Microtrenching

MT12
MicroTrench®



CE

CMW®

Issue 1.0
Original Instruction

053-2393

Foreword

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

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

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

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

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

Thank you for buying and using Ditch Witch equipment.

Microtrenching
MT12 MicroTrench®

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Part number 053-2393

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Ditch Witch®, Ditch Witch, CMW, AutoCrowd, Modularmatic, Jet Trac, Roto Witch, Subsite, Fluid Miser, Perma-Soil, Power Pipe, Super Witch, Super Witch II, Pierce Airrow, The Underground, and The Underground Authority Worldwide are registered trademarks of The Charles Machine Works, Inc.

Intended Use

The Ditch Witch® MT12 MicroTrench® is an attachment designed install buried service lines and cables in a trench 0.75-1.25 in (19-32 mm) wide and 6-12.5 in (165-318 mm) deep. Microtrenching typically occurs in asphalt and concrete jobsites. The attachment is designed for operation with a Ditch Witch RT45 or RT55 tractor equipped for microtrenching. Using a Ditch Witch FX60 vacuum excavation unit to remove spoils is optional.

The MT12 MicroTrench is designed for use in temperatures typically experienced in earth moving and construction work environments. Provisions may be required to operate in extreme temperatures. Contact your Ditch Witch dealer. Use in any other way is considered contrary to the intended use.

The MT12 MicroTrench should be used with genuine Ditch Witch blades, bits, and bit holders. It should be operated, serviced, and repaired only by persons familiar with its particular characteristics and acquainted with the relevant safety procedures.

Equipment Modification

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

About This Manual

This manual contains information for the proper use of the MT12 MicroTrench. For more information about tractor controls or vacuum unit controls, see RT45 Operator's Manual, the RT55 Operator's Manual, or FX60 Operator's Manual. 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.

Microtrenching



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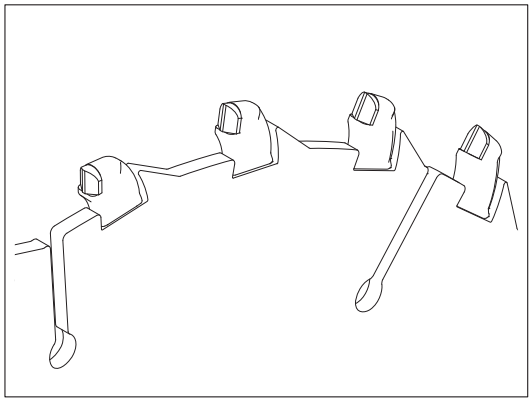
About Blades

Blade Description

The following blades are available for use with the Ditch Witch MT12 MicroTrencher attachment.

0.75” (19 mm) Shark, 24T Saw Blade (301-1096)

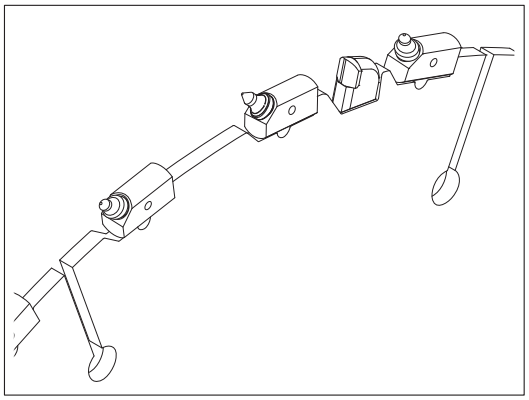
- Cuts a narrow trench, approximately 0.75” (19 mm) wide.
- Uses fixed carbide-tipped Sharktooth bits.
- Best in relatively soft conditions. Not recommended for hard digging.
- Resists abrasive wear.
- Cuts smooth and allows fast trenching speed in appropriate conditions.
- Bit life is highly dependent upon material being cut.
- Because bits must be welded in precise locations, rebuilding is not recommended.



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0.75” (19 mm) Combo, 24T/8T Saw Blade (301-1590)

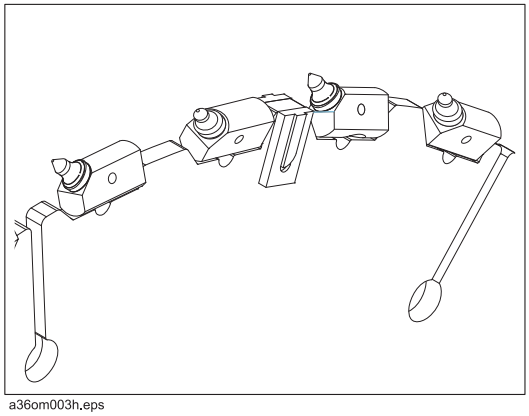
- Cuts a narrow trench, approximately 0.75” (19 mm) wide.
- Uses a combination of 10 mm rotating conical bits and fixed carbide tipped bits.
- Good in medium to hard conditions.
- Very good blade life in abrasive conditions.
- Not as fast as 0.95” (24 mm) or 1.25” (32 mm) blades.
- Rotating conical bits can be replaced. Fixed bits will last for the life of the blade in most conditions.



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0.95” (24 mm) Conical, 32T Saw Blade (301-0580)
1.25” (32 mm) Conical, 32T Saw Blade (301-0686)

- 0.95” (24 mm) blade cuts a sub-inch trench.
  1.25” (32 mm) blade cuts a trench approximately 1.25” wide.
- Trench width decreases slightly as bits wear.
- Uses 32 replaceable10 mm rotating conical carbide full-cap bits.
- Good general purpose blade.
- Good trenching speeds in most conditions.
- Wear bars can be replaced or additional wear bars can be added for abrasive conditions.



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Blade Performance

This chart is meant as a guideline only. No one blade works well in all conditions. See your Ditch Witch dealer for soil conditions and blade recommendations in your area.

Cutting Conditions	
soft	old weathered asphalt over compacted soil base
soft abrasive	asphalt with soft aggregate over fine, hard gravel or sand base
hard	asphalt with hard aggregate
hard abrasive	asphalt with hard aggregate over sandy soil or hard gravel base
concrete	**NOTICE**: While the MT12 MicroTrench system may be used to cut concrete, doing so will shorten the life of the bits and blade, particularly if the concrete contains rebar.

Rating Scale
1 = best
2 = better
3 = good
4 = fair
5 = not recommended

Saw Blade	Performance	Asphalt Aggregate				Concrete
		Soft	Soft Abrasive	Hard	Hard Abrasive	
 0.75” Shark blade with 24 fixed, carbide-tipped bits (301-1096)	**cutting speed**	1	1	2	2	3
	blade wear	1	2	4	4	5
 0.75” Combo blade with 24 rotating conical bits and 8 fixed bits (301-1590)	**cutting speed**	3	3	3	3	4
	bit life	2	2	3	3	4
	blade wear	1	1	2	2	3
 0.95” Conical blade with 32 rotating conical bits (301-0580)	**cutting speed**	2	2	2	2	3
	bit life	1	1	2	2	3
	blade wear	2	3	2	3	4
 1.25” Conical blade with 32 rotating conical bits (301-0686)	**cutting speed**	2	2	2	2	3
	bit life	1	1	2	2	3
	blade wear	2	3	2	3	4

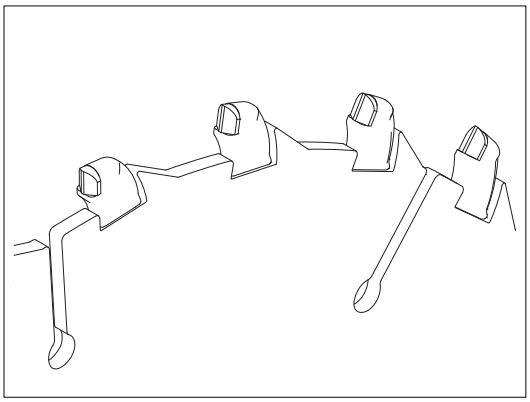
Blade Components

Ditch Witch MicroTrench blades are made of bits, bit holders, and wear bars. Inspect blade components often while trenching to extend the life of the blade and maintain trench width and quality.

Bits

Carbide coated bits are the key to consistent and efficient cutting with the MicroTrench System. Your blade may have fixed bits, rotating bits, or a combination.

Fixed bits are welded to bit holders that are part of the blade. These bits are carbide-tipped and do not rotate. When fixed bits become excessively worn and no longer cut efficiently, replace the entire blade.

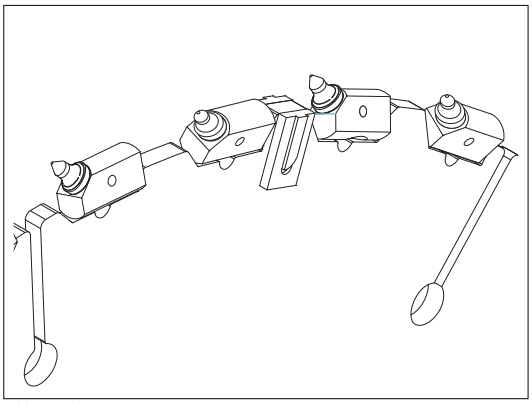


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Rotating conical bits attach to bit holders with a roll pin. These bits are made with full carbide caps that help protect bit holders from wear.

Check bits frequently to ensure they freely rotate in bit holders, especially when cutting in new or unfamiliar conditions. Replace bits when carbide becomes dull or excessively worn. Trenching with worn bits reduces trenching efficiency, increases load on equipment, and exposes bit holders to digging conditions, which reduces blade life.

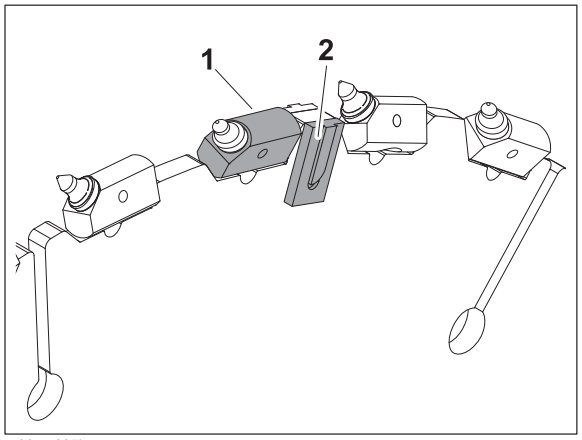
Use the Ditch Witch Bit Gauge (301-1507) to measure bit wear. See “Rotating Conical Bits” on page 20.



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Bit Holders



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Bit holders (1) keep rotating bits in place. If bit holders wear excessively, the tail of the bit will be exposed digging conditions. If the tail of the bit wears away, the bit will fall out of the holder. A blade is worn out when bits will no longer stay in the holders long enough to obtain the full wear life of the bit.

To extend blade life in very abrasive conditions, use a hard-facing welding rod to place a small bead at the front of the bit holder as shown. This added hard-facing will protect the tail of the bit. See procedure on page 21.

Wear Bars

Wear bars (2, above) are installed on the side of the blade to protect bit holders and extend blade life. If needed, worn wear bars may be cut off and replaced with new ones. In extremely abrasive conditions, additional wear bars may be installed between existing ones. All wear bars should be installed at the same distance from the center of the blade.

NOTICE: DO NOT weld wear bars over relief slots.

Use the Ditch Witch Bit Gauge (301-1507) to measure wear bar material. See “Wear Bars / Hard-Surface Material” on page 21.

Setup

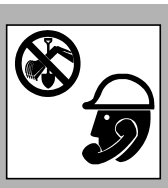
EMERGENCY SHUTDOWN - Turn ignition switch to STOP.



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

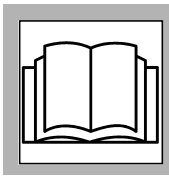
NOTICE: Use attachments or counterweights to make front and rear loads balance when all attachments are raised. Contact your Ditch Witch dealer about counterweighting for your equipment.





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

NOTICE: Comply with all utility notification regulations before digging or drilling.



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

Before First Use and After Replacing Bits

NOTICE: Unless otherwise instructed, all service should be performed with microtrencher attachment raised and **tractor off** and parking brake set.

Check Bit Clearance

For blades using 10 mm rotating conical bits

1. Remove blade cover.
2. Check that all bits are properly secured.
3. Check that all bit retaining pins are secure.
4. Ensure blade retaining nut is tight.
5. Turn blade by hand and make sure bits do not hit metal frame.

   Note: If new bits and deflectors are installed, it is normal for bits to hit the deflectors until a portion of the deflector is worn away.

6. If bits hit frame, repeat steps 2-5 to make sure bits are in the proper location and secured at proper depth.
7. If bits do not hit frame:
   - Install blade cover.

     NOTICE: Do not operate microtrencher with blade cover removed.

   - Fasten and adjust seat belt.
   - Start tractor and adjust throttle.
   - Raise microtrencher slightly.
   - Use attachment speed/direction control to rotate blade slowly. Listen for clicking sounds. If clicking is present, turn off tractor and repeat steps 1-6.

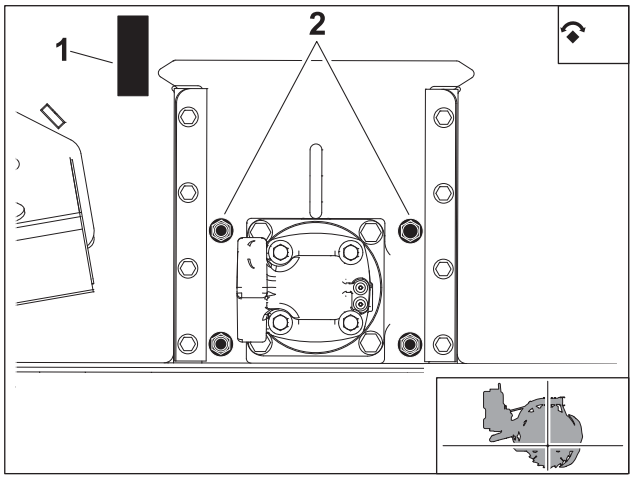
Normal Use

1. Fasten and adjust seat belt.
2. Start tractor. See Operator's Manual for tractor operation procedures.
3. Raise blade and drive to starting point. Move in line with planned trench.
4. Lower backfill blade.
5. Engage parking brake.
6. Lower blade to just above ground.
7. Check that blade is in line with planned trench and that tires are pointing straight ahead.

Adjust Trench Depth

Blade

1. Shut down tractor and remove blade (see page 22.)
2. Remove 4 bolts (2).
3. Lift or lower blade motor to desired depth. Use the depth decal (1) as a guide.
4. Install bolts and tighten nuts to 200 ft-lb (271 N-m).



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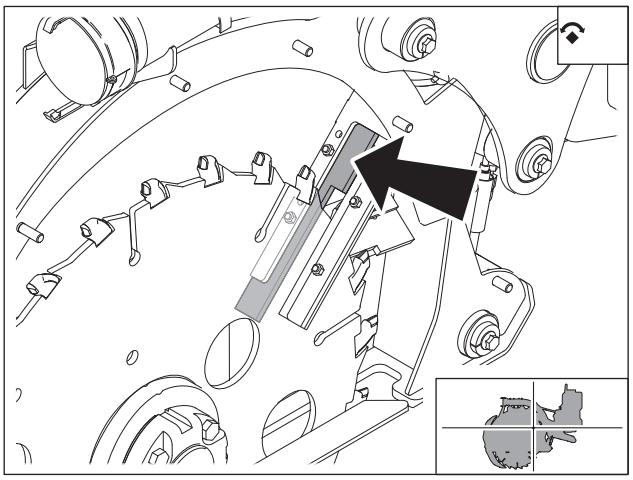
Spoils Deflector

1. Remove blade cover.
2. Remove bolts and nuts that retain the inside spoils deflector.
3. Position spoils deflector.

IMPORTANT: For best spoils removal, set the spoils deflector as close to the blade as possible.

4. Install bolts and tighten nuts firmly.

NOTICE: Overtightening nuts will distort deflector.

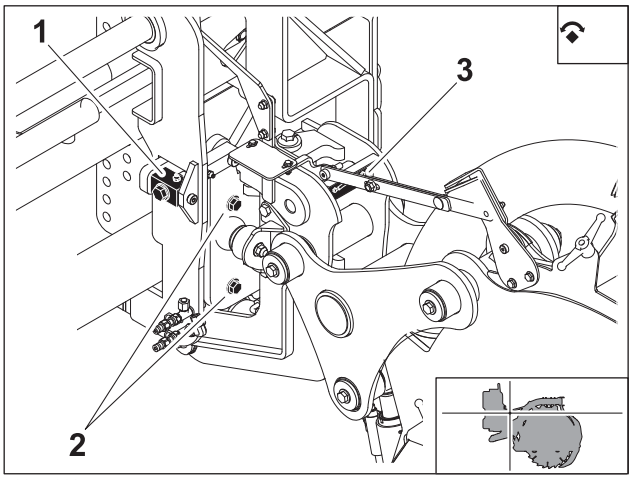

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Adjust Tilt

IMPORTANT: Microtrenching requires good contact between the microtrencher frame and the surface being cut. Use lift control, level control, and manual tilt to adjust microtrencher to match jobsite conditions.

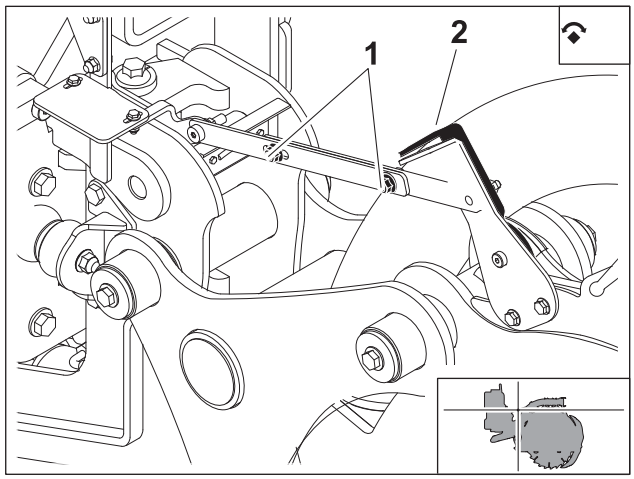
1. Lower blade and turn off tractor.
2. Loosen 4 clamp bolts (2, and two on other side of mount).
3. Adjust manual adjustment turn screw (1) and watch bubble level (3) until desired tilt is achieved.
4. Tighten clamp bolts.



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Adjust Level Indicator

1. Shut down tractor and remove blade. (See page 22.)
2. Using lift control and level control, position base of microtrencher flat on pavement.
3. Loosen bolts (1) in adjustable link and align moving pointer (2) with fixed pointer.
4. Tighten bolts.



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Prepare Spoils Removal

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

NOTICE: Do not operate without blade cover and chutes or chute plates installed.

The MT12 MicroTrencher is designed to operate optimally with an 800 cfm vacuum excavator unit to remove spoils. If vacuum excavator is not available, set up unit to operate without it.

With Vacuum Excavator

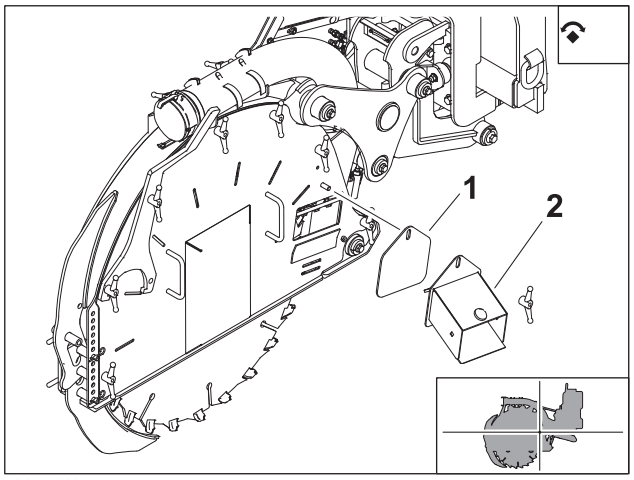
1. Connect vacuum hose on excavator to vacuum hose on tractor.
2. Operate vacuum unit at full speed for best results. Full vacuum flow to the microtrencher is necessary for best spoils removal.

IMPORTANT: Ensure that vacuum hoses are clear, vacuum filters are clean, and separator canister is empty prior to operation.

Without Vacuum Excavator

1. Cap vacuum hose on tractor.
2. Remove chute plates (1).
3. Install spoils chutes (2).

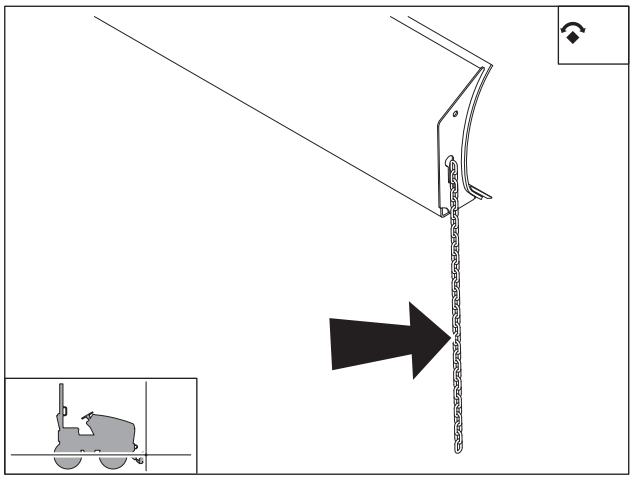
IMPORTANT: Note orientation of spoils chute as indicated by decal on chute.



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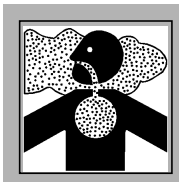
Position Alignment Guide

1. Mark intended trench path with paint.
2. Attach chain to backfill blade.
3. Adjust backfill blade until chain is in line with microtrencher blade.
4. Monitor chain periodically while trenching to ensure chain follows paint line during operation.
5. Remove chain from backfill blade before transporting tractor.



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Operation



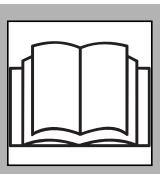
⚠ WARNING Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

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.

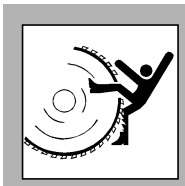
NOTICE: Use attachments or counterweights to make front and rear loads balance when all attachments are raised. Contact your Ditch Witch dealer about counterweighting for your equipment.



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

NOTICE:

- Never operate microtrencher without blade cover installed.
- Keep everyone away from machine.



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

NOTICE:

- Machine might jerk when digging starts. Allow 3’ (1 m) between digging teeth and obstacle.
- Keep everyone at least 6’ (2 m) from machine, attachments, and their range of movement.

IMPORTANT:

- Before operating microtrencher, check bits for free rotation. Tap bits lightly and turn by hand. If bits are stuck, remove and clean packed soil from bit block.
- Work slowly and carefully.
- Microtrencher is not recommended for soft, wet, or sticky soil conditions.

Begin Trenching

1. Adjust throttle to low idle.
2. Lower backfill blade to ground.
3. Move attachment speed/direction control to desired speed. BLADE WILL TURN.
4. Increase engine speed to full throttle.
5. Slowly lower microtrencher to full depth.



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

IMPORTANT:

- When possible, lower microtrencher into softer material then move into harder or abrasive material. For example, lower microtrencher into dirt at shoulder before cutting across road.
- Apply down force at the back of the microtrencher and ensure front of frame is in contact with or slightly above the ground.

6. Raise backfill blade.
7. Release parking brake.
8. Use ground drive control to set trenching speed.

IMPORTANT:

- Ground drive speed/direction can be controlled with foot pedal or hand lever. When trenching, set ground drive speed with hand lever. Use foot pedal to temporarily adjust speed if digging conditions change for a short distance.
- Release swing lock when cutting curved trenches.
- If a curved trench tighter than a 40’ (12.2 m) radius must be cut, make a series of straight cuts.

NOTICE: Do not attempt to trench a radius smaller than 40’ (12.2 m). Serious damage to microtrencher and/or blade may result.

Stop Trenching

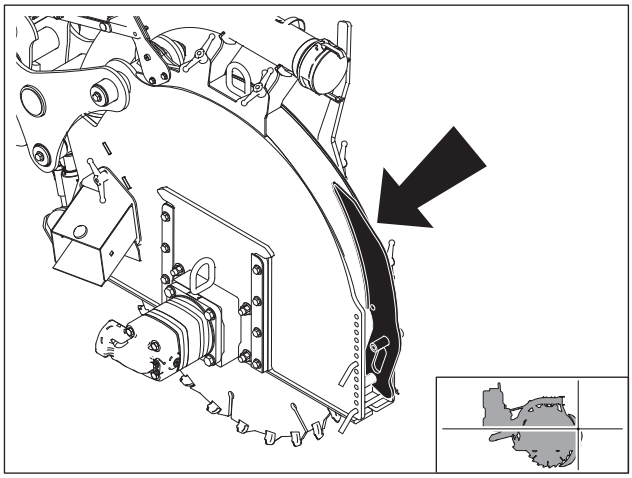
1. When trench is complete, move ground drive control to neutral and adjust throttle to low idle.
2. Raise microtrencher.
3. As blade clears top of trench, move attachment speed/direction control to neutral.
4. Drive a short distance away from work site.
5. Shut down tractor. See page 69 for correct shutdown procedures.
6. Wash bits and mounting blocks with high pressure water before parking unit overnight.

Using a Trench Cleaner

Use the correct trench cleaner for your blade. Two trench cleaners are available: one for blades 1” (25 mm) or less; and one for blades wider than 1” (25 mm).

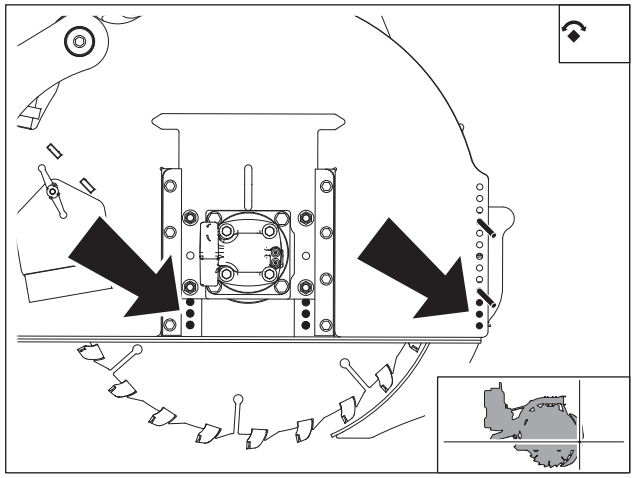
NOTICE: Do not start trench with trench cleaner in place.

1. Start trench and move forward a short distance.
2. Move ground drive to neutral and engage parking brake.
3. Raise microtrencher and stop rotation.
4. Remove trench cleaner from stowed position (shown).


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5. Set trench cleaner to desired depth by matching number of holes below trench cleaner mounting pin to number of holes below blade motor, as shown. Trench cleaner should be close to, but not touching, blade.

NOTICE: Operating microtrencher with trench cleaner in the wrong position can damage trench cleaner or blade.


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6. Start blade rotation and slowly lower microtrencher into trench to continue trenching.
7. When finished, stop trenching and return trench cleaner to stowed position.

Maintenance

Inspect Blade and Bits

Remove blade cover and inspect blade and bits for wear every 100’ (30.5 m), or when performance declines.



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

NOTICE: Blade and bits will be hot after trenching.

Fixed Bits

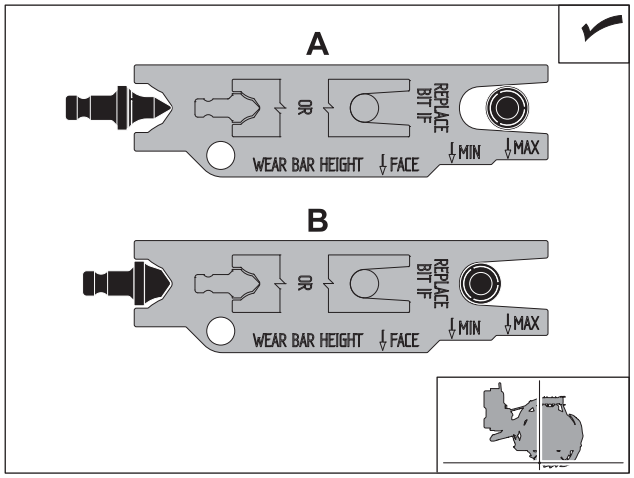
Replace blade when bits are worn. See “Change Blade” on page 22.

Rotating Conical Bits

- Check that all bits are rotating freely in bit blocks. If bits are stuck, tap with a brass or rubber mallet.
- Use gauge (shown, p/n 301-1507) to check bit condition. Replace bits when carbide components become dull or excessively worn.

  A: Bits okay.

  B: Replace bits if outer diameter or length is excessively worn as indicated by gauge.



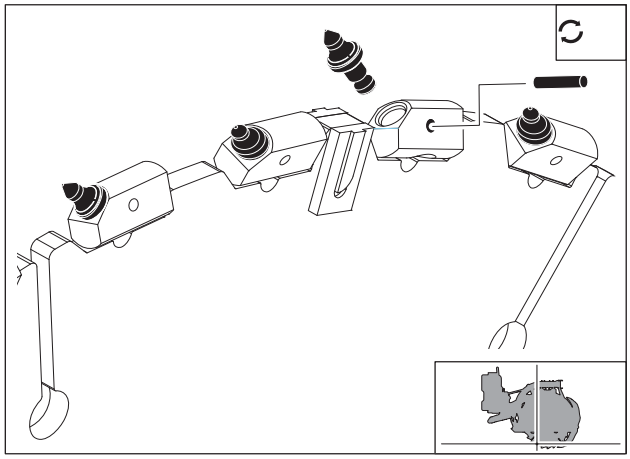
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NOTICE: When installing new rotating bits:

- Always replace bits in complete sets; do not mix worn bits and new bits on the same blade.
- Always use new roll pins.

To replace bits:

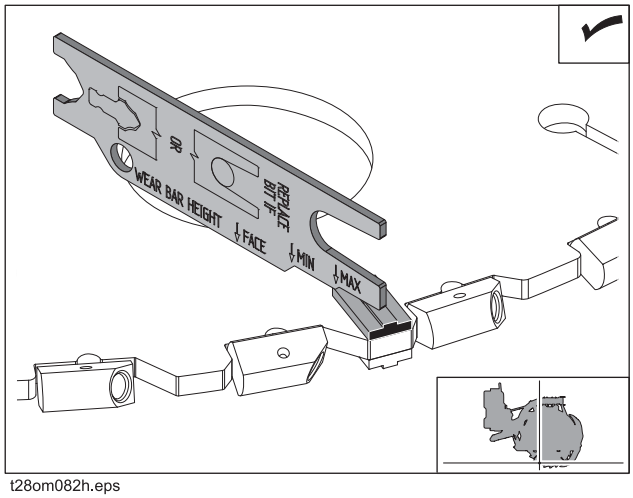
1. Drive out roll pin and remove old bit.
2. Install new bit into holder and drive in new roll pin.


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Wear Bars / Hard-Surface Material

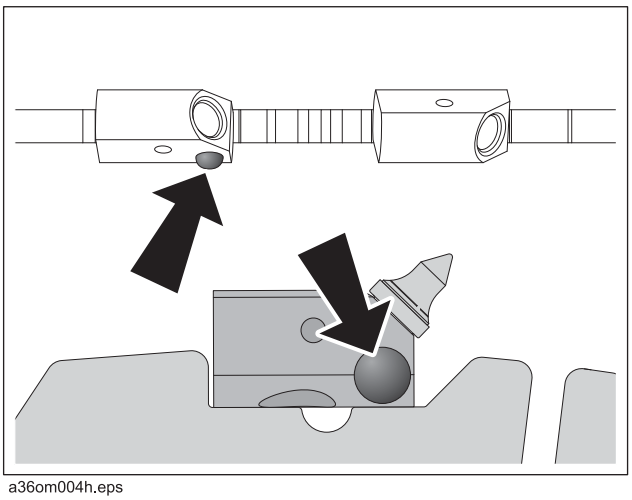
Use gauge (shown, p/n 301-1507) to check thickness of wear bars/hard-surface material on blade. Replace wear bars when the height of the wear bars is no longer 0.18” - 0.25” (4.5 - 6 mm) above the face of the blade.To measure:

1. Place the bit gauge across the top of the bit holders.
2. Check the step gauge: If the face of the wear bar is below the minimum indicator, replace the wear bar.



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To protect bits when digging in very abrasive conditions, use a hard-facing welding rod to place a small bead at the front of bit holders as shown. Bead should of not extend past the MAX wearbar measurement on gauge.

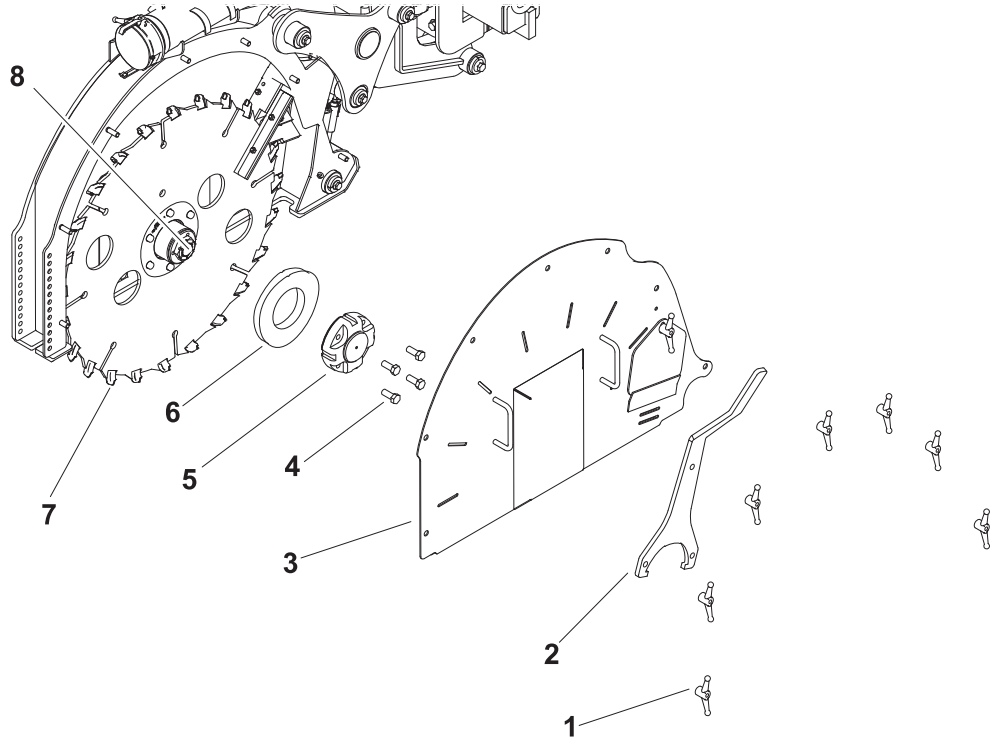

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Change Blade



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

NOTICE: Blade and bits will be hot after trenching.



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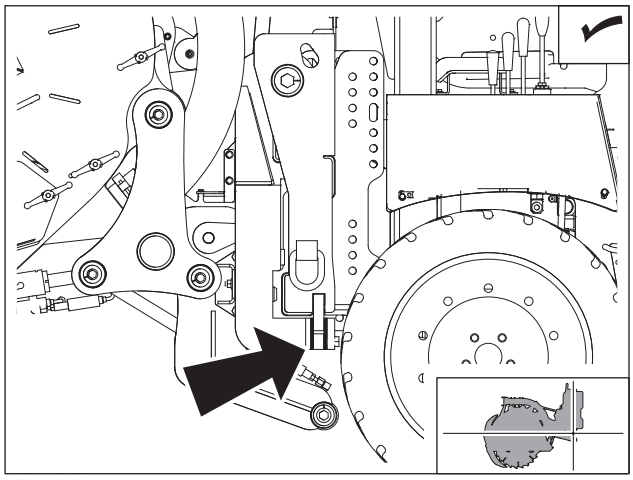
1. Start tractor, position microtrencher slightly above ground, then shut down tractor.
2. Remove 7 wingnuts (1), spanner wrench (2), and cover (3).
3. Loosen clamp bolts (4) and use spanner wrench (2) to remove large nut (5). (Insert a pry bar through cutout in blade to keep blade from turning.)
4. Remove spacer (6) and blade (7).
5. Clean threads on hub (8) and nut (6). Apply a dry lubricant such as graphite or silicone to threads.
6. Install new blade (note direction of rotation), spacer (6), and large nut (5).
7. Use spanner wrench to fully tighten large nut (5).
8. Tighten bolts (4) to 100-120 ft-lb (135-160 N-m).
9. Loosen bolts (4) and repeat steps 7 and 8.
10. Install cover, spanner wrench, and wingnuts.

IMPORTANT:

- Do not use petroleum-based lubricant which can attract and hold dust and grit in threads.
- Do not tighten large nut when blade has contact with ground. Blade may not be straight.

Inspect Slide Plate

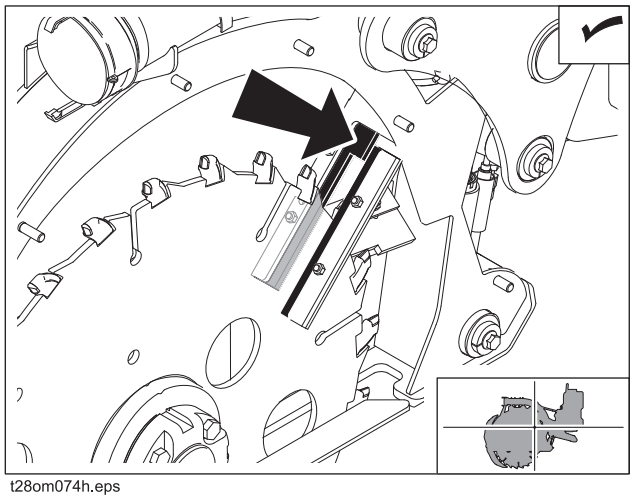
Inspect side plate for wear every 10 hours. Replace as needed.



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Inspect Spoils Deflectors

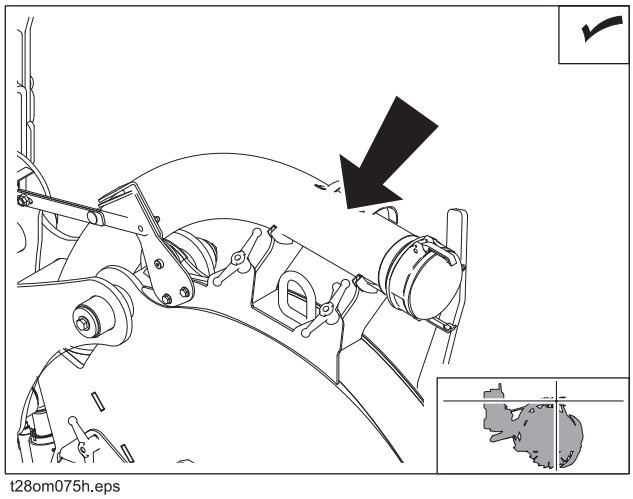
If not using a vacuum system for spoils removal, inspect spoils deflectors inside microtrencher frame every 10 hours. Clean vacuum chute and replace deflectors as needed.



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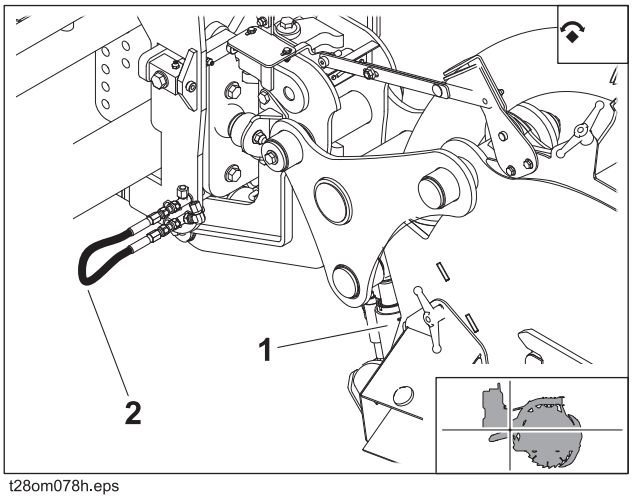
Check Trencher Vacuum Hoses

If using a vacuum system for spoils removal, check inside of hoses for caked spoils every 10 hours. Clean as needed.



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Bleed Level Cylinder



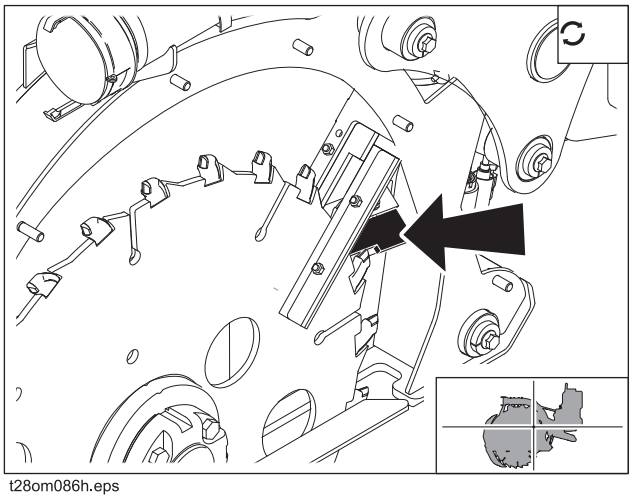
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Bleed air from level cylinder whenever the hydraulic hoses have been disconnected, or when excessive bounce is noticed.

To bleed cylinder:

1. Remove blade (see page 22).
2. Start tractor.
3. Use level control to fully retract level cylinder (1) until it is vertical.
4. Use lift control to lower rear of microtrencher to just above the ground.
5. Shut down tractor and operate controls to relieve residual pressure in the level cylinder circuit.
6. Connect jumper hose (2, p/n 350-2479) to test ports on left side of microtrencher.
7. Start tractor and set throttle to low speed.
8. Push level control to slowly extend cylinder to full length. Hold lever at full range for 10 seconds. Air trapped at top of cylinder will return to tank.
9. Pull control lever to slowly retract cylinder. Hold lever for 10 seconds. Air trapped at bottom of cylinder will return to tank.
10. Repeat steps 7 and 8.
11. Shutdown tractor and remove jumper hose.

Change Spoils Deflector


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If not using vacuum system for spoils removal, change spoils deflectors when excessive spoils are left inside trench. Deflector is most effective when it fits next to the blade.

To change:

1. Remove cover.
2. Replace all old spoils deflectors on saw frame, cover, and spoils chutes, noting orientation on decal on spoils chute.
3. Install cover.