

# SK600

## Operator's Manual



# Overview



## Chapter Contents

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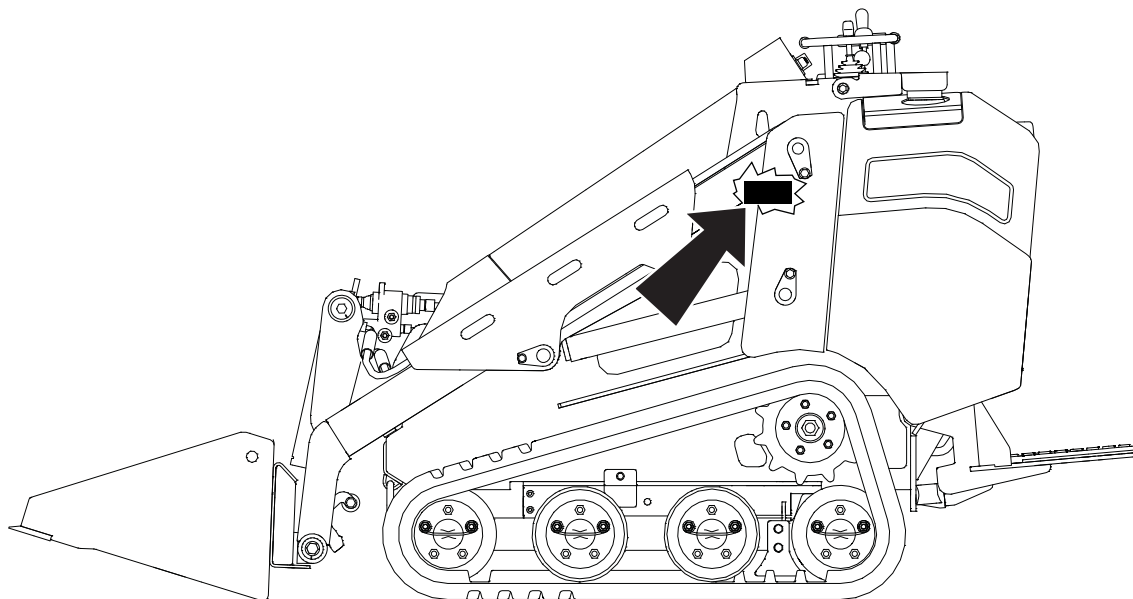
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## Serial Number Location

Record serial numbers and date of purchase in spaces provided. Unit serial number is located as shown.



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Item	
date of manufacture	
date of purchase	
unit serial number	
engine serial number	

## Intended Use



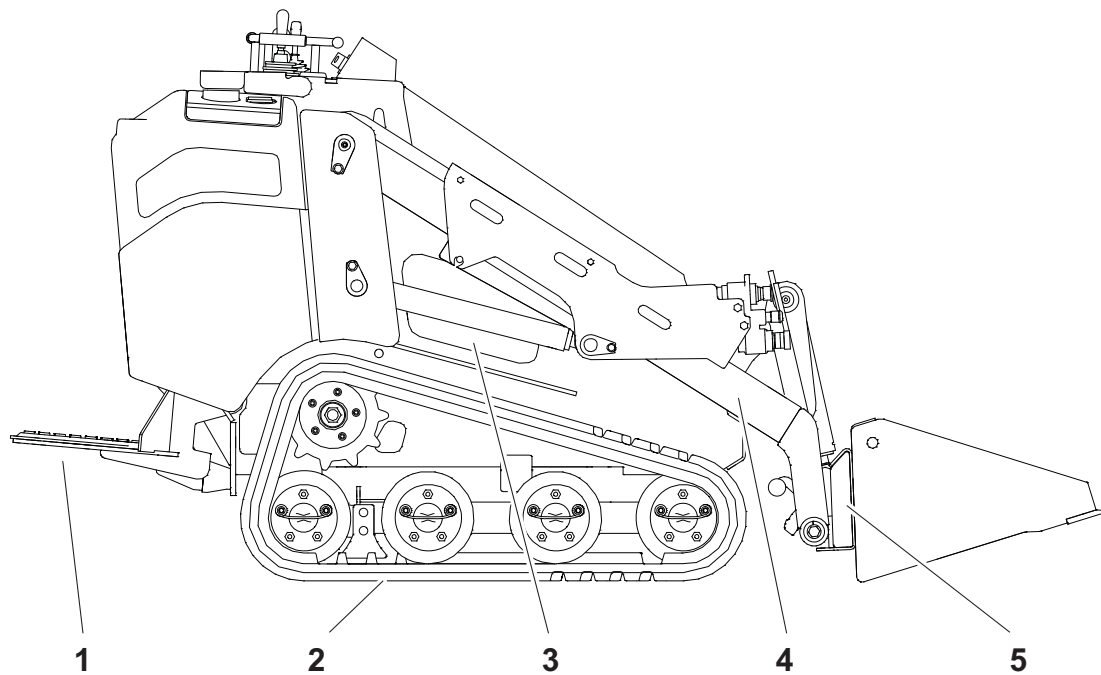
The SK600 is a platform, rubber track mini skid steer unit designed for light-to medium-duty construction work. The SK600 has a quick attach plate which makes it easy for an operator to connect different attachments. The unit is designed for operation in temperatures typically experienced in earth moving and construction work environments. Provisions may be required to operate in extreme temperatures. Contact your Ditch Witch® dealer. Use in any other way is considered contrary to the intended use.

The SK600 should be operated, serviced, and repaired only by persons familiar with its particular characteristics and acquainted with the relevant safety procedures.

## Equipment Modification

This equipment was designed and built in accordance with applicable standards and regulations. Modification of equipment could mean that it will no longer meet regulations and may not function properly or in accordance with the operating instructions. Modification of equipment should only be made by competent personnel possessing knowledge of applicable standards, regulations, equipment design functionality/requirements and any required specialized testing.

## Unit Components

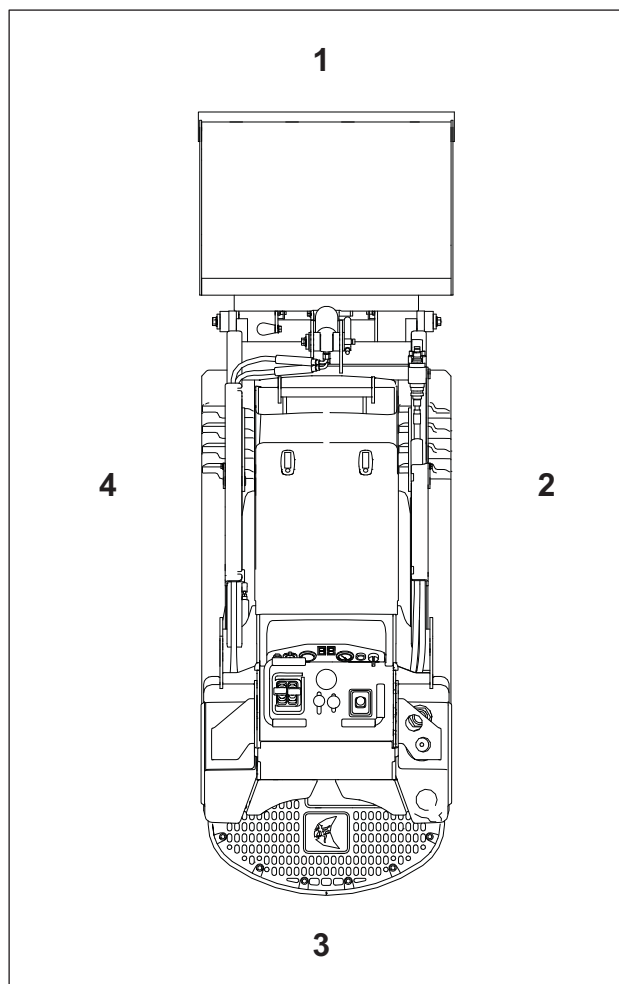


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1. Operator station
2. Tracks
3. Engine compartment
4. Lift arms
5. Attachment plate

## Operator Orientation

1. Front of unit
2. Right side of unit
3. Rear of unit
4. Left side of unit



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## About This Manual

This manual contains information for the proper use of this machine. See the beige **Operation Overview** pages for basic operating procedures. Cross references such as "See page 50" will direct you to detailed procedures.

### Bulleted Lists

Bulleted lists provide helpful or important information or contain procedures that do not have to be performed in a specific order.

### Numbered Lists

Numbered lists contain illustration callouts or list steps that must be performed in order.

# Foreword



This manual is an important part of your equipment. It provides safety information and operation instructions to help you use and maintain your Ditch Witch® equipment.

Read this manual before using your equipment. Keep it with the equipment at all times for future reference. If you sell your equipment, be sure to give this manual to the new owner.

If you need a replacement copy, contact your Ditch Witch dealer. If you need assistance in locating a dealer, visit our website at **[www.ditchwitch.com](http://www.ditchwitch.com)** or write to the following address:

The Charles Machine Works, Inc.  
Attn: Marketing Department  
PO Box 66  
Perry, OK 73077-0066  
USA

The descriptions and specifications in this manual are subject to change without notice. The Charles Machine Works, Inc. reserves the right to improve equipment. Some product improvements may have taken place after this manual was published. For the latest information on Ditch Witch equipment, see your Ditch Witch dealer.

Thank you for buying and using Ditch Witch equipment.





## **SK600 Operator's Manual**

**Issue number 2.0/OM-1/17**

**Part number 053-2962**

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# Safety

## Chapter Contents



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## Guidelines



When you see this safety alert sign, carefully read and follow all instructions. **YOUR SAFETY IS AT STAKE.** Read this entire section before using your equipment.

Follow these guidelines before operating any jobsite equipment:

- Complete proper training and read operator's manual before using equipment.
- Mark proposed path with white paint and have underground utilities located before working. In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service. In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.
- Classify jobsite based on its hazards and use correct tools and machinery, safety equipment, and work methods for jobsite.
- Mark jobsite clearly and keep spectators away.
- Wear personal protective equipment.
- Review jobsite hazards, safety and emergency procedures, and individual responsibilities with all personnel before work begins. Safety videos are available from your Ditch Witch® dealer or at [www.ditchwitch.com/safe](http://www.ditchwitch.com/safe). Safety Data Sheets (MSDS) are available at [www.ditchwitch.com/support](http://www.ditchwitch.com/support).
- Fully inspect equipment before operating. Repair or replace any worn or damaged parts. Replace missing or damaged safety shields and safety signs. Contact your Ditch Witch dealer for assistance.
- Use equipment carefully. Stop operation and investigate anything that does not look or feel right.
- Do not operate unit where flammable gas may be present.
- Only operate equipment in well-ventilated areas.
- Contact your Ditch Witch dealer if you have any question about operation, maintenance, or equipment use.
- Complete the equipment checklist located at [www.ditchwitch.com/safe](http://www.ditchwitch.com/safe).

## California Proposition 65 Warning

This product may contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

- battery posts, terminals and related accessories
- engine exhaust
- ethylene glycol

## Emergency Procedures



**⚠ WARNING**

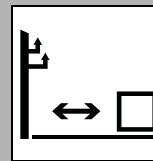
Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.



Before operating any equipment, review emergency procedures and check that all safety precautions have been taken.

**EMERGENCY SHUTDOWN** - Turn ignition switch to stop position or push remote engine stop button (if equipped).

## Electric Strike Description



**⚠ DANGER**

Electric shock will cause death or serious injury. Stay away. 274-049

When working near electric cables, remember the following:

- Electricity follows all paths to ground, not just path of least resistance.
- Pipes, hoses, and cables will conduct electricity back to all equipment.
- Low voltage current can injure or kill. Many work-related electrocutions result from contact with less than 440 volts.

Most electric strikes are not noticeable, but indications of a strike include:

- power outage
- smoke
- explosion
- popping noises
- arcing electricity

**If any of these occur, assume an electric strike has occurred.**

## If an Electric Line is Damaged

If you suspect an electric line has been damaged and you are on tractor, DO NOT MOVE. Remain on tractor and take the following actions. The order and degree of action will depend upon the situation.

- Warn people nearby that an electric strike has occurred. Instruct them to leave the area and contact utility.
- Raise attachments and drive from immediate area.
- Contact utility company to shut off power.
- Do not return to jobsite or allow anyone into area until given permission by utility company.

If you suspect an electric line has been damaged and you are **off tractor**, DO NOT TOUCH TRACTOR. Take the following actions. The order and degree of action will depend upon the situation.

- LEAVE AREA. The ground surface may be electrified, so take small steps with feet close together to reduce the hazard of being shocked from one foot to the other. For more information, contact your Ditch Witch® dealer.
- Contact utility company to shut off power.
- Do not return to jobsite or allow anyone into area until given permission by utility company.

## **If a Gas Line is Damaged**



**⚠ WARNING** Fire or explosion possible. Fumes could ignite and cause burns. No smoking, no flame, no spark. 275-419 (2P)



**⚠ WARNING** Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.

If you suspect a gas line has been damaged, take the following actions. The orders and degree of action will depend on the situation.

- Immediately shut off engine(s), if this can be done safely and quickly.
- Remove any ignition source(s), if this can be done safely and quickly.
- Warn others that a gas line has been cut and that they should leave the area.
- Leave jobsite as quickly as possible.
- Immediately call your local emergency phone number and utility company.
- If jobsite is along street, stop traffic from driving near jobsite.
- Do not return to jobsite until given permission by emergency personnel and utility company.



## **If a Fiber Optic Cable is Damaged**

Do not look into cut ends of fiber optic or unidentified cable. Vision damage can occur. Contact utility company.

## **If Machine Catches on Fire**

Perform emergency shutdown procedure and then take the following actions. The order and degree of action will depend on the situation.


- Immediately move battery disconnect switch (if equipped and accessible) to disconnect position.
- If fire is small and fire extinguisher is available, attempt to extinguish fire.
- If fire cannot be extinguished, leave area as quickly as possible and contact emergency personnel.


## **Safety Alert Classifications**


These classifications and the icons defined on the following pages work together to alert you to situations which could be harmful to you, jobsite bystanders or your equipment. When you see these words and icons in the book or on the machine, carefully read and follow all instructions. **YOUR SAFETY IS AT STAKE.**



Watch for the three safety alert levels: **DANGER**, **WARNING** and **CAUTION**. Learn what each level means.

 **DANGER** indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

 **WARNING** indicates a hazardous situation that, if not avoided, could result in death or serious injury.

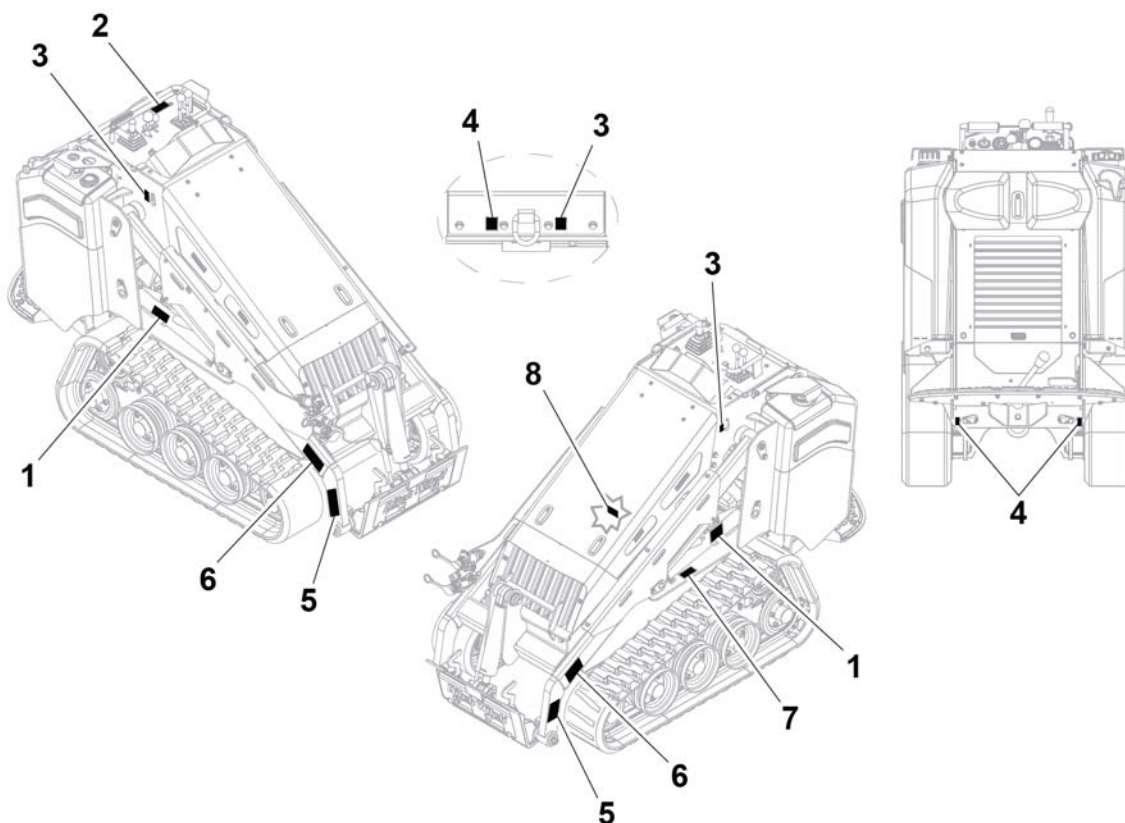
 **CAUTION** indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Watch for two other words: **NOTICE** and **IMPORTANT**.

**NOTICE** indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

**IMPORTANT** can help you do a better job or make your job easier in some way.

## Machine Safety Alerts



Decal\_SK600.png

1



**⚠ WARNING** Crushing weight. Place cylinder lock on extended cylinder and secure. 273-413

2



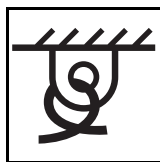
**⚠ WARNING** Read operator's manual. Follow safety rules and know how to use all controls. Your safety is at stake. 273-475

3



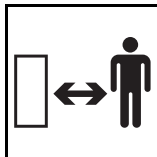
Lift point. See Transport chapter for more information. 274-442

4



Tiedown location. See Transport chapter for more information.  
274-318

5

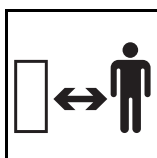


**WARNING**

275-184

Moving parts could cut off hand or foot. Stay away.

6

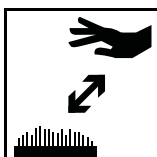


**WARNING**

275-326

Crushing weight could cause death or serious injury. Stay away.

7

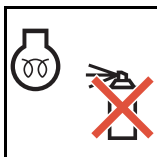


**CAUTION**

275-355 (2-P)

Hot parts may cause burns. Do not touch until cool or wear gloves.

8



**WARNING**

273-459 (2P), 274-206 (2P), 700-206 (2P)

Fire or explosion possible. Do not use starter fluid.





# Controls

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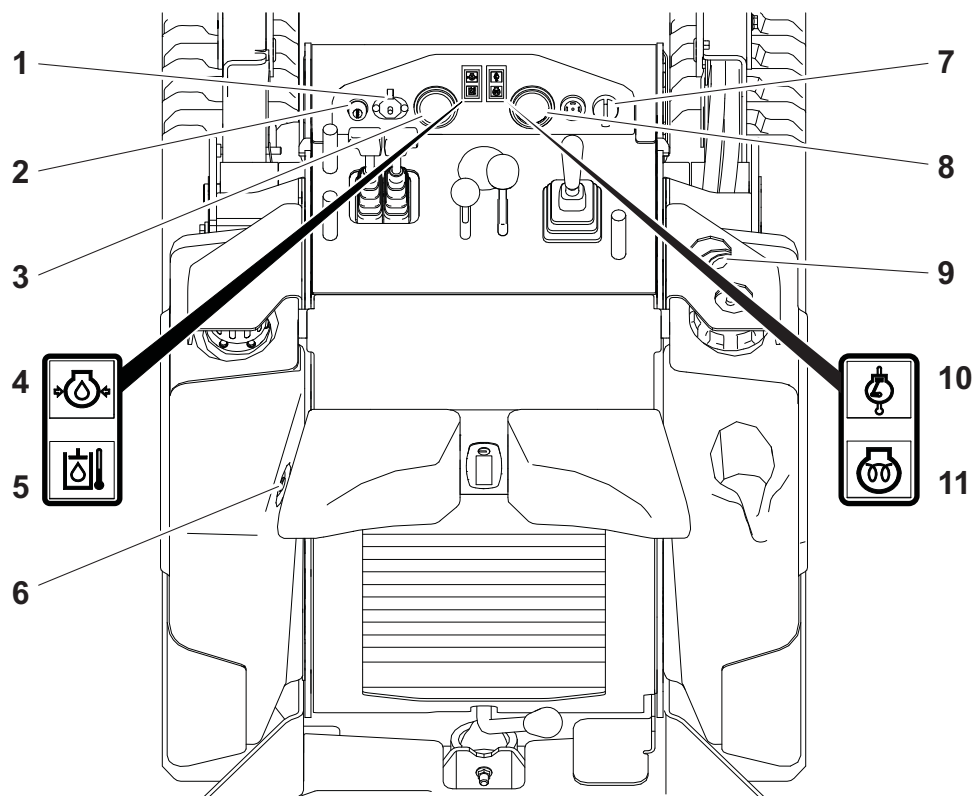
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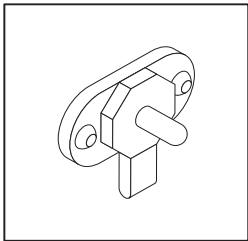
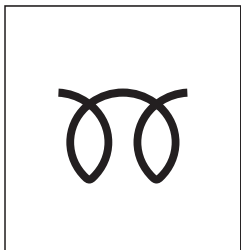
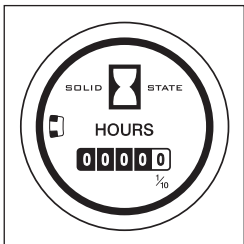
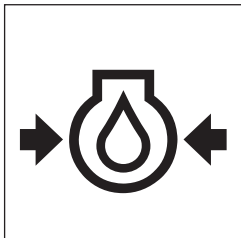


## Gauges and Indicators



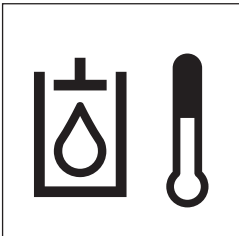
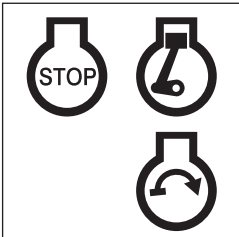
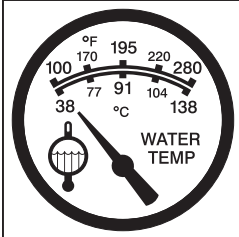
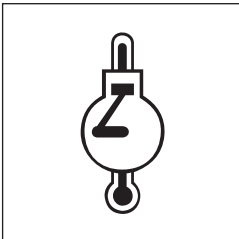
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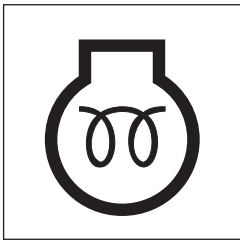
- |  |   |
|--|---|
| 1. Auxiliary outlet                      | 7. Ignition switch                      |
| 2. Glow plug button                      | 8. Engine coolant temperature gauge     |
| 3. Hourmeter                             | 9. Engine coolant temperature indicator |
| 4. Engine oil pressure indicator         | 10. Glow plug indicator                 |
| 5. Hydraulic fluid temperature indicator | 11. Fuel gauge                          |
| 6. Hydraulic fluid level sight glass     |   |

Item	Description	Notes
<b>1. Auxiliary outlet</b>  <small>c00ic114a.eps</small>	<p>To operate work lights or other 12V devices, plug into outlet.</p>	
<b>2. Glow plug button</b>  <small>c00ic108h.eps</small>	<p>To help start cold engine, turn ignition switch to first position.</p> <p>Press glow plug button as directed in notes.</p> <p>Release button, then turn ignition switch all the way clockwise to start.</p>	<p><b>IMPORTANT:</b> Press glow plug button according to temperatures below.</p> <ul style="list-style-type: none"> <li>If ambient temperature is below 40° F (4° C), press and hold button for 5 seconds.</li> <li>If ambient temperature is below 20° F (-7° C), press and hold button for 10 seconds.</li> <li>Do not press button for more than 20 seconds continuously.</li> </ul>
<b>3. Hourmeter</b>  <small>c00ic019h.eps</small>	<p>Displays engine operating time.</p>	<p>Use these times to schedule service.</p>
<b>4. Engine oil pressure indicator</b>  <small>c00ic119h.eps</small>	<p>Lights when engine oil pressure is low.</p> <p>Also lights briefly when engine is started.</p>	<p>Engine will stop.</p> <ol style="list-style-type: none"> <li>Check oil level.</li> <li>Check for leaks before starting engine.</li> </ol>



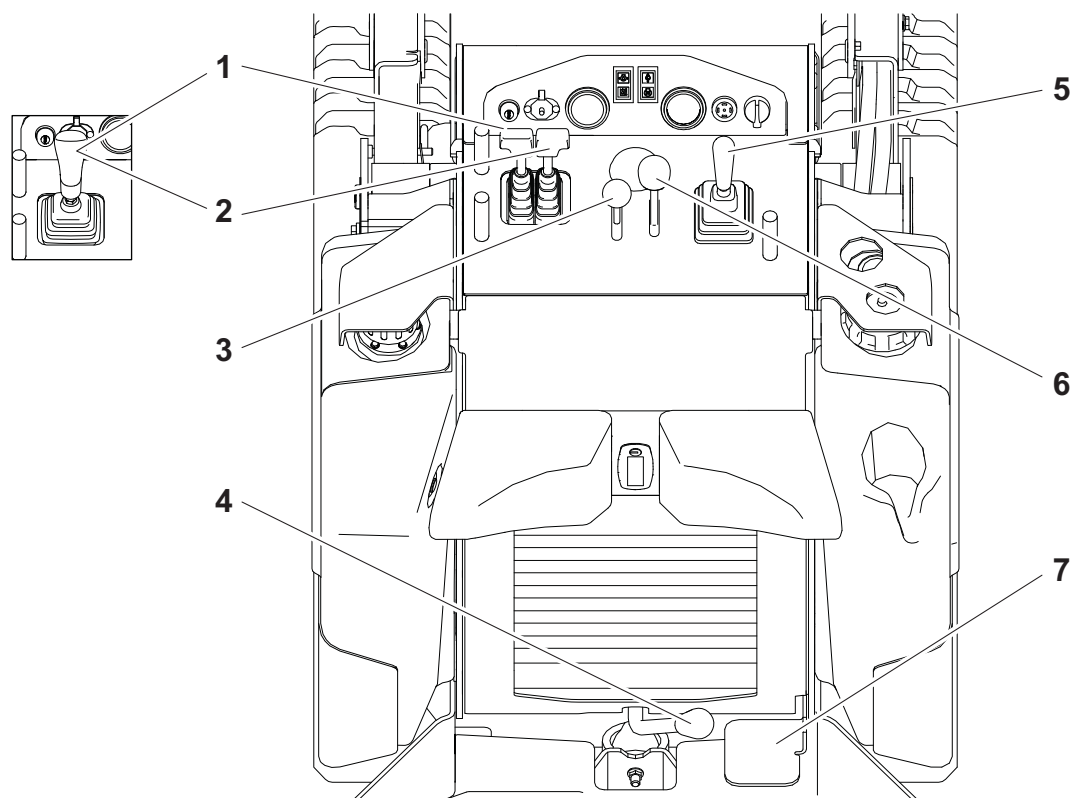


Item	Description	Notes
<b>5. Hydraulic fluid temperature indicator</b>  c00ic023h.eps	Lights and alarm sounds when hydraulic fluid is overheating.	Check hydraulic fluid level.  Reduce load.  Ensure oil cooler is clean.
<b>6. Hydraulic fluid sight glass</b>	Shows level of hydraulic fluid in tank. Maintain fluid at halfway point on glass.	
<b>7. Ignition switch</b>  c00ic065h.eps	To start engine, insert key and turn clockwise.  To stop engine, turn key counterclockwise.	<b>IMPORTANT:</b> <ul style="list-style-type: none"> <li>If engine does not start or stalls, turn key to STOP and then restart.</li> <li>Do not allow starter motor to run continuously for more than 20 seconds.</li> </ul>
<b>8. Engine coolant temperature gauge</b>  c00ic086a.eps	Displays coolant temperature.	<b>IMPORTANT:</b> If temperature goes above 230°F (110°C): <ol style="list-style-type: none"> <li>Stop operation, set throttle to low idle, and allow engine to cool.</li> <li>Stop engine.</li> <li>Check coolant level. See "Check Coolant Level" on page 65.</li> <li>Ensure radiator is clean. See "Check Radiator/Fluid Cooler" on page 68.</li> </ol>
<b>9. Engine coolant temperature indicator</b>  c00ic274h.eps	Lights and alarm sounds when engine coolant temperature is too high.	<ol style="list-style-type: none"> <li>Stop operation, set throttle to low idle, and allow engine to cool.</li> <li>Stop engine.</li> <li>Check coolant level. See "Check Coolant Level" on page 65.</li> </ol>

Item	Description	Notes
<b>10. Glow plug indicator</b>  <small>c00ic180h.eps</small>	Lights when ignition switch is on and glow plug button is pressed.	
<b>11. Fuel tank sight window</b>	Shows level of fuel in tank.	<b>NOTICE:</b> Use low sulfur or ultra low sulfur fuel only.

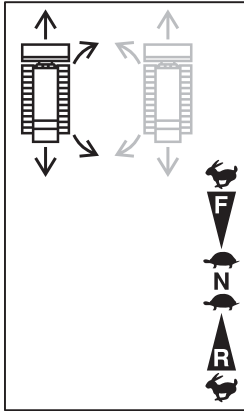
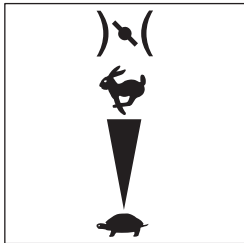


## Controls

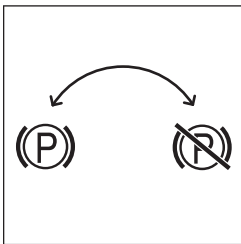
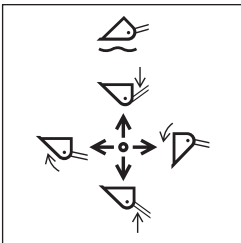
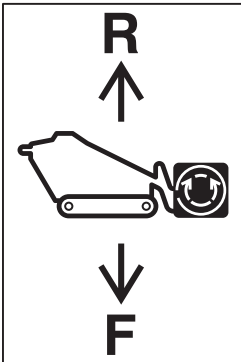


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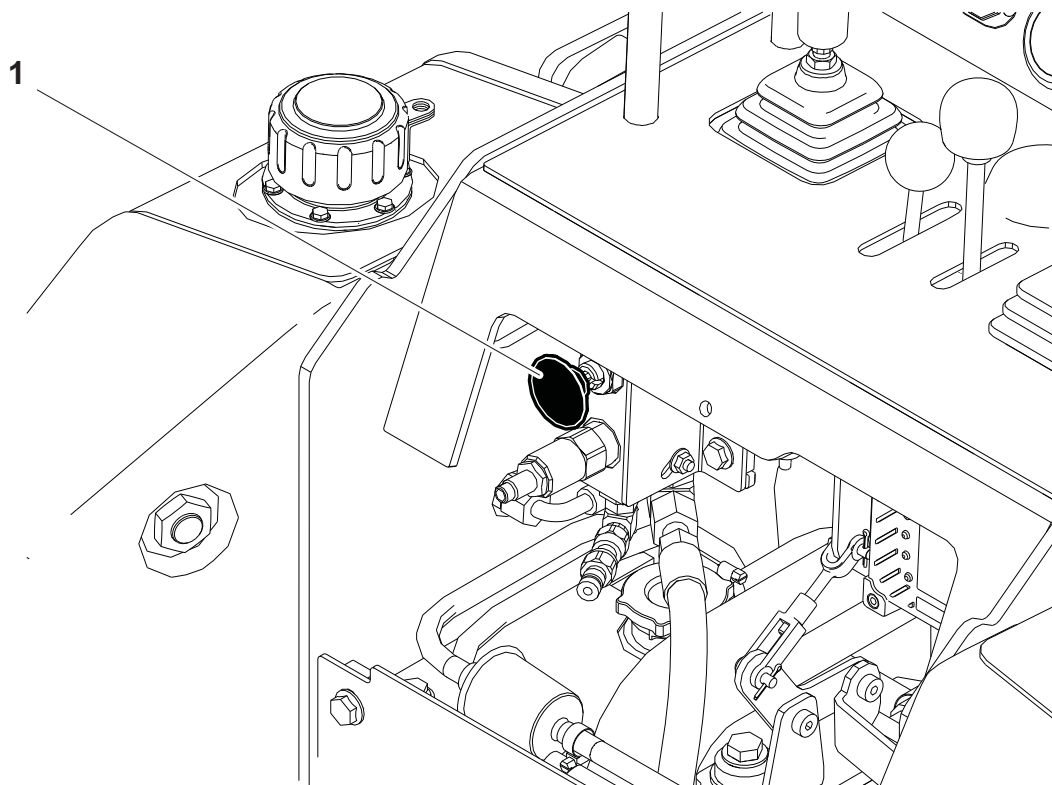
- |   |                                  |
|---|----------------------------------|
| 1. Left track drive control or track drive joystick (optional)  | 4. Parking brake lever           |
| 2. Right track drive control or track drive joystick (optional) | 5. Lift arm control              |
| 3. Throttle   | 6. Attachment drive control      |
|   | 7. Attachment drive foot control |

Item	Description	Notes
<b>1. Left track drive control</b> <b>2. Right track drive control</b>  <p>c00ic087a.eps</p>	<p>To move forward, push.</p> <p>To move backward, pull.</p> <p>To go faster in either direction, move control farther from neutral position.</p> <p>To stop, move to neutral position.</p>	<p>To turn right, move left control farther forward than right control.</p> <p>To turn left, move right control farther forward than left control.</p> <p>To counter-rotate in either direction, move controls in opposite directions as indicated above.</p>
<b>Track drive joystick (optional)</b>	<p>To move forward, push.</p> <p>To move backward, pull.</p> <p>To go faster in either direction, move control farther from neutral.</p> <p>To stop, move to neutral.</p>	<p>To steer while moving forward, push joystick forward, then move left or right. Unit will gradually turn left or right.</p> <p>To steer while moving backward, pull joystick back, then move left or right. Unit will gradually turn left or right.</p> <p>For tight steering in low speed, move joystick to center position then to left or right side. Tracks will counter rotate and turn unit in a tight circle.</p>
<b>3. Throttle</b>  <p>c00ic007c.eps</p>	<p>To increase engine speed, push.</p> <p>To decrease engine speed, pull.</p>	<p>Increasing engine speed also increases attachment speed.</p>



Item	Description	Notes
<b>4. Parking brake lever</b>  c00ic662w.eps	<p>To set, rotate lever counterclockwise.</p> <p>To release, rotate lever clockwise.</p>	<b>IMPORTANT:</b> Ensure unit is stopped before setting parking brake.
<b>5. Lift arm control</b>  c00ic284h.eps	<p>To move lift arms down, push.</p> <p>To float, push forward to end.</p> <p>To move lift arms up, pull.</p> <p>To curl attachment up, move to left.</p> <p>To curl attachment down, move to right.</p>	<b>IMPORTANT:</b> Exercise caution when lifting loads. See page 82 for operating capacities.
<b>6. Attachment drive control</b>  c00ic090a.eps	<p>To engage attachment drive in reverse, push forward.</p> <p>To engage attachment drive in forward, pull back.</p>	<b>IMPORTANT:</b> <ul style="list-style-type: none"> <li>Use foot pedal to hold attachment control in the on position when hands are busy operating lift arm or track drive controls.</li> <li>See "Hydraulic fluid bypass" on page 29 for instructions on operating attachment drive control at low flow.</li> </ul>
<b>7. Attachment drive foot control</b>	<p>To hold attachment drive in engaged position (forward or reverse), lift lever lock, move lever in desired direction, and press pedal.</p> <p>To return attachment drive control to neutral, release pedal.</p>	<b>IMPORTANT:</b> Use foot pedal to hold attachment control in the on position when hands are busy operating lift arm or track drive controls.

## Engine Compartment



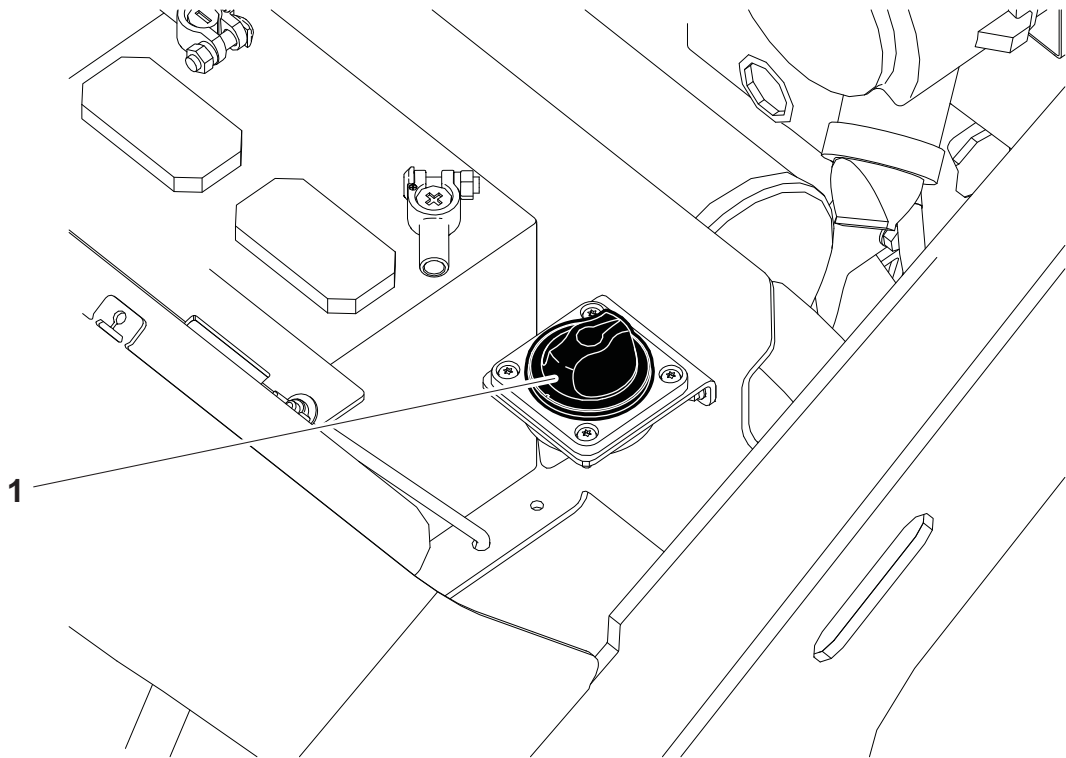
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### 1. Hydraulic fluid bypass

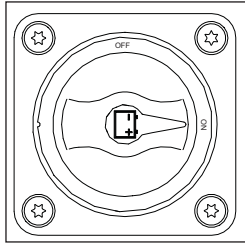
Item	Description	Notes
<b>1. Hydraulic fluid bypass</b> <p>c00ic180w.eps</p>	<p>To open bypass valve, pull and rotate knob until it seats in the open position.</p> <p>Start engine and run five minutes to warm hydraulic fluid.</p> <p>To close bypass valve, rotate knob until it seats in the closed position.</p>	<p><b>IMPORTANT:</b></p> <ul style="list-style-type: none"> <li>Use the hydraulic fluid bypass to assist starting a cold engine.</li> <li>Attachment will <b>not</b> operate at full flow when knob is pulled out.</li> <li>Auxiliary hydraulics can be operated at low flow using hydraulic fluid bypass.</li> </ul>

# Battery Disconnect

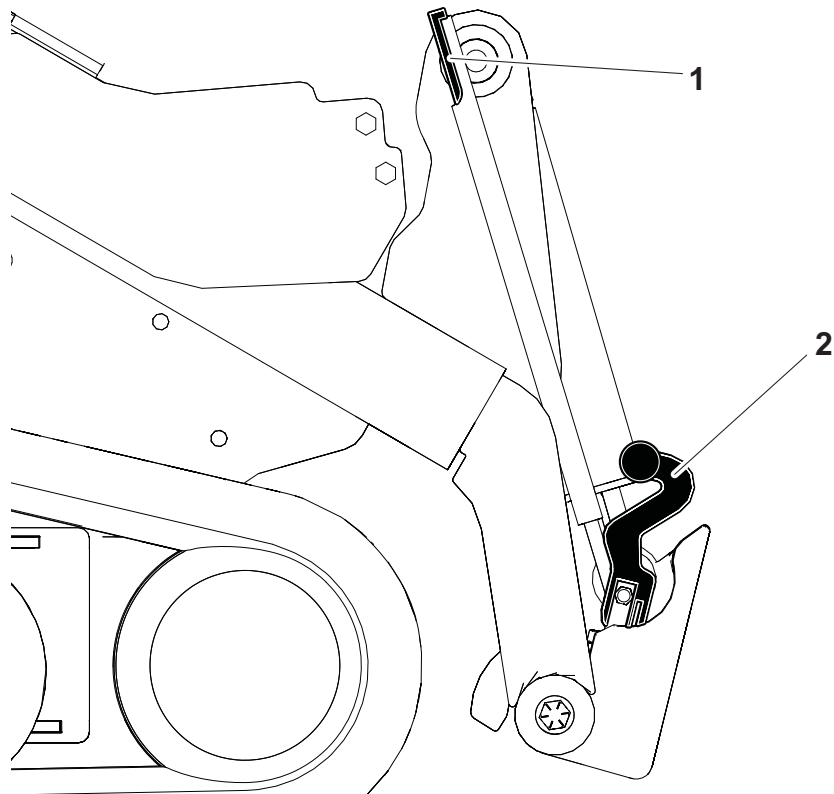


t51om002w.eps

- 1. Battery disconnect switch

Item	Description	Notes
<div>1. Battery disconnect switch</div> <div></div> <div>c00ic179w.eps</div>	<p>To disconnect, move counterclockwise to the OFF position.</p> <p>To connect, move clockwise to the ON position.</p>	<p><b>NOTICE:</b> Do not operate battery disconnect switch with engine running.</p>

## Attachment Plate



t51om034w.eps

1. Level indicator

2. Attachment latches

Item	Description	Notes
1. Level indicator	To level bucket, adjust bucket position until indicator is at top of sleeve.	To level other attachments, adjust attachment position until it is level. Mark indicator position on sleeve. Use mark to indicate level with that attachment.
2. Attachment latches	To lock attachment, move latch down.  To unlock attachment, move latch up.	





# Prepare

## Chapter Contents

**Gather Information . . . . . 34**

- All Jobs . . . . .34
- Ground-Penetrating Jobs . . . . .34
- Above-Ground Jobs . . . . .34

**Inspect Site . . . . . 35**

- Identify Hazards . . . . .35

**Classify Jobsite . . . . . 36**

- Select a Classification . . . . .36
- Apply Precautions . . . . .37

**Check Supplies and Prepare Equipment . . . . . 38**

- Check Supplies . . . . .38
- Prepare Equipment . . . . .38
- Assemble Accessories . . . . .38

**Connect Attachment . . . . . 39**

- Attachment . . . . .39
- Hydraulic Hoses . . . . .41



## **Gather Information**

A successful job begins before you start working. The first step in planning is reviewing information already available about the job and jobsite.

### **All Jobs**

#### **Review Job Plan**

Review blueprints or other plans. Check for information about existing or planned structures, elevations, or proposed work that may be taking place at the same time.

#### **Arrange for Traffic Control**

If working near a road or other traffic area, contact local authorities about safety procedures and regulations.

#### **Plan for Emergency Services**

Have the telephone numbers for local emergency and medical facilities on hand. Check that you will have access to a telephone.

### **Ground-Penetrating Jobs**

#### **Notify One-Call Services**

Mark proposed path with white paint and have underground utilities located before working.

- In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service.
- In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.

### **Above-Ground Jobs**

#### **Locate Overhead Lines**

Note location and height of all overhead lines in jobsite and ensure that fully lifted attachment and/or load will not touch lines.

## **Inspect Site**

### **Identify Hazards**

Inspect jobsite before transporting equipment. Check for the following:

- changes in elevation such as hills or other open trenches
- obstacles such as buildings, railroad crossings, or streams
- signs of utilities on jobsite and perimeter, such as:
  - “buried utility” notices
  - utility facilities without overhead lines
  - gas or water meters
  - junction boxes
  - drop boxes
  - light poles
  - manhole covers
  - sunken ground
- traffic
- access
- soil type and condition

Have an experienced locating equipment operator sweep area within 20' (6 m) to each side of work path to verify previously marked line and cable locations. Mark location of all buried utilities and obstructions.



## Classify Jobsite



**WARNING** Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

### To help avoid injury:

- Wear personal protective equipment including hard hat, safety eye wear, and hearing protection.
- Do not wear jewelry or loose clothing.
- Comply with all utility notification regulations before digging or drilling.
- Mark proposed path with white paint and have underground utilities located before working.
- Verify location of previously marked underground hazards.
- Mark jobsite clearly and keep spectators away.

**Remember, jobsite is classified by hazards in place -- not by line being installed.**

## Select a Classification

Jobsites are classified according to underground hazards present.

If working . . .	then classify jobsite as . . .
within 10' (3 m) of a buried electric line	electric
within 10' (3 m) of a natural gas line	natural gas
in sand or granite which is capable of producing crystalline silica (quartz) dust	crystalline silica (quartz) dust
within 10' (3 m) of any other hazard	other

**NOTICE:** If you have any doubt about jobsite classification, or if jobsite might contain unmarked hazards, take steps outlined previously to identify hazards and classify jobsite before working.

## **Apply Precautions**

Once classified, precautions appropriate for jobsite must be taken. Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.

### **Electric Jobsite Precautions**

Use one or both of these methods.

- Expose line by careful hand digging or soft excavation.
- Have service shut down while work is in progress. Have electric company test lines before returning them to service.

### **Natural Gas Jobsite Precautions**

In addition to positioning equipment upwind from gas lines, use one or both of these methods.

- Expose lines by careful hand digging or soft excavation.
- Have gas shut off while work is in progress. Have gas company test lines before returning them to service.

### **Crystalline Silica (Quartz) Dust Precautions**

Crystalline silica dust is a naturally occurring substance found in soil, sand, concrete, granite, and quartz. Breathing silica dust particles while cutting, drilling, or working materials may cause lung disease or cancer. To reduce exposure:

- Use water spray or other means to control dust.
- Refer to U.S. Department of Labor Occupational Safety and Health Administration guidelines to learn more about appropriate breathing protection and permissible exposure limits.

### **Other Jobsite Precautions**

You may need to use different methods to safely avoid other underground hazards. Talk with those knowledgeable about hazards present at each site to determine which precautions should be taken or if job should be attempted.



## Check Supplies and Prepare Equipment

### Check Supplies

- fuel
- keys
- lubricants
- personal protective equipment, such as hard hat and safety glasses

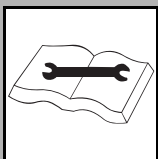
### Prepare Equipment

#### Fluid Levels

- fuel
- hydraulic fluid
- battery charge
- engine oil

#### Condition and Function

- all controls

**⚠ WARNING**

Improper control function could cause death or serious injury. If control does not work as described in instructions, stop machine and have it serviced.

- parking brake pins (See “Check Brake Operation” on page 64.)
- filters (air, oil, hydraulic)
- tracks
- pumps and motors
- hoses and valves
- signs, guards, and shields

### Assemble Accessories

#### Fire Extinguisher

If required, mount a fire extinguisher near the power unit but away from possible points of ignition. The fire extinguisher should always be classified for both oil and electric fires. It should meet legal and regulatory requirements.

## Connect Attachment

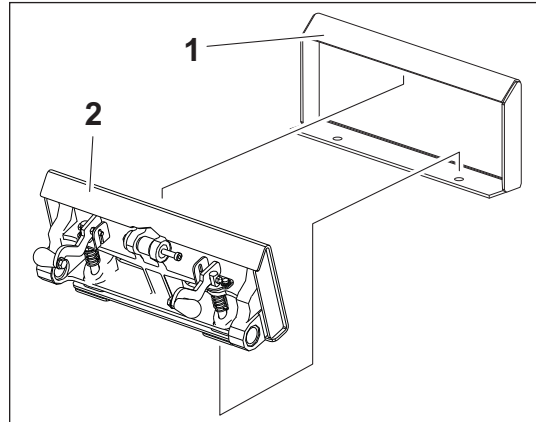
**NOTICE:** Use only Ditch Witch®-approved attachments. Attachments can change the stability and operating characteristics of the unit. See attachment operation manual for instructions regarding proper operation of attachments.

### Attachment

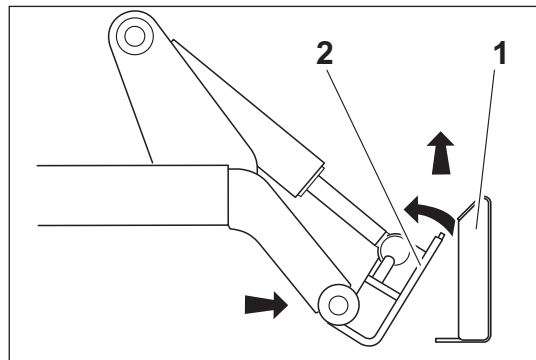
**IMPORTANT:** Before connecting attachment to unit, ensure that attachment and receiver plates are free of dirt and debris.

1. Position attachment on level surface with enough space behind it to accommodate unit.
2. Start engine. See "Start Unit" on page 44.
3. Tilt attachment plate (2) forward.
4. Position attachment plate in the upper lip of the receiver plate (1) on attachment.
5. Raise lift arms while tilting back attachment plate.

**IMPORTANT:** Attachment should be raised enough to clear the ground. Attachment plate should be tilted back fully.



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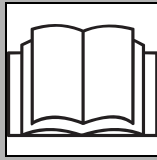


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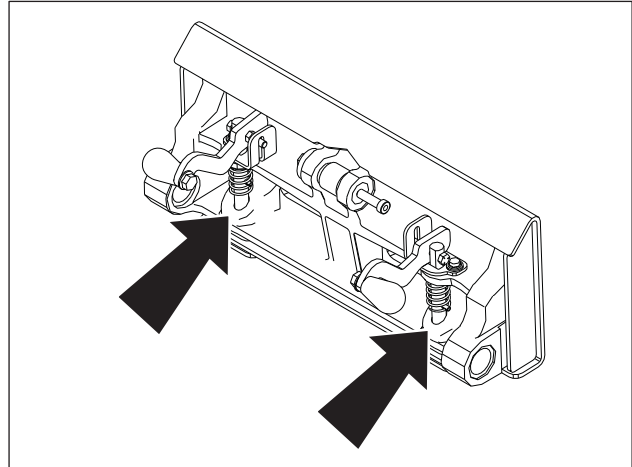
6. Pins will automatically engage.



**WARNING** Read operator's manual. Know how to use all controls. Your safety is at stake.

**To help avoid injury:** Ensure proper connection by verifying that bottoms of lock pins are visible under attachment receiver plate (shown).

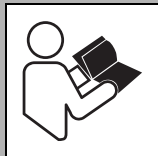
7. Ensure pins are engaged by rotating attachment down.



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## Hydraulic Hoses

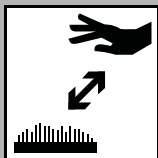
If attachment requires hydraulic power for operation, connect hydraulic hoses.



**WARNING** Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use.

### To help avoid injury:

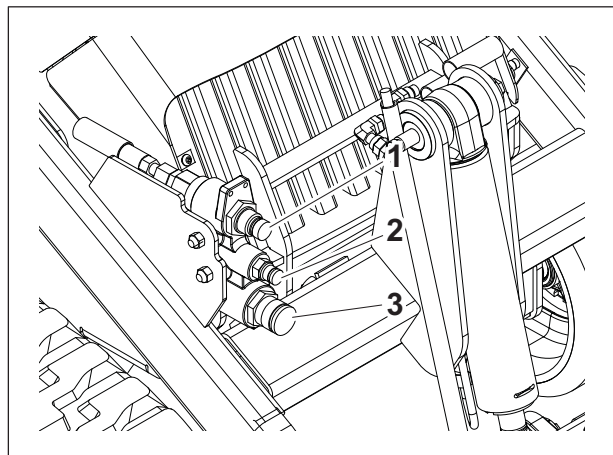
- Escaping pressurized fluid can cause injury or pierce skin and poison.
- Before disconnecting a hydraulic line, turn engine off and operate all controls to relieve pressure. Lower, block, or support any raised component with a hoist. Cover connection with heavy cloth and loosen connector nut slightly to relieve residual pressure. Catch all fluid in a container.
- Before using system, check that all connections are tight and all lines are undamaged.
- Use a piece of cardboard or wood, rather than hands, to search for leaks.
- Wear protective clothing, including gloves and eye protection.
- If you are injured, seek immediate medical attention from a doctor familiar with this type of injury.



**WARNING** Hot parts may cause burns. Do not touch until cool.

**To help avoid injury:** Wear gloves when connecting and disconnecting hydraulic hoses and wait until unit has cooled before touching hydraulic components.

1. Cycle attachment drive control to relieve residual pressure at hydraulic couplers.
2. Remove dirt and debris from hydraulic couplers.
3. Connect male coupler on attachment to female coupler (3) on unit.
4. Connect female coupler on attachment to male coupler (1) on unit.
5. If needed, connect attachment case drain hose to case drain connector (2).
6. Ensure that connections are secure by pulling on hoses.



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# Drive

## Chapter Contents

Start Unit ..... 44

Drive..... 44

Shut Down ..... 46



## Start Unit

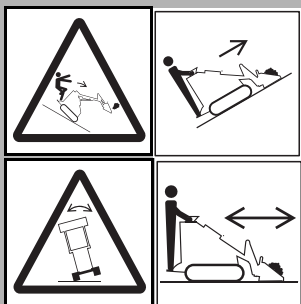
**IMPORTANT:** Only operate unit from operator platform.

1. Ensure all controls are in neutral.
2. Set parking brake.
3. If necessary, use glow plugs and/or hydraulic fluid bypass control to start in cold weather conditions. See "Hydraulic fluid bypass" on page 29.
4. Move throttle to half open.
5. Turn ignition switch to start position and release when engine starts.

**EMERGENCY SHUTDOWN:** Turn ignition switch to STOP.

## Drive

### General Operation



**WARNING** Tipover possible. Machine can tip over and crush you.

To help avoid injury: see "Safe Slope Operation" on page 45.

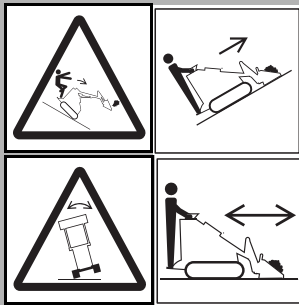
1. Release parking brake.
2. Pull lift arm control to raise attachment plate (and attachment) off ground.
3. Move track drive control to steer unit. See page 27.

**IMPORTANT:** If needed for attachment operation, push attachment drive foot control to hold attachment control in the forward position while operating track drive and lift arm controls.

4. Adjust throttle as needed.
5. See attachment operation manual for instructions regarding proper operation of attachments.

**EMERGENCY EXIT:** Release controls and step off platform.

## Safe Slope Operation



**WARNING** Tipover possible. Machine can tip over and crush you.

### To help avoid injury:

- Always operate with load end uphill.
- Always carry load low. High load can cause tipping, loss of load or loss of visibility.
- Operate at slow speed when on rough terrain.
- Never drive across slopes.
- Never jerk control levers. Use a steady even motion.
- Do not park unit on slope without lowering attachment to the ground, returning all controls to neutral position, shutting down unit, and applying parking brake.
- See page 80 for operating capacity.



Operating safely on a slope depends upon many factors including:

- Distribution of machine weight, including front loading and absence of load
- Height of load
- Even or rough ground conditions
- Potential for ground giving way causing unplanned tilt forward, reverse or sideways
- Nearness of ditches, ruts, stumps or other obstructions and sudden changes in slope
- Speed
- Turning
- Braking performance
- Operator skill

**EMERGENCY EXIT:** Release controls and step off platform.

These varying factors make it impractical to specify a maximum safe operating angle in this manual. It is therefore important for the operator to be aware of these conditions and adjust operation accordingly. Maximum engine angle and braking performance are two absolute limits which must never be exceeded. These maximums are stated below since they are design limits. **These design limits usually exceed the operating limits and must never be used alone to establish safe operating angle for variable conditions.**

Maximum engine lubrication angle – 20°

Maximum service brake retarding force – equal to traction of both tracks.

Maximum park brake holding force – equal to traction of one track.

## **Shut Down**

1. Lower lift arms to ground.
2. Move all controls to neutral position.
3. Apply parking brake.
4. Run engine at low idle for five minutes to cool.
5. Turn ignition switch to STOP.
6. Remove key.

# Transport

## Chapter Contents

**Lift . . . . . 48**

- Points . . . . . 48
- Procedure . . . . . 48

**Haul . . . . . 49**

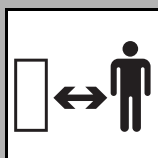
- Load . . . . . 49
- Tie Down . . . . . 50
- Unload . . . . . 51

**Retrieve . . . . . 52**





## Lift

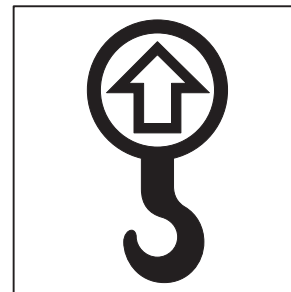


Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

**To help avoid injury:** Only lift unit without attachment installed.

## Points

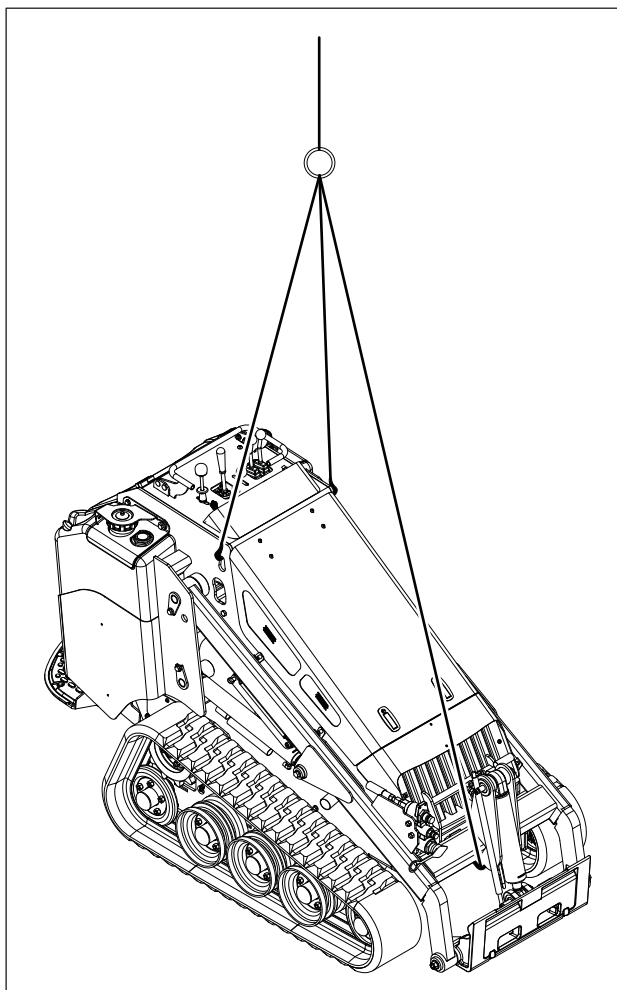
Lifting points are identified by lifting decals. Lifting at other points is unsafe and can damage machinery.



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## Procedure

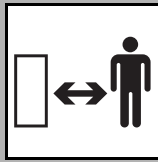
Use a hoist capable of supporting the equipment's size and weight to lift as shown. See "Specifications" on page 81 or measure and weigh equipment before lifting.



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## Haul

### Load



**WARNING** Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

#### To help avoid injury:

- Load and unload trailer on level ground.
- Incorrect loading can cause trailer swaying.
- Attach trailer to vehicle before loading or unloading.
- Only operate unit from operator platform.
- To help prevent trailer sway, load trailer so that ten to fifteen percent of total vehicle weight (equipment plus trailer) is on tongue.
- If loading onto tilt-bed trailer, be prepared for trailer to tilt.
- Move all controls to neutral position when stopped.

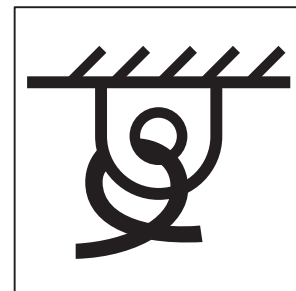
1. Release parking brake.
2. Start engine. See "Start Unit" on page 44.
3. Adjust throttle to low speed.
4. Pull lift arm control to raise attachment plate (and attachment) clear of trailer, but keep it low.
5. Move unit to rear of trailer and align with ramps.
6. Drive forward slowly to move unit onto trailer until tiedown position is reached. See "Drive" on page 44.
7. Push lift arm control to lower attachment plate (and attachment) to trailer bed.
8. Set parking brake.
9. Ensure that all controls are in neutral position.
10. Turn ignition switch to STOP. See "Shut Down" on page 46.
11. Tie down unit.



## Tie Down

### Points

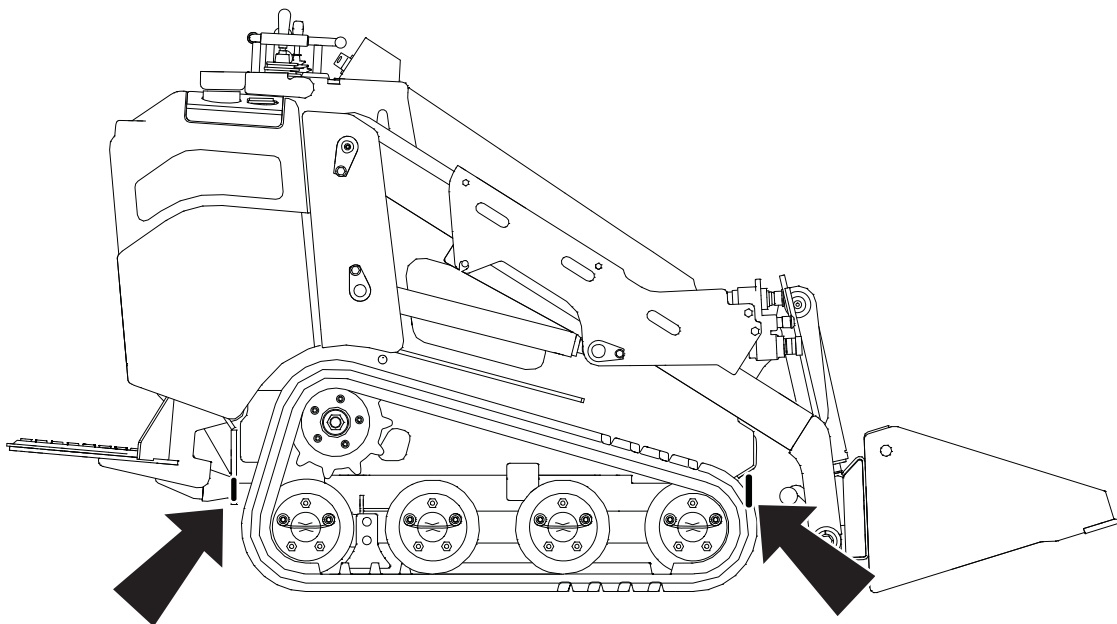
Tiedown points are identified by tiedown decals. Securing to truck or trailer at other points is unsafe and can damage machinery.



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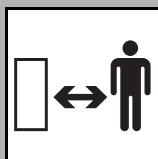
### Procedure

Loop tiedowns around unit at tiedown points. Make sure tiedowns are tight before transporting.



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## Unload



Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

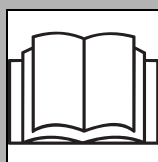
### To help avoid injury:

- Load and unload trailer on level ground.
- Attach trailer to vehicle before loading or unloading.
- Only operate unit from operator platform.
- If unloading from tilt-bed trailer, be prepared for trailer to tilt.

1. Prepare trailer and ramps for unloading.
2. Remove tiedowns.
3. Start engine.
4. Release parking brake.
5. Pull lift arm control to raise attachment plate (and attachment) off ground, but keep it low.
6. Adjust throttle to low speed and slowly back unit down trailer or ramps.



## Retrieve



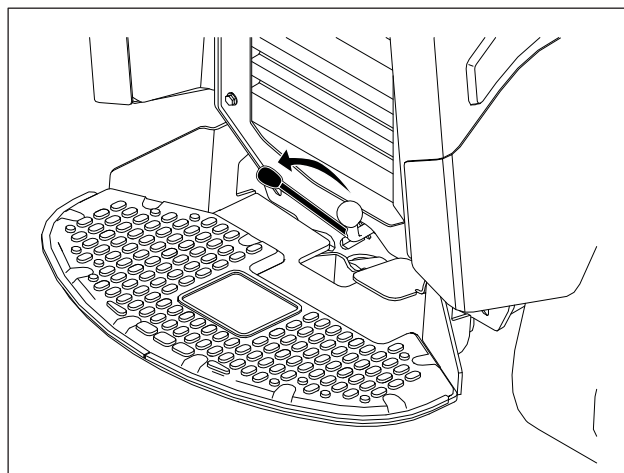
Read operator's manual. Follow safety rules and know how to use all controls. Your safety is at stake 273-475

Under normal conditions, unit should not be towed. If unit breaks down and retrieval is necessary:

- tow for no more than 100' (30 m) at less than 1 mph (1.6 km/h),
- use towing chains appropriately rated for maximum towing force,
- use no more than 1,300 lb (5800 N) of towing force,
- steering will be difficult

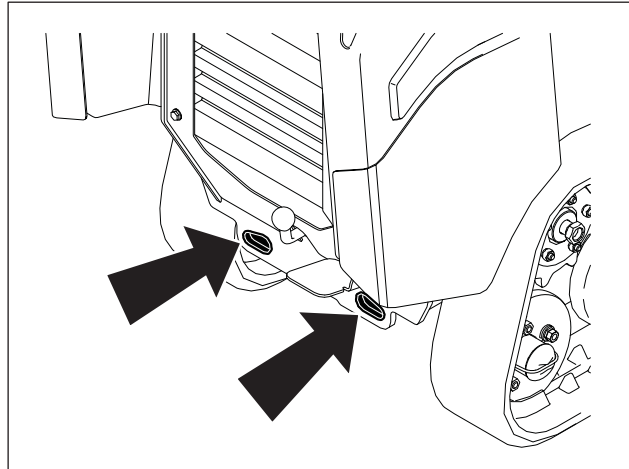
## Procedure

1. Set parking brake (shown). See "Parking brake lever" on page 28.
2. Block tracks to prevent unit from rolling.



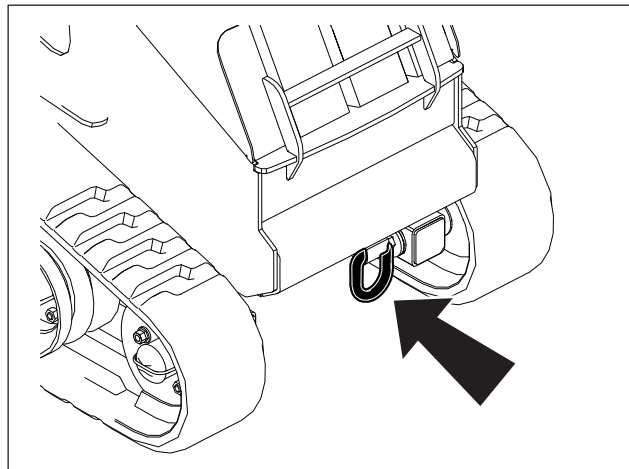
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3. Attach tow line to tow points shown facing towing vehicle. (Operator station not shown in graphic.)



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rear tow point



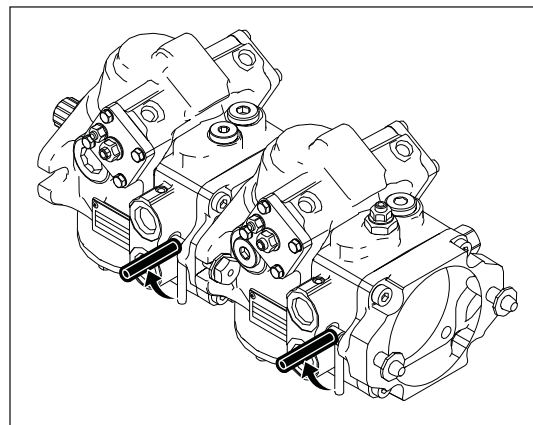
t51om020w.eps

front tow point

4. Activate tow valves on both front and rear pumps by turning levers into position as shown.

**NOTICE:** When bypass valves are open, only parking brake is functional.

5. Remove blocks.
6. Release parking brake.
7. After towing, turn levers back into operating position.



t51om032w.eps





# Complete the Job

## Chapter Contents

Rinse Equipment ..... 56

Disconnect Attachment ..... 56

Stow Tools ..... 56





## Rinse Equipment

1. Spray water onto equipment to remove dirt and mud.

**NOTICE:**

- Do not spray water onto operator's console. Electrical components could be damaged. Wipe down instead.
- Ensure all mud and debris is rinsed from undercarriage, paying special attention to brake pin area.
- Ensure all mud and debris is rinsed from tracks and track sprockets.

2. Open hood and allow unit to cool. Remove debris from inside of unit.

## Disconnect Attachment

1. Lower attachment to the ground.
2. Turn off engine. See "Shut Down" on page 46.
3. Disengage lock pins by turning handles away from center of attachment.
4. Cycle attachment drive control and disconnect hydraulic hoses, if used.
5. Start engine. See "Start Unit" on page 44.
6. Tilt attachment plate forward and back unit away from attachment.

## Stow Tools

Make sure all tools and accessories are loaded and properly secured on trailer.

# Service



## Chapter Contents

**Service Precautions . . . . . 58**

- Working Under Raised Lift Arms . . . . . 58
- Welding Precaution . . . . . 59
- Washing Precaution . . . . . 59

**Recommended Lubricants/Service Key . . . . . 60**

**Engine Oil Temperature Chart . . . . . 61**

**10 Hour . . . . . 63**

**50 Hour . . . . . 67**

**100 Hour. . . . . 69**

**300 Hour . . . . . 70**

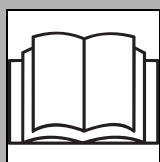
**600 Hour . . . . . 73**

**900 Hour. . . . . 74**

**1200 Hour. . . . . 74**

**As Needed . . . . . 75**

## Service Precautions

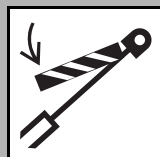


**WARNING** Read operator's manual. Follow safety rules and know how to use all controls. Your safety is at stake. 273-475

### To help avoid injury:

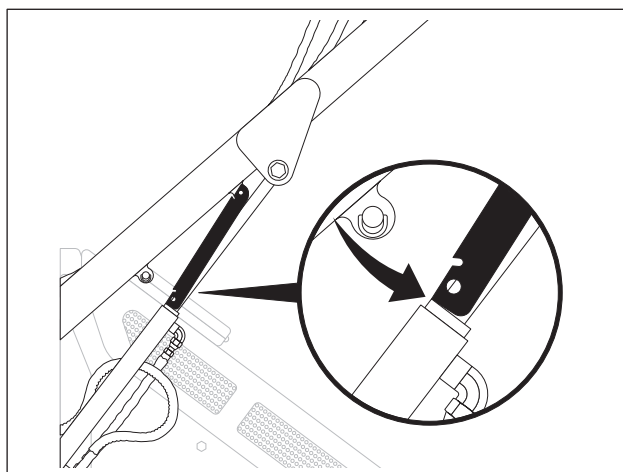
- Unless otherwise instructed, all service should be performed with engine off.
- Refer to engine manufacturer's manual for engine maintenance instructions.
- Lower unstowed attachments to ground before servicing equipment.

## Working Under Raised Lift Arms



**WARNING** Crushing weight. Place cylinder lock on extended cylinder and secure. 273-231

Remove attachments and use safety supports as indicated when working under raised lift arms.



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## Welding Precaution












**NOTICE:** Welding can damage electronics.

- Disconnect battery at battery disconnect switch, if equipped, or disconnect battery cables before welding to prevent damage to battery.
- Do not turn off battery disconnect switch with engine running or alternator and other electronic devices may be damaged.
- Welding currents can damage electronic components. Always disconnect the ECU ground connection from the frame, harness connections to the ECU, and other electronic components prior to welding on machine or attachments. Connect welder ground clamp close to welding point and ensure no electronic components are in the ground path.

## Washing Precaution

**NOTICE:** Water can damage electronics. When cleaning equipment, do not spray electrical components with water.

## Recommended Lubricants/Service Key

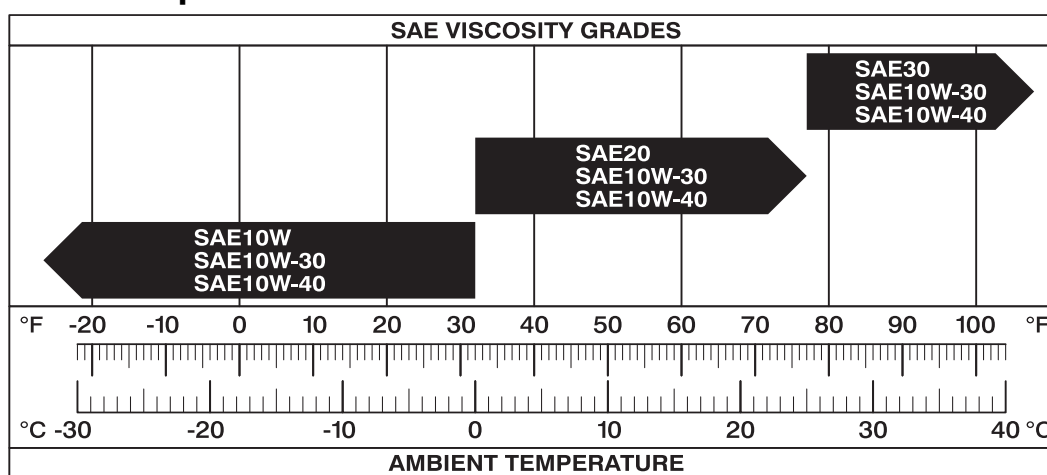
Item	Description		
 DEO	<b>U.S., Canada, EU, Japan:</b> Diesel engine oil meeting or exceeding API service classification CH-4 (CH-4, CI-4, or CJ-4) or ACEA E7 (E6, E7, or E9). See viscosity chart.		
 DEO	<b>Less regulated markets (outside the U.S., Canada, EU, Japan):</b> Diesel engine oil compatible with the sulfur content of the fuel used. If the fuel sulfur content exceeds 500 ppm (500 mg/kg) the oil's base number (TBN) should exceed 10. If the fuel sulfur content exceeds 5000 ppm (5000 mg/kg) the oil change interval should be reduced to every 50 hours. See viscosity chart.		
 DEAC	Low silicate, fully formulated diesel engine antifreeze/coolant meeting ASTM D6210.		
 THF	Tractor hydraulic fluid, similar to Phillips 66 <sup>®</sup> HG, Mobilfluid <sup>®</sup> 423, Chevron <sup>®</sup> Tractor Hydraulic Fluid, Texaco <sup>®</sup> TDH Oil, or equivalent		
 MPG	Multipurpose grease meeting NLGI GC-LB Grade 2		
	Check level of fluid or lubricant		Check condition
	Filter		Change, replace, adjust, service or test

Proper lubrication and maintenance protects Ditch Witch<sup>®</sup> equipment from damage and failure. Service intervals listed are for minimum requirements. In extreme conditions, service machine more frequently. Use only genuine Ditch Witch parts, filters, approved lubricants, TJC, and approved coolants to maintain warranty. Fill to capacities listed in "Specifications" on page 79.

For more information on engine lubrication and maintenance, see your engine manual.

**IMPORTANT:** Use the "Service Record" on page 89 to record all required service to your machine.

## Engine Oil Temperature Chart



t18om049a.eps

Temperature range anticipated before next oil change

For more information on engine lubrication and maintenance, see your engine manual.

## Approved Coolant

This unit was filled with Fleetguard® ES Compleat™ coolant (**blue** in color) before shipment from factory. This coolant is available, pre-diluted, from your Ditch Witch® dealer as part number 255-1055. Add or replace with heavy duty diesel engine coolant meeting ASTM D6210.

### NOTICE:

- Use only pre-diluted coolant or concentrated coolant mixed with distilled water. Do not use tap water.
- Do not use water or high-silicate automotive-type coolant. This will lead to engine damage or premature engine failure.
- Do not mix heavy-duty diesel engine coolant and automotive-type coolant. This will lead to coolant breakdown and engine damage.

## Approved Fuel

### U.S., Canada, EU, and Japan

**⚠ WARNING**

Avoid static electricity when fueling. Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations. Avoid death or serious injury from fire or explosion. Consult with your fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

This engine is designed to run on diesel fuel. Use only high quality fuel meeting ASTM D975 No. 2D, EN590, or equivalent. At temperatures below 32°F (0°C) winter fuel blends are acceptable. See the engine operation manual for more information.

**NOTICE:** Use only Ultra Low Sulfur Diesel (less than 15ppm sulfur content in US and Canada or 10 mg/kg sulfur content in Japan) in this unit. Operating with higher sulfur content will increase emissions and violate regulations.

Biodiesel blends up to 5% (B5) are approved for use in this unit. The fuel used must meet the specifications for diesel fuel shown above. In certain markets, higher blends may be used if certain steps are taken. Extra attention is needed when using biodiesel, especially when operating in cold weather or storing fuel. Contact your Ditch Witch® dealer or the engine manufacturer for more information.

### Less Regulated Markets (Outside the U.S., Canada, EU, and Japan)

This engine is designed to run on diesel fuel. Use only high quality fuel meeting ASTM D975 No. 2D, EN590, or equivalent. At temperatures below 32°F (0°C) winter fuel blends are acceptable. See the engine operation manual for more information.

**IMPORTANT:** Fuel sulfur content should be less than 10,000 ppm (10,000 mg/kg). Worldwide, fuel sulfur regulations vary widely. Fuel used should always comply with local regulations. Prior to shipping, this unit was filled with API CJ-4 DEO. If operating fuel with sulfur content above 500 ppm (500 mg/kg), change oil initially at 50 hours.

Biodiesel blends up to 5% (B5) are approved for use in this unit. The fuel used must meet the specifications for diesel fuel shown above. In certain markets, higher blends may be used if certain steps are taken. Extra attention is needed when using biodiesel, especially when operating in cold weather or storing fuel. Contact your Ditch Witch dealer or the engine manufacturer for more information.

## Startup/10 Hour

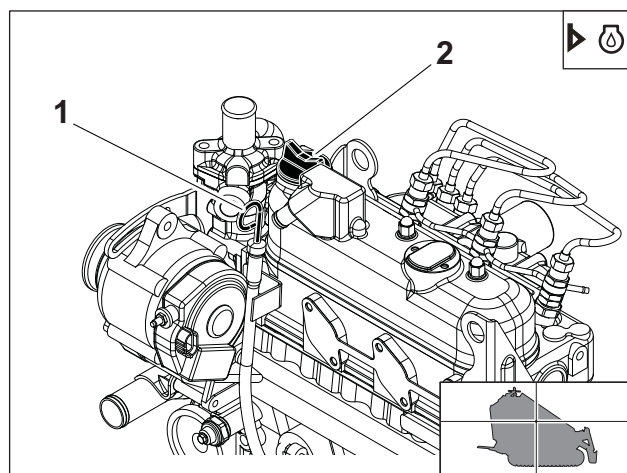


Location	Task	Notes
	Check engine oil level	DEO
	Check engine air filter service indicator	
	Check engine coolant level	DEAC
	Check hydraulic fluid level	THF
	Check brake operation	
	Check track tension	
	Check lug nut torque	80 ft•lb (108 N•m)
	Check hydraulic hoses	

### Check Engine Oil Level

**IMPORTANT:** See "Recommended Lubricants/Service Key" on page 60.

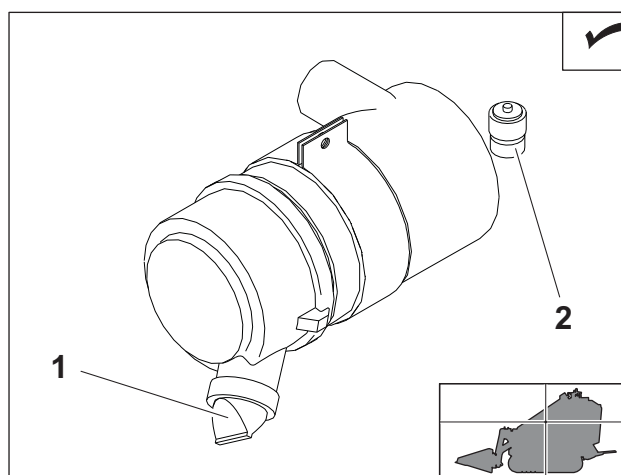
Check engine oil level at dipstick (1) at startup and every 10 hours on level surface at least 15 minutes after stopping engine. Add DEO at fill (2) as necessary to keep oil level at highest line on dipstick.



t35om009w.eps

### Check Engine Air Filter Service Indicator

Check air filter service indicator (2) and dust ejector (1) at startup and every 10 hours and change filter as needed. See "Change Air Filter" on page 75.

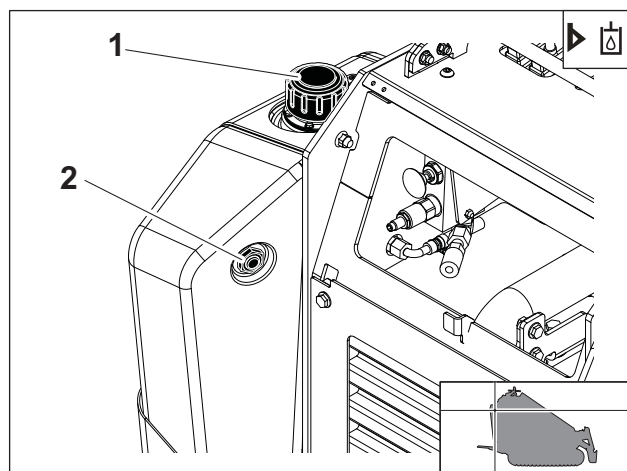


t51om026w.eps



## Check Hydraulic Fluid Level

Check hydraulic fluid level at sight glass (2) at startup and every 10 hours. Maintain fluid level at midway point on sight glass when engine is off, cylinders are fully retracted, and fluid is cool. Add THF at fill (1) as needed.

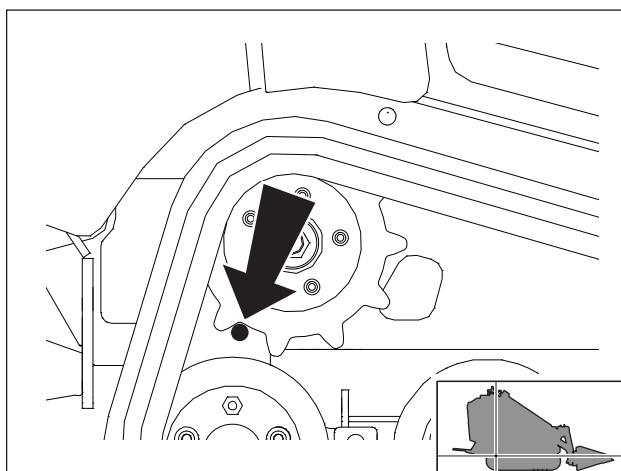


t35om013w.eps

## Check Brake Operation

Check brake operation at startup and every 10 hours or more often when conditions warrant.

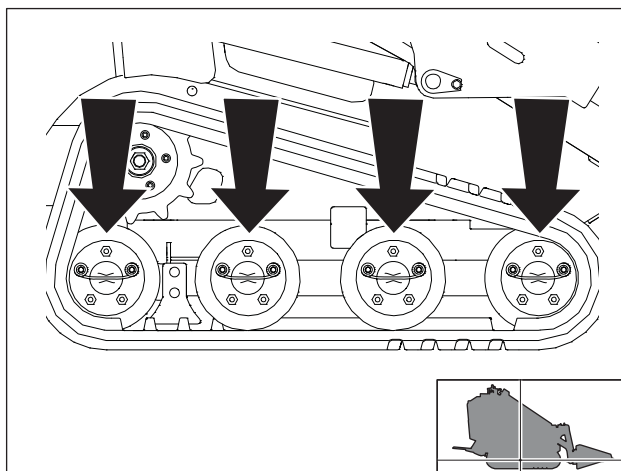
- Ensure parking brake pin (shown) moves freely allowing brake to be set and released.
- Clean mud and debris from area around pin.



t51om023w.eps

## Check Lug Nut Torque

Check lug nut torque at 10 hours, 50 hours and every 200 hours thereafter. Tighten to 80 ft•lb (108 N•m) as needed.



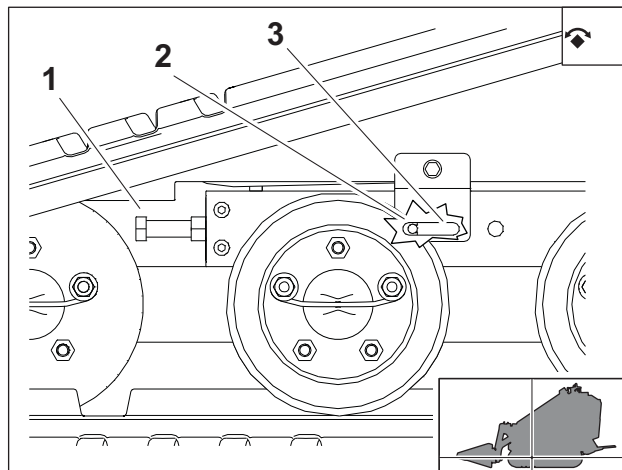
t51om024w.eps

## Check Track Tension

Check track tension at startup and every 10 hours and adjust as needed.

### To adjust:

1. Remove cover.
2. Turn bolt (1) clockwise to tighten and counterclockwise to loosen.
3. Align mark on tube (3) into cutout on plate (2).
4. Replace cover.

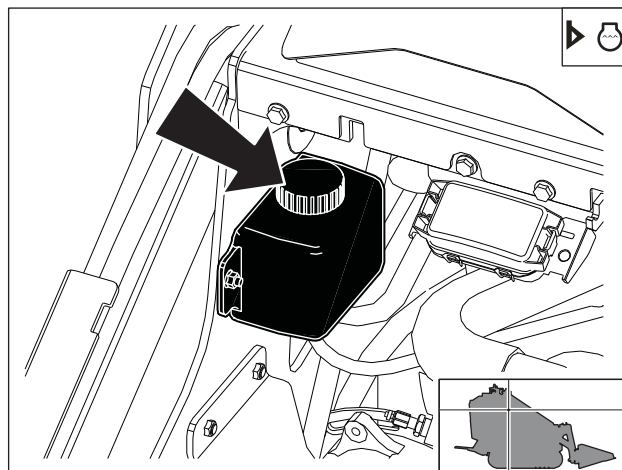


t510m025w.eps

## Check Coolant Level

**IMPORTANT:** See "Approved Coolant" on page 61.

Check coolant level, with engine cool and unit on level ground, at overflow bottle (shown) at startup and every 10 hours. Maintain coolant level at halfway point on bottle. If low, add approved coolant. Do not overfill.



t510m006w.eps



## Check Hydraulic Hoses

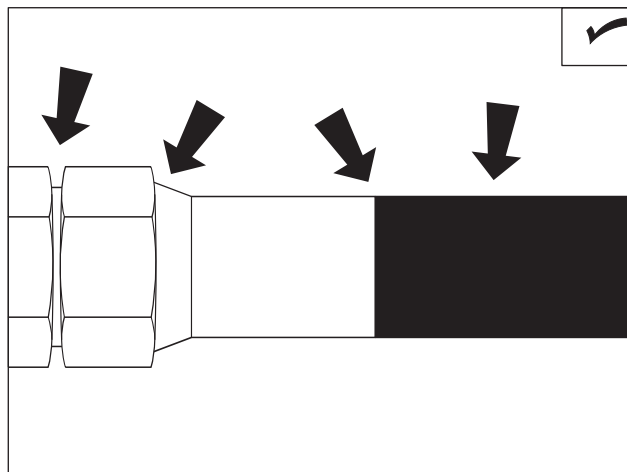


**WARNING** Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use. 270-6035

### To help avoid injury:

- Use a piece of cardboard or wood, rather than hands, to search for leaks.
- Wear protective clothing, including gloves and eye protection.
- Before disconnecting a hydraulic line, turn engine off and operate all controls to relieve pressure.
- Lower, block, or support any raised component with a hoist.
- Cover connection with heavy cloth and loosen connector nut slightly to relieve residual pressure. Catch all fluid in a container.
- Before using system, check that all connections are tight and all lines are undamaged.
- If you are injured, seek immediate medical attention from a doctor familiar with this type of injury.

Check hydraulic hoses for leaks at startup and every 10 hours.



## 50 Hour



Location	Task	Notes
	Change engine oil and filter	initial, 3.9 qt (3.7 L) DEO
	Change hydraulic fluid filter	initial
	Check fuel hose and clamp band	
	Check radiator/hydraulic fluid cooler for dirt and debris	
	Check lug nut torque	80 ft•lb (108 N•m)

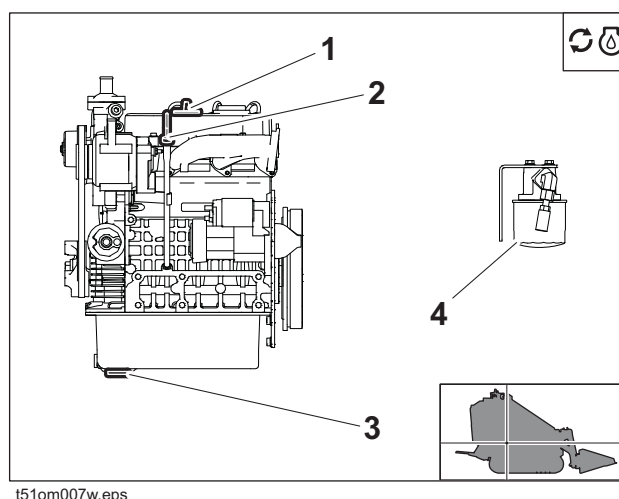
### Change Engine Oil and Filter (Initial)

Change engine oil after 50 hours.

**IMPORTANT:** See "Recommended Lubricants/Service Key" on page 60.

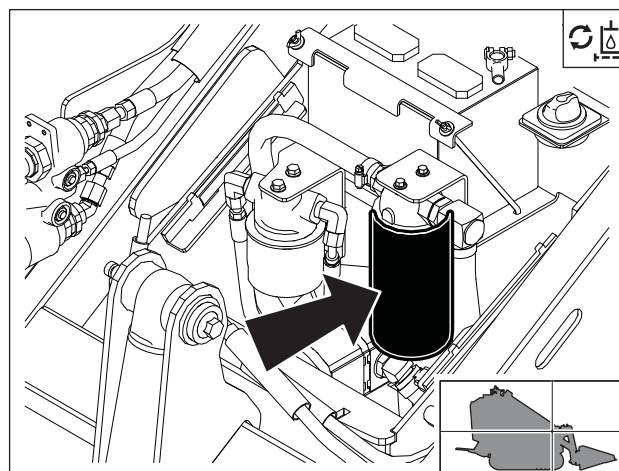
#### To change:

1. While oil is warm, remove drain plug (3). Drain oil and replace plug.
2. Remove filter (4) and replace with new filter each time oil is changed. Add DEO at fill (1) until oil level is at highest capacity on dipstick (2). Capacity is 3.9 qt (3.7 L).



### Change Hydraulic Filter

Change hydraulic filter (shown) after 50 hours.

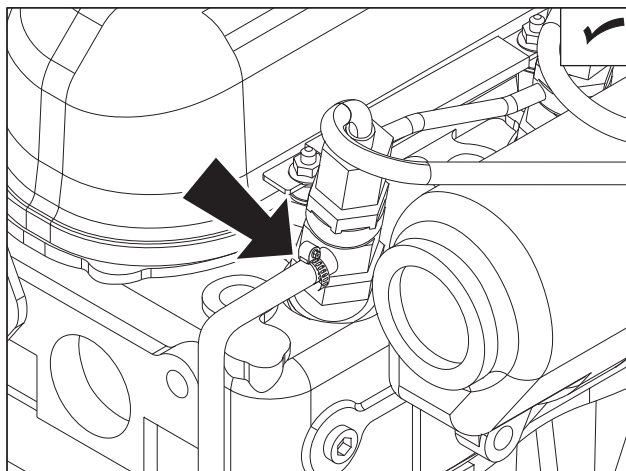


## Check Fuel Hose and Clamp Bands

Check fuel hose (shown) and clamp bands every 50 hours.

If the clamp is loose, apply oil to the threads and retighten it. If the hose is worn, replace it.

Bleed the fuel system if the hose and/or clamp is changed.

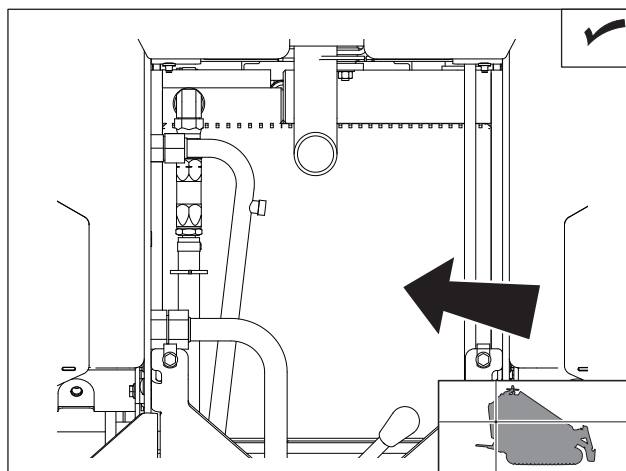


t180m053t.eps

## Check Radiator/Fluid Cooler

Check radiator/hydraulic fluid cooler for dirt, grass, and other foreign matter every 50 hours. Clean out with compressed air or spray wash if required. Be careful not to damage fins with high-pressure air or water. Check more often if operating in dusty or grassy conditions.

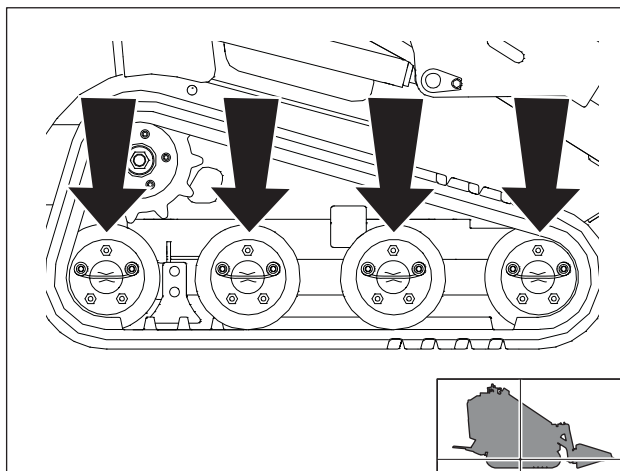
Check radiator hoses for wear. Check hose clamps for proper tightness.



t350m020w.eps

## Check Lug Nut Torque

Check lug nut torque at 50 hours and every 200 hours thereafter. Tighten to 80 ft•lb (108 N•m) as needed.



t510m024w.eps

## 100 Hour



Location	Task	Notes
	Change engine oil and filter	3.9 qt (3.7 L) DEO
	Check fan belt tension and condition	1/4-1/3" (7-9 mm)

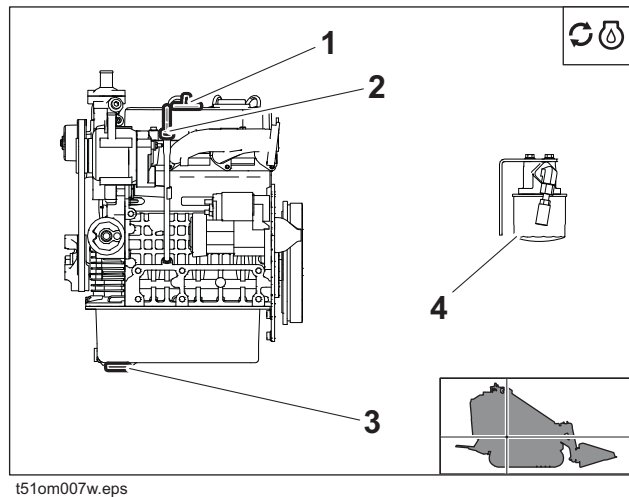
### Change Engine Oil and Filter

Change engine oil every 100 hours.

**IMPORTANT:** See "Recommended Lubricants/Service Key" on page 60.

#### To change:

1. While oil is warm, remove drain plug (3). Drain oil and replace plug.
2. Remove filter (4) and replace with new filter each time oil is changed. Add DEO at fill (1) until oil level is at highest capacity on dipstick (2). Capacity is 3.9 qt (3.7 L).

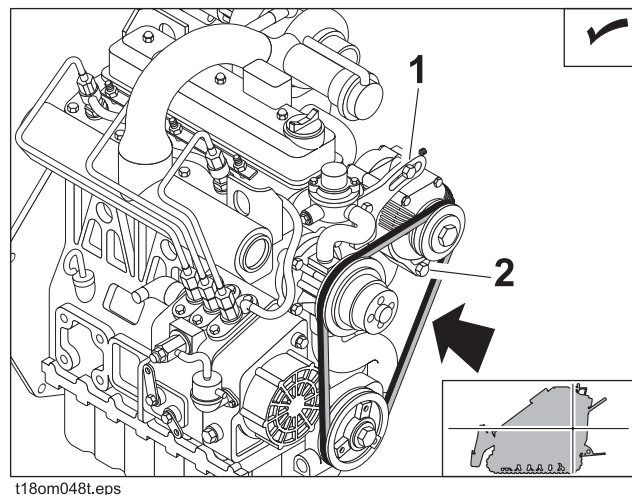


### Check Fan Belt Tension and Condition

Check belt tension every 100 hours. Belt is properly tensioned when it moves about 1/4-3/8" (7-9 mm) when pushed at the long span (shown). Replace the belt when it is worn and sinks into the pulley groove. See "Change Fan Belt" on page 73.

#### To adjust:

1. Loosen two alternator bolts (1,2).
2. Adjust position as needed.
3. Tighten bolts.
4. Check tension.



## 300 Hour

Location	Task	Notes
	Check intake air line	1/4-1/3" (7-9 mm)
	Change hydraulic filter	
	Check lug nut torque	80 ft•lb (108 N•m)
	Check idler roller bearings	

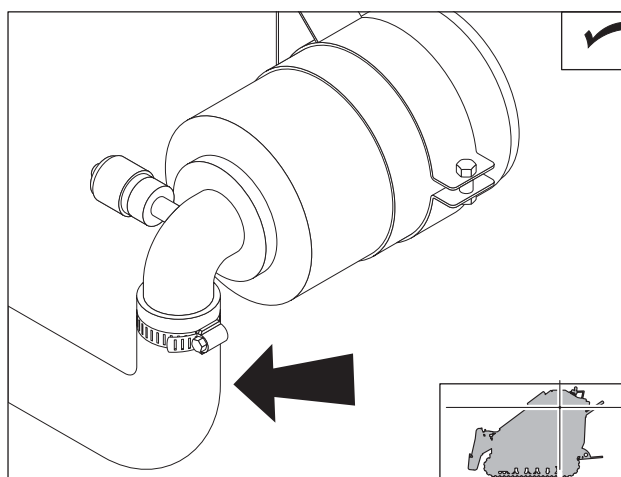
### Check Intake Air Line

Check the intake air line every 300 hours.

**NOTICE:** Keep dust out of the intake air line to prevent damage to the engine.

If the clamp is loose, apply oil to the threads and retighten it.

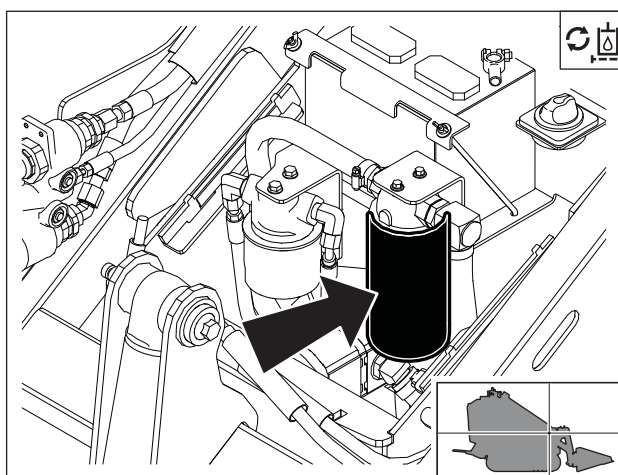
If the hose appears cracked or worn, replace it.



t180m056t.eps

### Change Hydraulic Filter

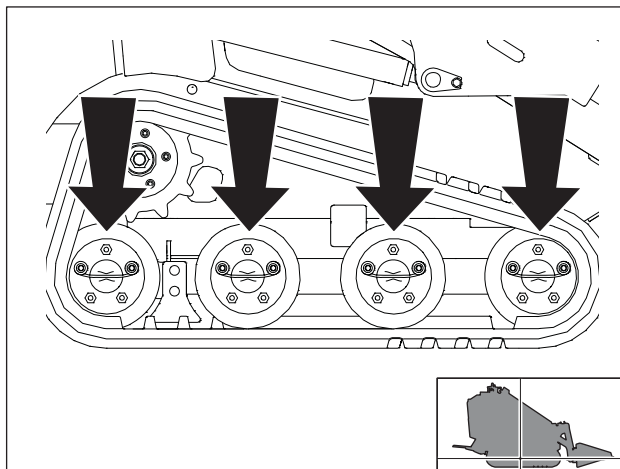
Change hydraulic filter every 300 hours.



t510m004w.eps

## Check Lug Nut Torque

Check lug nut torque at 10 hours, 50 hours and every 300 hours thereafter. Tighten to 80 ft•lb (108 N•m) as needed.



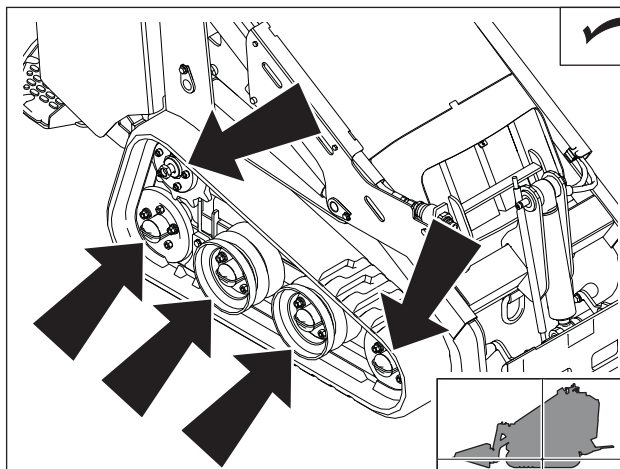
t510m024w.eps

## Check Idler Roller Bearings

Check for proper positioning of idler roller bearings every 300 hours.

### To check:

1. Lift unit off ground.
2. Release track tension. See "Check Track Tension" on page 65.
3. Check for movement of each hub when rocked back and forth. If hub has noticeable movement, adjust idler roller bearing. See "Adjust Idler Roller Bearings" on page 76.
4. Adjust track tension.



t510m027w.eps



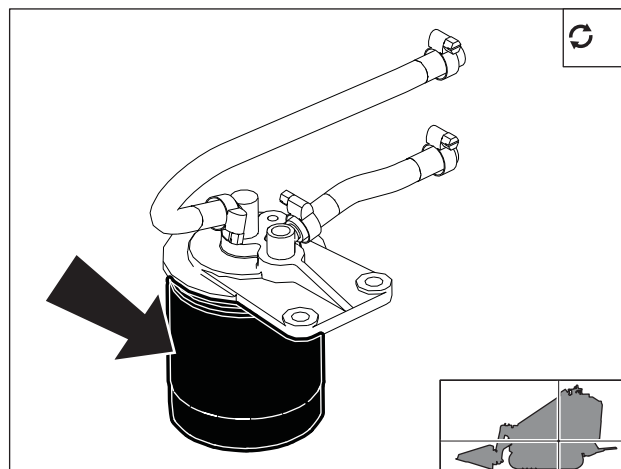


## 400 Hours

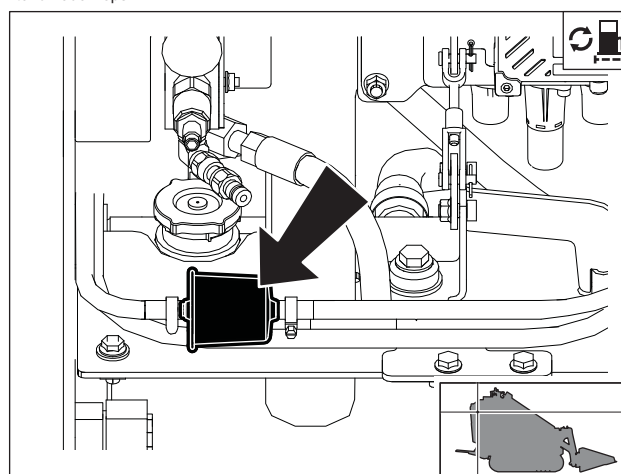
### Change Fuel Filters

Change fuel filters every 400 hours. If you refuel from cans, replace filters more often.

See parts manual or contact your Ditch Witch® dealer for correct replacement filter.



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t51om005w.eps

## 600 Hour

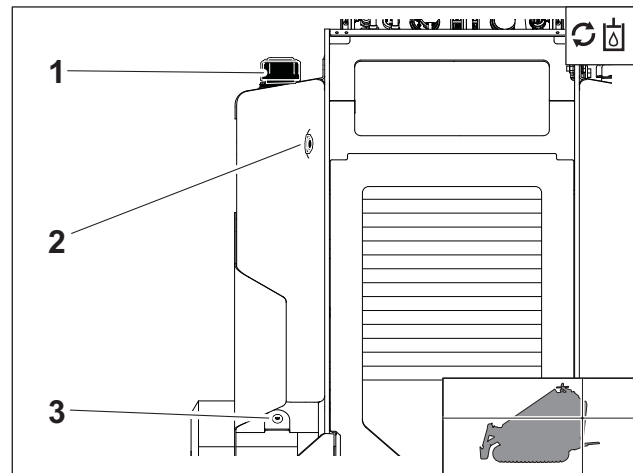


Location	Task	Notes
	Change hydraulic fluid and filter	
	Change fan belt	

### Change Hydraulic Fluid and Filter

Change hydraulic fluid and filter every 600 hours. Change every 250 hours if jobsite temperature exceeds 100°F (38°C) more than 50% of the time.

1. Remove drain plug (3).
2. Drain fluid and replace plug.
3. Change filter. See page 69.
4. Add THF at fill (1) until fluid level is at halfway point on sight glass (2). Capacity is 9.2 gal (35 L).



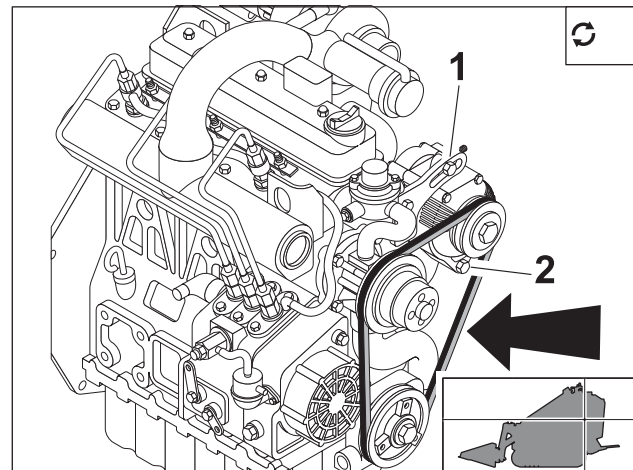
t35om029w.eps

### Change Fan Belt

Change fan belt every 600 hours. Belt is properly tensioned when it moves about 1/4-3/8" (7-9 mm) when pushed at the long span (shown).

#### To change:

1. Loosen two alternator bolts (1,2).
2. Replace fan belt. Adjust position as needed.
3. Tighten bolts.
4. Check tension.



t51om033w.eps

## 900 Hours

### Adjust Valve Clearance

Adjust valve clearance every 900 hours.

To adjust, see a certified Kubota® engine technician.

**NOTICE:** If valve clearance is adjusted by anyone other than a certified Kubota engine technician, engine warranties could be voided. Please see engine manual for more information.

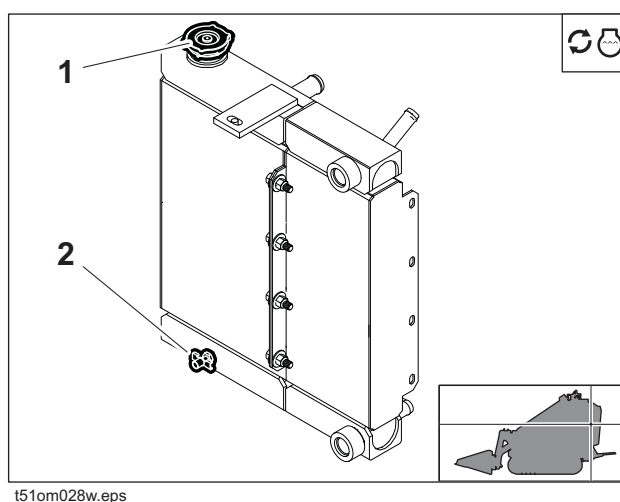
## 1200 Hour

### Change Engine Coolant

Drain cooling system at drain (2). Add approved coolant at fill (1) every two years or 1200 hours.

**NOTICE:**

- The use of non-approved coolant may lead to engine damage or premature engine failure and will void engine warranty.
- See "Approved Coolant" on page 61.



## As Needed

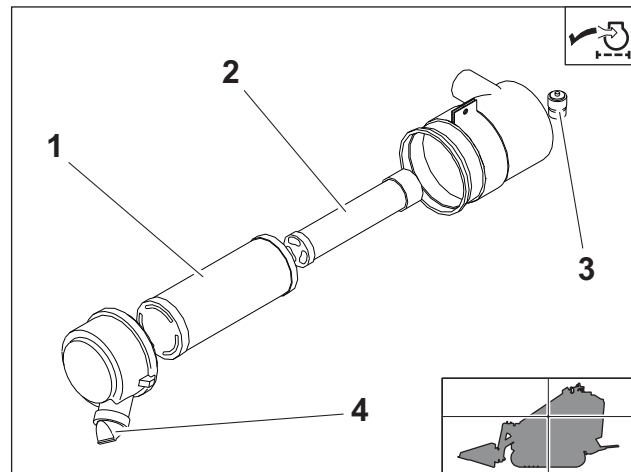


Location	Task	Notes
	Change air filter	
	Adjust idler roller bearings	
	Check battery	
	Charge battery	

### Change Air Filter

Change air filter when red band on indicator (3) is visible. Replace secondary element (2) every third change of primary filter (1) or any time primary element has become damaged.

1. Open air filter housing at latches.
2. Remove primary element.
3. Wipe inside of housing and end cap and clean dust ejector valve (4).
4. Insert new secondary element if necessary and ensure it is seated correctly.
5. Insert new primary element.
6. Latch air filter housing with dust ejector facing downward.
7. Reset air filter service indicator.



t51om010w.eps

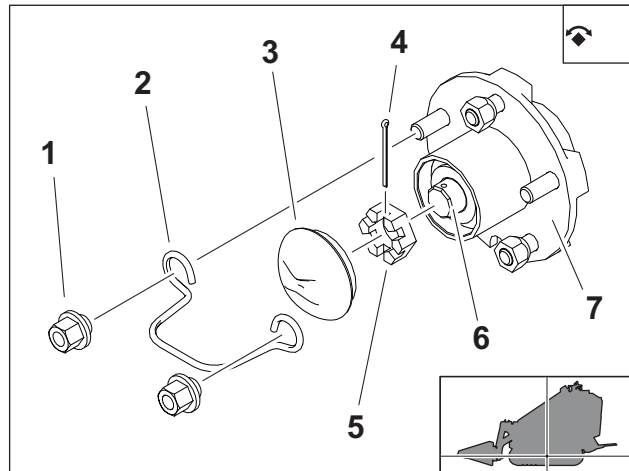
**NOTICE:** Only open the air filter housing when red band on indicator is visible. Change the elements. Do not attempt to clean them.

- Improperly installed primary element can lead to premature engine failure.
- Compressed air or water may damage filter elements.
- Tapping filter elements to loosen dirt may damage the elements.

## Adjust Idler Roller Bearings

Adjust idler roller bearings to keep dirt, grass, and other foreign matter from damaging bearings as needed when hubs become loose.

1. Release track tension. See "Check Track Tension" on page 65.
2. Remove lug nuts (1) to remove dust cap retainer (2).
3. Remove dust cap (3).
4. Remove cotter pin (4).
5. Ensure bearings are properly seated by tightening castle nut (5) to 30-40 ft•lb (40.7-54.2 N•m) while turning the hub (7).



**IMPORTANT:** Do not move the hub after this step is completed.

6. Loosen the castle nut.
7. Hand-tighten the castle nut.
8. Insert the cotter pin into the wheel spindle (6).

**NOTICE:** If hole is visible in slot but cotter pin cannot be inserted, slightly loosen or tighten castle nut to align slot with hole and insert cotter pin. If hole is not visible in slot, loosen to next available slot and install cotter pin.

9. Bend the legs of the cotter pin over the top of the spindle.

**IMPORTANT:** The hub should not have noticeable movement when rocked back and forth.

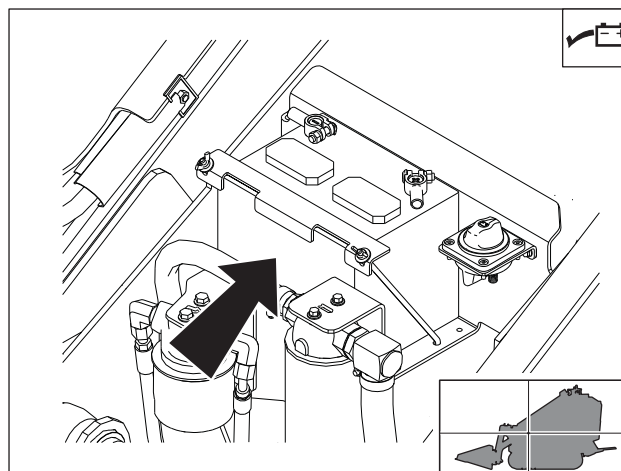
10. Replace dust cap retainer and lug nuts. Tighten lug nuts to 80 ft•lb (108 N•m).
11. Adjust track tension.

## Check Battery

Check battery as needed. Keep battery clean and terminals free of corrosion.

### To clean:

1. Turn battery disconnect switch, if equipped, to the off position.
2. Ensure that no ignition sources are near batteries.
3. Loosen and remove battery cable clamps carefully, **negative (-)** cable first.
4. Clean cable clamps and terminals to remove dull glaze.
5. Check for signs of internal corrosion in cables.
6. Connect battery cable clamps, **positive (+)** cable first.
7. Tighten any loose connections.
8. Ensure that battery tiedowns are secure.
9. Turn battery disconnect switch to the on position.



t51om030w.eps



### **WARNING**

Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.

**To help avoid injury:** Do not create sparks and do not short across battery terminals for any reason.



## Charge Battery

**⚠ WARNING**

Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.

**To help avoid injury:**

- Use a single 12V maximum source for charging. Do not connect to rapid chargers or dual batteries.
- Use caution and wear personal protective equipment such as safety eyewear, when charging or cleaning battery.
- Keep sparks, flames, and any ignition source away from batteries at all times. Internal contents are extremely hazardous. Leaking fluid is corrosive. Battery may be explosive at higher temperatures.
- NEVER lean over battery when making connections.
- Do not allow vehicles to touch when charging.
- Do not attempt to charge a battery that is leaking, bulging, heavily corroded, frozen, or otherwise damaged.
- NEVER short-circuit battery terminals for any reason or strike battery posts or cable terminals.
- Refer to MSDS for additional information regarding this battery.

**Before You Start**

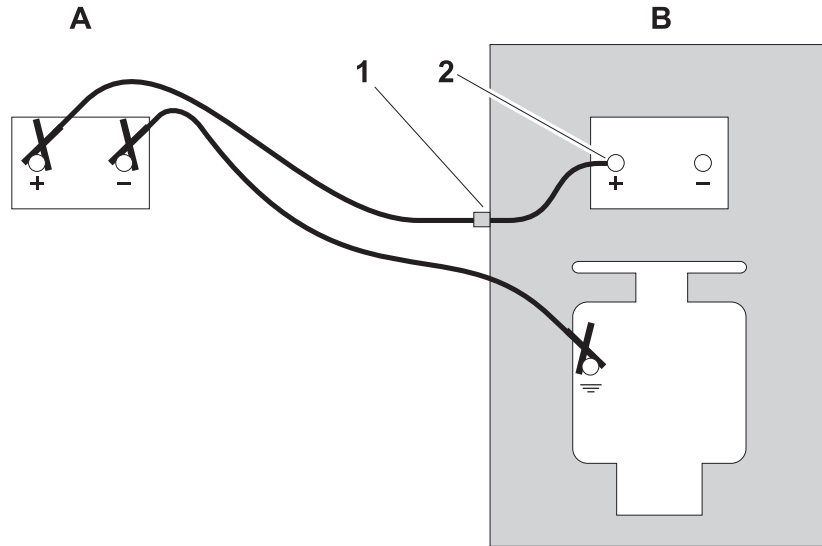
Electronic components can be easily damaged by electrical surges. Jump starting can damage electronics and electrical systems, and is not recommended. Try to charge the battery instead. Use quality large diameter jumper cables capable of carrying high currents (400 amps or more). Cheap cables may not allow enough current flow to charge a dead/discharged battery.

Read all steps thoroughly and review illustration before performing procedure.

**Charging Procedure (Engine Off)**



1. Park service vehicle close to disabled equipment but do not allow vehicles to touch. Set parking brake in both vehicles.
2. Turn the ignition switch to the OFF position in both vehicles, and turn off all electrical loads. Disconnect the machine controller.



3. Inspect battery in disabled vehicle (B) for signs of cracking, bulging, leaking, or other damage. Connect red positive (+) jumper cable clamp to positive (+) post (2) of battery in disabled vehicle first.

**IMPORTANT:** Some equipment may have a positive jumper cable terminal (1) located externally. If so equipped, connect red positive (+) jumper cable clamp to terminal.

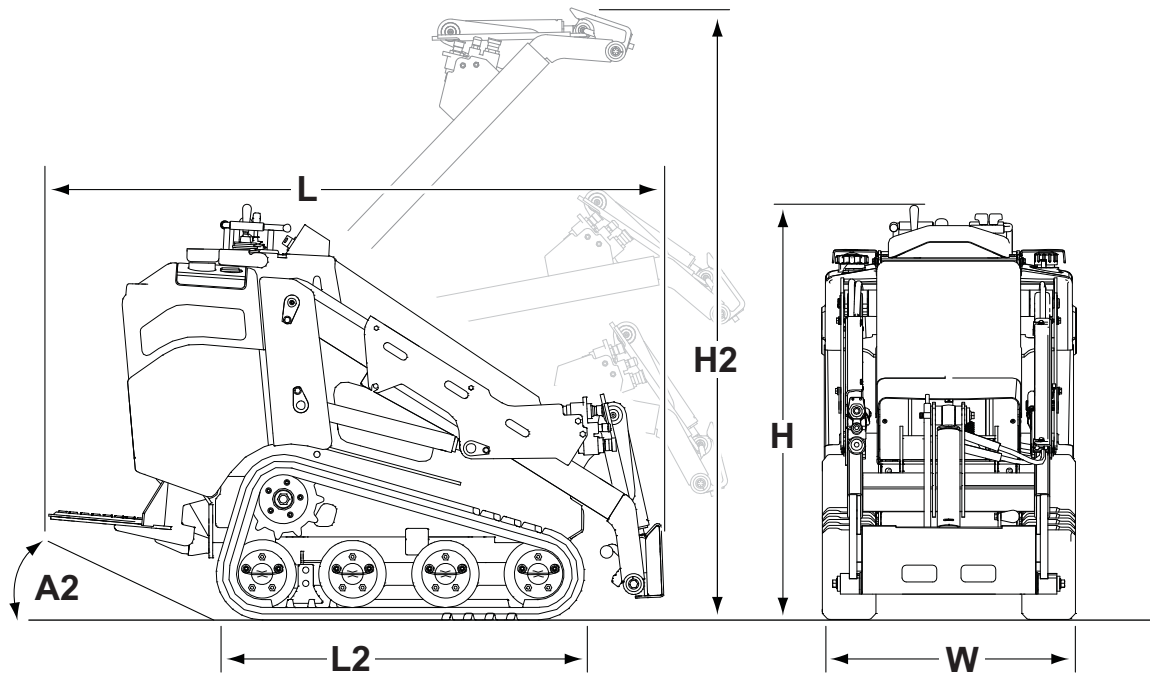
4. Connect the other red positive (+) jumper cable clamp to positive (+) post of battery (A) in the service vehicle.
5. Connect black negative (-) cable clamp to negative (-) post of battery (A) in service vehicle.
6. Connect the other black negative (-) cable clamp to the engine or frame ground on the disabled vehicle, at least 12" (305 mm) from the failed battery, as shown.
7. Operate service vehicle engine at 1500-2000 rpm for a few minutes to build an electrical charge in the failed battery.
8. Stop engine in service vehicle.
9. Remove jumper cables from the service vehicle, black negative (-) clamp first. Do not allow clamps to touch.
10. Remove black negative (-) cable clamp from the disabled engine or frame ground first.
11. Remove red positive (+) cable clamp from the disabled vehicle positive (+) battery post last.
12. Reconnect machine controller and try to start disabled vehicle.

If the disabled vehicle did not start, check for loose or corroded battery cable connections. Poor connections will prevent current from charging the failed battery. Clean terminals and posts if necessary and repeat steps above.





# Specifications



t51om036w.eps

Dimensions		U.S.	Metric
H2	Hinge pin height, max	76 in	1930 mm
	Operating height, max, standard bucket	103 in	2630 mm
H	Overall height of machine	54 in	1390 mm
L	Overall length of loader, no attachment	80 in	2040 mm
	Overall length of machine, with standard bucket	105 in	2680 mm
L2	Wheelbase/track length	36 in	914 mm
A2	Angle of departure	27°	27°
	Ground clearance, min (center/side)	8.2 in / 3.8 in	207 mm / 96 mm
W	Track width	33.5 in	850 mm
	Unit width, excluding tracks	33 in	838 mm
	Dump height, max, with standard bucket	53 in	1355 mm
	Reach, standard bucket at max dump height	25 in	640 mm
	Bucket rollback angle, ground level	30°	30°

Dimensions		U.S.	Metric
	Bucket rollback angle, full height	103°	103°
	Dump angle, standard bucket at max dump height	40°	40°
	Bucket width, max	44 in	1120 mm
	Bucket width, min	34 in	863 mm
	Swing radius, max, with standard bucket	61 in	1550 mm
	Swing radius, no attachment	45 in	1160 mm
	Rear overhang, max	28 in	711 mm

Performance	U.S.	Metric
Ground drive speed, forward and reverse	4.1 mph	6.6 km/h
Ground pressure, 7" (180 mm) tracks *	4.8 psi	0.33 bar
Tipping capacity  The rated operating capacity for this machine was determined using a standard bucket in the drive position with center of gravity 7 in (18 cm) from the attachment plate. Depending on the attachment, the actual operating capacity of the attachment may vary.	1725 lb	782 kg
Operating capacity (35% of tipping capacity)	600 lb	272 kg
Machine weight (no attachment, fluids full)	2418 lb	1096 kg

\* Includes machine weight, 175-lb (80-kg) bucket, 165-lb (75-kg) operator

### Battery

SAE reserve capacity 85 min, SAE cold crank @ 0°F (-18°C) 525 amp, 12V electrical system

Fluid Capacities	U.S.	Metric
Fuel tank	10.5 gal	40 L
Engine oil, with filter	3.9 qt	3.7 L
Hydraulic reservoir	9.2 gal	35 L

Power	U.S.	Metric
Engine: Kubota® D902-E4B, diesel, EPA Tier 4, EU Stage IIIa		
Number of cylinders	3	
Displacement	54.8 in <sup>3</sup>	0.898 L
Bore	2.83 in	72 mm
Stroke	2.9 in	73.6 mm
Manufacturer's gross power rating (per SAE J1955)	24.8 hp	18.5 kW
Estimated net power rating (per SAE 1348)	23.5 hp	17.5 kW
Rated engine speed	3600 rpm	3600 rpm



Hydraulic System	U.S.	Metric
Auxiliary: double gear pump		
Flow rate (pump 1)	6.0 gpm	22.7 L/min
Flow rate (pump 2)	6.0 gpm	22.7 L/min
Pressure	3000 psi	207 bar
Ground drive: dual hydrostat		
Flow rate	12.5 gpm	47.2 L/min
Pressure	3625 psi	250 bar

Noise Levels
Operator 90 dBA sound pressure per ISO 6394    Exterior 104 dBA sound power per ISO 6393

Vibration Level
Average vibration transmitted to the operator's hand during normal operation with a loader bucket is 6.5 m/sec <sup>2</sup> . Average vibration transmitted to the whole body during normal operation with a loader bucket is 0.81 m/sec <sup>2</sup> . Actual vibration will depend upon the attachment being used.

Specifications are called out according to SAE recommended practices. Specifications are general and subject to change without notice. If exact measurements are required, equipment should be weighed and measured. Due to selected options, delivered equipment may not necessarily match that shown.



# Support

## Procedure

Notify your dealer immediately of any malfunction or failure of Ditch Witch equipment.

Always give model, serial number, and approximate date of your equipment purchase. This information should be recorded and placed on file by the owner at the time of purchase.

Return damaged parts to dealer for inspection and warranty consideration if in warranty time frame.

Order genuine Ditch Witch replacement or repair parts from your authorized Ditch Witch dealer. Use of another manufacturer's parts may void warranty consideration.

## Resources

### Publications

Contact your Ditch Witch dealer for publications and videos covering safety, operation, service, and repair of your equipment.



### Ditch Witch® Training

For information about on-site, individualized training, contact your Ditch Witch dealer.

# Warranty

## Ditch Witch® Equipment and Replacement Parts Limited Warranty Policy

Subject to the limitation and exclusions herein, free replacement parts will be provided at any authorized Ditch Witch dealership for any Ditch Witch equipment or parts manufactured by the Ditch Witch factory that fail due to a defect in material or workmanship within one (1) year of first commercial use. Free labor will be provided at any authorized Ditch Witch dealership for installation of parts under this warranty during the first year following "initial commercial" use of the serial-numbered Ditch Witch equipment on which it is installed. The customer is responsible for transporting their equipment to an authorized Ditch Witch dealership for all warranty work.

### Exclusions from Product Warranty

- All incidental or consequential damages.
- All defects, damages, or injuries caused by misuse, abuse, improper installation, alteration, neglect, or uses other than those for which products were intended.
- All defects, damages, or injuries caused by improper training, operation, or servicing of products in a manner inconsistent with manufacturer's recommendations.
- All engines and engine accessories (these are covered by original manufacturer's warranty).
- Tires, belts, and other parts which may be subject to another manufacturer's warranty (such warranty will be available to purchaser).
- ALL IMPLIED WARRANTIES NOT EXPRESSLY STATED HEREIN, INCLUDING ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY.

IF THE PRODUCTS ARE PURCHASED FOR COMMERCIAL PURPOSES, AS DEFINED BY THE UNIFORM COMMERCIAL CODE, THEN THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE HEREOF AND THERE ARE NO IMPLIED WARRANTIES OF ANY KIND WHICH EXTEND TO A COMMERCIAL BUYER. ALL OTHER PROVISIONS OF THIS LIMITED WARRANTY APPLY INCLUDING THE DUTIES IMPOSED.

Ditch Witch products have been tested to deliver acceptable performance in most conditions. This does not imply they will deliver acceptable performance in all conditions. Therefore, to assure suitability, products should be operated under anticipated working conditions prior to purchase.

Defects will be determined by an inspection within thirty (30) days of the date of failure of the product or part by Ditch Witch Product Support (DWPS) or its authorized dealer. DWPS will provide the location of its inspection facilities or its nearest authorized dealer upon inquiry. DWPS reserves the right to supply remanufactured replacement parts under this warranty as it deems appropriate.

Extended warranties are available upon request from your local Ditch Witch dealer or the Ditch Witch factory.

Some states do not allow exclusion or limitation of incidental or consequential damages, so above limitation of exclusion may not apply. Further, some states do not allow exclusion of or limitation of how long an implied warranty lasts, so the above limitation may not apply. This limited warranty gives product owner specific legal rights and the product owner may also have other rights which vary from state to state.

For information regarding this limited warranty, contact the DWPS department, P.O. Box 66, Perry, OK 73077-0066, or contact your local dealer.

**A Note To  
Ditch Witch  
Equipment Owners:**

If your equipment was purchased through a Ditch Witch dealer, there is no need to read further.

However, if you purchased from any other source, please fill out the form on the reverse side and return it to us.

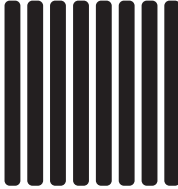
This will enable you to receive updates on this equipment as well as information on new products of interest.

Thanks for using Ditch Witch equipment.

(Please Fold Along This Line And Seal At Bottom With Tape)



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO 23 PERRY OKLAHOMA

POSTAGE WILL BE PAID BY

**The Charles Machine Works, Inc.  
P.O. Box 66  
Perry, Oklahoma 73077-9989**



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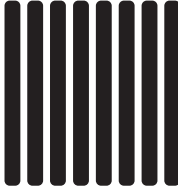
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# Ditch Witch® Registration Card

Please Type or Print All Information

Purchaser's Company Name		
Attention		
Street Address or P.O. Box		
City	County	
State	Zip	Nation
(      )		
Phone Number With Area Code		
Model	Serial Number	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Name of Ditch Witch Dealership		
Your Signature		

# Ditch Witch® Registration Card

Please Type or Print All Information

Purchaser's Company Name		
Attention		
Street Address or P.O. Box		
City	County	
State	Zip	Nation
(      )		
Phone Number With Area Code		
Model	Serial Number	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Attachments/Accessories	Serial Numbers	
Name of Ditch Witch Dealership		
Your Signature		

## Service Record

[illegible]

[illegible]