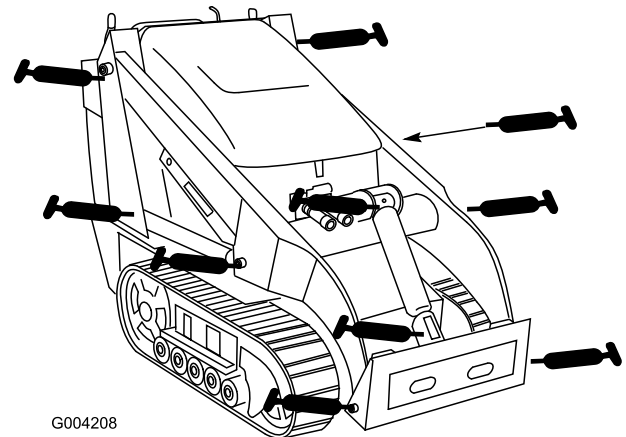
## Lubrication

### Greasing the Traction Unit

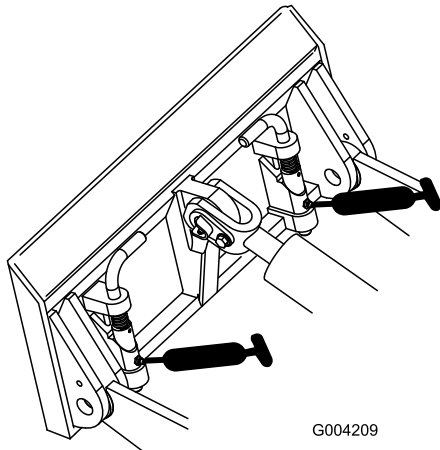
Grease all pivot joints every 8 operating hours and immediately after every washing.

Grease Type: General-purpose grease.

- 1. Lower the loader arms and stop the engine. Remove the key.
- 2. Clean the grease fittings with a rag.
- 3. Connect a grease gun to each fitting (Figure 23 and Figure 24).



**Figure 23**



**Figure 24**

4. Pump grease into the fittings until grease begins to ooze out of the bearings (approximately 3 pumps).
5. Wipe up any excess grease.

## Engine Maintenance

### Servicing the Air Cleaner

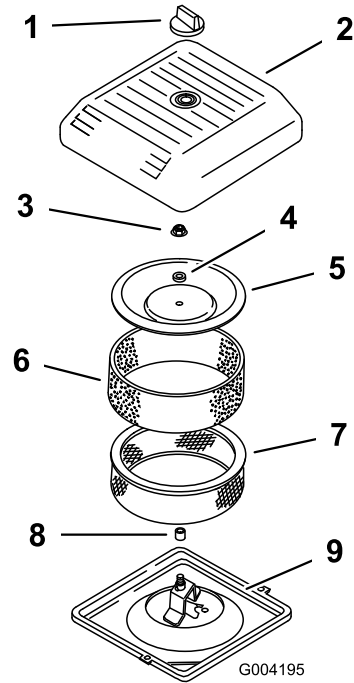
Foam Pre-filter: Clean every 25 operating hours.

Paper Filter: Clean every 25 operating hours.  
Replace after every 100 operating hours.

**Note:** Service the air cleaner more frequently if operating conditions are extremely dusty or sandy.

#### Removing the Filters

1. Lower the loader arms, stop the engine, and remove the key.
2. Open the hood.
3. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage.
4. Unscrew the knob and remove the air cleaner cover (Figure 25).



**Figure 25**

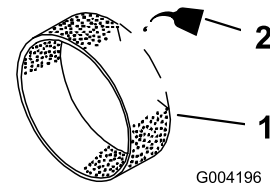
- |                      |                     |
|----------------------|---------------------|
| 1. Knob              | 6. Foam pre-filter  |
| 2. Air cleaner cover | 7. Paper filter     |
| 3. Cover nut         | 8. Rubber seal      |
| 4. Spacer            | 9. Air cleaner base |
| 5. Cover             |                     |

5. Carefully slide the foam pre-filter off of the paper element (Figure 25).
6. Unscrew the cover nut and remove the cover, spacer and paper filter (Figure 25).

#### Cleaning the Filters

**Important:** Replace the foam element if it is torn or worn.

1. Wash the foam pre-filter in liquid soap and warm water. When clean, rinse it thoroughly.
2. Dry the pre-filter by squeezing it in a clean cloth (do not wring).
3. Put one or two ounces of oil on the pre-filter (Figure 26).

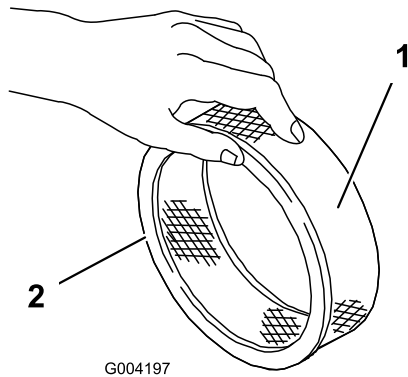


**Figure 26**

- |                 |        |
|-----------------|--------|
| 1. Foam element | 2. Oil |
|-----------------|--------|

4. Squeeze the pre-filter to distribute the oil.

- Lightly tap the paper filter on a flat surface to remove dust and dirt (Figure 27).



**Figure 27**

- Paper element
- Rubber seal

- Inspect the paper filter for tears, an oily film, and damage to the rubber seal.

**Important:** Never clean the paper element with pressurized air or liquids, such as solvent, gas, or kerosene. Replace the paper element if it is damaged, or cannot be cleaned thoroughly (i.e., after approximately 100 operating hours).

### Installing the Filters

**Important:** To prevent engine damage, always operate the engine with the complete foam and paper air cleaner assembly installed.

- Carefully slide the foam pre-filter onto the paper filter (Figure 27).
- Place the air cleaner assembly onto the air cleaner base (Figure 25).
- Install the cover, spacer and secure it with the cover nut (Figure 25). Torque the nut to 95 inch-lb (11 N·m).
- Install the air cleaner cover and secure with the knob (Figure 25).
- Close the hood.

### Servicing the Engine Oil

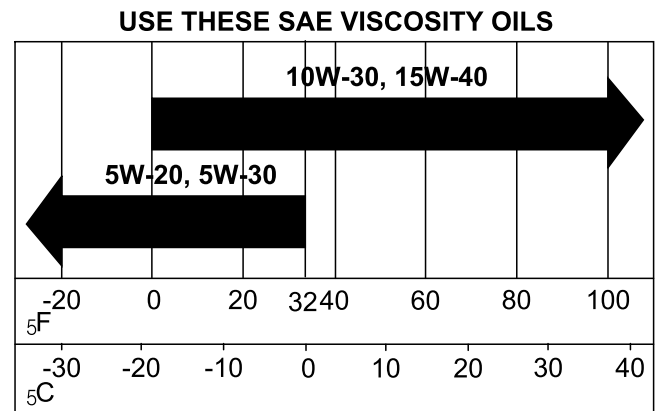
Change oil after the first 50 operating hours and then every 100 operating hours thereafter.

**Note:** Change oil more frequently when operating conditions are extremely dusty or sandy.

Oil Type: Detergent oil (API service SG, SH, SJ, or higher)

Crankcase Capacity: w/filter, 2.1 qt. (2 l)

Viscosity: See table below

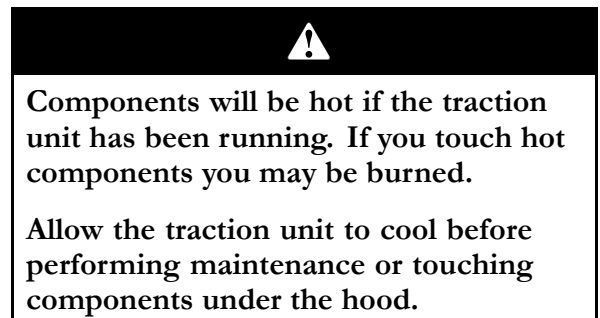


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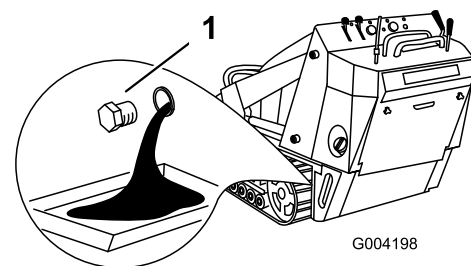
**Figure 28**

### Changing the Oil

- Start the engine and let it run for five minutes. This warms the oil so it drains better.
- Park the traction unit so that the drain side is slightly lower than the opposite side to ensure that the oil drains completely.
- Lower the loader arms, set the parking brake, stop the engine, and remove the key.



- Remove the drain plug (Figure 29).



**Figure 29**

- Oil drain valve

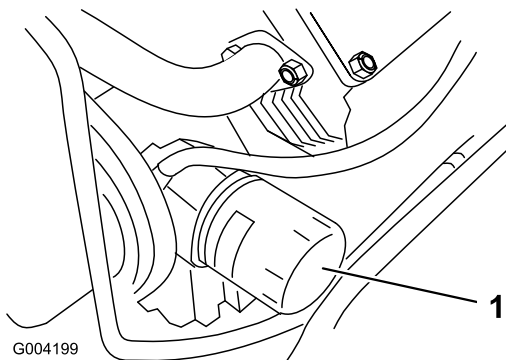
- When the oil has drained completely, replace the plug.
- Note:** Dispose of the used oil at a certified recycling center.
- Remove the oil fill cap and slowly pour approximately 80% of the specified amount of oil in through the valve cover.
  - Check the oil level; refer to Checking the Engine Oil Level in Operation, page 18.
  - Slowly add additional oil to bring the level to the F (full) mark on the dipstick.
  - Replace the fill cap.

## Changing the Oil Filter

Replace the oil filter every 200 hours or every other oil change.

**Note:** Change the oil filter more frequently when operating conditions are extremely hot, dusty, or sandy.

- Drain the oil from the engine; refer to Changing the Oil.
- Place a shallow pan or rag under the filter to catch oil.
- Remove the old filter (Figure 30) and wipe the surface of the filter adapter gasket.



**Figure 30**

- Oil filter

- Pour new oil of the proper type through the center hole of the filter. Stop pouring when the oil reaches the bottom of the threads.
- Allow a minute or two for the oil to be absorbed by filter material, then pour off the excess oil.
- Apply a thin coat of new oil to the rubber gasket on the replacement filter.

- Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn.
- Fill the crankcase with the proper type of new oil; refer to Changing the Oil.

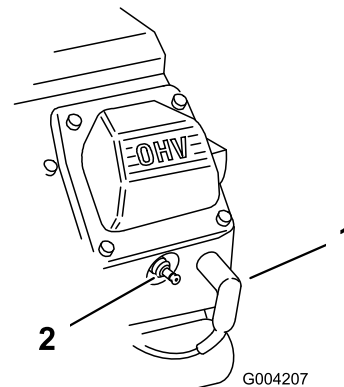
## Servicing the Spark Plugs

Check the spark plugs after every 200 operating hours. Ensure that the air gap between the center and side electrodes is correct before installing each spark plug. Use a spark plug wrench for removing and installing the spark plugs and a gapping tool/feeler gauge to check and adjust the air gap. Install new spark plugs if necessary.

Type: Champion Premium Gold 2071, RC12YC, or equivalent. Air Gap: 0.030 inch (0.76 mm)

## Removing the Spark Plugs

- Lower the loader arms, stop the engine, and remove the key.
- Open the hood.
- Pull the wires off of the spark plugs (Figure 31).



**Figure 31**

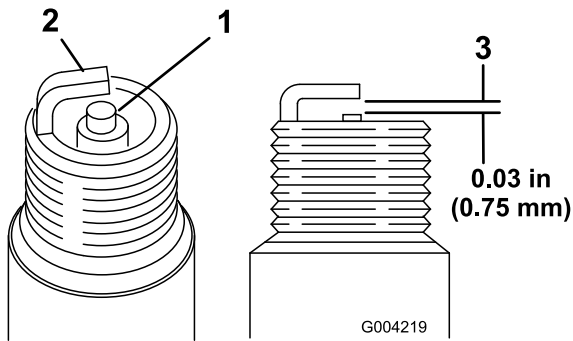
- Spark plug wire
- Spark plug

- Clean around the spark plugs.
- Remove both spark plugs and metal washers.

## Checking the Spark Plugs

- Look at the center of both spark plugs (Figure 32). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

**Important:** Never clean the spark plugs. Always replace the spark plugs when they have a black coating, worn electrodes, an oily film, or cracks.



**Figure 32**

1. Center electrode insulator
2. Side electrode
3. Air gap (not to scale)

2. Check the gap between the center and side electrodes (Figure 32).
3. Bend the side electrode (Figure 32) if the gap is not correct.

## Installing the Spark Plugs

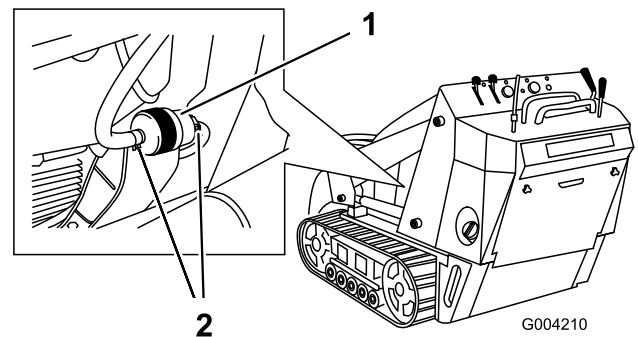
1. Thread the spark plugs into the spark plug holes.
2. Tighten the spark plugs to 20 ft-lb (27 N·m).
3. Push the wires onto the spark plugs (Figure 31).
4. Close the hood.

# Fuel System Maintenance

## Changing the Fuel Filter

Change the fuel filter after every 200 operating hours or yearly, whichever occurs first.

1. Lower the loader arms, stop the engine, and remove the key.
2. Open the hood and remove the left side screen.
3. Loosen the tank cap to relieve pressure.
4. Clamp the fuel lines on both sides of the fuel filter (Figure 33).



**Figure 33**

1. Filter
2. Hose clamp

5. Squeeze the ends of the hose clamps together and slide them away from the filter (Figure 33).
6. Place a drain pan under the fuel lines to catch any leaks, then remove the filter from the fuel lines.
7. Slide the fuel lines on the new fuel filter fittings, ensuring that the arrow on the filter points away from the fuel line coming from the fuel tank and toward the line going to the fuel pump.

**Important:** Never install a dirty filter.

8. Move the hose clamps close to the filter.
9. Remove the clamp blocking fuel flow and open the fuel valves.
10. Secure the tank cap.
11. Replace the side screen and close the hood.

## Draining the Fuel Tank



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

- Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.
- Never smoke when draining gasoline, and stay away from an open flame or where a spark may ignite the gasoline fumes.

1. Lower the loader arms, stop the engine, and remove the key.
2. Syphon the gasoline from the tank using a pump type syphon.

**Note:** Now is the best time to install a new fuel filter because the fuel tank is empty.

## Electrical System Maintenance

### Servicing the Battery

#### 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.

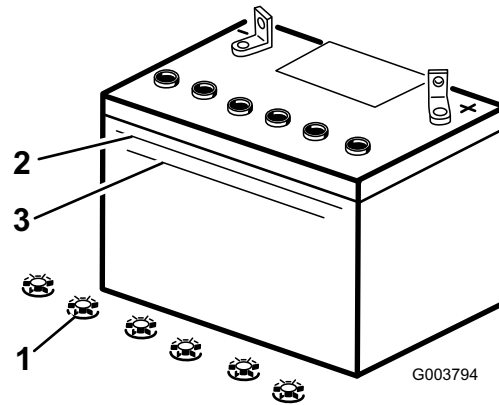
**Important:** The following procedures apply when servicing a (dry) battery that has replaced the original battery. The original (wet) battery does not require service.

Check the electrolyte level in the battery every 100 hours. Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of four parts water and one part baking soda. Apply a light coating of grease to the battery terminals to reduce corrosion.

Voltage: 12 v, 450 Cold Cranking Amps

#### Checking the Electrolyte Level

1. Stop the engine and remove the key.
2. Remove the 4 bolts securing the battery cover and remove it from over the battery.
3. Look at the side of the battery. The electrolyte must be up to the Upper line (Figure 34). Do not allow the electrolyte to fall below the Lower line (Figure 34).



**Figure 34**

1. Filler caps
2. Upper line
3. Lower line

4. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery.

#### Adding Water to the Battery

The best time to add distilled water to the battery is just before you operate the traction unit. This lets the water mix thoroughly with the electrolyte solution.



Battery electrolyte contains sulfuric acid which is a deadly poison and causes severe burns.

- Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and rubber gloves to protect your hands.
- Fill the battery where clean water is always available for flushing the skin.

1. Remove the battery from the traction unit.

**Important:** Never fill the battery with distilled water while the battery is installed in the traction unit. Electrolyte could be spilled on other parts and cause corrosion.


2. Clean the top of the battery with a paper towel.
3. Remove the filler caps from the battery (Figure 34).
4. Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line (Figure 34) on the battery case.



**Important:** Do not overfill the battery because electrolyte (sulfuric acid) can cause severe corrosion and damage to the chassis.

- Wait five to ten minutes after filling the battery cells. Add distilled water, if necessary, until the electrolyte level is up to the Upper line (Figure 34) on the battery case.
- Install the battery filler caps.

## Charging the Battery

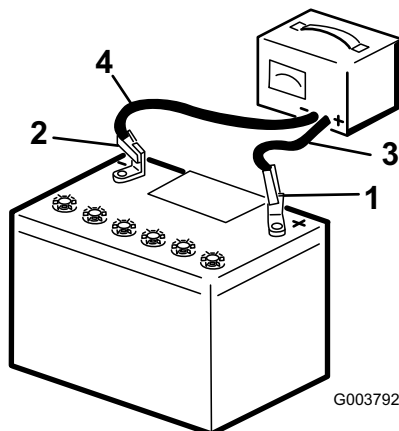


**Charging the battery produces gasses that can explode.**

**Never smoke near the battery and keep sparks and flames away from battery.**

**Important:** Always keep the battery fully charged (1.265 specific gravity). This is especially important to prevent battery damage when the temperature is below 32°F (0°C).

- Check the electrolyte level; refer to Checking Electrolyte Level.
- Make sure the filler caps are installed in the battery.
- Charge the battery for 10 to 15 minutes at 25 to 30 amps or 30 minutes at 4 to 6 amps (Figure 35). Do not overcharge the battery.



**Figure 35**

- |                          |                           |
|--------------------------|---------------------------|
| 1. Positive battery post | 3. Red (+) charger lead   |
| 2. Negative battery post | 4. Black (-) charger lead |

- When the battery is fully charged, unplug the charger from the electrical outlet, then

disconnect the charger leads from the battery posts (Figure 35).

- Replace the battery cover.

## Drive System Maintenance

### Servicing the Tracks

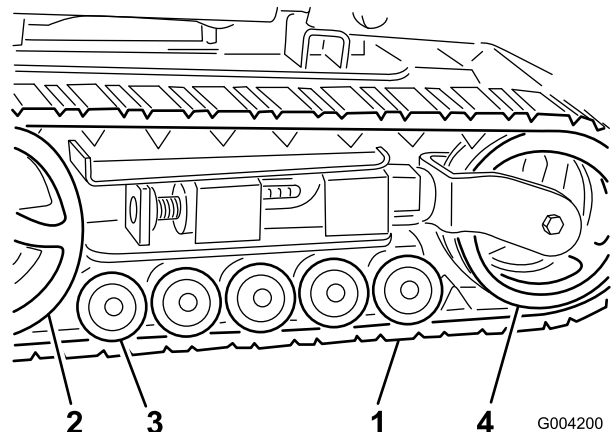
#### Cleaning the Tracks

Check the tracks for excessive wear and clean them periodically. If the tracks are worn, replace them.

- With a bucket on the loader arms, lower the bucket to the ground so that the front of the traction unit lifts off of the ground a few inches.
- Stop the engine, and remove the key.
- Using a water hose or pressure washer, remove dirt from each track system.

**Important:** Ensure that you use high-pressure water to wash only the track area. Do not use a high-pressure washer to clean the rest of the traction unit. High-pressure washing can damage the electrical system and hydraulic valves or deplete grease.

**Important:** Ensure that you fully clean the road wheels, the tension wheel, and the drive sprocket (Figure 36). The road wheels should rotate freely when clean.

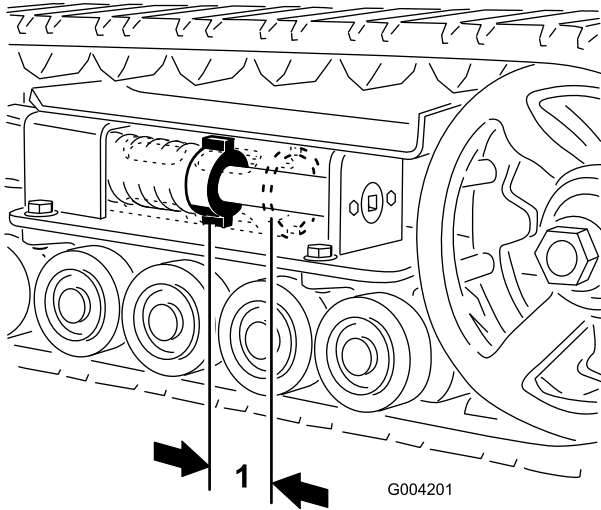


**Figure 36**

- |                  |                   |
|------------------|-------------------|
| 1. Track         | 3. Road wheels    |
| 2. Tension wheel | 4. Drive sprocket |

## Adjusting the Track Tension

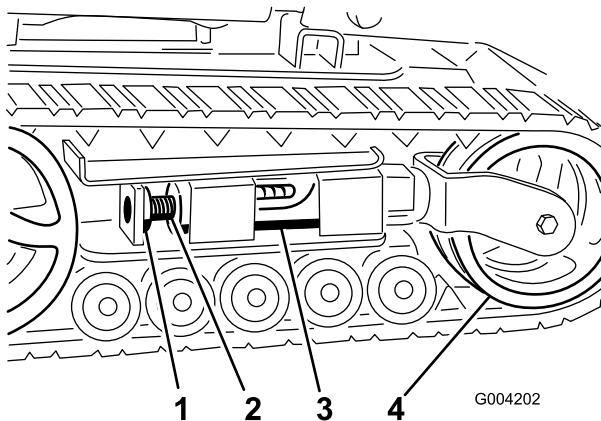
Check and adjust the track tension after the first 50 operating hours and every 100 operating hours thereafter. There should be 2-3/4 inches (7 cm) between the tension nut and the back of the tension tube (Figure 37). If not, adjust the track tension using the following procedure:



**Figure 37**

1. 2-3/4 inches (7 cm)

1. Lower the loader arms, stop the engine, and remove the key.
2. Lift/support the side of the unit to be worked on so that the track is off of the ground.
3. Remove the locking bolt and nut (Figure 38).



**Figure 38**

- |                     |                  |
|---------------------|------------------|
| 1. Locking bolt     | 3. Tension tube  |
| 2. Tensioning screw | 4. Tension wheel |

4. Using a 1/2 inch drive socket (Figure 39), turn the tensioning screw counter-clockwise until the distance between the tension nut and the

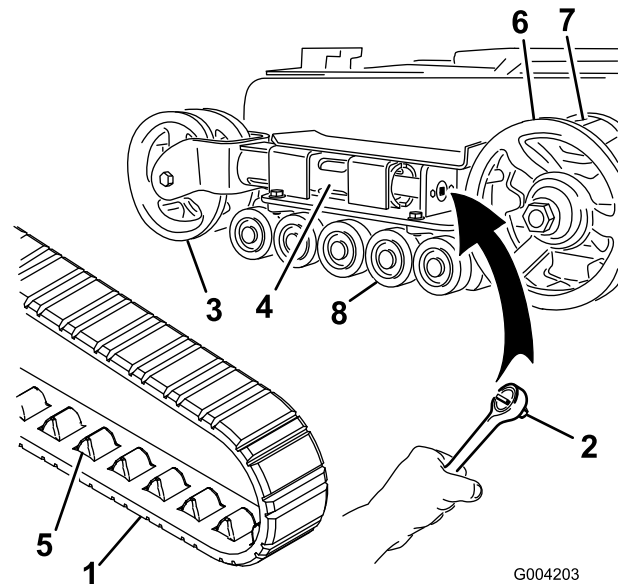
back of the tension tube (Figure 37) is 2-3/4 inches (7 cm).

5. Align the closest notch in the tension screw to the locking bolt hole and secure the screw with the locking bolt and nut (Figure 38).
6. Lower the traction unit to the ground.

## Replacing the Tracks (TX 420, Model 22306)

When the tracks are badly worn, replace them.

1. Lower the loader arms, stop the engine, and remove the key.
2. Lift/support the side of the unit to be worked on so that the track is 3 to 4 inches (7.6 to 10 cm) off of the ground.
3. Remove the locking bolt and nut (Figure 38).
4. Using a 1/2 inch drive socket, release the drive tension by turning the tensioning screw clockwise (Figure 38 and Figure 39).



**Figure 39**

- |                    |                    |
|--------------------|--------------------|
| 1. Track           | 5. Track lug       |
| 2. 1/2 inch socket | 6. Drive sprocket  |
| 3. Tension wheel   | 7. Sprocket spacer |
| 4. Fork tube       | 8. Road wheels     |

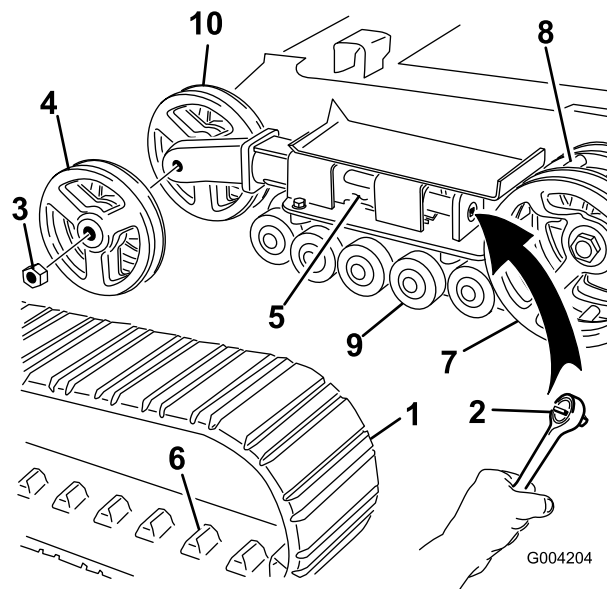
5. Push the tension wheel toward the rear of the unit to move the fork tube against the frame (Figure 39). (If it does not touch the frame, continue turning the tensioning screw until it does.)
6. Begin removing the track at the top of the tension wheel, peeling it off of the wheel while rotating the track forwards.

7. When the track is off of the tension wheel, remove it from the drive sprocket and road wheels (Figure 39).
8. Beginning at the drive sprocket, coil the new track around the sprocket, ensuring that the lugs on the track fit between the spacers on the sprocket (Figure 39).
9. Push the track under and between the road wheels (Figure 39).
10. Starting at the bottom of the tension wheel, install the track around the wheel by rotating the track rearward while pushing the lugs into the wheel.
11. Turn the tensioning screw counter-clockwise until the distance between the tension nut and the back of the fork tube (Figure 37) is 2-3/4 inches (7 cm).
12. Align the closest notch in the tension screw to the locking bolt hole and secure the screw with the locking bolt and nut.
13. Lower the traction unit to the ground.
14. Repeat steps 2 through 13 to replace the other track.

### Replacing the Tracks (TX 425, Model 22307)

When the tracks are badly worn, replace them.

1. Lower the loader arms, stop the engine, and remove the key.
2. Lift/support the side of the unit to be worked on so that the track is 3 to 4 inches (7.6 to 10 cm) off of the ground.
3. Remove the locking bolt and nut (Figure 38).
4. Using a 1/2 inch drive socket, release the drive tension by turning the tensioning screw clockwise (Figure 38 and Figure 40).



**Figure 40**

- |                        |                         |
|------------------------|-------------------------|
| 1. Track               | 6. Track lug            |
| 2. 1/2 inch socket     | 7. Drive sprocket       |
| 3. Tension wheel nut   | 8. Sprocket spacer      |
| 4. Outer tension wheel | 9. Road wheels          |
| 5. Fork tube           | 10. Inner tension wheel |

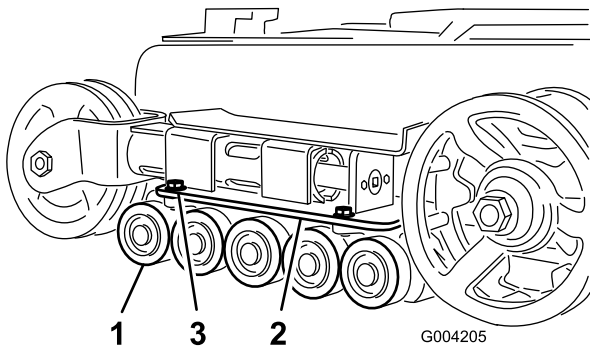
5. Push the tension wheel toward the rear of the unit to move the tension tube against the frame (Figure 40). (If it does not touch the frame, continue turning the tensioning screw until it does.)
6. Remove the nut securing the outer tension wheel and remove the wheel (Figure 40).
7. Remove the track (Figure 40).
8. Remove the nut securing the inner tension wheel and remove the wheel (Figure 40).
9. Pull the 4 large washers out of the 2 wheels, 1 on each side of each wheel.
10. Clean the old grease and dirt out of the area between where the washers were installed and the bearings inside the wheels, then fill this area on each side of each wheel with grease.
11. Install the large washers on the wheels over the grease.
12. Install the inner tension wheel and secure it with the nut removed previously (Figure 40).
13. Torque the nut to 300 ft-lb (407 N·m).
14. Install the new track, ensuring that the lugs in the track fit between the spacers in the middle of the drive sprocket (Figure 40).
15. Install the outer tension wheel and secure it with the nut removed previously (Figure 40).

16. Torque the nut to 300 ft-lb (407 N·m).
17. Turn the tensioning screw counter-clockwise until the distance between the tension nut and the back of the tension tube (Figure 37) is 2-3/4 inches (7 cm).
18. Align the closest notch in the tension screw to the locking bolt hole and secure the screw with the locking bolt and nut.
19. Repeat steps 2 through 18 to replace the other track.
20. Lower the traction unit to the ground.

## Maintaining the Road Wheels

Check and grease the road wheels every 250 operating hours or yearly.

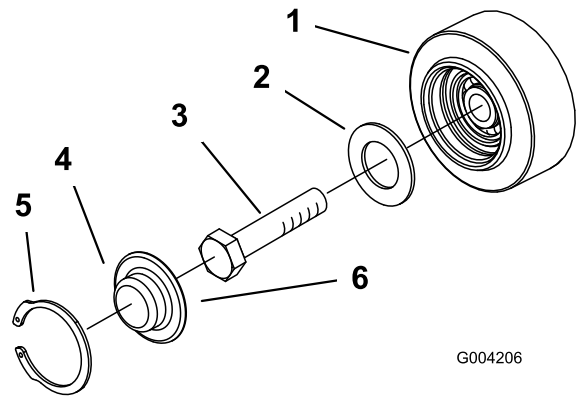
1. Remove the tracks; refer to Replacing the Tracks.
2. Remove the 4 bolts securing each lower track guide which contains the road wheels, and remove them (Figure 41).



**Figure 41**

1. Road wheels
2. Lower track guide
3. Track guide bolts (only two shown)

3. Remove the snap ring and cap from a road wheel (Figure 42).



G004206

**Figure 42**

1. Road wheel
2. Gasket
3. Bolt
4. Road wheel cap
5. Snap ring
6. Add grease under the cap

4. Check the grease under the cap and around the gasket (Figure 42). If it is dirty, gritty, or depleted, clean out all of the grease, replace the gasket, and add new grease.
5. Ensure that the road wheel turns smoothly on the bearing. If it is frozen, replace the road wheel as described in the *Road Wheel Kit Installation Instructions* or contact your Authorized Service Dealer for repair.
6. Place the greased road wheel cap over the bolt head (Figure 42).
7. Secure the road wheel cap with the snap ring (Figure 42).
8. Repeat steps 3 through 7 for the other road wheels.
9. Install each track guide to the traction unit frame using the fasteners you removed previously. Torque the bolts to 67 to 83 ft-lb (91 to 112 N·m).
10. Install the tracks; refer to Replacing the Tracks.

## Controls System Maintenance

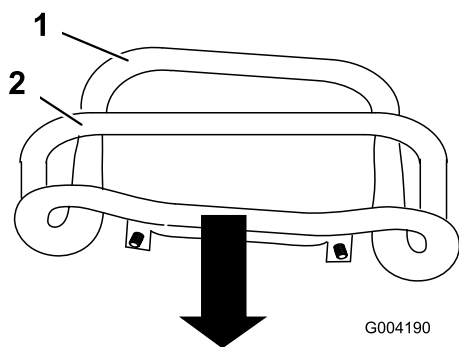
The factory adjusts the controls before shipping the traction unit. However, after many hours of use, you may need to adjust the traction control alignment, the neutral position of the traction control, and the tracking of the traction control in the full forward position.

**Important:** To adjust the controls properly, complete each procedure in the order listed.

## Adjusting the Traction Control Alignment

If the traction control bar does not rest flush and square with the reference bar when in the full backward position, immediately complete the following procedure:

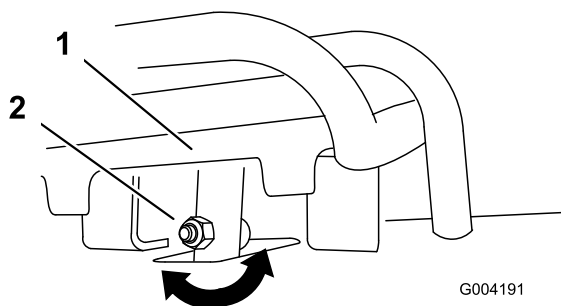
1. Park the traction unit on a flat surface and lower the loader arm.
2. Stop the engine and remove the key.
3. Pull straight back on the traction control so the front of the control contacts the reference bar (Figure 43).



**Figure 43**

1. Front of the control, out of alignment
2. Reference bar alignment

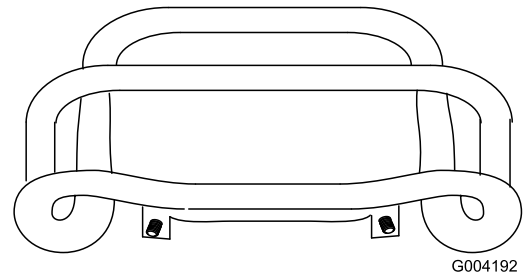
4. If the front of the traction control does not rest square and flush with the reference bar, loosen the flange nut and bolt in the stem of the traction control (Figure 44).



**Figure 44**

1. Traction control
2. Stem, bolt and nut

5. Adjust the traction control so that it rests flush against the reference bar when it is pulled straight back (Figure 44 and Figure 45).



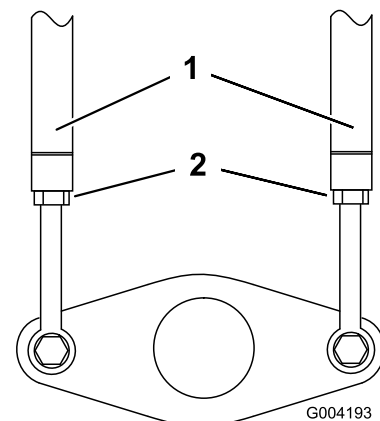
**Figure 45**

6. Tighten the flange nut and bolt in the traction control stem.

## Adjusting the Traction Control Neutral Position

If the traction unit creeps forward or backward when the traction control is in neutral and the unit is warm, immediately complete the following procedure:

1. Lift/support the traction unit so that both tracks are off of the ground.
2. Open the rear access cover.
3. Loosen the jam nuts on the traction rods, under the control panel (Figure 46).



**Figure 46**

1. Traction rod
2. Jam nut

4. Start the traction unit and set the throttle to about 1/3 open position.



When the traction unit is running, you could be caught and injured in moving parts or burned on hot surfaces.

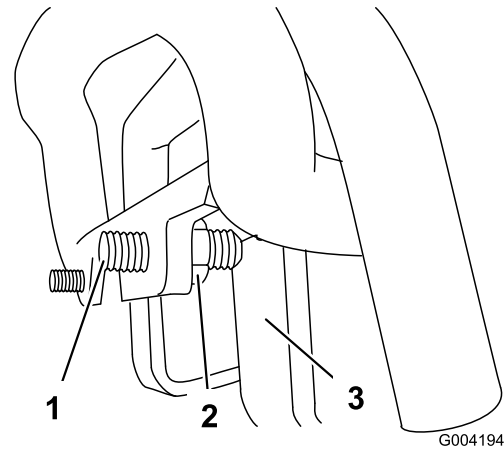
Stay away from pinch points, moving parts, and hot surfaces when adjusting the running traction unit.

5. If the **left** track moves, lengthen or shorten the **right** traction rod until the track stops moving.
6. If the **right** track moves, lengthen or shorten the **left** traction rod until the track stops moving.
7. Tighten the jam nuts.
8. Close the rear access cover.
9. Stop the engine and lower the traction unit to the ground.
10. Drive the traction unit in full reverse, checking to see if the unit tracks straight. If it does not, note the direction the traction unit veers. Repeat the adjustment previously described so that it tracks straight in reverse.

## Adjusting the Tracking of the Traction Control, Full Forward Position

If the traction unit does not drive straight when you hold the traction control against the reference bar, complete the following procedure:

1. Drive the traction unit with the traction control against the reference bar, noting which direction the traction unit veers.
2. Release the traction control.
3. If the traction unit veers to the **left**, loosen the **right** jam nut and adjust the tracking set screw on the front of the traction control (Figure 47).
4. If the traction unit veers to the **right**, loosen the **left** jam nut and adjust the tracking set screw on the front of the traction control (Figure 47).



**Figure 47**

1. Set screw
2. Jam nut
3. Stop

5. Repeat steps 1 through 4 until the traction unit drives straight in the full forward position.

**Important:** Ensure the tracking set screws touch the stops in the full forward position to avoid over stroking the hydraulic pumps.

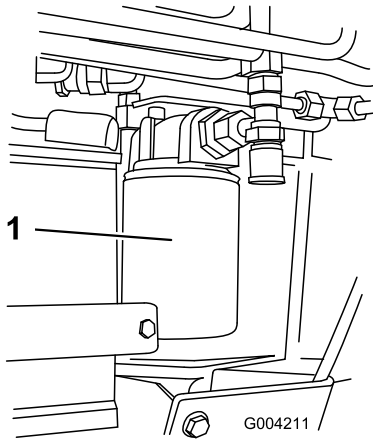
## Hydraulic System Maintenance

### Replacing the Hydraulic Filter

**Important:** Do not substitute an automotive oil filter or severe hydraulic system damage may result.

Change the hydraulic filter:

- After the first 8 operating hours
  - After every 200 operating hours
1. Position traction unit on a level surface.
  2. Lower the loader arms, stop the engine, and remove the key.
  3. Open the rear access cover.
  4. Place a drain pan under the filter (Figure 48).



**Figure 48**

1. Hydraulic filter

5. Remove the old filter (Figure 48) and wipe the surface of the filter adapter gasket clean.
6. Apply a thin coat hydraulic fluid to the rubber gasket on the replacement filter.
7. Install the replacement hydraulic filter onto the filter adapter (Figure 48). Tighten it clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 3/4 turn.
8. Clean up any spilled fluid.
9. Start the engine and let it run for about two minutes to purge air from the system.
10. Stop the engine and check for leaks.

**Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.**

- **Keep your body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks, never use your hands.**

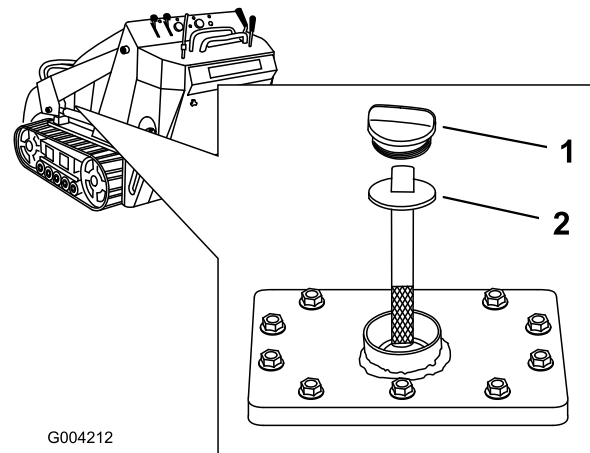
11. Check the fluid level in the hydraulic tank (refer to Checking the Hydraulic Fluid in Operation, page 18) and add fluid to raise the level to mark on dipstick. Do not over fill the tank.
12. Close the rear access cover.

## Changing the Hydraulic Fluid

Change the hydraulic fluid after every 400 operating hours or yearly.

1. Position the traction unit on a level surface.
2. Open the hood.
3. Install the cylinder lock, stop the engine, and remove the key.
4. Allow the traction unit to cool completely.
5. Remove the hydraulic tank cap and dipstick (Figure 49).

**Note:** The filler cap is behind the front screen. If you want to improve your access to it, remove the screen.

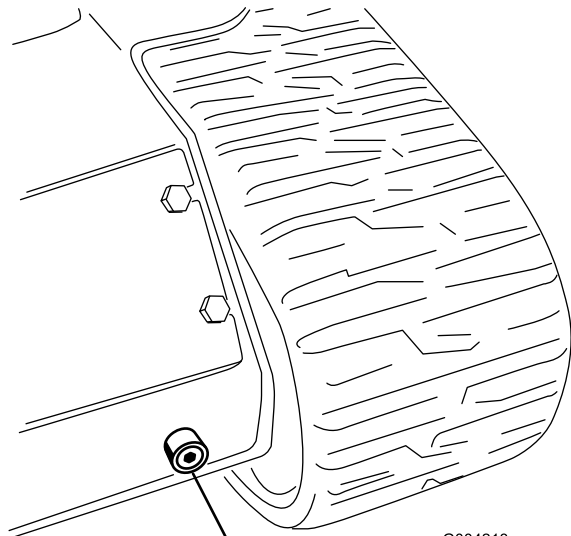


**Figure 49**

1. Filler neck cap
2. Dip stick

6. Place a large drain pan (capable of holding 15 US gallons) under the drain plug on the front of the traction unit (Figure 50).

**Note:** The drain plug is located behind the front weight, under the muffler.



**1**  
**Figure 50**

1. Drain plug

7. Remove the drain plug and allow the oil to drain into the pan (Figure 50).
  8. When finished, install and tighten the drain plug.
- Note:** Dispose of the used oil at a certified recycling center.
9. Fill the hydraulic tank with approximately 12 US gallons (45.4 l) of 10W-30 detergent, diesel engine oil (API service CH-4 or higher); refer to Checking Hydraulic Fluid in Operation, page 18.
  10. Start the engine and let it run for a few minutes.
  11. Stop the engine.
  12. Check the hydraulic fluid level and top it off if necessary; refer to Checking Hydraulic Fluid in Operation, page 18.
  13. Close the hood.

## Checking the Hydraulic Lines

After every 100 operating hours, check the hydraulic lines and hoses for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather, and chemical deterioration. Replace all moving hydraulic hoses every 1500 hours or 2 years, whichever comes first. Make necessary repairs before operating.



Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

- Keep your body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid.
- Use cardboard or paper to find hydraulic leaks, never use your hands.

## Cleaning

### Removing Debris from the Traction Unit

**Important:** Operating the engine with blocked screens, dirty or plugged cooling fins, and/or cooling shrouds removed, will result in engine damage from overheating.

1. Park the traction unit on a level surface, lower the loader arms, and stop the engine.
2. Remove the key and allow the engine to cool.
3. Open the hood.
4. Clean any debris from the front and side screens.
5. Wipe away debris from the air cleaner.
6. Clean any debris build-up on the engine and in the oil cooler fins with a brush or blower.

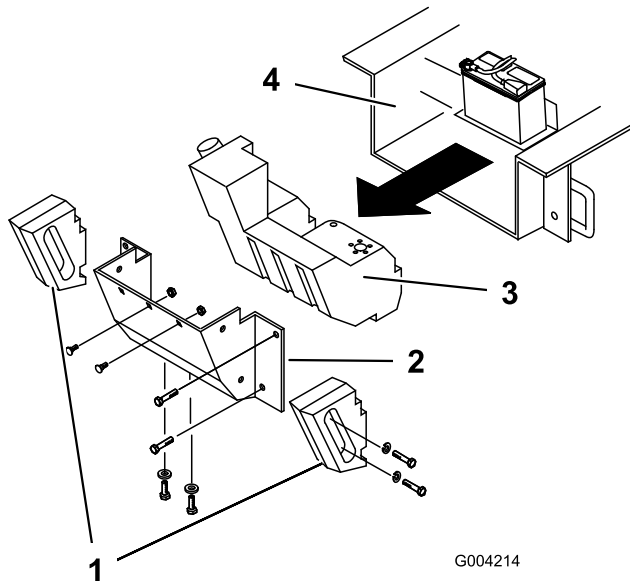
**Important:** It is preferable to blow dirt out, rather than washing it out. If water is used, keep it away from electrical items and hydraulic valves. Do not use a high-pressure washer. High-pressure washing can damage the electrical system and hydraulic valves or deplete grease.

7. Clean debris from the cooler fan grill on the hood.
8. Close the hood.



## Cleaning the Chassis

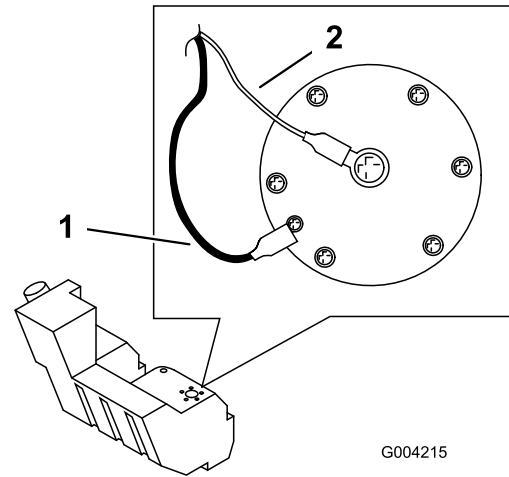
Over time, the chassis under the engine collects dirt and debris that must be removed. Using a flashlight, open the hood and inspect the area under the engine on a regular basis. When the debris is 1 to 2 inches deep, complete the following procedure (refer to Figure 51 throughout this procedure):



**Figure 51**

- |                 |              |
|-----------------|--------------|
| 1. Side weights | 3. Fuel tank |
| 2. Rear panel   | 4. Chassis   |

1. Lift and support the front of the traction unit.
2. Stop the engine and remove the key.
3. Disconnect the negative battery cable.
4. Remove the bolts, washers, and lock washers securing the two side weights, removing the weights (Figure 51).
5. Open the rear access cover.
6. Remove the 2 carriage bolts and washers from the battery base.
7. Remove the six nuts and bolts securing the rear panel, removing the panel (Figure 51).
8. Loosen the tank cap to relieve pressure.
9. Place a clamp on the fuel line, 2 inches from where it comes out of the fuel tank.
10. Slide the fuel tank to the rear (Figure 51).
11. Disconnect the fuel line.
12. Disconnect the two wires leading to the right side of the tank (Figure 52).



**Figure 52**

- |               |                |
|---------------|----------------|
| 1. Black wire | 2. Orange wire |
|---------------|----------------|

13. Carefully remove the tank and set it upright to keep from spilling the gasoline.



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

- **Remove the fuel tank outdoors in an open area. Wipe up any gasoline that spills.**
- **Do not remove the fuel tank near an open flame or where gasoline fumes may be ignited by a spark.**
- **Do not smoke while handling the fuel tank.**

14. Remove any large deposits of debris.
15. Wash out the chassis with water until the water running out the back of the unit is clear.

**Important: Take care not to get water into the engine or electrical components.**

16. Slide the fuel tank part way into the chassis (Figure 51).
17. Connect the fuel line and remove the clamp.
18. Secure the tank cap.
19. On the right side of the tank, connect the orange wire to the center post and the black wire to the outside post (Figure 52).
20. Slide the tank all the way into the traction unit.

**Important:** The fuel line and wires must be away from the engine pulleys and the frame.

21. Replace the rear panel and secure it with the six bolts and nuts removed previously (Figure 51).
22. Secure the battery tray with the bolts and washers removed previously.
23. Install the side weights with the bolts, washers, and lock washers removed previously (Figure 51).
24. Close the rear access cover.
25. Lower the traction unit to the ground.

# Storage

1. Lower the loader arms, stop the engine, and remove the key.
2. Remove dirt and grime from the external parts of the entire traction unit, especially the engine. Clean dirt and chaff from the outside of the engine cylinder head fins and blower housing.

**Important:** You can wash the traction unit with mild detergent and water. Do not pressure wash the traction unit. Avoid excessive use of water, especially near the control panel, engine, hydraulic pumps, and motors.

3. Service the air cleaner; refer to Servicing the Air Cleaner.
4. Grease the traction unit; refer to Greasing the Traction Unit.
5. Change the crankcase oil; refer to Servicing the Engine Oil.
6. Change the crankcase oil; refer to Servicing the Engine Oil
7. Remove the spark plugs and check the condition of each; refer to Servicing the Spark Plugs.
8. With the spark plugs removed from the engine, pour two tablespoons of engine oil into each spark plug hole.
9. Place rags over the spark plug holes to catch any oil spray, then use the starter to crank the engine and distribute the oil inside the cylinder.
10. Install the spark plugs, but do not install the wires on the spark plugs.
11. Charge the battery; refer to Servicing the Battery.
12. For storage over 30 days, prepare the traction unit as follows:

- A. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from stabilizer manufacturer. (1 oz. per US gallon). **Do not use an alcohol based stabilizer (ethanol or methanol).**

**Note:** Fuel stabilizer/conditioner is most effective when mixed with fresh gasoline and used at all times.

- B. Run the engine to distribute conditioned fuel through the fuel system (5 minutes).
- C. Stop the engine, allow it to cool and drain the fuel tank using a pump type syphon.
- D. Restart the engine and run it until it stops.
- E. Choke the engine.
- F. Start and run the engine until it will not start again.
- G. Dispose of fuel properly. Recycle as per local codes.

**Important:** Do not store stabilizer/conditioned gasoline over 90 days.

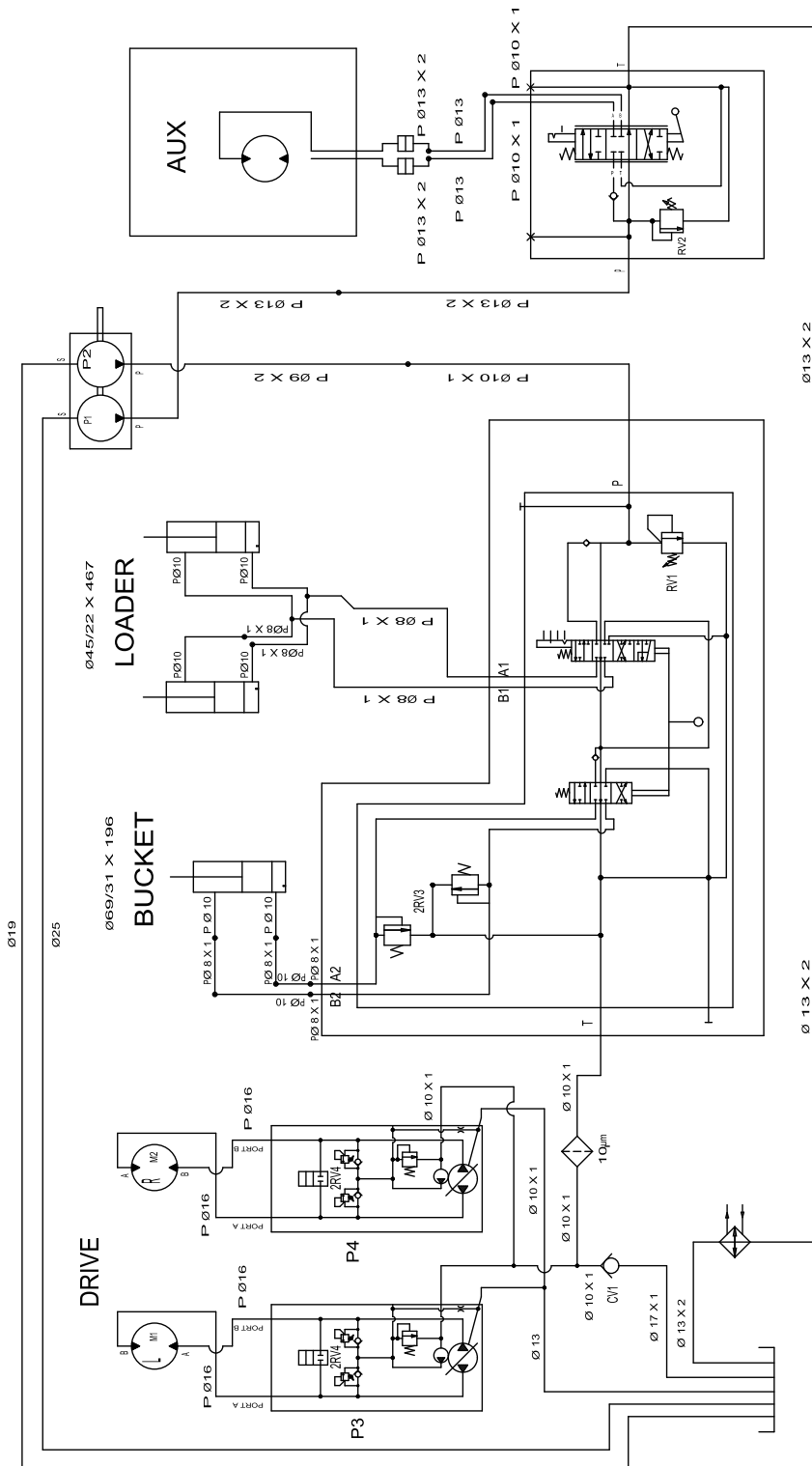
13. Check and adjust the track tension; refer to Adjusting the Track Tension.
14. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
15. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
16. Store the traction unit in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it in a memorable place.
17. Cover the traction unit to protect it and keep it clean.

# Troubleshooting

Problem	Possible Cause	Corrective Action
The starter does not crank	<ol style="list-style-type: none"> <li>1. The battery is discharged.</li> <li>2. The electrical connections are corroded or loose.</li> <li>3. The relay or switch is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Charge the battery or replace it.</li> <li>2. Check the electrical connections for good contact.</li> <li>3. Contact your Authorized Service Dealer.</li> </ol>
The engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> <li>1. The fuel tank is empty.</li> <li>2. The choke is not on.</li> <li>3. The air cleaner is dirty.</li> <li>4. The spark plug wires are loose or disconnected.</li> <li>5. The spark plugs are pitted, fouled, or the gap is incorrect.</li> <li>6. There is dirt in the fuel filter.</li> <li>7. Dirt, water, or stale fuel is in fuel system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill the fuel tank with gasoline.</li> <li>2. Move the choke lever fully forward.</li> <li>3. Clean or replace the air cleaner elements.</li> <li>4. Install the wires on the spark plugs.</li> <li>5. Install new, correctly gapped spark plugs.</li> <li>6. Replace the fuel filter.</li> <li>7. Contact Authorized Service Dealer.</li> </ol>
Engine loses power.	<ol style="list-style-type: none"> <li>1. The engine load is excessive.</li> <li>2. The air cleaner is dirty.</li> <li>3. The oil level in crankcase is low.</li> <li>4. The cooling fins and air passages under the engine blower housing are plugged.</li> <li>5. The spark plugs are pitted, fouled, or the gap is incorrect.</li> <li>6. There is dirt in the fuel filter.</li> <li>7. Dirt, water, or stale fuel is in fuel system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce ground speed.</li> <li>2. Clean or replace the air cleaner elements.</li> <li>3. Check and add oil to the crankcase.</li> <li>4. Remove any obstructions from the cooling fins and air passages.</li> <li>5. Install new, correctly gapped spark plugs.</li> <li>6. Replace the fuel filter.</li> <li>7. Contact Authorized Service Dealer.</li> </ol>

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
The engine overheats.	<ol style="list-style-type: none"> <li>1. The engine load is excessive.</li> <li>2. The oil level in crankcase is low.</li> <li>3. The cooling fins and air passages under the engine blower housing are plugged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce ground speed.</li> <li>2. Check and add oil to the crankcase.</li> <li>3. Remove any obstructions from the cooling fins and air passages.</li> </ol>
Abnormal vibration.	<ol style="list-style-type: none"> <li>1. The engine mounting bolts are loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten the engine mounting bolts.</li> </ol>
The traction unit does not drive.	<ol style="list-style-type: none"> <li>1. The parking brake is on.</li> <li>2. The hydraulic fluid level low.</li> <li>3. The tow valves are open.</li> <li>4. The hydraulic system is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Release the parking brake.</li> <li>2. Check and add hydraulic fluid.</li> <li>3. Close the tow valves.</li> <li>4. Contact Authorized Service Dealer.</li> </ol>





**Hydraulic Schematic (Rev. A)**

**DISPLACEMENT AND PRESSURE CHART**

COMPONENT	DISPLACEMENT		PRESSURE		FLOWRATE*	
	CU IN/REV	CU CM/REV	PSI	BAR	GPM	LPM
P1	0.73	CU IN/2 CC			11.2	42.4
P2	0.38	CU IN/2 CC			5.5	21.0
M2	32.3	CU IN/528 CC				64
P013	0-128	CU IN/21 CC	2455 PSI	170 BAR		
RV1			5000 PSI	307 BAR		
RV2			3000 PSI	210 BAR		
RV3			2500 PSI	169 BAR		
RV4			2000 PSI	138 BAR		
CV1			15 PSI	1.03 BAR		

\* FLOWRATE CALCULATED AT 3600 RPM AND 98% EFFICIENCY.

\*\* FLOWRATE CALCULATED AT 3100 RPM AND 98% EFFICIENCY.











## Evaporative Emission Control Warranty Statement

California Evaporative Emission Control Warranty Statement  
Your Warranty Rights and Obligations

### Introduction

The California Air Resources Board and The Toro® Company are pleased to explain the evaporative emission control system's warranty on your 2006 model year equipment. In California, new equipment that use small off-road engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. The Toro® Company must warrant the evaporative emission control system on your equipment for two years provided there has been no abuse, neglect or improper maintenance of your equipment. Your evaporative emission control system may include parts such as: fuel lines, fuel line fittings, and clamps.

### Manufacturer's Warranty Coverage:

This evaporative emission control system is warranted for two years. If any evaporative emission-related part on your equipment is defective, the part will be repaired or replaced by The Toro® Company.

### Owner's Warranty Responsibilities:

- As the equipment owner, you are responsible for performance of the required maintenance listed in your Operator's Manual. The Toro® Company recommends that you retain all receipts covering maintenance on your equipment, but The Toro® Company cannot deny warranty solely for the lack of receipts.
- As the equipment owner, you should however be aware that The Toro® Company may deny you warranty coverage if your emission warranty parts have failed due to abuse, neglect, or improper maintenance or unapproved modifications.
- You are responsible for presenting your equipment to an Authorized Service Dealer as soon as the problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. If you have a question regarding your warranty coverage, you should contact The Toro® Company at 1-952-948-4027 or call us toll free at the number listed in your Toro Warranty statement.

### Defects Warranty Requirements:

1. The warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser.
2. General Evaporative Emissions Warranty Coverage. The emission warranty parts must be warranted to the ultimate purchaser and any subsequent owner that the evaporative emission control system when installed was:
  - A. Designed, built, and equipped so as to conform with all applicable regulations; and
  - B. Free from defects in materials and workmanship that causes the failure of a warranted part for a period of two years.
3. The warranty on evaporative emissions-related parts will be interpreted as follows:
  - A. Any warranted part that is not scheduled for replacement as required maintenance in the written instructions must be warranted for the warranty period of two years. If any such part fails during the period of warranty coverage, it must be repaired or replaced by The Toro® Company. Any such part repaired or replaced under the warranty must be warranted for a time not less than the remaining warranty period.
  - B. Any warranted part that is scheduled only for regular inspection in the written instructions must be warranted for the warranty period of two years. A statement in such written instructions to the effect of "repair or replace as necessary" will not reduce the period of warranty coverage. Any such part repaired or replaced under warranty must be warranted for a time not less than the remaining warranty period.
  - C. Any warranted part that is scheduled for replacement as required maintenance in the written instructions must be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part must be repaired or replaced by The Toro® Company. Any such part repaired or replaced under warranty must be warranted for a time not less than the remainder of the period prior to the first scheduled replacement point for the part.
  - D. Repair or replacement of any warranted part under the warranty provisions of this article must be performed at no charge to the owner at an Authorized Service Dealer.
  - E. Notwithstanding the provisions of subsection (D) above, warranty services or repairs must be provided at an Authorized Service Dealer.
  - F. The owner must not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at an Authorized Service Dealer.
  - G. Throughout the evaporative emission control system's two year warranty period, The Toro® Company must maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
  - H. Manufacturer approved replacement parts must be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of The Toro® Company.
  - I. The use of any add-on or modified parts will be grounds for disallowing a warranty claim made in accordance with this article. The Toro® Company will not be liable under this Article to warrant failures of warranted parts caused by the use of an add-on or modified part.
  - J. The Toro® Company shall provide any documents that describe the warranty procedures or policies within five working days of request by the Air Resources Board.

### Emission Warranty Parts List:

The following lists includes the parts covered under this warranty:

- Fuel Lines
- Fuel Line Fittings
- Clamps



## The Toro Dingo® Product Line Warranty

A One-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 Dingo Product (“Product”) to be free from defects in materials or workmanship. The following time periods apply from the date the Product is delivered to the original retail purchaser:

Products	Warranty Period
All traction units and attachments	1 year or 1000 operational hours, whichever occurs first
All engines	2 years

Where a warrantable condition exists, we will repair the Product at no cost to you including diagnosis, labor, and parts.

### Instructions for Obtaining Warranty Service

If you think that your Toro Product contains a defect in materials or workmanship, follow this procedure:

1. Contact any Authorized Dingo Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, access our website at [www.Toro.com](http://www.Toro.com). U.S. Customers may also call 800-348-2424.
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer.

If for any reason you are dissatisfied with the Service Dealer’s analysis or with the assistance provided, contact us at:

LCB Customer Service Department  
 Toro Warranty Company  
 8111 Lyndale Avenue South  
 Bloomington, MN 55420-1196  
 Toll Free: 888-577-7466 (U.S. customers)  
 Toll Free: 877-484-9255 (Canada customers)

### Owner Responsibilities

You must maintain your Toro Product by following the maintenance procedures described in the *Operator’s Manual*. Such routine maintenance, whether performed by a dealer or by you, is at your expense. Parts scheduled for replacement as required maintenance (“Maintenance Parts”), are warranted for the period of time up to the scheduled replacement time for that part. 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

### 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.

- 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, digging teeth, tines, spark plugs, tires, tracks, filters, chains, 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, worn painted surfaces, scratched decals or windows, etc.
- Any component covered by a separate manufacturer’s warranty
- Pickup and delivery charges

### General Conditions

Repair by an Authorized Toro Service 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.

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.

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.

**Note to California residents:** 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) 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 California Emission Control Warranty Statement printed in your operator’s manual or contained in the engine manufacturer’s documentation for details.