1330

Operator's Manual

CE

CMW®

Issue 2.1

Overview

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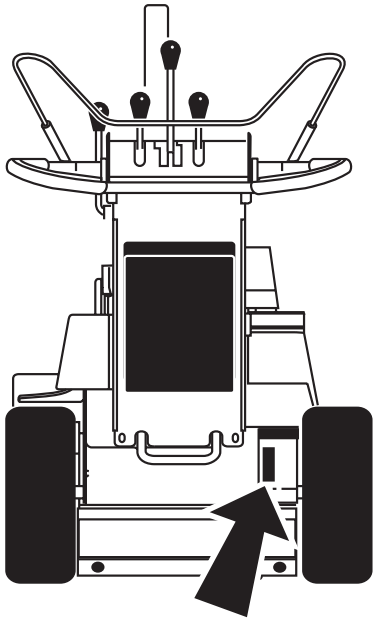
Serial Number Location

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



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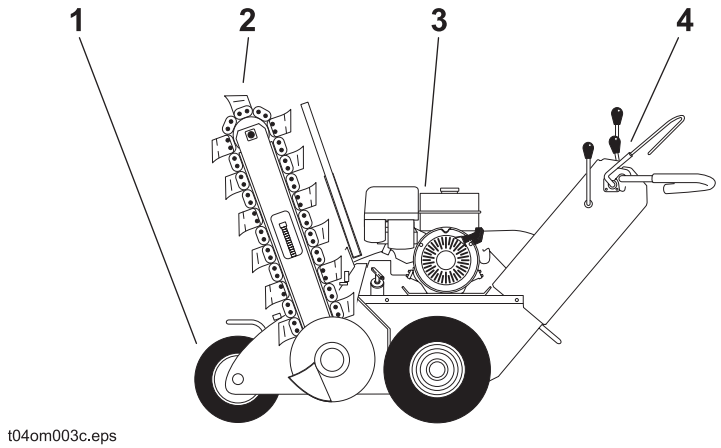
Item	
date of manufacture	
date of purchase	
trencher serial number	
trailer serial number	
engine serial number	

Intended Use

The 1330 is a pedestrian trencher designed to install buried cable and pipe to depths of 36 in (915 mm) and widths of 6 in (150 mm). It is intended for operation in ambient temperatures from 20° to 115°F (-7° to 46°C). Use in any other way is considered contrary to the intended use.

The 1330 should be used with genuine Ditch Witch chain, teeth, and sprockets. It should be operated, serviced, and repaired only by persons familiar with its particular characteristics and acquainted with the relevant safety procedures.

Unit Components



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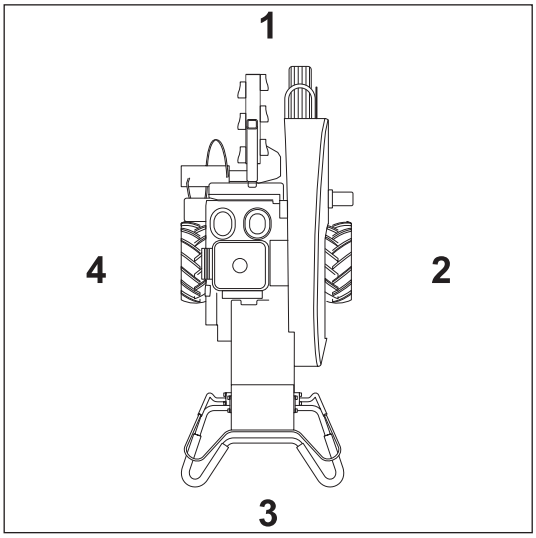
1. Trail wheel
2. Digging boom and chain
3. Engine
4. Operator station

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** 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.

1330
Operator's Manual

Issue number 2.1/OM-9/04
Part number 054-085

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machine serial number, information about the type of work this machine is designed to perform, basic machine components, and how to use this manual

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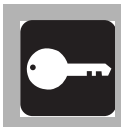
machine controls, gauges, and indicators and how to use them



Operation Overview 23
an overview for completing a job with this machine: planning, setting up, installing product, and restoring the jobsite; with cross references to detailed procedures

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procedures for inspecting and classifying the jobsite, planning the installation path, and preparing the jobsite for work

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the warranty policy for this machine, and procedures for obtaining warranty consideration and training

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a record of major service performed on the machine

Safety

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Guidelines

Follow these guidelines before operating any jobsite equipment:

- Complete proper training and read operator's manual before using equipment.
- Contact One-Call (888-258-0808) and any utility companies which do not subscribe to One-Call. Have all underground pipes and cables located and marked before operating equipment. If you damage a utility, contact utility company.
- 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.
- Replace missing or damaged safety shields and safety signs.
- Use equipment carefully. Stop operation and investigate anything that does not look or feel right.
- Do not operate unit where flammable gas is present.
- Contact your Ditch Witch dealer if you have any question about operation, maintenance, or equipment use.

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 an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

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

NOTICE can keep you from doing something that might damage the machine or someone's property. It can also alert you against unsafe practices.

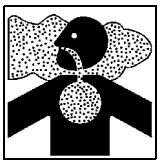
IMPORTANT can help you do a better job or make your job easier in some way.

Safety Alerts

DANGER Moving digging teeth will kill you or cut off arm or leg. Stay away.

DANGER Turning shaft will kill you or crush arm or leg. Stay away.

DANGER Electric shock. Contacting electric lines will cause death or serious injury. Know location of lines and stay away.



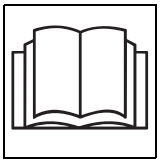
DANGER Deadly gases. Lack of oxygen or presence of gas will cause sickness or death. Provide ventilation.

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

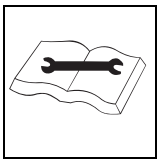
WARNING Crushing weight could cause death or serious injury. Use proper procedures and equipment or stay away.

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

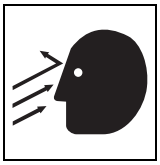
WARNING Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.



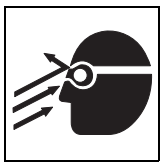
WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.



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.



WARNING Looking into fiber optic cable could result in permanent vision damage. Do not look into ends of fiber optic or unidentified cable.



WARNING Fluid or air pressure could pierce skin and cause injury or death. Stay away.

WARNING Fire or explosion possible. Fumes could ignite and cause burns. No smoking, no flame, no spark.

WARNING Moving traffic - hazardous situation. Death or serious injury could result. Avoid moving vehicles, wear high visibility clothing, post appropriate warning signs.

⚠ WARNING Hot pressurized cooling system fluid could cause serious burns. Allow to cool before servicing.

⚠ CAUTION Flying objects may cause injury. Wear hard hat and safety glasses.

⚠ CAUTION Hot parts may cause burns. Do not touch until cool.

⚠ CAUTION Exposure to high noise levels may cause hearing loss. Wear hearing protection.

⚠ CAUTION Fall possible. Slips or trips may result in injury. Keep area clean.

⚠ CAUTION Battery acid may cause burns. Avoid contact.

⚠ CAUTION Improper handling or use of chemicals may result in illness, injury, or equipment damage. Follow instructions on labels and in material safety data sheets (MSDS).

Emergency Procedures

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

EMERGENCY SHUTDOWN - Release operator presence device and turn ignition switch to STOP.

Electric Strike Description

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. Almost one-third of 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 **near pedestrian unit**, DO NOT MOVE and do not touch unit. 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.
- Do not allow anyone into area until given permission by utility company.

If a Gas Line is Damaged

If you suspect a gas line has been damaged, take the following actions. The order 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.

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) 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.

Controls

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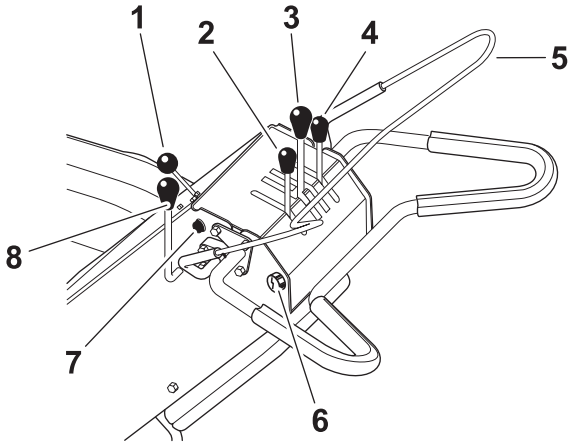
Control Console



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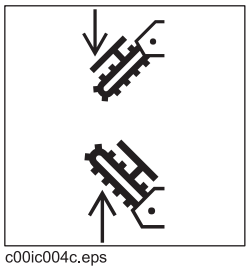
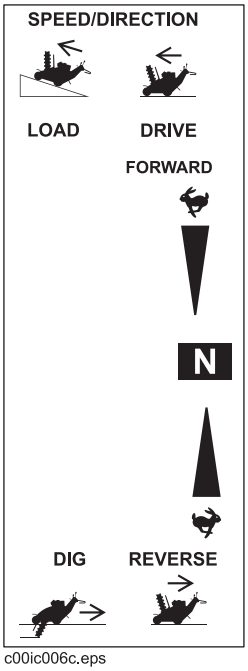
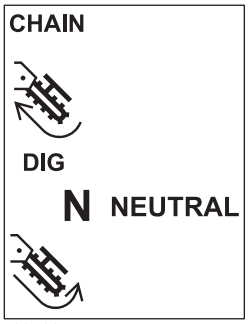
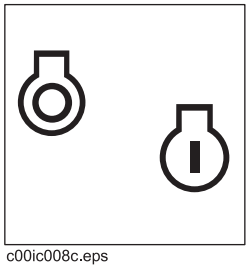
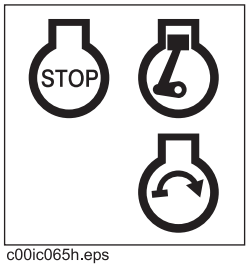
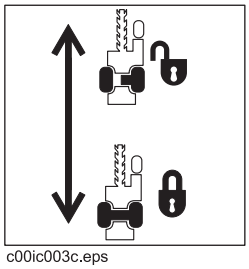
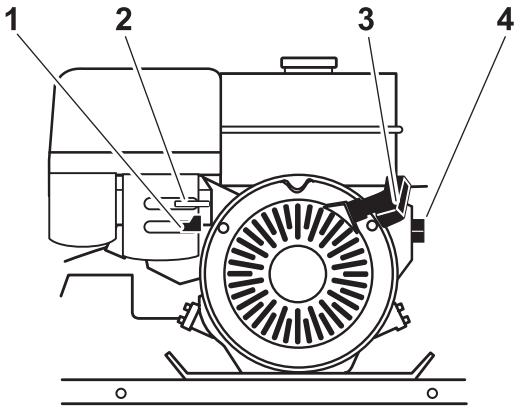
1. Throttle (orange)
2. Boom lift control (green)
3. Speed/direction control (orange)
4. Digging chain control (yellow)
5. Bail (red)
6. Ignition switch
7. Manual start bypass button
8. Axle lock (blue)

Item	Description	Notes
1. Throttle (orange)  c00ic007c.eps	To increase engine speed, push down. To decrease engine speed, pull up.	Increasing engine speed also increases digging chain speed.
2. Boom lift control (green)  c00ic004c.eps	To lower boom, push. To raise boom, pull.	Bail must be down for this control to function.

Item	Description	Notes
3. Speed/direction control (orange)  c00ic006c.eps	To drive, move to DRIVE slot, then slowly forward or reverse. To trench, move to DIG slot, then slowly pull to desired speed. To load onto truck or trailer, move to LOAD slot, then slowly push to desired speed. To go faster in any slot, move farther from N (neutral).	Bail must be down for this control to function. **NOTICE:** Trenching movement is always backward (toward you).
4. Digging chain control (yellow)  c00ic005c.eps	To start digging chain, push to DIG position. To stop digging chain, move to N (neutral). To dislodge a rock or other obstruction, pull back.	Bail must be down for this control to function. **NOTICE: Do not** attempt to trench with control pulled toward you.
5. Bail (red)	To enable ground drive and/or trenching controls, move bail down into handlebar. To disable ground drive and/or trenching controls but keep engine running, release.	

Item	Description	Notes
6. Ignition switch  c00ic008c.eps  c00ic065h.eps	**Units with rope start:** To turn power on, turn clockwise to middle position. Engine will start when rope is pulled. To stop engine, turn counterclockwise. **Units with electric start:** To start engine, turn all the way clockwise. To stop engine, turn counterclockwise.	
7. Manual start bypass button	To bypass electric start system and allow manual rope start with dead battery: • Turn ignition switch to ON. • Push and hold bypass button while pulling rope to start engine. • Release bypass button when engine starts.	**IMPORTANT:** If ignition switch is not in ON position, engine will start but will not continue running after bypass button is released. If ignition switch is not in ON position, engine will start but will not continue running after bypass button is released.
8. Axle lock (blue)  c00ic003c.eps	To unlock axle, push. To lock axle, pull.	Use unlocked axle to maneuver trencher. Use locked axle for loading, straight trenching, and driving over rough terrain.

Engine Controls



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1. Fuel shut-off valve
2. Choke
3. Rope start
4. Engine power switch

Item	Description	Notes
1. Fuel shut-off valve	When transporting unit to or from jobsite, or anytime machine is parked, close valve. Before starting engine, open valve.	This valve separates the fuel tank from the engine.
2. Choke	To help start cold engine, close valve.	This valve regulates air/fuel mixture.
3. Rope start	To start engine, pull rope.	Engine power switch and ignition switch must be on and fuel shut-off valve open for this control to function. If engine does not start after three pulls, turn power switch off and check for fuel blockage or electrical system problems.
4. Engine power switch	To turn power on, turn clockwise. To turn power off, turn counterclockwise.	For normal operation, leave this switch on all the time and use ignition switch to power unit.

Operation Overview

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Planning

1. Gather information about jobsite. See page 26.
2. Inspect jobsite. See page 27.
3. Classify jobsite. See page 28.
4. Select best chain type and tooth pattern for your application. See page 49.
5. Consider optional equipment, if necessary. See page 50.
6. Check supplies and prepare equipment. See page 30.
7. Load unit onto truck or trailer. See page 38.

Trenching

1. Unload unit from truck or trailer. See page 40.
2. Start unit. See page 32.
3. Drive to starting point of trench. See page 32.
4. Dig the trench. See page 45.

   NOTICE: If trencher becomes disabled and must be moved without engine running, see page 41 for important instructions.

5. Shut down unit. See page 33.

IMPORTANT: See "Operating Tips" on page 46 for additional operating information.

Leaving Jobsite

1. Restore the jobsite. See page 52.
2. Rinse unit and stow tools. See page 52.
3. Load unit onto trailer. See page 38.

Prepare

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- Accessories 30

Gather Information

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

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.

Notify One-Call Services

Call area One-Call or similar services and have existing lines located and marked. Call any utilities in your area that do not subscribe to One-Call.

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.

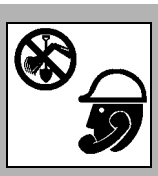
Inspect Site

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 (See "Inspect Jobsite" on page 28.)
- traffic
- access
- soil type and condition

Identify Hazards

Identify safety hazards and classify jobsite. See "Classify Jobsite" on page 28.

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

NOTICE:

- Wear personal protective equipment including hard hat, safety eye wear, and hearing protection.
- Do not wear jewelry or loose clothing.
- Notify One-Call and companies which do not subscribe to One-Call.
- Comply with all utility notification regulations before digging or drilling.
- 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.

Classify Jobsite

Inspect Jobsite

- Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.
- Contact One-Call (888-258-0808) and any utility companies which do not subscribe to One-Call.
- Inspect jobsite and perimeter for evidence of underground hazards, such as:
  - "buried utility" notices
  - utility facilities without overhead lines
  - gas or water meters
  - junction boxes
  - drop boxes
  - light poles
  - manhole covers
  - sunken ground
- Have an experienced locating equipment operator sweep area within 20 feet (6 m) to each side of trench path. Verify previously marked line and cable locations.
- Mark location of all buried utilities and obstructions.
- Classify jobsite.

Select a Classification

Jobsites are classified according to underground hazards present.

If working . . .	then classify jobsite as . . .
within 10 ft (3 m) of a buried electric line	electric
within 10 ft (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 ft (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.

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

Follow OSHA or other guidelines for exposure to crystalline silica when trenching, sawing or drilling through material that might produce dust containing crystalline silica (quartz).

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

Supplies

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

Fluid Levels

- fuel
- hydraulic fluid
- battery charge
- engine oil

Condition and Function

- digging chain and teeth
- filters (air, oil, hydraulic)
- tires and tracks
- pumps and motors
- hoses and valves
- signs, guards, and shields

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.

Drive

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Start Unit 32

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Shut Down 33

Start Unit

1. Check that bail is up, fuel shut-off valve is open, and engine power switch is on.
2. If necessary, choke cold engine.
3. Move throttle to 1/4 open.
4. Turn ignition switch on.
5. Pull rope start, if equipped.

IMPORTANT:

- If engine does not start after three pulls, turn ignition switch off and check for fuel blockage or electrical system problems.
- To rope start electric start unit with dead battery, see "Manual start bypass button" on page 20.

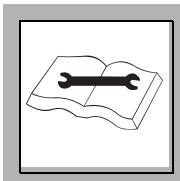
6. Run engine at half throttle or less for five minutes before operating trencher. During warmup, check that all controls work properly.

EMERGENCY SHUTDOWN: Release operator presence device and turn ignition switch off.

Drive

NOTICE: Keep digging boom low when operating on a slope. Drive slowly and cautiously at all times.

1. Move bail down into handlebar.



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.

NOTICE:

- If interlock system does not work, contact your Ditch Witch dealer. Improper repair might allow machine to start or operate with controls in gear.
- Do not wire or tape bail to handlebar or defeat interlock system in any manner. Machine will not start.

2. Pull boom control to raise digging boom.
3. In rough terrain or to drive straight, push axle lock to lock wheels together.
4. Move throttle to 3/4 open.
5. Move speed/direction control to DRIVE slot, then slowly forward or reverse.

Steer

1. Push axle lock to unlock wheels.
2. Push down on handlebar.
3. Turn machine.

Shut Down

1. Move speed/direction control to N (neutral).
2. Push boom control to lower digging boom, if space allows.
3. Release bail.
4. Run engine at low idle for three minutes to cool.
5. Turn ignition switch off.
6. Close fuel shut-off valve
7. Remove key.

NOTICE: Machine should not be parked on a slope unless chocked or blocked.

Transport

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- Points 36
- Procedure 36

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- Inspect Trailer 37
- Hitch Trailer 37
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- Unhitch Trailer 40

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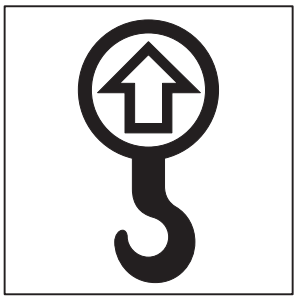
Tow 41

Lift

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

Points

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



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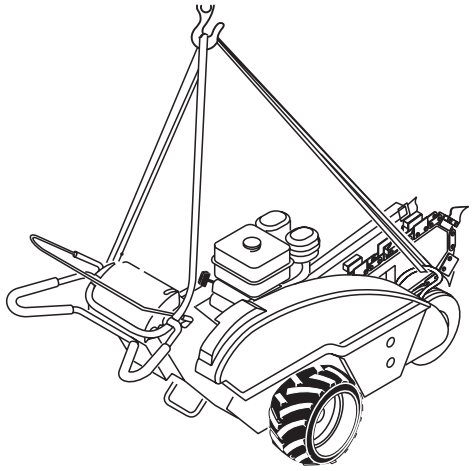
Procedure

Use a hoist capable of supporting the equipment's size and weight. See “Specifications” on page 75 or measure and weigh equipment before lifting.

Run a sling through the front guide, under handlebar, and around back of console tower.



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Haul

IMPORTANT: The 1330 can be hauled in the bed of a light truck or by trailer. If using a trailer, follow these general procedures. For complete information, see the trailer manufacturer's manual.

Inspect Trailer

- Check hitch for wear and cracks. Lubricate if needed.
- Check battery for 12 volt charge, if installed.
- Inspect lights for cleanliness and correct operation. Inspect reflectors and replace if needed.
- Check tire pressure. Check lug nut torque with a torque wrench. Adjust if needed.
- If equipped, ensure trailer brakes are adjusted to come on in synchronization with tow vehicle brakes.
- Check ramps and trailer bed for cracks.

Hitch Trailer

1. Back tow vehicle to trailer.
2. Put manual transmission into first or reverse gear or automatic transmission into park. Turn off ignition. Set parking brake.
3. Connect trailer drawbar, lunette or coupler to tow vehicle hitch and lock in place with lock pin. If needed, adjust drawbar, lunette or coupler height to level load.
4. Connect safety chains to tow vehicle chain keepers (cross-shaped slots on bumper of tow vehicle). Attach left chain to right side of tow vehicle and vice versa to cradle hitch.

   IMPORTANT: Do not connect safety chains to pintle hook or hitch ball.

5. If equipped, connect breakaway switch cable to tow vehicle.

   IMPORTANT: Do not connect breakaway switch cable to pintle hook or hitch ball.

6. If equipped, plug trailer electrical connector into tow vehicle connector.
7. If equipped, use jack crank to raise jack base and stow.
8. Remove wheel blocks.

Load

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

NOTICE:

- Load and unload trailer on level ground.
- Incorrect loading can cause trailer swaying.
- Attach trailer to vehicle before loading or unloading.
- Ten to fifteen percent of total vehicle weight (equipment plus trailer) must be on tongue to help prevent trailer sway.

1. Start engine.
2. Pull boom control to raise digging boom, but keep it low.
3. Move trencher to rear of trailer or truck and align with ramps or center of trailer bed.

IMPORTANT: Boom should be facing ramps or trailer.

4. Pull axle lock to lock wheels together.
5. Slow engine to low throttle.
6. Move speed/direction control to LOAD slot, then slowly push to desired speed.
7. Drive unit onto trailer or truck, digging boom first, until tiedown position is reached.

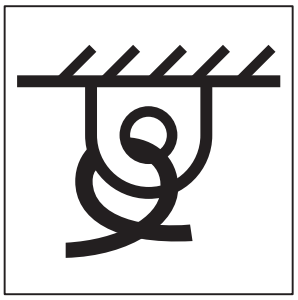
NOTICE: If loading onto tilt-bed trailer, be prepared for trailer to tilt.

8. Push boom control to lower digging boom, if space allows.
9. Turn ignition switch off.
10. Close fuel shut-off valve.

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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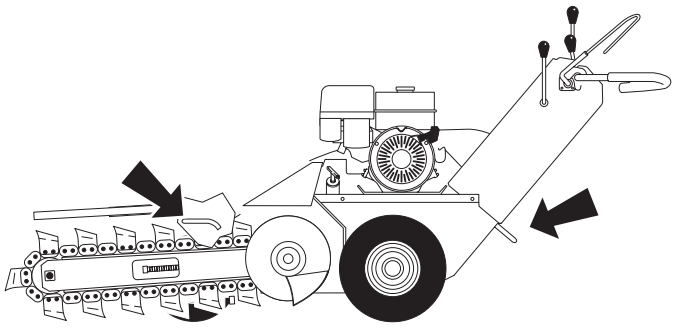
Procedure

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



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Unload

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

NOTICE:

- Load and unload trailer on level ground.
- Attach trailer to vehicle before loading or unloading.

1. Lower trailer or ramps.
2. Remove tiedowns.
3. Open fuel shut-off valve.
4. Start engine.
5. Pull boom control to raise digging boom, but keep it low.
6. Slow engine to low throttle and slowly back unit down trailer or ramps.

NOTICE: If unloading from tilt-bed trailer, be prepared for trailer to tilt.

Unhitch Trailer

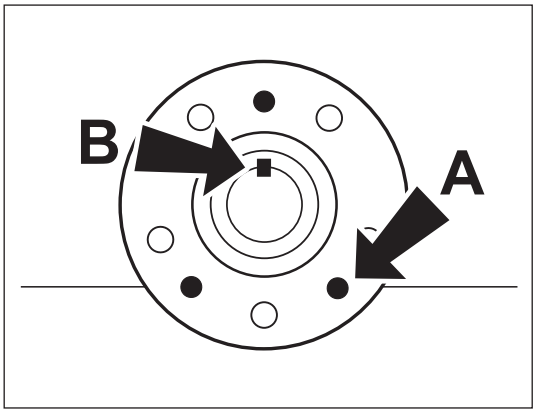
1. Stop tow vehicle and trailer on level ground.
2. Put manual transmission into first or reverse gear or automatic transmission into park. Turn off ignition. Set parking brake.
3. Block trailer wheels.
4. Reverse "Hitch Trailer" steps to unhitch trailer from tow vehicle.

Freewheel

If trencher must be moved without engine running, this feature allows it to be wheeled manually.

WARNING Crushing weight could cause death or serious injury. Use proper procedures and equipment or stay away.

1. Elevate left side of trencher with jackstand or safety blocks.
2. Remove nut from left wheel hub.
3. Horizontally align two of the three threaded holes (A) in wheel hub with machine frame, as shown.
4. Insert bolts (supplied in operator's manual compartment) into threaded holes and tighten until wheel is released from axle.
5. Remove key (B) from axle.
6. Replace wheel and hub, and tighten only enough to keep hub on axle. Overtightening can lock hub to axle.
7. Wheel trencher to a clear area of the jobsite.



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NOTICE: Do not freewheel the trencher more than 100 ft (30 m). Damage to wheel hub or axle will occur.

Tow

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

- follow "Freewheel" instructions
- tow for short distances at less than 1 mph (1.6 kph)
- do not tow for more than 100 ft (30 m)
- attach chains to indicated tow points facing towing vehicle
- use no more than 1,300 lb (5800 N) of towing force

Trench

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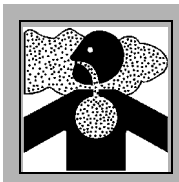
Trench 45

Operating Tips. 46



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

NOTICE: Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Use respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to the State of California to cause cancer.

DANGER Electrical shock. Contacting electrical lines will cause death or serious injury. Know location of lines and stay away.

NOTICE: Cutting high voltage cable can cause electrocution. Expose lines by hand before digging.

WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

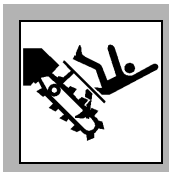
NOTICE:

- Comply with all utility notification regulations before digging or drilling.
- Notify companies that do not subscribe to One-Call.

CAUTION Flying objects thrown by machine may strike people. Wear hard hat and safety glasses.

Trench

1. Drive trencher to starting point. Move in line with planned trench.
2. Pull axle lock to lock wheels together.
3. Move throttle to half open.
4. Push boom control to lower digging boom to just above ground.



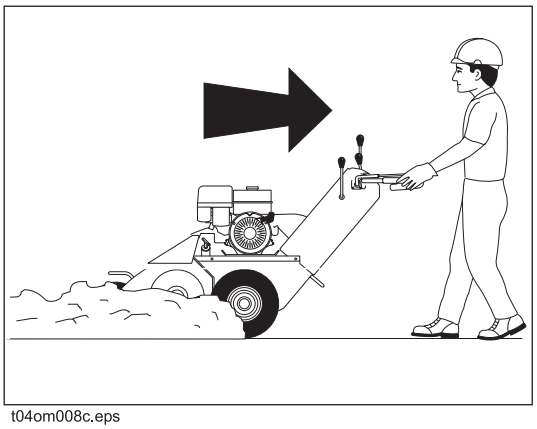
DANGER Moving digging teeth will cause death or serious injury. Stay away.

NOTICE:

- Keep everyone at lease 6 ft (2 m) from machine, digging boom, and its range of movement.
- Machine may move when chain starts to dig. Allow 3 ft (1 m) between end of chain and obstacle.
- Digging chain on top side of boom can catch on root or rock, forcing handlebar down suddenly. Stand back from console and hold handlebar loosely.

5. Push digging chain control to DIG. DIGGING CHAIN WILL MOVE.

EMERGENCY STOP: Release operator presence device and turn ignition switch off.



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6. Increase engine speed to full throttle.
7. Push boom control to slowly lower digging boom to desired trench depth.
8. Move speed/direction control to DIG, then slowly pull to desired speed.

IMPORTANT: Trenching movement is toward you.

9. When trench is complete, push speed/direction control to N (neutral).
10. Move throttle to half open.
11. Pull boom control to raise digging boom to top of trench.
12. Pull digging chain control to N (neutral).
13. Drive away from trench.
14. See page 33 for shutdown procedure.

Operating Tips

- Avoid using badly worn teeth. When replacing teeth, maintain original pattern. Use Ditch Witch replacement teeth.
- Operate engine at full throttle when trenching.
- Use correct length boom. See your Ditch Witch dealer for more information.
- Do not make sharp turns. For easier turning, lower boom to full depth.
- If an object becomes lodged in chain, move digging chain control to neutral and raise boom slightly. Reverse chain direction. If object must be removed manually, turn engine off.

Systems and Equipment

Chapter Contents

Chain, Teeth, and Sprockets 48

- Chain and Tooth Maintenance 48
- Chain Types 48
- Chain Selection. 49

Optional Equipment 50

Chain, Teeth, and Sprockets

Chain and Tooth Maintenance

- Always replace sprockets at the same time you replace the digging chain. Sprockets and chain are designed to work together. Replacing one without the other will cause premature wear of the new part.
- Keep digging teeth sharp. Using dull, worn teeth will decrease production and increase shock load to other trencher components. It can also cause chain stretch, which leads to premature chain wear and failure.
- Maintain the proper amount of tension on the digging chain. Overtightening will cause chain stretch and loss of machine performance. For correct tightening procedure, see page 62.
- Use the tooth pattern most appropriate for your digging conditions. If you move to a different soil type, contact your Ditch Witch dealer for information about the most effective chain type and tooth pattern.

Chain Types

Chain type	Features
4-pitch	standard chain
2-pitch	more teeth for smoother cutting
alternating side bar	prevents spoil compaction on chain
bolt-on adapters	allow easy configuration changes
Shark Chain II	versatile, virtually maintenance-free
combination	provides pick and shovel effect

Chain Selection

These charts are meant as a guideline only. No one chain type works well in all conditions. See your Ditch Witch dealer for soil conditions and chain recommendations for your area. Ask for the latest Chain, Teeth, and Sprockets Parts Catalog.

- 1 = best
- 2 = better
- 3 = good
- 4 = not recommended

Chain	Sandy Soil	Soft Soil	Medium Soil	Hard Soil	Rocky Soil	Sticky Soil
4-pitch cup tooth	3	1	2	3	4	1
2-pitch cup tooth	2	3	1	1	3	4
bolt-on adaptor, 2-pitch	4	4	3	2	1	4
bolt-on adaptor/cup tooth combo	4	3	2	1	2	4
Shark Chain II	4	3	2	1	1	4
alternating side bar	4	4	4	4	4	1

Soil	Description
sandy soil	sugar sand, blow sand, or other soils where sand is the predominant component
soft soil	sandy loam
medium soil	loams, loamy clays
hard soil	packed clays, gumbo, all compacted soils
rocky soil	chunk rock, glacial till, cobble, rip rap, gravel
sticky soil	gumbo, sticky clays

Optional Equipment

See your Ditch Witch dealer for more information about the following optional equipment.

Equipment	Description
booms	provide depth options of 24-in (610-mm), 30-in (760-mm), or 36-in (915 mm); each length is available with either an adjustment screw or grease cylinder for tensioning the digging chain
mechanical trench cleaner	removes spoils from the trench floor
remote air filter	provides extra filtering capacity for dusty conditions
turf tires	minimize turf disturbance
tachometer	displays engine speed

Complete the Job

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Restore Jobsite

After product is installed, return spoils to the trench with shovels or small earth-moving equipment.

Rinse Equipment

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.

Stow Tools

Make sure all tools and accessories are loaded on trailer.

Service

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Recommended Lubricants/Service Key 55

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As Needed Service 73

Service Precautions

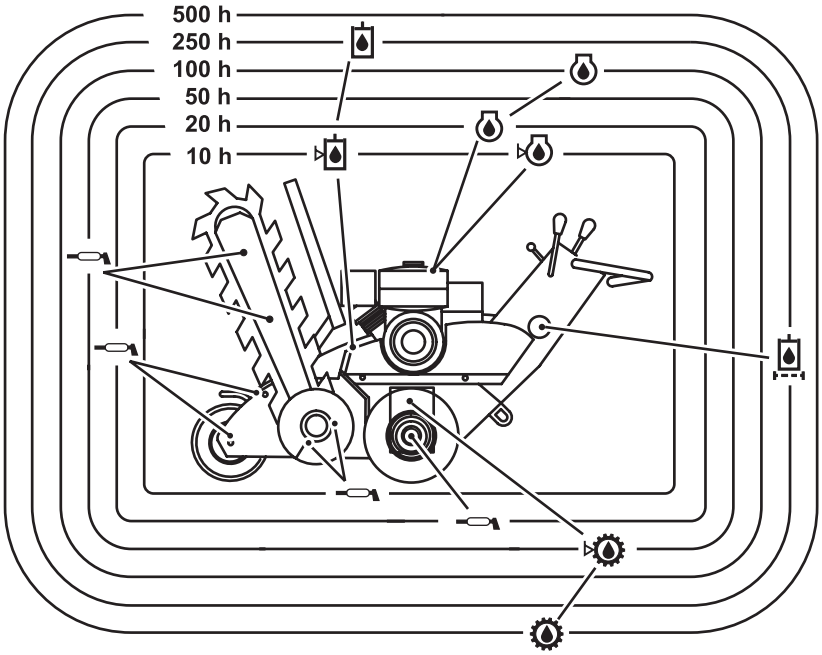
⚠ WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

NOTICES:

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

Overview

1330 LUBRICATION



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Recommended Lubricants/Service Key

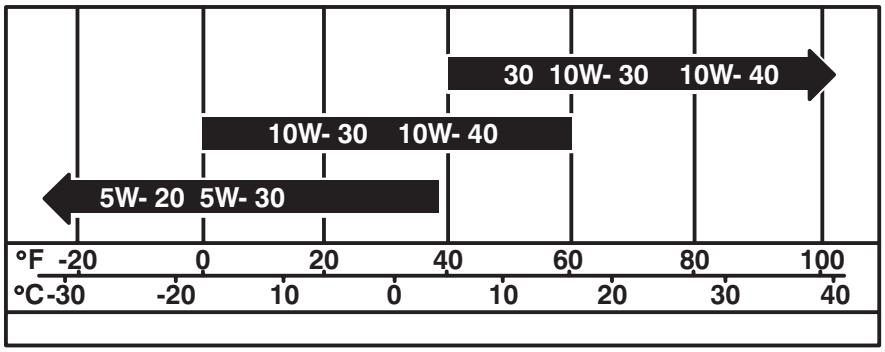
Item	Description
GEO	Gasoline engine oil meeting current API service classifications and SAE viscosity recommended by engine manufacturer (SAE 10W40)
MPG	Multipurpose grease meeting ASTM D217 and NLGI 5
AGMA-7	Worm gear lubricant matching American Gear Manufacturer's Association Compound #7
THF	Tractor hydraulic fluid, similar to Phillips 66 HG, Mobilfluid 423, Chevron Tractor Hydraulic Fluid, Texaco TDH Oil, or equivalent
	Check level of fluid or lubricant
	Check condition
	Filter
	Change, replace, adjust, service or test

Proper lubrication and maintenance protects Ditch Witch equipment from damage and failure. Service intervals listed are for minimum requirements. In extreme conditions, service machine more frequently. Use only recommended lubricants. Fill to capacities listed in "Specifications" on page 75.

NOTICE:

- Use only genuine Ditch Witch parts, filters, and approved lubricants to maintain warranty.
- Use the "Service Record" on page 83 to record all required service to your machine.

Engine Oil Temperature Chart



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Temperature range anticipated before next oil change

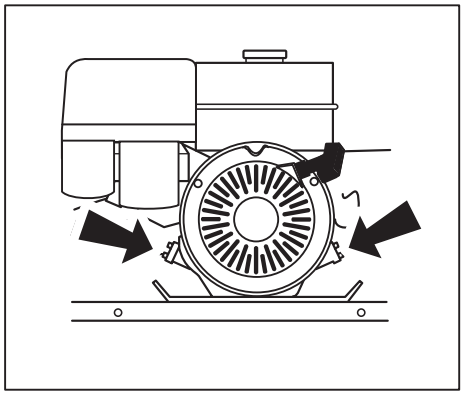
For more information on engine lubrication and maintenance, see your engine manual.

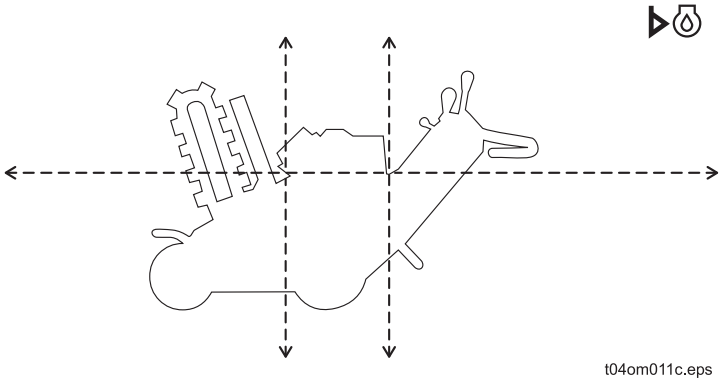
Each Use Service

Location	Task	Notes
Trencher	Check engine oil level	GEO
	Check hydraulic fluid level	THF
	Check tire pressure	15 psi (1 bar) standard tires 22 psi (1.5 bar) turf tires
	Check lug nut torque	85 ft•lb (115 N•m)
	Check air filter paper elements	

Trencher

Check Engine Oil Level

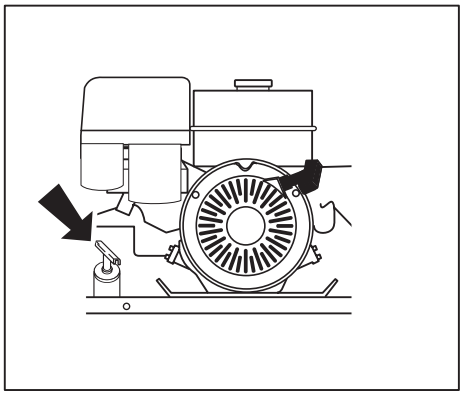


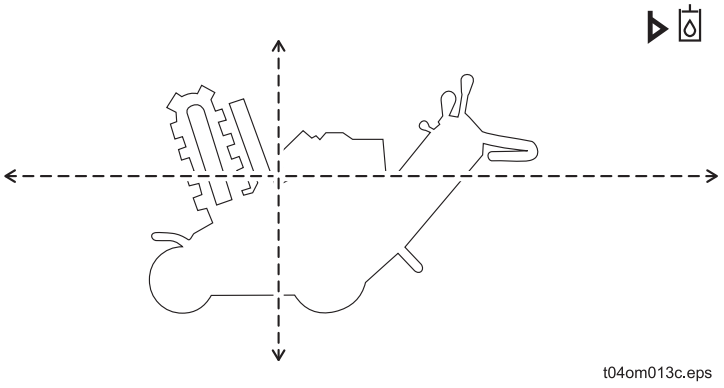


Check engine oil at either dipstick before each use. If low, fill with GEO until oil level is at highest line on dipstick.

IMPORTANT: For more information on engine oil, see "Recommended Lubricants/Service Key" on page 55 or see engine manual.

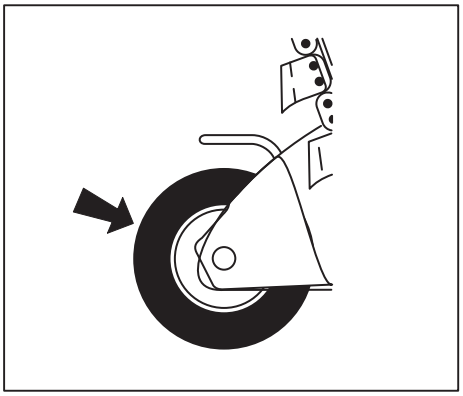
Check Hydraulic Fluid Level

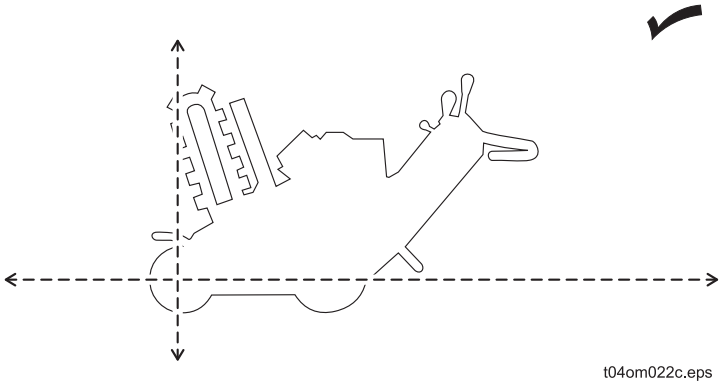




With digging boom fully raised, check hydraulic fluid at dipstick before each use. If low, fill with THF until oil level is at highest line on dipstick. Clean dust from cap by blowing with low pressure air.

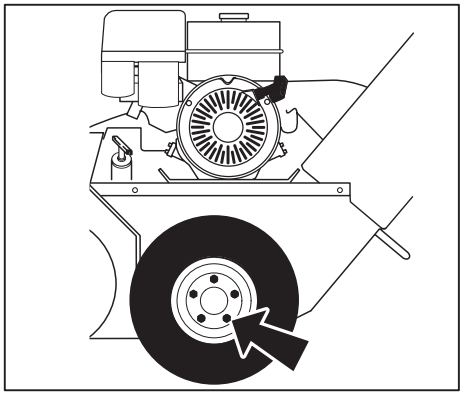
Check Tire Pressure

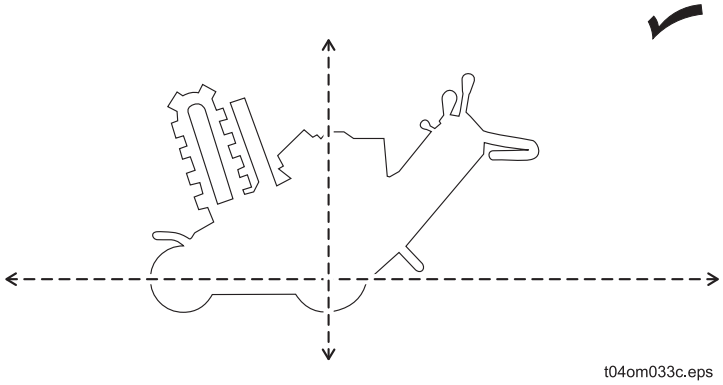




Check trail wheel tire pressure before each use. Maintain pressure at 20 psi (1.4 bar) for standard tires or 22 psi (1.5 bar) for optional turf tires.

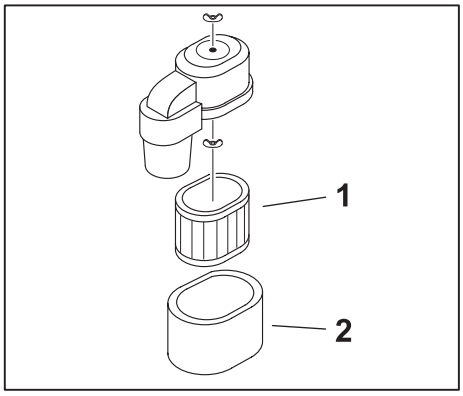
Check Lug Nut Torque

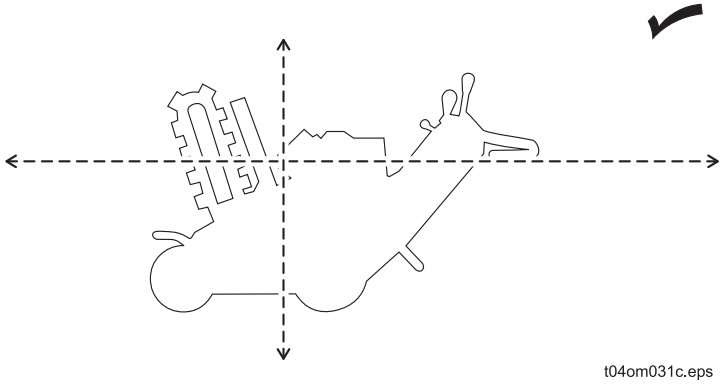




Check wheel lug nut torque before each use. Tighten to 85 ft•lb (115 N•m).

Check Air Filter Element



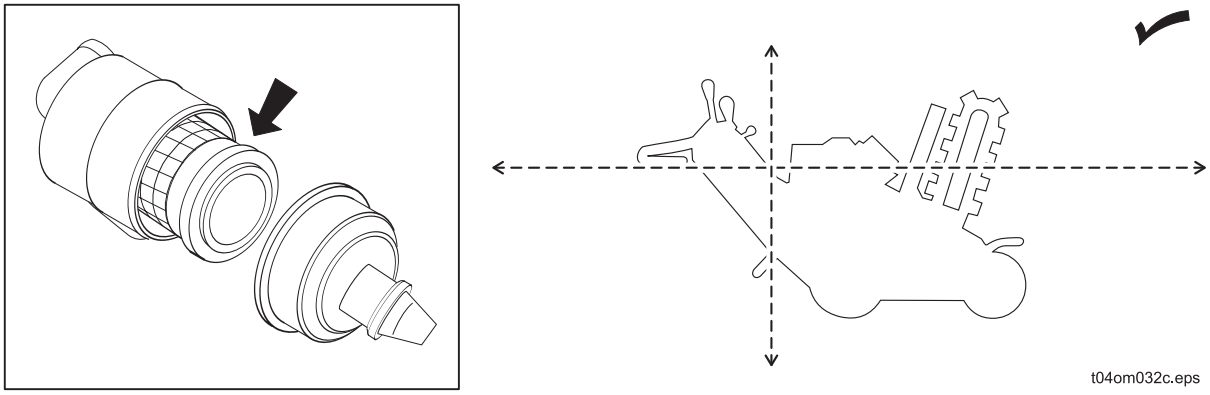


Check air filter paper element before each use. Clean if necessary.

To check:

1. Remove wing nut and air cleaner cover.
2. Remove elements and separate them.
3. Blow compressed air through the paper element (shown) from the inside out. Replace element if it is excessively dirty or damaged.

Check Optional Air Filter Element



Change optional air cleaner element as needed.

1. Remove remote air cleaner cover.
2. Blow compressed air through the paper element (shown) from the inside out. Replace element if it is excessively dirty or damaged.

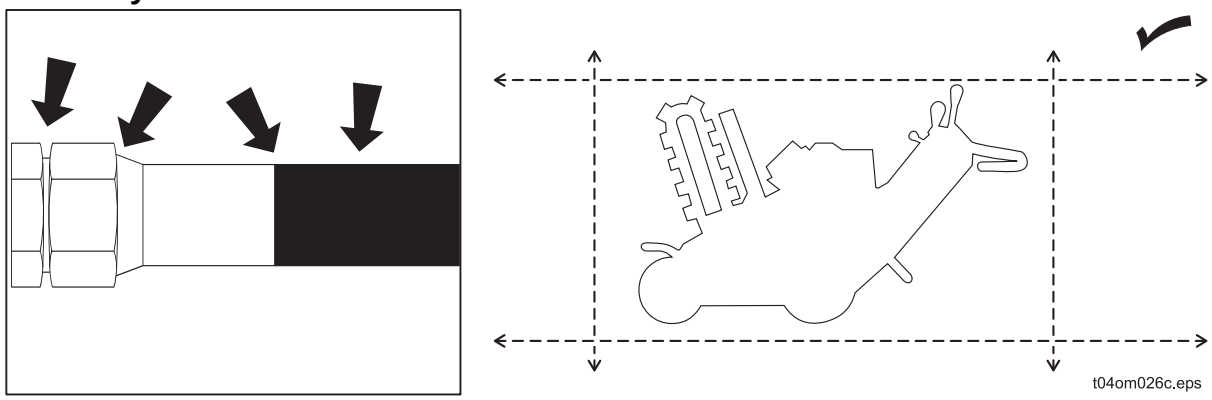
NOTICE: Never try to brush dirt off filters. Brushing will force dirt into the fibers.

10 Hour Service

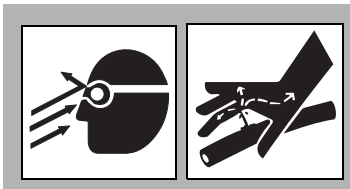
Location	Task	Notes
Trencher	Check hydraulic hoses	
	Lube pivot	MPG
	Check digging chain tension	MPG

Trencher

Check Hydraulic Hoses



Check hydraulic hoses for leaks every 10 hours.

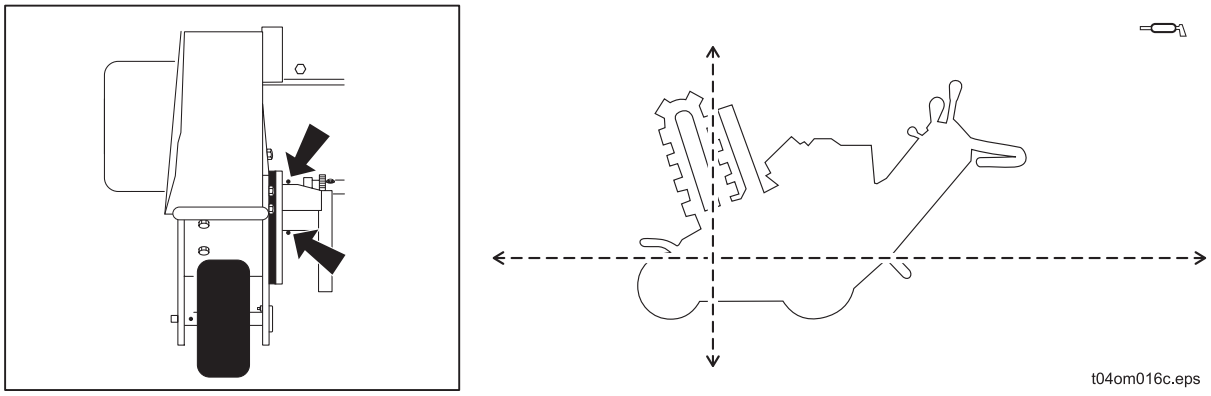


WARNING Fluid or air pressure could pierce skin and cause injury or death. Stay away.

NOTICE:

- 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.
- Fluid leaks can be hard to detect. 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.

Lube Pivot



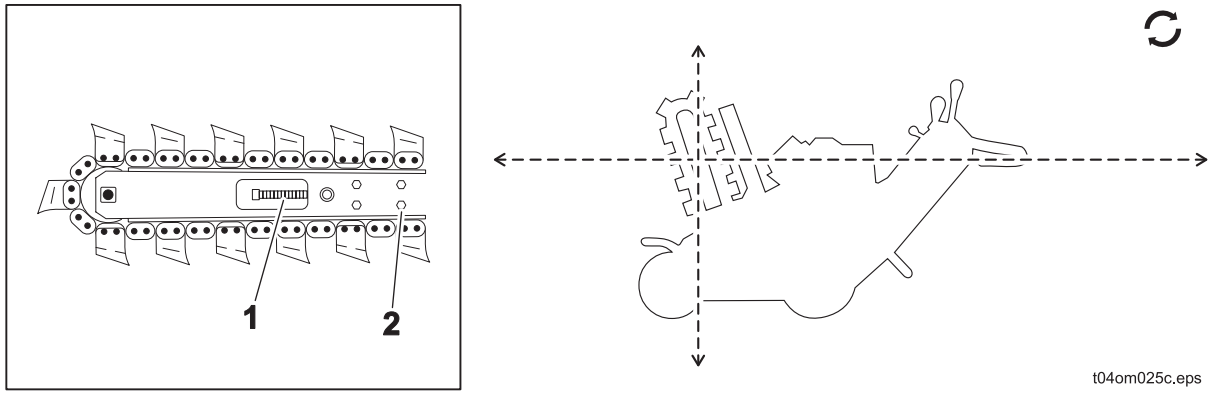
Lube two pivot zerks with MPG every 10 hours.

Check Digging Chain Tension

Check digging chain tension every 10 hours and adjust as needed. With boom horizontal, measure distance from bottom of boom to chain. When properly tensioned, distance should be .5 in (13 mm).

Adjustment Screw:

1. Loosen four clamp bolts (2) so that boom slides freely.
2. Loosen jam nut on adjustment screw (1).
3. To tighten digging chain, turn adjustment screw clockwise. To loosen digging chain, turn counterclockwise.
4. When proper tension is reached, tighten jam nut.
5. Torque clamp bolts to 75 ft•lb (102 N•m).

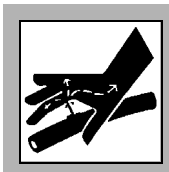


Grease Cylinder:

To tighten digging chain, pump MPG into cylinder at check valve zerk.

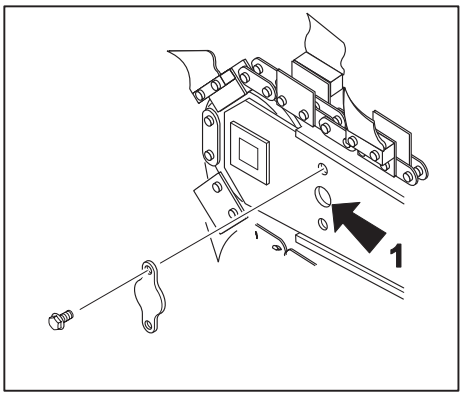
NOTICE: Do **not** overtighten chain. Overtightening will cause chain stretch, loss of machine performance, and possible premature chain failure.

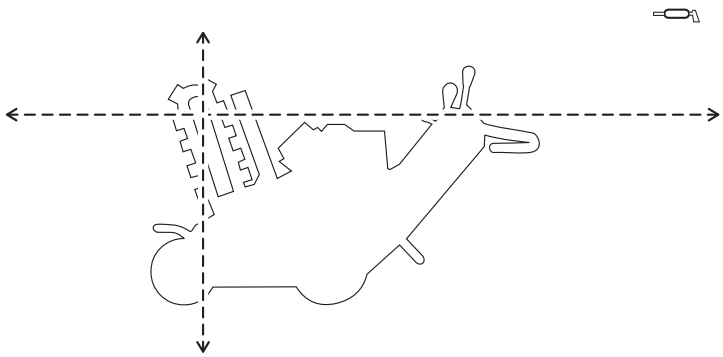
To loosen digging chain, stand on opposite side of boom and unscrew check valve zerk to release grease.



⚠WARNING Fluid pressure could pierce skin and cause injury or death. Stay away.

NOTICE: Service digging boom grease cylinder only while standing on opposite side of boom. Wear gloves and safety glasses and cover fitting with cloth when relieving pressure in cylinder.



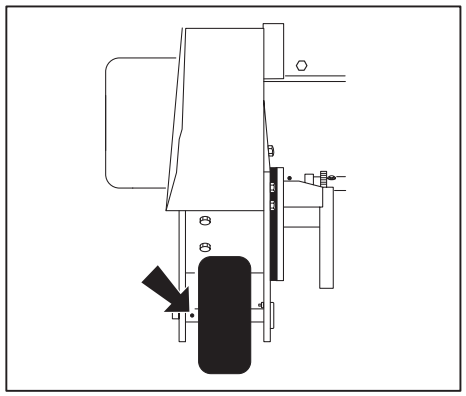


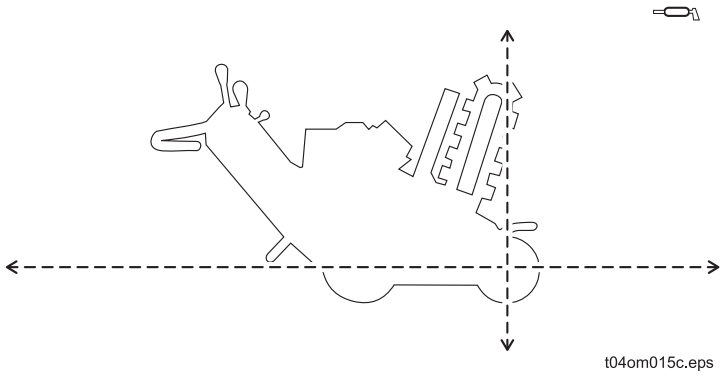
20 Hour Service

Location	Task	Notes
Trencher	Lube trail wheel	MPG
	Lube axle lock	MPG
	Lube headshaft bearing	MPG
	Change engine oil (initial)	GEO

Trencher

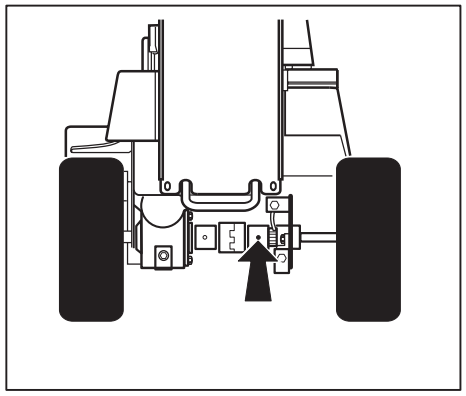
Lube Trail Wheel

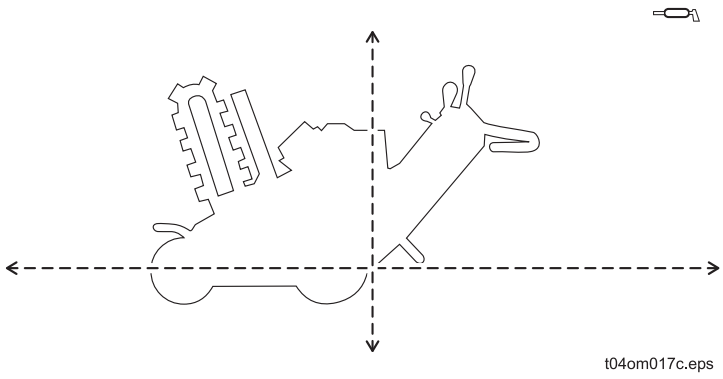




Lube trail wheel with MPG every 20 hours.

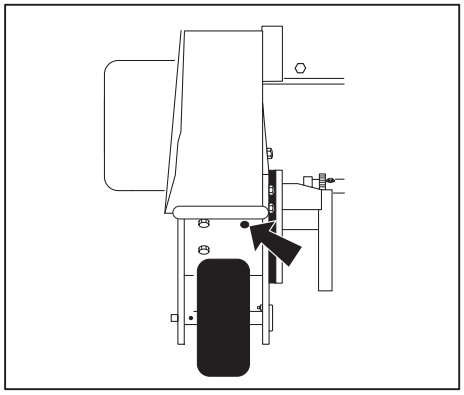
Lube Axle Lock

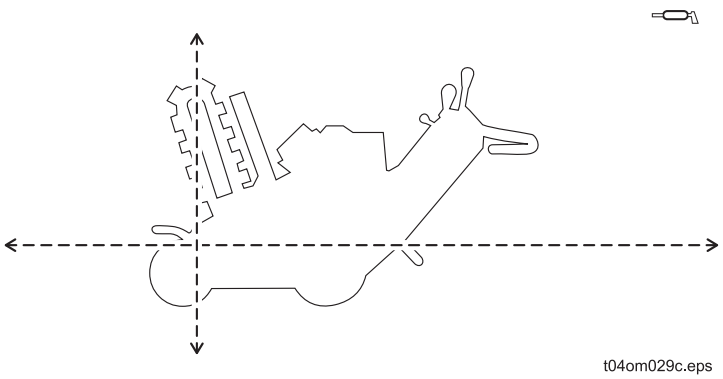




Lube axle lock with MPG every 20 hours.

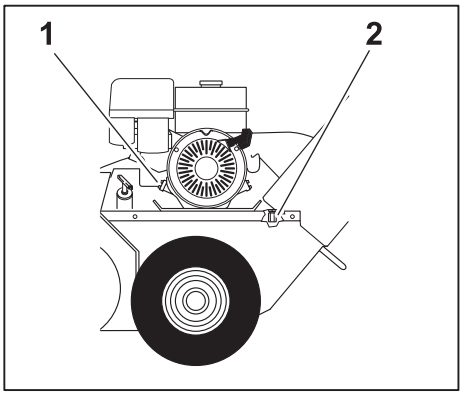
Lube Headshaft Bearing

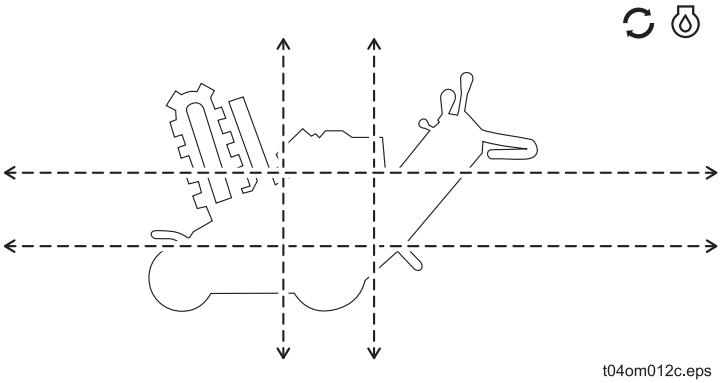




Lube headshaft bearing with MPG every 20 hours.

Change Engine Oil





Change engine oil after the first 20 hours of operation and every 100 hours thereafter.

1. Drain (2) while oil is still warm.
2. Replace plug.
3. Refill at fill neck (1) with 2.3 pt (1.1 L) of GEO.

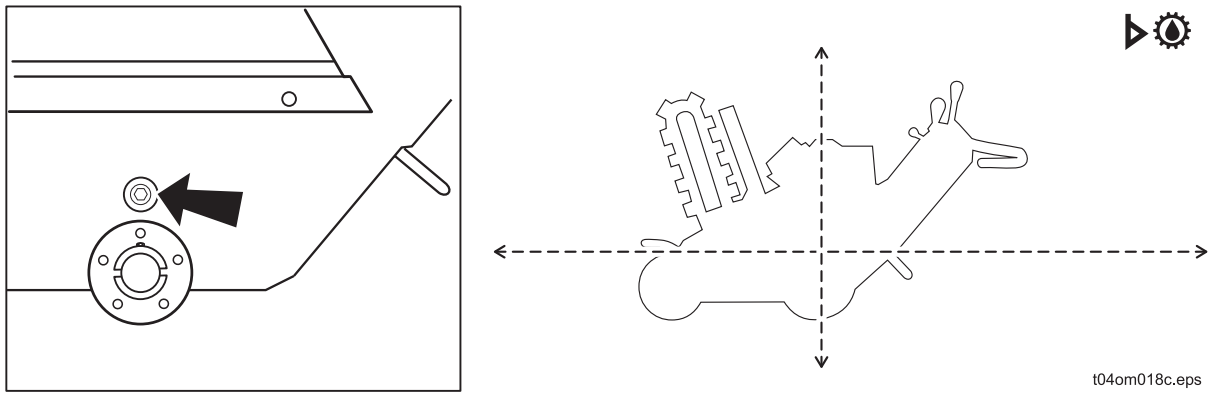
IMPORTANT: If operating in extremely dusty conditions, change oil more frequently. Use oil specified in temperature chart found in "Recommended Lubricants/Service Key" on page 55.

50 Hour Service

Location	Task	Notes
Trencher	Check worm drive oil	AGMA-7
	Lube digging boom adjustment screw and stub, if equipped	MPG
	Lube digging boom stub, if equipped	MPG
	Clean air filter elements	

Trencher

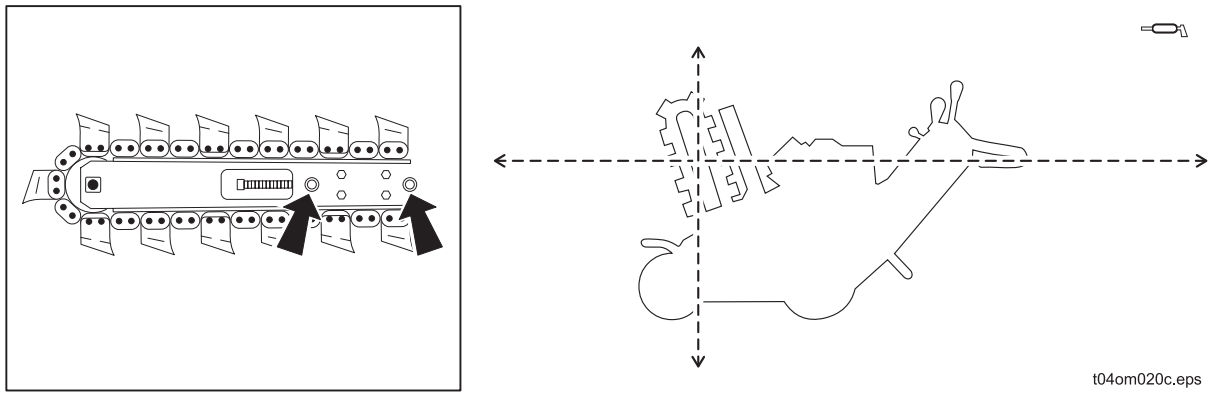
Check Worm Drive Oil



Check worm drive oil at fill plug every 50 hours.

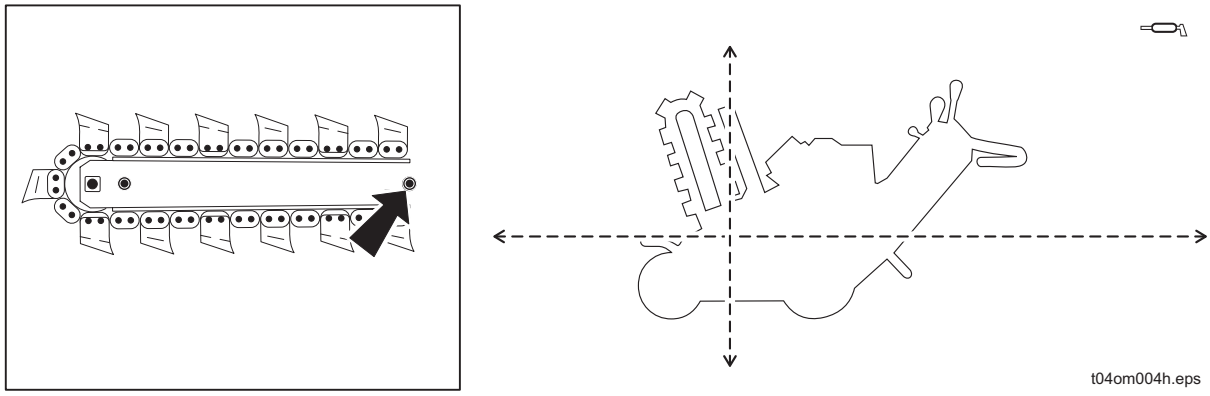
1. Elevate left side of trencher with a jack capable of supporting its weight.
2. Fill to level of fill plug with AGMA-7 as needed.
3. Replace wheel.

Lube Digging Boom Adjustment Screw and Stub



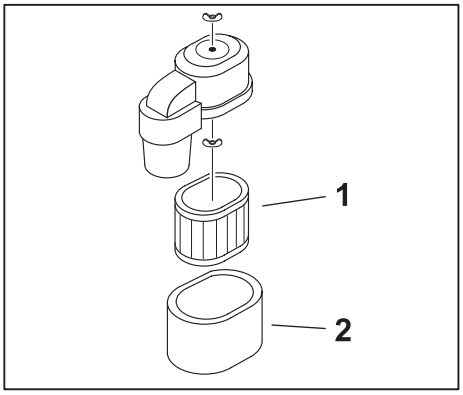
Lube adjustment screw and stub with MPG every 50 hours.

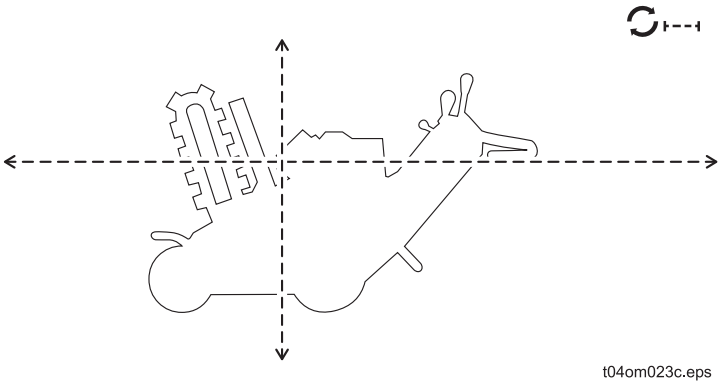
Lube Digging Boom Stub (Greaseable Boom)



Lube boom stub every 50 hours with MPG.

Clean Air Filter Elements





Clean air filter elements every 50 hours. Clean more frequently if operating in dusty conditions.

1. Remove wing nut and air cleaner cover.
2. Remove elements and separate them.
3. Blow compressed air through the paper element (1) from the inside out. Replace element if it is excessively dirty or damaged.

NOTICE: Never try to brush dirt off filters. Brushing will force dirt into the fibers.

4. Clean foam element:
   - Wash in soapy water and rinse thoroughly.
   - Allow to dry thoroughly.
   - Soak in clean engine oil, then squeeze out extra oil.

WARNING Fire or explosion possible. Fumes could ignite and cause burns. No smoking, no flame, no spark.

NOTICE: Never use gasoline or low flash point solvents to clean air filter element.

5. Reinstall both elements.

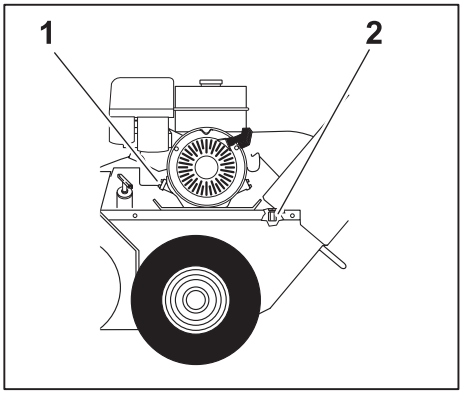
IMPORTANT: See engine owner's manual for more information.

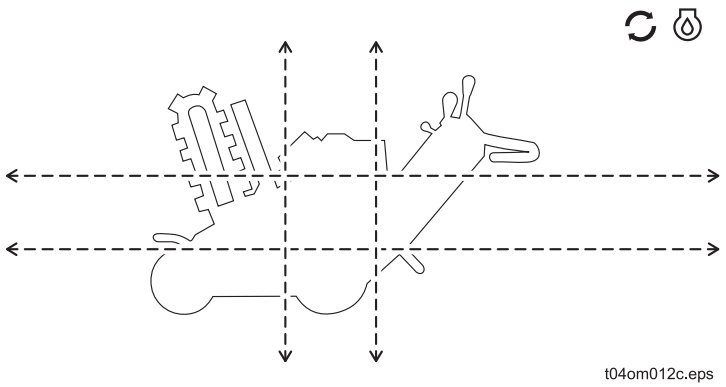
100 Hour Service

Location	Task	Notes
Trencher	Change engine oil	GEO
	Change air filter element	

Trencher

Change Engine Oil



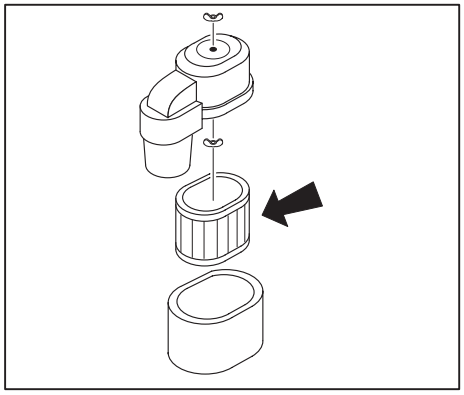


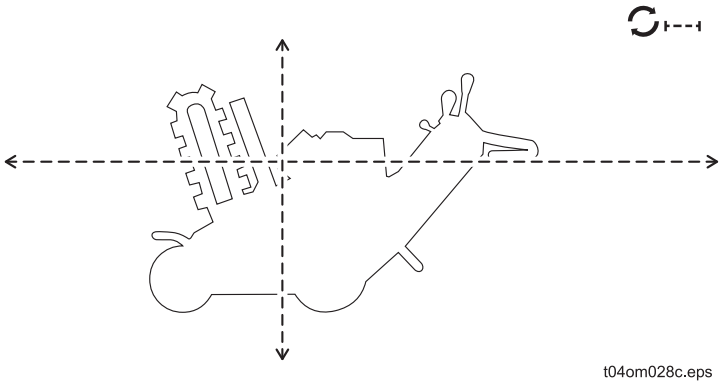
Change engine oil every 100 hours.

1. Drain (2) while oil is still warm.
2. Replace plug.
3. Refill at fill neck (1) with 2.3 pt (1.1 L) of GEO.

IMPORTANT: If operating in extremely dusty conditions, change oil more frequently. Use oil specified in temperature chart found in "Recommended Lubricants/Service Key" on page 55.

Change Air Filter Element





Change air filter paper element every 100 hours.

To change:

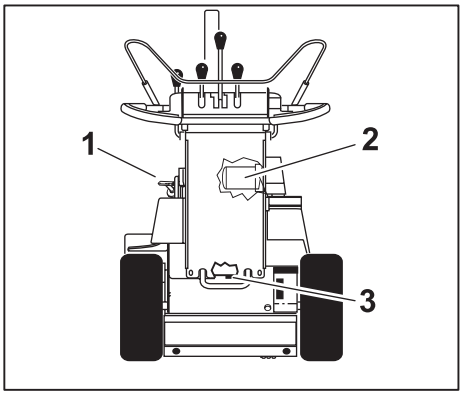
1. Remove wing nut and air cleaner cover.
2. Remove elements and replace.
3. Reverse procedure to install.

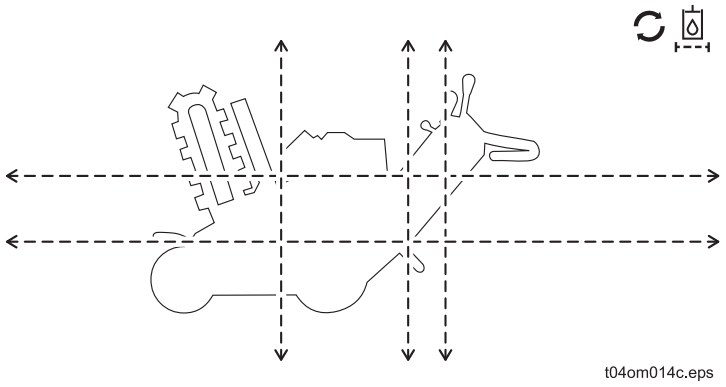
250 Hour Service

Location	Task	Notes
Trencher	Change hydraulic oil and filter	THF

Trencher

Change Hydraulic Oil and Filter





Change hydraulic oil and filter every 250 hours.

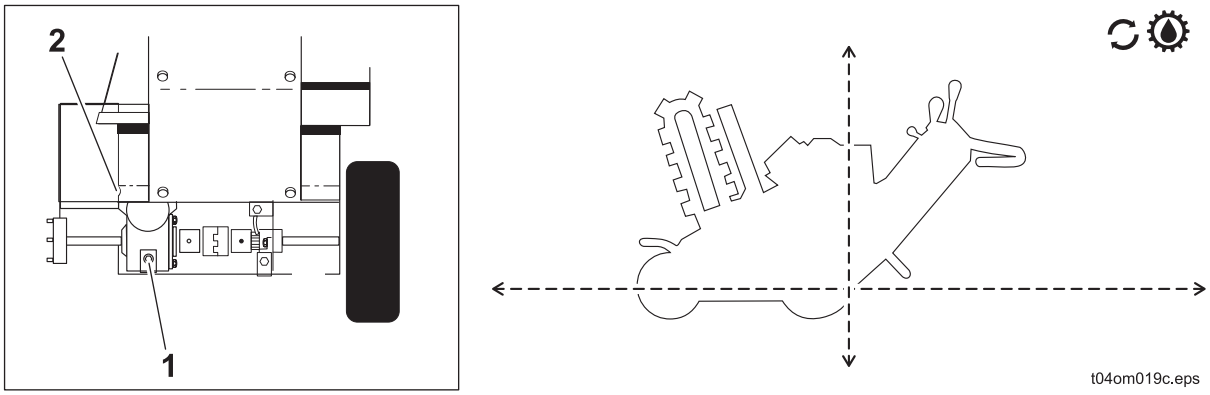
1. Drain hydraulic fluid at drain (3).
2. Replace plug.
3. Change filter (2).
4. Refill with THF at fill neck (1).

500 Hour Service

Location	Task	Notes
Trencher	Change worm drive oil	AGMA-7

Trencher

Change Worm Drive Oil



Change worm drive oil every 500 hours.

1. Drain oil at drain (1).
2. Replace plug.
3. Refill at fill plug (2) with approximatley 3.25 pt (1.5 L) of AGMA-7.

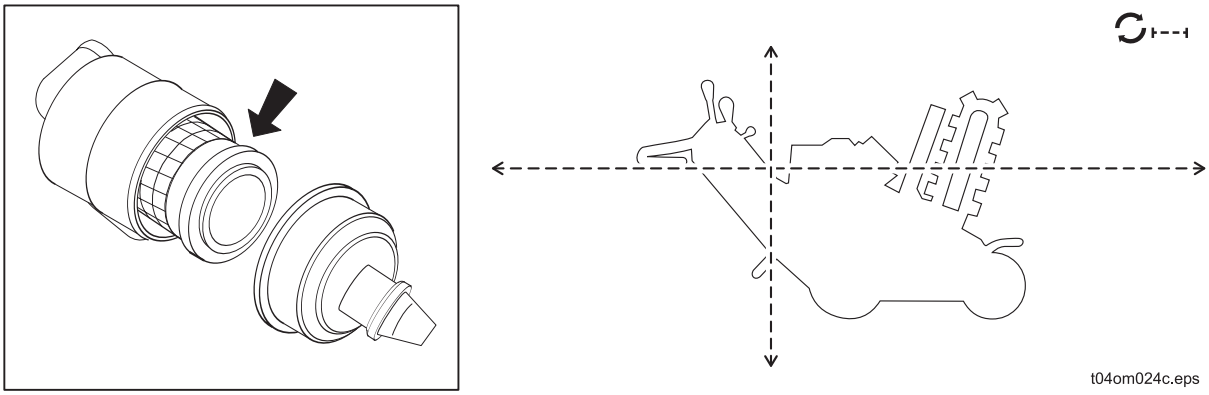
NOTICE: Do not use a substitute lubricant. Worm drive failure could occur.

As Needed Service

Location	Task	Notes
Trencher	Change optional air cleaner paper element	

Trencher

Change Optional Air Cleaner Element

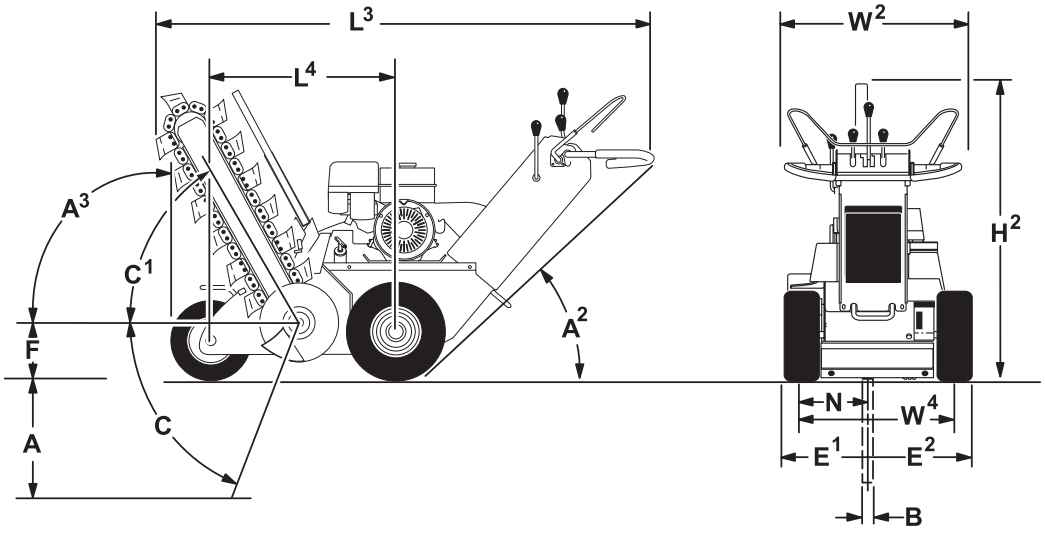


Change optional air cleaner element as needed.

1. Remove air cleaner cover.
2. Remove paper element and replace.

NOTICE: Use of this option does not eliminate the need for proper maintenance of standard air filter.

Specifications



t04om030c.eps

Dimensions		U.S.	Metric
A	Trench depth, maximum	36 in	915 mm
B	Trench width	4.3 - 6 in	110-150 mm
C	Boom travel down	60°	60°
C1	Boom travel up	60°	60°
F	Headshaft height, digging chain	8.6 in	220 mm
L3	Length	84 in	2.1 m
W2	Width	33 in	840 mm
H2	Height	47 in	1.2 m
W4	Tread	26 in	660 mm
A2	Angle of departure	35°	35°
L4	Wheelbase	32 in	810 mm
E1	Centerline trench to outside edge of machine, left	15 in	381 mm
E2	Centerline trench to outside edge of machine , right	18 in	457 mm
N	Spoil discharge reach	10.6 in	270 mm
A3	Angle of approach	85°	85°

Unless otherwise noted, dimensions are based on 16x6.50x8 tires, 6-in (150-mm) pivot, and 24-in (610-mm) boom in transport position.

General
Ditch Witch model 1330, self-propelled, hydrostatic, pedestrian, manually steered, two wheel drive rigid frame, chain type trencher.

Operational		U.S.	Metric
Vehicle speeds			
	Maximum transit forward	120 fpm	37 m/min
	Maximum transit reverse	196 fpm	60 m/min
Digging chain speed		275 fpm	84 m/min
Spoils handling (single, open-end auger)			
	Outer diameter	12 in	305 mm
	Inner diameter	4 in	102mm
	Length	9 in	229 mm
Operating weight (with 33,000-lb [14 969-kg] test, two-pitch digging chain and 24-in [610-mm] roller boom)		920 lb	417 kg

Power	U.S.	Metric
Engine: Honda GX390		
Fuel: gasoline		
Cooling medium: air		
Number of cylinders: one		
Displacement	23.7 in^3	389 cm^3
Bore	3.53 in	90 mm
Stroke	2.52 in	64 mm
Gross power @ 3600 rpm	13 hp	9.7 kW
Maximum governed speed installed (no load)	3600 rpm	3600 rpm
Flywheel power @ 3200 rpm (full load)	12 hp	8.9 kW
Fuel consumption @ 3600 rpm	.89 gph	3.4 L/hr
Maximum tilt angle	20°	20°

Battery
210, 12V

Power Train		U.S.	Metric
Ground drive transmission: hydrostatic, two speeds infinitely variable from zero to maximum, gearbox to axle, speed and direction controlled with single lever			
Digging chain drive: hydraulic direct drive, lever-operated, one speed forward and reverse			
Trencher drive: hydraulic direct drive			
Pump drive: direct drive from engine			
Spoils handling drive: mechanical, attached to and rotates with headshaft			
Tires			
	Drive, standard: 16x6.50x8	15 psi	103 kPa
	Drive, optional: 18x8.50x8	22 psi	152 kPa
	Trail: 13x5.00x6		

Hydraulic System		U.S.	Metric
Tandem pump capacity @ 3600 rpm			
	To digging drive	5.7 gpm	21.5 L/min
	To ground drive	1.4 gpm	5.3 L/min
	Total	7.1 gpm	26.8 L/min

Fluid Capacities	U.S.	Metric
Hydraulic reservoir	4.5 gal	17 L
Hydraulic system	5 gal	19 L
Axle reducer oil	2.75 pt	1.3 L
Fuel tank	1.7 gal	6.5 L
Engine oil	2.3 pt	1.1 L

Noise Levels
Operator 86 dBA sound pressure per ISO 6394
Exterior 100 dBA sound power per ISO 6393

Vibration Levels
Vibration at the operator's hand during normal operation is 8.4 m/s^2

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 Parts Limited Warranty Policy

Subject to the limitations 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 Charles Machine Works, Inc. (CMW) that fail due to a defect in material or workmanship within one (1) year of first commercial use (Exception: 2 years for all SK500 attachments). 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.

Exclusions from Product Warranty

- Wear-related failure of parts subject to ground contact including, but not limited to, digging teeth, digging chains, sprockets, backhoe buckets, plow blades, drill pipe, drill bits, backreamers, and swivels.
- 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 CMW or its authorized dealer. CMW will provide the location of its inspection facilities or its nearest authorized dealer upon inquiry. CMW reserves the right to supply remanufactured replacements parts under this warranty as it deems appropriate.

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

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 CMW's Product Support department, P.O. Box 66, Perry, OK 73077-0066, or contact your local Ditch Witch dealer.

First version: 1/91; Latest version: 1/03

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

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P.O. Box 66
Perry, Oklahoma 73077-9989

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Perry, Oklahoma 73077-9989

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

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( )

Phone Number With Area Code

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Name of Ditch Witch Dealership

Your Signature

Service Record

Service Performed	Date	Hours

Service Performed	Date	Hours