C16x/C24x/C30x

Operator's Manual

CE

Issue 1.1
Original Instruction

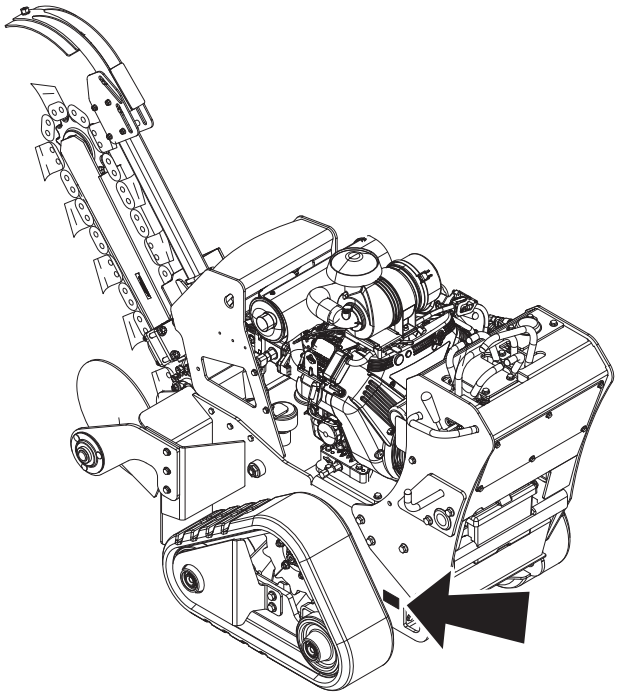
053-2869

Overview

Chapter Contents

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

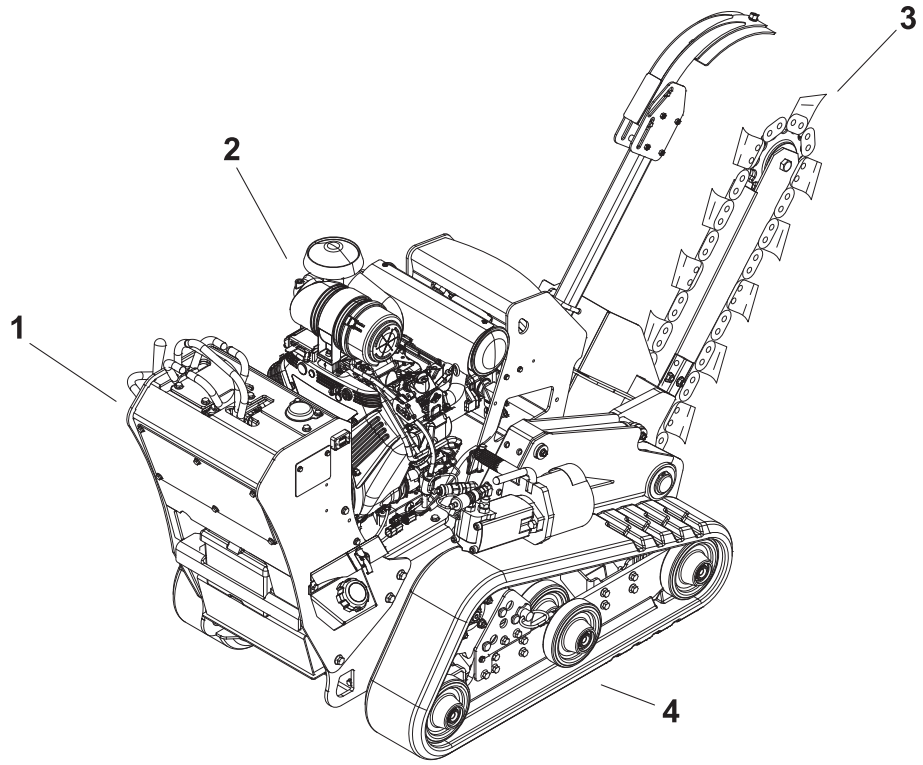
The C16x, C24x and C30x pedestrian trenchers are designed to install buried cable and pipe. The maximum trenching depth is 36" (915 mm) for C16x and C24x and 48" (1220 mm) for C30x. The maximum trenching width is 6" (200 mm). These units are intended for operation in ambient temperatures from 20° to 115°F (-7° to 46°C). Use in any other way is considered contrary to the intended use.

C16x, C24x and C30x units should be used with genuine Ditch Witch® chain, teeth, and sprockets. They should be operated, serviced, and repaired only by persons familiar with their 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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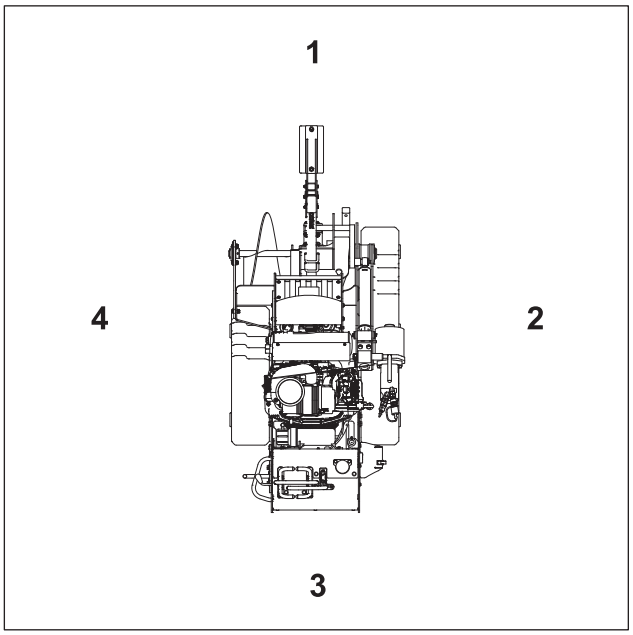
1. Control console
2. Engine
3. Digging boom and chain
4. Track drive

Operator Orientation

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



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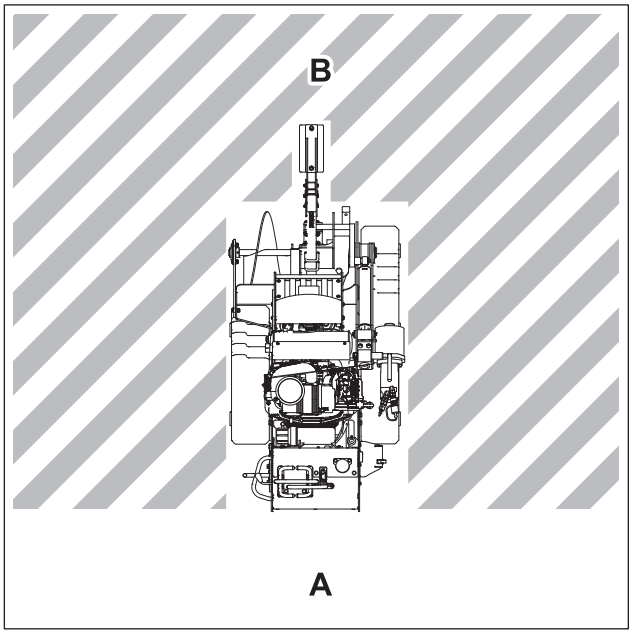
Operating Area

The operating area (A) is at the rear of the machine, behind the control console.

Any other area less than 6 ft (2 m) from the machine is a danger area (B). Stay away.



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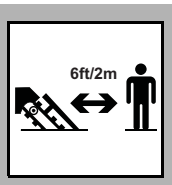

DANGER Moving digging teeth can kill. Trench cave-in can cause you to fall. Stay away.

To help avoid injury:

- Keep everyone from danger area (B) during operation.
- If someone enters danger area (B) during operation, use emergency shutdown.

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.

C16x/C24x/C30x
Operator's Manual

Issue number 1.1/OM-02/16
Part number 053-2869

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Contents

Safety

Chapter Contents

Guidelines

Follow these guidelines before operating any jobsite equipment:

- Complete proper training and read operator's manual before using equipment.
- Contact your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service. Mark proposed path with white paint prior to contacting One-Call or utilities.
- 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.
- 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.

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

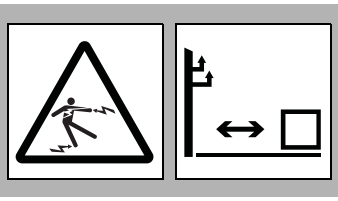
Emergency Procedures

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: Release controls and turn ignition switch to OFF position.

Electric Strike Description



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

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 **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.
- Do not allow anyone to touch equipment.

If a Gas Line is Damaged


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

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.

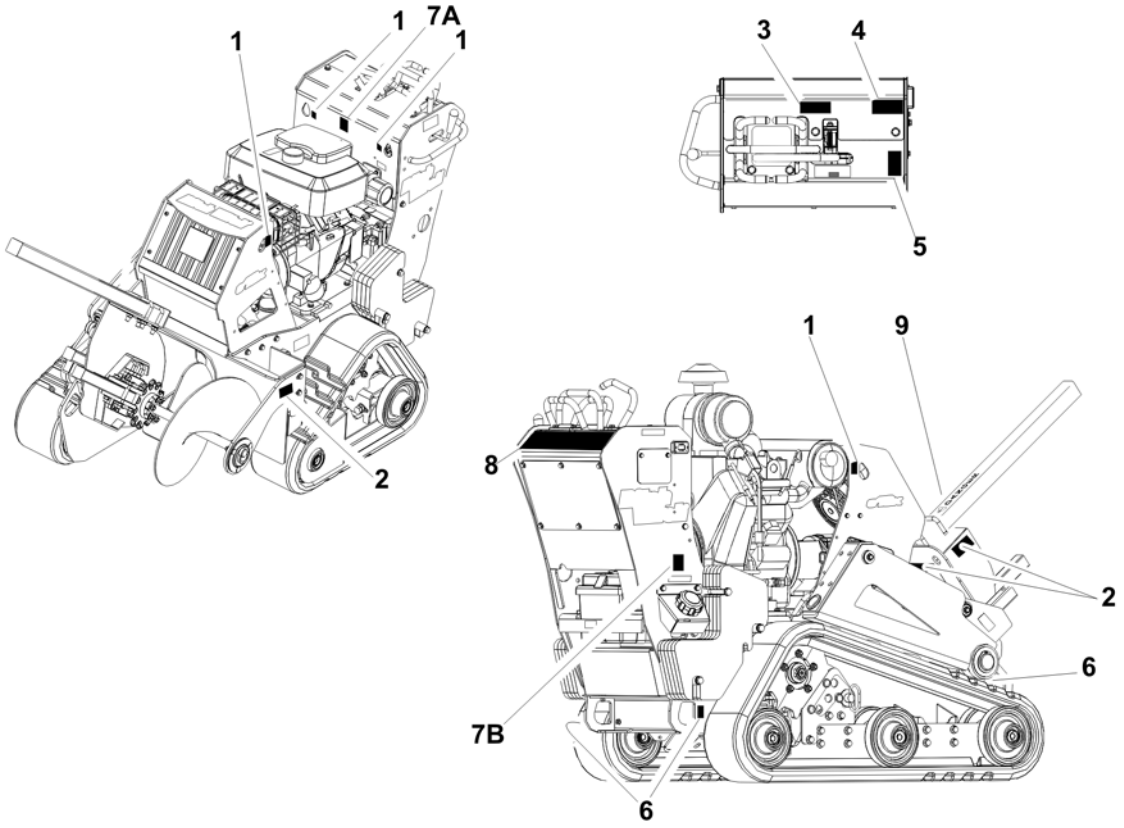
CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

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

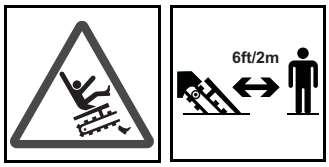
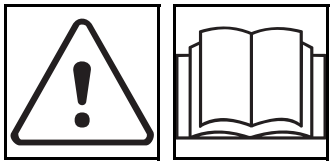
NOTICE indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

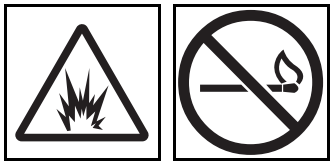
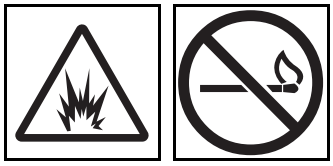
IMPORTANT can help you do a better job or make your job easier in some way.

Machine Safety Alerts



Decal_C30x_C24x_C16x.png

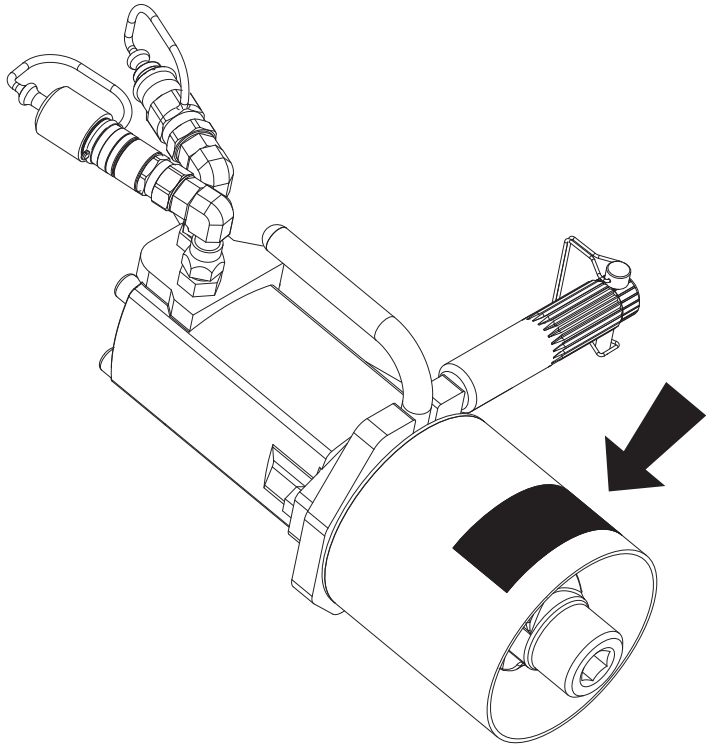
1		Lift point. See Transport chapter for more information. 274-442
2		**DANGER** Moving digging teeth can kill. Trench cave-in can cause you to fall. Stay away. 270-6900
3		**WARNING** Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment. 700-133
4		**WARNING** Read operator's manual. Follow safety rules and know how to use all controls. Your safety is at stake. 273-475

5		**CAUTION** Exposure to high noise levels may cause hearing loss. Wear hearing protection. 700-009 (2P)
6		Tiedown location. See Transport chapter for more information. 274-318
7A*		**WARNING** Fire or explosion possible. Fumes could ignite and cause burns. No smoking, no flame, no spark. 275-419 (2P)
7B**		**WARNING** Fire or explosion possible. Fumes could ignite and cause burns. No smoking, no flame, no spark. 275-419 (2P)
8		**CAUTION** Tip over possible. When loading/unloading run at low idle and keep boom low. 270-6704
9		**DANGER** Moving digging teeth can kill. Trench cave-in can cause you to fall. Stay away.

* C16x
** C24x, C30x

Attachment Safety Alerts

Roto Witch® Drilling Attachment



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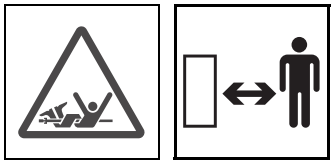


DANGER Rotating shaft will kill or seriously injure. Stay away. 275-197

Operation Overview

Chapter Contents

Plan

1. Gather information about jobsite. See page 33.
2. Inspect jobsite. See page 35.
3. Classify jobsite. See page 36.
4. Select best chain type and tooth pattern for your application. See page 72.
5. Consider optional equipment, if necessary. See page 74.
6. Check supplies and prepare equipment. See page 38.
7. Load unit onto trailer. See page 47.

Trench

1. Unload unit from trailer. See page 50.
2. Leave optional backfill blade, if equipped, in stowed position with digging boom low to ground. See page 75.
3. Start unit. See page 40.
4. Drive to starting point of trench. See page 41.
5. Dig the trench. See page 54.
6. Shut down unit. See page 43.

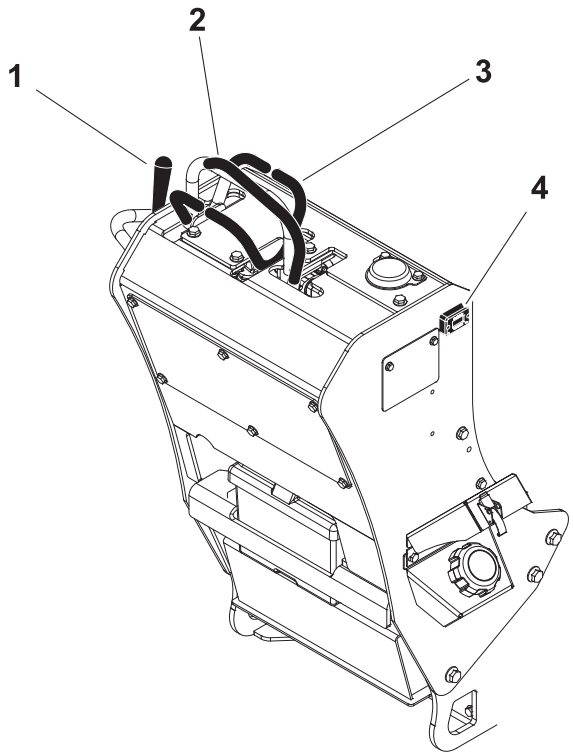
Leave Jobsite

1. Restore the jobsite. See page 80.
2. Rinse unit and stow tools. See page 80.
3. Load unit onto trailer. See page 47.

Controls

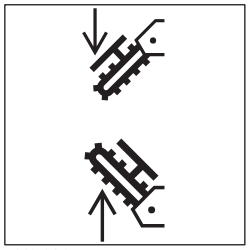
Chapter Contents

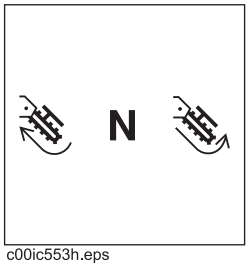
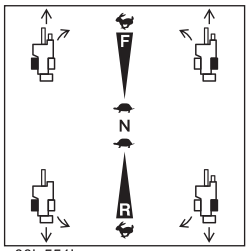
Control Console

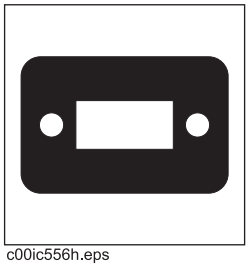


t47om005h.eps

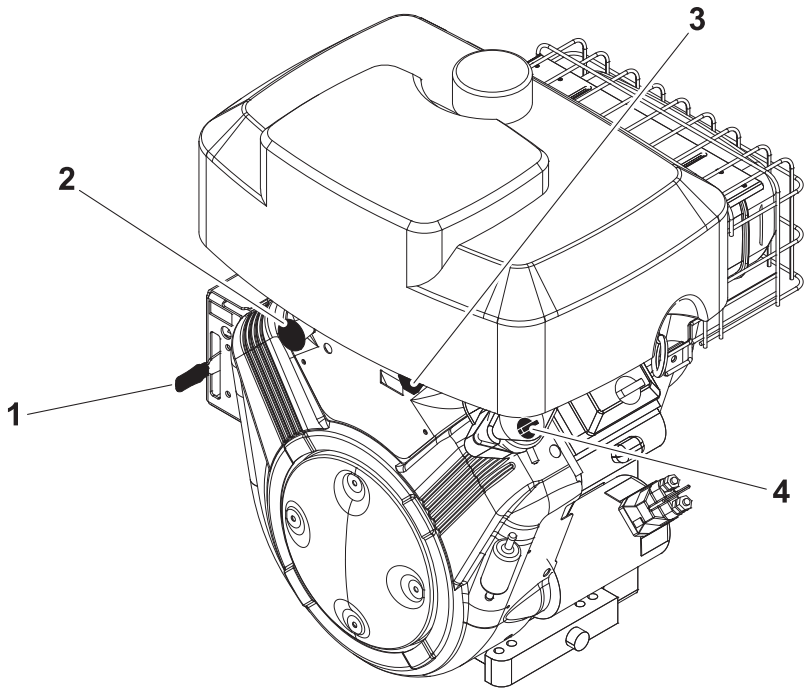
1. Boom lift control
2. Digging chain/Roto Witch® control
3. Speed/Direction controls
4. Hourmeter/Tachometer (C16x and C30x only)

Item	Description	Notes
1. Boom lift control  c00ic004c.eps	To lower boom, push. To raise boom, pull.	

Item	Description	Notes
2. Digging chain control  c00ic553h.eps	To start digging chain, pull toward operator, then push down to dig position. To stop digging chain, release control. To dislodge a rock or other obstruction, pull up on control to reverse chain. **IMPORTANT:** This control changes function when equipped with optional Roto Witch®. **In drill mode:** To drill clockwise, push down. To stop drill rotation, release control. To drill counterclockwise, pull up.	Trenching movement is always backward (toward you). ***NOTICE:*** Do not attempt to travel with digging chain control pulled up (chain in reverse position).
3. Speed/direction controls  c00ic551h.eps	To drive straight forward, push BOTH controls slowly forward. To drive straight in reverse, pull BOTH controls slowly rearward. To turn left, move RIGHT speed/direction control for forward or reverse. To turn right, move LEFT speed/direction control for forward or reverse. To go faster in any direction, move controls farther from neutral position. To stop, release controls.	Trenching movement is always backward (toward you).

Item	Description	Notes
4. Hourmeter/tachometer  c00ic556h.eps	Displays engine operating time and engine speed.	Use engine operating times to schedule service.

C16x Engine Controls



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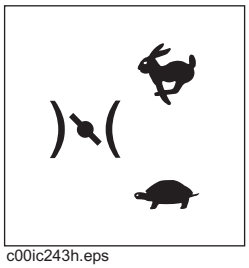
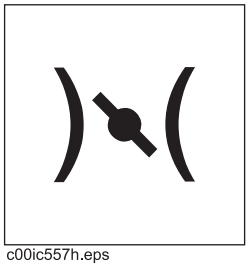
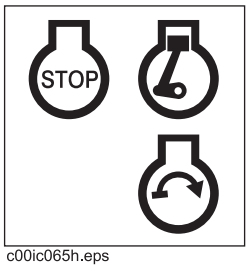
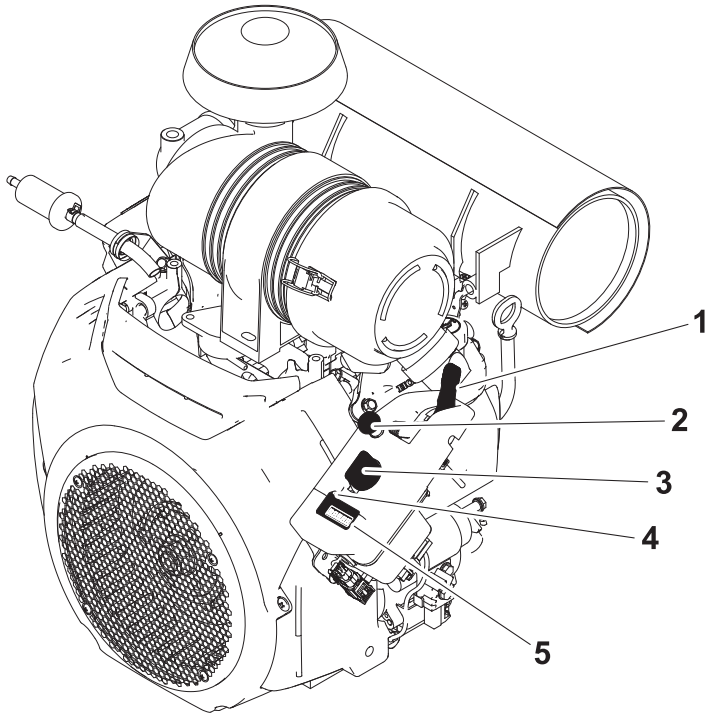
1. Throttle control
2. Choke control
3. Ignition switch
4. Fuel shut-off valve

Item	Description	Notes
1. Throttle control  c00ic243h.eps	To increase engine speed, pull up. To decrease engine speed, push down.	

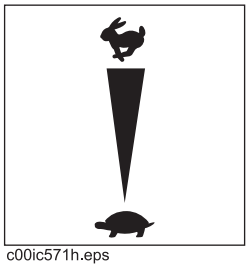
Item	Description	Notes
2. Choke control  c00ic557h.eps	To close choke valve, pull choke control.	Close valve to enrich air/fuel mixture and help start cold engine. Open choke valve after engine runs for a few seconds.
3. Ignition switch  c00ic065h.eps	To start engine, turn key all the way clockwise. Release key as engine starts. To stop engine, turn key counterclockwise.	
4. Fuel shut-off valve  c00ic562h.eps	To stop fuel flow from fuel tank to engine, turn valve clockwise. To allow fuel flow, turn valve counterclockwise.	Close valve when transporting unit to or from jobsite, or whenever machine is parked.

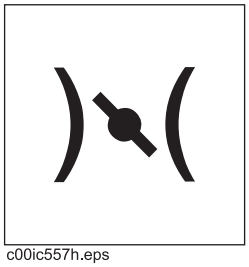
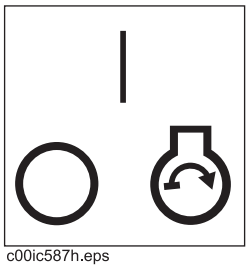
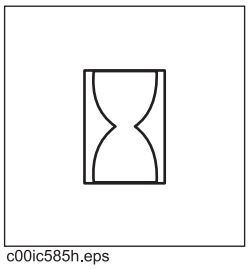
C24x Engine Controls



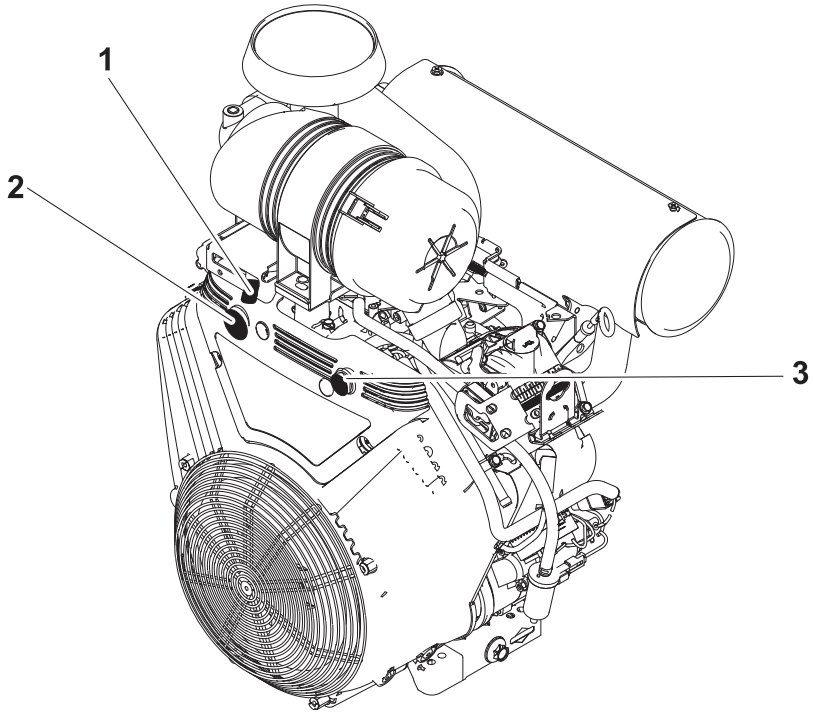
t47om008h.eps

1. Throttle control
2. Choke control
3. Ignition switch
4. Oil pressure indicator
5. Hourmeter

Item	Description	Notes
1. Throttle control  c00ic571h.eps	To increase engine speed, pull up. To decrease engine speed, push down.	

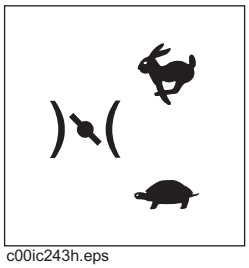
Item	Description	Notes
2. Choke control  c00ic557h.eps	To close choke valve, pull choke control.	Close valve to enrich air/fuel mixture and help start cold engine. Open choke valve after engine runs for a few seconds.
3. Ignition switch  c00ic587h.eps	To start engine, turn key all the way clockwise. Release key as engine starts. To stop engine, turn key counterclockwise.	
4. Oil alert Indicator  c00ic586h.eps	Lights when oil level is too low. Engine will not start.	Check oil level. Add oil as needed.
5. Hourmeter  c00ic585h.eps	Displays number of hours engine has operated.	

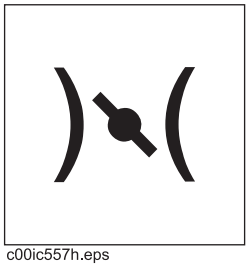
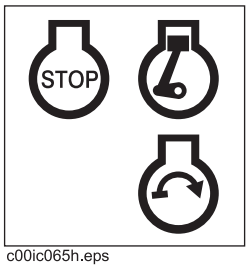
C30x Engine Controls



t47om006h.eps

1. Throttle control
2. Choke control
3. Ignition switch

Item	Description	Notes
1. Throttle control  c00ic243h.eps	To increase engine speed, pull up. To decrease engine speed, push down.	

Item	Description	Notes
2. Choke control  c00ic557h.eps	To close choke valve, pull choke control.	Close valve to enrich air/fuel mixture and help start cold engine. Open choke valve after engine runs for a few seconds.
3. Ignition switch  c00ic065h.eps	To start engine, turn key all the way clockwise. Release key as engine starts. To stop engine, turn key counterclockwise.	

Prepare

Chapter Contents

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

Contact your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.

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.

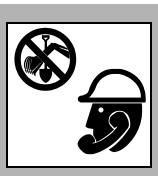
Inspect Site

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 36.
- traffic
- access
- soil type and condition

Identify Hazards

Identify safety hazards and classify jobsite. See "Classify Jobsite" on page 36.

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 glasses 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 your local One-Call (811 in USA) or the One-Call referral number (888-258-0808 in USA and Canada) to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.
- 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' (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' (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

IMPORTANT: 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

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

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, and fuel if equipped)
- tires and tracks
- pumps and motors
- hoses and valves
- signs, guards, and shields

Accessories

Fire Extinguisher

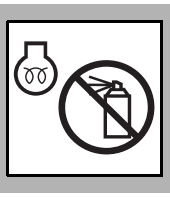
If required, mount a fire extinguisher near the power unit but away from possible points of ignition. The fire extinguisher should always be classified for both oil and electric fires. It should meet legal and regulatory requirements.

Drive

Chapter Contents

Start

1. Ensure all controls are in neutral.
2. If necessary, use choke control to start cold engine.

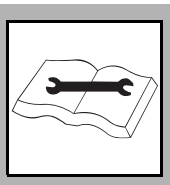
WARNING Fire or explosion possible.

To help avoid injury: Do not use starter fluid.

3. Move throttle to 1/4 open.
4. Turn ignition switch to START position to crank engine.
5. Release key when engine starts.

IMPORTANT: If engine does not start, turn ignition switch to OFF position and check for fuel blockage or electrical system problems.

6. Run engine at half throttle or less for five minutes before operating trencher.
7. During warm-up, do a check of all controls. Ensure they operate correctly.

WARNING Incorrect control function can cause death or serious injury.

To help avoid injury:

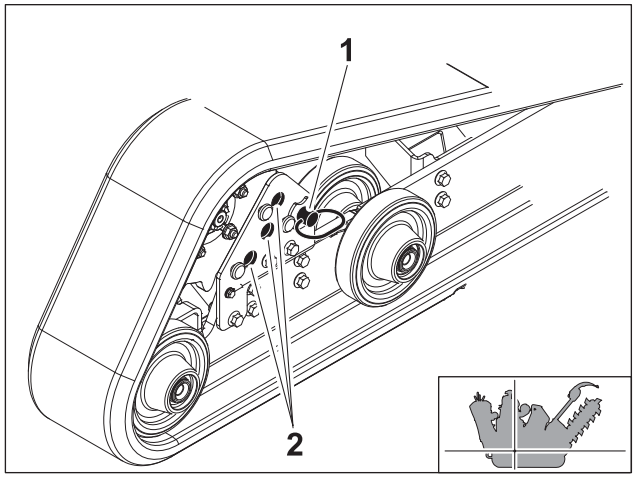
If controls do not operate as given in instructions:

- Shut down machine immediately.
- Have machine repaired.

EMERGENCY SHUTDOWN: Release controls and turn ignition switch to OFF position.

Drive

1. Remove parking pin from parking position (2) and insert it in drive position (1).
2. Pull boom control to raise digging boom.
3. Move throttle to 3/4 open.
4. Move speed/direction control in direction of preferred travel. Ground speed increases with control movement.



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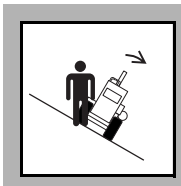
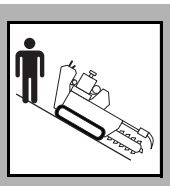
Drive on a Slope

WARNING Machine can tip over and crush you.

To help avoid injury:

- Operate from uphill side of machine.
- Keep digging boom low.
- Drive cautiously at all times.
- Never jerk control levers. Use a steady even motion.


WARNING If the machine tips over, there is a risk of fuel leakage. Fire or explosion can cause death or serious injuries.

To help avoid injury: If the machine tips over, turn ignition switch to OFF position or close the fuel shutoff valve.

Driving safely on a slope depends upon many factors including:

- Distribution of machine weight (weight of machine may change due to configuration)
- 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
- Operator skill

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.

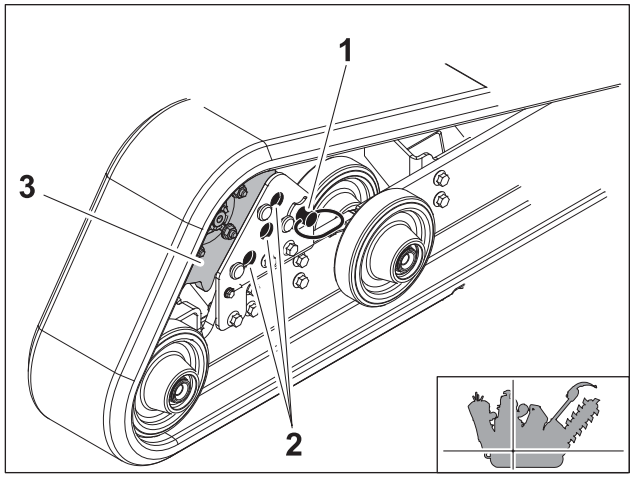
Maximum engine lubrication angle – 20°

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

Maximum secondary brake retarding force – equal to traction of one track

Shut Down

1. Release speed/direction controls.
2. Push boom control to lower digging boom, if space allows.
3. Insert parking pin in the correct parking hole (2).



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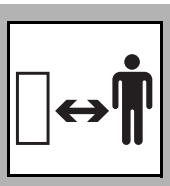
IMPORTANT: The stopping position of the gear (3) determines the correct parking hole.

4. Run engine at low throttle for three minutes to cool.
5. Turn ignition switch to OFF position.
6. If present, close fuel shut-off valve.
7. Remove key.
8. If you park machine on a slope: block tracks with wooden blocks and engage parking pin.

Transport

Chapter Contents

Lift



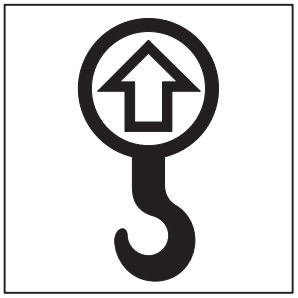
WARNING Crushing weight could cause death or serious injury. Stay away.

To help avoid injury:

- Use applicable lifting device and lifting equipment.
- Only use approved lifting points.
- Stay away from lifted load.

Lifting points

Lifting points are identified by lifting decals.



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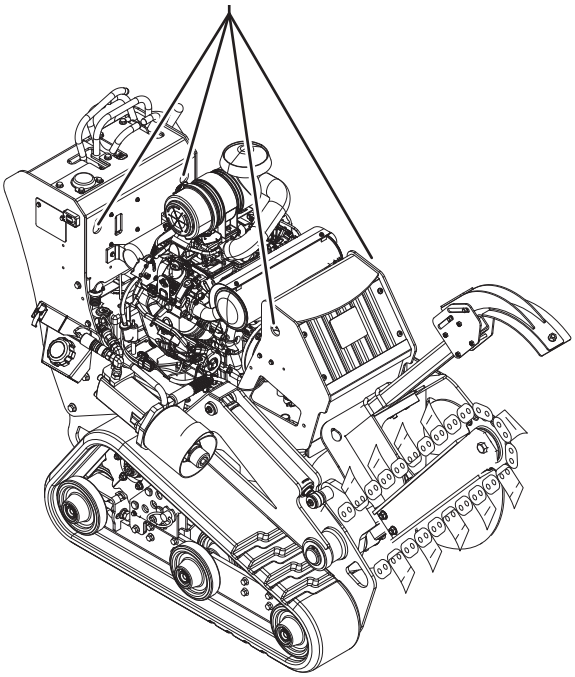
Lift

Use a hoist and lifting accessories adapted to the size and weight of the machine. See "Specifications" on page 105 or measure and weigh machine before lifting.



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1. Use approved methods to attach lifting accessories.
2. Use lifting device to carefully tension lifting slings.
3. Slowly lift machine.

Haul

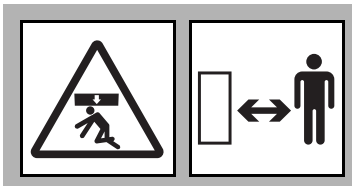
Load

IMPORTANT: Use Ditch Witch S2B trailer for transport. If you use a different trailer, obey additional instructions from the manufacturer. Load trencher as far to the front of the trailer as possible.

Prepare trailer

1. Attach trailer to vehicle.
2. Park vehicle with trailer on level and firm ground.

Load machine



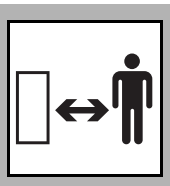
WARNING Crushing weight could cause death or serious injury. Stay away.

To help avoid injury:

- Keep boom as low as possible during loading procedure.
- Ensure ten to fifteen percent of total weight (machine plus trailer) is on tongue of trailer.

1. If equipped, put backfill blade in stowed position. See "Backfill Blade" on page 75.
2. Remove parking pin from parking position.
3. Start engine.
4. Pull boom control to slightly raise digging boom.
5. Move machine to rear of trailer. Have boom face ramps. Align tracks with ramps and machine with center of trailer bed.
6. Set engine to low throttle.
7. Move speed/direction control slowly and push to appropriate speed.
8. Drive unit onto trailer, digging boom first, until tiedown position is reached.
9. If space allows, push boom control to lower digging boom onto trailer.
10. Engage parking pin in parking position and shut down unit. If present, turn fuel shut-off to off position.

Tie Down



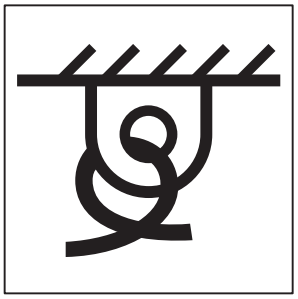
WARNING Crushing weight could cause death or serious injury. Stay away

To help avoid injury:

- Only use approved tiedown points.
- Use applicable tiedown equipment.

Tiedown points

Tiedown points are identified by tiedown decals.



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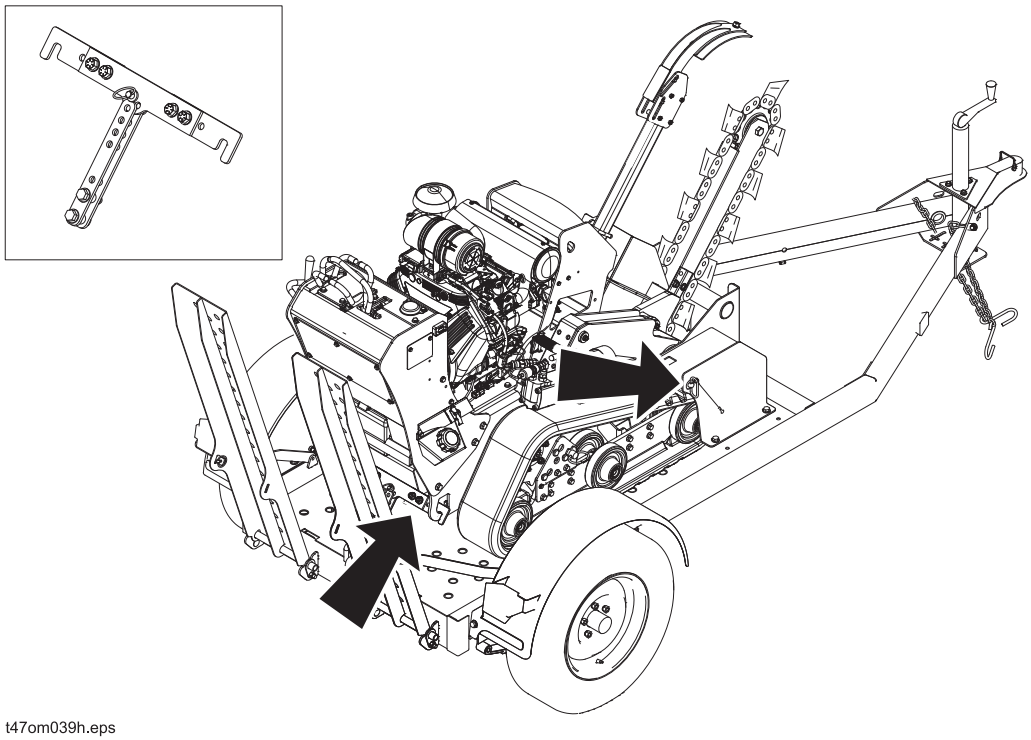
Procedure

With Tie-Down Kit on S2B Trailer



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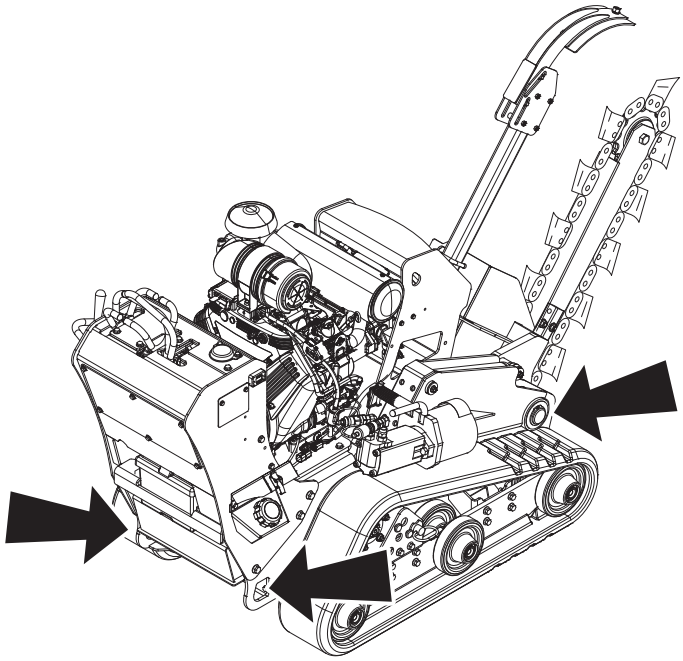
1. Use pins to secure front and rear of machine to trailer.
2. Secure rear latch in lower holes as shown in inset when latch is not in use.

Without Tie-Down Kit



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1. Loop tiedowns around unit at tie-down points.
2. Ensure tiedowns are tight before transport.

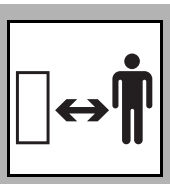
Unload

IMPORTANT: Use Ditch Witch S2B trailer for transport. If you use a different trailer, obey additional instructions from the manufacturer.

Prepare trailer

1. Park vehicle with trailer on level and firm ground.
2. Ensure trailer is correctly attached to vehicle.

Unload machine

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

To help avoid injury:

- Keep all persons away from machine and trailer.
- Keep boom as low as possible during unloading procedure.

1. Lower trailer or ramps.
2. Remove tiedowns.
3. If present, open fuel shut-off valve.
4. Start engine and set to low throttle.
5. Remove parking pin from parking position.
6. Pull boom control to raise digging boom, but keep it as low as possible.
7. Slowly back unit down trailer or ramps.

Retrieve

NOTICE: Machine is not approved for towing. Towing can damage components.

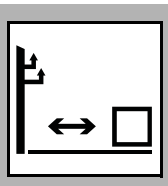
- Do not tow machine.

1. If machine becomes defective, repair on location or use lifting procedure to retrieve machine.
2. If machine cannot be repaired or lifted, contact customer support.

Trench

Chapter Contents

Precautions

DANGER Electric shock will cause death or serious injury.

To help avoid injury:

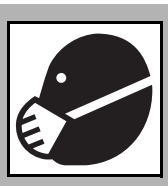
- Know location of electrical lines and stay away.
- Carefully expose lines by hand before digging.


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


WARNING Jobsite hazards could cause death or serious injury.

To help avoid injury:

- Comply with all utility notification regulations before digging or drilling.
- Notify companies that do not subscribe to One-Call.
- Set up warning barriers and keep people away from machine and jobsite.

CAUTION Cutting, drilling, or working materials such as concrete, sand, or rock containing quartz can result in exposure to silica dust. Breathing silica dust can cause lung disease.

To help avoid injury:

- Use water spray or other appropriate means to control dust.
- Use appropriate breathing protection when exposed to silica dust.

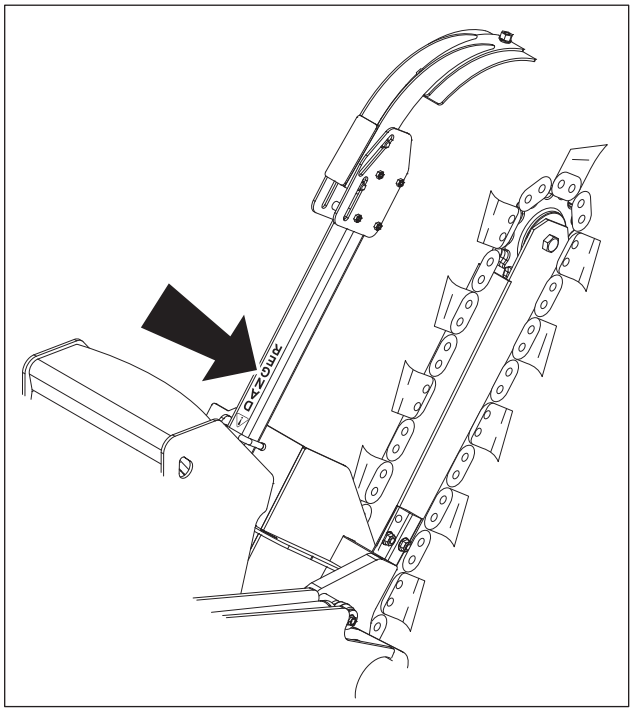

CAUTION Flying objects thrown by machine may strike people.

To help avoid injury: Wear hard hat and safety glasses.

Set Up

1. Ensure all preparatory tasks have been done correctly. See "Prepare" on page 33.
2. Ensure engine is shut down.
3. Ensure restraint bar is installed correctly:
   - Danger word must be facing up, as shown.
   - Restraint bar must be in correct position. See "Check Restraint Bar Position" on page 93.

   IMPORTANT: Trench cleaner shown installed on restraint bar is optional.
4. If equipped, remove backfill blade. See "Backfill Blade" on page 75.
5. Install correct counterweight configuration. See "Counterweights" on page 76.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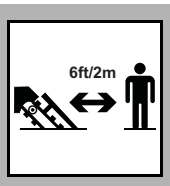
Operate

Dig Trench



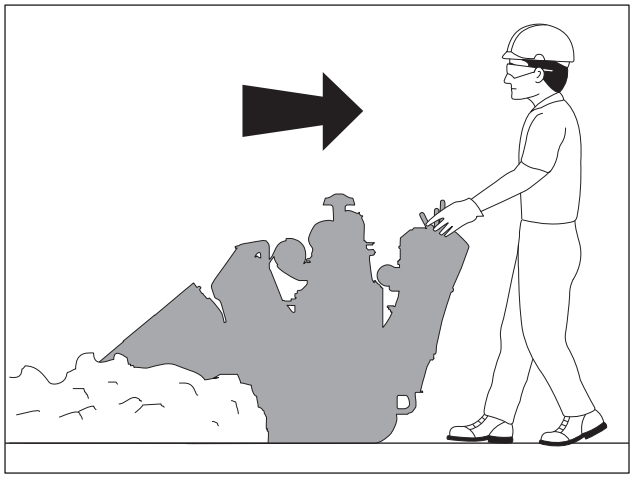
DANGER Moving digging teeth can kill. Trench cave-in can cause you to fall. Stay away.

To help avoid injury:

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

1. Start engine. See "Start" on page 40.
2. Drive machine to starting point. Move in line with planned trench.
3. Move throttle to half open.
4. Push boom control to lower digging boom to just above ground.
5. Push digging chain control to dig position.
   - DIGGING CHAIN WILL MOVE.
   - Trenching movement is toward you.

   EMERGENCY STOP: Release controls and turn ignition switch to OFF position.
6. Increase engine speed to full throttle.
7. Slowly push boom control to lower digging boom to desired trench depth.
8. Slowly move speed/direction control to desired speed.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NOTICE: Incorrect use will damage machine.

- Do not make sharp turns.
- Lower boom to full depth when turning.

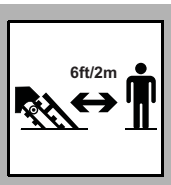
Remove Objects from Digging Chain

If object becomes lodged in chain:

1. Move attachment speed/direction control to neutral.
2. Slightly raise boom.
3. Reverse chain direction.

If object stays lodged in chain:

1. Shut down machine. See "Shut Down" on page 43.
2. Engage parking pin in parking position.



DANGER Moving digging teeth can kill. Trench cave-in can cause you to fall. Stay away.

To help avoid injury:

- Wait until digging chain is completely stopped.
- Wear safety gloves.

3. Carefully remove object by hand.

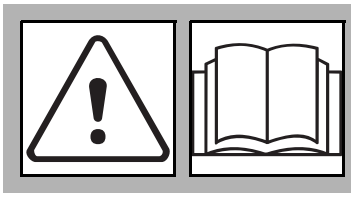
Finish Job

1. When trench is complete, release speed/direction controls.
2. Move throttle to half open.
3. Pull boom control to raise digging boom to top of trench.
4. Release digging chain control.
5. Install backfill blade in work position for backfilling.
6. When backfilling is completed, position blade in upright "stowed" position for transporting, keeping digging boom low to ground. See "Backfill Blade" on page 75.
7. Drive away from trench.
8. Shut down machine. See "Shut Down" page 41.

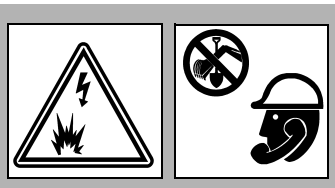
Drill

Chapter Contents

Set up



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



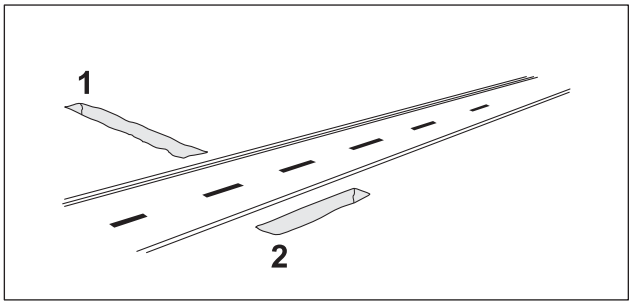
WARNING Jobsite hazards could cause death or serious injuries.

To help avoid injury:

- Comply with all utility notification regulations before digging or drilling.
- Set up warning barriers and keep people away from machine and jobsite.
- Do not operate drilling attachment if bore path is less than 10' (3 m) from any underground hazard.

Dig Approach Trench

1. Mark path where you intend to drill.
2. Dig an approach trench (1) **along** the intended bore path.



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IMPORTANT: Ensure that approach trench is:

- deep enough for pipe to lay flat and enter soil at correct angle;
- at least 20' (6 m) long;
- at least 4" (10 cm) wide.

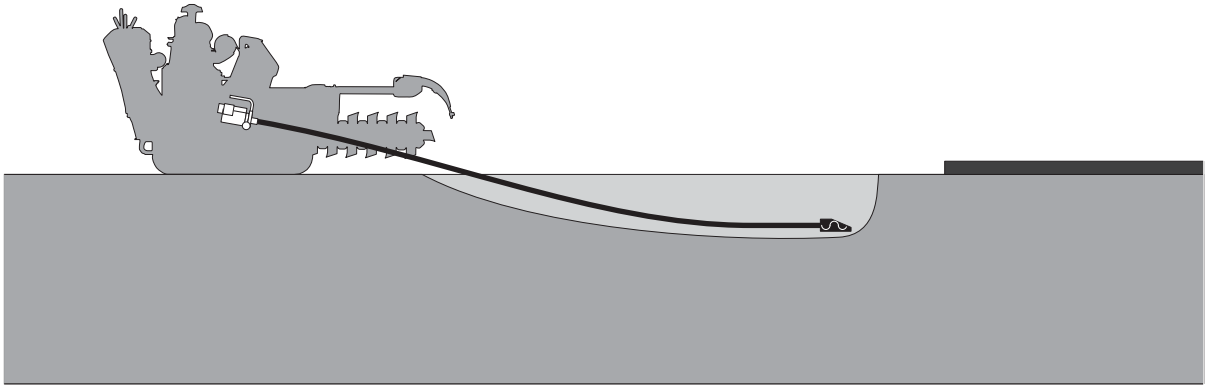
Dig Target Trench

1. Select a completion point for the bore.
2. Dig a target trench (2) **across** the intended completion point.

IMPORTANT: Ensure that target trench is:

- deep enough for drill bit to enter slightly above the trench floor;
- long enough to allow for drift of unguided drill string. Accuracy of bore decreases with length and varies with soil conditions.

Install Drill String



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1. Assemble at least 20' (6 m), but not more than 30' (9 m), of rod sections.
2. Install drill bit at the cutting end of the drill string.
3. Put drill string in approach trench and align with intended bore path.

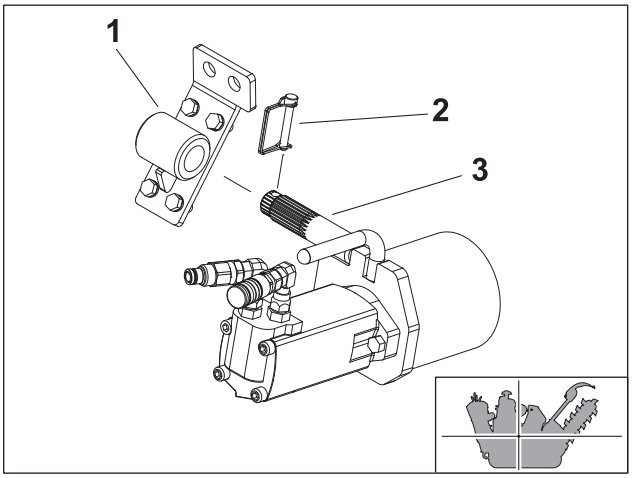
> ***NOTICE:*** Incorrect installation can cause rod sections to bend.
>
> - Have more than half of drill string length inside trench.
> - If necessary, remove rod sections or increase length of trench.

4. Start engine and set to low throttle. See "Start" on page 40.
5. Lower boom in parallel position to ground.
6. Move machine toward approach trench.
7. Shut down engine. See "Shut Down" on page 43.

Install Drilling Attachment

The operating position of the Roto Witch® drilling attachment is on the right side of the machine.

1. Ensure engine is shut down.
2. Remove attachment from storage position. For storage position, see "Remove Drilling Attachment" on page 69.
3. Fully insert mount pin (3) in cylinder of attachment plate (1) at correct angle: drilling attachment must be aligned with drill string.
4. Secure the assembly with pin (2).
5. Use slip latch to attach drill string to drilling attachment.



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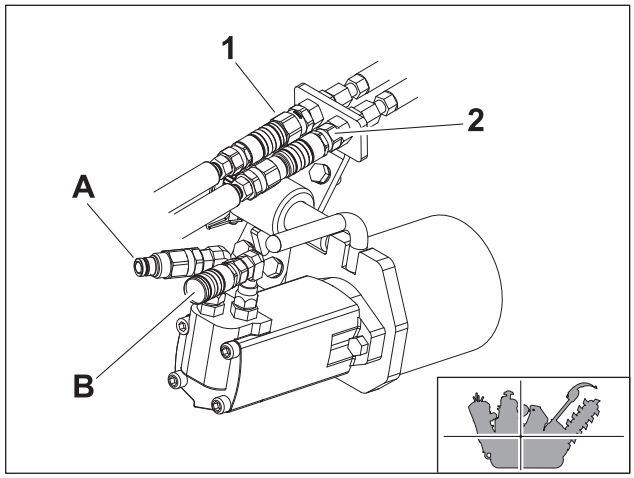
Connect Hydraulic Lines

1. Ensure engine is shut down.
2. Remove dust covers from connectors (A) and (B).
3. Disconnect hydraulic connector (1) and connect with connector (A).
4. Disconnect hydraulic connector (2) and connect with connector (B).



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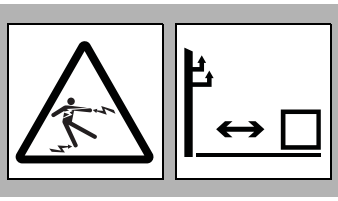
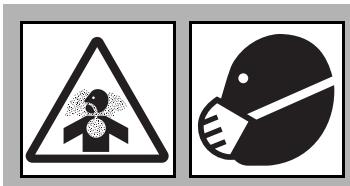
Operate



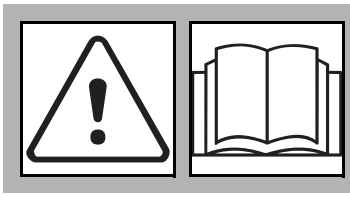
DANGER Electric shock. Contacting electric lines will cause death or serious injury. Know location of lines and stay away.



CAUTION Cutting, drilling, or working materials such as concrete, sand, or rock containing quartz can result in exposure to silica dust. Breathing silica dust can cause lung disease.

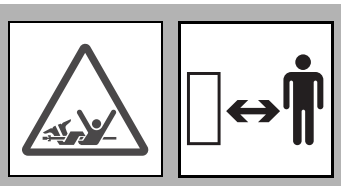
To help avoid injury:

- Use water spray or other appropriate means to control dust.
- Use appropriate breathing protection when exposed to silica dust.



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

Drill



DANGER Rotating shaft will kill or seriously injure. Stay away.

To help avoid injury:

- Keep everybody at least 10' (3 m) away from drill string and machine.
- If a person enters the danger zone, use emergency shutdown.
- Wear close-fitting clothing and the applicable personal protective equipment.

1. Evaluate jobsite conditions. If you determine it is necessary, have helper use drill string guide to align drill string as it enters the soil. See "Start Bore with Drill String Guide" on page 63.
2. Start engine and set to low throttle. See "Start" on page 40.
3. Operate drilling attachment controls to start clockwise rotation.
4. Slowly move machine forward while maintaining rotation:
   - When length of bore is more than 5' (1.5 m), you may carefully and slowly increase speed.
   - Always use lowest speed necessary.
5. Carefully monitor progress of bore:
   - If rod section starts to bow, stop forward movement of machine and back machine slightly until rod straightens.
   - If drill string becomes blocked, rotate drill string counterclockwise to back up slightly.

NOTICE: Incorrect drilling will damage drilling equipment.

- Do not drill too quickly. Drilling bit will drift off course and rod sections may bow or break.
- Do not drill with bent rod section.

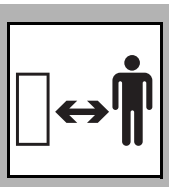
6. When drill bit enters target trench, stop rotation immediately.

IMPORTANT: When initial bore has been drilled, choose the next task:

- Backream to enlarge bore. See "Backream" on page 65.
- Pull drill string to install product. See "Pull Product" on page 66.

Start Bore with Drill String Guide

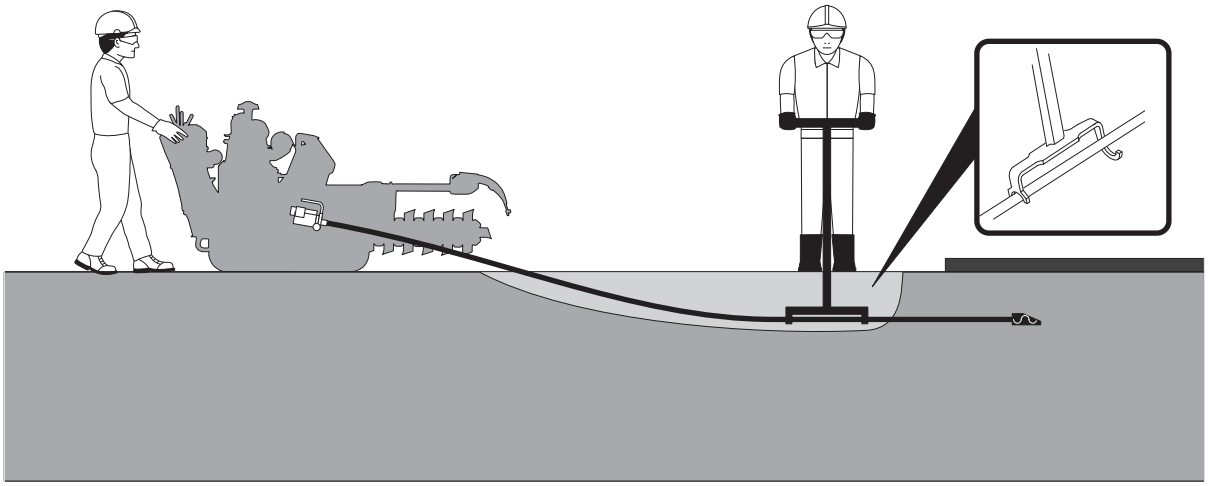
If jobsite conditions make it necessary, ask a helper to follow the instructions below to operate the drill string guide at start of bore.

DANGER Rotating shaft will kill or seriously injure. Stay away.

To help avoid injury:

- Use only the approved Ditch Witch® drill string guide (p/n 118-079).
- Do not straddle trench or drill string. Do not enter trench.
- Keep hands and feet away from drill string and drilling attachment.
- Do not use drill string guide during backreaming or when drill string is being pulled back.
- Only use drill string guide on left side of approach trench.



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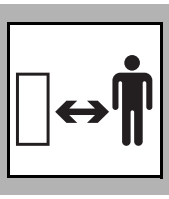
1. Stand on **left** side of approach trench.
2. Put drill string guide in correct position:
   - at least 3' (1 m) behind drill bit
   - hook side toward bore
   - cradle side toward machine
3. When drill string guide is in correct position, signal machine operator to start bore.
4. Use drill string guide to control the first 5' (1.5 m) of the bore path.
5. When length of bore is 5' (1.5 m), have machine operator stop machine.
6. When drill string has stopped, remove drill string guide and leave danger area.

Add Rod

If more length is needed, ask a helper to add a rod section.

DANGER Rotating shaft will kill or seriously injure. Stay away.

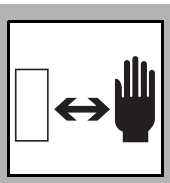
To help avoid injury: Only access drilling attachment with hands when engine is shut down.

Disconnect Drill String from Drilling Attachment

1. Operate controls to stop rotation of drilling attachment.
2. To loosen drill string in ground: operate ground drive controls to move machine rearward 6" (15 cm).
3. Shut down engine.
4. Disconnect drill string from drilling attachment with applicable special tool (p/n 351-272). See "Disassemble Drill String" on page 69.
5. Start engine.
6. Operate ground drive controls to move unit rearward, slightly more than length of rod section.

Add Rod Section

1. Shut down engine.
2. Have helper connect new rod section to drilling attachment.
3. Start engine and set to low throttle.
4. Slowly move machine forward until new rod section and drill string are about 1' (30 cm) apart.
5. Rotate drilling attachment to align slip latches of new rod section and drill string.
6. Have helper lightly hold new rod section and drill string so that they are aligned.

WARNING Pinch point. Crushing will cause serious injury.

To help avoid injury:

- Keep hands at least 6" (15 cm) from ends of rod section and drill string.
- Support rods from underneath with open palms. Do not grip rods.

7. Move unit forward slowly. As soon as new rod section engages drill string, have helper move hands clear.
8. Slightly move forward until slip latch connection is correctly latched.

Backream

After drill bit enters target trench, the bore hole may be enlarged by changing the drill bit to a reamer and pulling it back through the initial bore.

NOTICE: Incorrect use may damage components and increase wear.

- Do not try to increase hole size too much in one pass. Make several passes using successively larger reamers.
- Keep drill string straight and aligned with drilling attachment. Sharp bow of drill string at drilling attachment can cause rod failure.
- Never have more than 30' (9 m) of exposed rod outside the bore. Remove rods as necessary.

Single pass

1. Shut down engine.
2. Remove drill bit and install applicable reamer.
3. Start engine and begin clockwise rotation.

   IMPORTANT: Always rotate clockwise during backreaming. Rotate counterclockwise only if drill bit or reamer is blocked in bore.

4. Slowly back up machine while maintaining rotation.

   IMPORTANT: If length of rod outside the bore reaches 30' (9 m), remove rod section. See "Remove Rod" on page 67.

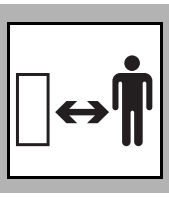
5. When reamer exits approach trench, stop rotation immediately.

Multiple passes

1. Do a single pass.
2. Install drill bit.
3. Push drill string through bore. Do not rotate.
4. Do a single pass. At final pass, pull product. See "Pull Product" on page 66.

Pull Product

To install product, pull it through the bore after drilling or at final pass of backreaming.



DANGER Rotating shaft will kill or seriously injure. Stay away.

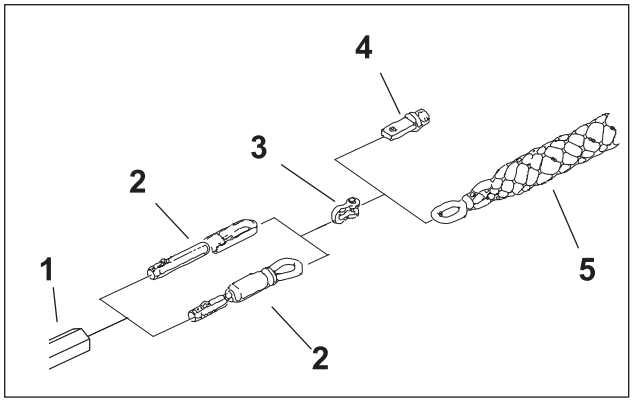
To help avoid injury: Ensure no one is in target trench or near product being installed. If swivel malfunctions, material can rotate.

After drilling

1. Remove drill bit and attach applicable swivel (2) to drill string (1). Ensure swivel (2) swivels correctly.
2. Use shackle (3) to attach pipe pulling adapter (4) or pulling grip (5) to swivel (2).
3. Attach material to pipe pulling adapter (4) or pulling grip (5).
4. Set engine to low throttle.
5. Slowly back up machine. If there is a blockage, begin counterclockwise rotation.

   IMPORTANT: If length of rod outside the bore reaches 30' (9 m), remove rod section. See "Remove Rod" on page 67.

6. When product exits approach trench, stop machine immediately.



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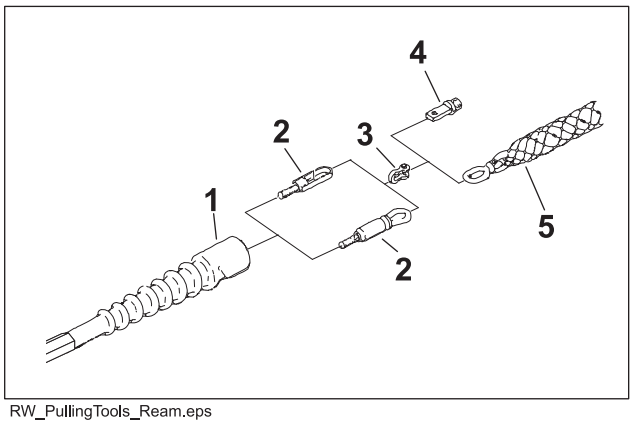
When backreaming

1. Attach applicable swivel (2) to reamer (1). Ensure swivel (2) swivels correctly.
2. Use shackle (3) to attach pipe pulling adapter (4) or pulling grip (5) to swivel (2).
3. Attach material to pipe pulling adapter (4) or pulling grip (5).
4. Backream. See "Backream" on page 65.



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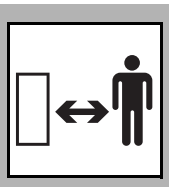
Remove Rod

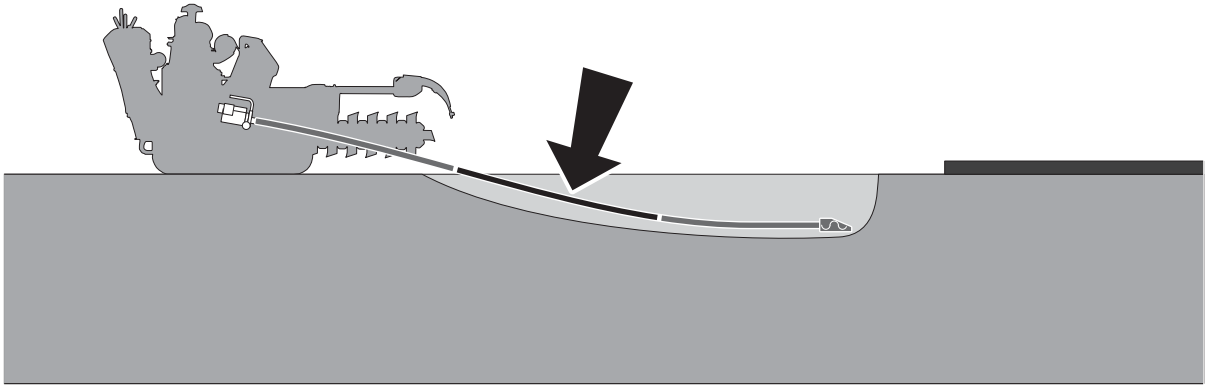
If the length of rod outside the bore reaches 30' (9 m), ask a helper to remove rod sections as needed.



DANGER Rotating shaft will cause death or serious injury.

To help avoid injury:

- Only access drill string with hands when engine is shut down.
- Always remove second rod section (as shown). Leave first rod section attached to drilling attachment.



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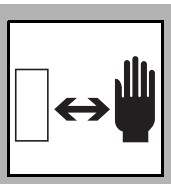
Remove Rod Section

1. Operate controls to stop rotation of drilling attachment.
2. Shut down engine.
3. Disconnect and remove applicable rod section with applicable special tool (p/n 351-272). See "Disassemble Drill String" on page 69.

Reconnect Drill String

1. Start engine and set to low throttle.
2. Slowly move machine forward until attached rod section and drill string are about 1' (30 cm) apart.
3. Operate drilling attachment controls to align slip latches of attached rod section and drill string.

4. Have helper lightly hold attached rod section and drill string so that they are aligned.



WARNING Pinch point. Crushing will cause serious injury.

To help avoid injury:

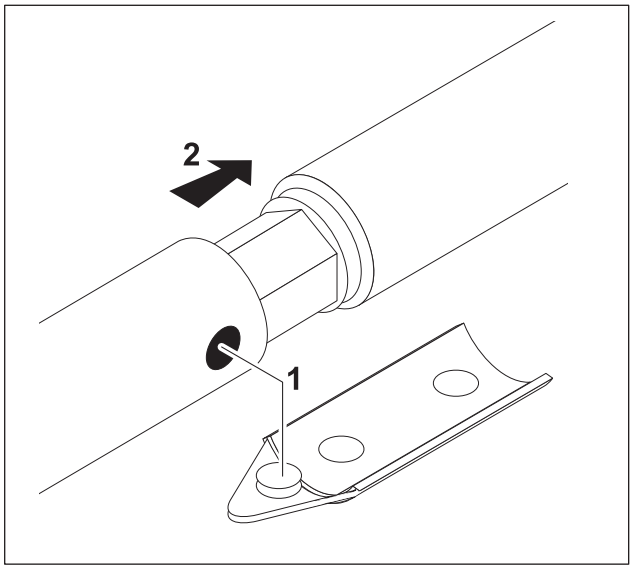
- Keep hands at least 6" (15 cm) from ends of rod section and drill string.
- Support rods from underneath with open palms. Do not grip rods.

5. Move unit forward slowly. As soon as attached rod section engages drill string, have helper move hands clear.
6. Slightly move forward until slip latch connection is correctly latched.

Finish Job

Disassemble Drill String

1. Shut down engine.
2. Disconnect drill string from drilling attachment.
3. Remove drill bit.
4. Disconnect rod sections:
   - Press tab through hole in female side of joint (1) using special tool (p/n 351-272).
   - Pull rod sections apart (2).

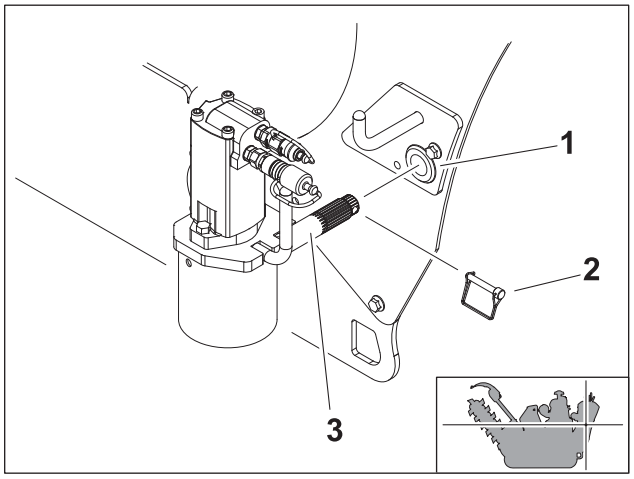


Drill_Attchmnt_RodJoints.eps

Remove Drilling Attachment

When not in use, install the Roto Witch® drilling attachment in storage position on left side of console.

1. Ensure engine is shut down.
2. Disconnect hydraulic lines.
3. Install dust covers on hydraulic connectors of drilling attachment.
4. Engage mount pin (3) in bore of console (1).
5. Secure the assembly with pin (2).



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Systems and Equipment

Chapter Contents

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.
- 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®II chain	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® II chain	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.

NOTICE: Adding or removing optional equipment changes counterweight requirement. Use applicable chart on page 77 or page 78 to ensure you have the correct counterweights for your configuration.

Equipment	Description
booms	provide depth options of 18" (457mm), 24" (610 mm), 30" (760 mm), 36" (915 mm) or 48" (1220 mm); each length is available with an adjustment screw for tensioning the digging chain
mechanical trench cleaner	removes spoils from the trench floor
backfill blade	cover trench using machine
drilling attachment	drill under sidewalks and driveways
counterweights	provide unit balance in various configurations
10-tooth sprocket	slows digging chain speed to allow teeth time to penetrate into the ground and increase performance in rocky or extremely hard soil

Backfill Blade

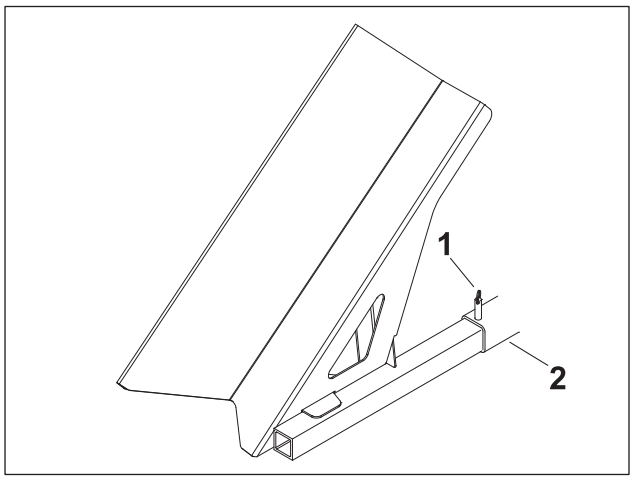
The optional backfill blade must be in position related to the job at hand.

Stowed position

Install the backfill blade in stowed position for transport and drilling.

1. Shut down engine.
2. Insert backfill blade in upright position onto mounting stub (2).
3. Secure with pin (1).

IMPORTANT: Completely remove backfill blade for trenching.



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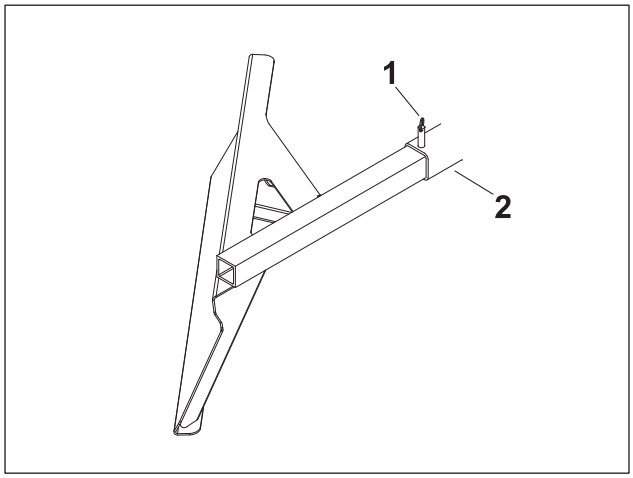
Work position

Install the backfill blade in work position for backfilling only.

1. Shut down engine.
2. Insert backfill blade in work position onto mounting stub (2).
3. Secure with pin (1).



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Drilling Attachment

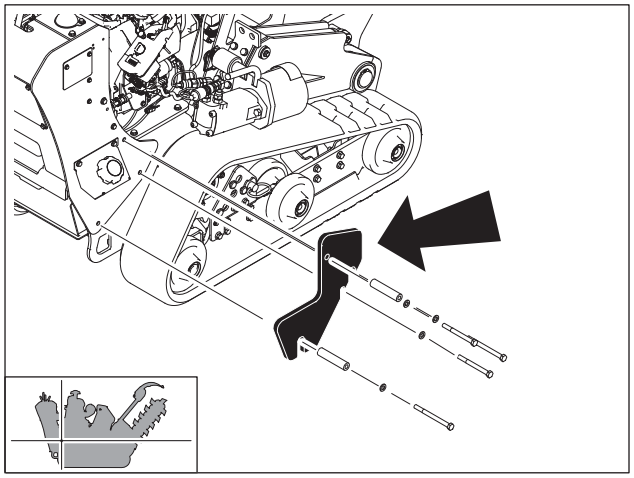
The optional Roto Witch® drilling attachment can be used to drill under obstructions such as sidewalks and driveways. For operational information, see "Drill" on page 57.

Counterweights

Select the applicable counterweight configuration to balance the machine.

IMPORTANT: Do not add more counterweights than indicated.

1. Use the applicable chart to determine the correct number of counterweights.
2. Install applicable counterweight configuration on console.



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Counterweight configurations for C16x and C24x

Tool type	Boom length	Tooth type	Number of counterweights
19K Chain	18 in	Duratooth® Cup	0
		Duratooth®Combos (Shark®/Alligator)	0
	24 in	Duratooth®	0
		Duratooth® Combos (Shark®/Alligator)	0
	30 in	Duratooth®	0
		Duratooth® Combos (Shark®/Alligator)	0
	36 in	Duratooth®	0
		Duratooth® Combos (Shark®/Alligator)	0
35K Chain	24 in	Duratooth® Cup	0
		Duratooth® Combos (Shark®/Alligator)	0
		Shark® II	0
	30 in	Duratooth® Cup	0
		Duratooth® Combos (Shark®/Alligator)	0
		Shark® II	0
	36 in	Duratooth® Cup	0
		Duratooth® Combos (Shark®/Alligator)	0
		Shark® II (4 and 6" width)	**8** (4 left, 4 right)
Drilling attachment	-	-	0

Counterweight configurations for C30x

Tool type	Boom length	Tooth type	Number of counterweights
19K Chain	18 in	Duratooth® Cup	0
		Duratooth® Combos (Shark®/Alligator)	0
	24 in	Duratooth®	0
		Duratooth® Combos (Shark®/Alligator)	0
	30 in	Duratooth®	0
		Duratooth® Combos (Shark®/Alligator)	0
	36 in	Duratooth®	0
		Duratooth® Combos (Shark®/Alligator)	0
35K Chain	24 in	Duratooth® Cup	0
		Duratooth® Combos (Shark®/Alligator)	0
		Shark® II	0
	30 in	Duratooth® Cup	0
		Duratooth® Combos (Shark®/Alligator)	0
		Shark® II	0
	36 in	Duratooth® Cup	0
		Duratooth® Combos (Shark®/Alligator)	0
		Shark® II (4 and 6" width)	**8** (4 left, 4 right)
	48 in	Duratooth® Cup	**9** (4 left, 5 right)
		Duratooth® Combos (Shark®/Alligator)	**9** (4 left, 5 right)
		Shark® II (4 and 6" width)	**12** (6 left, 6 right)
Drilling attachment	-	-	0

Complete the Job

Chapter Contents

Restore Jobsite

After product is installed, return spoils to the trench with optional backfill blade, shovels, or small earth-moving equipment. See "Backfill Blade" on page 75.

Rinse Equipment

Spray water onto equipment to remove dirt and mud.

NOTICE: Water can damage electrical components.

- Do not spray water onto operator's console.
- Wipe with dry cloth.

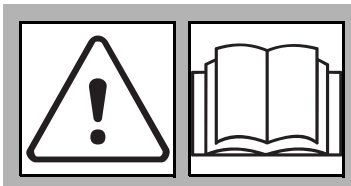
Stow Tools

Ensure all bits, pullback devices, and other tools are loaded and properly secured on trailer.

Service

Chapter Contents

Precautions



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

To help avoid injury:

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

Welding Precaution

NOTICE: Welding can damage electronics.

- Disconnect battery at battery disconnect switch before welding to prevent damage to battery.
- Connect welder ground clamp close to welding point and ensure no electronic components are in the ground path.

Cleaning Precaution

NOTICE: Water can damage electrical components.

- When cleaning equipment, do not spray electrical components with water.

Recommended Lubricants/Service Key

Item	Description
DEO	Diesel engine oil meeting API service classification CF-4 or E1-96 and SAE viscosity recommended by engine manufacturer (SAE15W40)
GEO	Gasoline engine oil meeting or exceeding API SJ. See oil temperature chart for recommended viscosity grade for each model.
MPL	Multipurpose gear oil meeting API service classification GL-5 (SAE 80W90)
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

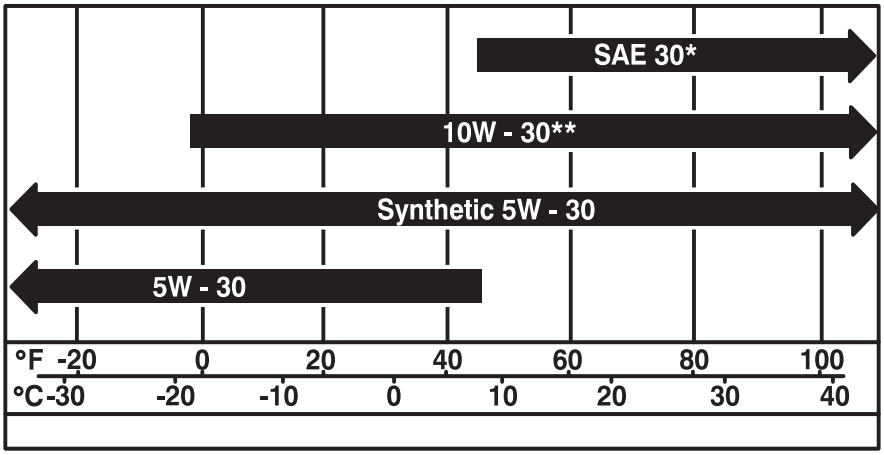
Proper lubrication and maintenance protects Ditch Witch® equipment from damage and failure. Service intervals listed are for minimum requirements. In extreme conditions, service machine more frequently. Use only genuine Ditch Witch parts, filters, approved lubricants, TJC, and approved coolants to maintain warranty. Fill to capacities listed in "Specifications" on page 105.

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

IMPORTANT: Use the "Service Record" on page 119 to record all required service to your machine.

Engine Oil Temperature Chart

C16x and C30x Briggs & Stratton®



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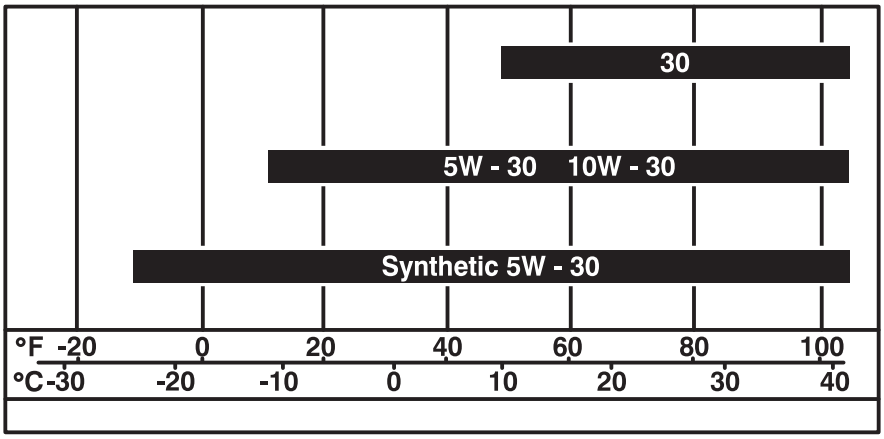
Temperature range anticipated before next oil change

C24x Honda GX690®



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Temperature range anticipated before next oil change

*Below 40°F (4°C) the use of SAE 30 will result in hard starting.

** Above 80°F (27°C) the use of 10W30 may cause increased oil consumption. Check oil level more frequently.

Each Use

Location	Task	Notes
Engine	Check engine oil level	GEO
	Check air filter elements	
Trencher	Check hydraulic fluid level	THF
	Check hydraulic fluid cooler	
	Check hydraulic hoses	
	Check lug nut torque	65 ft•lb (88 N•m)
	Check parking pin	

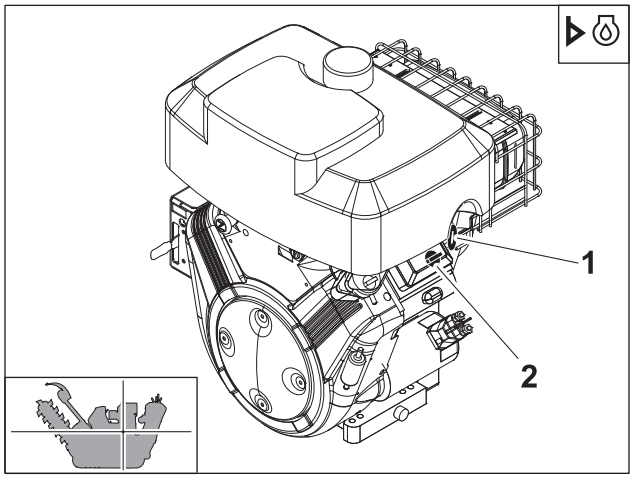
Check Engine Oil Level

C16x: Briggs & Stratton® Vanguard™ 16 HP

Check engine oil before each use.

1. Check engine oil at dipstick (1).
2. If low, add GEO at oil fill (2) until oil level is at FULL mark on dipstick.

IMPORTANT: For more information on engine oil, see "Recommended Lubricants/Service Key" on page 83 or see engine manual.



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C24x: Honda® GX690

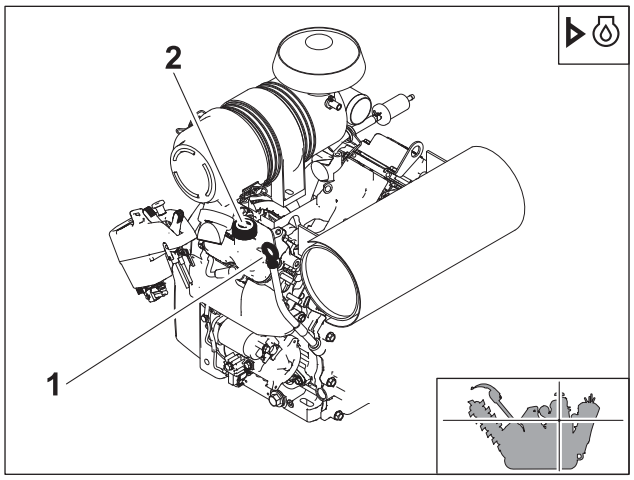
Check engine oil before each use.

NOTICE: Too much oil will damage the engine.

- Do not overfill.
- Keep oil level at FULL mark.

1. Check engine oil at dipstick (1).
2. If low, add GEO at oil fill (2) until oil level is at FULL mark on dipstick.

IMPORTANT: For more information on engine oil, see "Recommended Lubricants/Service Key" on page 83 or see engine manual.



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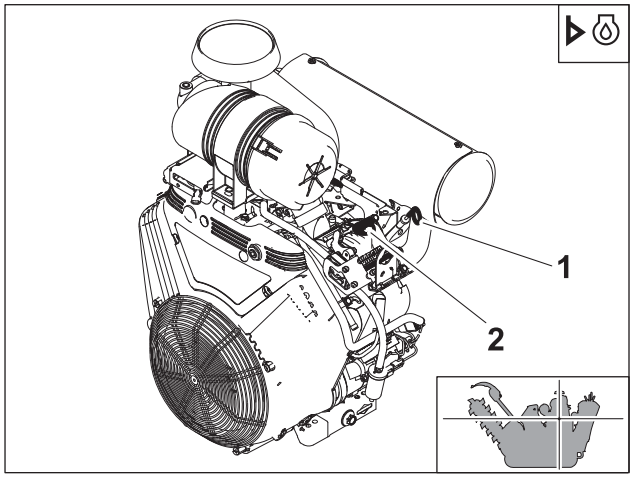
C30x: Briggs & Stratton® Vanguard™ 31 HP

Check engine oil before each use.

1. Check engine oil at dipstick (1).
2. If low, add GEO at oil fill (2) until oil level is at FULL mark on dipstick.

IMPORTANT: For more information on engine oil, see "Recommended Lubricants/Service Key" on page 83 or see engine manual.



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Check Air Filter Elements

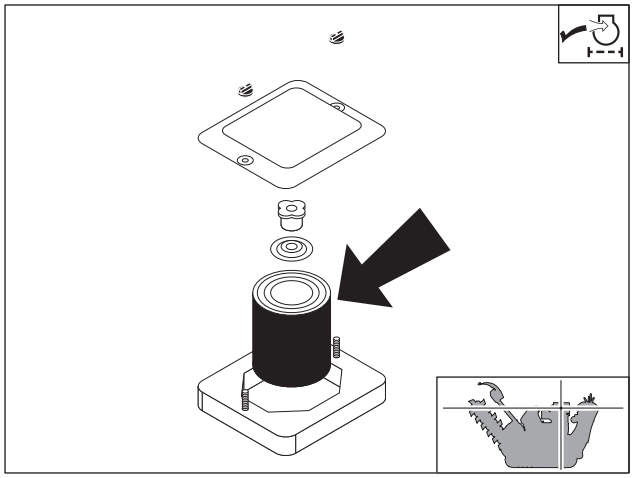
C16x

Check air filter element before each use. Replace element if it is dirty or damaged.

1. Remove wing nuts and cover.
2. Remove filter element, do a visual check and replace if dirty.

NOTICE: Cleaning can damage the filter elements.

- Do not tap filter elements to loosen dirt.
- Do not use compressed air or water.
- Replace the elements.



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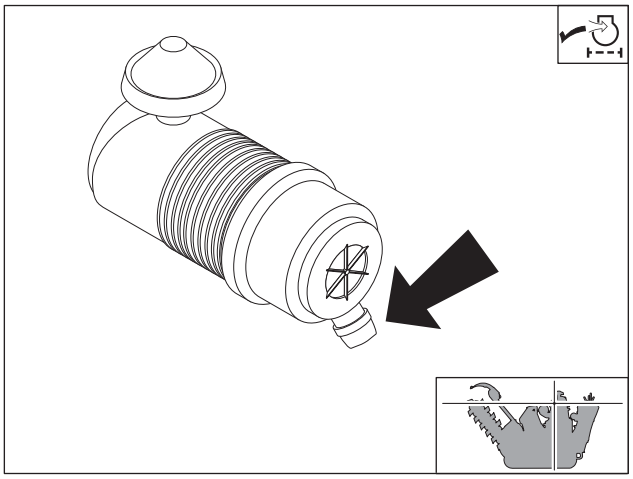
C24x and C30x

Press dust ejector valve to release dust every 10 hours.



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Check Hydraulic Fluid Level

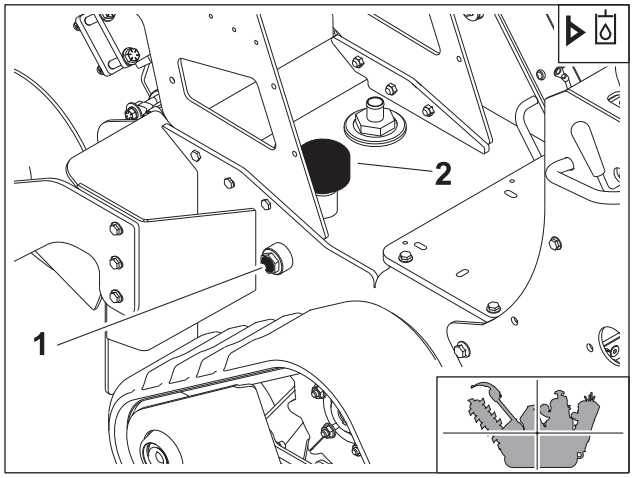
Check hydraulic fluid level before each use.

WARNING Contents under pressure. Relieve pressure before opening. Death or injury could occur.

To help avoid injury:

- Wear gloves and safety glasses.
- Wait until cool to decrease pressure in hydraulic reservoir.
- To release remaining pressure, slowly open hydraulic reservoir.

1. Ensure digging boom is fully raised.
2. Check hydraulic fluid at sight glass (1).
3. If low, add appropriate fluid until fluid level is at mid-level in sight glass.
4. To clean dust from cap (2), blow with low pressure air.



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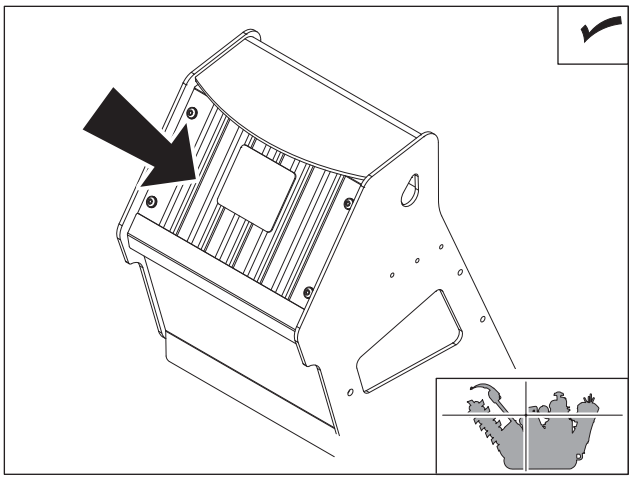
Check Hydraulic Fluid Cooler

Check hydraulic fluid cooler before each use.

1. Check hydraulic fluid cooler.
2. If dirty, blow with low pressure air.
3. For extensive cleaning, remove grill.



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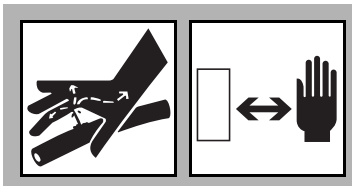
Check Hydraulic Hoses

Check hydraulic hoses for leaks and hydraulic connections for tightness before each use and every 10 hours. Replace any damaged part.



WARNING Fluid under pressure can pierce skin and cause death or serious injury.

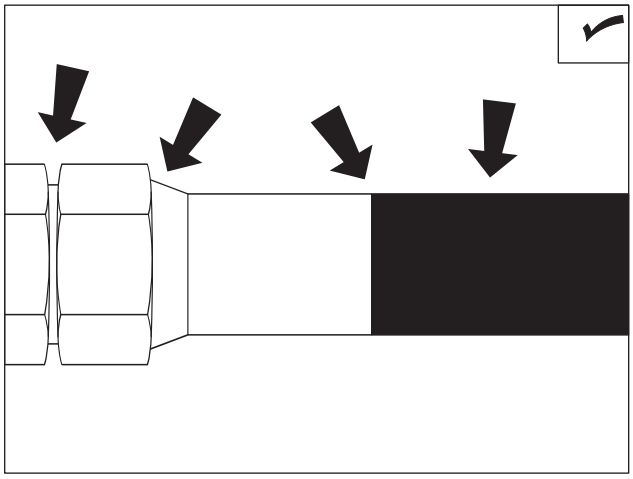
To help avoid injury:

- Do not use hands to search for leaks. Use a piece of cardboard or wood.
- Wear the necessary personal protective equipment, including gloves and safety glasses.

If you are injured, seek immediate medical attention from a doctor familiar with this type of injury.

To replace parts from the hydraulic system:

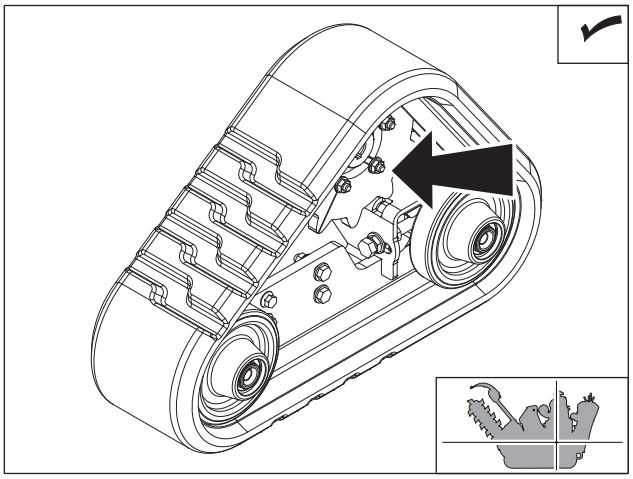
1. Turn engine off.
2. To release pressure, operate all controls.
3. If there is a raised component, lower, block or support with a hoist.
4. Cover connection with heavy cloth.
5. To release remaining pressure, loosen connector nut slightly.
6. Use appropriate container to collect all fluid.
7. Replace the damaged part.
8. Reconnect to the correct torque.



CheckHoses.eps

Check Lug Nut Torque

Check track lug nut torque before each use. Tighten to 65 ft•lb (88 N•m).



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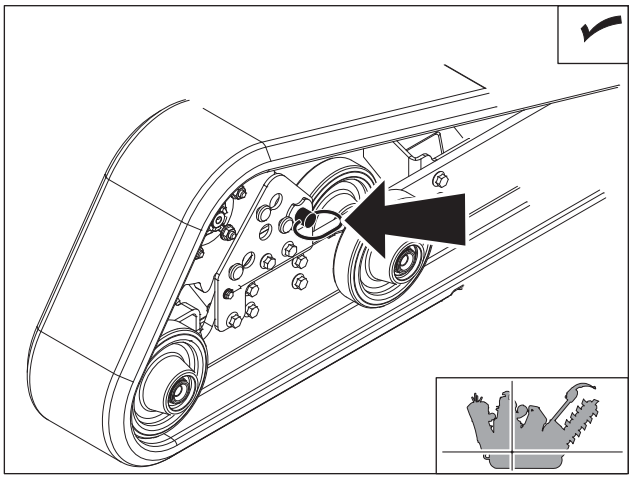
Check Parking Pin

Check parking pin for condition before each use.



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10 Hour Service

Location	Task	Notes
Engine	Change engine oil	Initial, GEO
Trencher	Check digging chain tension	
	Check restraint bar position	
	Check trench cleaner position	

Change Engine Oil

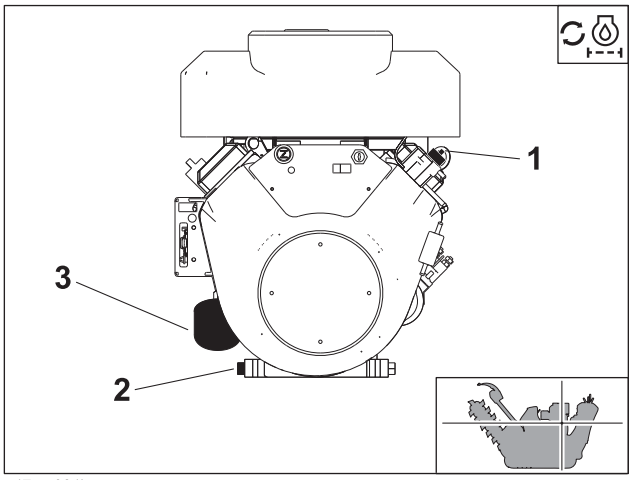
C16x: Briggs & Stratton® Vanguard™ 16 HP

Change engine oil and filter after the first 10 hours of operation and every 50 hours thereafter.

1. Drain at plug (2) while oil is still warm.
2. Replace plug.
3. Change oil filter (3).
4. Slowly add GEO at fill cap (1) until level rises to FULL mark on dipstick.
5. Tighten fill cap.

NOTICE: Engine oil capacity is 47 oz (1.47 L). Too much oil will damage the engine.

- Do not overfill.



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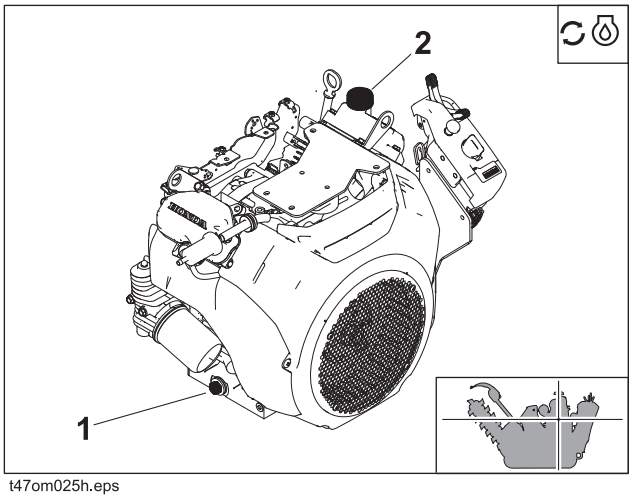
C24x: Honda® GX690

Change engine oil after the first 10 hours of operation and every 100 hours thereafter.

1. Drain at plug (1) while oil is still warm.
2. Replace plug.
3. Slowly add GEO at fill (2).

NOTICE: Engine oil capacity is 1.8 qt (1.7 L). Too much oil will damage the engine.

- Do not overfill.



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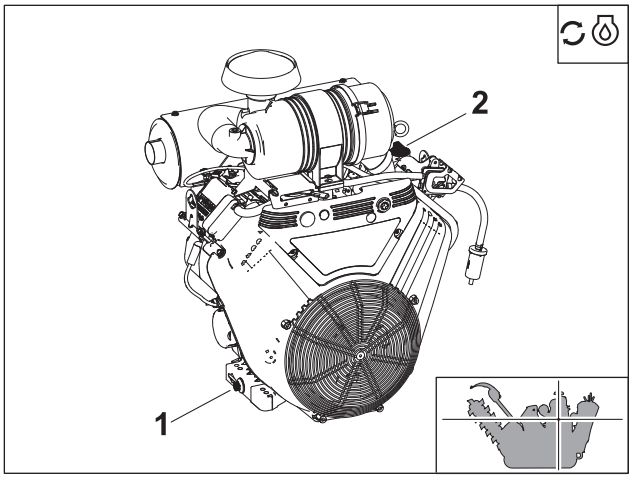
C30x: Briggs & Stratton® Vanguard™ 31 HP

Change engine oil after the first 10 hours of operation and every 100 hours thereafter.

1. Drain at plug (1) while oil is still warm.
2. Replace plug.
3. Slowly add GEO at fill cap (2) until level rises to FULL mark on dipstick.
4. Tighten dipstick.

NOTICE: Engine oil capacity is 78 oz (2.3 L). Too much oil will damage the engine.

- Do not overfill.



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Check Digging Chain Tension

Check digging chain tension every 10 hours and adjust as needed.

NOTICE: Overtightening will cause chain stretch, loss of machine performance, and possible premature chain failure.

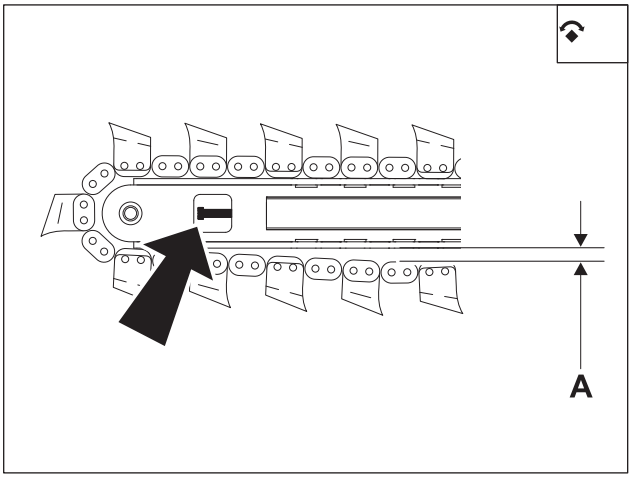
- Use correct chain tension.

To check:

1. Move boom in horizontal position.
2. Measure distance A from bottom of boom to chain:
   - When 35K chain is correctly tensioned, distance A is 1.5-2.0" (38-51 mm).
   - When 19K chain is correctly tensioned, distance A is 1-1.5" (25-38 mm).

To adjust tension with adjustment screw:

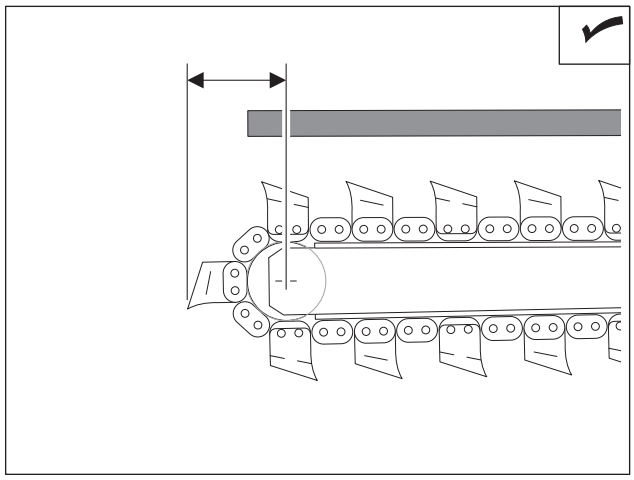
1. Loosen jam nut on adjustment screw.
2. To tighten digging chain, turn adjustment screw clockwise. To loosen digging chain, turn counterclockwise.
3. When proper tension is reached, tighten jam nut.



DiggingChainTension_Screw2.eps

Check Restraint Bar Position

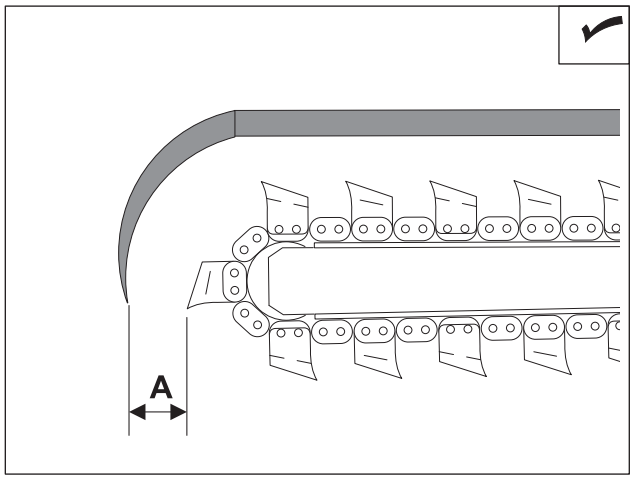
Check restraint bar position every 10 hours and after each adjustment or replacement of the digging chain. The restraint bar is correctly positioned when the end of bar extends between the center of the tail roller/sprocket and the end of the digging chain.



RestraintBarPosition.eps

Check Trench Cleaner Position

Check trench cleaner position every 10 hours and after each adjustment or replacement of the digging chain. The trench cleaner is correctly positioned when there is 3-4 in (76-102 mm) between the digging teeth and the inside of the trench cleaner shoe (A).



TrenchCleanerPosition.eps

50 Hour Service

Location	Task	Notes
Engine	Change engine oil and filter	C16x only, GEO

Change Engine Oil and Filter

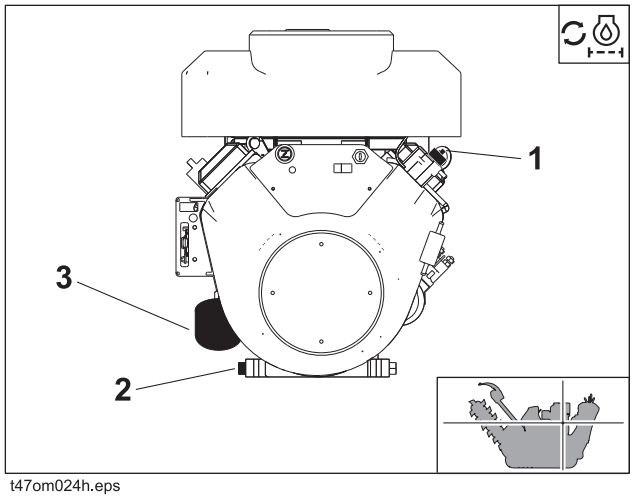
C16x: Briggs & Stratton® Vanguard™ 16 HP

Change engine oil and filter every 50 hours.

1. Drain at plug (2) while oil is still warm.
2. Replace plug.
3. Change oil filter (3).
4. Slowly add GEO at fill cap (1) until level rises to FULL mark on dipstick.
5. Tighten fill cap.

NOTICE: Engine oil capacity is 47 oz (1.47 L). Too much oil will damage the engine.

- Do not overfill.



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100 Hour Service

Location	Task	Notes
Engine	Change engine oil and filter	Honda GX690, Vanguard 31HP, GEO
	Change air filter elements	
	Check spark plug	

Change Engine Oil and Filter

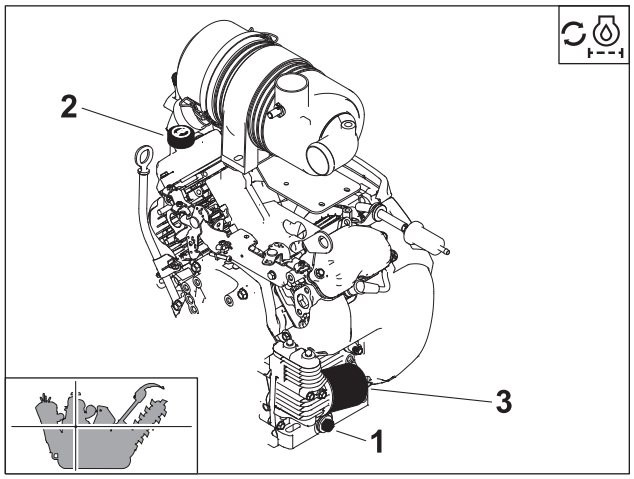
C24x: Honda® GX690

Change engine oil after the first 10 hours of operation and every 100 hours thereafter.

1. Drain at plug (1) while oil is still warm.
2. Replace plug.
3. Change spin-on oil filter (3).
4. Slowly add GEO at fill (2).

NOTICE: Engine oil capacity is 1.8 qt (1.7 L). Too much oil will damage the engine.

- Do not overfill.



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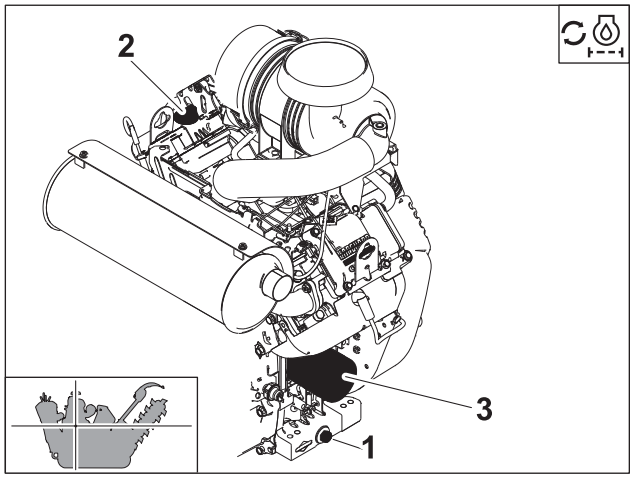
C30x: Briggs & Stratton® Vanguard™ 31 HP

Change engine oil after the first 10 hours of operation and every 100 hours thereafter.

1. Drain at plug (1) while oil is still warm.
2. Replace plug.
3. Change oil filter (3).
4. Slowly add GEO at fill cap (2) until level rises to FULL mark on dipstick.
5. Tighten fill cap.

NOTICE: Engine oil capacity is 78 oz (2.3 L). Too much oil will damage the engine.

- Do not overfill.



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Change Air Filter Elements

C16x

Change air filter element every 100 hours.

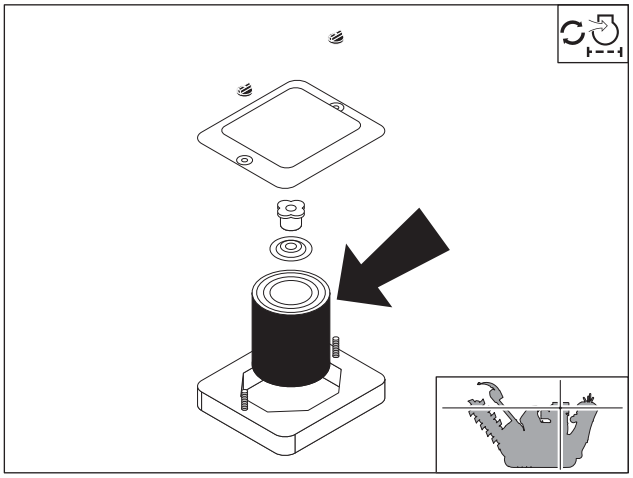
To change:

1. Remove wing nuts and air cleaner cover.
2. Remove filter element and replace it.

NOTICE: Cleaning can damage the filter elements.

- Do not tap filter elements to loosen dirt.
- Do not use compressed air or water.
- Replace the elements.

3. Install air cleaner cover.
4. Tighten wing nuts.



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C24x and C30x

Change air filter element every 100 hours.

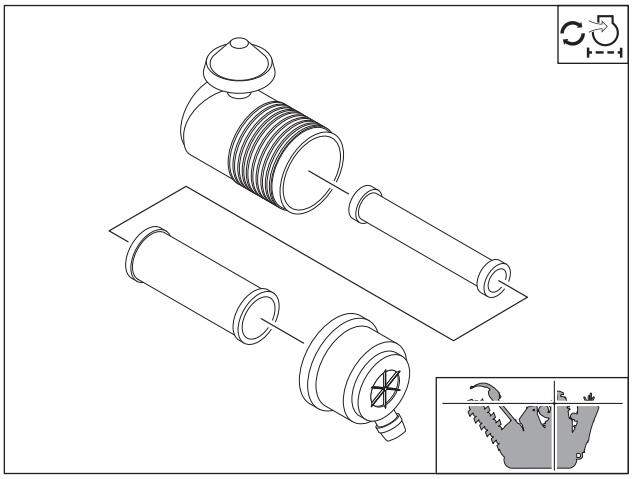
To change:

1. Remove air filter cover.
2. Remove filter elements and replace them.

NOTICE: Cleaning can damage the filter elements.

- Do not tap filter elements to loosen dirt.
- Do not use compressed air or water.
- Replace the elements.

3. Install air filter cover.



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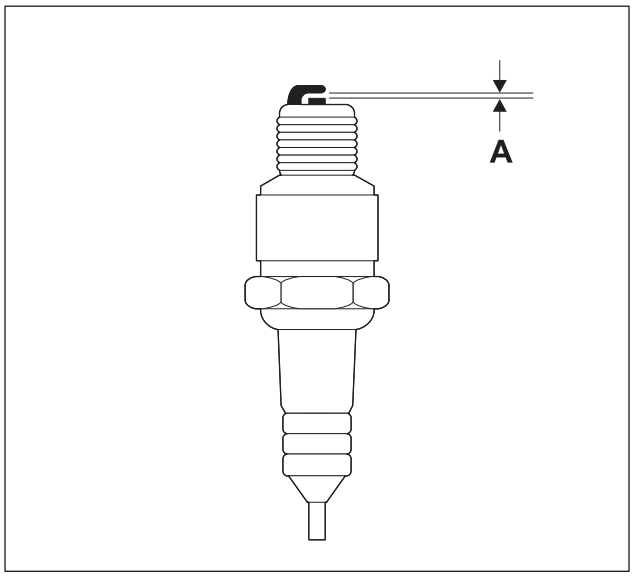
Check Spark Plug

Check spark plug gap every 100 hours. Correct spark plug gap (A) is 0.030" (0.76 mm).

See engine service manual for specific procedure and recommended replacement spark plugs.



SparkPlug.eps

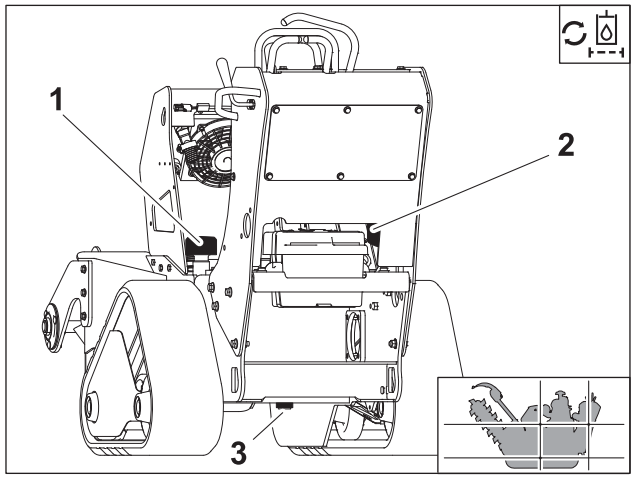
500 Hour Service

Location	Task	Notes
Trencher	Change hydraulic fluid and filter	THF

Change Hydraulic Fluid and Filter

Change hydraulic fluid and filter every 500 hours.

1. Place an appropriate container below hydraulic drain (3).
2. To drain fluid: remove drain plug (3).
3. Remove and clean strainer.
4. Install strainer.
5. Change filter (2).
6. To fill hydraulic reservoir, add fluid at fill cap (1) until correct level on sight glass is reached.



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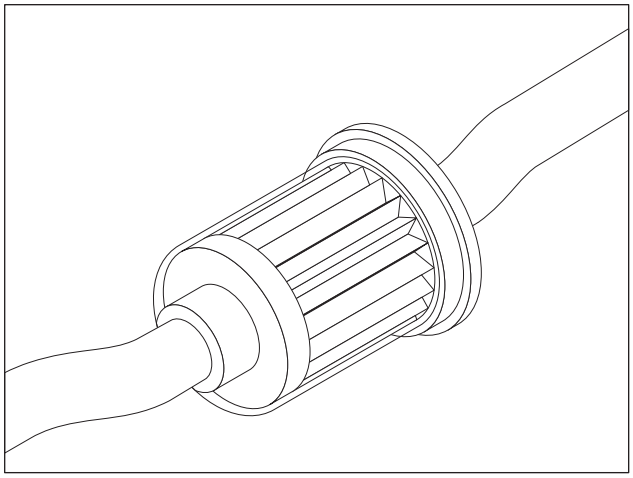
As Needed

Location	Task	Notes
Engine	Replace in-line fuel filter	
	Adjust wheel track tension	
	Check battery	

Replace In-Line Fuel Filter

See engine service manual for procedure.

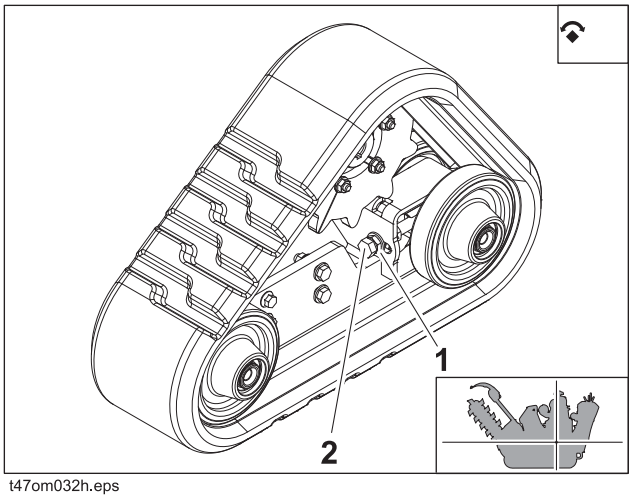

InLineFilter.eps

Adjust Wheel Track Tension

Adjust wheel track tension on both sides when tracks are replaced.

To adjust:

1. Park machine on level and firm ground.
2. Lay straight edge on top of track, spanning from sprocket to front idler roller.
3. Tighten bolt (2):
   - Loosen jam nut (1).
   - Turn bolt (2) counterclockwise until distance between track and straight edge is 1/4" (6 mm).
   - Tighten jam nut (1).



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To test:

Drive forward one track length and check tension with straight edge:

- If tension is too loose, tighten bolt (2).
- If tension is too tight, loosen bolt (2).

Check Battery

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

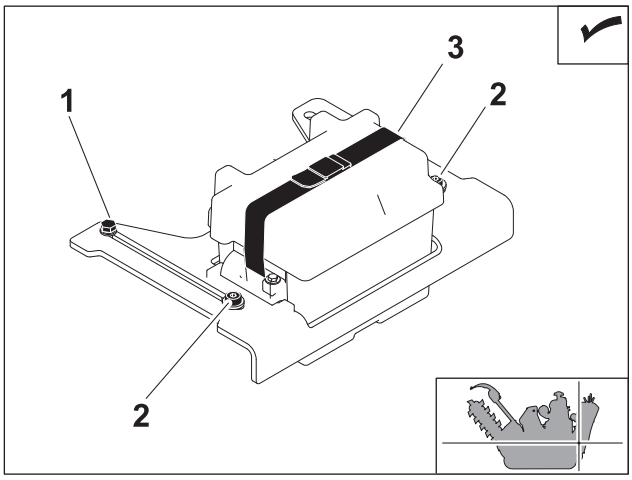
WARNING Hydrogen in batteries is highly flammable. Fire or explosion can cause death or serious injury.

To help avoid injury:

- Wear the correct personal protective equipment, including safety gloves and glasses.
- Keep sparks, fire and other ignition sources away.
- Connect and disconnect battery cables in the correct order.

Access battery

1. If equipped, turn battery disconnect switch to the OFF position.
2. Remove screw (1).
3. Loosen shoulder bolts (2).
4. Pull battery tray out.
5. Remove battery strap (3) and battery cover.



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Clean battery

1. Carefully loosen and remove battery cable clamps, negative **(-)** cable first.
2. Clean cable clamps and terminals to remove dull glaze.
3. Check cables for internal corrosion.
4. Check battery fixing bolts for tightness.

Stow battery

1. Connect battery cable clamps, positive **(+)** cable first.
2. Install battery cover and strap (3).
3. Push tray back in storage position.
4. Tighten shoulder bolts (2) and screw (1).
5. Turn battery disconnect switch to the ON position.

Jump Start Battery


WARNING Hydrogen in batteries is highly flammable. Fire or explosion can cause death or serious injury.

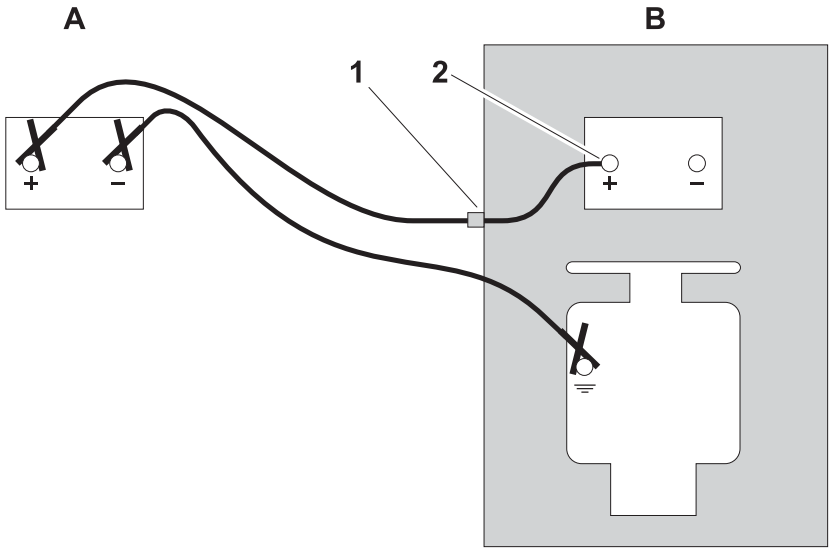
To help avoid injury:

- Wear the necessary personal protective equipment, including sufficiently insulated gloves and safety glasses.
- Keep sparks, fire and other ignition sources away.
- Do not charge a battery that is leaking, bulging, heavily corroded, frozen, or otherwise damaged.
- Use a single 12V maximum source for charging. Do not connect to rapid chargers or dual batteries.
- NEVER short-circuit battery terminals for any reason or strike battery posts or cable terminals.
- NEVER lean over battery when making connections.
- Do not allow vehicles to touch when charging.
- Do not allow battery clamps to touch.

NOTICE: Electrical surge hazard.
Electronic components can be damaged during jump start procedure.

- Replace battery as an alternative to jump start procedure.
- If jump start is necessary: use quality large diameter booster cables capable of carrying high currents (400 amps or more).

Set up and Check



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CAUTION Acid in battery is corrosive. Contact with skin will cause burns.

To help avoid injury:

- Avoid contact with battery fluid.
- Wear applicable safety glasses and gloves.
- See Material Safety Data Sheet (MSDS) for additional information.

1. Park service vehicle close to defective equipment but do not allow vehicles to touch.
2. Engage parking brake in both vehicles.
3. Turn the ignition switch to the OFF position in both vehicles, and turn off all electrical loads. Disconnect the machine controller.
4. Inspect defective battery (B) for signs of cracking, bulging, leaking, or other damage. If battery is damaged in any way, do not jump start. Replace battery.
5. Check for loose or corroded battery cable connections.
6. Carefully clean terminals and posts.

Connect Batteries

1. Connect red positive (+) cable clamp to positive (+) post (2) of defective battery.

IMPORTANT: Some machines have an external positive terminal (1). In that case, connect positive clamp to external terminal.

2. Connect other red positive (+) cable clamp to positive (+) post of service vehicle battery.
3. Connect black negative (-) cable clamp to negative (-) post of service vehicle battery.
4. Connect other black negative (-) cable clamp to engine or frame ground on defective equipment, at least 12" (305 mm) from defective battery.

Charge Defective Battery

1. Operate service vehicle engine at 1500-2000 rpm for a few minutes.
2. Stop engine in service vehicle.

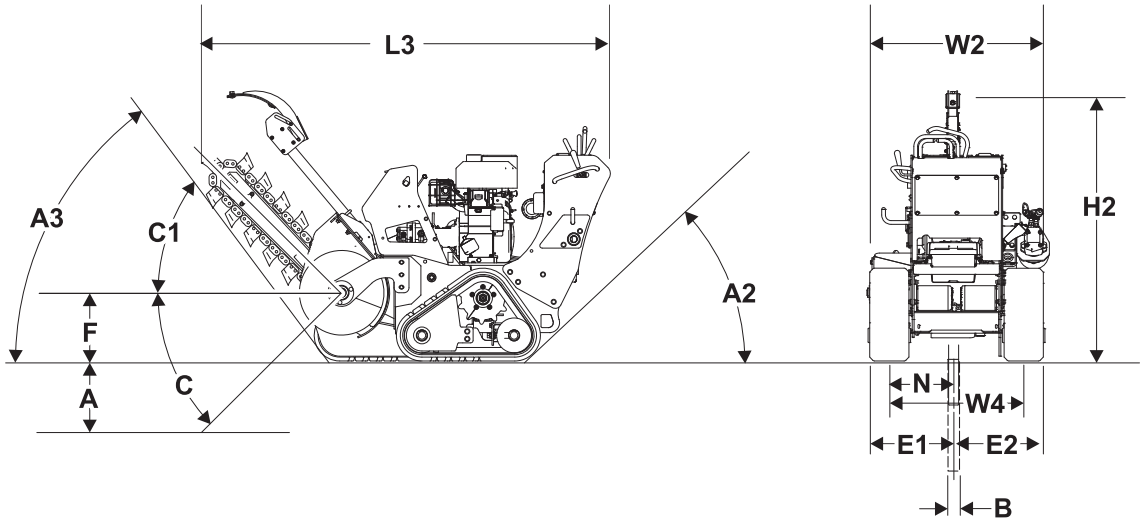
Disconnect Batteries

1. Remove black negative (-) clamp from negative post of service vehicle battery.
2. Remove black negative (-) clamp from engine or frame ground of defective machine.
3. Remove red positive (+) clamp from positive post of service vehicle battery.
4. Remove red positive (+) clamp from external positive terminal (1) or internal positive post (2) of defective battery.
5. Reconnect machine controller and try to start defective machine.
6. If defective machine does not start, replace battery.

Specifications

Chapter Contents

C16x



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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	63°	63°
C1	Boom travel up	60°	60°
F	Headshaft height, digging chain	13.7 in	348 mm
L3	Length, maximum	94 in	2390 mm
W2	Width	35.8 in	909 mm
H2	Height	57 in	1450 mm
W4	Tread	27 in	686 mm
A2	Angle of departure	45°	45°
E1	Centerline trench to outside edge of machine, left	17.2 in	437 mm
E2	Centerline trench to outside edge of machine, right	18.6 in	472 mm
N	Spoil discharge reach	14.1 in	358 mm
A3	Angle of approach	52°	52°

Unless otherwise noted, dimensions are based on 36" (915 mm) boom in transport position.

General
Ditch Witch® model C16x, self-propelled, hydraulic, pedestrian, skid steered, track drive, rigid frame, chain type trencher.

Operational		U.S.	Metric
Vehicle speeds			
	Maximum transit forward	120 fpm	36.6 m/min
	Maximum transit reverse	120 fpm	36.6 m/min
Digging chain speed			
	19K	366 fpm	111.6 m/min
	35K	309 fpm	94.2 m/min
Spoils handling (single, open-end auger):			
	Outer diameter	17 in	432 mm
Maximum operating weight		1895 lb	860 kg

Power	U.S.	Metric
Engine: Briggs & Stratton® Vanguard™ 16.0 Small Block V-Twin Horizontal Shaft		
Fuel: gasoline		
Cooling medium: air		
Number of cylinders: two		
Displacement	29.23 in^3	479 cm^3
Bore	2.68 in	68 mm
Stroke	2.60 in	66 mm
Manufacturer's net power rating @ 3600 rpm (SAE J1940)	16 hp	11.9 kW
Rated speed	3600 rpm	3600 rpm
Fuel consumption	1.33 gph	5 L/h
Maximum tilt angle*	20°	20°

*Exceeding these operational angles will cause engine damage. This DOES NOT IMPLY machine is stable to maximum angle of safe engine operation.

Battery
310 CA, 12V, reserve capacity 30 min

Power Train		**U.S.**	**Metric**
Hydraulic ground drive: infinitely variable from zero to maximum, speed and direction controlled with dual levers			
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			
Track			
	Width	200 mm	200 mm
	Ground pressure	4.5 psi	31 kPa

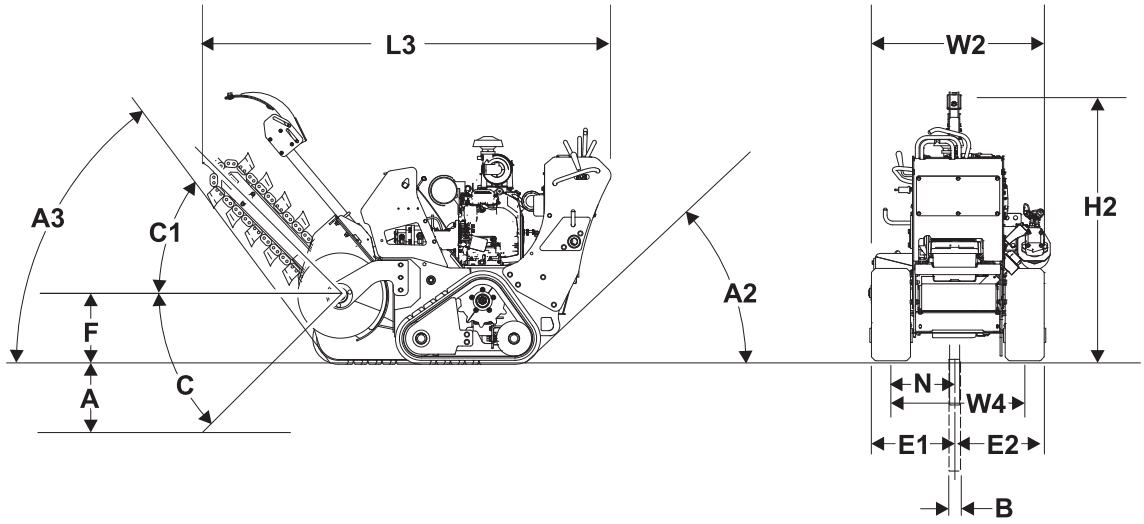
Hydraulic System		**U.S.**	**Metric**
Dual pump total capacity @ 3600 rpm		11.5 gpm	43.5 L/min
Pump characteristics @ 3600 rpm to ground drive:			
	Pressure, relief valve setting	2200 psi	152 bar
	Capacity	1.5 gpm	5.7 L/min
Pump characteristics @ 3600 rpm to digging drive:			
	Pressure, relief valve setting	3500 psi	241 bar
	Capacity	10 gpm	37.9 L/min

Fluid Capacities	**U.S.**	**Metric**
Hydraulic reservoir	11 gal	41.6 L
Hydraulic system	11.5 gal	43.5 L
Fuel tank	2.3 gal	6.5 L
Engine oil	47 oz	1.47 L

Noise Levels
Operator ear 87 dBA sound pressure per ISO 6394
Exterior 97 dBA sound power per ISO 6393

Vibration Levels
Vibration at the operator's hand during normal operation is less than 2.5 m/s^2

C24x



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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	63°	63°
C1	Boom travel up	60°	60°
F	Headshaft height, digging chain	13.7 in	348 mm
L3	Length, maximum	94	2390 mm
W2	Width	35.8 in	909 mm
H2	Height, maximum	57 in	1450 mm
W4	Tread	27 in	686 mm
A2	Angle of departure	45°	45°
E1	Centerline trench to outside edge of machine, left	17.2 in	437 mm
E2	Centerline trench to outside edge of machine, right	18.6 in	472 mm
N	Spoil discharge reach	14.1 in	358 mm
A3	Angle of approach	52°	52°

Unless otherwise noted, dimensions are based on 36" (915 mm) boom in transport position.

General
Ditch Witch® model C24x, self-propelled, hydraulic, pedestrian, skid steered, track drive, rigid frame, chain type trencher.

Operational		**U.S.**	**Metric**
Vehicle speeds:			
	Maximum transit forward	176 fpm	53.6 m/min
	Maximum transit reverse	136 fpm	41.5 m/min
Digging chain speed:			
	19K	366 fpm	111.6 m/min
	35K	309 fpm	94.2 m/min
Spoils handling (single, open-end auger):			
	Outer diameter	17 in	432 mm
Maximum operating weight		1915 lb	869 kg

Power	**U.S.**	**Metric**
Engine: Honda® GX690		
Fuel: gasoline		
Cooling medium: air		
Number of cylinders: two		
Displacement	42 in^3	688 cm^3
Bore	3.07 in	78 mm
Stroke	2.83 in	72 mm
Manufacturer's net power rating @ 3600 rpm (SAE J1349)	22.1 hp	16.5 kW
Rated speed	3600 rpm	3600 rpm
Fuel consumption @ 3600 rpm	1.77 gph	6.7 L/h
Maximum tilt angle*	20°	20°
*Exceeding these operational angles will cause engine damage. This DOES NOT IMPLY machine is stable to maximum angle of safe engine operation.		

Battery
310 CA, 12V, reserve capacity 30 min

Power Train		U.S.	Metric
Hydraulic ground drive: infinitely variable from zero to maximum, speed and direction controlled with dual levers			
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			
Track			
	Width	200 mm	200 mm
	Ground pressure	4.5 psi	31 kPa

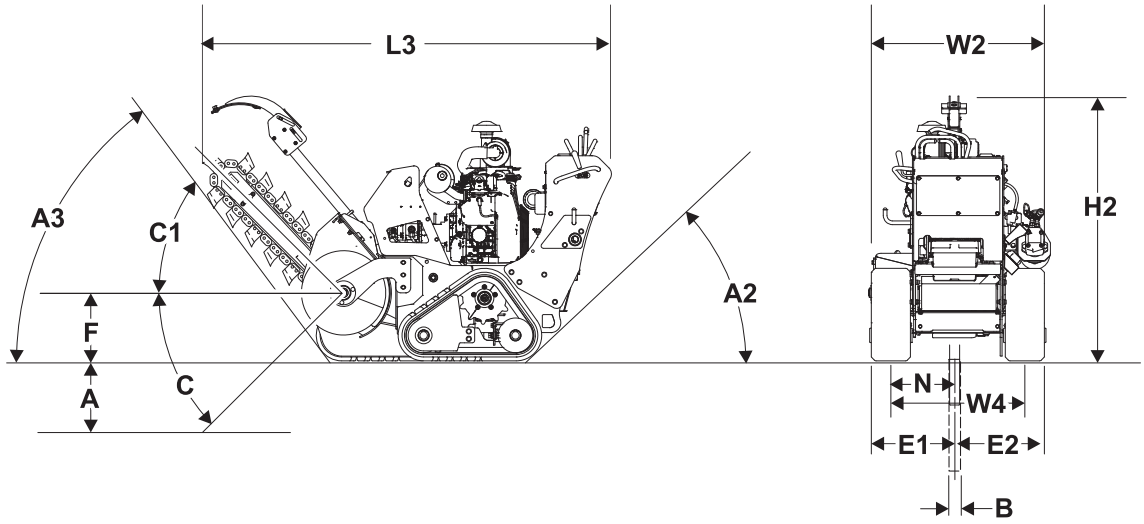
Hydraulic System		U.S.	Metric
Dual pump total capacity @ 3600 rpm		13 gpm	49.2 L/min
Pump characteristics @ 3600 rpm to ground drive:			
	Pressure, relief valve setting	2500 psi	172 bar
	Capacity	3 gpm	11.4 L/min
Pump characteristics @ 3600 rpm to digging drive:			
	Pressure, relief valve setting	3500 psi	241 bar
	Capacity	10 gpm	37.9 L/min

Fluid Capacities	U.S.	Metric
Hydraulic reservoir	11 gal	41.6 L
Hydraulic system	11.5 gal	43.5 L
Fuel tank	6 gal	22.7 L
Engine oil	1.8 qt	1.7 L

Noise Levels
Operator 91 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 less than 2.5 m/s^2

C30x



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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	63°	63°
C1	Boom travel up	60°	60°
F	Headshaft height, digging chain	13.7 in	348 mm
L3	Length	101 in	2570 mm
W2	Width	35.8 in	909 mm
H2	Height	66 in	1680 mm
W4	Tread	27 in	686 mm
A2	Angle of departure	45°	45°
E1	Centerline trench to outside edge of machine, left	17.2 in	437 mm
E2	Centerline trench to outside edge of machine, right	18.6 in	472 mm
N	Spoil discharge reach	14.1 in	358 mm
A3	Angle of approach	51°	51°

Unless otherwise noted, dimensions are based on 48" (1220 mm) boom in transport position.

General
Ditch Witch® model C30x, self-propelled, hydraulic, pedestrian, skid steered, track drive, rigid frame, chain type trencher.

Operational		U.S.	Metric
Vehicle speeds			
	Maximum transit forward	176 fpm	53.6 m/min
	Maximum transit reverse	136 fpm	41.5 m/min
Digging chain speed:			
	19K	366 fpm	111.6 m/min
	35K	309 fpm	94.2 m/min
Spoils handling (single, open-end auger):			
	Outer diameter	17 in	432 mm
Maximum operating weight		2100 lb	953 kg

Power	U.S.	Metric
Engine: Briggs & Stratton® Vanguard™ 31.0 Big Block V-Twin Horizontal Shaft		
Fuel: gasoline		
Cooling medium: air		
Number of cylinders: two		
Displacement	54.68 in^3	896 cm^3
Bore	3.37 in	86 mm
Stroke	3.07 in	78 mm
Manufacturer's net power rating @ 3600 rpm (SAE J1940)	31 hp	23.1 kW
Rated speed	3600 rpm	3600 rpm
Fuel consumption	2.49 gph	9.4 L/h
Maximum tilt angle*	20°	20°
*Exceeding these operational angles will cause engine damage. This DOES NOT IMPLY machine is stable to maximum angle of safe engine operation.		

Battery
310 CA, 12V, reserve capacity 30 min

Power Train		**U.S.**	**Metric**
Hydraulic ground drive: infinitely variable from zero to maximum, speed and direction controlled with dual levers			
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			
Track			
	Width	200 mm	200 mm
	Ground pressure	5 psi	34.5 kPa

Hydraulic System		**U.S.**	**Metric**
Dual pump total capacity @ 3600 rpm		13 gpm	49.2 L/min
Pump characteristics @ 3600 rpm to ground drive:			
	Pressure, relief valve setting	2500 psi	172 bar
	Capacity	3 gpm	11.4 L/min
Pump characteristics @ 3600 rpm to digging drive:			
	Pressure, relief valve setting	3500 psi	241 bar
	Capacity	10 gpm	37.9 L/min

Fluid Capacities	**U.S.**	**Metric**
Hydraulic reservoir	11 gal	41.6 L
Hydraulic system	11.5 gal	43.5 L
Fuel tank	6 gal	22.7 L
Engine oil	78 oz	2.3 L

Noise Levels
Operator 93 dBA sound pressure per ISO 6394
Exterior 103 dBA sound power per ISO 6393

Vibration Levels
Vibration at the operator's hand during normal operation is less than 2.5 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 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 Charles Machine Works, Inc. (CMW) 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 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 dealer.

First version: 1/91; Latest version: 11/11

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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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

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

Service Performed	Date	Hours

Service Performed	Date	Hours