16HP DITCH WITCH TRENCHER ON TRACKS, OPERATION AND SAFETY.

Intended Use

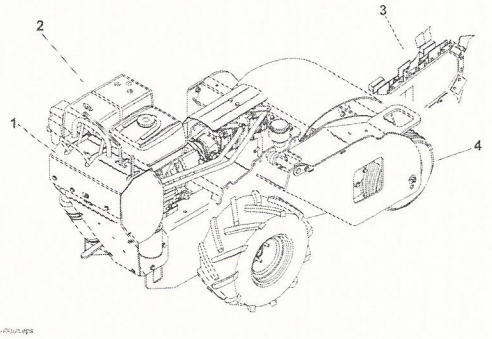
The RT12, RT16, RT20, and RT24 pedestrian trenchers are designed to install buried cable and pipe to depths of 48" (1220 mm) and widths of 8" (200 mm). These units are intended for operation in ambient temperatures from 20° to 115°F (-7° to 46°C). Use in any other way is considered contrary to the intended use.

RT12, RT16, RT20, and RT24 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



1. Control console
2. Engine
3. Digging boom and chain
4. Trail wheel

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 all controls and turn ignition switch to STOP.

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 order and degree of action will depend on the situation.

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

If a Fiber Optic Cable is Damaged

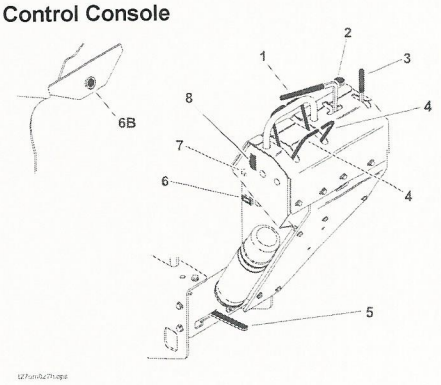
Do not look into cut ends of fiber optic or unidentified cable. Vision damage can occur.

If Machine Catches on Fire

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

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

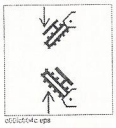
Control Console



1. Digging chain/Roto Witch® control
2. Selector valve control (Roto Witch® option)
3. Boom lift control
4. Speed/direction controls
5. Parking brake lever
6. Hourmeter/tachometer (RT16 option)

6B. Hourmeter (RT 12 option)

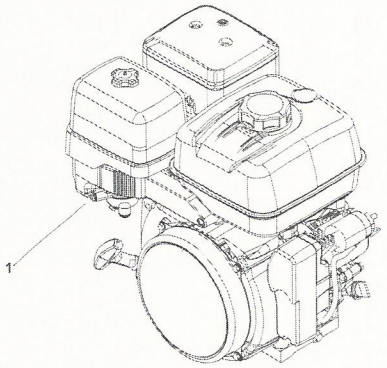
7. Ignition Switch (RT12)
8. Throttle switch (RT12)

Item	Description	Notes
1. Digging chain control  	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.	**NOTICE:** Trenching movement is always backward (toward you). **NOTICE:** To dislodge obstructions, reverse chain. **NOTICE:** Do not attempt to travel with digging chain control pulled up (chain in reverse position).
2. Selector valve control 	Optional selector valve control used on units equipped with Roto Witch to change function of digging chain control. To select drill mode, pull up. To select dig mode, push down.	
3. Boom lift control 	To lower boom, push. To raise boom, pull.	**NOTICE:** Keep digging boom low when operating on a slope or transporting. Drive slowly and cautiously at all times.

Item	Description	Notes
4. Speed/direction controls 	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.	**NOTICE:** Trenching movement is always backward (toward you).
5. Parking brake 	To engage parking brake, move lever to the right. To disengage parking brake, move lever left to notch.	**IMPORTANT:** • Move unit slightly to ensure parking brake pins are engaged. • It might be necessary to move unit slightly to disengage parking brake.

Item	Description	Notes
6. Hourmeter/tachometer (RT16 option)  **6B. (RT12 option)** 	Displays engine operating time and engine speed.	Use engine operating times to schedule service.
7. Ignition switch (RT12) 	To start engine, turn key all the way clockwise. Release key as engine starts. To stop engine, turn key counterclockwise.	
8. Throttle control (RT12) 	To increase engine speed, press bottom. To decrease engine speed, press top.	Start unit with throttle switch in the low position.

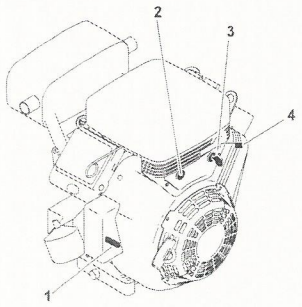
RT12 Engine Controls



1. Fuel shut-off valve

Item	Description	Notes
1. Fuel shut-off valve 	To stop fuel flow from fuel tank to engine, slide lever away from engine. To allow fuel flow, slide lever toward engine.	Close valve when transporting unit to or from jobsite, or whenever machine is parked.

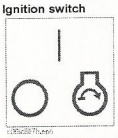
RT16 Engine Controls



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

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

Item	Description	Notes
2. Choke control 	To close choke valve, pull choke control.	This valve can be closed to enrich air/fuel mixture and help start cold engine. Open choke valve after engine runs for a few seconds.
3. Ignition switch 	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 	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.

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

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 34.)
- traffic
- access
- soil type and condition

Identify Hazards

Identify safety hazards and classify jobsite. See "Classify Jobsite" on page 34.

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

NOTICE:

- Wear personal protective equipment including hard hat, safety eye wear, and hearing protection.
- Do not wear jewelry or loose clothing.
- Notify One-Call and companies which do not subscribe to One-Call.
- Comply with all utility notification regulations before digging or drilling.
- Verify location of previously marked underground hazards.
- Mark jobsite clearly and keep spectators away.

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

Classify Jobsite

Inspect Jobsite

- Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.
- Contact 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

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

Apply Precautions

Once classified, precautions appropriate for jobsite must be taken.

Electric Jobsite Precautions

Use one or both of these methods.

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

Natural Gas Jobsite Precautions

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

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

Crystalline Silica (Quartz) Dust Precautions

NOTICE: Cutting, drilling, or working materials such as concrete, sand, or rock containing quartz may result in exposure to silica dust. Use water spray or other means to control dust. If workers are exposed to dust they must wear appropriate breathing protection. Silica dust may cause lung disease and is known to the State of California to cause cancer.

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.

Start Unit

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

⚠WARNING Explosion possible.

Using starting fluids will cause ignition in the intake manifold.

3. Move throttle to 1/4 open.

   RT12: Set throttle switch to low.
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. During warm-up, check that all controls work properly.

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

Drive

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

1. Disengage parking brake.

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

2. Pull boom control to raise digging boom.
3. Move throttle to 3/4 open.

   RT12: Set throttle switch to high/full.
4. Move speed/direction control in direction of preferred travel. Ground speed increases with control movement.

Shut Down

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

NOTICE: Machine should not be parked on a slope unless chocked, blocked, or parking brake engaged.

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

NOTICE: Cutting, drilling or working materials such as concrete, sand, or rock containing quartz may result in exposure to silica dust. Use water spray or other means to control dust. If workers are exposed to dust, they must wear appropriate breathing protection. Silica dust may cause lung disease and is known to the State of California to cause cancer.

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

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

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

NOTICE:

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

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

Trench

IMPORTANT:

- Position backfill blade in upright "stowed" position for transporting, keeping digging boom low to the ground. Remove blade for trenching and reinstall for backfilling.
- See "Counterweights" on page 66 for proper counterweights for your unit configuration.

1. Remove backfill blade, if equipped.
2. Drive trencher 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.

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

NOTICE:

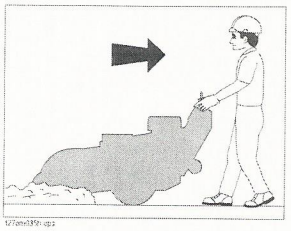
- Keep everyone at least 6' (2 m) from machine, digging boom, and its range of movement.
- Machine may move when chain starts to dig. Allow 3' (1 m) between end of chain and obstacle.
- Digging chain on top side of boom can catch on root or rock, forcing handlebar down suddenly. Stand back from console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

5. Push digging chain control to dig position. DIGGING CHAIN WILL MOVE.

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

IMPORTANT: Trenching movement is toward you.

6. Increase engine speed to **full throttle**.



7. Push boom control to slowly lower digging boom to desired trench depth.
8. Move speed/direction control slowly to desired speed.

IMPORTANT:

- Do not make sharp turns. Lower boom to full depth when turning.
- If an object becomes lodged in chain, move attachment speed/direction control to neutral and raise boom slightly. Reverse chain direction. If object must be removed manually, turn engine off and engage parking brake.

9. When trench is complete, release speed/direction controls.
10. Move throttle to half open.
11. Pull boom control to raise digging boom to top of trench.
12. Release digging chain control.
13. Reinstall backfill blade in work position for backfilling. After backfilling is completed, position blade in upright "stowed" position for transporting, keeping digging boom low to ground.
14. Drive away from trench.
15. See page 39 for shutdown procedure.