VP30

Briggs & Stratton® Vanguard™

Operator's Manual



CE UKCA

CMW®

Issue 5.0
Original Instruction

053-3030

Overview

Chapter Contents

Serial Number Location 2

Intended Use 3

Equipment Modification 3

Machine Components 4

Operator Orientation 5

Operating Area 5

About This Manual 6

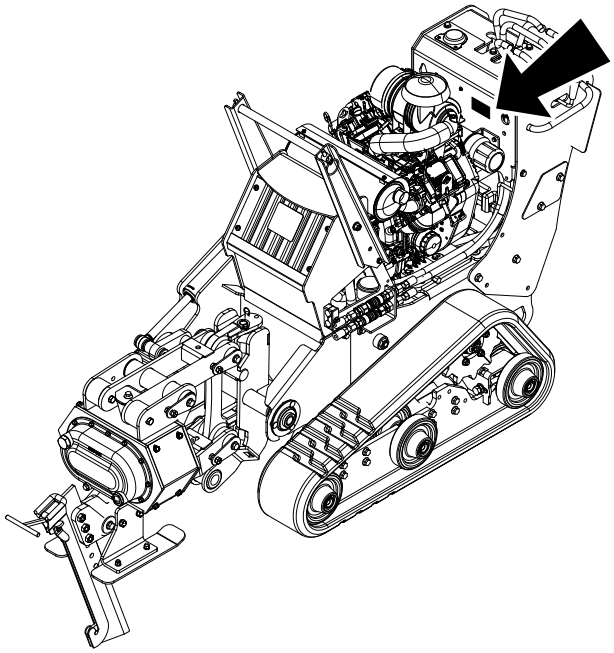
- Bulleted Lists 6
- Numbered Lists 6

California Proposition 65

⚠ WARNING The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm. www.P65warnings.ca.gov.

Serial Number Location

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



t56om001h.eps

Item	
Date of manufacture	
Date of purchase	
Machine serial number	
Trailer serial number	

Intended Use

The VP30 is a vibratory plow designed to install buried cable and pipe in a variety of soils. an optional drilling attachment and reel carrier are available.

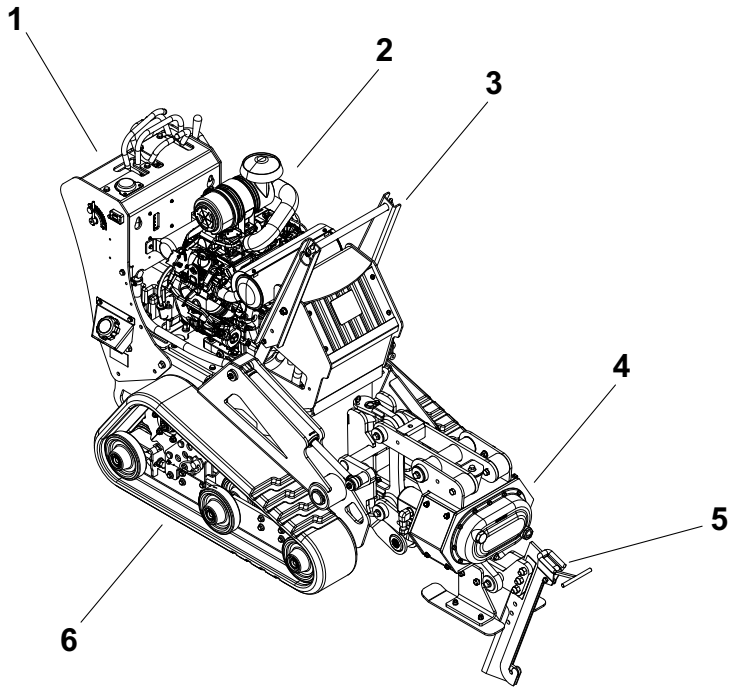
This machine is intended for operation only according to the instructions in this manual. Operate machine in ambient temperatures from 0° to 115°F (-18° to 46°C). Contact your Ditch Witch® dealer for provisions required for operating in extreme temperatures. Use in any other way is considered contrary to the intended use.

This machine should be operated, serviced, and repaired only by professionals 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 training.

Machine Components



t56om002h.eps

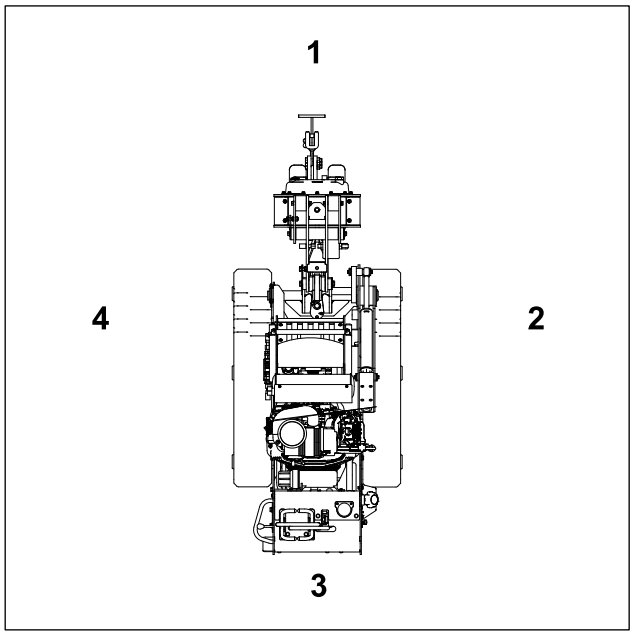
1. Control console
2. Engine
3. Reel carrier*
4. Vibrator box
5. Plow blade
6. Track drive

*If equipped

Operator Orientation

IMPORTANT: Top view of machine is shown.

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

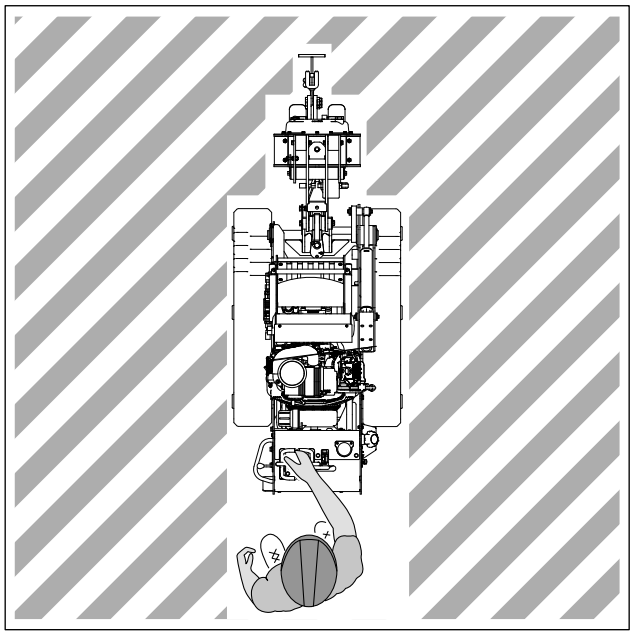


t56om003h.eps

Operating Area

IMPORTANT: Top view of machine is shown.

Operator should stand only in the location shown.


t56om004h.eps

About This Manual

This manual contains information for the proper use of this machine. 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 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.

VP30
Operator's Manual

Briggs & Stratton® Vanguard™

Issue number 5.0/OM-06/25
Part number 053-3030

Copyright 2021, 2023, 2024, 2025
by The Charles Machine Works, Inc.

 and Ditch Witch are registered trademarks of The Charles Machine Works, Inc. Other trademarks and trade names are those of their respective owners.

This product and its use may be covered by one or more patents at http://charlesmachine.works/patents.

Contents

Overview 1

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

Foreword 7

Part number, revision level, and publication date or this manual, and factory contact information

Safety 11

Machine safety alerts and emergency procedures

Prepare 21

Procedures for preparing jobsite, preparing operator, and preparing equipment

Controls 29

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

Drive 37

Procedures for startup, cold start, driving, and shutdown

Transport 43

Procedures for lifting, hauling, and retrieving

Drill 49

Procedures for drilling

Plow 61

Procedures for plowing

Systems and Equipment 65

Chain, teeth, sprockets, and optional equipment

Complete the Job 67

Procedures for restoring the jobsite and rinsing and storing equipment

Maintenance 69

Maintenance intervals and instructions for this machine including lubrication, replacement of wear items, and basic maintenance

Specifications 87

Machine specifications including weights, measurements, power ratings, and fluid capacities

Support 95

The warranty policy for this machine and procedures for obtaining warranty consideration and training

Safety

Chapter Contents



For additional precautions, see "Prepare" chapter.

Safety Alert Classification 12

Guidelines 13

Emergency Procedures 14

- Electric Strike Description 14
- If an Electric Line is Damaged 15
- If a Gas Line is Damaged 15
- If a Fiber Optic Cable is Damaged 16
- If Machine Catches on Fire 16

Machine Safety Alerts 17

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.

Guidelines

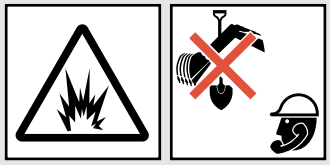


WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. Know how to use all controls.

Follow these guidelines before operating any jobsite equipment:

- Complete proper training.
- Read and understand operator's manual before using equipment.
- Wear personal protective equipment including long pants, hard hat, eye protection, hearing protection, and protective footwear.
- Do not wear jewelry or loose clothing.
- Mark proposed path with white paint and have underground utilities located before working. In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service. In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.
- Classify jobsite based on its hazards and use correct tools and machinery, safety equipment, and work methods for jobsite.
- Mark jobsite clearly and keep spectators away.
- 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/safety. Safety Data Sheets (SDS) are available at www.ditchwitch.com/support.
- Ensure jobsite is adequately lit. Arrange for secondary light sources as needed.
- Complete the equipment checklist located at www.ditchwitch.com/safety.
- Fully inspect equipment before operating. Repair or replace any worn or damaged parts. Replace missing or damaged safety shields and safety alert signs. Contact your Ditch Witch dealer for assistance.
- Follow instructions on all safety alert signs on machine.
- Keep access steps and platforms clean and free of obstacles and debris.
- Use equipment carefully per the instructions in this manual. Stop operation and investigate anything that does not look or feel right.
- Do not operate machine where flammable gas may be present.
- Only operate equipment in well ventilated areas.
- Always tie down equipment and properly stow accessories, even if traveling short distances.
- Contact your Ditch Witch dealer if you have any questions about operation, maintenance, or equipment use.

Emergency Procedures



WARNING Underground utilities. Contact can cause death or serious injury. Locate and verify underground utilities before digging or drilling.

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

EMERGENCY SHUTDOWN: Shut off machine or press remote engine stop button or emergency stop button (if equipped).

Electric Strike Description

When working near electric cables, remember the following:

- Electricity follows all paths to ground, not just path of least resistance.
- Pipes, hoses, and cables will conduct electricity back to all equipment.
- Low voltage current can injure or kill. 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, DO NOT MOVE and DO NOT TOUCH ANY EQUIPMENT. Take the following actions. The order and degree of action will depend on the situation.

- If you are **operating machine,** immediately RELEASE CONTROLS.
- If you must leave the area, take small steps with feet close together to reduce the hazard of being shocked from one foot to another.
- Warn people nearby that an electric strike has occurred. Instruct them to leave the area.
- Have someone contact electric company to shut off power.
- If you leave the area, do not return to jobsite or allow anyone into area until given permission by utility company.

If a Gas Line is Damaged

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

- Immediately shut off engine(s), if this can be done safely and quickly.
- Remove any ignition source(s), if this can be done safely and quickly.
- Warn others that a gas line has been cut and that they should leave the area.
- After warning others to 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

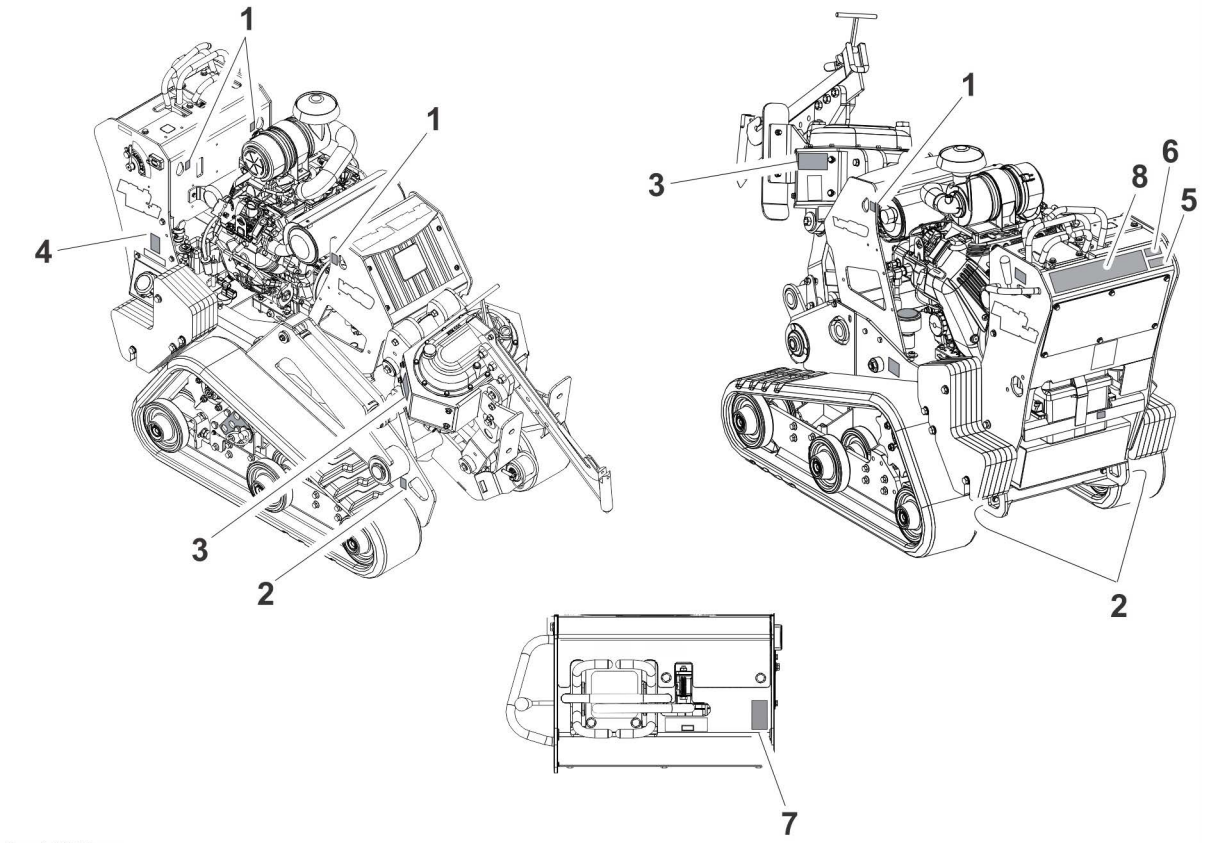
Do not look into cut ends of fiber optic or unidentified cable. Vision damage can occur. Contact utility company.

If Machine Catches on Fire

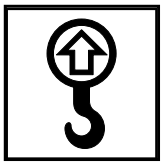
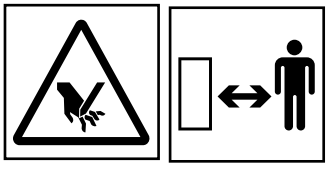
Perform emergency shutdown procedure and then take the following actions. The order and degree of action will depend on the situation.

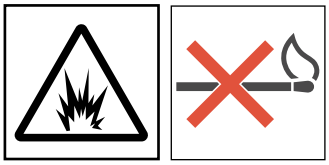
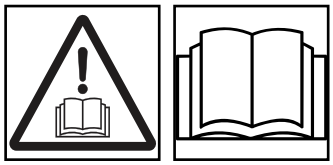
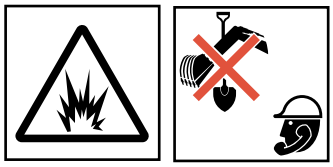
- Immediately move battery disconnect switch (if equipped and accessible) to disconnect position.
- If fire is small and fire extinguisher is available, attempt to extinguish fire.
- If fire cannot be extinguished, leave area as quickly as possible and contact emergency personnel.

Machine Safety Alerts



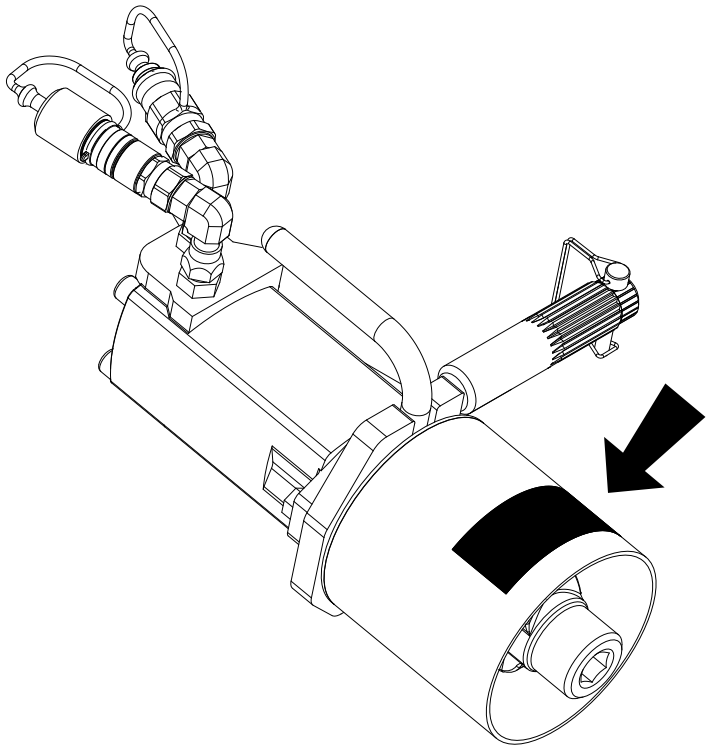
Decal_VP30.png

1		Lift point. See Transport chapter for more information.
2		Tiedown location. See Transport chapter for more information.
3		**⚠ WARNING** Moving parts. Contact can cause serious injury. Stay away.

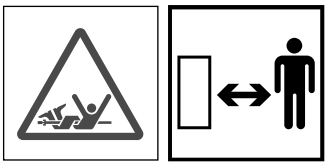
4		**⚠ WARNING** Gasoline. Fire or explosion can cause death or serious injury. Keep heat, flames, sparks and other ignition sources away.
5		**⚠ WARNING** Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. Know how to use all controls.
6		**⚠ WARNING** Underground utilities. Contact can cause death or serious injury. Locate and verify underground utilities before digging or drilling.
7		**⚠ CAUTION** High noise levels. Exposure can cause hearing loss. Wear hearing protection.

Attachment Safety Alerts

Roto Witch® Drilling Attachment



t47om046h.eps



DANGER Rotating shaft. Crushing will cause death or serious injury. Stay away.

Prepare

Chapter Contents



For additional precautions, see "Safety Awareness" chapter.

Wear proper personal protective equipment.

Prepare Jobsite 22

- Review Job Plan 22
- Select Start and End Points 22
- Identify Hazards 23
- Locate Utilities 24
- Classify Jobsite 25
- Arrange for Traffic Control 26

Prepare Operator 27

Prepare Equipment 28

- Check Supplies 28
- Check Equipment 28
- Assemble Accessories 28

Prepare Jobsite



WARNING Underground utilities. Contact can cause death or serious injury. Locate and verify underground utilities before digging or drilling.

To help avoid injury:

- Expose lines by careful hand digging or soft excavation before operating equipment. Use appropriate equipment and procedures for exposing utility lines.
- Classify jobsite and follow precautions based on classification.
- Follow local regulations for digging near utilities.

A successful job begins before working. 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.

Select Start and End Points

Select one end to use as a starting point. Consider the following when selecting a starting point:

Slope

Equipment should be parked on a level site. Consider how slope will affect setup and operation. Assess the risks on each slope to determine if factors affecting risks create an unsafe condition for working. See "Slope Guidelines" on page 48.

Space

Check that starting and ending points allow enough space for working.

Comfort

Consider shade, wind, fumes, and other site features.

Identify Hazards

Inspect jobsite before transporting equipment. Check for the following:

- overall grade or slope
- changes in elevation such as hills or open trenches
- obstacles such as buildings, railroad crossings, or streams
- signs of utilities
  - "buried utility" notices
  - gas or water meters
  - drop boxes
  - manhole covers
  - utility facilities without overhead lines
  - junction boxes
  - light poles
  - sunken ground
- traffic
- access
- soil type and condition
- loose material such as fencing or cable

Take soil samples from several locations along bore path to determine best bit and backreamer combinations.

Identify safety hazards and classify jobsite if attachment will penetrate ground. See "Classify Jobsite" on page 25.

Locate Utilities

Notify One-Call Services

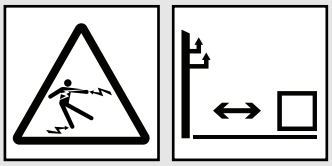
Mark proposed path with white paint and have underground utilities located before working.

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

Verify Underground Utilities

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

Locate Overhead Lines



DANGER Overhead electrical lines. Contact will cause death or serious injury. Know location of lines. Stay away.

Note location and height of all overhead lines in jobsite and ensure that equipment maintains proper distance from live lines.

Classify Jobsite

Select a Classification

Jobsites are classified according to underground hazards present, not by line being installed. Jobsite may have more than one classification.

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 concrete, sand, or granite which is capable of producing crystalline silica dust	crystalline silica dust
within 10' (3 m) of any other hazard	other

Classify jobsite as electric if jobsite is in question or if the possibility of unmarked electric utilities exists.

Apply Precautions



⚠ WARNING Underground utilities. Contact can cause death or serious injury. Locate and verify underground utilities before digging or drilling.

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

Electric Jobsite Precautions

Use one or both of these methods:

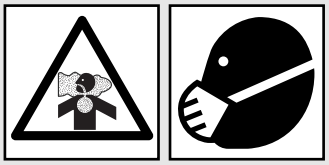
- Expose line by careful hand digging or soft excavation.
- Have service shut down while work is in progress. Have electric company test lines before returning them to service.

Natural Gas Jobsite Precautions

Position equipment upwind from gas lines and 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 gas company test lines before returning them to service.

Crystalline Dust Jobsite Precautions



WARNING Silica dust. Exposure can cause lung disease or cancer. Use breathing protection.

Crystalline silica dust is a naturally occurring substance found in soil, sand, concrete, granite, and quartz.

To reduce exposure when cutting, drilling, or working these materials:

- Use water spray or other means to control dust.
- Refer to US Occupational Safety and Health Administration (OSHA) guidelines or other applicable regulating guidelines for appropriate breathing protection or dust control methods.

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.

Clear objects such as landscaping fabric, cable, and wire from the work area. These objects may be underground or partially buried.

Arrange for Traffic Control

Vehicle and pedestrian traffic must be a safe distance from equipment. Evaluate jobsite and allow an appropriate buffer zone around equipment. If working near a road or other traffic area, contact local authorities about safety procedures and regulations.

Prepare Operator



WARNING Jobsite hazards. Exposure can cause death or serious injury. Use correct equipment and work methods. Use and maintain appropriate safety equipment.

To help avoid injury:

- Wear personal protective equipment including hard hat, safety eye wear, foot protection, hearing protection, and gloves (except when near rotating equipment).
- Remove jewelry.
- Wear close-fitting, high visibility clothing.
- Have other personal protective equipment, such as insulated boots and gloves, breathing protection, and face shield, etc. available for use depending on jobsite hazards or requirements.

Follow these guidelines before operating any jobsite equipment:

- Complete proper training and read operator's manual before using equipment.
- 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.
- 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. Safety Data Sheets (SDS) are available at www.ditchwitch.com/support.
- Use equipment carefully. Stop operation and investigate anything that does not look or feel right.

Prepare Equipment

Check Supplies

- fuel
- keys
- marking flags or paint
- notepad and pencil
- spare fuses
- lubricants

Check Equipment

Fluid Levels

- fuel
- engine oil
- hydraulic fluid
- engine coolant

Condition and Function

- all controls



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

- battery
- hoses and valves
- pumps and motors
- tires or tracks
- signs, guards, and shields
- filters (air, oil, hydraulic)
- belts

Assemble Accessories

If required, mount 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.

Controls

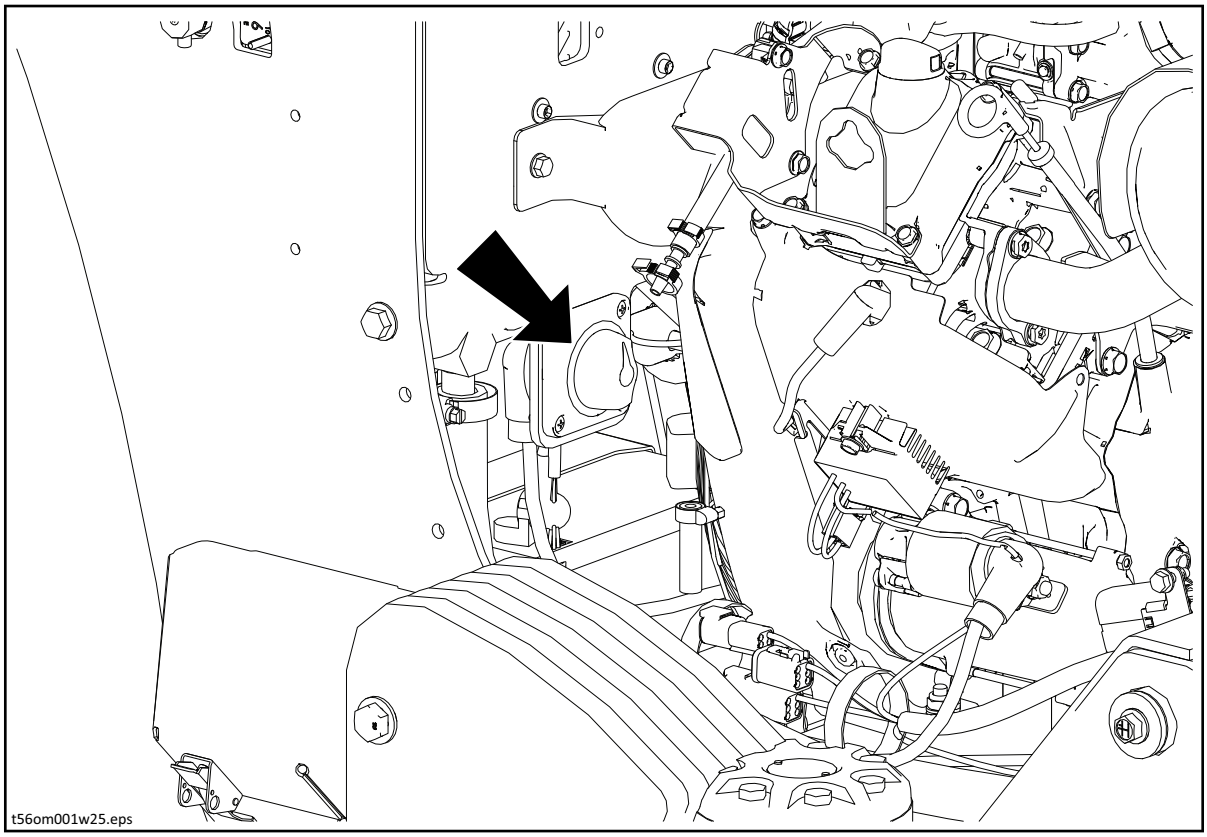
Chapter Contents

Battery Disconnect 30

Console 31

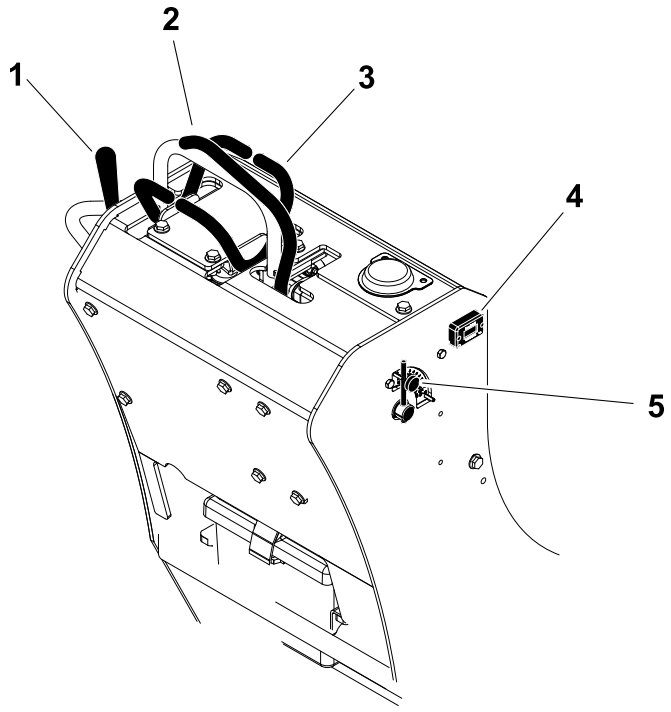
Engine 34

Battery Disconnect



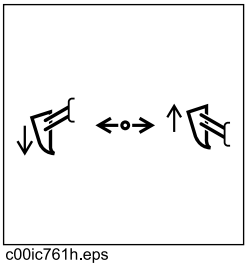
Item	Description	IMPORTANT
1. Battery disconnect switch	To connect, move right. To disconnect, move left.	***NOTICE:*** • Do not disconnect with engine running. • Wait two minutes after turning engine off before disconnecting battery.

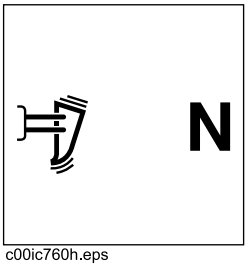
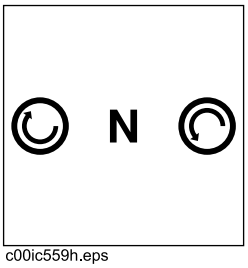
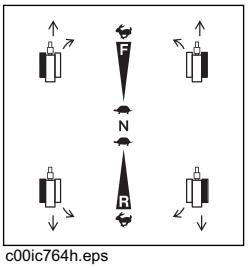
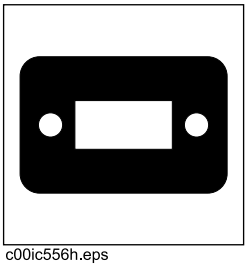
Console

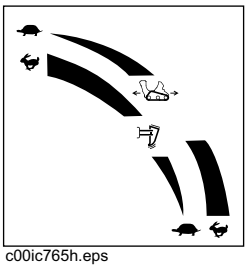


t56om005h.eps

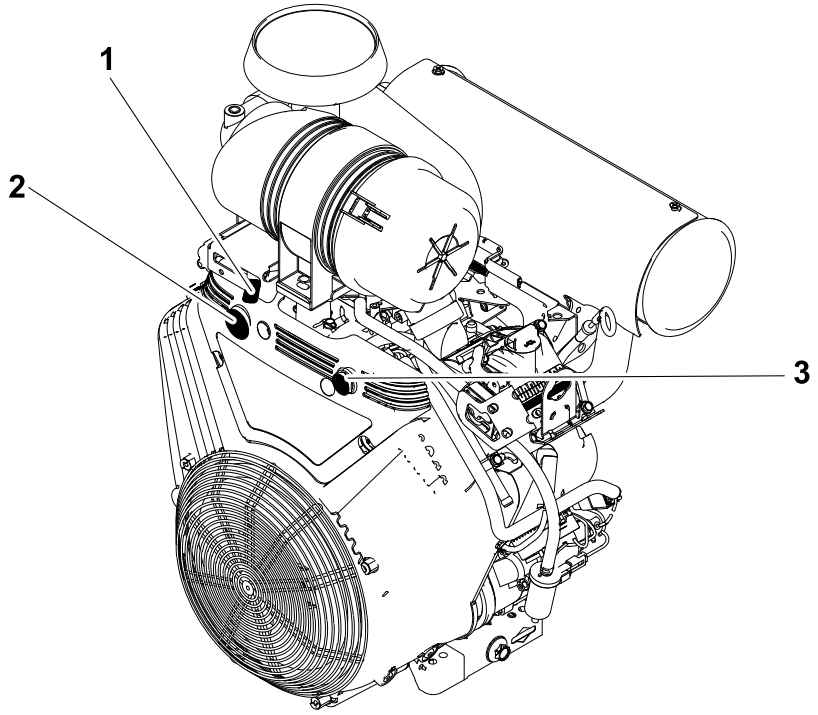
1. Plow lift control
2. Plow vibrator/Drilling attachment control
3. Speed/Direction controls
4. Hourmeter/Tachometer
5. Variable speed control

Item	Description	IMPORTANT
1. Plow lift control  c00ic761h.eps	To lower, push. To lift, pull.	

Item	Description	IMPORTANT
2. Plow vibrator/Drilling attachment control  c00ic760h.eps	To start plow vibration, pull, then move down to plow position.	**IMPORTANT:** Plowing movement is always backward (toward operator).
 c00ic559h.eps	To drill clockwise, move down. To drill counterclockwise, move up.	**IMPORTANT:** Always rotate clockwise during drilling and backreaming. Rotate counterclockwise only to dislodge a dry bore bit or reamer that has seized in the bore hole.
3. Speed/Direction controls  c00ic764h.eps	To drive straight forward, push both controls slowly. To drive straight in reverse, pull both controls slowly. To turn left, move right control. To turn right, move left control. To go faster in any direction, move controls farther from neutral.	**IMPORTANT:** Plowing movement is always backward (toward operator).
4. Hourmeter/Tachometer  c00ic556h.eps	Displays engine operating time and speed.	

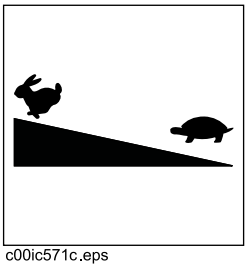
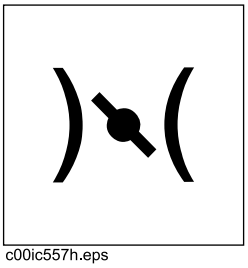
Item	Description	IMPORTANT
5. Variable speed control  c00ic765h.eps	To increase vibrator speed and decrease ground drive speed, loosen knob, move control up, then tighten. To decrease vibrator speed and increase ground drive speed, loosen knob, move control down, then tighten knob.	

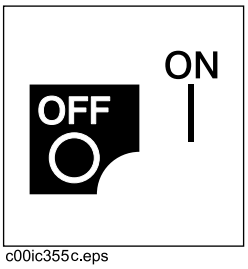
Engine



t47om006h.eps

1. Throttle
2. Choke
3. Ignition switch

Item	Description	IMPORTANT
1. Throttle  c00ic571c.eps	To increase engine speed, move up. To decrease, move down.	
2. Choke  c00ic557h.eps	To close, pull. To open, push.	Close choke to help start a cold engine. Wait until engine warms to gradually open choke.

Item	Description	IMPORTANT
3. Ignition switch  c00ic355c.eps	To enable engine startup, turn right. To shut off machine, turn left.	

Drive

Chapter Contents



For additional precautions, see "Safety" and "Prepare" chapters.

IMPORTANT: For more information on how to operate controls, see "Controls" chapter.

Start 38

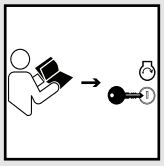
Operate 39

- Slope Guidelines 40
- Reduce Track Wear 41

Shut Down 41

Start

EMERGENCY SHUTDOWN: Release all controls and stop engine.

⚠ WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. Know how to use all controls.

To help avoid injury:

- Allow hydraulic fluid time to warm before operating in cold weather. Cold hydraulic fluid can lengthen ground drive stopping time.
- For starting in extreme temperatures, contact your Ditch Witch dealer.

NOTICE: If engine turns but does not start within 5 seconds, allow starter to cool. Wait at least one minute and try again.

1. Ensure all controls are in neutral.
2. If necessary, close choke valve.
3. Move throttle to low.
4. Insert key and activate using ignition switch.
5. **If starting machine in normal conditions,**

   5.1 Start engine and run at low throttle under light load for at least three minutes before applying heavier load.

   5.2 Gradually open choke valve, if equipped, after engine warms.

   If starting machine in cold weather:

   5.1 Start engine.

   5.2 Warm engine and hydraulic fluid by gradually increasing engine speed for up to 30 minutes.

   5.3 After warmup, carefully operate all hydraulic controls at low throttle until controls operate as described in controls chapter.

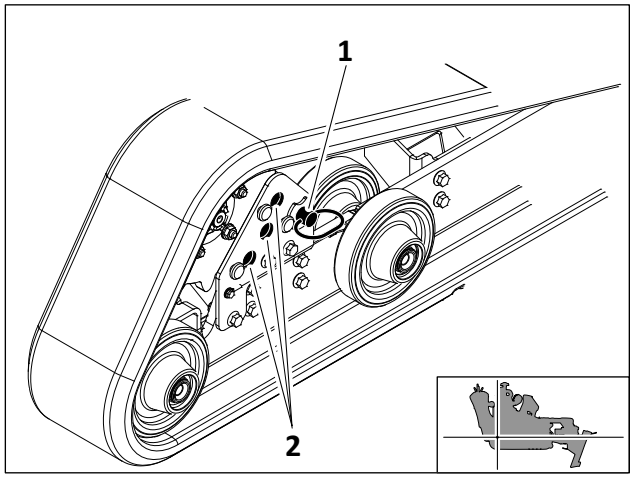
   5.4 Gradually open choke valve after engine warms.

Operate

NOTICE:

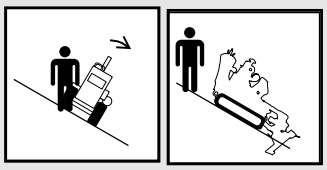
- Drive carefully in congested areas. Know machine's clearance and turning radius.
- Survey field of vision when operating machine.

1. Remove parking pin from parking position (2) and insert it in drive position (1).
2. Raise plow.
3. Set throttle to 3/4 open.
4. Move machine in direction of preferred travel.



t56om027h.eps

Slope Guidelines



WARNING Tipover. Crushing can cause death or serious injury. Follow procedure in operator's manual. Drive cautiously.

To help avoid injury:

- Operate at slow speed when on rough terrain.
- Avoid driving across slopes.
- Never jerk control levers. Use a steady, even motion.
- Always operate from the uphill side of the machine.
- Always drive with attachment low to the ground.
- If tipover occurs, shut engine off if possible.

Operating safely on a slope depends upon many factors including:

- distribution of machine weight (can change due to configuration)
- even or rough ground conditions
- potential for ground giving way causing unplanned tilt forward, backward 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 is an absolute limit which must never be exceeded. This maximum is stated below since it is a design limit. **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 parking brake retarding force: equal to traction of both tracks

Reduce Track Wear

Rubber tracks are best suited at soil-based jobsites with minimal rocks and debris. To reduce track wear drive slowly and make wide turns. Avoid the following:

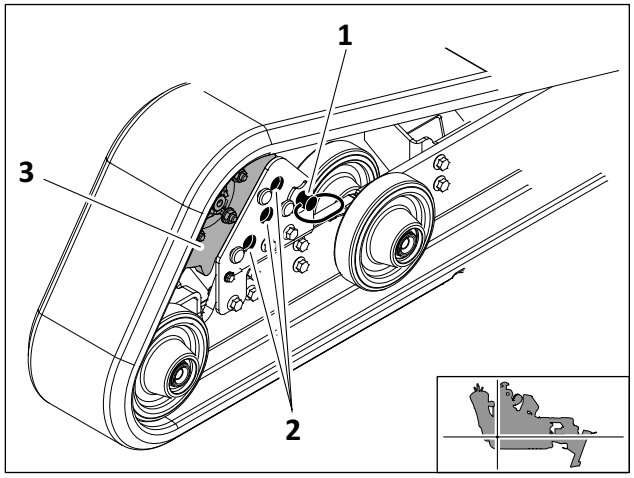
- spinning tracks under heavy load
- turning on sharp objects such as stones, broken concrete, or debris
- quick turns on asphalt or concrete
- driving over curbs or ledges
- driving with track edges pressed against hard walls or curbs
- operating on corrosive materials such as salt or fertilizer

Shut Down

1. When job is complete, move machine to level ground.
2. Stop machine movement.
3. Lower plow, if space allows.
4. Return all controls to neutral.
5. Set to low throttle.
6. Shut off machine.
7. Insert parking pin (1) in parking position (2).

   IMPORTANT: Stopping position of gear (3) determines parking position.

8. Close fuel shutoff valve, if equipped.
9. If leaving machine unattended, remove key, if equipped.



t56om028h.eps

Transport

Chapter Contents



For additional precautions, see "Safety" and "Prepare" chapters.

IMPORTANT: For more information on how to operate controls, see "Controls" chapter.

Lift 44

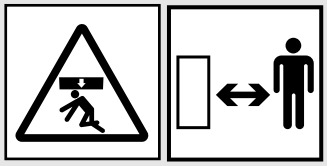
- Points 44
- Procedure 44

Haul 45

- Inspect Trailer 45
- Load 46
- Tie Down 47
- Unload 48

Retrieve 48

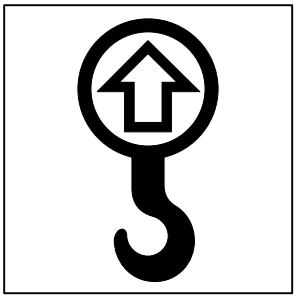
Lift



WARNING Lifted load. Crushing weight can cause death or serious injury. Stay away from lifted load and its range of movement.

Points

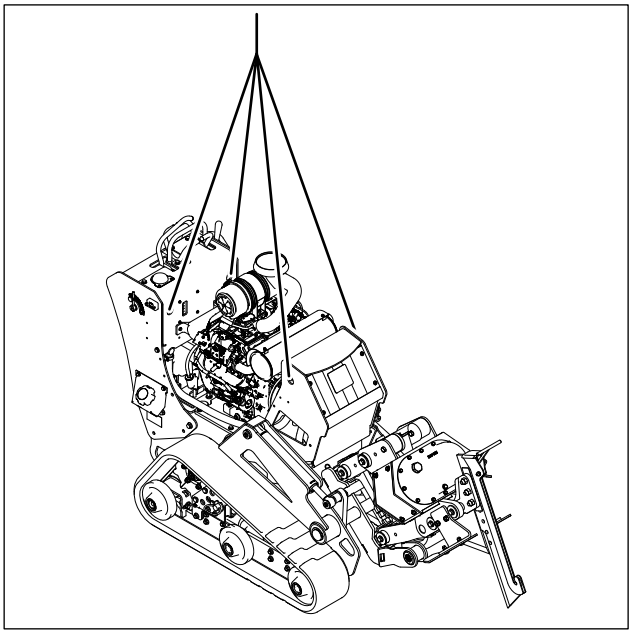
Lifting points are identified by lifting decals. Lifting at other points is unsafe and can damage machinery.



ic1319a.eps

Procedure

Use equipment capable of supporting machine's size and weight as shown. See "Specifications" on page 87 or measure and weigh equipment before lifting.



t56om006h.eps

Haul



WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. Know how to use all controls.

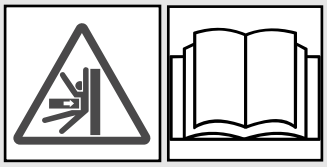
To help avoid injury:

- Read trailer operator's manual before loading or transporting machine.
- Ensure tow vehicle has proper tow capacity rating.
- Attach trailer to vehicle before loading or unloading.
- Load and unload trailer on level ground.
- To help prevent trailer sway, load trailer so that 10-15 percent of total vehicle weight (equipment plus trailer) is on tongue.
- If loading onto tilt-bed trailer, be prepared for trailer to tilt.

Inspect Trailer

- Check hitch for wear and cracks.
- Check battery for 12V charge.
- Inspect lights for cleanliness and correct operation.
- Inspect reflectors and replace if needed.
- Check tire pressure.
- Check lug nut torque.
- Ensure trailer brakes are adjusted to come on with tow vehicle brakes.
- Check trailer bed for cracks.

Load



⚠ WARNING Horizontal movement. Crushing can cause death or serious injury. Read and understand operator's manual and all safety instructions before use.



⚠ CAUTION Tipover. Crushing can cause injury. When loading/ unloading, run at low throttle. Keep plow low.

1. Remove parking pin from parking position.
2. Start engine.
3. Set to low throttle.
4. Raise plow clear of trailer, but keep it low.
5. Move machine to rear of trailer and align with ramps.

> **IMPORTANT:** Boom should be facing ramps.

6. Drive forward slowly to move machine onto trailer until tiedown position is reached.

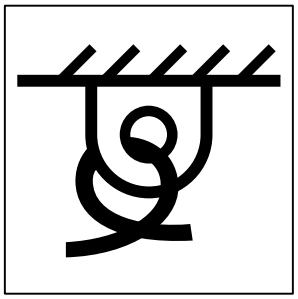
> ***NOTICE:*** If loading onto tilt-bed trailer, be prepared for trailer to tilt. Load trencher as far to the front of trailer as possible.

7. Lower plow to trailer bed, if space allows.
8. Ensure all controls are in neutral position.
9. Shut off machine.
10. Insert parking pin in parking position.
11. Tie down machine.

Tie Down

Points

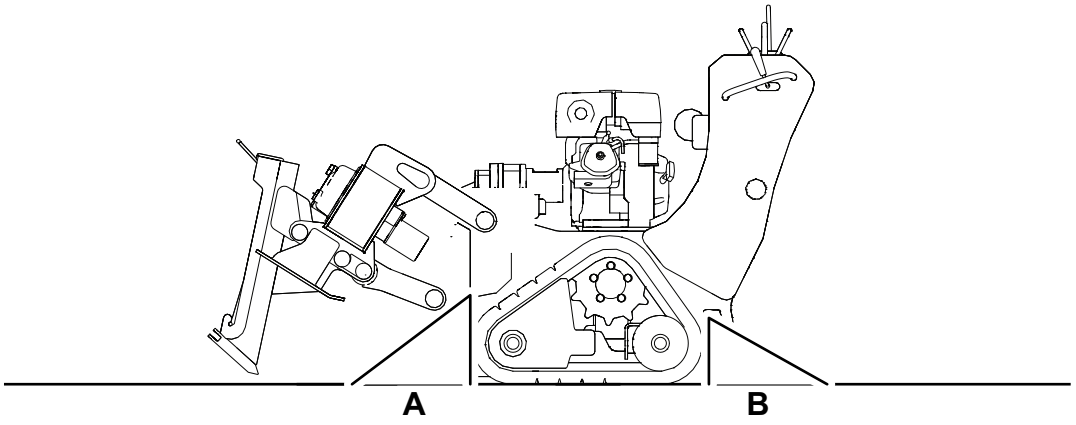
Tiedown points are identified by tiedown decals. Securing to truck or trailer at other points is unsafe and can damage machinery.



ic1320a.eps

Procedure

Loop a transport chain around each tie down point. See chart below for correct distances between tiedown ends. Ensure tiedowns are tight before transporting.



t57om002w25.eps

Distance	US	Metric
A	40-50°	40-50°
B	40-50°	40-50°

Unload



⚠ CAUTION Tipover. Crushing can cause injury. When loading/ unloading, run at low throttle. Keep plow low.

1. Prepare trailer and ramps for unloading.
2. Remove tiedowns.
3. If equipped, open fuel shutoff valve.
4. Remove parking pin from parking position.
5. Start engine.
6. Set to low throttle.
7. Raise plow clear of trailer, but keep it low.
8. Slowly back machine down trailer or ramps.

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

Retrieve

Under normal conditions, machine should not be towed. If machine becomes disabled and retrieval is necessary:

- Tow for no more than 200 yd (180 m) at less than 1 mph (1.6 km/hr).
- Use towing chains appropriately rated for maximum towing force.
- Attach tow line to all available tiedown points facing towing vehicle.
- Steering will be difficult.

Drill

Chapter Contents



For additional precautions, see "Safety" and "Prepare" chapters.

IMPORTANT: For more information on how to operate controls, see "Controls" chapter.

Set Up 50

- Dig Approach Trench 50
- Dig Target Trench 50
- Install Drilling Attachment 51
- Connect Hydraulic Lines 51
- Install Drill String 52

Operate 53

- Drill 53
- Add Rod 56
- Backream 57
- Install Product 58
- Remove Rod 59

Finish Job 60

- Disassemble Drill String 60
- Remove Drilling Attachment 60

Set Up

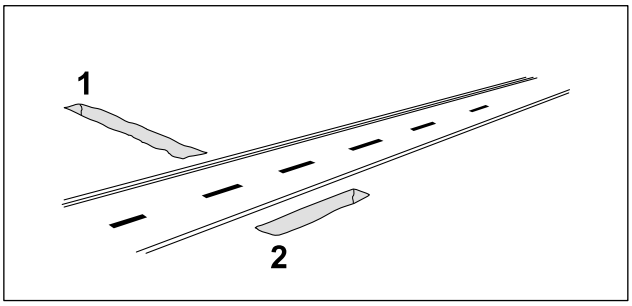


WARNING Underground utilities. Contact can cause death or serious injury. Locate and verify underground utilities before digging or drilling.

To help avoid injury: Only operate drilling attachment if bore path is more than 10' (3 m) from any underground hazard.

Dig Approach Trench

1. Mark planned bore path and all located utility lines with flags or paint.
2. Dig approach trench (1) along intended bore path.



Drill_Attchmnt_Prep_Job.eps

IMPORTANT: Ensure approach trench is:

- deep enough for pipe to lay flat and to enter soil at correct angle,
- at least half the total length of drill string, and
- at least 4" (10 mm) wide.

Dig Target Trench

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

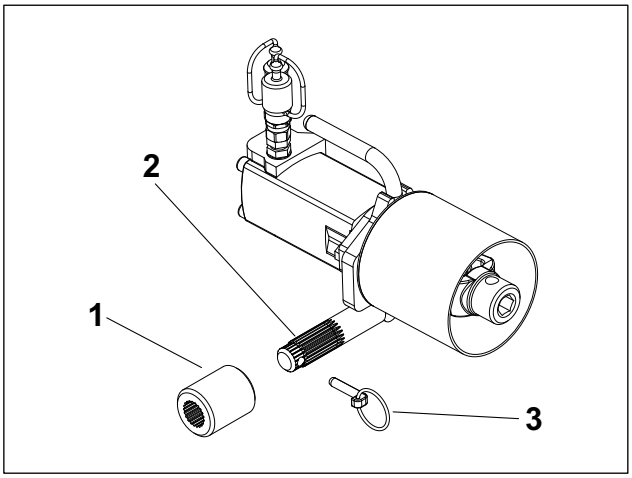
IMPORTANT: Ensure that trench is:

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

Install Drilling Attachment

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

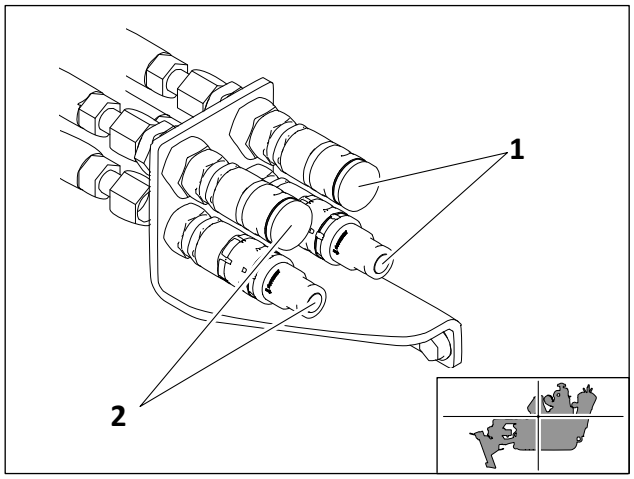
1. Shut off machine.
2. Remove attachment from storage position. See "Remove Drilling Attachment" on page 60.
3. Fully insert mount pin (2) in boss of knuckle (1), aligning drilling attachment with drill string.
4. Secure assembly with pin (3).
5. Use slip latch to attach drill string to drilling attachment.



RW_Mounting.eps

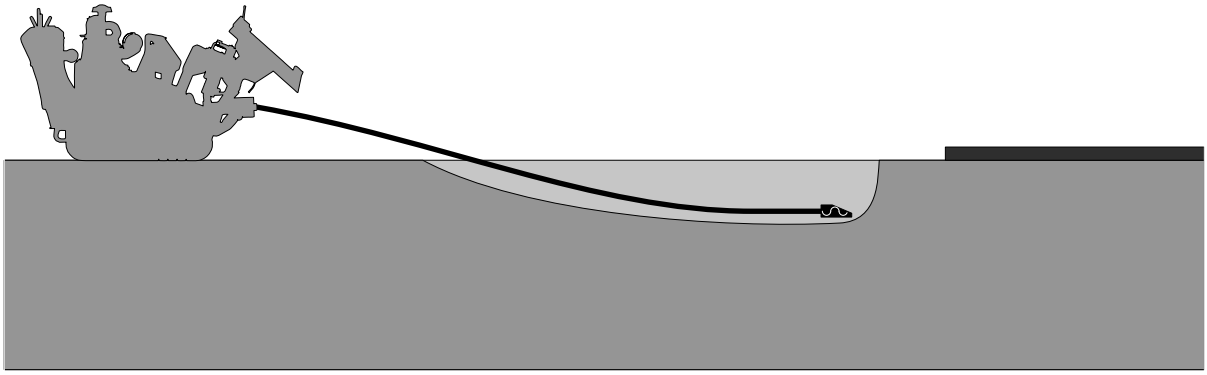
Connect Hydraulic Lines

1. Remove dust covers from connectors.
2. Disconnect plow quick attach connectors (1).
3. Connect quick attach connectors (2) to drill.



t56om036h.eps

Install Drill String


t56om020h.eps

1. Check condition and function of equipment:
   - Ensure rod sections are not bent.
   - Ensure slip latches are functioning properly.
   - Ensure bits are in good condition.
2. Assemble at least 20' (6 m), but no more than 30' (9 m), of drill rod.

> ***NOTICE:*** Incorrect installation can cause rod sections to bend. Ensure at least half of drill string length is inside trench.

3. Install drill bit.
4. Put drill string in approach trench.
5. Start engine.
6. Raise attachment fully.
7. Align machine with drill string and intended bore path.
8. Shut off machine.
9. Attach drill string to drilling attachment.

Operate

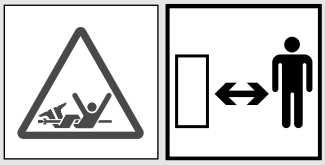


WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. Know how to use all controls.

To help avoid injury:

- Never alter controls. Improper control function can cause serious injury.
- Never tape or tie down switch or lever.

Drill



DANGER Rotating shaft. Crushing will cause death or serious injury. Stay away.

To help avoid injury:

- Keep everyone at least 10' (3 m) away from drill string and machine unless drill string guide is needed.
- Never force drilling process. Drilling bit will drift off course and rod sections may bow or break. Proceed slowly and carefully.
- Never drill with bent rod section.

1. Evaluate jobsite conditions. If drill string needs guidance have Helper (trained on equipment operation and associated hazards) use drill string guide to align drill string as it enters the soil. See "Start Bore with Drill String Guide" on page 54.
2. Start engine.
3. Set to low throttle.
4. Operate drilling attachment controls to start clockwise rotation.
5. Slowly move machine forward while maintaining rotation.

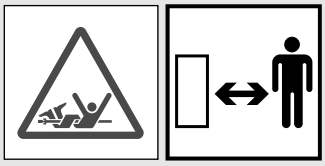
IMPORTANT: Always use lowest speed necessary. Increase speed only if more than 5' (1.5m) of rod is in the ground and other conditions allow.

6. Carefully monitor progress of bore:
   - If rod section starts to bow, stop forward movement of machine and reverse slightly until rod straightens.
   - If drilling becomes obstructed, stop rotation immediately.
7. When drill bit enters target trench, stop rotation immediately.

IMPORTANT: After initial bore is complete, backream to enlarge bore or install product.

- See "Backream" on page 57.
- See "Install Product" on page 58.

Start Bore with Drill String Guide

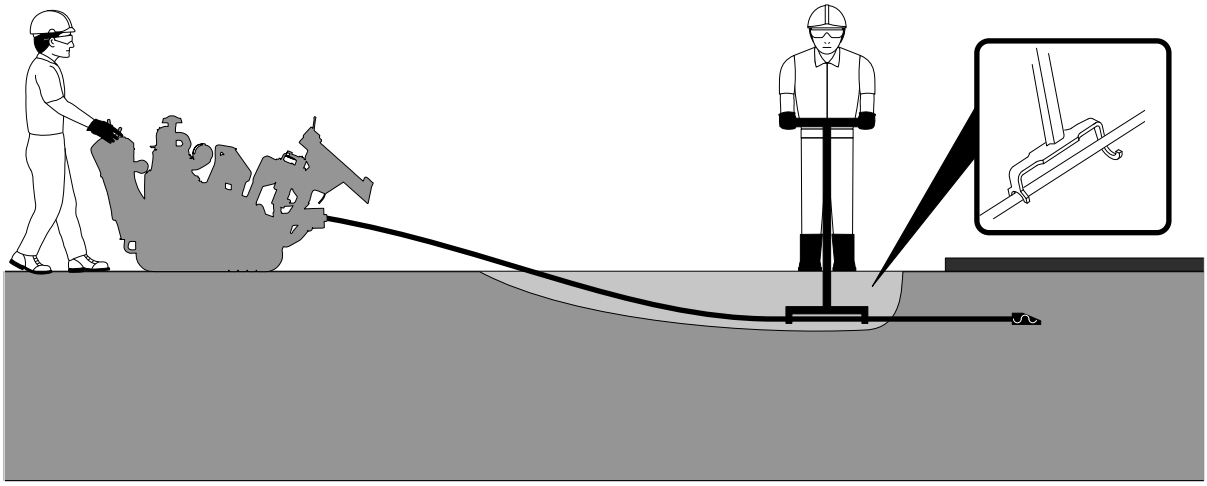


DANGER Rotating shaft. Crushing will cause death or serious injury. Stay away.

To help avoid injury:

- Use only the approved Ditch Witch drill string guide (p/n 118-079).
- Never straddle trench or drill string.
- Never enter trench.
- Keep hands and feet away from drill string and drilling attachment.
- Never 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.

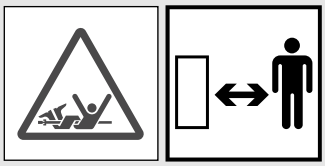
If drill string needs guidance have Helper follow the instructions below to operate the drill string guide at start of bore.



t56om022h.eps

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 5' (1.5 m) of rod is in the ground, signal machine operator to stop rotation of drilling attachment.
6. When drill string has stopped, remove drill string guide and leave area.

Add Rod



DANGER Rotating shaft. Crushing will cause death or serious injury. Stay away.

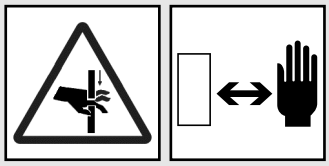
To help avoid injury: Only access drilling attachment once rotation has fully stopped.

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

Disconnect Drill String from Drilling Attachment

1. Stop rotation of drilling attachment.
2. Operate ground drive controls to move machine in reverse 6" (15 cm) to loosen drill string in ground.
3. Disconnect drill string from drilling attachment. Special tool (p/n 351-272) may be used. See "Disassemble Drill String" on page 60.
4. Move machine in reverse 10' (3.05 m), about the length of a rod section.

Add Rod Section



WARNING Pinch point. Crushing will cause serious injury. Stay away.

To help avoid injury:

- Keep hands at least 6" (15 cm) from ends of rod.
- Support rods from underneath with open palms. Never grip rods.

1. Have Helper connect new rod section to drill string.
2. Slowly move machine forward until new rod section and drilling attachment are about 1" (2.5 cm) apart.
3. Have Helper lightly hold new rod section.
4. Rotate drilling attachment to align slip latches of new rod section and drilling attachment if needed.
5. Move machine forward slowly. As soon as new rod section engages drilling attachment, have Helper move hands clear.
6. Slightly move forward until slip latch connection is correctly latched.

Backream

Sometimes it is necessary to drill a pilot hole first, then enlarge the hole to accommodate larger product. As a general rule, the final hole should be 1.5 times larger than the diameter of the product being installed. The number of passes needed depends on soil conditions.

NOTICE:

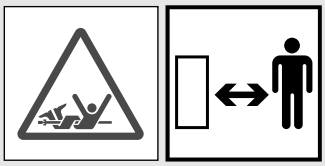
- Do not try to increase hole size too much in one pass. Make several passes using successively larger reamers.
- Keep drill string straight and aligned with drilling attachment. Sharp bends can cause rod failure.
- Ensure no more than 30' (9 m) of exposed rod is outside the bore. Remove rods as necessary. See "Remove Rod" on page 59.

1. Shut off machine.
2. Remove drill bit and install appropriate reamer.
3. Start engine.
4. Begin clockwise rotation.

NOTICE: Always rotate clockwise during backreaming. Rotate counterclockwise only if reamer is blocked in bore.

5. Slowly drive in reverse while maintaining rotation. When reamer exits approach trench, stop rotation immediately.

Install Product

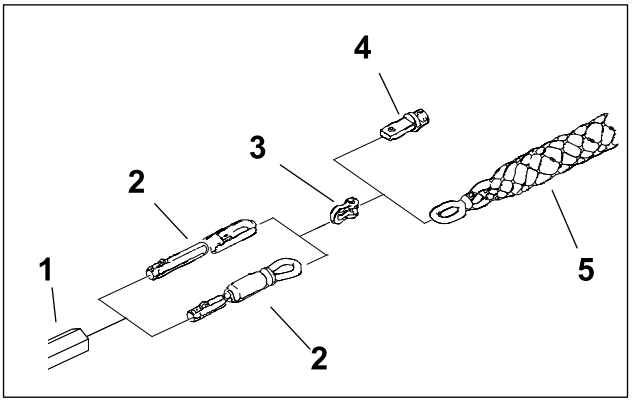


DANGER Rotating shaft. Crushing will cause death or serious injury. Stay away.

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

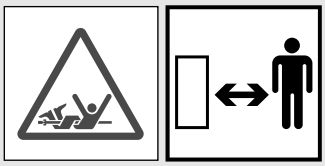
To install product, pull through the bore after drilling or at final pass of backreaming.

1. Shut off machine.
2. Remove drill bit and attach appropriate swivel (2) to drill string (1) or reamer. Ensure swivel functions correctly.
3. Use shackle (3) to attach pipe pulling adapter (4) or pulling grip (5) to swivel.
4. Attach material to pipe pulling adapter or pulling grip.
5. Start engine.
6. Set to low throttle.
7. Slowly drive in reverse while maintaining rotation. When product exits approach trench, stop rotation immediately.



RW_PullingTools.eps

Remove Rod



DANGER Rotating shaft. Crushing will cause death or serious injury. Stay away.

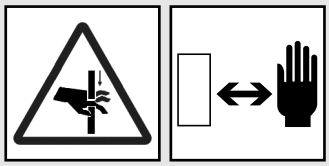
To help avoid injury: Only access drilling attachment once rotation has fully stopped.

If the length of rod outside the bore reaches 30' (9 m), or as required by space, use a Helper to remove rod sections as needed.

Remove Rod Section

1. Stop rotation of drilling attachment.
2. Disconnect and remove first rod. Special tool (p/n 351-272) may be used. See "Disassemble Drill String" on page 60.

Reconnect Drill String



WARNING Pinch point. Crushing will cause serious injury. Stay away.

To help avoid injury:

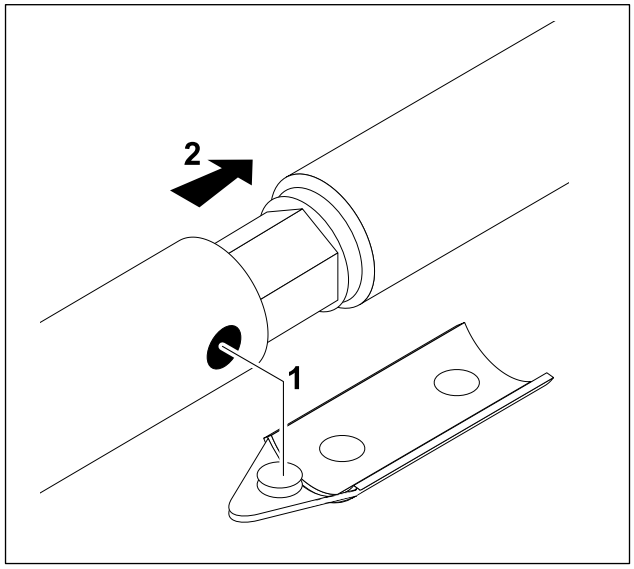
- Keep hands at least 6" (15 cm) from ends of rod.
- Support rods from underneath with open palms. Never grip rods.

1. Slowly move machine forward until rod section and drilling attachment are about 1" (2.5 cm) apart.
2. Have Helper lightly hold new rod section.
3. Rotate drilling attachment to align slip latches of new rod section and drilling attachment if needed.
4. Move machine forward slowly. As soon as new rod section engages drilling attachment, have Helper move hands clear.
5. Slightly move forward until slip latch connection is correctly latched.

Finish Job

Disassemble Drill String

1. Shut off machine.
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).

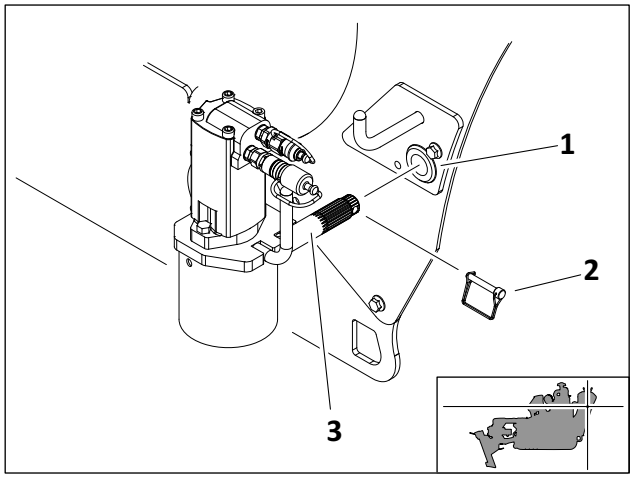


Drill_Attchmnt_RodJoints.eps

Remove Drilling Attachment

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

1. Shut off machine.
2. Disconnect hydraulic lines.
3. Install dust covers on hydraulic connectors of drilling attachment.
4. Insert mount pin (3) in bore of console (1).
5. Secure assembly with pin (2).



t56om024h.eps

Plow

Chapter Contents



For additional precautions, see "Safety" and "Prepare" chapters.

IMPORTANT: For more information on how to operate controls, see "Controls" chapter.

Set Up 62

- Position Machine 62
- Load Reel Carrier 62
- Attach Product 62
- Prepare Machine 63

Operate 63

Finish Job 64

Set Up

Position Machine

IMPORTANT: If material must be at constant depth, dig starting and target trenches.

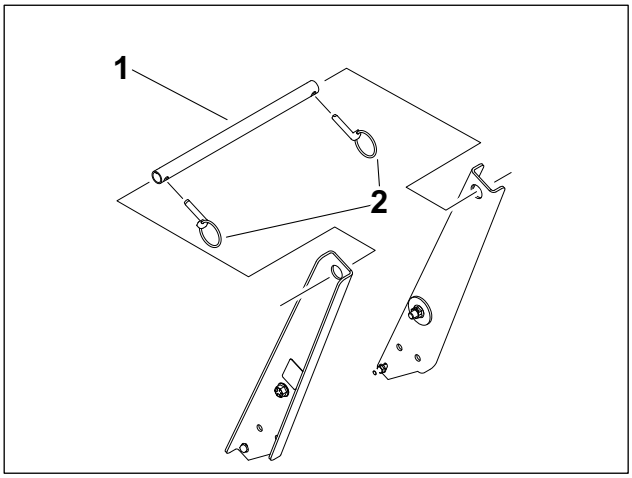
1. Start engine.
2. Drive to starting point. Move in line with planned plow path.
3. Set parking pin.
4. Lower plow to starting point of trench.
5. Shut off machine.

Load Reel Carrier

1. Remove pins (2).
2. Install arbor (1) into spool.

   NOTICE: Maximum weight is 210 lb (95.25 kg).

3. Install arbor and spool on arms using pins.



t56om040h.eps

Attach Product

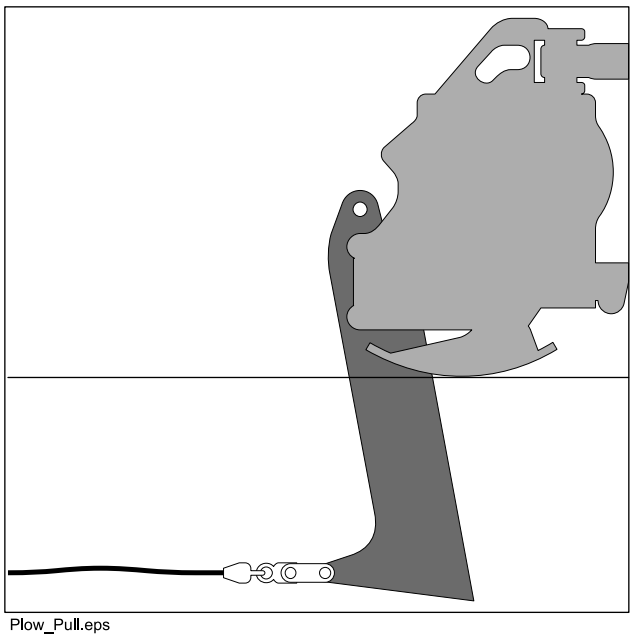
Pull Product

1. Insert material into pulling grip, as shown.
2. Tape grip with duct tape.

Feed Product

NOTICE: Use only genuine Ditch Witch cable guide.

1. Remove cable guide. Feed cable through tube from top to bottom.
2. Replace cable guide and tighten fasteners.
3. Secure cable.


Plow_Pull.eps

Prepare Machine

1. Start machine.
2. Release parking pin.

Operate

1. Drive in reverse.

> **IMPORTANT:** Plowing movement is toward operator.

2. Lower plow blade into ground.
3. Start plow vibration. PLOW WILL VIBRATE.

> ***NOTICE:***
>
> - Only operate vibrator with plow blade in the ground.
> - When plow blade is in the ground, only drive in reverse.

4. Slowly increase vibration to desired speed.
5. Set to full throttle.
6. Adjust plow vibrator and ground drive speeds as needed. If using vibrator speed control, move ground drive to maximum speed and use vibrator speed control to make finer adjustments as needed.
7. Monitor product for damage during plowing.

Finish Job

1. When installation is complete, stop machine movement.
2. With vibrator running, raise plow to ground level while reducing vibrator speed.

> ***NOTICE:*** Only operate vibrator with plow blade in the ground.

3. Stop vibration.
4. Raise plow fully.
5. Set parking pin.
6. Shut off machine.
7. Remove product from plow.
8. Start machine.
9. Release parking pin.
10. Drive a short distance away from work site.
11. Shut off machine.

Systems and Equipment

Chapter Contents



For additional precautions, see "Safety" and "Prepare" chapters.

Optional Equipment 66

Optional Equipment

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

Equipment	Description
drilling attachment	drill under sidewalks and driveways
blades	several blade options are available
bullets	allow larger cavity for material being installed
reel carrier	designed to speed cable installation
European compliance kit	includes lockable fuel cap

Complete the Job

Chapter Contents



For additional precautions, see "Safety" and "Prepare" chapters.

Restore Jobsite 68

Rinse Equipment 68

Stow Tools 68

Decommission Machine 68

Restore Jobsite

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

Rinse Equipment

NOTICE:

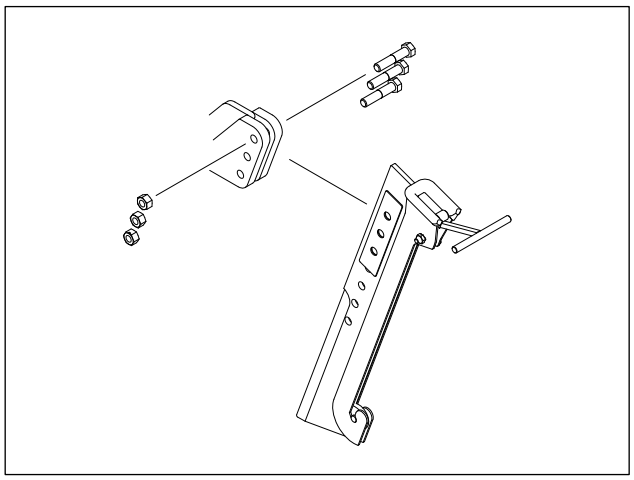
- Do not spray water onto operator console or electrical center in engine compartment. Water can damage electrical components. Wipe down instead.
- Ensure all mud and debris is rinsed from tracks before parking machine overnight.

Spray water onto equipment to remove dirt and mud.

Stow Tools

Ensure all tools and accessories are loaded and properly secured on trailer.

1. Remove bolts to remove plow blade from front end as shown.
2. Store front end upright in a clean, dry place on even ground.
3. Cover front end.



t56om035h.eps

Decommission Machine

Before decommissioning machine, follow local regulations for disposing of hazardous substances. For more information on draining fluids, see Maintenance chapter or contact your Ditch Witch dealer.

Maintenance

Chapter Contents



For additional precautions, see "Safety" and "Prepare" chapters.

IMPORTANT: For more information on how to operate controls, see "Controls" chapter.

Maintenance Precautions 70

- Refueling Precaution 71
- Welding Precaution 72
- Washing Precaution 72

Recommended Lubricants 72

- Engine Oil Temperature Charts 73
- Approved Fuel 73

Maintenance Interval Chart 74

Procedures 75

Maintenance Precautions



⚠WARNING Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. Know how to use all controls.

To help avoid injury:

- Unless otherwise instructed, all maintenance should be performed with the engine off and cool.
- Lower unsecured, raised components before servicing equipment.
- Unless otherwise instructed, all maintenance should be performed with machine parked on level surface.
- Refer to US Occupational Safety and Health Administration (OSHA) guidelines for appropriate lockout-tagout procedures.

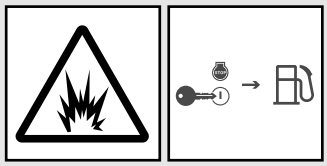


⚠WARNING Jobsite hazards. Exposure can cause death or serious injury. Use correct equipment and work methods. Use and maintain appropriate safety equipment.

To help avoid injury:

- Wear personal protective equipment including hard hat, safety eye wear, foot protection, hearing protection, and gloves (except when near rotating equipment).
- Remove jewelry.
- Wear close-fitting, high visibility clothing.
- Have other personal protective equipment, such as insulated boots and gloves, breathing protection, and face shield, etc. available for use depending on jobsite hazards or requirements.

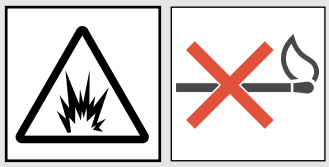
Refueling Precaution



DANGER Gasoline. Fire or explosion will cause death or serious injury. Shut down engine before refueling.

To help avoid injury:

- Ensure engine has completely cooled before removing fuel cap.
- Always hold grips on fuel tank cap and loosen slowly to relieve any pressure in tank.
- Ensure fuel nozzle is inserted securely into filler neck before refueling.



WARNING Gasoline. Fire or explosion can cause death or serious injury. Keep heat, flames, sparks and other ignition sources away.

To help avoid injury:

- Touch a metal surface away from fuel tank to discharge any static electricity.
- Ensure anyone near open fuel tank has discharged any static electricity.

NOTICE: Clean spilled fuel immediately.

Welding Precaution

NOTICE: Welding can damage electronics.

- Welding currents can damage electronic components. Always disconnect the ECU ground connection from the frame, harness connections to the ECU, and other electronic components prior to welding on machine or attachments.
- Connect welder ground close to welding point and make sure no electronic components are in the ground path.
- Failure to disconnect battery will cause damage to battery.

Washing Precaution

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

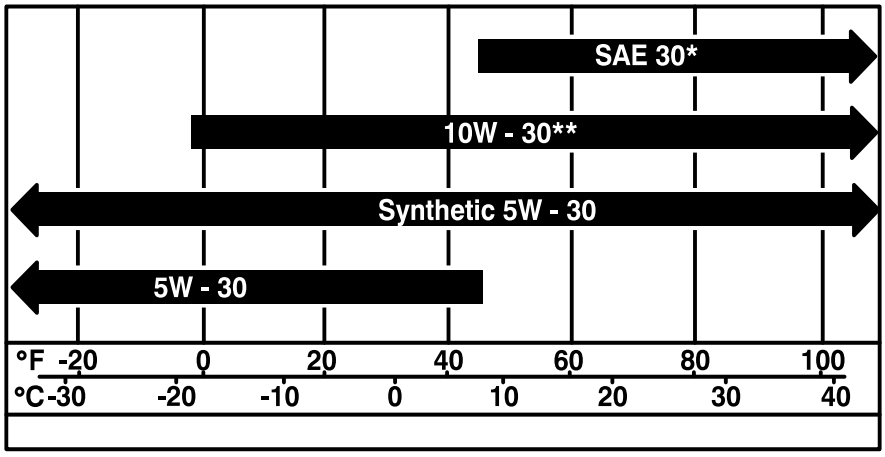
Recommended Lubricants

Item	Description
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 GL-5 (SAE 80W90)
THF	Tractor hydraulic fluid, Phillips 66® PowerTran Fluid, Mobilfluid® 432, Chevron® Tractor Hydraulic Fluid, Texaco® TDH Oil, or equivalent

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 109.

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

Engine Oil Temperature Chart



t27om036h.eps

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.

Approved Fuel

NOTICE: Incorrect fuel will damage the engine. Use only approved fuel.

This engine is designed to run on unleaded gasoline. Use only high quality fuel meeting ASTM D4814, EN228, or equivalent. Ethanol blends up to 10% (E10) are approved for use in this machine.

Minimum octane rating:

- 87 pump octane number [(R+M)/2]
- 91 research octane number (RON)

At altitudes above 5000' (1524 m), lower octane fuels may be acceptable. Carburetors, if equipped, may also require adjustment. Consult engine operator's manual, your Ditch Witch dealer, or authorized engine servicing dealer for more information.

Maintenance Interval Chart

IMPORTANT: Chart indicates first instance of repeated service procedures. See detailed information below.

▽	Adjust, service, or test	□	Change, initial	○	Lube, initial
▲	Check	■	Change	●	Lube

Service	Startup	10 Hours	50 Hours	100 Hours	300 Hours	500 Hours	As Needed
Battery		▲					▽
Dust ejector valve	▲	▲					
Feed tube							▽
Filter, air	▲			■			
Filter, engine oil (see Oil, engine)							
Filter, hydraulic fluid (see Fluid, hydraulic)							
Filter, in-line fuel							■
Fluid, hydraulic	▲					■	
Hydraulic fluid cooler	▲						■
Hydraulic hoses	▲	▲					
Oil, engine	▲	□		■			
Oil, plow vibrator		▲		□	■		
Plow blade bolts	▲						▽
Sod cutter							▽
Spark plug				▲			
Track lug nuts	▲						▽
Track tension			▲				▽

Procedures

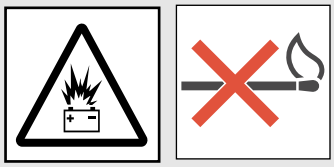
Battery



WARNING Corrosive fluid. Contact can cause death or serious injury. Avoid contact. Wear appropriate gloves. See Safety Data Sheet (SDS) for more information.

To help avoid injury:

- Never attempt to charge a battery that is leaking, bulging, heavily corroded, frozen, or otherwise damaged.
- Refer to Safety Data Sheet (SDS) for additional information regarding battery.



WARNING Explosive hydrogen gas. Fire or explosion can cause death or serious injury. Keep heat flames, sparks, and other sources of ignition away.

To help avoid injury:

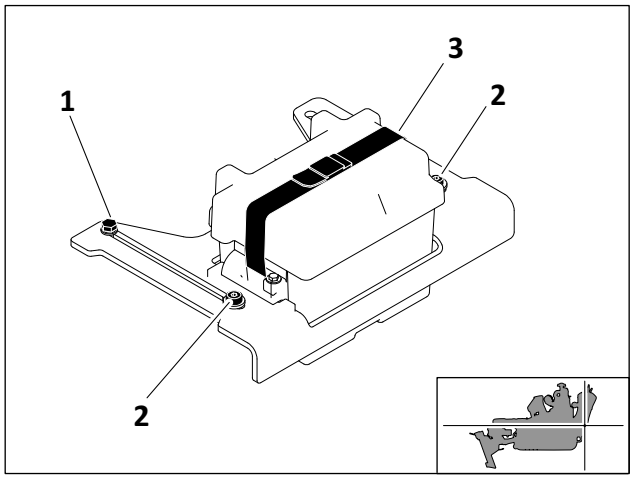
- Use a single 12V maximum source for charging. Never connect to rapid chargers or dual batteries.
- Never lean over battery when making connections.
- Never allow vehicles to touch when charging.
- Never short-circuit battery terminals for any reason or strike battery posts or cable terminals.
- Refer to Safety Data Sheet (SDS) for additional information regarding battery.

NOTICE:

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

Check battery every 10 hours. Charge as needed.

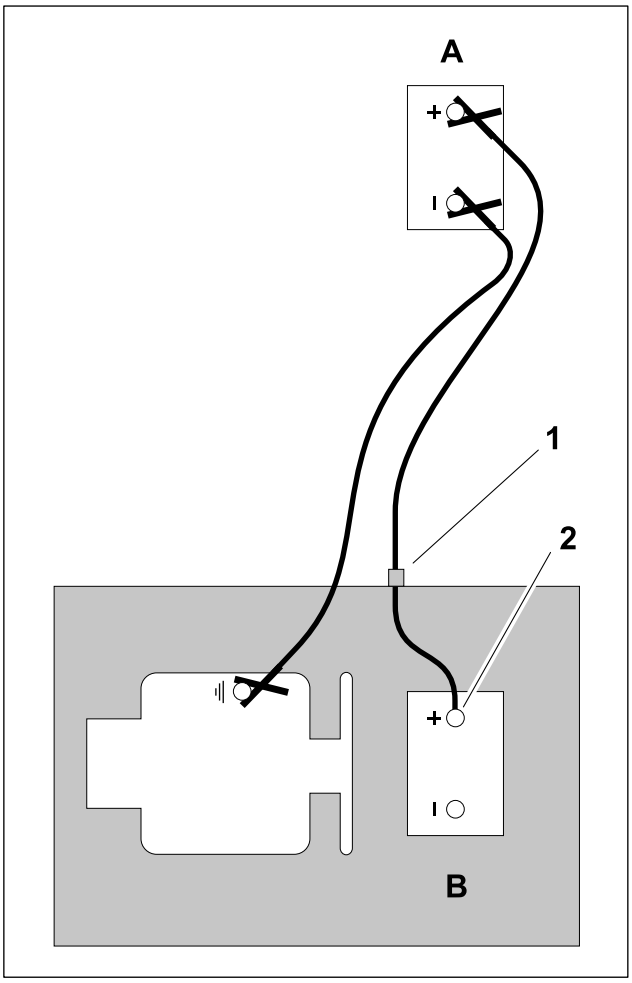
Check



t56om019h.eps

1. Disconnect battery at battery disconnect switch, if equipped.
2. Ensure no ignition sources are near battery.
3. Remove screw (1).
4. Pull battery tray out.
5. Remove bolts (2) to remove battery hold-down (3).
6. Loosen and remove battery cable clamps carefully, negative (-) cable first.
7. Clean cable clamps and terminals to remove dull glaze.
8. Check for signs of internal corrosion in cables.
9. Connect battery cable clamps, positive (+) cable first.
10. Tighten any loose connections.
11. Install battery hold-down.
12. Loosely tighten bolts.
13. Push tray back into storage position.
14. Tighten screw.
15. Turn battery disconnect, if equipped, on.

Charge



Battery_Jumpstart_B.eps

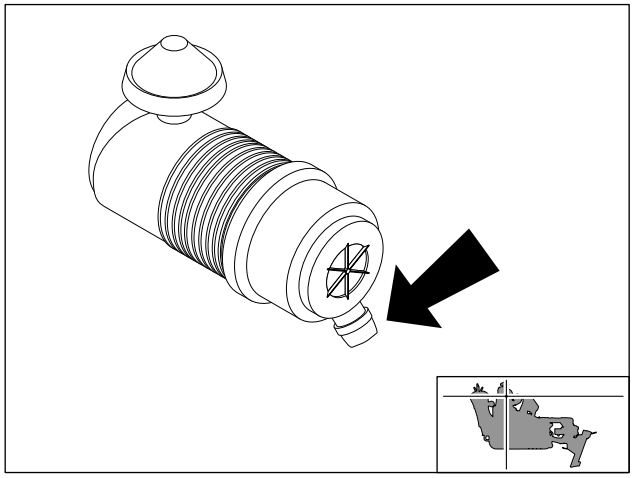
1. Park service vehicle close to disabled equipment but do not allow vehicles to touch.
2. Set parking brake in both, if equipped.
3. Turn both off.
4. Disconnect machine controller, if equipped.
5. Inspect battery in disabled machine (B) for signs of cracking, bulging, leaking, or other damage.
6. Connect red positive (+) jumper cable clamp to positive (+) post of battery (2) in disabled machine.

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

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

Dust Ejector Valve

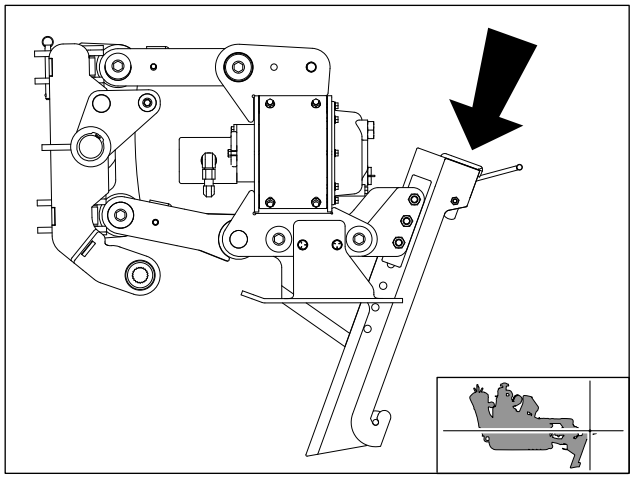
Check valve (shown) before startup and every 10 hours. Ensure that valve is not inverted, damaged, plugged, or cracked.



t56om011h.eps

Feed Tube

Clean feed tube (shown) as needed.

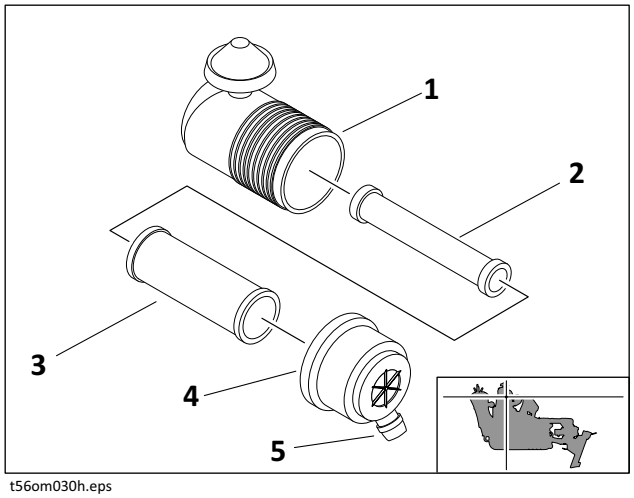


t56om037h.eps

Filter, Air

Check before startup. Change every 100 hours.

1. Remove air filter cover (4).
2. Remove primary (3) and secondary (2) elements.
3. Wipe inside of housing (1) and wash cover.
4. Inspect elements. Replace if needed.
5. Insert secondary element and ensure it is seated correctly.
6. Insert primary element.
7. Replace cover with dust ejector (5) facing down.

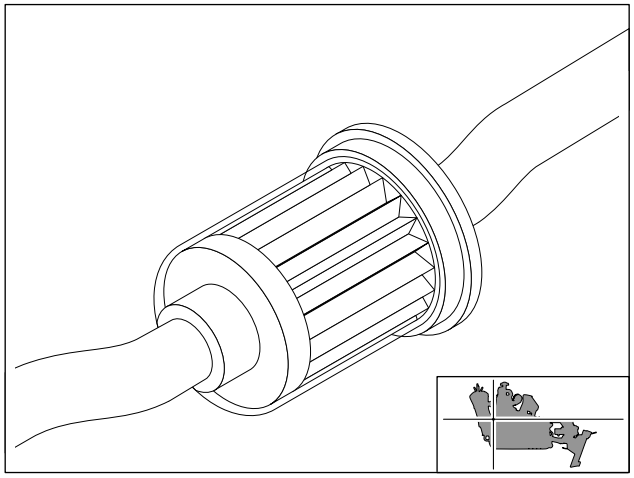


t56om030h.eps

Filter, In-Line Fuel

Check before startup and change as needed.

1. Open clips.
2. Remove filter.
3. Replace.
4. Attach filter.



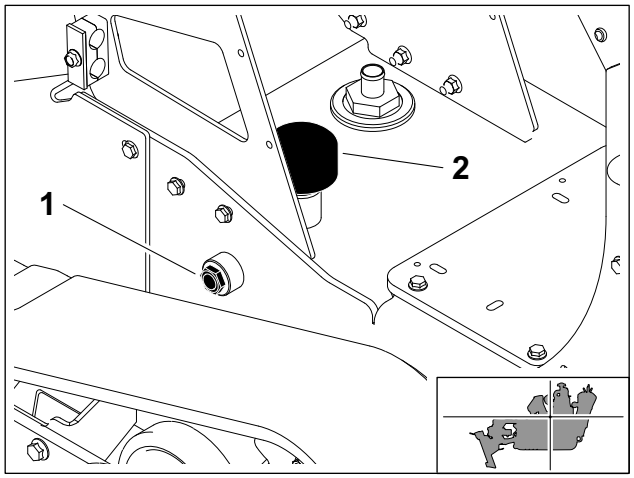
t56om041h.eps

Fluid, Hydraulic

Check before startup. Change every 500 hours.

Check

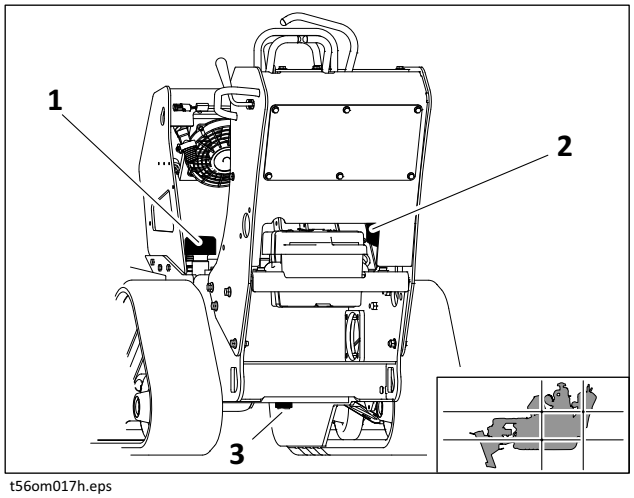
1. Check level at sight glass (1).
2. Clean reservoir cap (2) as needed.
3. Add THF at fill (2) as needed to keep level at halfway point on sight glass.



t56om012h.eps

Change

1. Remove plug (3) to drain.
2. Install plug.
3. Change filter (2).
4. Add THF at fill (1) until level is at halfway point on sight glass.



t56om017h.eps

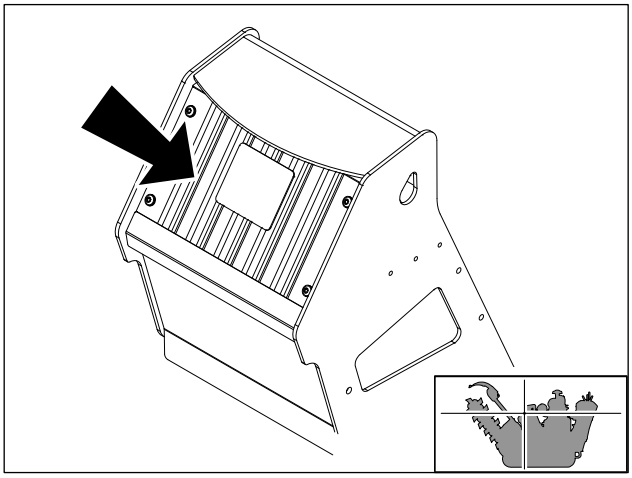
Hydraulic Fluid Cooler

NOTICE:

- Check more often if operating in large brush, grassy conditions, or if machine is being stored.
- Do not use high-pressure air or water.

Check before startup. Clean as needed.

1. Check fluid cooler (shown) for dirt and debris.
2. Clean fins with compressed air or spray wash.



t57om015w.eps

Hydraulic Hoses

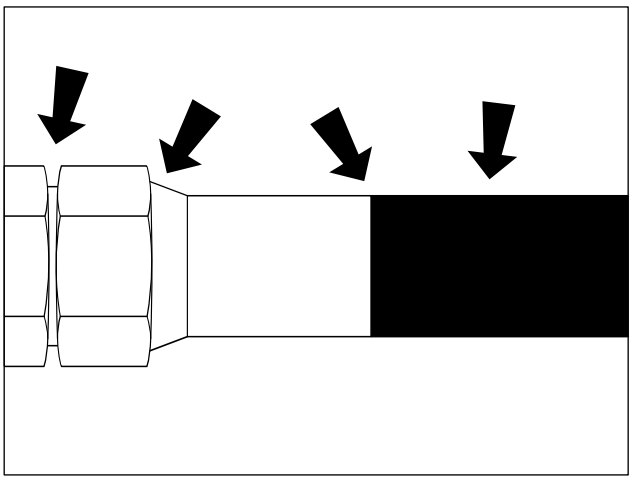


⚠ WARNING Pressurized fluid or air. Injection can cause death or serious injury. Refer to operator's manual for correct use.

To help avoid injury:

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

Check for leaks where shown before startup and every 10 hours.



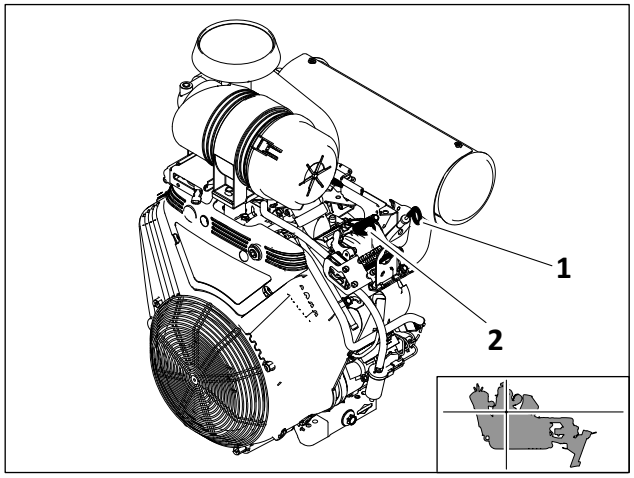
CheckHoses.eps

Oil, Engine

Check before startup. Change at 10 hours and every 100 hours thereafter.

Check

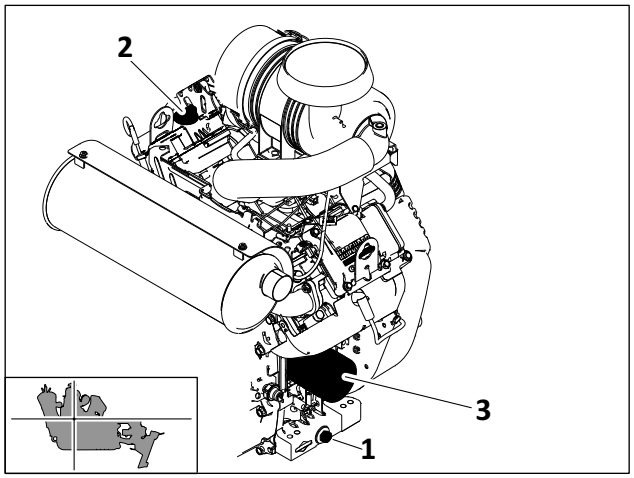
1. Check level at dipstick (1) before each use.
2. Add GEO at fill (2) as needed to keep level at highest line on dipstick.



t56om010h.eps

Change

1. While oil is warm, remove plug (1) and drain.
2. Install plug.
3. Replace filter (3) each time oil is changed.
4. Add GEO at fill (2) to keep level at highest line on dipstick.



t56om016h.eps

Oil, Plow Vibrator

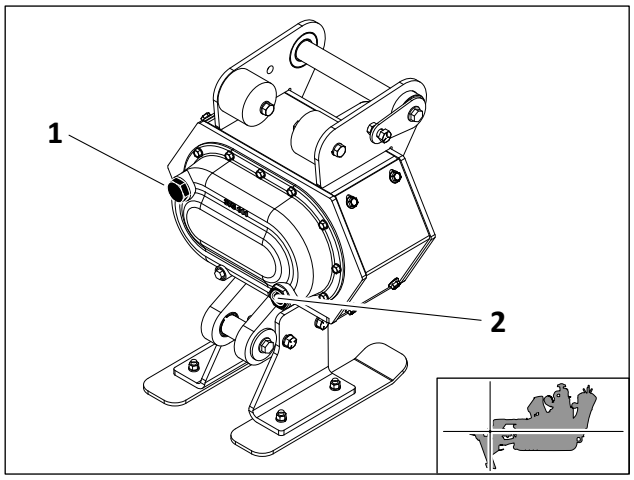


⚠ CAUTION Hot parts. Contact can cause burns. Only touch when cool or wear gloves.

Check plow vibrator oil every 10 hours. Change at 100 hours and every 300 hours thereafter.

Check

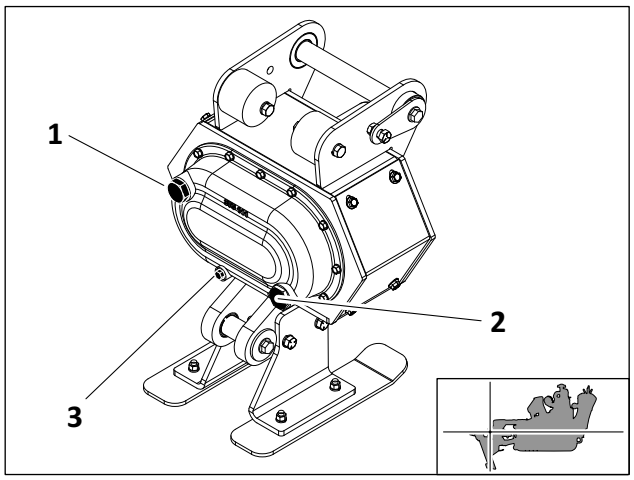
1. With vibrator horizontal, check oil at sight glass (2).
2. Add MPL at fill (1) as needed to keep level at halfway point on sight glass.



t56om026h.eps

Change

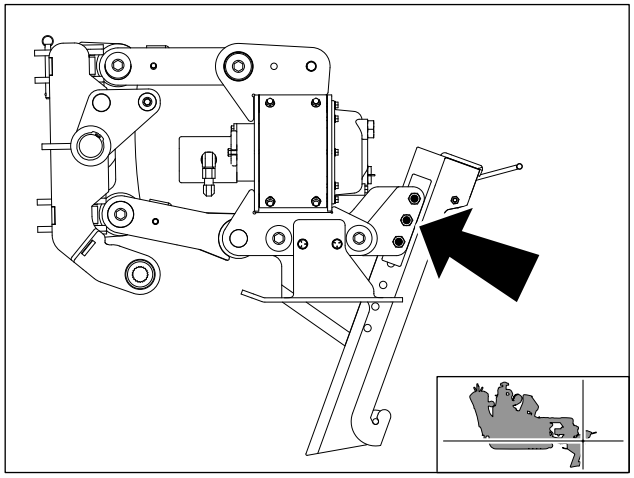
1. Open fill (1).
2. Drain oil at drain plug (3).
3. Install plug.
4. Start machine.
5. Move plow to horizontal position.
6. Shut off machine.
7. Add MPL at fill until oil is at halfway point on sight glass (2).



t56om025h.eps

Plow Blade Bolts

Check plow blade bolts (shown) before startup. Tighten to 160 ft•lb (271 N•m) as needed.

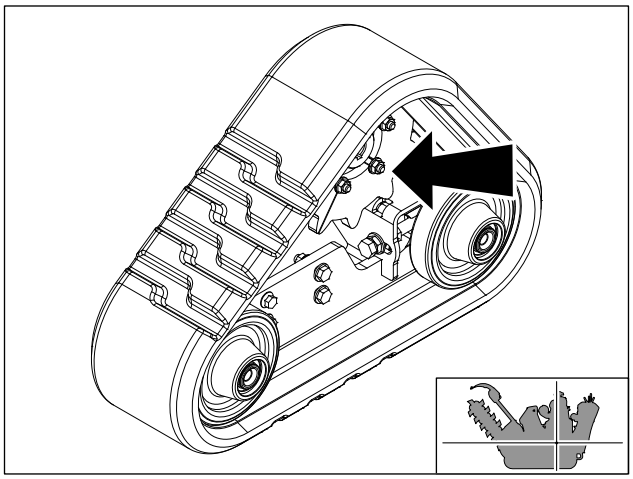


t56om039h.eps

Track Lug Nuts

Check lug nuts (shown) before startup. Tighten as needed.

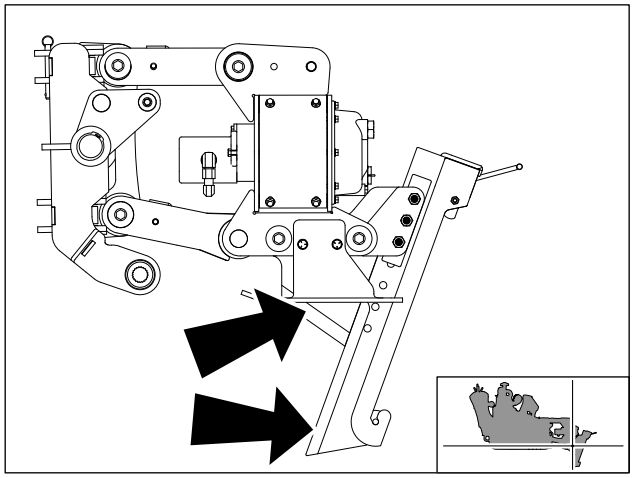
1. Apply Loctite® 242 (blue).
2. Tighten to 65 ft•lb (88 N•m) as needed.



t47om022h.eps

Sod Cutter

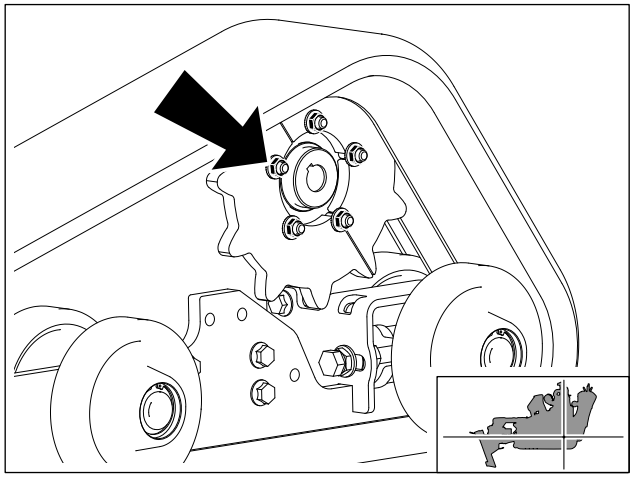
Replace sod cutter and plow blade (shown) as needed.



t56om038h.eps

Track Lug Nuts

Check lug nuts (shown) before startup. Tighten to 65 ft•lb (88 N•m) as needed.

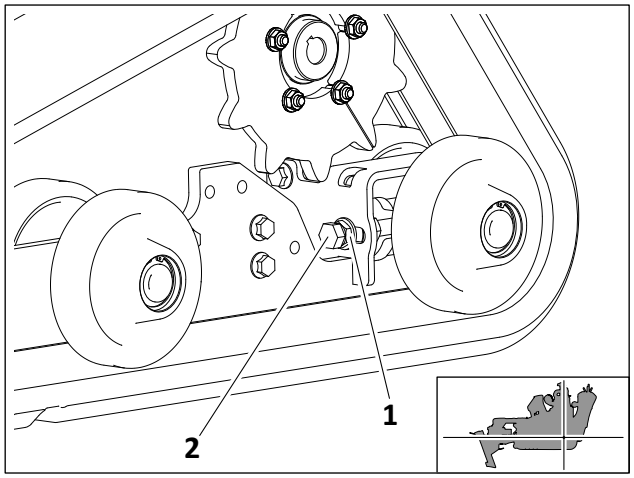

t56om013h.eps

Track Tension

Check every 50 hours. Adjust as needed.

Check

1. Place straightedge across front track span from idler to sprocket.
2. Measure distance from top edge of bottom of track to straightedge. Distance should be 0.25" (6 mm).



t56om018h.eps

Adjust

1. Loosen jam nut (1).
2. Turn bolt (2) counterclockwise until distance between track and straight edge is 0.25" (6 mm).
3. Tighten jam nut.
4. Start engine.
5. Drive straight forward one machine length.
6. Shut machine off and let cool.
7. Check track tension and adjust if needed.

Specifications

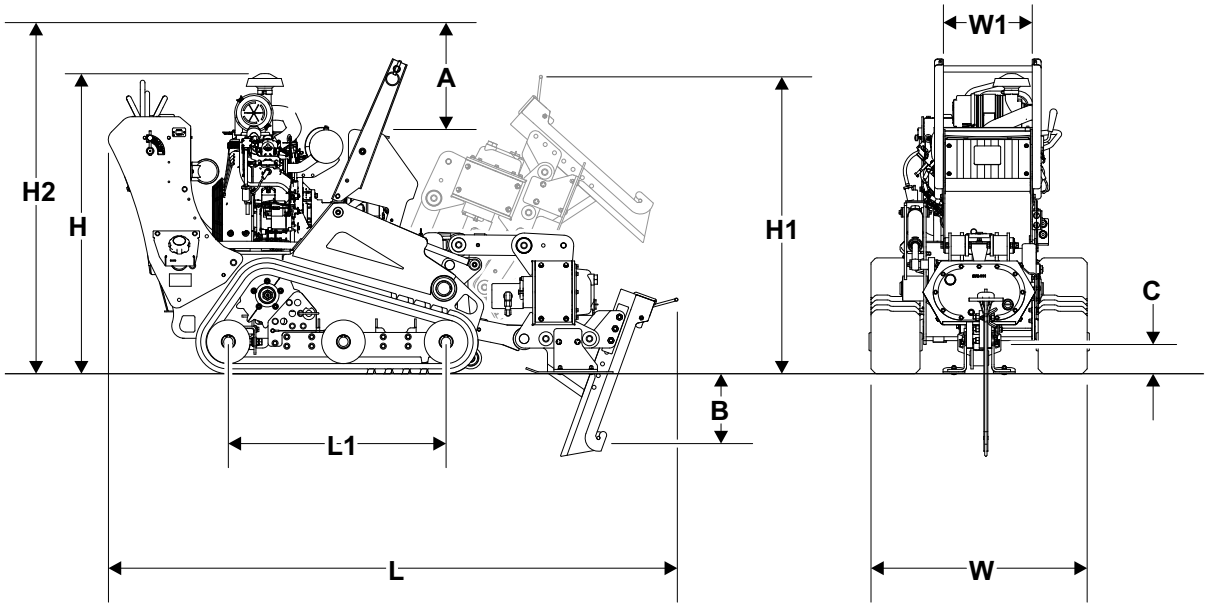
Specifications are called out according to SAE recommended practices. Specifications are general and subject to change without notice. If exact measurements are required, equipment should be weighed and measured. Due to selected options, delivered equipment may not match that shown.

Chapter Contents

VP30 88

Declarations of Conformity 92

VP30



t56om031h.eps

Dimensions		US	Metric
A	Diameter of product reel, max	20 in	50.8 cm
B	Plow depth, max	1 ft	30.48 cm
C	Ground clearance with plow in stow, min	6 in	15.2 cm
H	Machine height	48 in	122 cm
H1	Plow blade height in stow	47 in	119.4 cm
H2	Max height with max reel diameter	59 in	150 cm
L	Machine length, max	91 in	231.1 cm
L1	Wheelbase	35 in	88.9 cm
W	Machine width	35 in	88.9 cm
W1	Product reel width, max	14 in	35.6 cm

Operation		US	Metric
Ground drive speed			
	Forward	1.41 mph	2.27 km/h
	Reverse	1.43 mph	2.3 km/h
Ground pressure 7 in (180 mm) tracks		4.1 psi	0.28 bar
Approach angle: plow blade dependent			
	with adjustable feed blade	35°	35°
Machine weight (fluids full)		1993 lb	904 kg
Reel carrier internal width		14.25 in	361.95 mm
Reel carrier capacity		21 lb	95.25 kg

31-Hp (23.1-Kw) Engine		US	Metric
Briggs & Stratton® 31 HP Vanguard™			
	Fuel	gasoline	
	Cooling medium	air	
	Number of cylinders	2	
	Displacement	54.7 in^3	0.90 L
	Bore	3.37 in	86 mm
	Stroke	3.07 in	78 mm
Manufacturer's net power rating @3600 rpm (per SAE J1940)		31 hp	23.1 kW
Rated speed		3600 rpm	3600 rpm
Fuel consumption		2.44 gph	9.4 L/h
Max 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.

33-Hp (24.6-Kw) Engine		**US**	**Metric**
Briggs & Stratton® 33 HP Vanguard™			
	Fuel	gasoline	
	Cooling medium	air	
	Number of cylinders	2	
	Displacement	60.59 in^3	993 cm^3
	Bore	3.37 in	86 mm
	Stroke	3.41 in	86.6 mm
Manufacturer's net power rating @3600 rpm (per SAE J1940)		33 hp	24.6 kW
Rated speed		3600 rpm	3600 rpm
Fuel consumption		2.44 gph	9.4 L/h
Max 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

Hydraulic System		**US**	**Metric**
Dual pump total capacity		13 gpm	49.2 L/min
Auxiliary circuit: double gear pump			
	Pressure	3000 psi	207 bar
	Flow rate, pump 1	13.25 gpm	60.3 L/min
	Flow rate, pump 2	3.74 gpm	17.0 L/min
Ground drive: dual hydrostatic pumps			
	Pressure	2500 psi	172 bar

Fluid Capacities	**US**	**Metric**
Fuel tank	6.2 gal	23.5 L
Engine oil	2.3 qt	0.95 L
Hydraulic reservoir	11.5 gal	43.5 L
Hydraulic system	11.5 gal	43.5 L

Noise Level	
Operator sound pressure per ISO 6394	103dBA ±2dBA
Exterior sound power per ISO 6393	105dBA ±2dBA
Actual noise emission in jobsite conditions could be different. Always wear appropriate hearing protection when operating the machine.	

Vibration Levels	
Operator hand/arm	4.1m/s²±2m/s²
Vibration levels listed are for typical operation. Actual jobsite conditions could be different.	

EU Declaration of Conformity

The Charles Machine Works Inc., PO Box 66, 1959 West Fir Avenue, Perry, Oklahoma, USA, declares that the following unit(s):

Model	Serial Number	Description
XXXXX	XXXXXXXXXXXXXXXX	Trencher

Conform(s) to the following directives:

2006/42/EC (Machinery Directive), 2014/30/EU (Electromagnetic Compatibility Directive), and
2000/14/EC (Noise Emission Directive)

Each model listed has been evaluated with the following standards and/or other normative documents:

EN 474-1:2022
EN 474-10:2022
EN ISO 13766-1:2018

Data for 2000/14/EC Noise Emission Directive:

Model	Classification	Measured Sound Power (dBA)	Guaranteed Sound Power (dBA)	Engine Speed (rpm)	Engine Power (kW)
XXXXX	Trencher	XXX	XXX	XXXX	XXX

Determined in accordance with ISO 6393:2008.
Conformity Assessment: Annex V

The Technical Construction File is maintained at the manufacturer's location.

This declaration has been issued under the sole responsibility of the manufacturer.
The object of the declaration is in conformity with relevant Union harmonization legislation.

Certified:

Authorized Representative:

Marcel Dutrieux
Manager European Product Integrity
Toro Europe NV
Nijverheidsstraat 5
2260 Oevel
Belgium

Engineering Director
1959 West Fir Avenue
Perry, OK 73077, USA

Date _____

UK Declaration of Conformity

The Charles Machine Works Inc., PO Box 66, 1959 West Fir Avenue, Perry, Oklahoma, USA, declares that the following unit(s):

Model	Serial Number	Description
XXXXX	XXXXXXXXXXXXXXXX	Trencher

Conform(s) to the following UK national laws:

S.I. 2001 No.1701 (Noise), S.I. 2008 No.1597 (Machinery Safety), and S.I. 2016 No.1091 (EMC).

Each model listed has been evaluated with the following standards and/or other normative documents:

EN 474-1:2022
EN 474-10:2022
EN ISO 13766-1:2018

Data for Noise Regulation (S.I. 2001 No. 1701)

Model	Classification	Measured Sound Power (dBA)	Guaranteed Sound Power (dBA)	Engine Speed (rpm)	Engine Power (kW)
XXXXX	Trencher	XXX	XXX	XXXX	XXX

Determined in accordance with ISO 6393:2008.
Conformity Assessment: Schedule 8

The Technical Construction File is maintained at the manufacturer's location.

This declaration has been issued under the sole responsibility of the manufacturer.
The object of the declaration is in conformity with relevant UK legislation.

Certified:

Authorized Representative:

Marcel Dutrieux
Manager European Product Integrity
Toro U.K. Limited
Spellbrook Lane West
Bishop's Stortford
CM23 4BU
United Kingdom

Engineering Director
1959 West Fir Avenue
Perry, OK 73077, USA

Date _____

Support

Registration

If your equipment was purchased through a Ditch Witch dealer, it is already registered. If you purchased from any other source, please email productsupportwarrantyadmin@ditchwitch.com or fill out the registration card located in the back of the parts manual. Registration enables you to receive updates on this equipment as well as information on new products of interest.

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, maintenance, and repair of your equipment.

Ditch Witch Training

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

Warranty

Ditch Witch Equipment and Replacement Parts
Limited Warranty Policy

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

Exclusions from Product Warranty

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

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

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

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

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

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

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

First version: 1/91; Latest version: 7/19